
Printing Visual User Manual

V7.0

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catalogue

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一. Software installation and environment setup

1、 System requirements:

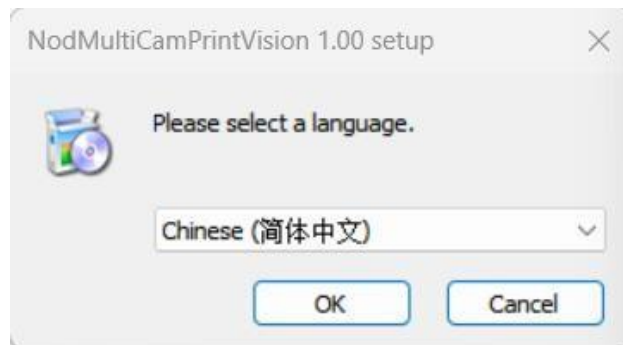
(1) System: 64-bit; CPU: Intel 12th generation or higher; RAM: $\geq 16\text{GB}$; Monitor: $\geq 21\text{-inch}$ (1920×1080 resolution); SSD: $\geq 500\text{GB}$.

(2) System requirements: Windows 10 or Windows 11 Professional, Enterprise, or Flagship edition must be installed.

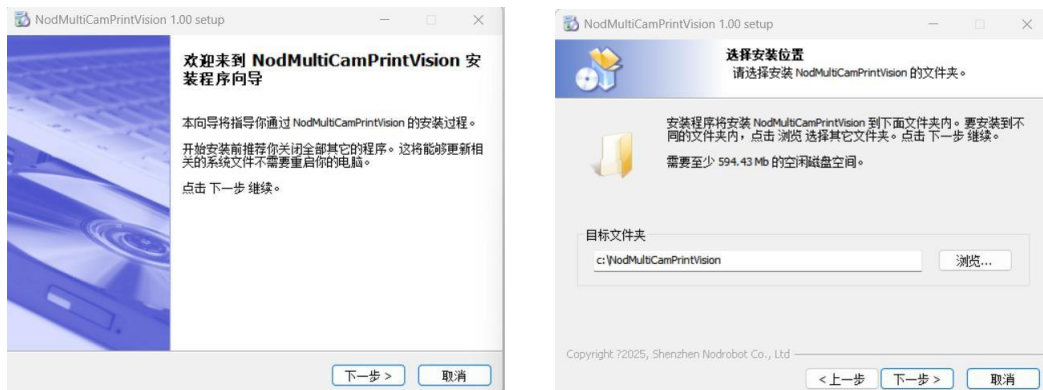
2、 Install the software as follows:

(1) Locate the installed files  Setup on the USB drive and double-click to open them;

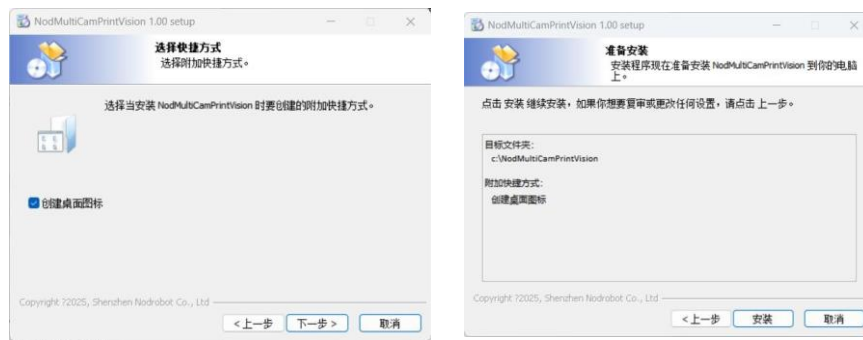
(2) Select the language and click OK;



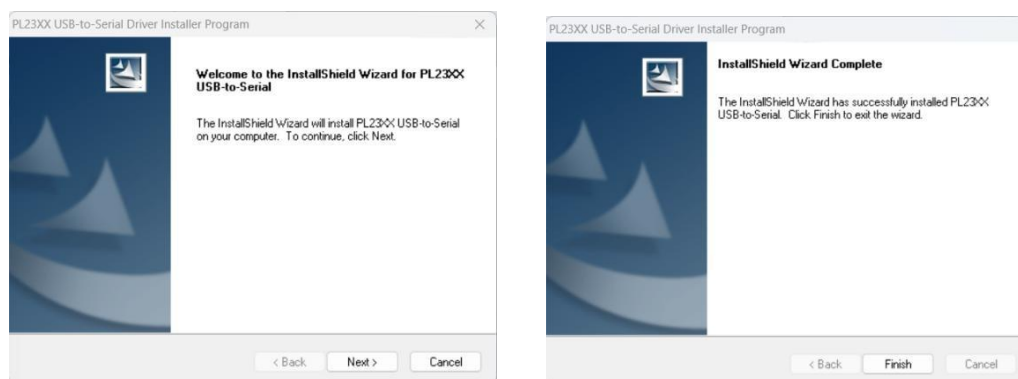
(3) Click Next to select the installation location;



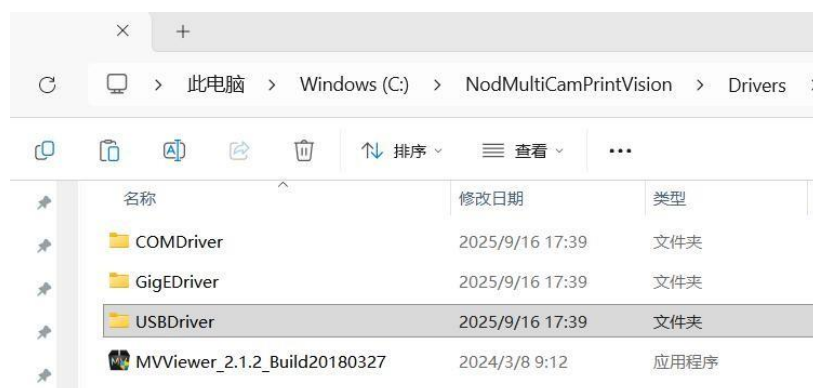
(4) Create a desktop icon and click Install



(5) Click "Next", then click "Finish" to complete the installation.



(6) Install other related driver software:



Open the folder and click to install the following drivers. Follow the prompts to complete the installation.

 PL23XX-M_LogoDriver_Setup_v200_20190815

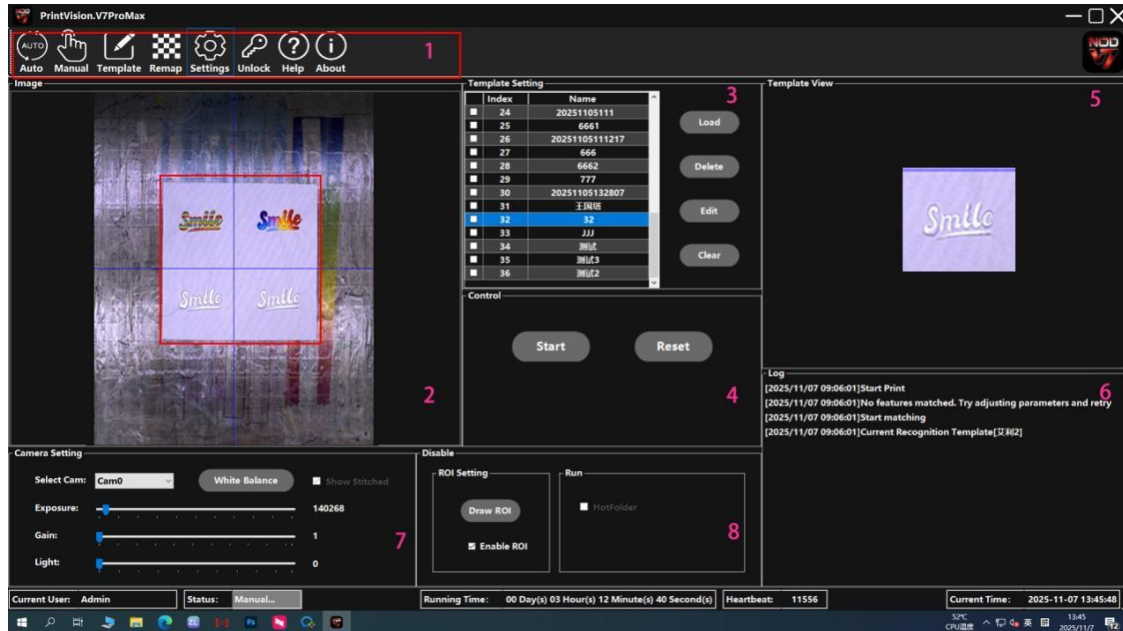
 instGigEDriver

 instUSBDriver

 MVViewer_2.1.2_Build20180327

二. Software Operation Guide

1. Software "Auto-Print" interface description: Locate the print operation interface;



① Toolbar buttons, corresponding function keys;

② Image capture area: real-time image display area with template search capability;

③ Template settings area: areas for template operations and settings;

"Load template": retrieve a pre-made template file

Delete template: Delete the selected template

Edit template: Modify the selected template's features, images, angles, and print settings.

