



深圳锐沣科技有限公司

深圳锐沣 RF4030 打印机使用说明书

User Manual for Rayform RF4030 Printer



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一、目的 Purpose

通过明确设备注意事项、设备结构、设备操作、输入输出测试、软件安装、Rayform 软件操作，指导设备操作者进行日常设备操作使用，遇到问题时能及时参考。同时，明确固化炉的使用方法，作为产品后处理的操作指导。

This document aims to:

- **Define critical operational aspects** including equipment precautions, structural components, operating procedures, I/O port testing, software installation, and Rayform software operations;
- **Guide equipment operators** in daily usage and troubleshooting through standardized references;
- **Standardize the operating procedures for the post-curing oven**, serving as an operational guideline for product post-processing.

二、使用范围 Scope of Application

本使用说明书适用于 RF4030 系列 3D 打印机的操作使用。

This operation manual applies to the RF4030 Series 3D Printers.

三、术语及定义 Terms and Definitions

无。None.

四、主要内容 Main Content

4.1. 注意事项 Precautions

4.1.1. 室内条件 Environmental Requirements

- 1) 温度：空调常开保持室内温度 24~28℃。

Temperature: Maintain ambient temperature at 24 - 28℃.

- 2) 湿度：<65%RH。

Humidity: Less than 65% RH.

- 3) 通风：空气要流通。

Ventilation: The air should be well-circulated.

- 4) 光线：安全黄光（照度小于 80uw/cm²）。

Lighting: Use safety yellow light (illuminance < 80uw/cm²).

- 5) 电力：220V-50HZ 交流。

本设备以 220V-50HZ (±10%) 单相电源设计 (额定功率 2.5KW)。

Power Supply: 220V-50Hz (±10%) AC, single-phase (rated power: 2.5kW)

4.1.2. 操作和保养注意事项 Operational & Maintenance Precautions

- 1) 设备必须进行良好接地，以保证使用安全。

Grounding: The equipment must be properly grounded for safety.

- 2) 在检查或维修保养机器之前，必须将电源开关和总电源（断路器）置于 OFF。

注意：如果检查维修保养工作正在进行，未能将总电源（断路器）置于 OFF，机器有可能错误的启动。在这种情况下，机器有可能损坏，人身安全也处于危险中。

Power Isolation: Turn OFF the power switch and the main power (circuit breaker) before inspection or maintenance.

Warning: If the inspection and maintenance work is in progress and the main power (circuit breaker) is not turned OFF, the machine may start accidentally. In this case, the machine may be damaged and personal safety may be at risk.

3) 如果发现机器冒烟, 机器表面不正常发热或听到异常声音, 应将电源开关和总电源 (断路器) 置于 OFF, 并与本公司取得联系。

Emergency Response: If smoke, abnormal heating, or unusual noise is detected:

Immediately turn OFF the power switch and the main power (circuit breaker)
Contact our technical support team.

4) 更换零部件, 请用本公司推荐的零部件。

注意: 使用本公司推荐以外的零部件, 质量保证书不再有效。

Replacement Parts: Use only manufacturer-recommended components.

Note: Non-approved parts void the warranty.

4.1.3. 使用模型树脂的注意事项 Resin Handling Guidelines

1) 在固定地点存放树脂, 避光、避热, 并锁好。

Storage: Store the resin in a designated area, protected away from light and heat, and keep it locked.

2) 使用医用手套操作。

Wear medical-grade gloves during operation.

3) 如果皮肤接触到树脂可用肥皂水和清水冲洗。

Skin Contact: Rinse immediately with soap and water.

4) 眼睛接触: 提起眼睑, 用流动清水或生理盐水冲洗。立即就医。

Eye Contact: Flush with clean water or saline solution for 15 minutes.
Seek immediate medical attention.

5) 误食入: 饮足量温水, 催吐。立即就医。

Ingestion: Rinse mouth thoroughly and induce vomiting. Seek immediate medical attention.

4.1.4. 日常耗材 Consumables

1) 无水酒精: 模型打印出来后需要用酒精清洗。(水洗树脂、免洗树脂除外)

Anhydrous Alcohol: For post-print cleaning (excludes water-washable or self-cleaning resins).

2) 医用手套: 可以防止手直接接触酒精、树脂。

Medical Gloves: Prevent direct contact with resin/alcohol.

3) 卷纸: 擦拭模型上的酒精或树脂。

Absorbent papers: Wipe residual resin/alcohol from models.

4) 斜口铲: 辅助取出固化好的模型。

Angled Spatula: Safely remove cured models.

4.2. 设备结构 Equipment Structure

设备结构主要包括结构部件、机械运动部件、光学引擎部件、硬件控制部件、

软件控制部件五个部分。

The system comprises five core modules: Structural Components, Mechanical Motion System, Optical Engine Assembly, Hardware Control Unit, and Software Control System.

4.2.1. 结构部件 Structural Components

结构部件主要支撑光学引擎部件、机械运动部件。结构部件包括设备框架、支撑架、树脂槽、光机平台。光学引擎部件主要安装在光机平台上，机械运动部件主要安装在支撑架、设备框架上。

The structural assembly provides foundational support for both the optical engine assembly and mechanical motion system.

• It comprises:

1. Equipment Frame: Main chassis (typically aluminum alloy or steel) for rigidity.
2. Support Brackets: Reinforced mounts for motion system integration.
3. Resin Vat: for resin containment.
4. Optical Engine Mounting Platform: Precision-machined surface for DLP module installation.

• Installation Layout:

1. Optical Engine Assembly: Mounted on the Optical Engine Mounting Platform.
2. Mechanical Motion System: Anchored to Support Brackets and Equipment Frame through vibration-damped couplings.

4.2.2. 机械运动部件 Mechanical Motion System

机械运动部件主要是控制零部件的运动系统。机械运动部件包括电机、电机驱动、气泵、打印平台、浮筒、刮刀、刮板，通过电机控制打印平台、浮筒的升降，以及刮刀、刮板的移动。

The mechanical motion system governs the movement of critical functional parts. It comprises:

1. Motors: Stepper motors with closed-loop control
2. Motor Drivers: High-precision drivers for microstepping operation
3. Air Pump: Pneumatic system
4. Build Platform
5. Float Tank: Resin level adjustment system
6. Scraper & Squeegee Blade: Titanium alloy tools for resin leveling

4.2.3. 光学引擎部件 Optical Engine Assembly

光学引擎部件主要是用于光成像。光学引擎部件包括 4 台光学引擎组件、HDMI 数据线、USB 控制线、光机电源线。引擎电源线与引擎开关连接，为引擎供电；HDMI 数据线与电脑连接，进行数据传输；USB 控制线与 USB 分接器连接，为控制引擎的曝光。

The optical engine assembly is responsible for photopolymerization imaging in the 3D printing process. It comprises the following components:

1. Four Optical Engine Modules: DLP based UV light sources (wavelength: 405nm $\pm$ 5nm).

2. HDMI Data Cables connect to Computer GPU to transmits sliced image data from the computer to the engines.
3. USB Control Cables connect to Industrial USB Hub to controls exposure timing/light intensity via software commands
4. Optical Engine Power Cables connect to Engine Power Switch
Provides stable power supply

4.2.4. 硬件控制部件 Hardware Control Unit

硬件控制部件主要包括机箱服务器、显示器、液位探测仪，机箱服务器和显示器是软件控制部件的安装使用载体，是光成像数据传输的载体。液位探测仪是液位数据反馈的器件。

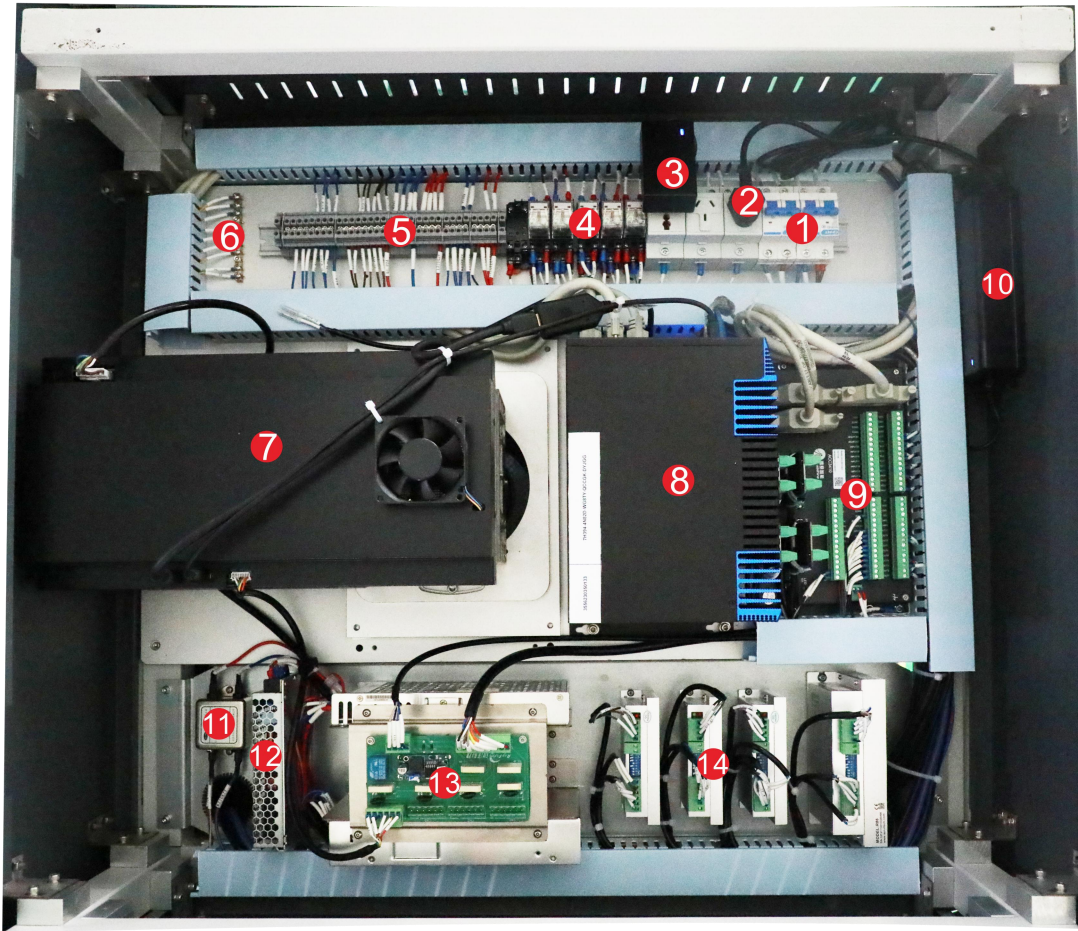
The hardware control system comprises three core elements:

