NC UV1314-II
Visual Positioning System
User Manual

Catalogue

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Summary

The cart-type visual printer is an integrated application that highly integrates the software and hardware of a line-scan camera and a flatbed printer.

Compared with other visual printers on the market, advantages of this product are as follows: no any additional devices such as extra sensor, grating, magnetic grid ,light sources and power supplies are required. It only needs to install a camera on the right side of the cart. Besides, compared with other visual software, it is more concise in interface, easy in operation and highly user-friendly.

It can be applied to high-precision positioning printing of materials such as metal/non-metal badges, ornaments, logos and packages.

Hardware Installation

Table 2-1 Camera Hardware List

No.	Material Name	Mode	Quantity	Type	Remarks/Notes
1	Line-scan Camera	Custom	1	Required	Integrated Package
2	Camera Board		1	Required	Integrated Package
3	Camera Acquisition Card	Custom	1	Required	PCIEx4Slot
4	Printer Board	Custom	1	Required	Printer-Included
5	Visual Dongle	Custom	1	Required	
6	Camera Link Communication Cable	Included	2	Required	10m
7	Camera External Trigger Cable	Included	1	Required	10m

2.1 Camera Characteristic Parameters

Table 2-2 Camera Scanning Parameters

No.	Relevant Parameters	Parameters Values	
1	Scanning Width	219 mm	
2	Resolution/Pixel Size	1200dpi	21.16um×21.16um
3	Line Rate/Speed	10kHz	210mm/s(8.33 ips)
4	Image Color/Format	Gray	8 Bit
5	Working Distance/Depth of Field	Around 8mm	±0.3mm
6	Scanning Mode	Hardware Trigger/Free Run	
7	Light Source	RGB LED	
8	Transmission Interface	Camera Link	
9	Power Supply	24V/1A	
10	Dimensions/Weight	263×40×26.5mm	<1.0Kg
11	Working Temperature/Humidity	5-50℃	10%~90%RH

2.2 Camera Physical Characteristic

Figure 2-1 Camera Dimension Diagram

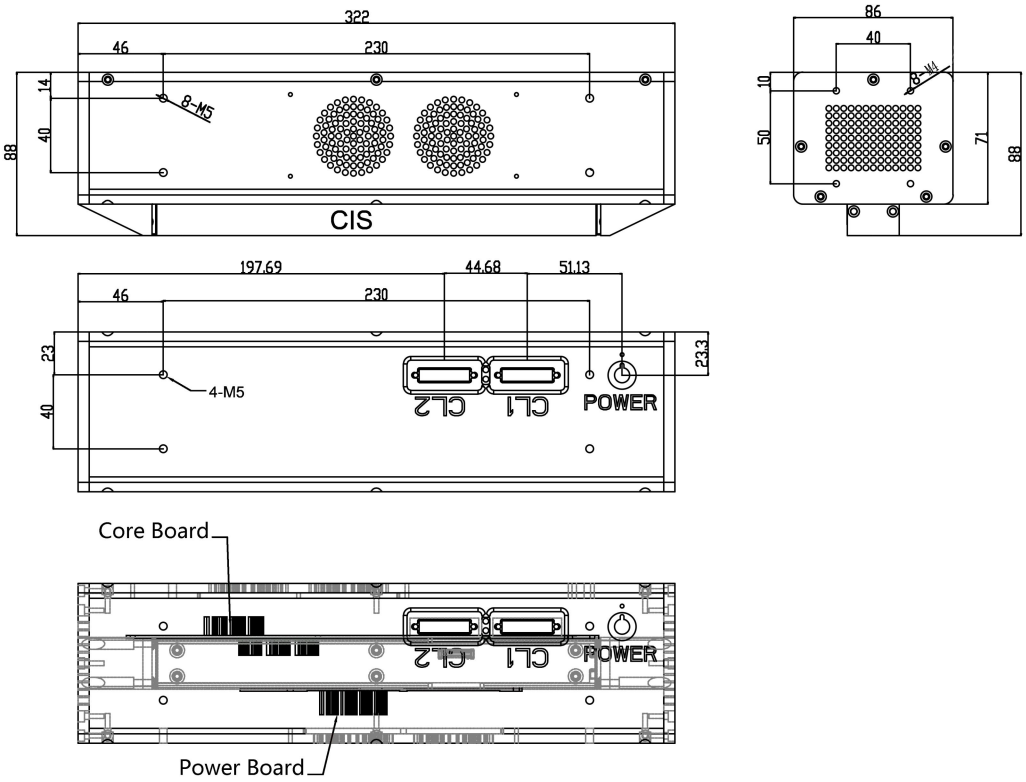
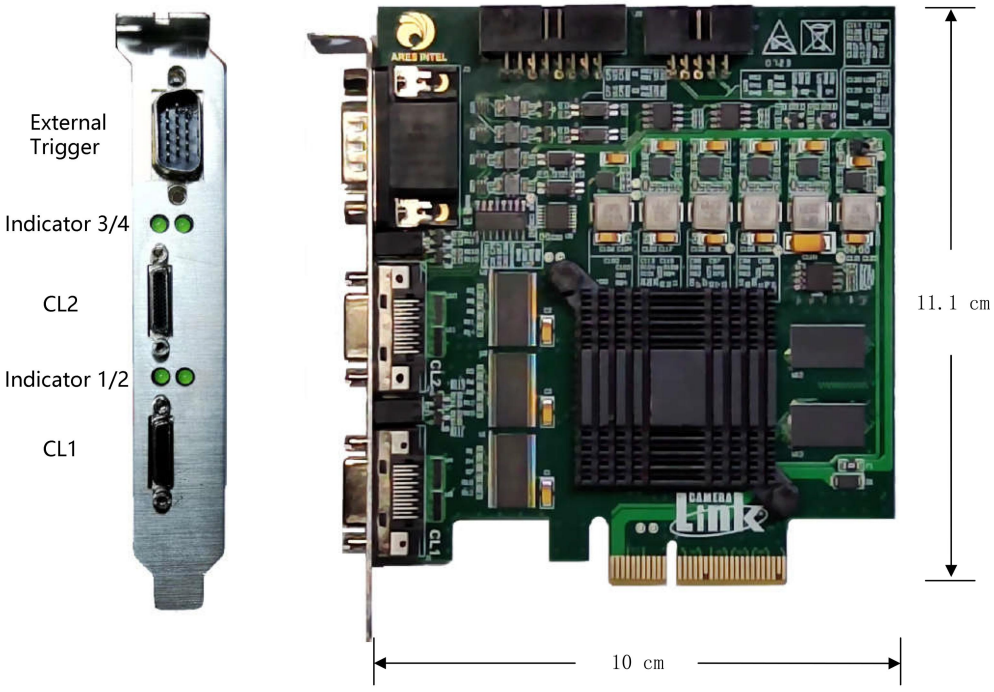


Figure 2-2 Dimension Diagram of Camera Acquisition Card



2.3 Camera Electrical Characteristic

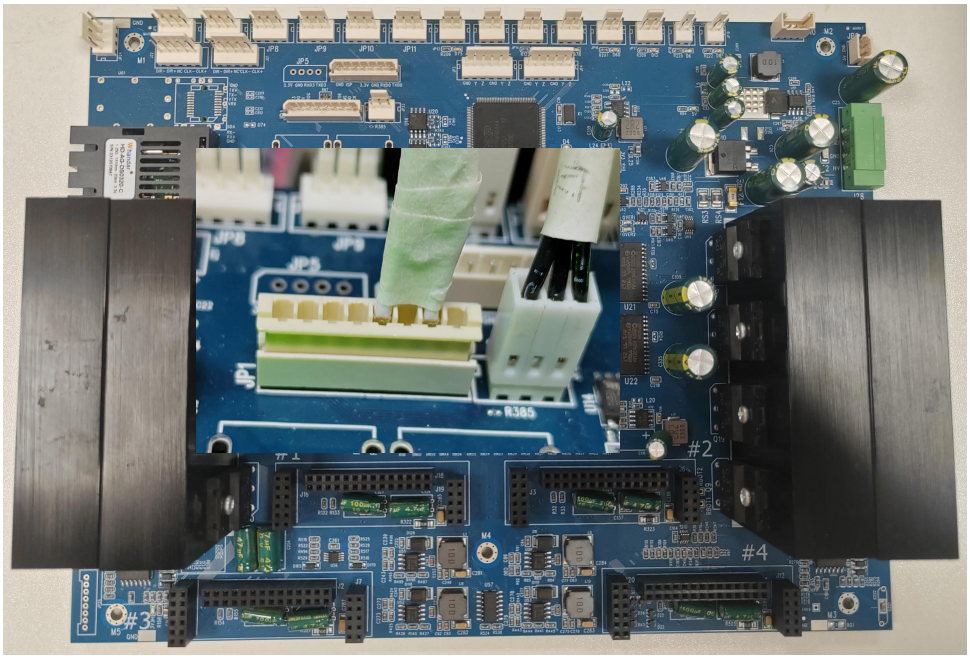
The camera board has been packaged, with a 24V power supply, CL1,CL2 interfaces reserved.

The acquisition signals are shown in figure2-4, which are the 5(3.3V)AND 7(GND)signals of the origin, corresponding to the start-stop signals in the figure above.

Figure 2-3 Wiring of External Trigger Signals for Camera Acquisition Card

No.	Color	Description
1	Black	GeneralOutput1_Signal
2	Black/White	GeneralOutput2_Signal
3	Brown	GeneralOutput1_VCC
4	Brown/White	ShaftEncoder1_A+
5	Red	ShaftEncoder1_A-
6	Red/White	ShaftEncoder1_B+
7	Orange	GeneralOutput1_GND
8	Yellow	ShaftEncoder1_B-
9	Green	GeneralInput1-
10	Blue	GeneralOutput2_GND
11	Purple	GeneralInput2-
12	Gray	GeneralInput2+
13	White	GeneralOutput2_VCC
14	Pink	NC
15	Light Green	GeneralInput1+

Figure 2-4 Wiring of External Trigger Start-Stop Signals



2.4 Preliminary Calibration for Camera Installation

Four key points to confirm during camera installation:

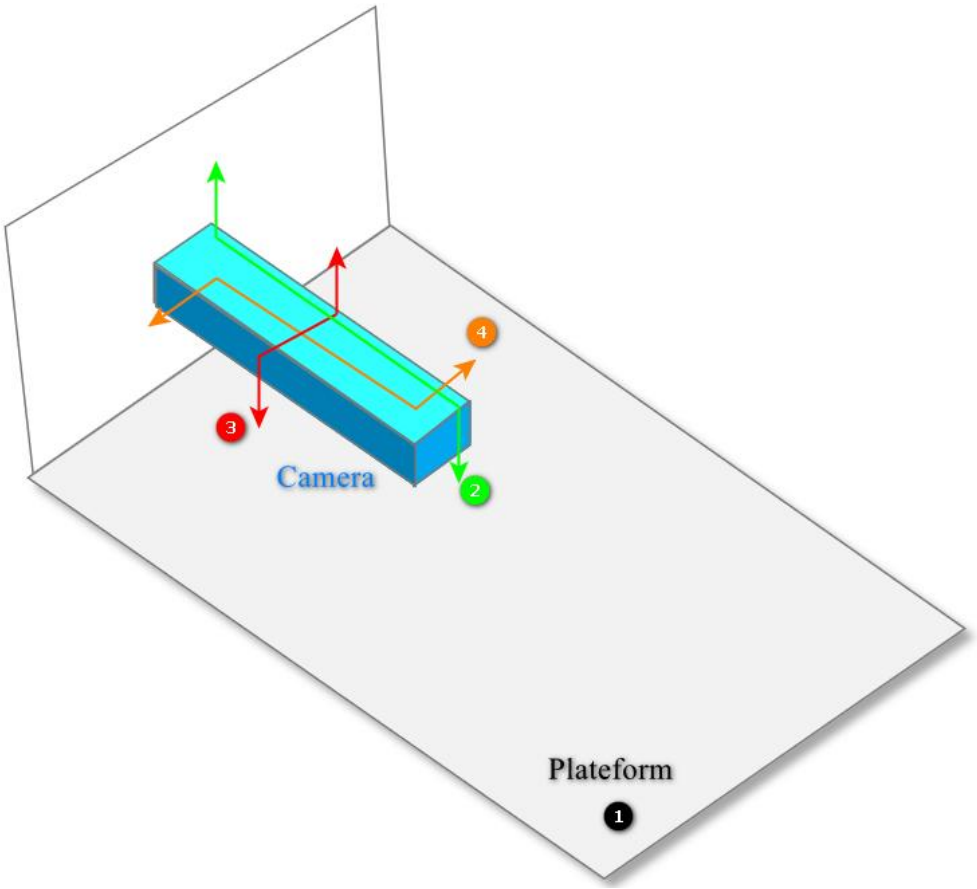
①Platform levelness: Use dial indicator to calibrate the platform, ensuring that the levelness error of the platform is within 0.10mm.

② Camera pitch angle:Raise the Z axis, fix the dial indicator on the platform, attach the indicator head to the edge of the camera glass. Move the platform back and forth, to ensure that the front and rear pitch angle error is within 0.05mm.

③Camera tilt angle:After pitch angle calibration, move the cart left and right, to ensure that the left and right tilt angle error is within 0.10mm.

④Camera parallel angle:Use a dial indicator, fix the indicator head on the side of the camera, and ensure that the parallel error is within 0.05mm.

Figure 2-5 Diagram of Camera Installation and Calibration

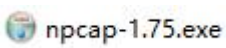


Software Installation

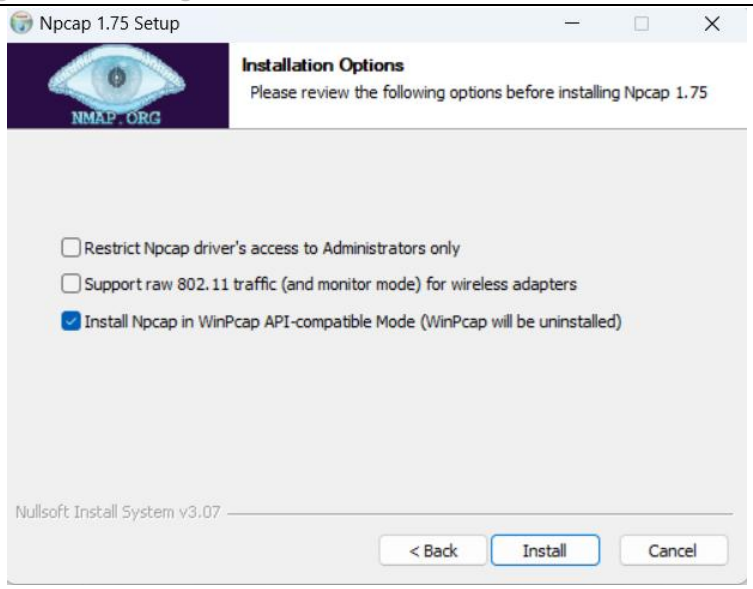
Table 3-1 Camera Software List

No.	Software Type	Tool Name	Type	Description
1	Camera Acquisition Tool	Volans CameraLink Image Acquisition Card_1.0.1.127_X64	Required	Image acquisition, camera calibration
2	Serial Port Debugging Tool	TLC_UI_SDK_Cs++_x64	Required	Acquisition parameter control
3	Communication Environment Tool	npcap_1.75	Required	Acquisition data transmission communication
4	Scanning and Printing Tool	NC_1314II_I3200(4H)_Camera_ATools_V*****GL_	Required	Printer ATools, Complete installation includes camera acquisition toll and communication environment tool

3.1 Camera Software Installation

(1) Install 

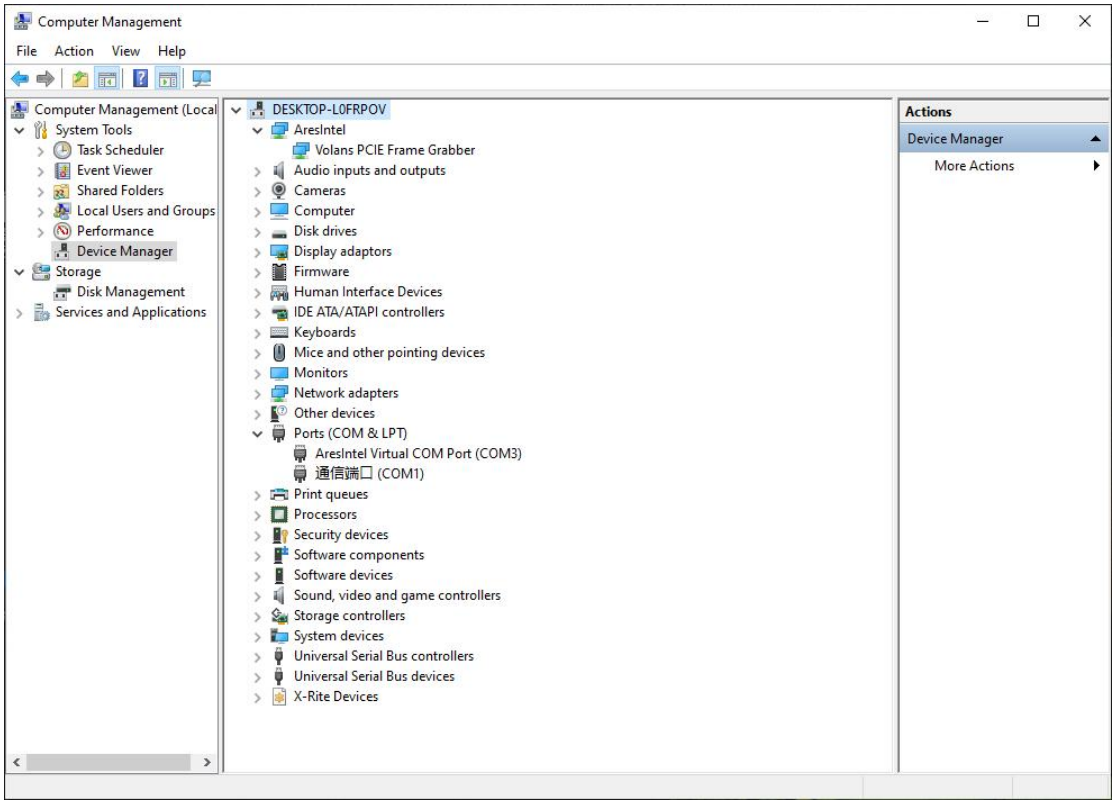
(The installation process will automatically uninstall wincap4.1.3). Only check the third option during installation.



(2) Install Volans CameraLink 图像采集卡_1.0.1.127_X64

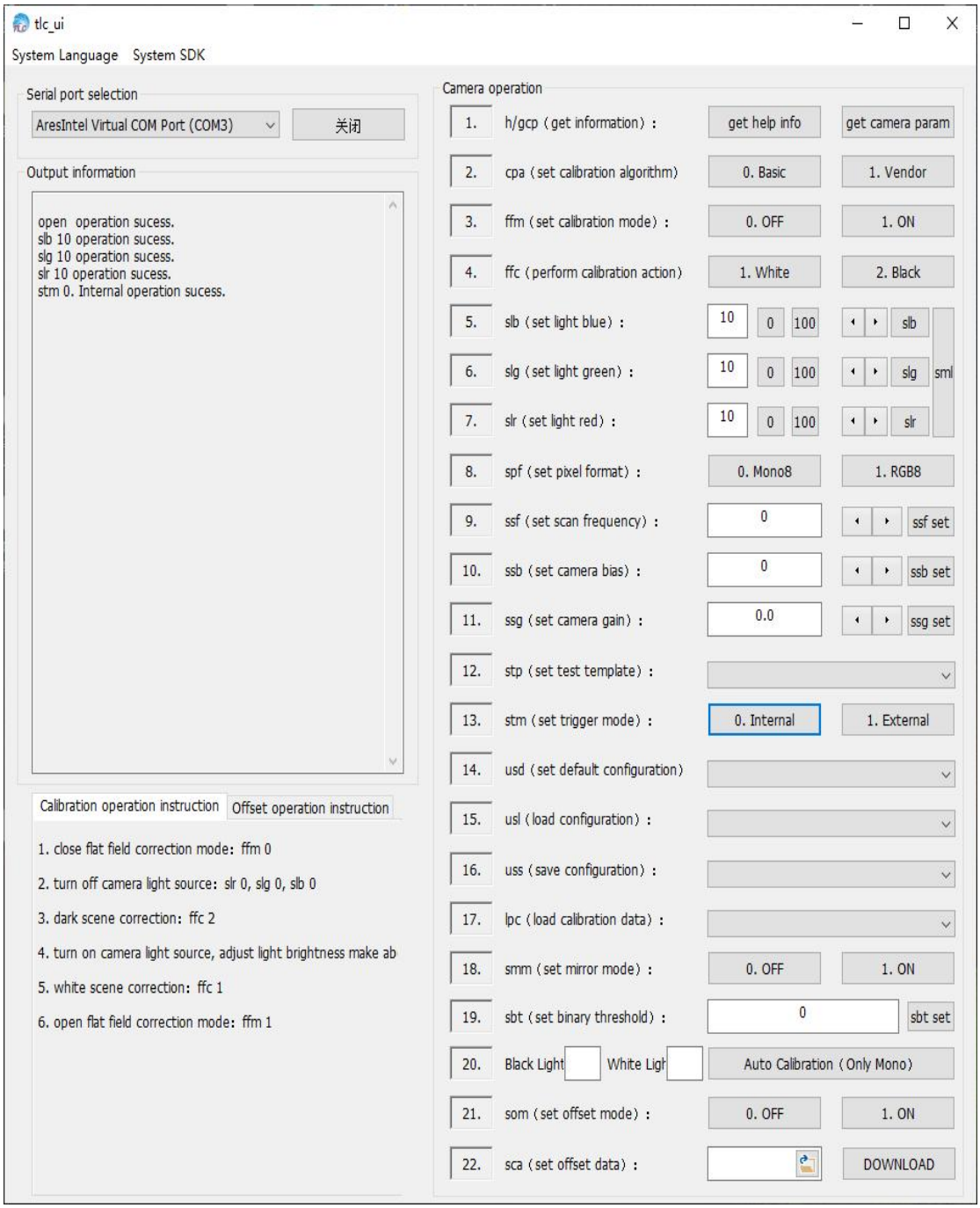
(3) Use TLC tool to test the camera.