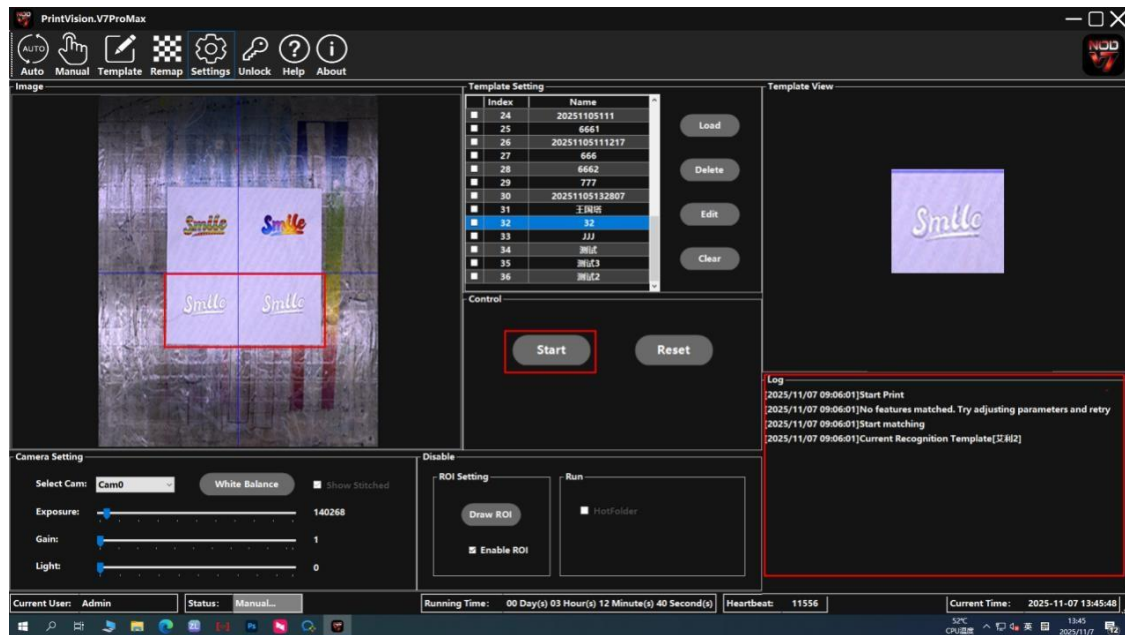
Clear Templates: Clear all templates in the area

④ Control Panel Area: Template Matching, Send Image to RIP Software

Click "Start Print" to match the template and send the matched print file to the RIP software.

Click "Pause" to stop the "Start Printing" process. Click "Start Printing" again. Resume execution from the previously interrupted process (see the figure below);

Click Reset, then click Start Printing to restart the process.



⑤ Template preview area: displays template information and matching results.

⑥ Log recording area: software operation logs are displayed.

⑦ Camera settings: select camera, exposure, gain, light source settings, and white balance calibration.

⑧ Block settings area

ROL settings: Select to enable ROL, which allows drawing a defined area within the image capture zone.

Run settings: Select in "Parameter Settings" first to choose from the external interface. Generally, this is not enabled for special needs.

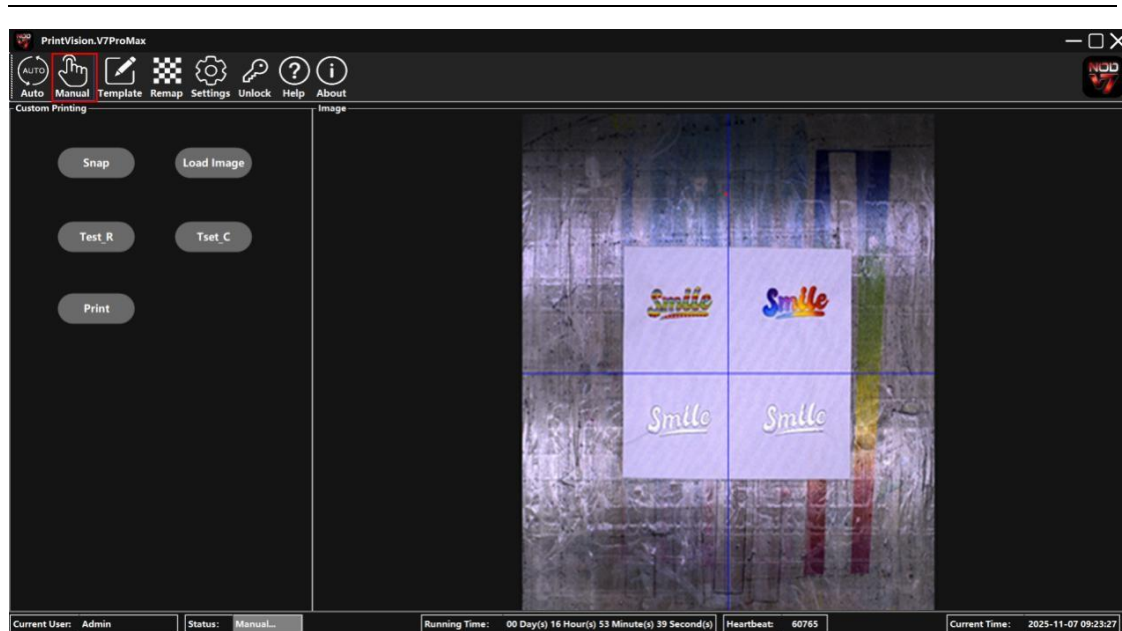
Hot folder mode: Retrieve images from the hot folder without using the imported templates.

Field of view division template: The image acquisition area is divided into upper and lower parts, which are matched with two templates respectively.

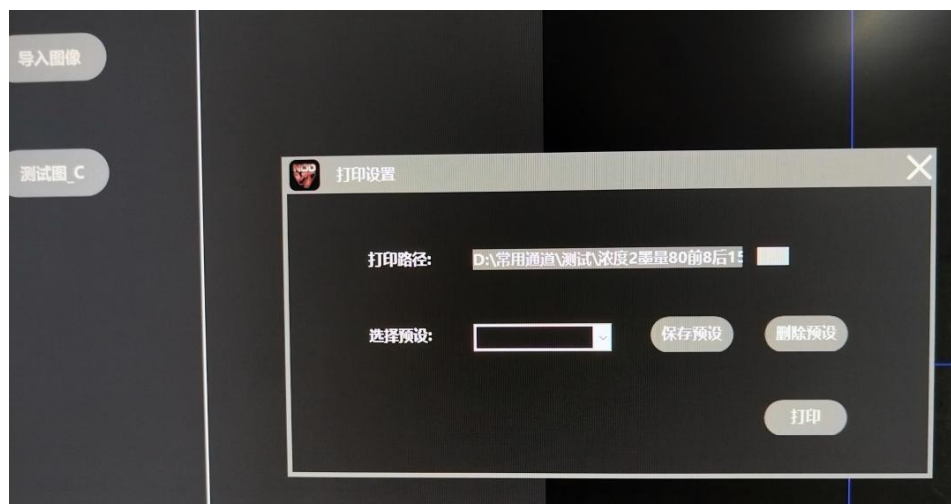
⑨Displays running information. "Heartbeat": Indicates the software's current status.

If data remains static, it signifies a freeze requiring software restart.

2. Manual printing interface: Do not use template matching. Adjust manually and print directly.



- ① The "Capture Image" button updates the current tablet screen image;
- ② Button "Import Image": Load and print images. Supports loading multiple images in PNG, JPG, BMP, or TIFF formats, including 32-bit depth images.
- ③ Buttons "Test Image-R" and "Test Image-C": Load red or cyan grid images, typically used for positioning verification.
- ④ Print button: Select the hot folder path to save or delete presets. Click Print to send the print file.



- ⑤ The image preview area allows you to edit and print images in the view, such as zooming, rotating, and moving.

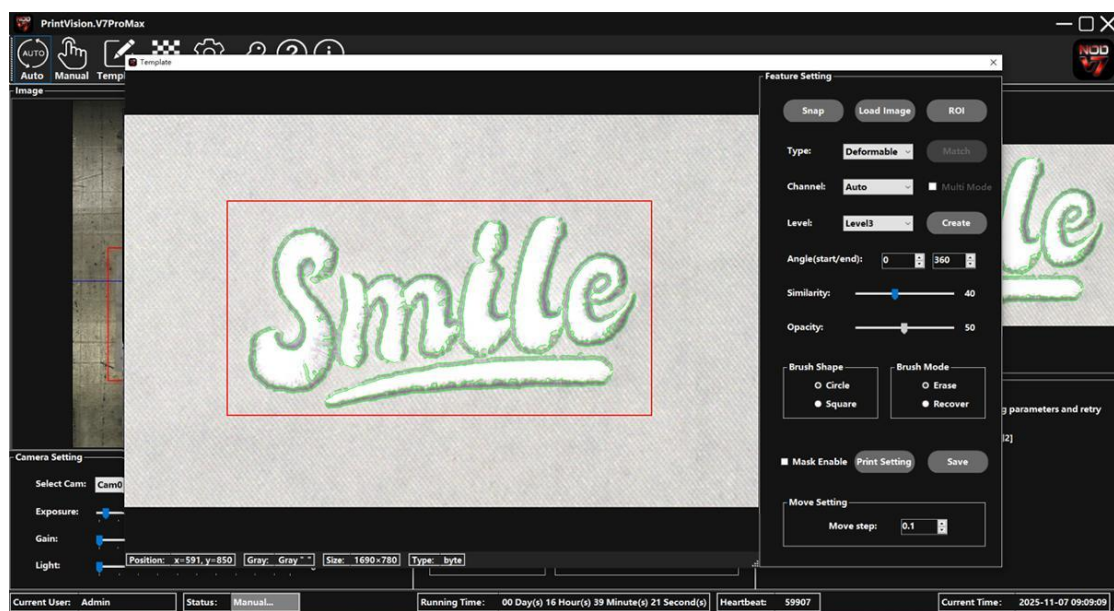
Zoom: Click the image and swipe the mouse wheel forward or backward; or right-click the image, select "Move", and hold down the left mouse button to move the image.

Rotate: Hold the CTRL key and move the mouse; or right-click the image, select Rotate, and hold the left mouse button while moving the mouse.

Move: Hold the ALT key on the keyboard to move the mouse; or right-click the image, select Move, and hold the left mouse button to move the mouse.

Horizontal and vertical mirrors:

3. Template settings interface: Create or modify templates



(1) Left area: Display area

(2) The "Feature Settings" area: Set features.

① Button "Capture Image": Update the current tablet image

② Button "Import Image":

③ Button "Set ROI": Select the area to edit

④ Feature types: Select different feature types



"Unformable": rigid and unchangeable;

"Deformable": Features can be bent, stretched, or compressed;

"Local deformation": Features can be bent, stretched, or deformed locally;

Key points: Use key points to define features (generally not selected).

⑤ channel selection :

"AUTO": Includes all channel features

"R": Select red channel features; ("G", "B", "H", "S", "V" are all channel features), "Gray": Convert to grayscale.

⑥ Feature level: Different feature levels are selected. Under different light sources, the same feature level has different results. Generally, feature level 3 or feature level 4 is used;



⑦ *Multi-image mode matching test:*

⑧ Button "Create Feature": Click the button to create a feature.