1. Chassis Server (Industrial Control Computer – IPC)
Function: Hosts and executes the printer control software.
Data Interface: Manages optical imaging data transmission via HDMI/USB protocols.
2. Display Monitor
Role: Human-Machine Interface (HMI) for operational visualization.
3. Liquid Level Sensor
Function: Provides real-time resin level feedback.

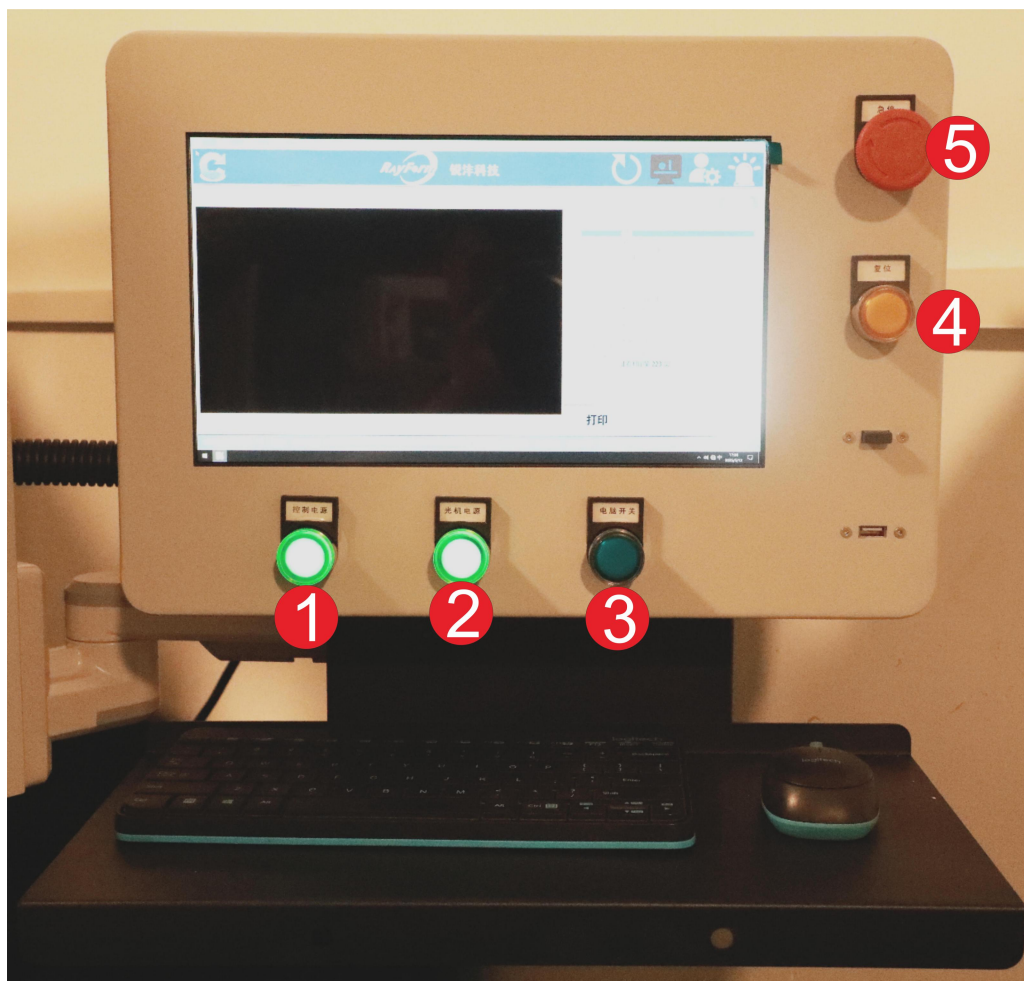
4.2.5. 软件控制部件 Software Control System

软件控制部件主要包括 Rayform 软件，是机械运动部件的控制系统、曝光部件的控制系统。

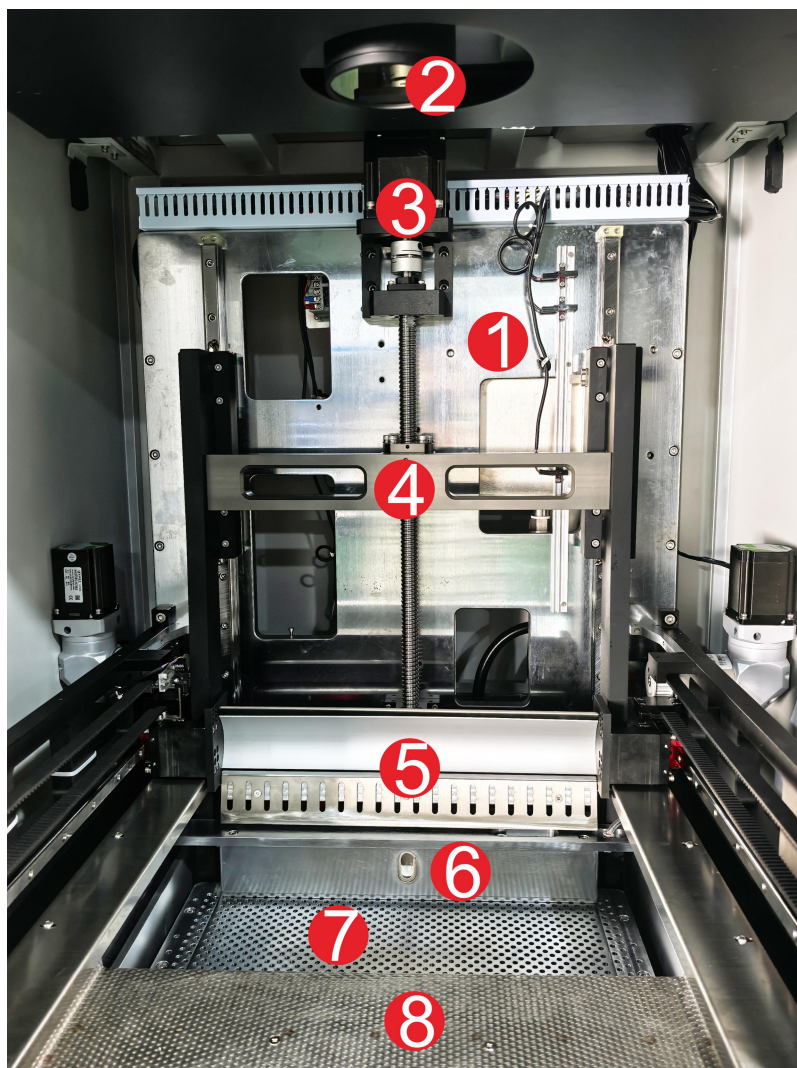
The software control system is primarily comprised of Rayform® Software, which serves as the centralized control system for both the mechanical motion components and the optical exposure assembly.