①Open Device Manager, and confirm that both camera acquisition card hardware (Volans PCIE Frame Grabber)and COM port(AresIntel Virtual COM Port)are recognized normally.



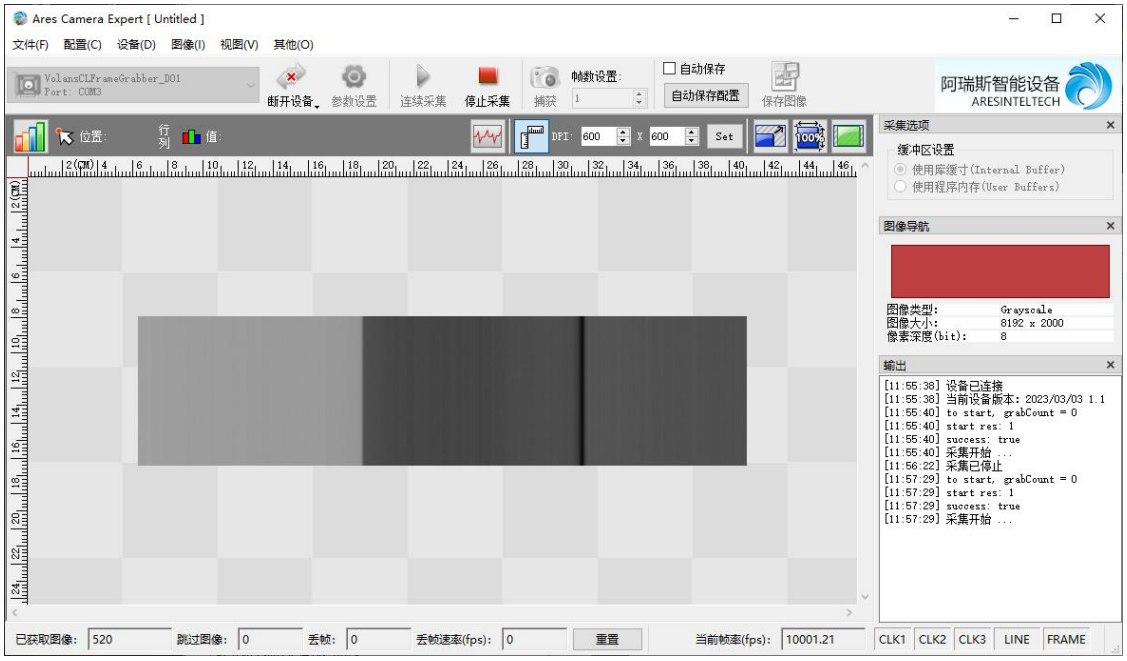
②Extract TLV tool,【open】 tlc_ui , select the serial port corresponding to Ares and click Open, and the information bar will prompt【Open Operation Successful】.

③【Camera operation】Set Option 13【stm(Set Camera Trigger Mode)】to 0.Internal. Enter the brightness of the three-color light sources in items 5./6./7, and click【slb】【slg】【slr】respectively.



④Open the Ares camera software AresCamExpert, click 【Connect Device】, 【Parameter Setting】, and select the acquisition mode as 【Free Run】, and click OK.

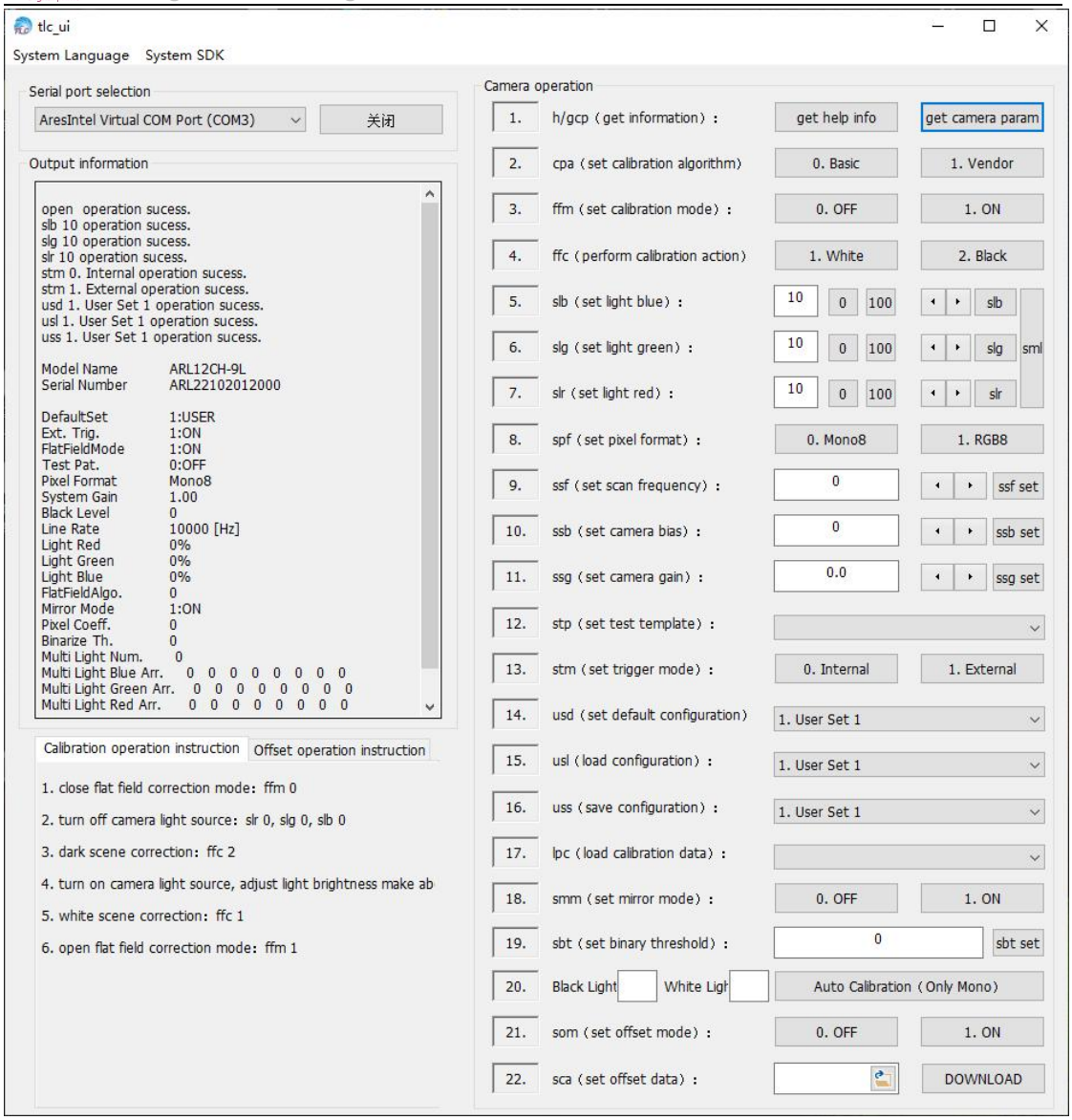
⑤Click 【Continuous Acquisition】. If a picture is acquired, it indicates that the camera is normal. Click【Stop Acquisition】.



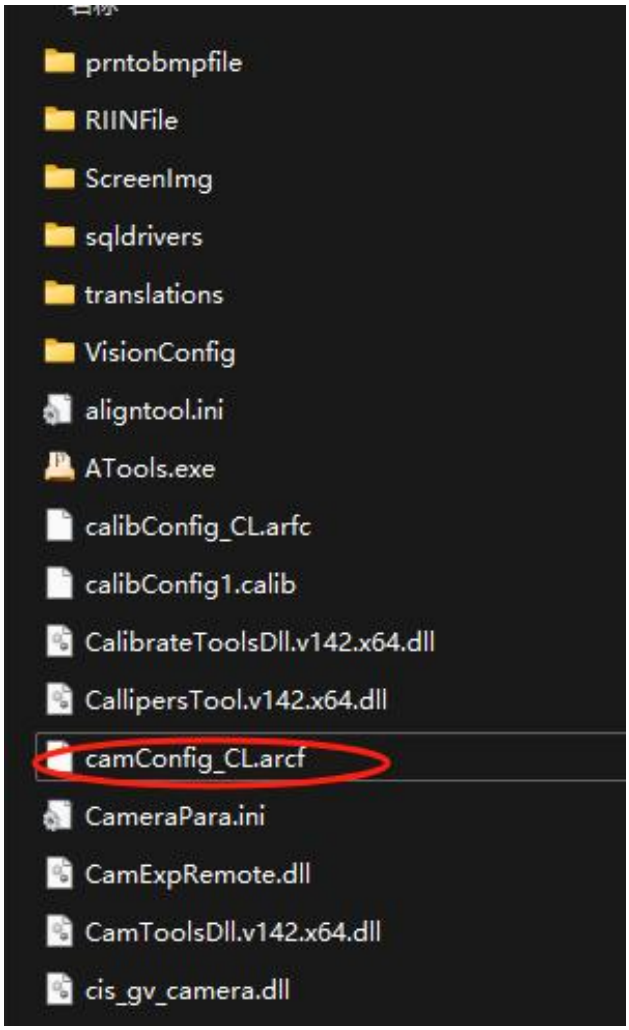
(4) Use TLC tool to load and save camera configurations

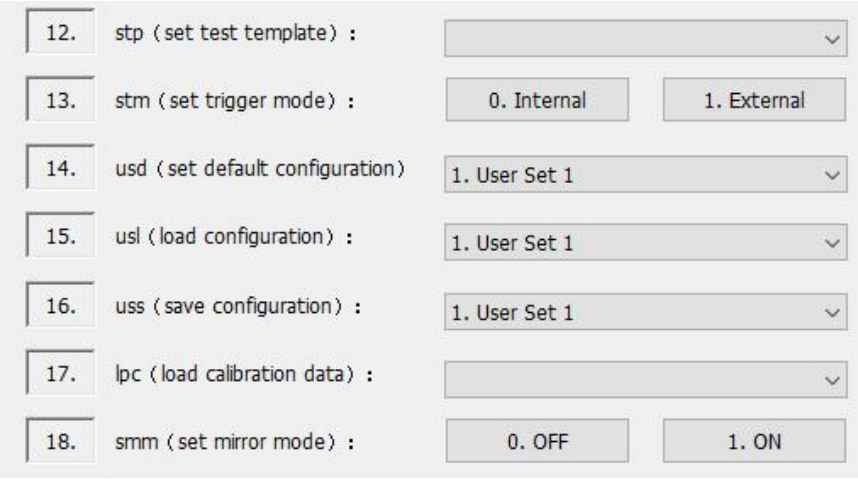
①The TLC tool parameters are stored in the acquisition card. During production, it is necessary to set the camera trigger mode(stm)to External on the tool, and the mirror output mode(smm)needs to be set according to the actual imaging.