⑨ Angle range: restrict the recognition image angle range, and do not identify if it exceeds the range;

⑩ Matching similarity: Set the minimum standard for template matching. The lower the matching degree, the greater the matching tolerance, but the error may also increase.

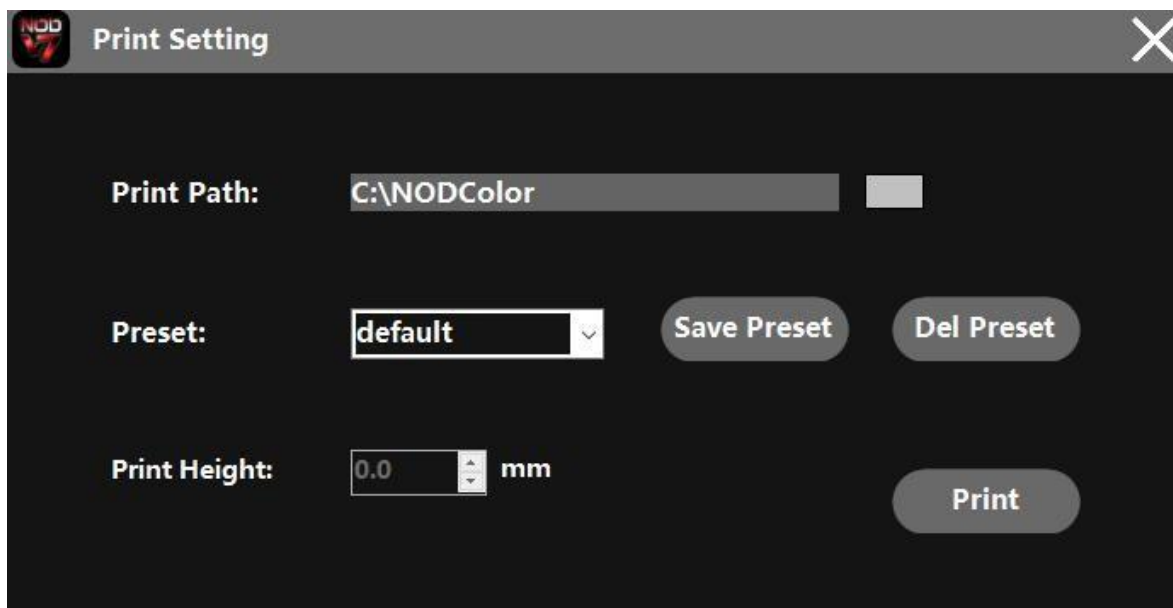
④ *Image transparency:*

⑫ Mask settings: Select (√) to analyze or restore image features;

Brush shape: Select square or circle to erase or restore features.

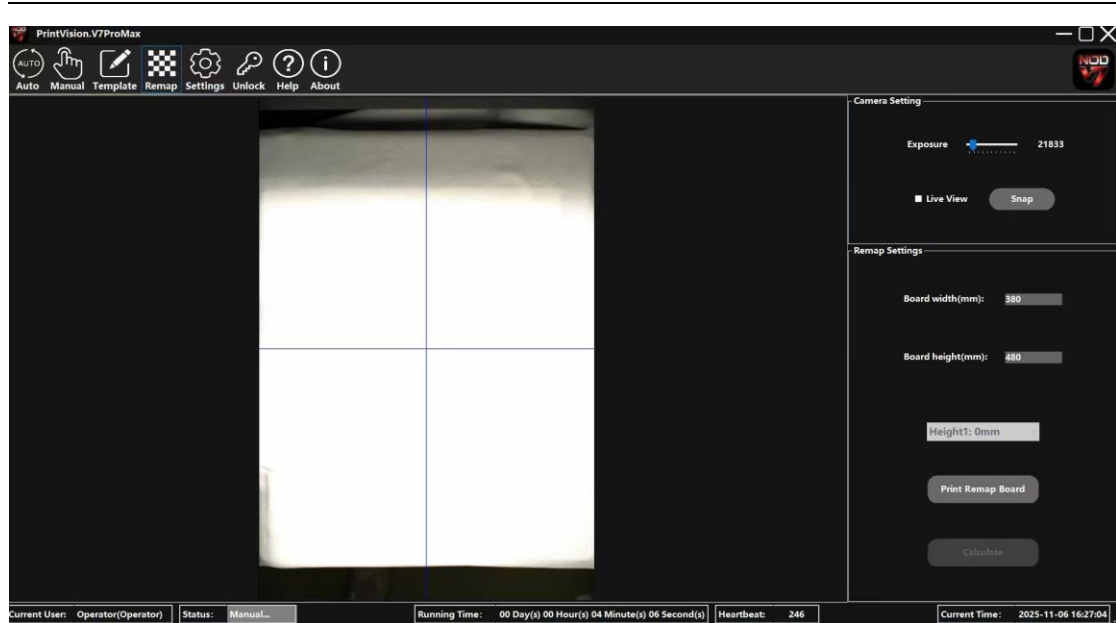
Brush type: Select to erase or restore features;

⑬ Print settings: Select the hot folder path to save or delete presets. Click OK to save the print settings.



⑭ Button "Save": Save template

4. Image Mapping Interface: Calibration



(1) Left area: Image display area

(2) Camera settings: Adjust the "Exposure" settings to choose between "Continuous capture" or "Single capture" for the image.

(3) Parameter Settings:

① Adjust the rectangular width (mm): Select the printer bed width;

② Adjust the rectangular height (mm): Set the printer bed height;

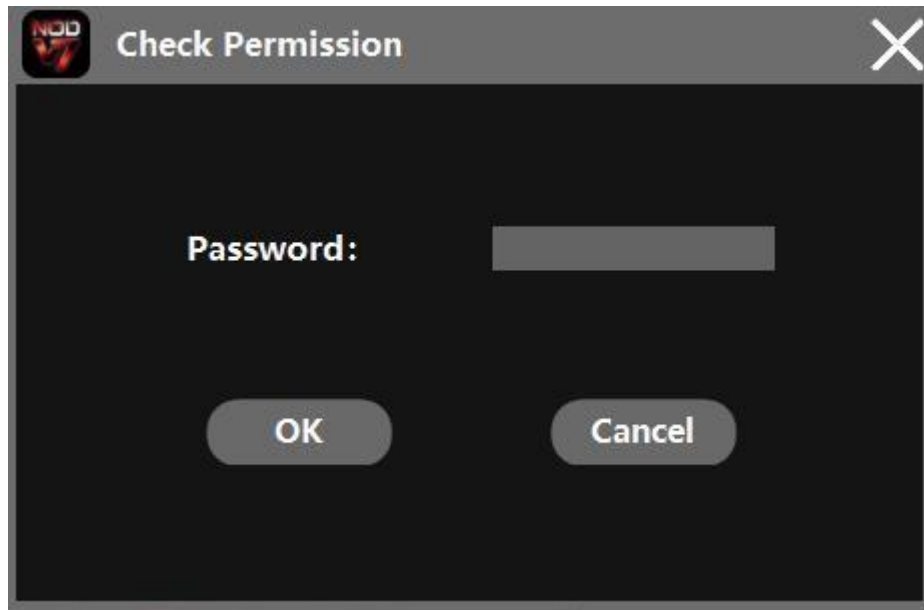
③ *Height: (applicable only when the table height cannot adjust the nozzle height)*

③ Send calibration rectangle: Send the calibration image according to the preset rectangle size;

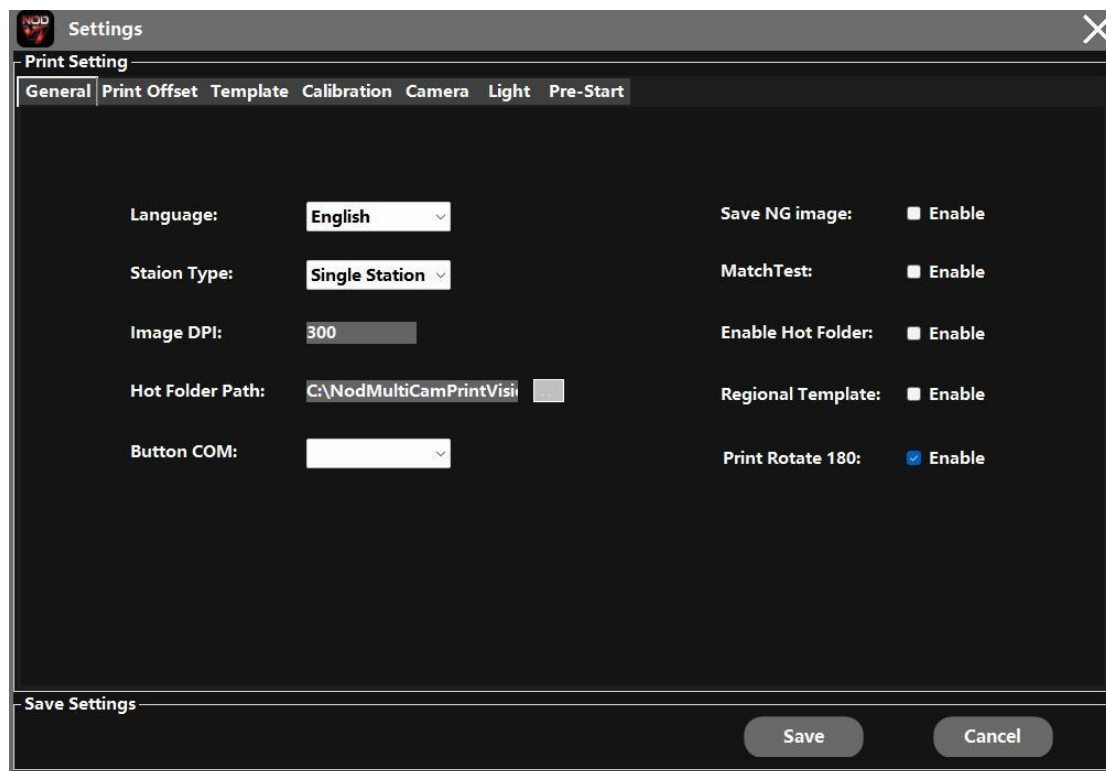
④ Calculate the transformation coefficient: Collect the printed calibration image and then calculate the calibration result.