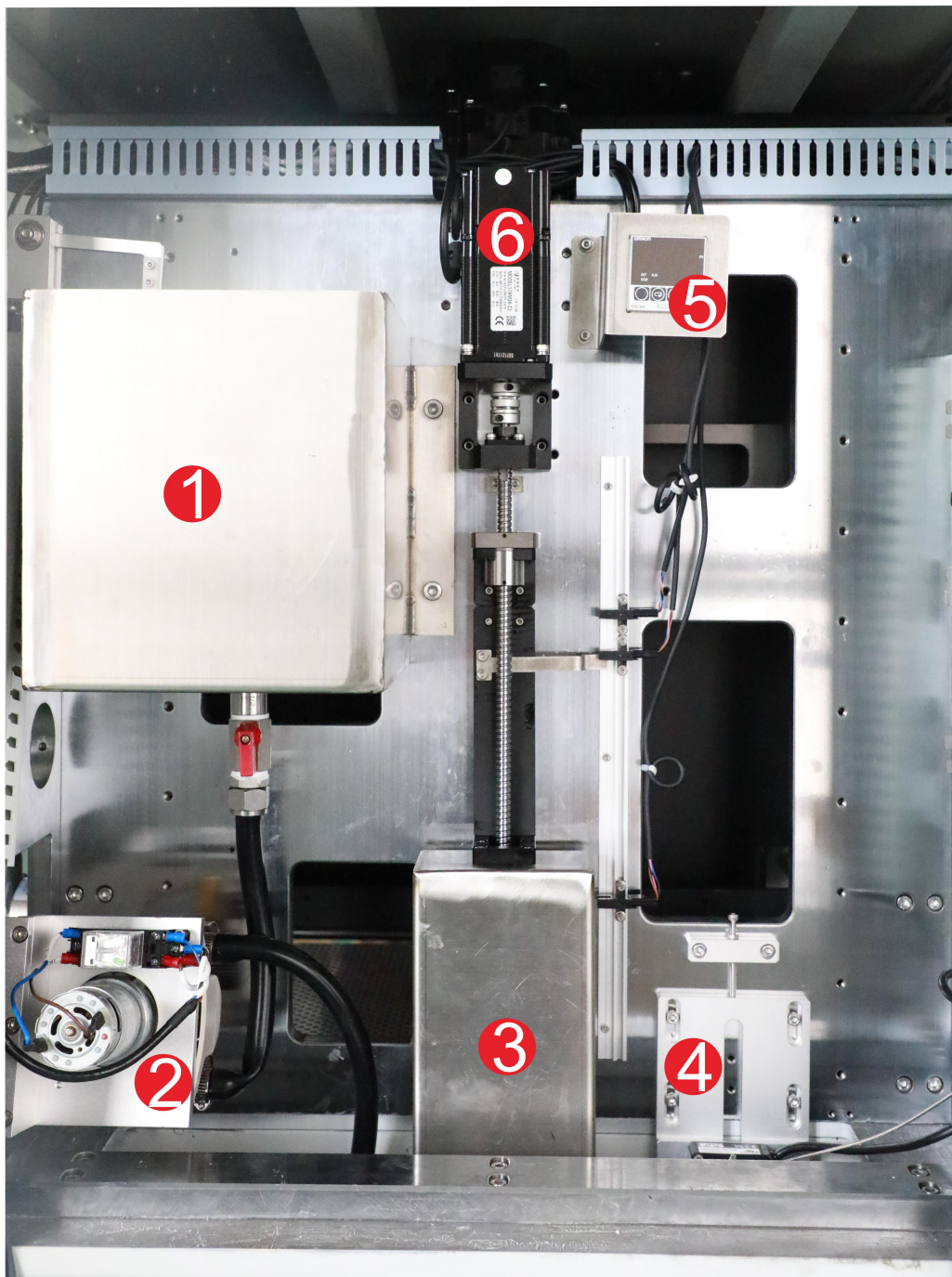
- 1、设备总开关 Main Power Switch
- 2、光机电源 Optical Engine Power Supply
- 3、显示器电源 Display Power Supply
- 4、继电器 Relay
- 5、端子排 Terminal Block
- 6、地线排 Grounding Terminal Block
- 7、DLP 光学引擎 DLP Optical Engine
- 8、工控机 Industrial Control Computer (IPC)
- 9、运动控制卡 Motion Control Card
- 10、光机电源适配器 Opto-Mechanical Power Adapter
- 11、滤波器 Power Filter
- 12、电源 Power Supply Unit (PSU)
- 13、GPIO 控制板 GPIO Control Board
- 14、电机驱动器 Motor Driver



- 1、机械运动电源开关 Mechanical Motion Power Switch
- 2、光机电源开关 Optical Engine Power Switch
- 3、电脑电源开关 Computer Power Switch
- 4、设备复位按钮 System Reset Button
- 5、急停按钮 Emergency Stop Button (ESB)



- 1、设备框架 Frame Assembly
- 2、光学引擎组件 Optical Engine Assembly
- 3、平台升降电机 Platform(Z-Axis) Lift Motor
- 4、平台拖筋组件 Platform Lead Screw Assembly
- 5、铲料组件 Model Ejection Kit
- 6、刮刀 Resin Leveling Blade/Scraper
- 7、打印平台 Build Platform
- 8、导料组件 Material Guiding Component



- 1、补液筒 Resin Refill Canister
- 2、补液蠕动泵 Resin Refill Peristaltic Pump
- 3、浮筒 Float Tank
- 4、液位探测器 Liquid Level Sensor
- 5、树脂温度计 Resin Thermometer
- 6、浮筒电机 Float Tank Level Adjustment Motor

4.3. 设备操作 Equipment Operation

按照配套清单清点配件，并将设备移至设备安装区，设备安全区应达到上述室内条件的要求。然后进行设备安装调试，调试完成后，开启设备，启动软件，进行打印。设备操作包括设备开机及操作步骤、模型打印完取件及后处理、设备关机三个部分 Verify all accessories against the packing list, relocate the equipment to the installation area (ensuring compliance with Section 4.1.1 environmental requirements), complete installation and commissioning, then power on the system and initiate printing. Operations include startup procedures, post-printing model handling, and shutdown protocols.

4.3.1. 设备开机及操作步骤 Startup & Operation Procedures

序号 Step	操作步骤 Procedure	操作描述 Description	注 意 事 项 Precautions
01	设备开机 Power On	1. 开启机械运动电源开关； 2. 开启光机电源开关。 3. 开启电脑电源开关； 1. Turn on the mechanical motion power switch. 2. Activate the optical engine power switch. 3. Power on the computer.	设备启动后，如有异响，立即断开电源总开关。 If abnormal noises occur, immediately disconnect the main power switch.
02	启动软件 Launch Software	1. 在显示器主界面，双击 Rayform 软件图标，开启软件； 2. 进入 Rayform 软件主界面，等待软件自动进行运动平台、光机初始化； 3. 点击平台复位，等待平台复位完成。 1. Double-click the Rayform® icon on the desktop. 2. Wait for automatic initialization of the motion platform and optical engine. 3. Click "Platform Reset" and wait for completion.	/
03	打开文件 Load File	1. 点击<打开文件>图标，选择排版好的 STL 文件。 1. Click the <Open File> icon and select the pre-sliced STL file.	/
04	打印 Start Printing	1. 点击<打印>图标。 1. Click the <Print> icon.	/

4.3.2. 模型打印完取件后处理操作 Post-Printing Model Handling

序号 Step	操 作 步 骤 Procedure	操作描述 Description	注 意 事 项 Precautions
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01	取模型 Model Removal	1. 双手带干净的医用手套； 2. 将模型放入清洗盆中；若有模型未脱离打印平台，则使用斜口铲将模型铲下来，放入清洗盆中。 1. Wear medical gloves. 2. Place the model in a cleaning tray. If adhesion occurs, use an angled spatula to gently detach it.	/
02	清洗模型 Cleaning	1. 将无水酒精倒入清洗盆中，手动将模型清洗干净并取出； 2. 用干净的纸巾将模型上残留的酒精擦干。 1. Submerge the model in anhydrous alcohol and scrub manually. 2. Wipe residual alcohol with absorbent paper.	/
03	固化 Post-Curing	1. 将擦净的模型放入固化炉中，关门； 2. 手动设置固化时间，一般设置为 8 分钟； 3. 按下启动按钮，开始固化，反面固化； 4. 固化完成后，取出模型。 1. Place the model in the post-curing oven and close the door. 2. Set curing time (default: 8 minutes). 3. Press Start Button to initiate curing. Flip the model for uniform exposure. 4. Retrieve the model after completion.	/

4.3.3. 设备关机操作 Shutdown Procedure

序号 Step	操作步骤 Procedure	操作描述 Description	注意事项 Precautions
01	设备关机 Power Off	1. 关闭设备开关； 2. 关闭电脑； 3. 关闭总开关。 1. Turn off the equipment power switch. 2. Shut down the computer. 3. Disconnect the main circuit breaker.	/

4.4. Rayform 软件使用 Rayform Software Usage

软件界面介绍 Software Interface Overview



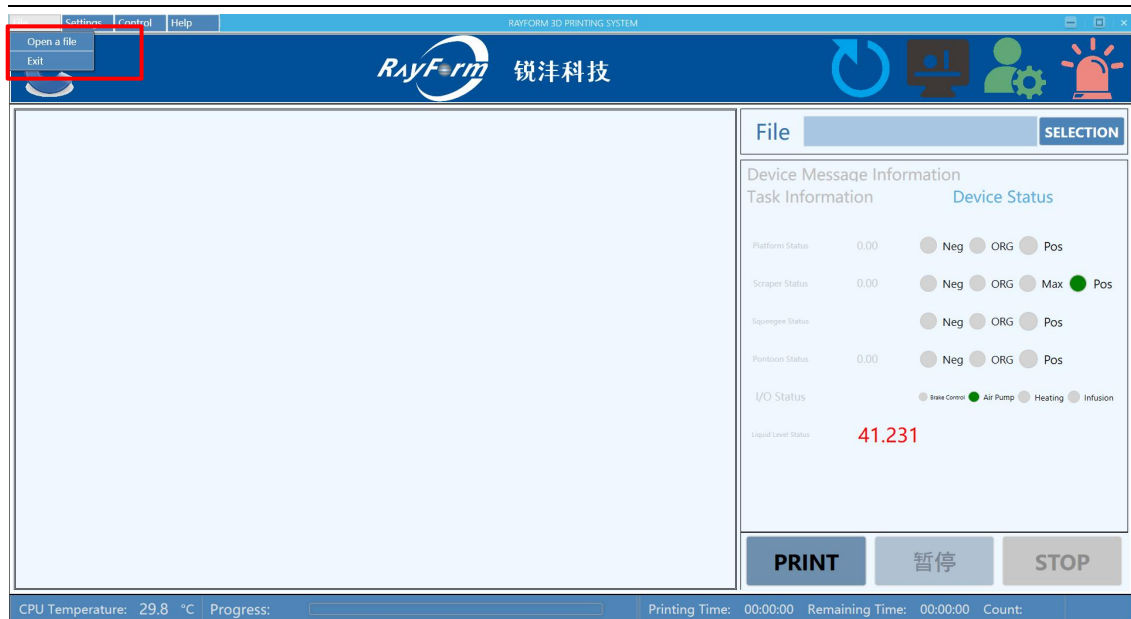
- 1、设置栏 Settings Panel
- 2、初始化按钮 Initialize Icon
- 3、图像显示区域 Image Preview Window
- 4、CPU 温度 CPU Temperature
- 5、打印进度条 Print Progress Bar
- 6、时间区域 Time Status Panel
- 7、打印控制按钮 Print Controls Icon
- 8、动作信息栏 Operation Log
- 9、打印模型详细信息 Model Information Panel
- 10、设备运行信息 Equipment Operation Information / Device Running Information
- 11、文件选择按钮 Select File Icon
- 12、报警按钮 Alarm Button
- 13、用户登录按钮 Login Icon
- 14、平台控制按钮 Motion Controls Icon
- 15、设备复位按钮 System Reset Icon