②After setting, click 14. usd , 15.usl, and 16.uss in sequence, so as to save the parameters into the acquisition card.

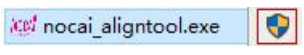


③Open file on the Ares software, find camConfig_CL.arcf in the installation catalogue of the printer driver software, select import, click【Continuous Acquisition】. When the cart moves to the left, observe whether continuous images are captured.



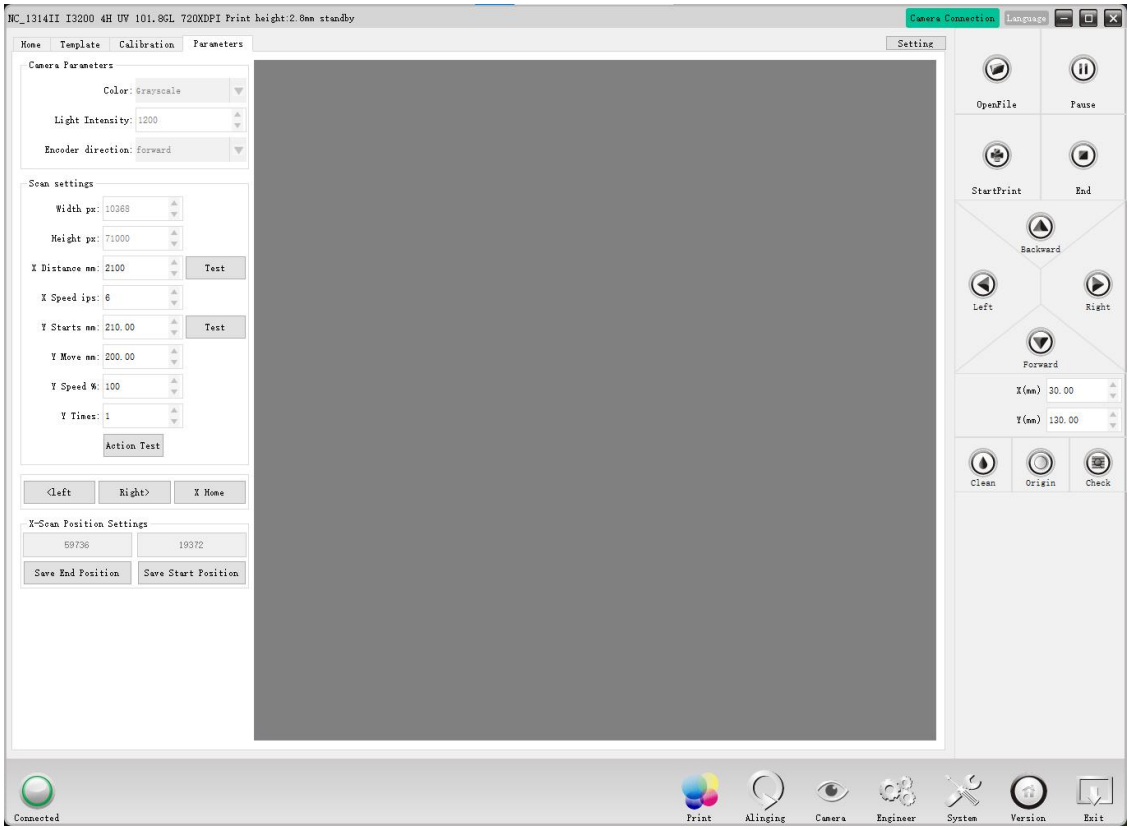


3.2 Printer Driver Software Installation

For first use, please right-click and run as administrator. 

(1) Make sure that the printer IP address is set directly, and it is recommended to select 【Complete Installation】 for installation.

(2) Confirm that the camera scanning parameters are as follows.

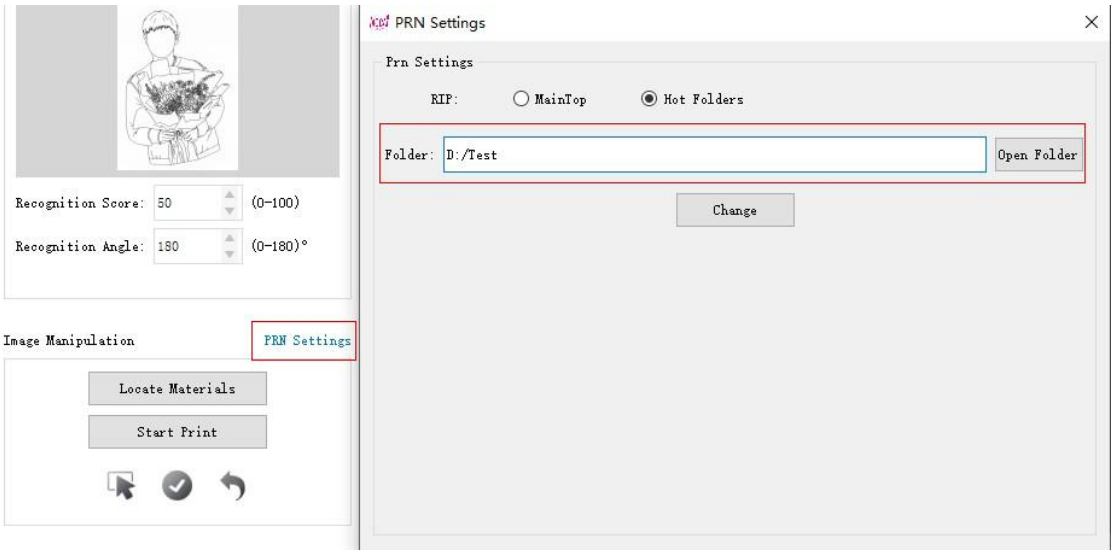


(3) Set the start and end positions of acquisition. Manually move the cart out so that the camera is just on the right side of the printing platform. Click【Save Acquisition Start Position】,enter the X movement distance as 2050mm, Click 【Test】 to make the camera just on the left side of the printing platform, and click【Save Acquisition End Position】.

(4) Click the green button【Camera Connection】, and click the red button【Camera Disconnection】to reconnect the camera. Click 【Start Scanning】in【Camera Calibration】, and observe whether images are acquired.

3.3 FlexiPRINT 22 Installation

Add the printer model UV1314-II, and set the hot folder to be the same as that of printing software.



Print the Calibration Graphic

1. Use the function of printing calibration graphic built-in the driver. Confirm that the color calibration is normal, the carrier starting point, X and Y white edge values, and the lower limit of the Z axis print height, ensure that the 1300mm×1300mm calibration graphic can be printed in the center.

2. Precautions and operations:
   ① The platform size is X=1400mm,Y=1300mm. It is necessary to ensure that the paper is slightly longer by 20-50mm in the Y direction, so that the calibration graphic can be printed completely.
   ② The paper should not be warped. Turn on the air suction to make it stick to the platform surface.
   ③ The wireframe should bot be printed on the tape-adhered edges of the paper, otherwise, it will increase the calibration error.
   ④ Rise to the【Scanning Error Correction】height, Click【Start Scanning】, click【Start Calibration】,and click once on the image from the upper left corner to the lower right corner.
   (After two clicks, the "dot pattern" will be automatically selected.
   ⑤ Click 【Start Calculation】and wait for the calibration result to be returned.

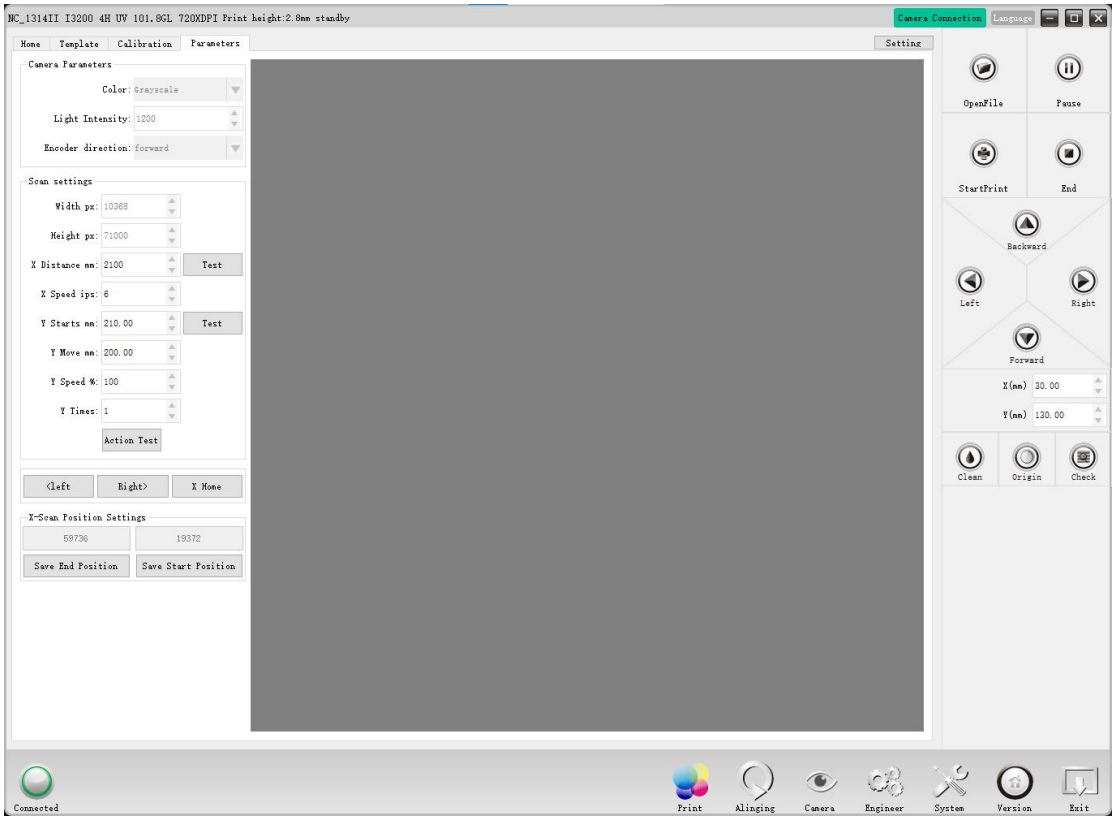
3. Standards for calibration results:

① Check whether each point's calibration increases by100, and a total of 144 points(12 rows and 12 columns)are returned.

② The returned calibration error within the range of X<0.15, Y<0.15is a normal value for use , and the optimal error is X<0.05， Y<0.05.

Camera Calibration

Open the camera software, click【Device Connection】, confirm that the connection is normal, and the camera parameters are set as follows. Ensure that the Z axis is at the lower limit position.