5. Parameter Settings: Configure printing parameters;

(1) Enter the operation permission password ndlbt, then click OK to access the settings interface.



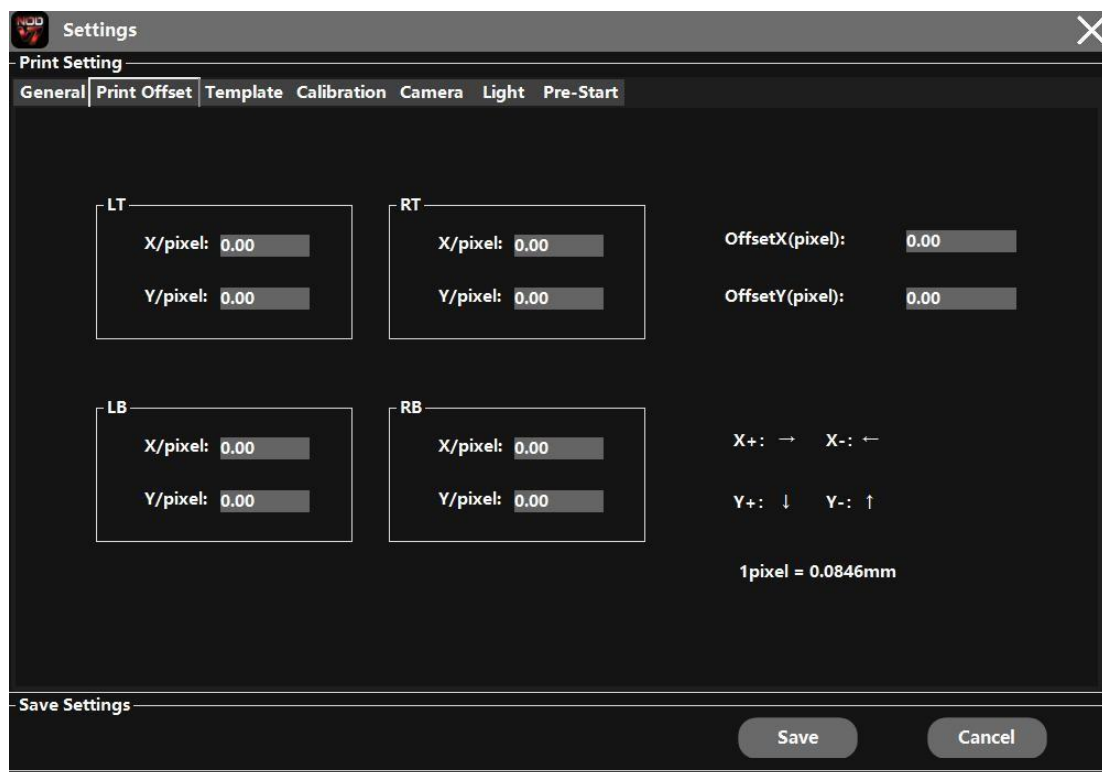
(2) General parameter settings



- ① Select language: Chinese, English, Japanese;
- ② Survival Image DPI: 300;
- ③ *Print image path:*
- ④ COM port: In the Device Manager, check the COM port number and select the corresponding port

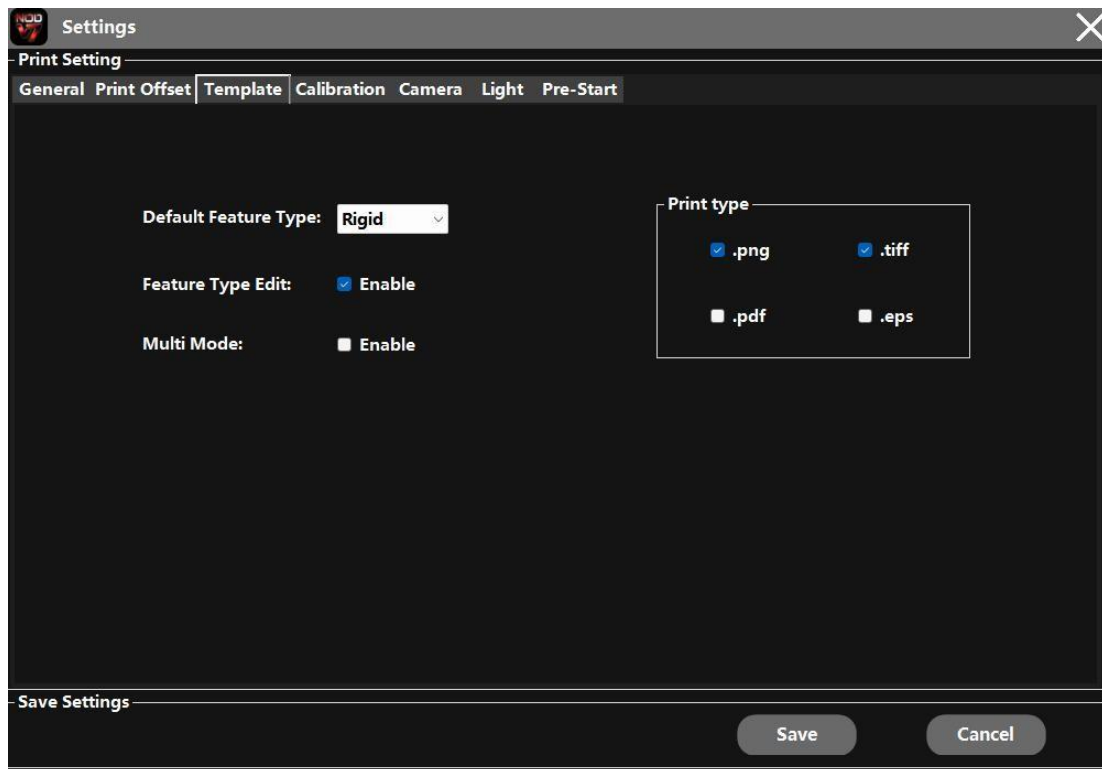
-
- ⑤ *Save NG images: Generally disabled;*
 - ⑥ *Template editing test: Select and perform matching test in the template settings interface; generally not enabled.*
 - ⑥ *Enable hot folder: Print images in the folder one by one without enabling*
 - ⑦ *Partition settings template: not enabled*
 - ⑧ *Rotate 180 degrees: Rotate the image by 180 degrees and output it to RIP software, which is usually not enabled*

(3) Print Compensation Settings



- ① "Global Compensation X (pixel)": Total offset in the X-axis direction;
X+: Shift image right, X-: Shift image left;
- ② "Global compensation y (pixel)": Overall offset in the Y-axis direction;
Y+: Move down, Y-: Move up;
- ③ Left upper corner, right upper corner, left lower corner, right lower corner: local compensation;
- ④ Buttons "Save" and "Cancel": Save or cancel the settings.

(4) Template Settings:



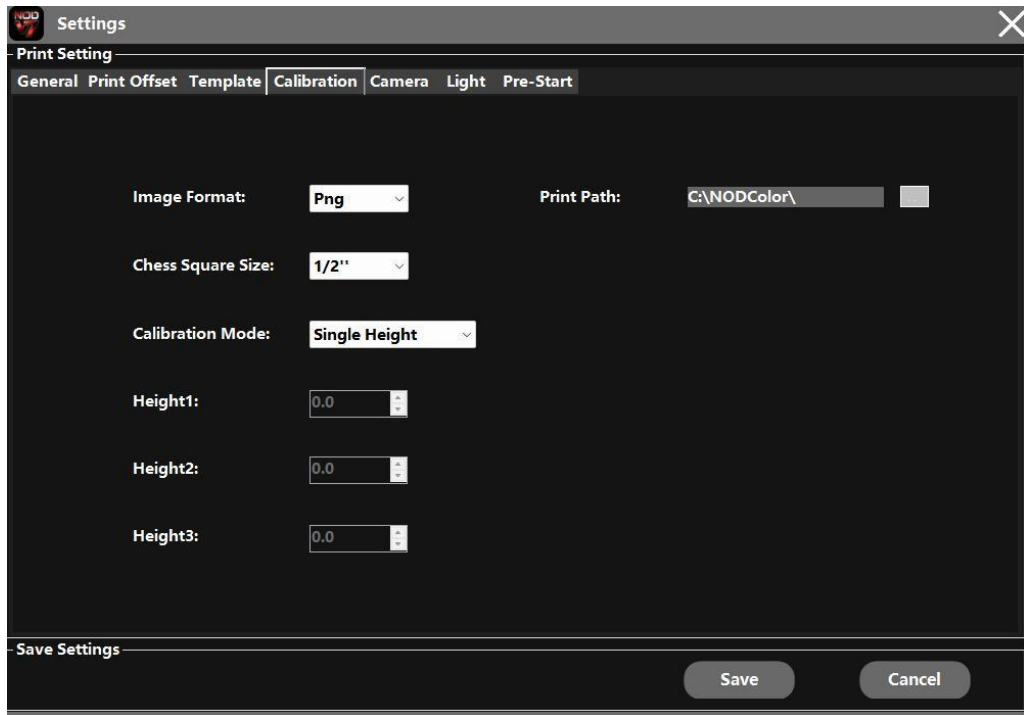
① Default feature types: Unchanged, Deformed, Local Deformed, Key Points

② Feature type editing: Enable to select options like "no deformation", "deformation", or "partial deformation".