4.4.1 设置栏：包含“文件”、“设置”、“控制”、“帮助”4个菜单栏

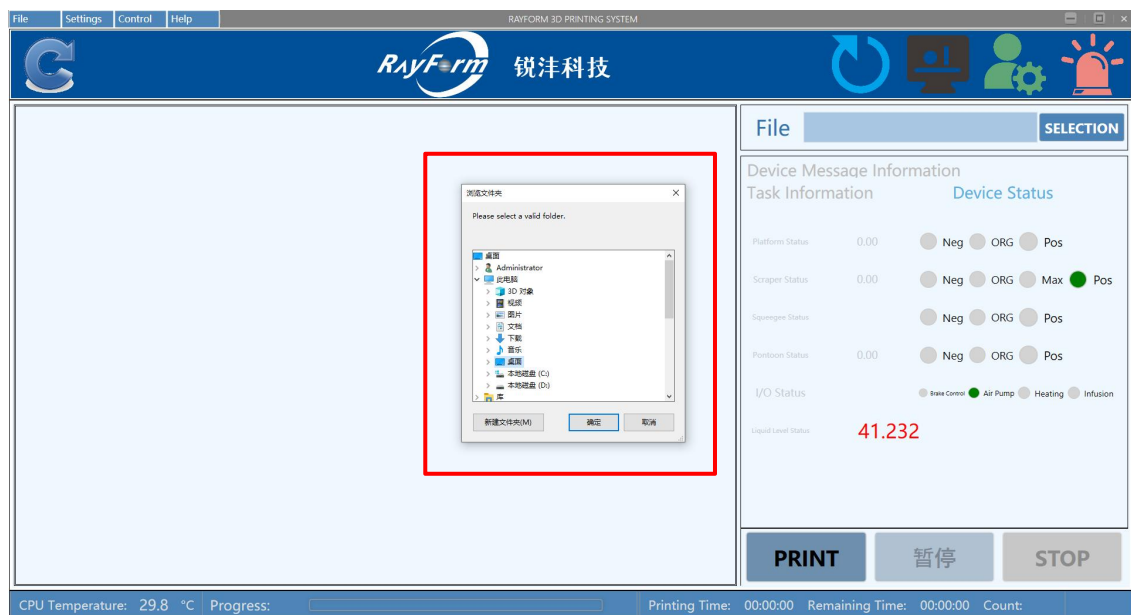
Settings Panel contains four menu bars: File, Settings, Control, and Help.

1) “文件”菜单栏，包括“文件打开”、“退出”2个按钮

1) “File” Menu contains two buttons: Open File, and Exit.



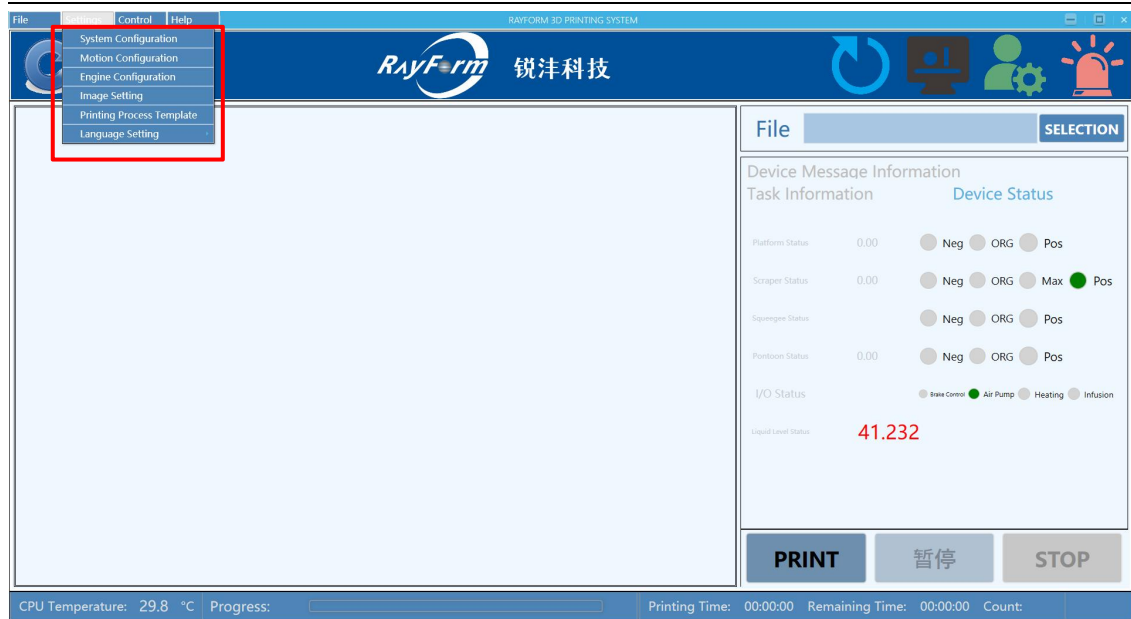
- a. Click “Open File” to select the model files for printing.



- b. Click the “Exit” and the software will close.

1) “设置”菜单栏,包括“系统配置”、“运动配置”、“引擎配置”、“图像设置”、“工艺模板”、“语言设置”6个按钮

The “Settings” menu bar includes six buttons: “System Configuration”, “Motion Configuration”, “Engine Configuration”, “Image Settings”, “Process Templates”, and “Language Settings”.



a. 点击“系统配置”按钮，弹出系统配置对话框。

a. Click the "System Configuration" button, and the system configuration dialog box will pop up.

1、点击系统配置，运动轴的数量不能超过 4，引擎数量不能超过 4 个，传感器数量不能超过 14 个，起始打印层是根据实际的情况设置，一般情况下不需要设置，打印起始位置是控制打印平台下降到打印第一层开始的位置。

Click "System Configuration" button

Motion Axis: Maximum 4 axes (factory preset)

Optical Engines: Up to 4 DLP modules (factory preset)

Sensors: Limit 14 units (factory preset)

Initial Print Layer is set according to the printing situation. Generally, printing starts from the first layer of the image.

Print start position is the position where the printing platform begins to print the first layer. (Z-axis initial height)



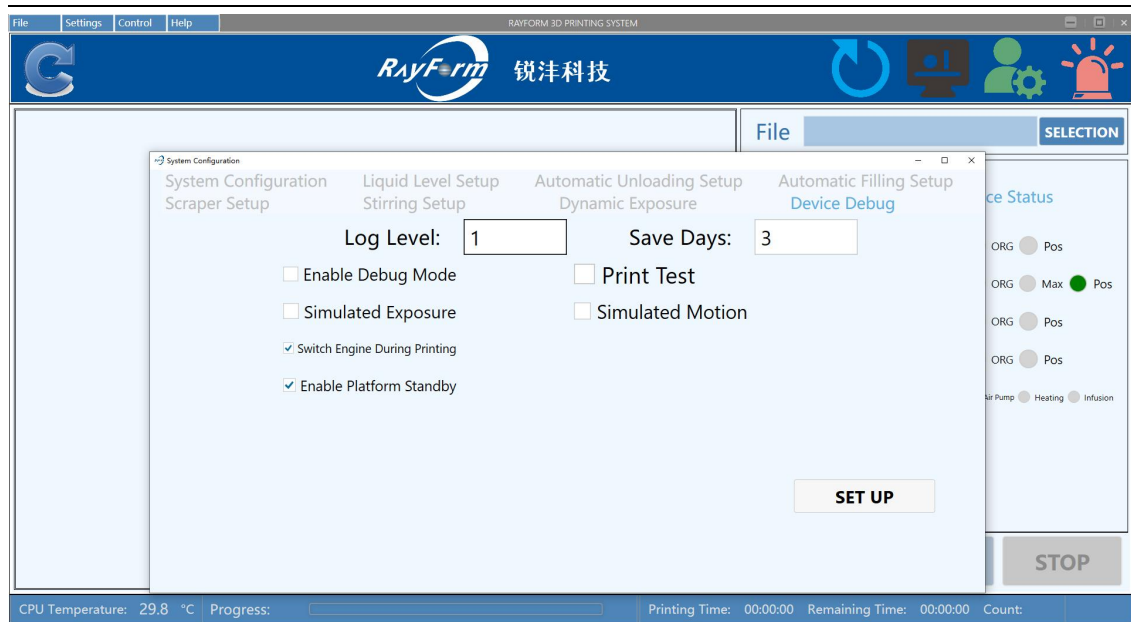
2、点击液位设置，可液面高度，以及液位调整步长。

Click “Liquid Level Settings” to set the liquid height level and the leveling step size for liquid level adjustment.