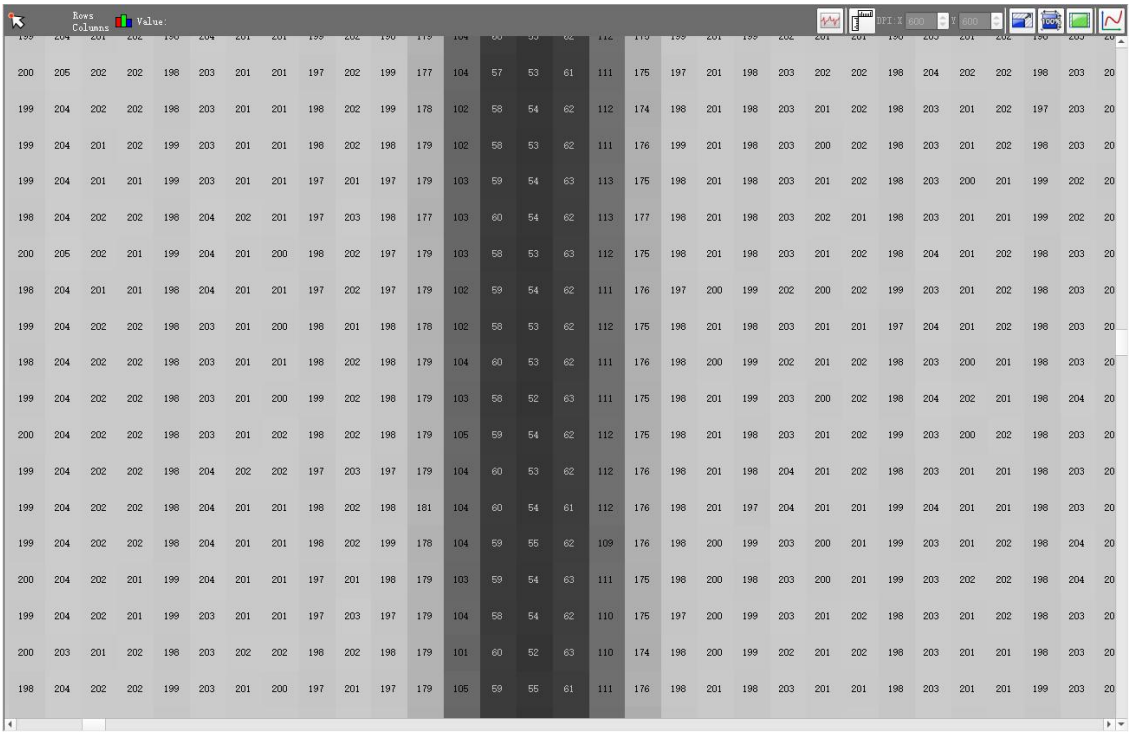
5.1 Working Height Calibration

(1) Set the camera to【Auto-trigger】mode. First click【UP】, wait for the ink station to release moisturizing, then click 【LEFT】 to move the cart out above the calibration graphic. Move the platform so that the lens can capture multiple horizontal

lines from front to back.

（2）Click【Continuous Acquisition】, and check the lines clarity. Use keypad to manually adjust Z axis height with slight clicks to find the position where the lines are imaged most clearly. At this position, the lines usually occupy 5-8 pixels, and the grayscale value inside the lines is the smallest. Ensure that the front and rear lines are imaged clearly with consistent sharpness.

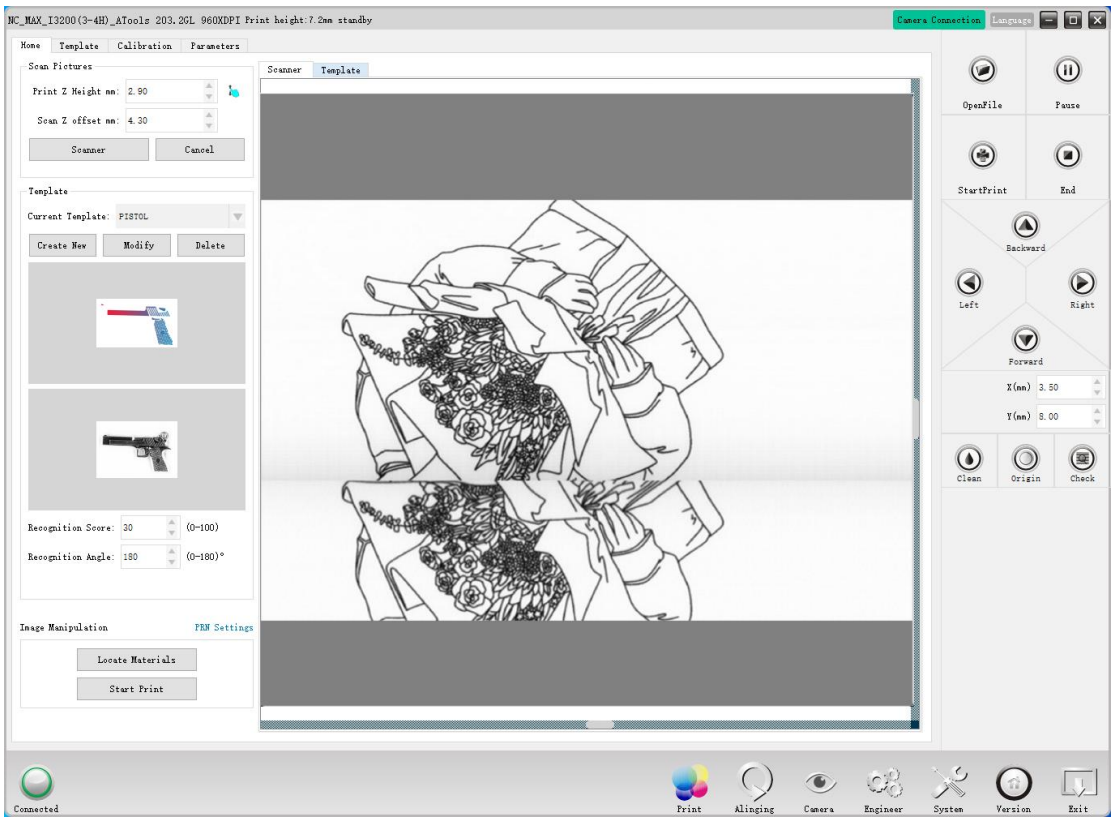
（3）Click Save, then operate the cart to reset. At this time, the Z-axis height in the title bar will be updated, and this height is recorded as the 【Scanning-correction】height.



5.2 Front-Rear Pitch Calibration

（1）Use the printer driver software to confirm the scanning parameters and scan the calibration graphic.

（2）Compare the clarity of the line at the joint position of the calibration graphic. If there is a difference in clarity between the front and rear parts, fine tune the height of the mounting screws on the front/rear side of the camera to ensure consistent clarity.



5.3 Left-Right Tilt Angle Calibration

(1) Set the camera to【Auto-trigger】and【Disable】modes, capture the horizontal lines of the calibration graphic, and conform that the clarity of both ends of the horizontal lines is consistent.

(2) If necessary, a dial indicator can be used to measure the inclination, ensuring that the deviation is within 0.10mm.

5.4 Horizontal Y-Axis Parallel Calibration

(1) Use the printer driver software to confirm the scanning parameters and scan the calibration graphic.

(2) Check the misalignment of lines at the joint position to ensure that the front and rear stitched pines can connect, or at least that the joint position is within the calibration graphic and close to the center. Generally, if the lines on the upper side of joint position are misaligned to the left, it is necessary to fine tune the front side of the camera to the left.

5.5 Flat Field Calibration

When the position or angle of the camera changes, re-calibration is required.

A. Use the TLC tool to set the flat filed calibration parameters in the acquisition card

(1) Place a piece of opaque, evenly textured, fine white paper(photo paper pr coated paper is recommended) on the platform. Move the cart out to above the white paper at the 【Scanning Deviation Correction】 height.

(2) Open the TLC serial-port debugging tool, the Ares port, and the Cam Expert acquisition software.

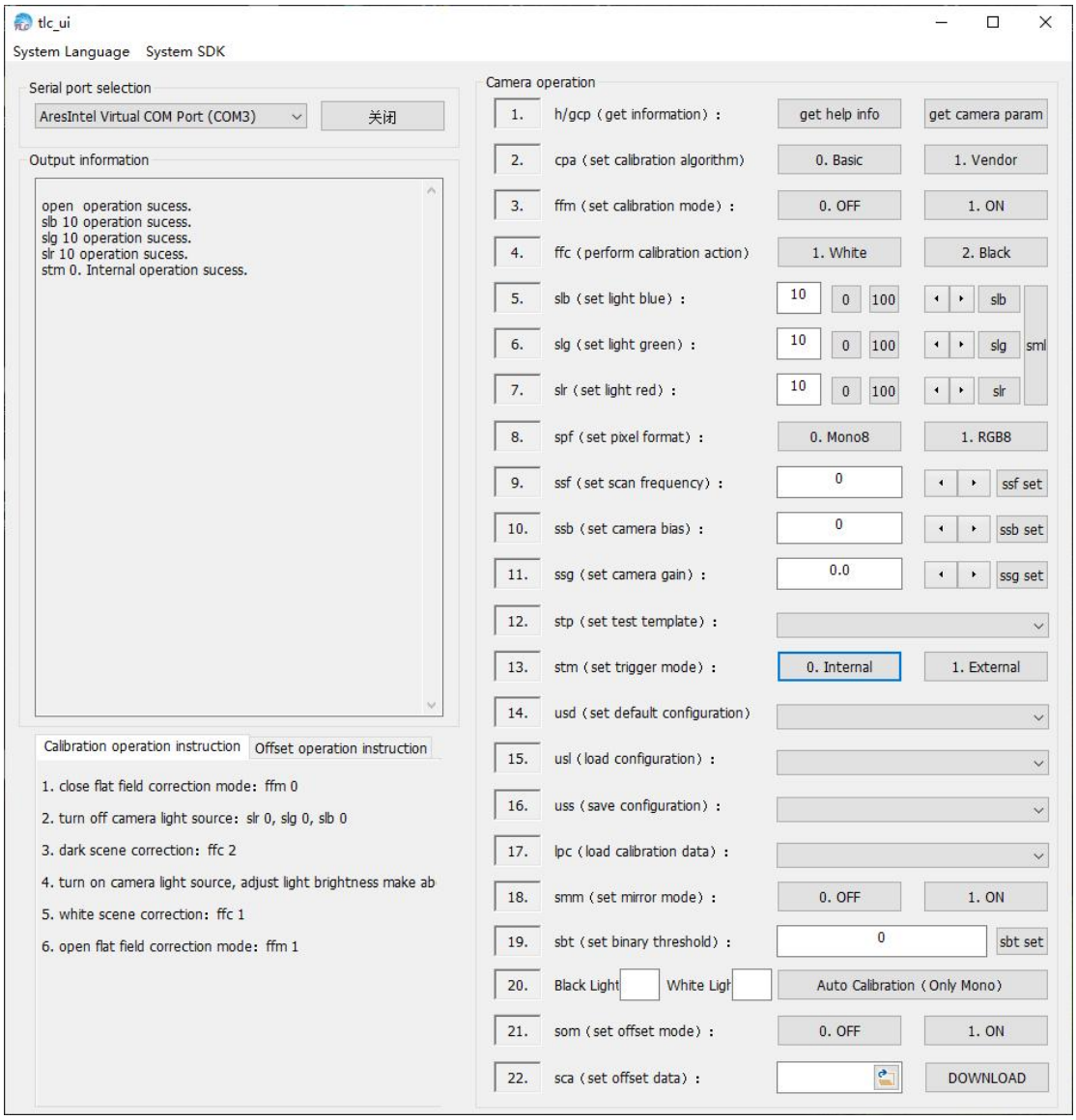
(3) Click and set 15.usl【load configuration】to User Set 1, turn off the calibration mode(set ffm to 0)to make the camera output raw data. Cam Expert does not use the camera's grayscale calibration data, then click Continuous Acquisition.