③ *Multiple images mode: not enabled*

④ Print image types: Currently supports PNG and TIFF formats;

(5) Calibration Settings



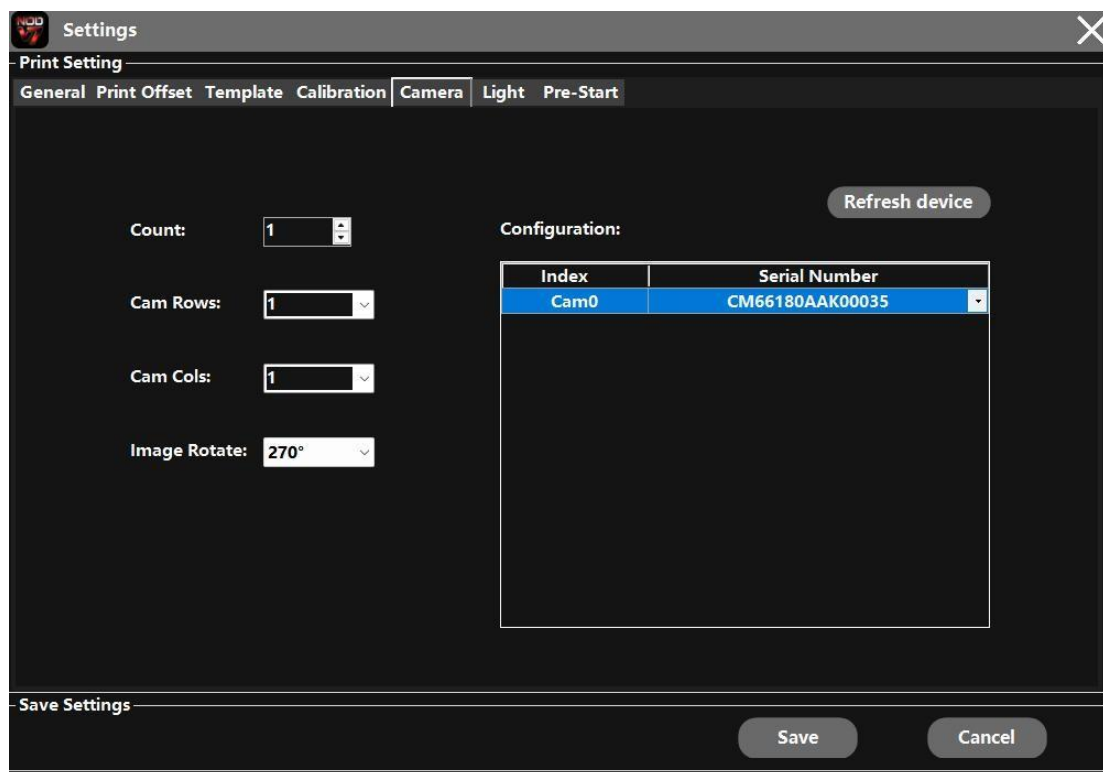
① Image format: PNG or TIFF; PNG is generally preferred.

② Grid size: Set the individual grid size. Smaller grids improve calibration accuracy, but will this enhance the 'calculated transformation coefficients' during image mapping? It is recommended to set it to 1/2 or 1/3.

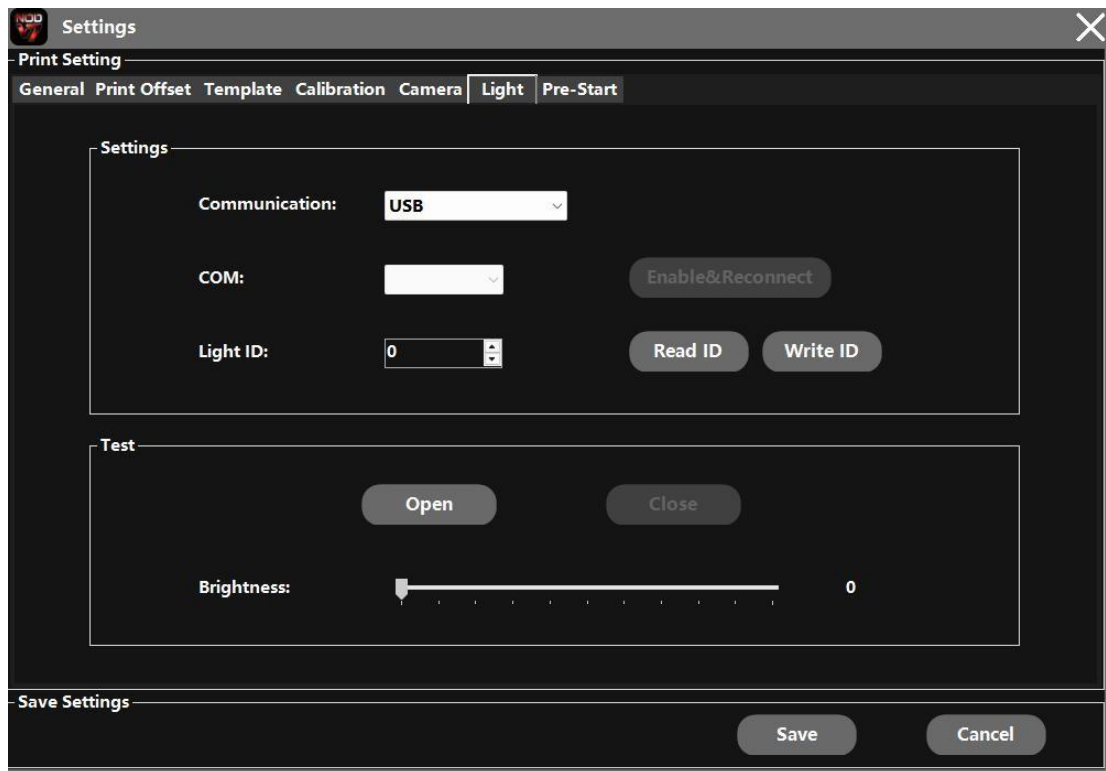
③ Calibration mode: Select single-point calibration

Other calibration methods: Height 1, Height 2, Height 3: When the height of the camera and printed image changes, the software automatically matches the calibration parameters within the set height range. (Only applicable when the table cannot be adjusted.)

(6) Camera Settings



- ① Camera count: Select the number of cameras installed on the device, choose 1;
- ② Camera rows: for multi-camera use; printer selection 1
- ③ Camera column count: for multi-camera use; select 1 for printer
- ④ Image Rotation: Rotate the image before sending it to RIP software. Do not modify this parameter.
- ⑤ Update list: Click to update current settings; click the blue bar, then select the corresponding camera serial number from the right-side selection arrow.
- (7) Light source settings



① set up :

Communication mode: Select the connection method (USB or COM). USB is typically used for standalone devices.

② Serial port number: corresponding interface number;

③ Button "Enable Serial Port and Reconnect": Refresh connection;

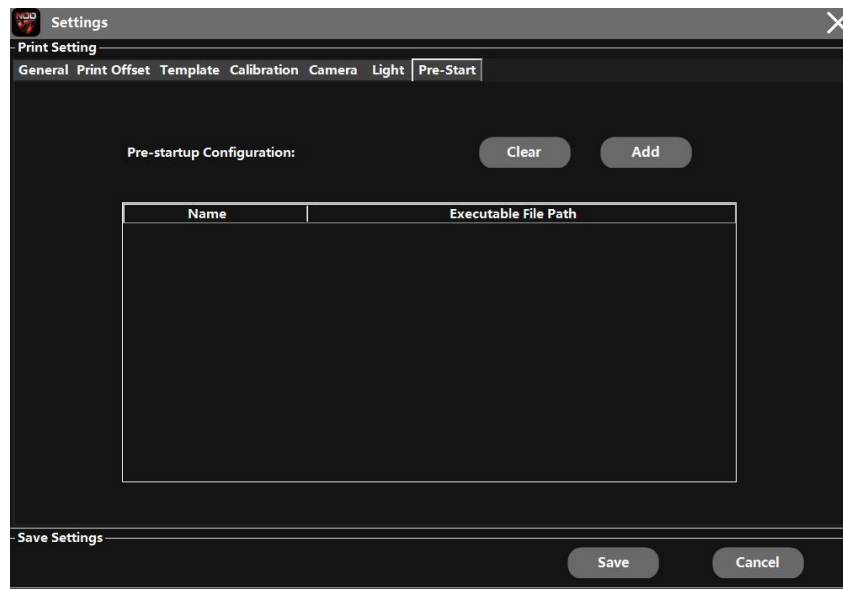
④ Light source ID: Set the light source ID;

⑤ Buttons "Read ID" and "Write ID":

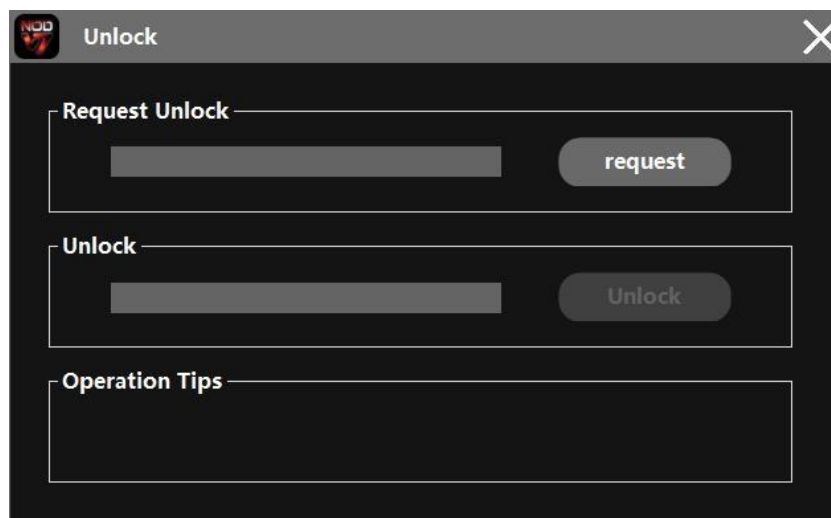
⑥ Buttons "Turn On Light Source" and "Turn Off Light Source": Click to activate or deactivate the light source.