3、动态曝光不需要设置。

Dynamic exposure does not require setting.



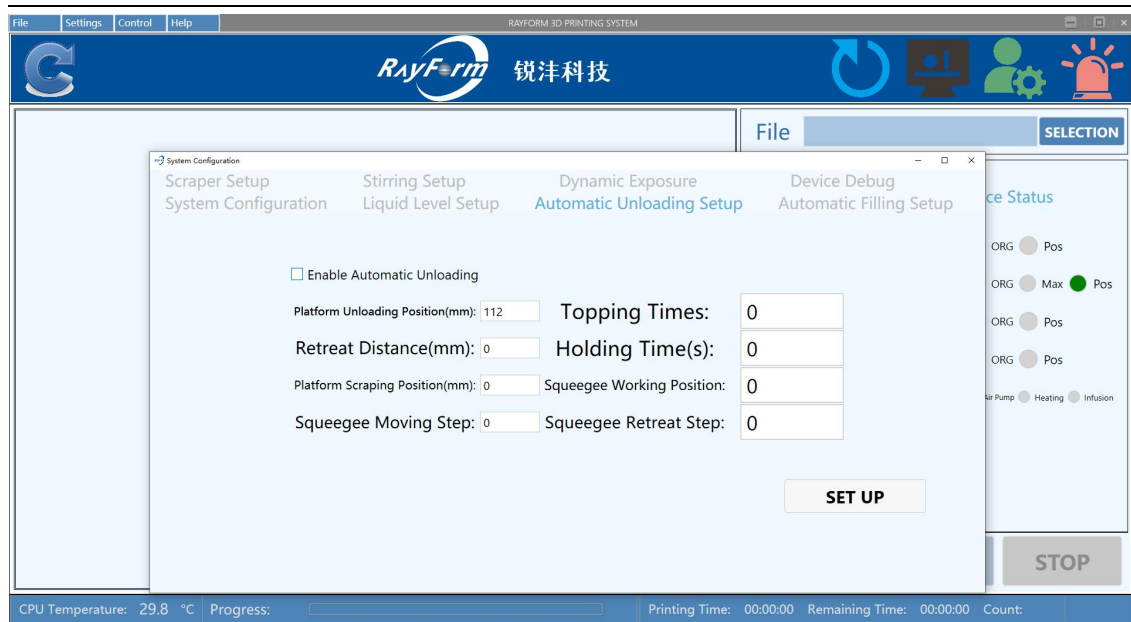
4、日志由详细程度分为 0, 1, 2, 一般不需设置。

Log verbosity is categorized into three levels (0, 1, 2) and typically does not require user configuration under normal operating conditions. Default setting: Level 1 (recommended for daily use)



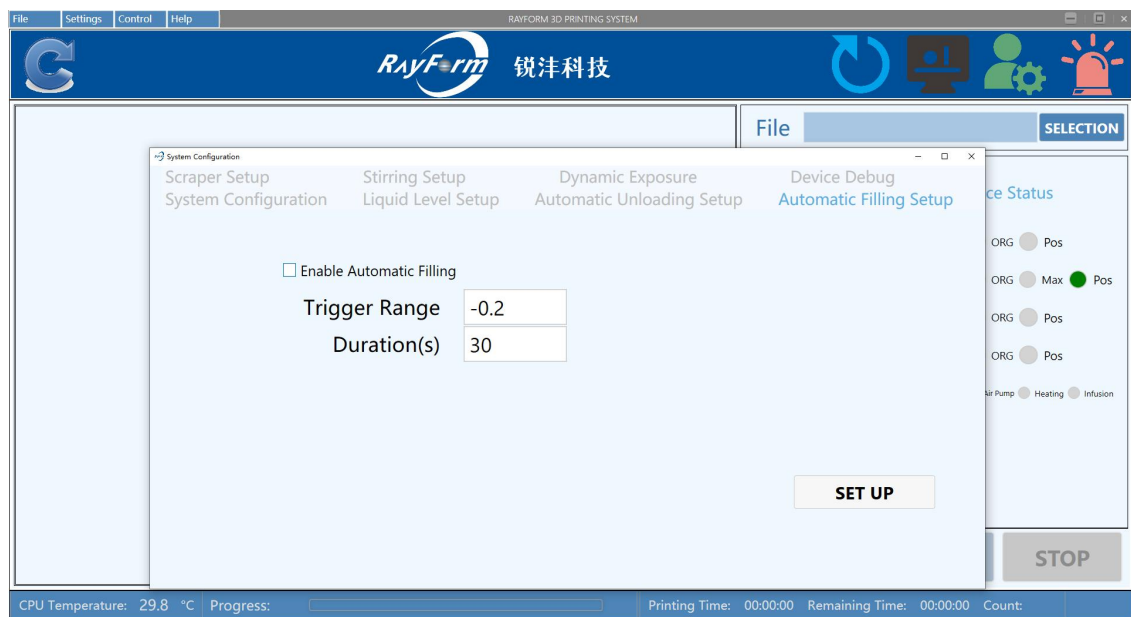
5、平台顶料位置是设置自动顶出的位置。

The build platform ejection position is configured for automatic part removal after printing.



6、自动补液设置。

Automatic Resin Refill Settings



7、自动搅拌设置。

Automatic Stirring Settings



以上设置会在出厂前都设置好。每一项设置好参数后点击设置，推出后点击系统初始化按钮，设置好的参数就可以在下一次打印中使用该参数。

All the above settings are factory-configured.

To apply user-modified parameters:

1. Click [Apply] after adjusting any configuration.
2. Exit the system configuration dialog box and click the [System Initialize] button.
3. The new parameters will be activated in the next print job.

b. 点击“运动设置”按钮，弹出运动配置对话框。运动配置是控制设备上电机的运动参数。设备 ID 里有 4 个电机选项，里面的设置参数在出厂前会设置好，需要调整时联系售后维护人员进行修改。

Click the “Motion Settings” button to open the Motion Configuration dialog box. This interface controls motion parameters for the printer’s motors.

Device ID: Contains 4 motor channels.

Factory Presets: All parameters are factory-optimized and locked.

Modification Protocol: Contact authorized service personnel for adjustments.



c. 点击“引擎配置”按钮，弹出引擎配置对话框。引擎配置是设置所有光学引擎的参数，有4个光学引擎，在出厂前会把所有的光学引擎参数都设置好，要注意是否模拟键，如果打上勾的话，该引擎就不会出光。需要调整时联系售后人员。

Click the “Optical Engine Configuration” button to open the configuration dialog. This interface sets parameters for optical engines, which are pre-configured at the factory.

• Critical Note:

• Simulation Mode: Check this box to disable UV light output from the selected engine (for safe testing purposes).

• Modification Protocol: Contact authorized service personnel for parameter adjustments.



d. 点击“图像设置”按钮，弹出图像设置对话框。

1、图像设置是优化打印效果的选项，边缘增强功能是把投影出来的图形边缘增强。

2、轮廓优化是把边缘的像素投影的更光滑。

3、打印文件类型，即可以使用 STL 文件直接打印，也可以切片好后打印。

4、切片层厚是每一层切片的厚度。

5、畸变矫正的功能是光学引擎的镜头畸变选项。

Click the “Image Settings” button to open the image configuration dialog box.

1. Edge Enhancement: Sharpens projected contours to optimize the printing effect..

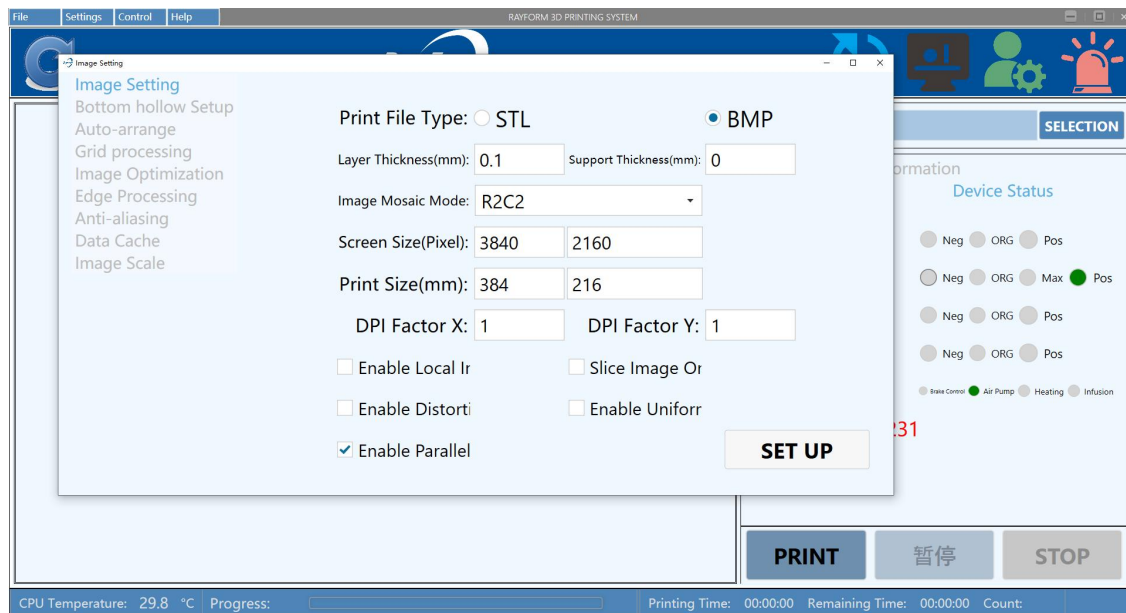
2. Contour Smoothing (Anti-aliasing): Reduces pixelation for smoother edge transitions.