(4) Turn off the camera light source, set slb slg slr to 0, and make the ambient brightness as dark as possible. Click ffc.2. Black to calibrate the dark field data.

(5) Turn on camera light source and adjust the three-color brightness parameters so that the camera's acquisition brightness value is between 150-170. Click ffc.1.White to calibrate the bright field data. Save and overwrite the calibration data at this point.

(6) Click ffm.1to enable calibration. Do not modify the brightness, and observe whether the imaging area presents a uniform white color.

(7) Click and set 16.uss【save configuration】and 14.usd【set default configuration】to User Set 1.



B. Use the Cam Expert tool to generate a flat-field calibration file

(1) Place a piece of opaque, evenly textured, fine white paper(photo paper pr coated paper is recommended) on the platform. Move the cart out to above the white paper at the 【Scanning Deviation Correction】height.

(2) Click in the following order in the menu bar:Image->Flat Field Calibration->Calibration, enter the calibration interface

①Dark field calibration: Control the brightness value to 0 with TLC, and click【Acquire Dark Image】.

②Bright field calibration: Control the brightness value to 15 with TLC(It is necessary to observe whether the peak value on the calibration interface is within 150-170), and click 【Acquire Bright Image】. If it is greater than 170, reduce the brightness; If it is less than 150, increase the brightness. After readjusting the brightness value, click【Acquire Bright Image】again.

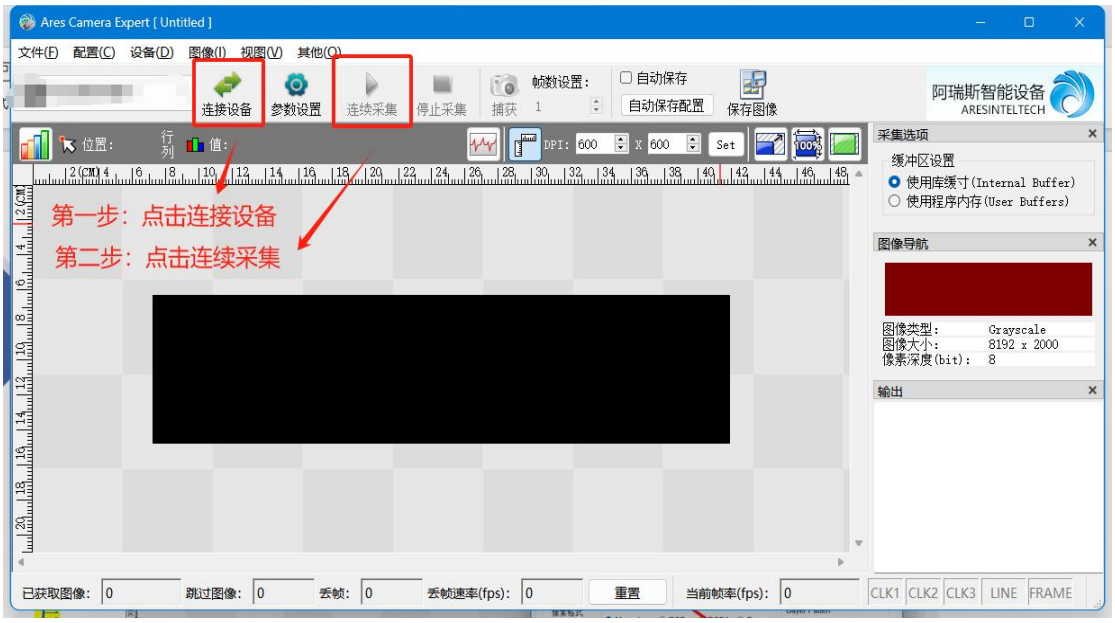
③Click【Save Calibration Datas】to place the file into the bin directory of the printing software installation，click calibConfig_CL.arfc file，and click Save to confirm replacement.

（3）Use the camera software to test the flat field calibration is effective.

①Click【Load Correction/Calibration File】, and load the generated and saved file.

②Click【Use Correction/Calibration Data】, and set the brightness to 15 in the TLC.

③Click【Continuous Acquisition】, move the camera to various areas, check whether the white paper area appears pure white ,and whether the pixel grayscale is 255.



5.6 Imaging Proportional Calibration

（1）Import the camera configuration file on in the printing-tool directory again using Ares, and then change it to external-trigger imaging using TLC. (Now the camera is switched to the external -trigger imaging mode.)

(2) Have the printing tool control the camera to scan the three calibration graphics in the first format.

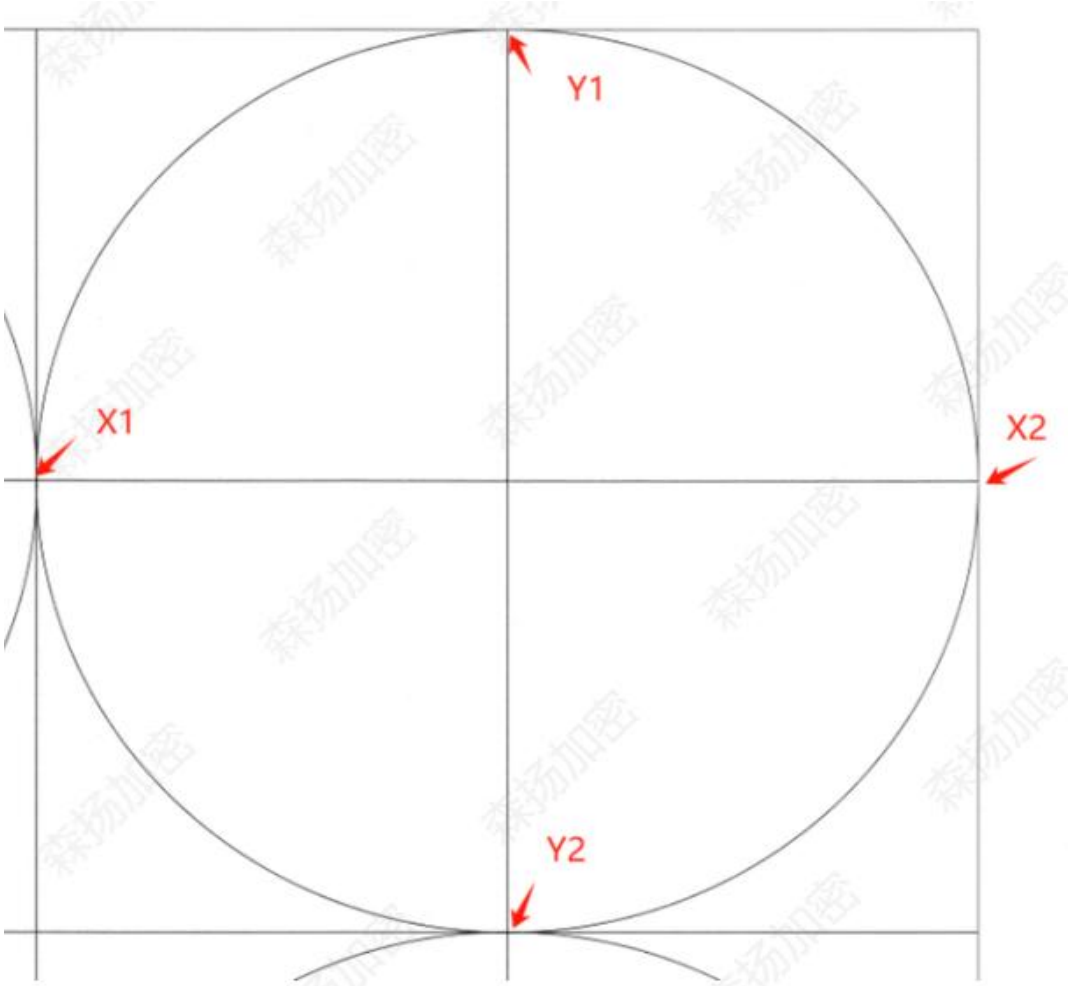
(3) The scanned original image will appear on Ares. Export the image to the local device, then import it into the Photoshop.

(4) Calculate the height-width ratio and the stretching parameter based on the calibration pattern at the middle position. For example, stretching parameter=W/H=0.8333333333333(retain at least 9 decimal places, and fill this stretching parameter into the camera configuration file) .

(5) Fill the stretching parameter obtained in the obvious step into the corresponding value in the camera parameter file.

(6) Close Ares without selecting to save the camera configuration.

(7) Connect the camera of the printing tool properly, scan in the first format, drag the scanned image from the ScreenImg directory into Photoshop, and check whether the first, middle and last three calibration graphics are imaged in a 1:1 ratio.



Instructions for Use of Visual Positioning Printing Tool

6.1 Camera Scanning Parameters

Parameter settings such as driver installation illustration, parameter description and function introduction are as shown in the figure.

Parameter Name	Parameter Description	Recommended as Shown in the Figure
Color	Camera default option. Camera is grayscale.	√
Resolution	Camera default resolution is 1200dpi.	√
Encoder Direction	Camera default direction. Set to [Forward/Reverse]according to the installation method.	√
Exposure Time	Camera brightness. Fill in according to the material. Use 4 during calibration. Different materials require different exposure levels. (For bright materials, 3-5 is recommended; for dark materials, 8-20 is recommended. Please adjust according to the actual effect.	x
Format Width	Camera length. A fixed parameter, referring to the number of pixels corresponding to the current camera length.	√

Format Height	Width of the image during one-pass scan imaging. The number of pixels calculated based on the width.	√
X-axis Movement Distance	The maximum distance that the cart moves to the left during scanning.	√
Movement Speed	The moving speed of the cart moving to the left during scanning.	√
Y-axis Scan Start	Start position of the Y-axis platform to be scanned when starting the scan. Adjust it according to the actual position. (Ensure that the first line of the calibration grid can be captured clearly.	x
Y-axis Movement Distance	Used to set the distance that the Y-axis moves after each X-scan is completed. It is also the stitching distance in the Y direction.	√
Y-axis Scan Times	Refers to the number of stitching times in the Y direction, i.e., how many scans that the platform needs to complete to achieve full coverage.	√
Save Acquisition Start Position	Set the start position where the camera lights up within the "start-end" area. Adjust it according to the actual position.	x
Save Acquisition End Position	Set the end position where the camera lights up within the "start-end" area. Adjust it according to the actual position.	x

6.2 Camera Calibration

Calibration Operations：

1．Use the panel to lower the Z-axis to the “lower limit position”. at this point, the “Z-axis height” is 0mm.

2．Click【Print Calibration】

Instructions: The area within the outer frame is the material placement zone. Ensure that materials do not exceed the outermost boundary lines. The built-in dots are arranged in a 12×12 grid with a spacing of 100mm×100mm. If you need to reduce the placement area, you can import a PRN file for printing(arranged in an m×n grid)by yourself. When the start position changes, it is necessary to re-perform the camera calibration step. Calibration files can be backed up and moved to other computers for use.