⑥ Light source brightness: adjustable

(8) Start Settings



6. Remote unlock interface:



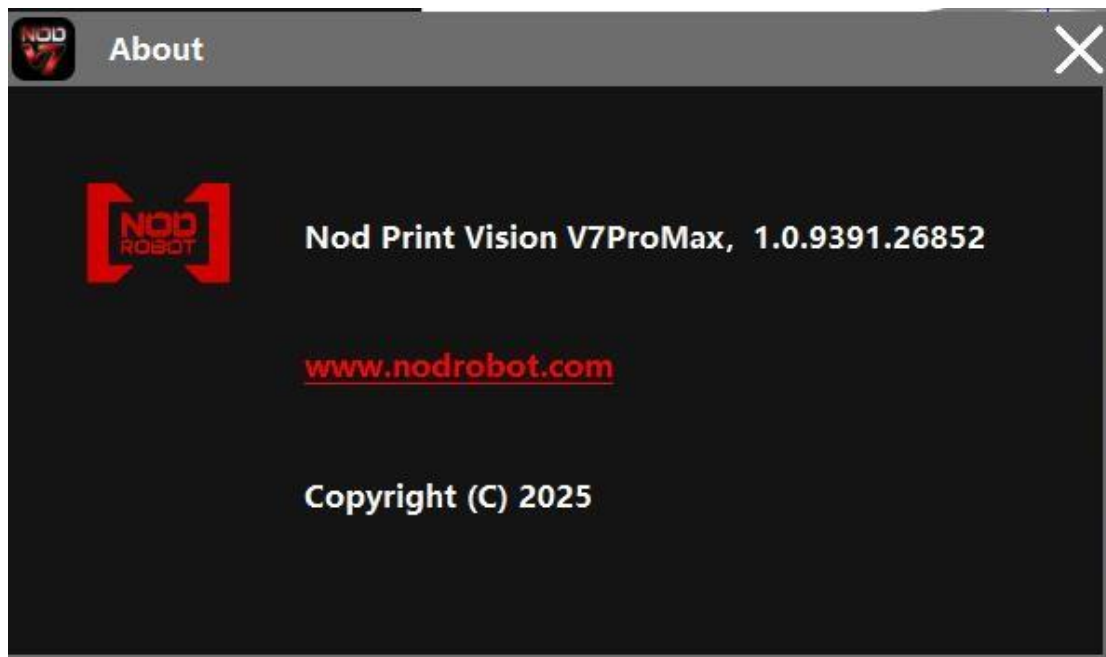
(1) The "Request Unlock Code" button generates an application code and sends it back to the supplier.

(2) Enter the unlock code provided by the supplier in remote unlock mode, then click the "Unlock" button to complete the process.

(3) Operation prompt: Display the operation result.

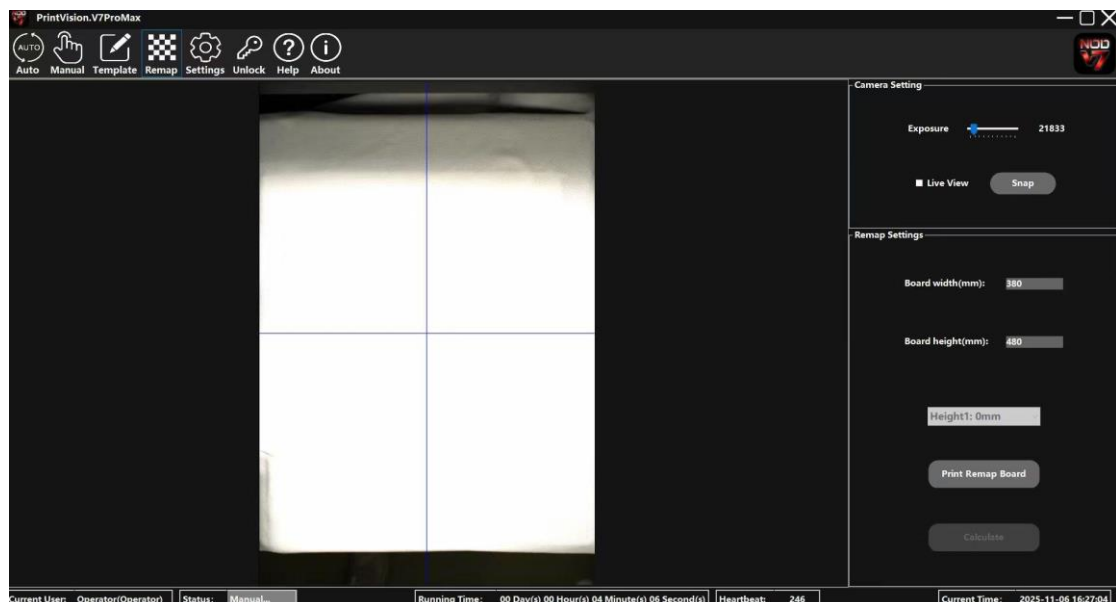
7. Help: View instructions

8. About: View website



三. Image Mapping (Calibration)

1. Lay the same size of "water transfer film" or pre-treated white cloth on the table;
Adjust the height of the table to about 3.0-4.0mm from the lower end of the nozzle;
2. Click the toolbar's "Image Mapping" to access the calibration interface.



3. In the camera settings list, check the "Continuous Capture" option or select "Single Capture".
4. In the parameter setting list, the height and width of the correction rectangle are

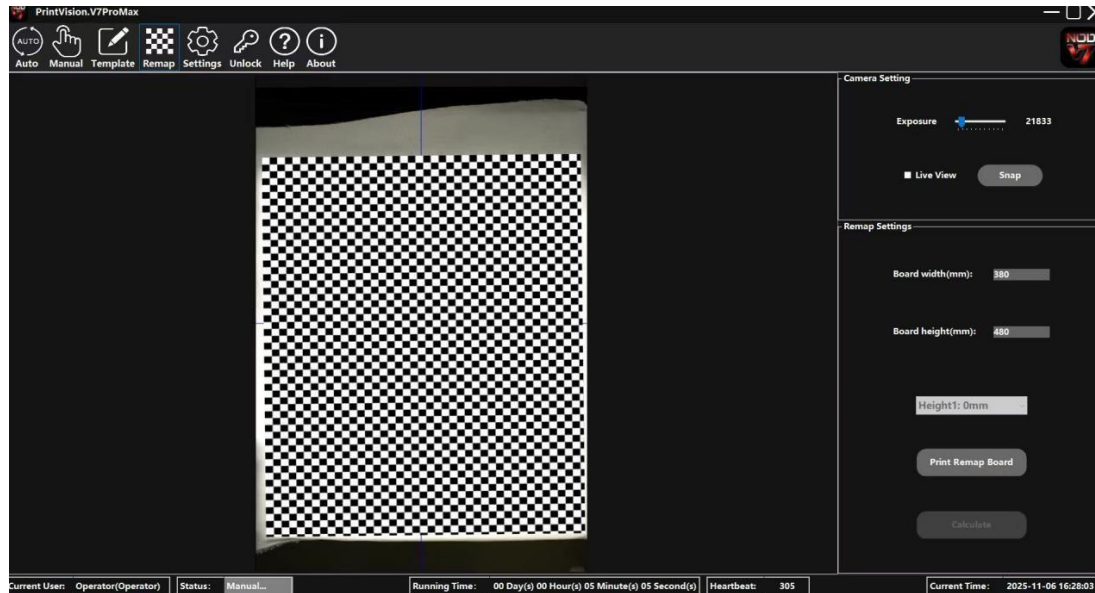
generally set according to the size of the table;

Single station: 380*480, double station: 400*500

5. Click "Send Rectangular Correction" to export the correction file.

Automatically select the output folder set in the "Parameter Settings" interface.

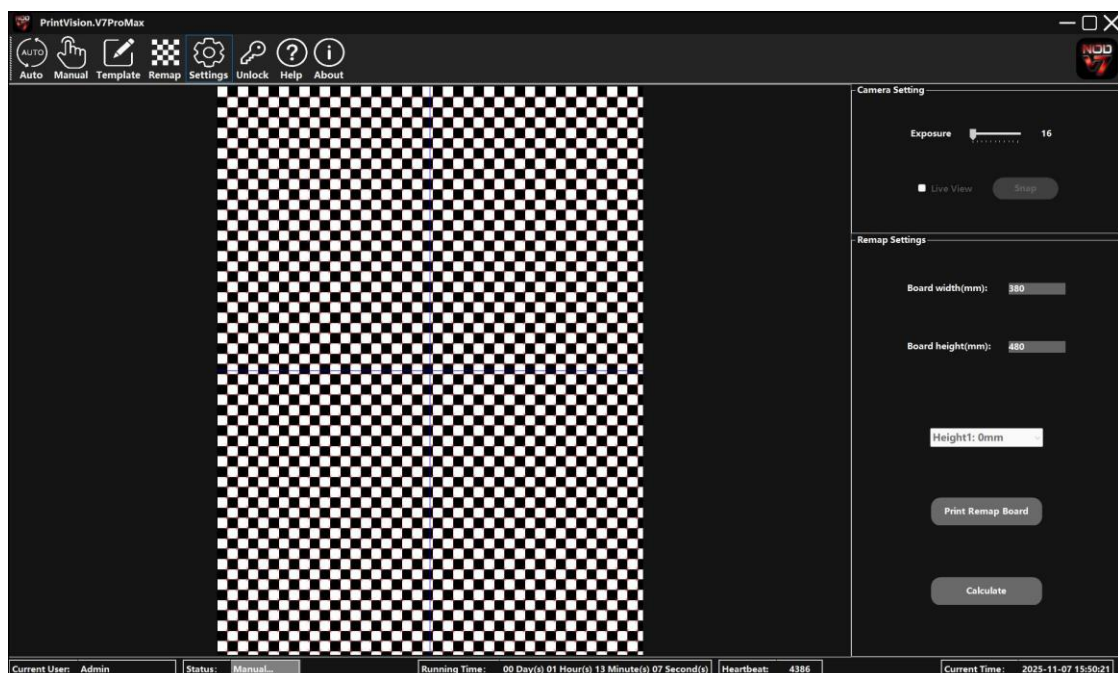
6. Print the calibration file (as shown in the figure below);



7. Adjust exposure parameters in the exposure settings to ensure all parts of the corrected image are clear and not overexposed;

8. After printing, wait for the tray to return to the starting position. Click "Single Capture" and then "Calculate Transformation Coefficients".