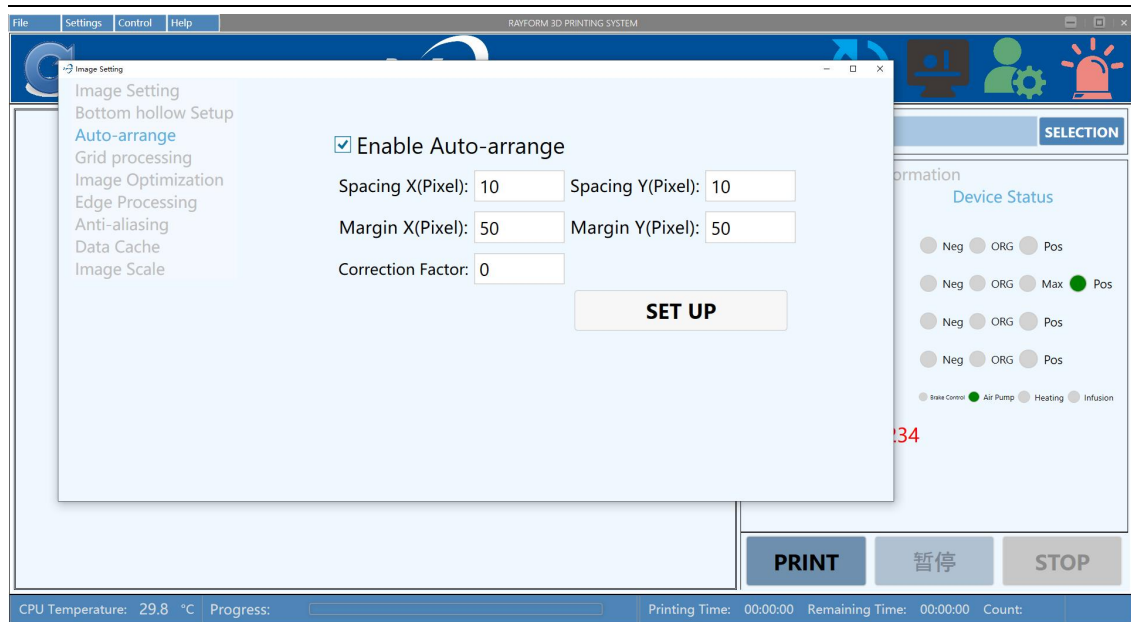
3.Print File Type:

- Direct STL Printing: Raw model printing without pre-slicing.
- Sliced File Printing: Standard mode using pre-sliced layers.

4.Layer Thickness: Defines Z-axis resolution.

5.Distortion Correction: Compensates for optical lens distortion (pre-calibrated per engine).





e. 点击“工艺模板”按钮，弹出工艺模板对话框。

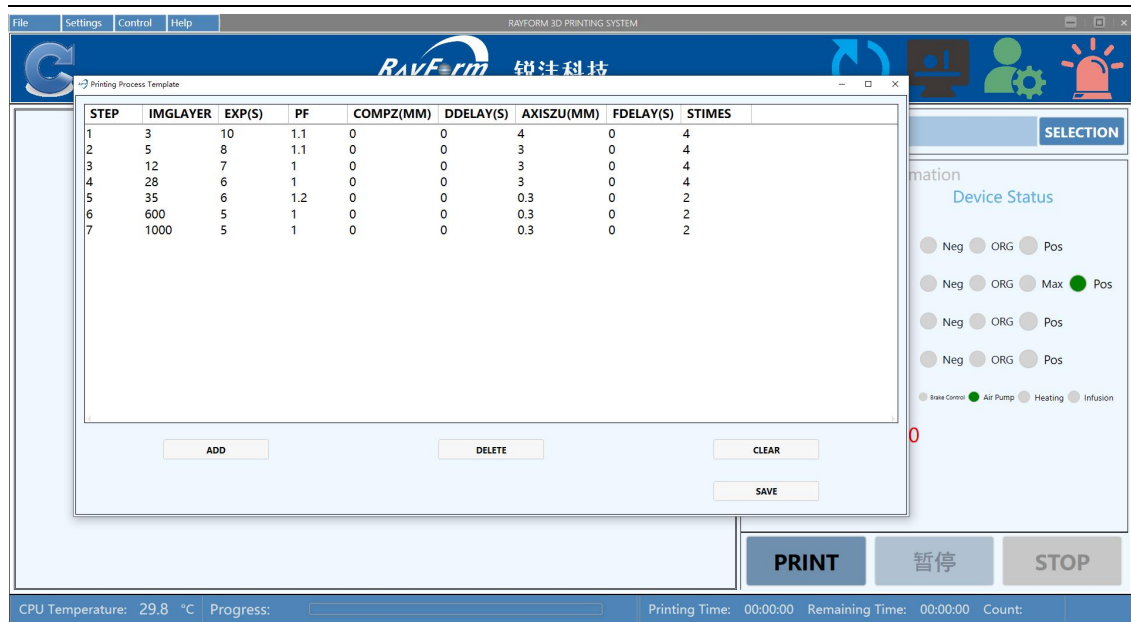
Step 是每个阶段的参数，可分成多个阶段去曝光，如果打印一版牙齿可以同时用一个工艺参数，则这里只需要 1 个 step 就行，IMGLAYER 是图像层数，exp (s) 是曝光时间，AXISZD 是 Z 轴打印完后下降多少，DDELAY 是打印完后液位平复时间，AXISZU 是 Z 轴下降后上升多少，这个不需要设置。FDELAY 是打印前液位平复时间。

以上参数会在出厂前设置好，如需修改联系售后人员。

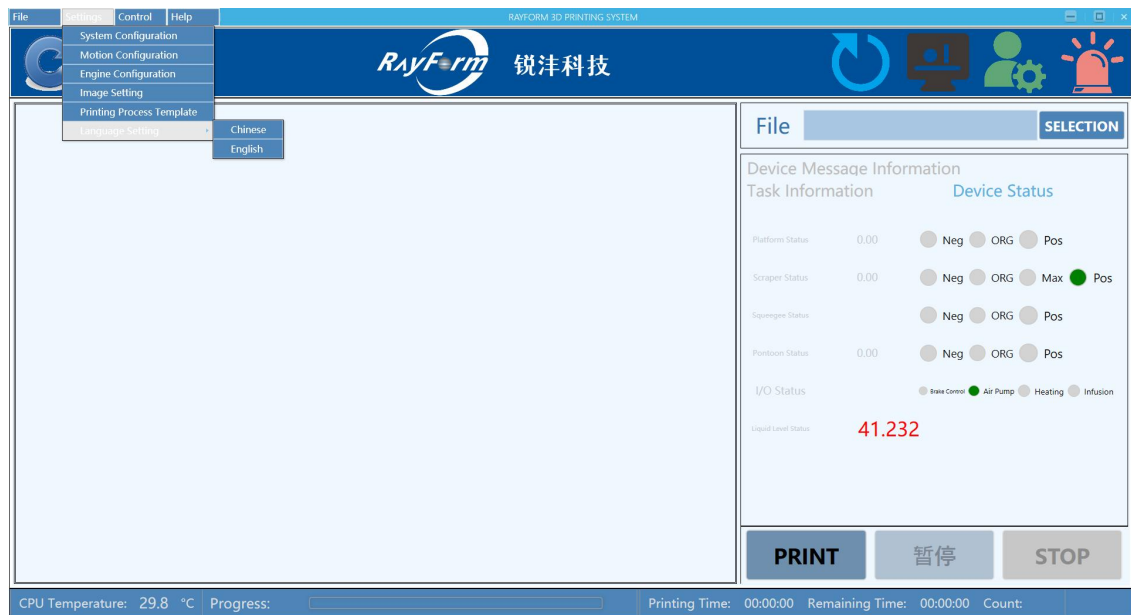
Click the “Process Template” button to open the process configuration dialog.