3．In【Z-axis Height】, enter 【Scanning Deviation Correction】height determined in step 5.1 of the working height calibration，click【Start Scanning】, and a scanned image will be generated in the right area(with 6 stitching passes).

4．Click【Start Calibration】, click once on the image from the top-left to bottom-right corner. After two clicks, the “dot pattern”will be automatically selected, as shown in Figure 5-1.

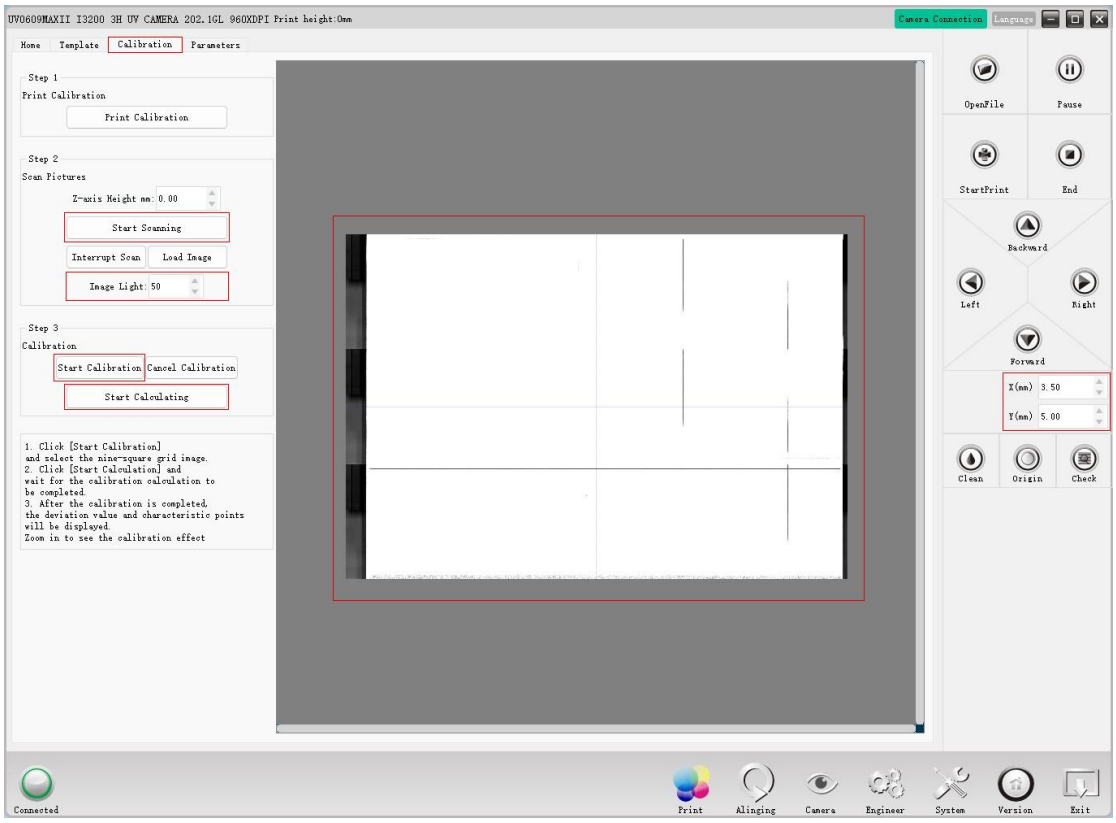


Figure5-1 Camera Calibration

Calibration Results:

5 . It is optimal to keep the X and Y errors within 0.05, and errors within 0.15 are acceptable for normal use.

6 . Check whether each mark point progresses in 100mm increments. A normal calibration will return coordinates of 12×12 dots, as shown in Figure 5-2 and Figure5-3.

7. After calibration, the excess parts outside the grid will be cropped. The displayed image will be identified locatable area, as shown in Figure 5-2.

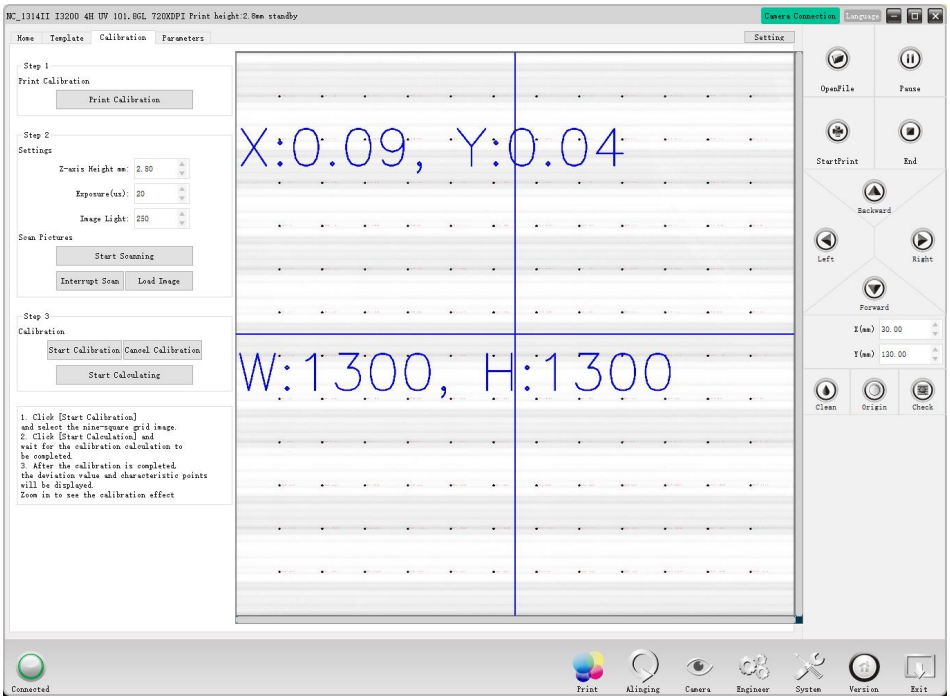


Figure 5-2 Calibration Result

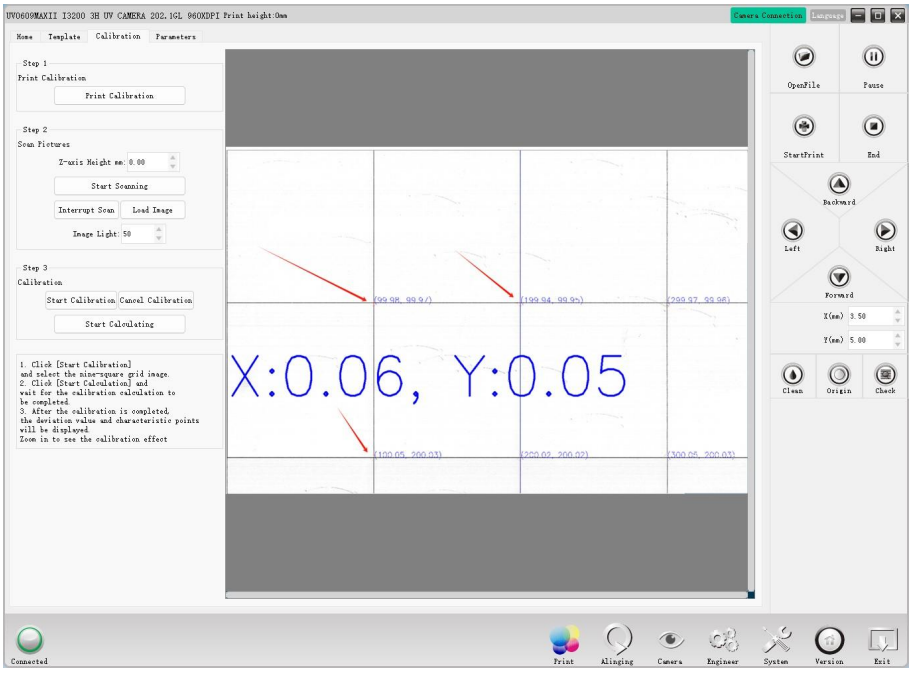


Figure5-3 Calibration Coordinates

6.3 Visual Tool Template Configuration

Scan materials:

1、 Fill in 【Print Height】according to the material height, save it and conform the 【Scan Offset】height.

(If necessary, you can move the cart out above the material to confirm the safe height of the printhead.)

2、 Adjust and confirm the camera exposure time. Click【Scan】and the camera will move out automatically for printing. Wait for the scanning to complete, and the image will be formed on the right side.

The adjustment of the exposure values needs to be confirmed according to the material scanning effect. Some recommended values can be found in “Typical Material Usage Parameters”.

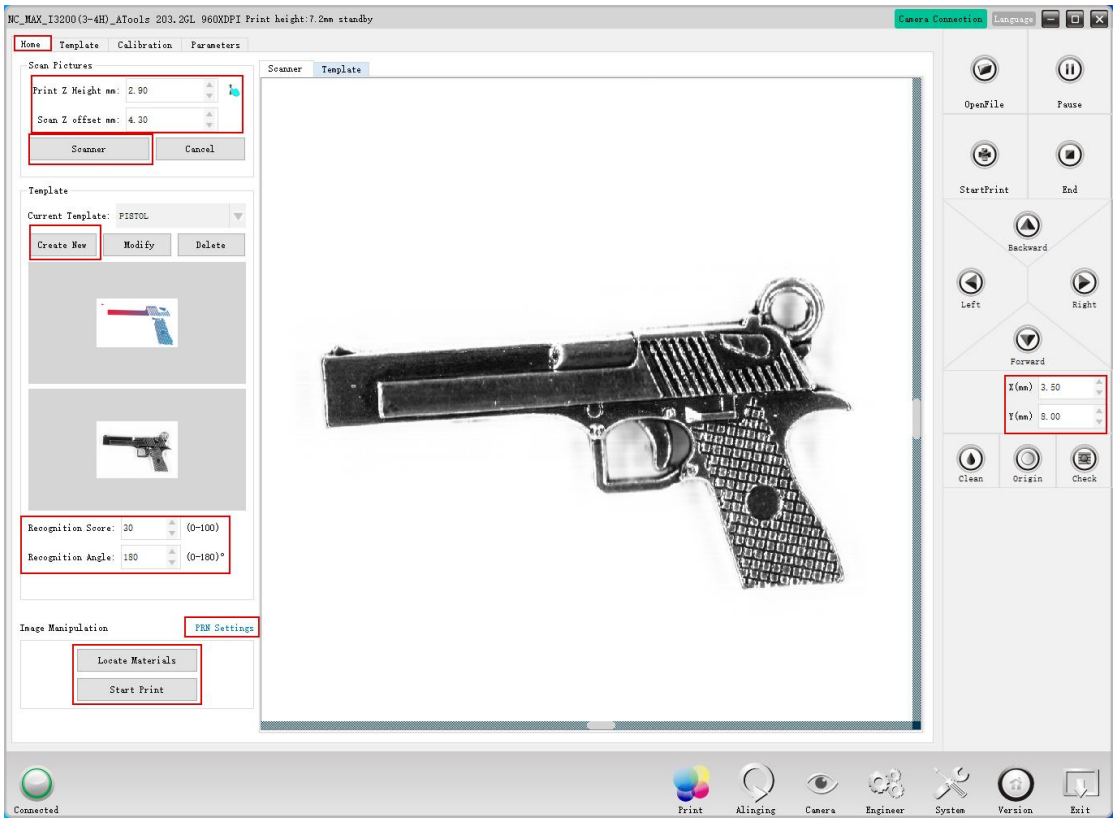


Figure 5-4 Scan and Create New Template

Template Configuration:

3、 Click【Create New Template】, enter 【Template Name】, click confirm, and wait to automatically jump to the template configuration.