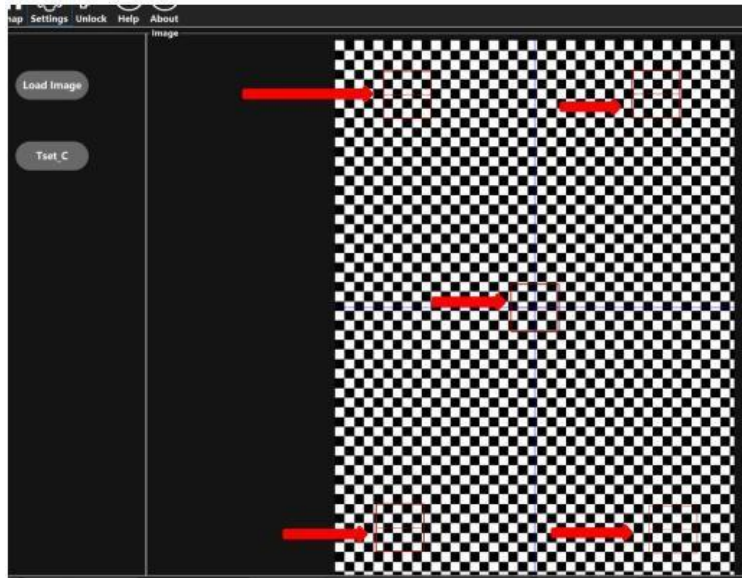
(1) If "Calculation Successful" appears, the calibration is normal. Check the chessboard image: there should be a red or green "×" at each corner where borders meet (as shown in the red box below), with no "×" elsewhere. Click "OK" to complete the calibration.



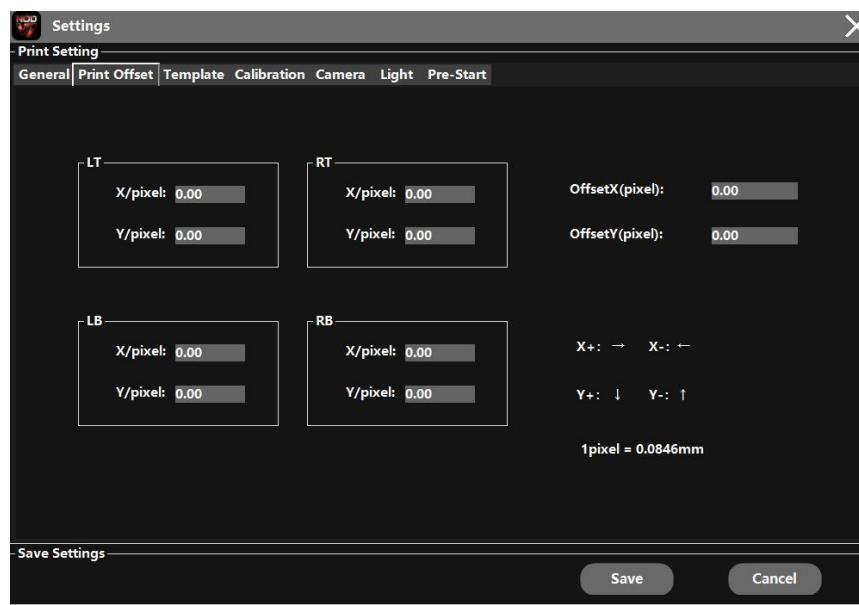
(2) "Calculation failed. Check the grid image. A 'X' appears in non-transfer areas. Adjust the right top corner 'Exposure Settings', click 'Single Capture', then click 'Calculate Transformation Coefficient' until 'Calculation succeeded'."

Note: If the light source on the chessboard image is uneven (e.g., some areas are dark), adjusting only the "exposure settings" may not achieve successful calibration. You need to adjust the ambient light to ensure uniform illumination on the table. A stable and uniform light source is essential for accurate template-matching printing.

9. Go to the Manual Print interface and print the grid pattern (marked as 'field') in all four corners and the center. After printing, click 'Collect' to verify that the printed image perfectly matches the grid pattern. The verification is complete.



If the printed image is offset from the original, you can adjust the offset compensation in the parameter settings.

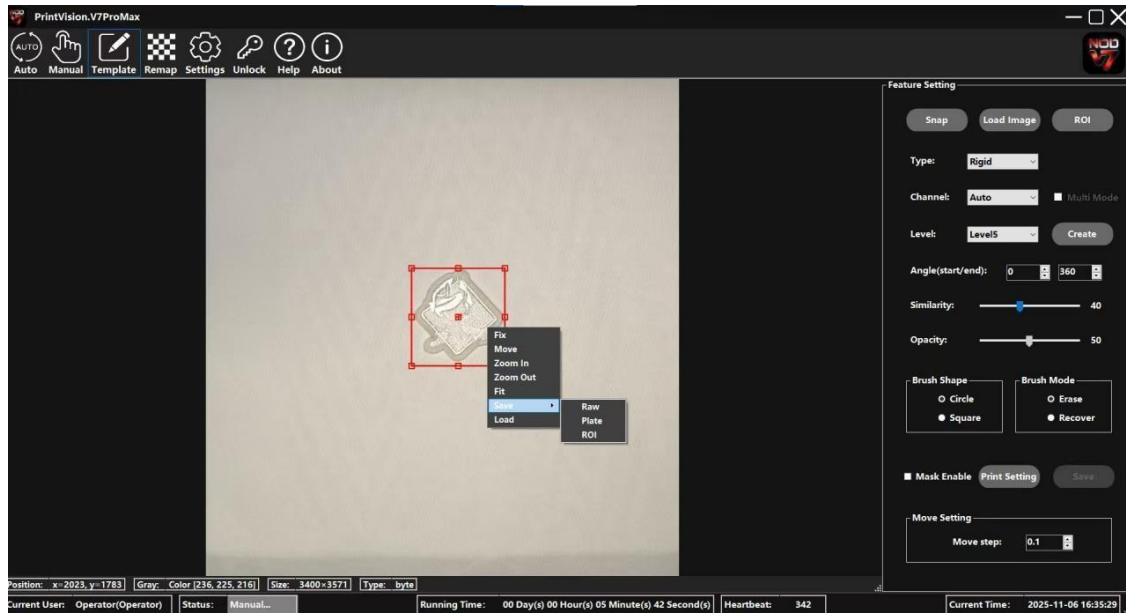


Note: Use the imported image as the reference to determine the direction and size of the printed image deviation, and then compensate.

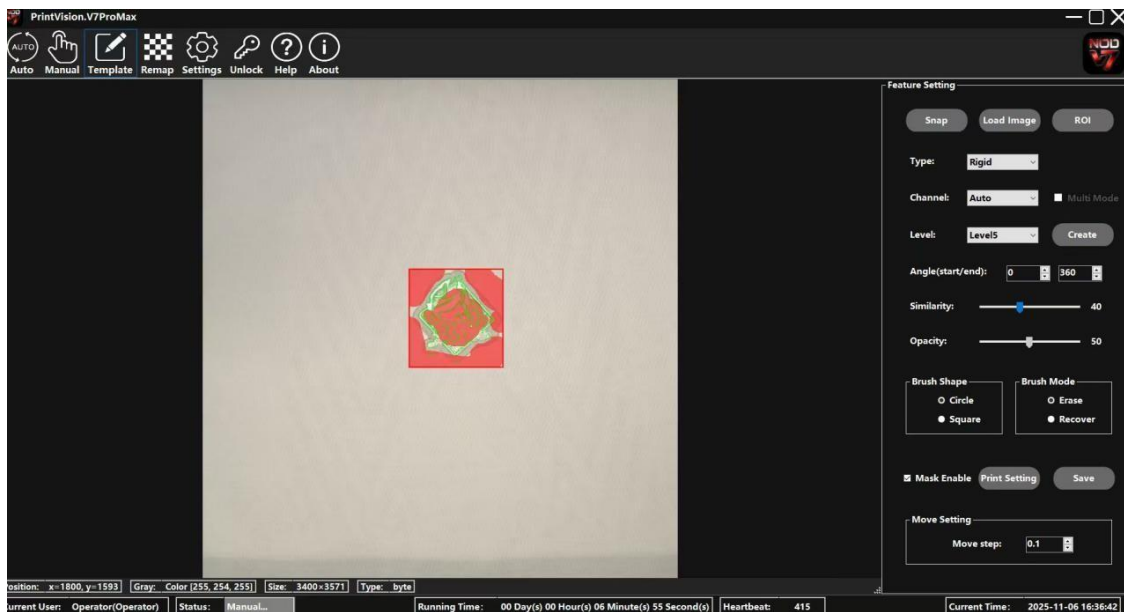
Daily work must be verified before production can begin.

四. Template Creation

1. Lay the substrate to be patterned on the table, then adjust the table height to ensure the upper surface of the substrate is 3.0mm-4.0mm away from the lower surface of the nozzle.
2. Tap "Template Settings" to access the template creation interface;
3. Right-click the image to save the template.



Click "Set ROL" and edit the required feature image within the red box.



4. Select the "Feature Type":

The materials to be printed are very regular, and generally do not deform;

When printing materials deform significantly, deformable materials are generally preferred, such as wedding dresses.

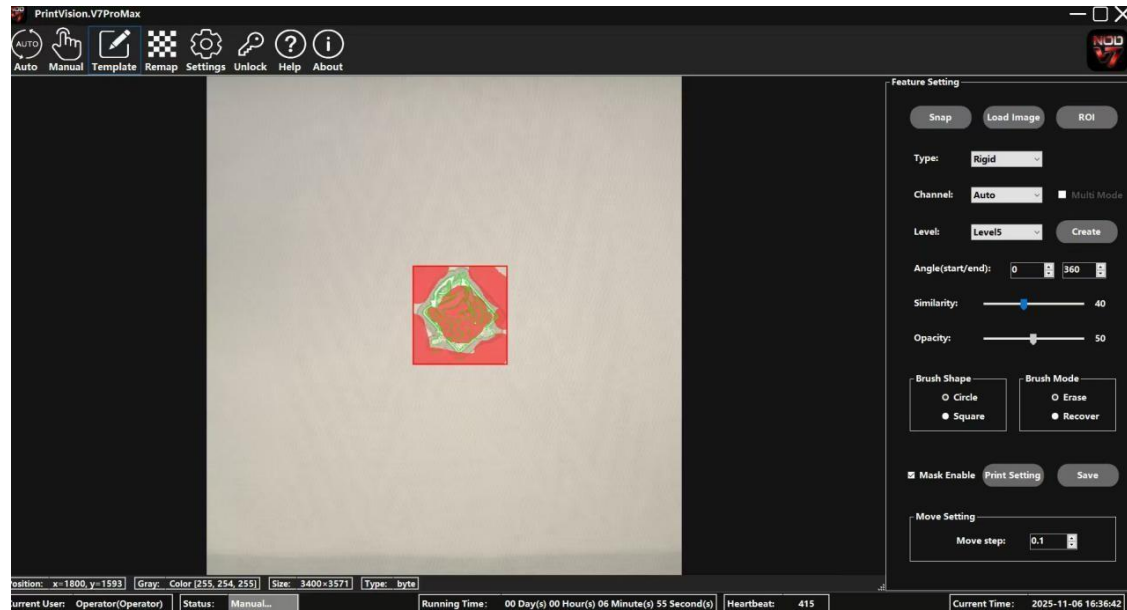
The printed material shows only partial deformation, typically referred to as 'partial deformation,' such as in the case of seal stamps.