Parameter Definitions:

- Step is Exposure Stage which divide printing into multiple phases with distinct parameters. If a single set of process parameters can be applied to print a full dental model, only one Step is required in this configuration
- Image Layer is total number of sliced image layers in the current stage
- exp (s) is exposure time which is UV curing duration per layer (critical for resin polymerization)
- AXISZD is Z-Axis Retract Distance (mm)
- DDELAY is Post-Print Settling Delay (s) which is the time for resin to stabilize after printing
- AXISZU is Z-Axis Post-Retract Lift (mm) which is reserved for advanced dynamic leveling.
- FDELAY is Pre-print Settling Delay (s). It is Resin stabilization time before layer exposure

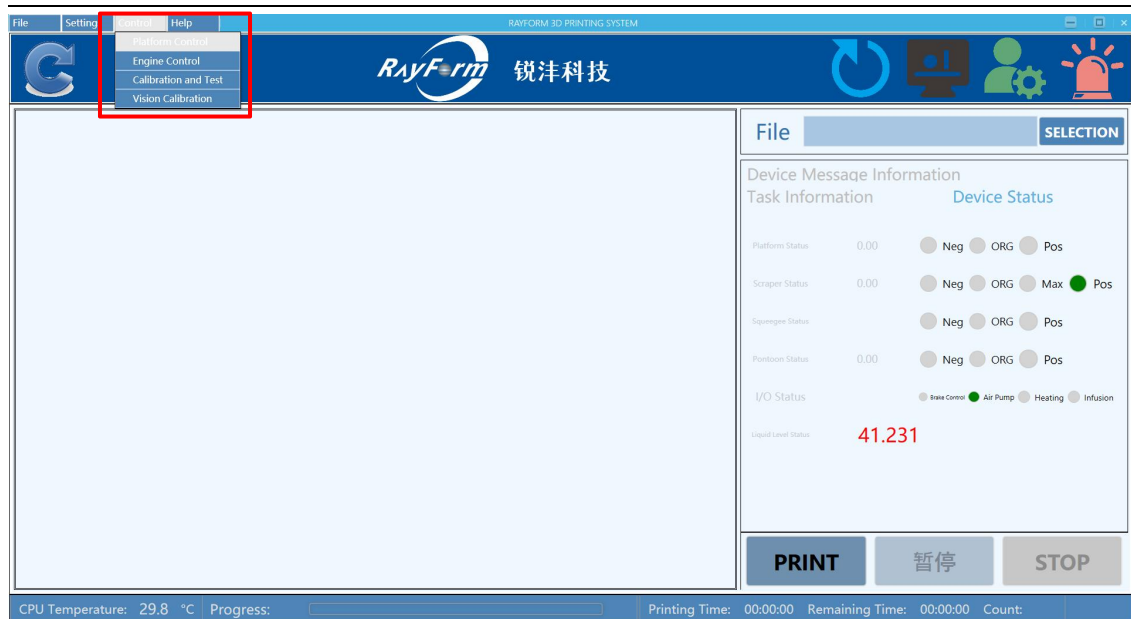


f. 点击“语言设置”按钮，弹出语言设置对话框。可选择“中文”、“英文”2种语言。
Click the “Language Settings” button to open the language configuration dialog box, where you can select between ‘Chinese’ and ‘English’.



2) “控制”菜单栏，包括“平台控制”、“引擎控制”、“功能测试”、“视觉标定”4个按钮

The “Control” menu includes four functional buttons: “Platform Control”, “Optical Engine Control”, “Functional Test”, and “Vision Calibration”.



- a. 点击“平台控制”按钮，弹出运动控制对话框。分为工件平台控制、刮板运动控制、浮筒高度控制、刮刀控制 4 个模块。

Click the “Platform Control” button to open the motion control dialog box, which includes four modules: Build Platform Control, Squeegee Blade Motion Control, Float Tank Level Adjustment and Scraper Control.



- b. 点击“引擎控制”按钮，弹出引擎控制对话框。分为设备信息、引擎控制 2 个模块。这个功能是控制光学引擎单独曝光，是检测光学引擎单独出光是否正常的功能。引擎 ID 是选择哪个引擎，可设置曝光的电流，输入数值后点击“电流测试”即可。出光之前要确保 DLP 以及 LED 是开着的状态。

Click the “Optical Engine Control” button to open the engine control dialog box, which includes two modules: Device Information and Optical Engine Control.

Key Functions:

Individual Exposure Testing:

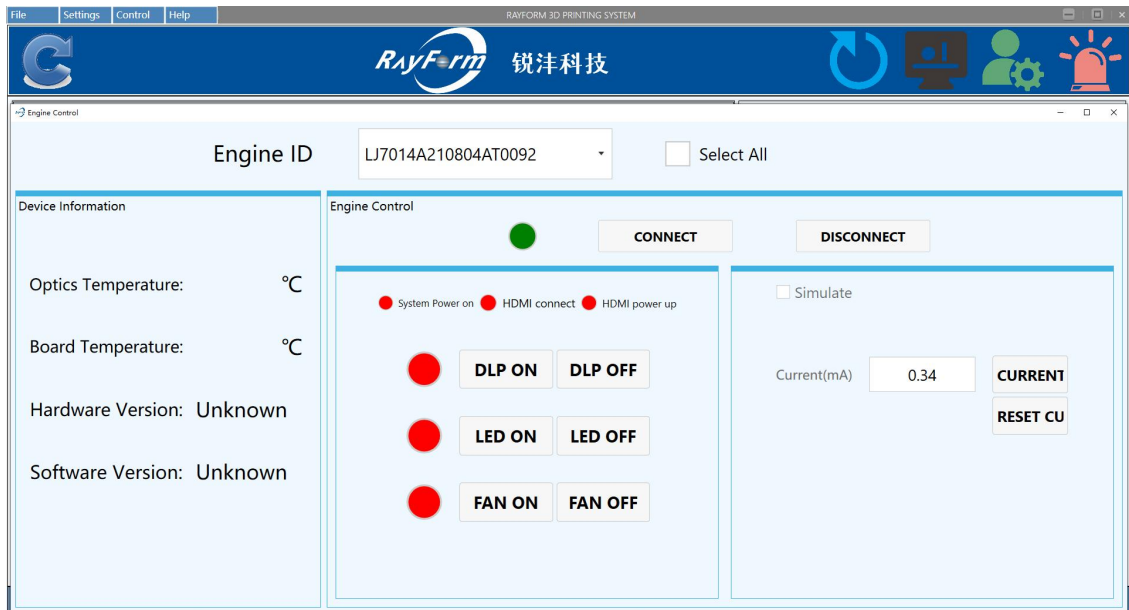
Engine ID: Select the optical engine (1-4) for standalone light output verification.

Exposure Current: Set the LED driver current .

Click “Current Test” to validate light output.

Prerequisites:

Ensure DLP projection and LED power are enabled before testing.



c. 点击“功能测试”按钮，弹出功能测试对话框。分为检测、测试、IO 测试 3 个模块。这里要注意的是 IO 测试，运动部件的 IO 是否正常，其中有四个选项。

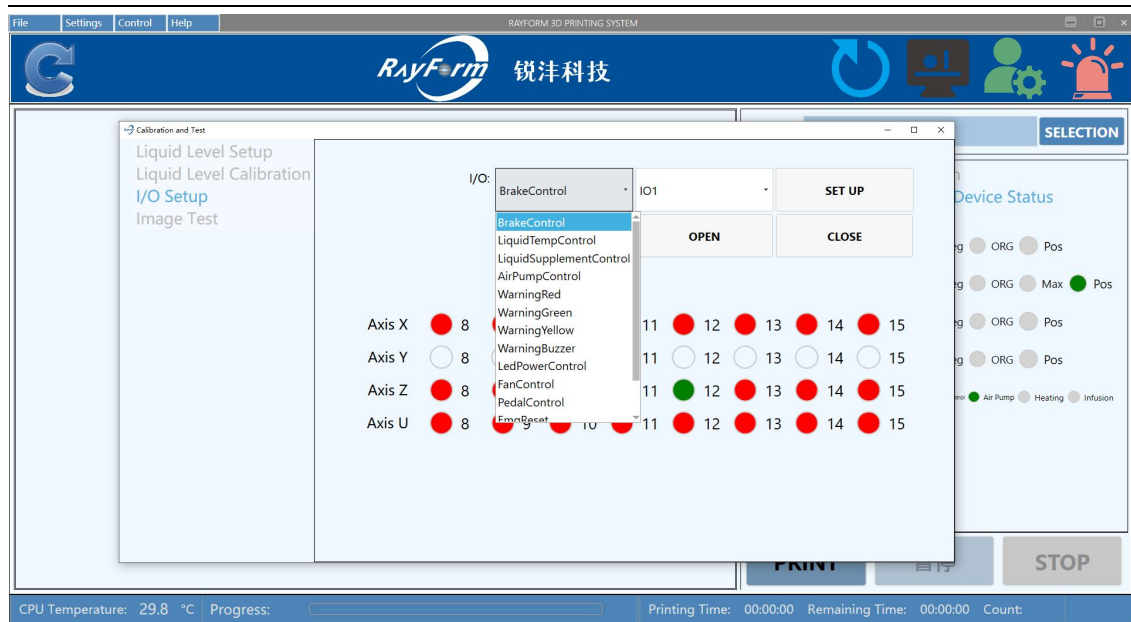
- 1、brakecontrol 刹车控制，对应的是 IOBit1，点击开关按钮可测试电机的刹车是否正常。
- 2、Airpumpcontrol 气泵控制，对应 IOBit2，点击开关按钮可测试气泵是否正常。
- 3、Liquidsupplementcontrol 补液槽控制，对应 IOBit3，点击开关按钮可测试补液阀是否正常。
- 4、Liquidtempcontrol 树脂槽加热控制，对应 IOBit4，点击开关按钮可测试补液槽是否正常。

Click the “Functional Test” button to open the diagnostics dialog box, which includes three modules: System Check, Component Test and I/O Test.