5. Channel selection: Generally select "Auto".

6. Select an appropriate feature level (continuous features are preferred). Click "Create Feature" to display the result after feature creation. Generally, use feature level 3 or 4.

Note: If there is a lot of noise in the feature, adjust the light source again to make the border feature visible and reduce the useless feature.

7. Check the "Mask Settings" box to select the appropriate brush shape. The "Erase" or "Restore" options can remove unwanted features or noise, and recover accidentally erased valid features.



Note: After erasing or restoring features, you must click "Create Special" again for the changes to take effect.

"Clear" or "Restore" can be switched by right-clicking.

Valid features generally refer to the outer contour of the red box image and the outer contour of the small image in the middle of the image.

8、Edit the mask image in Photoshop.

Open both the template image and the mask image. Drag the mask into the template. Use tools like Transform and Liquefy to adjust the mask's position, scale, and stretch/shrink specific areas. Align the mask with the template, then expand its edges by 1-3 pixels based on the material and precision requirements. Save the modified mask in PNG format using the Save As option.

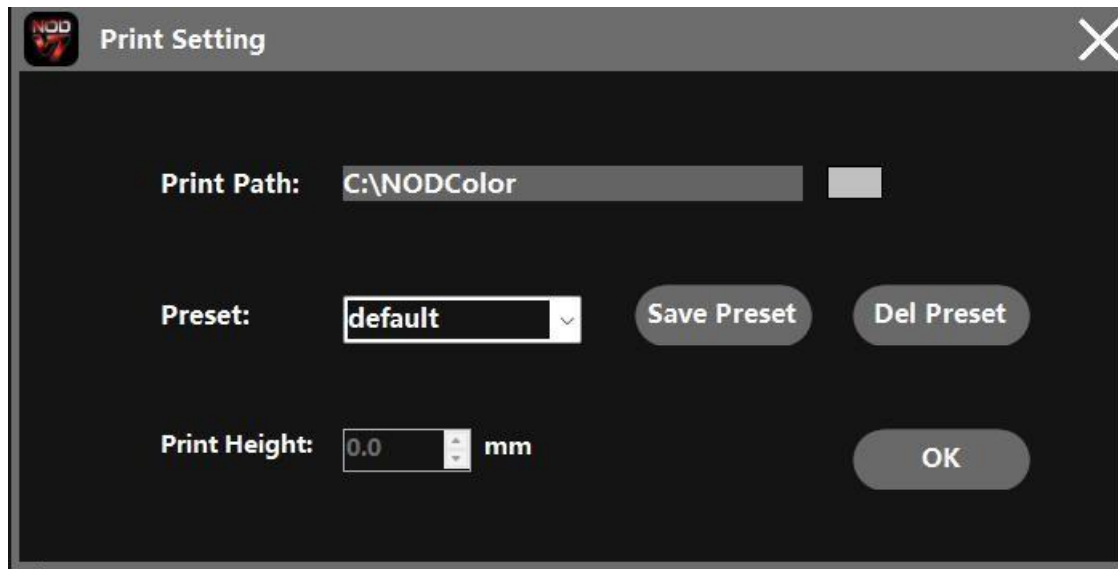
Note: If the medium material is dark, the mask image edge can be expanded to 3 pixels. If it is white, it is generally only expanded by 1-2 pixels.

9. Click "Import Image" to import the modified mask image (no movement, shrinkage, or rotation adjustments will be applied after import);

10. Adjust "Match Similarity" (default value is usually selected);

(1) Click "Print Settings" to configure your print path (see the figure below). You can save

frequently used paths as preset names for quick access, or delete infrequently used preset names.



(2) Click OK, then click Save Template. Name the template and save it to the specified folder.

(3) Go to the "Auto Print" interface and check that the template is already in the list. The template is ready.

pay attention to :

The larger the template image, the more complex the features, and the longer the matching time.

The higher the feature level, the wider the angle range, the lower the matching similarity, and the longer the matching time.

五. Print (Automatic and Manual)

1. Automatic Printing (Template Matching): Designed for batch printing or high-precision alignment tasks (requiring manual adjustments in Photoshop).

Mask image).

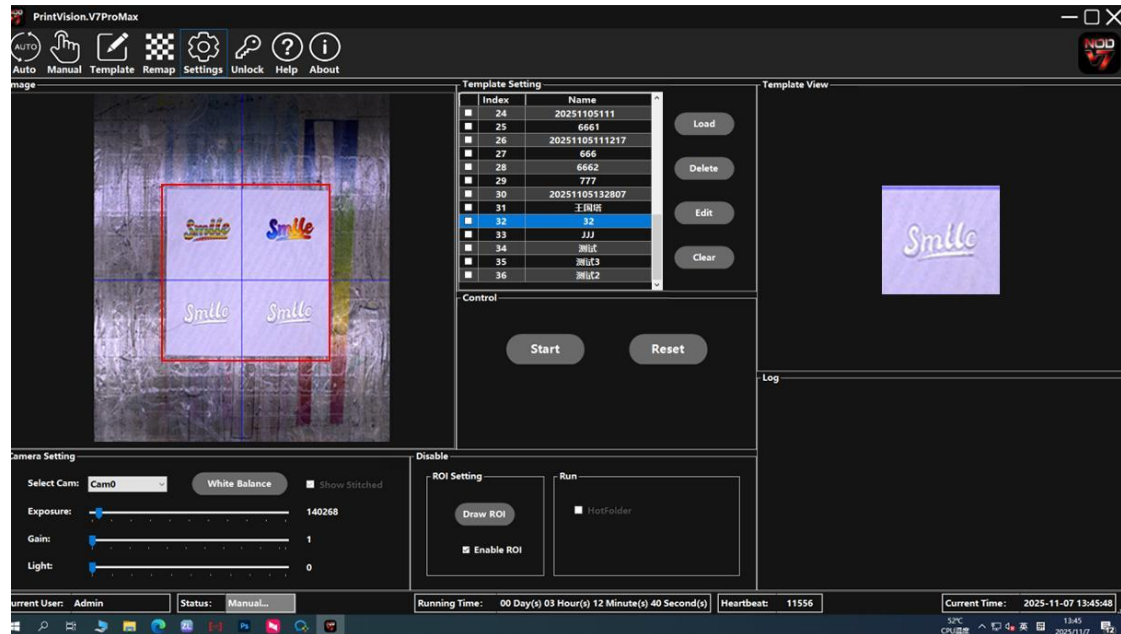
(1) Lay and arrange the materials to be printed on the table, and pay attention to the materials to be firmly attached to the table to prevent the printing process from lifting and scratching the nozzle;

(2) Adjust the height of the table according to the thickness of the material to be printed;

(3) Go to the "Auto Print" interface, select "Draw ROL", and mark the area of the medium to be printed;

Click "Start Print" to complete the photo, match, and send the print file (see the figure below).

(4) Open the RIP software, click Print (or set to automatic printing), and complete the printing.

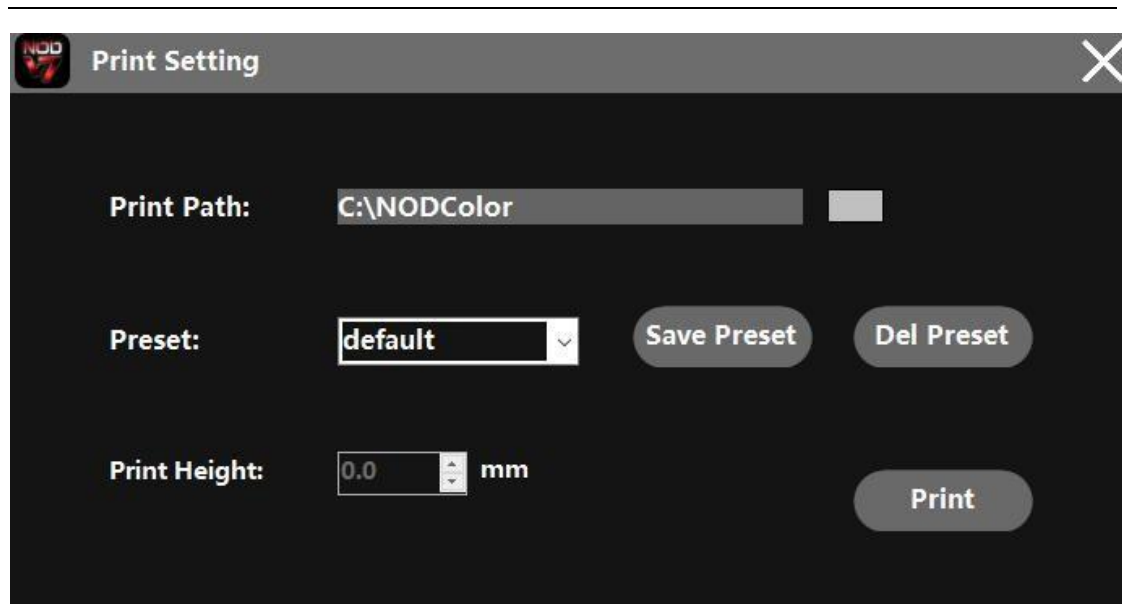


2. Manual printing: For single-piece printing or printing with low positional requirements;

- (1) Lay the materials and adjust the table height according to the automatic printing operation
- (2) Go to the "Manual Print" interface, click "Import Image", and perform image operations such as moving, zooming, and rotating (see the figure below);



- (3) Click "Print", select the print path, click "Print" (see the figure below), and send the file to the RIP software.



六. Supplementary Notes:

1. Definition:

- (1) Template image: refers to the image taken and saved when making the template;
- (2) Mask image: refers to the image to be printed;

2. Save template images, mask images, and template suggestions in separate folders with the same names, such as image content or customer names.

3. Photoshop editing: Refer to the "PS Operation Manual".