I/O Test (Critical Focus)

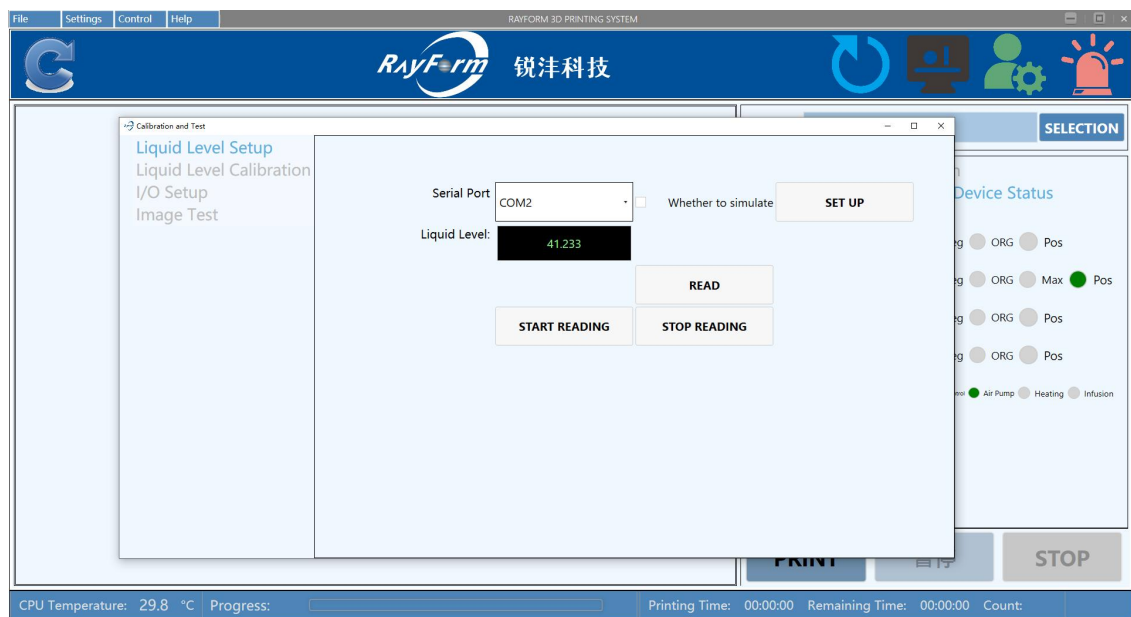
Verifies the input/output signals of motion components via four test options

1. Brake Control is IOBit1. Toggle the switch to test motor brake engagement.
2. Air Pump Control is IOBit2. Activate/deactivate the pneumatic pump.
3. Liquid supplement control is IOBit3. Open/close the resin refill solenoid valve.
4. Liquid temp control is IOBit4. Enable/disable resin tank temperature regulation.



d. 液位设置界面是由液位传感器读取液位数据，达到连续校准的作用。

The Liquid Level Settings interface utilizes data from the liquid level sensor to achieve continuous real-time calibration of the resin height level.



e. 点击“液位标定”按钮，弹出液位标定对话框。该功能需要由售人员操作。

Click the “Liquid Level Calibration” button to open the calibration dialog box. This function must be operated by authorized service personnel only.



3) “帮助” 菜单栏，包括“设备注册”、“关于” 2 个按钮

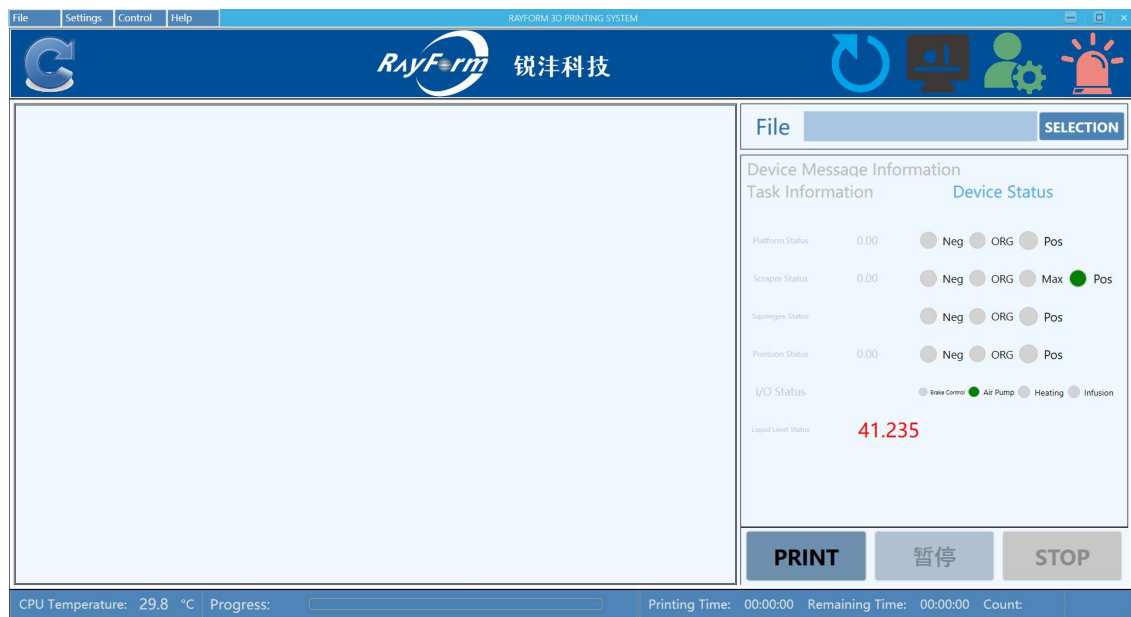
The “Help” menu includes two buttons: “Device Registration” and “About”



- 当设备使用至期限，点击“帮助文档”按钮，弹出设备注册对话框。生成授权序列号→保存序列号至桌面→发送至邮箱，并待回复文件，将授权文件保存至桌面，再打开这个界面导入授权文件。

When the device approaches its license expiration date, click the “Help Documentation” button to open the Device Registration dialog box. Follow these steps:

- 1.Generate Authorization Serial Number and save the license key to your desktop.
- 2.Email the key to Shenzhen Rayform company and wait the authorization file.
- 3.Save the received authorization file to your desktop.
- 4.Return to this interface and click “Import Authorization File” to complete activation.



b. 补充各区域内容。

4.5.1. 图像显示区域：是当前层的实时图片投射。

4.5.1. 温度显示栏：是显示电脑 CPU 的温度。

4.5.2. 打印进度条：是显示当前打印完成的进度。

4.5.3. 时间区域：打印时间表示从开始打印牙模到打印完牙模的预计所需时间；剩余时间表示当前进度下剩余未打印完部分的所需时间。

4.5.4. 液面高度：表示当前树脂液面的高度。

4.5.5. 打印控制按钮：用于控制打印机的工作状态。

a. 点击“打印”按钮，即打印机开始打印；

b. 点击“暂停”按钮，即打印机暂停打印，仍可点击“打印”按钮，继续打印；

c. 点击“停止”按钮，即打印机终止打印。

4.5.6. 动作信息栏：显示设备动作信息。

4.5.7. 打印模型详细信息：显示模型的详细信息。

4.5.8. 点击“文件选择”按钮，可选择需要打印的 STL/BMP 模型文件，前提是需要先在设置→图像设置选择 STL/BMP。



4.5.9. 点击“”按钮，一是可重新连接光学引擎以及电机；二是可更新设置的参数。



4.5.10. 点击“”按钮，打印前的准备工作，让打印平台在打印位置，让浮筒调整树脂液面至打印位置。



4.5.11. 点击“ ”按钮，控制平台、刮刀、浮筒运动。



4.5.12. 点击“ ”按钮，可登录/登出。

b. Other Software Interface Elements

4.5.1. Image Display Area is Preview Window

Function: Projects real-time layer images during printing.

4.5.2. Temperature Display is CPU Temperature Monitor

Function: Displays the temperature of the industrial control computer's CPU.

4.5.3. Print Progress Bar

Function: Visualizes current print progress (percentage + layer count).

4.5.4. Time Status Panel

Elapsed Time: Total duration since printing started.

Remaining Time: Estimated time to completion based on current progress.

4.5.5. Resin Level Indicator

Function: Displays real-time resin height level.

4.5.6. Print Control Buttons

a. Start Print icon: Initiates the printing process.

b. Pause/Resume icon: Temporarily halts printing; resume by clicking .

c. Abort Print icon: Terminates the print job irreversibly.

4.5.7. Action Log

Function: Records real-time device operations (e.g., motor movements, exposure events).

4.5.8. Model Metadata Panel

Print Model Details: Display detailed information of the model.

4.5.9. File Selector

Function: Load STL/BMP model files (must enable file type in Settings → Image Settings).



4.5.10. Reconnect/Refresh Button

Function:

1. Re-establishes communication with optical engines and motors.
2. Synchronizes and updates configuration parameters.



4.5.11. Pre-Print Setup Button

Function: Prepares the printer for printing by:

1. Positioning the build platform at the initial Z-height.
2. Adjusting the float tank to set the resin level to the calibrated position.



4.5.12. Manual Motion Control Button

Function: Enables manual adjustment of Build Platform, Squeegee Blade, and Float Tank



4.5.13. Login/Logout Button

Function: Authenticates user access. Logs in and out the current user session.