4、Click【Frame Selection Template】to frame the material, and then click【Confirm Selection】

Note: When framing template, select materials with clear lines, distinct outline,relatively straight orientation, and no connection with other materials. Do not frame excessive blank areas around the material.

5、Select【Recognition Mode】on the left, click【Clear Feature Area】（newly created templates will inherit features of existing templates，then click【Box Feature Area】to frame several features with distinct outline and continuous line segments, and click【Add New Feature Area】,to calculate features. For some satisfactory feature areas, click【Box Feature Area】in this area, and click【Delete Feature Area】, so that features of this area will no longer be calculated. Click【Save Template】to complete the selection of template features.

①Standard Mode **corresponds to regular badges(such as metal badges and other badges with relatively more uneven surface features).**

②Simple Badge **corresponds to flat-surface material(such as acrylic plates, and other simple badges without complex patterns inside).**

③ Simple Plane **corresponds to simple graphics printed on paper such as rectangles, squares, circles,etc.**

④The Custom Mode **requires users to configure relevant feature -recognition parameters by themselves.**

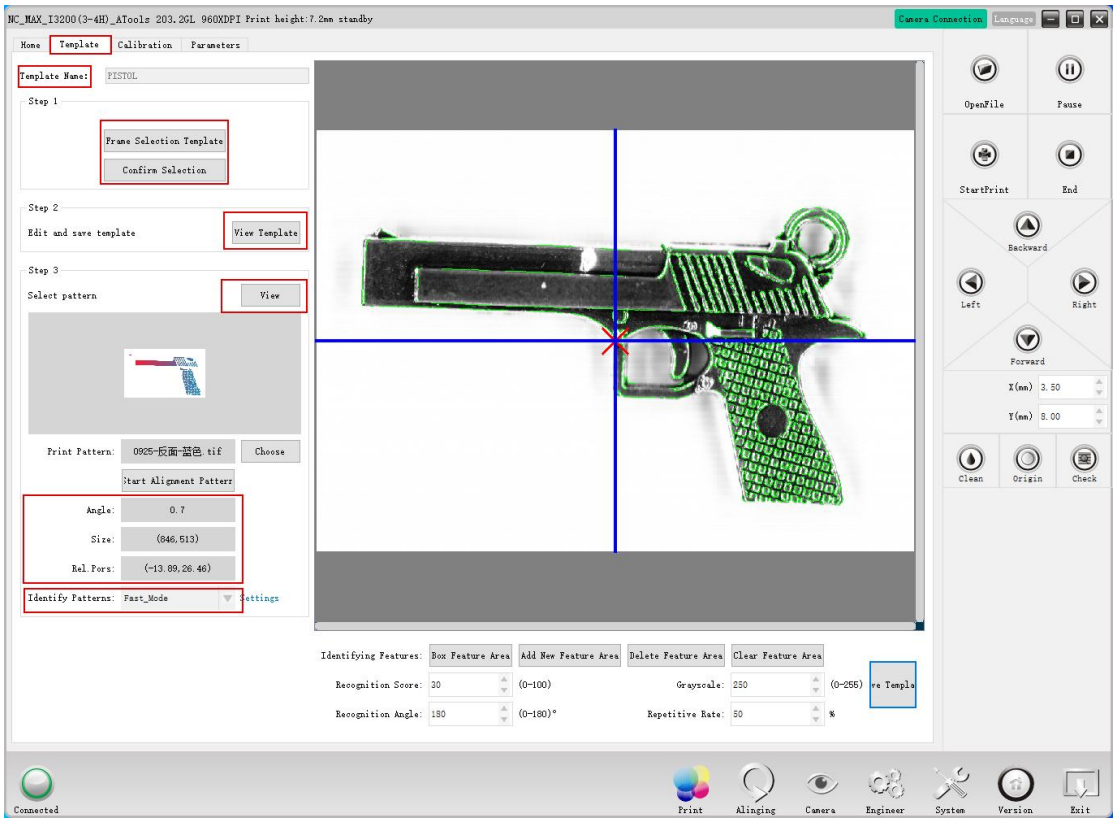


Figure 5-5 Template Configuration

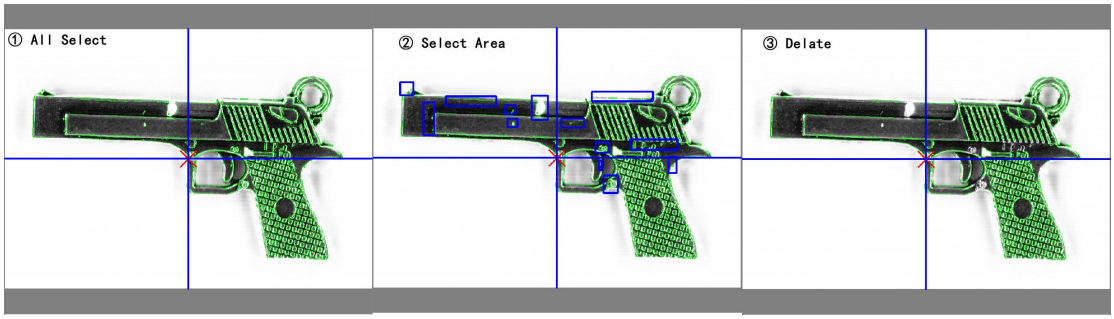


Figure 5-6 Feature Selection

6、Explanation of Feature Recognition Parameters:

①Recognition Score(0-100%): When recognizing feature points, the system will locate patterns in the area when it determines that the coincidence rate between the recognized material feature points and that of the template is XX%. The actual score needs to be adjusted according to the recognition situation.

②Recognition Angle(0-180°): Taking the selected template as the 0referenc, the material feature points rotated by XX° to the left or right are all within the recognizable range. Generally, it should be adjusted according to the actual placement of materials and the recognition situation.

③ Grayscale(0-255): The grayscale level for template processing during feature

recognition: For bright materials with high light absorption, the grayscale is recommended to be above 200; for dark materials with high light absorption, the grayscale is recommended to be below 180. the optional grayscale range is also affected by the exposure time, and the actual needs to be adjusted according to the feature extraction situation of the template.

④ Repetitive Rate(0-100%)： when recognizing feature, increase the material recognition repetitive rate according to the density of material placement. It is generally set to 5-10. When materials are placed densely, increase the repetitive rate to 60% or higher to improve the recognition success rate.

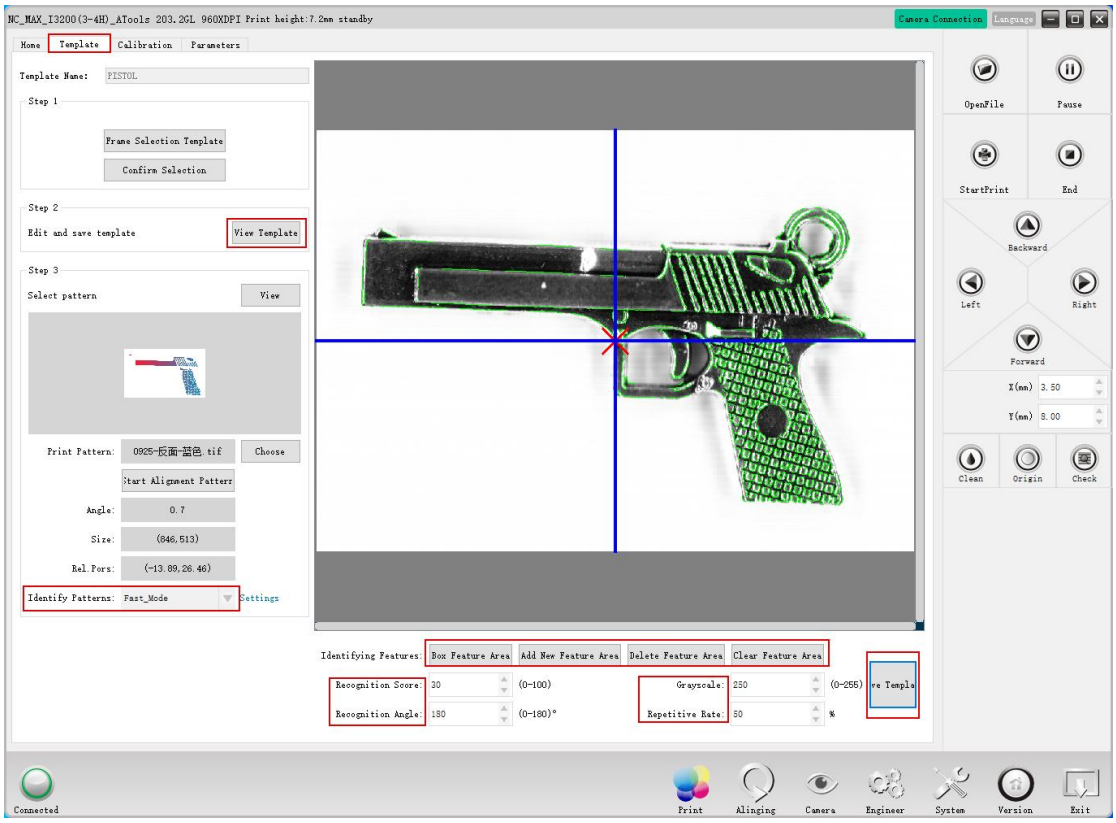


Figure 5-7 Feature Recognition Parameters

7、【Choose】the template pattern that needs alignment, click【Start Alignment Pattern】, and double left click the blue dot at the center of the pattern.

Key pressing and do not release, you can drag the pattern to align it. Click Save to confirm the alignment information:【Angle】、【Size】、【Relative Position】

①**Opacity**(0-100%)：Adjust the pattern opacity to facilitate the alignment operation.

② **Pattern Scale**(0-100%)： Adjust the scaling size of the pattern in the X and Y directions , which is convenient for drawing and when there is a mismatch between

the pattern and the material.

③ **Pattern Outline**： After checking, the pattern will only display outline, which is convenient for alignment and size confirmation.

④**Rotation and Translation** ：Left click the pattern inside the blue frame. You can use the **WASD** keys and **QE** keys to control the translation and rotation of the pattern respectively, or use the six alignment buttons at the bottom of the interface. The translation magnification can be selected from×0.1、×1、×2、×5, and the rotation magnification can be selected from×0.01、×0.1、×0.5、×1、×5.

⑤Auto Align：The pattern will automatically finds the matching position based on the angle and location of the material template.

After the template is created, the exposure value, feature parameters, recognition parameters, alignment information used are all saved in the template. When scanning the same material, you can first select the previously created template. Generally, there is no need to modify parameters such as the exposure value. You can start scanning after confirming two heights.

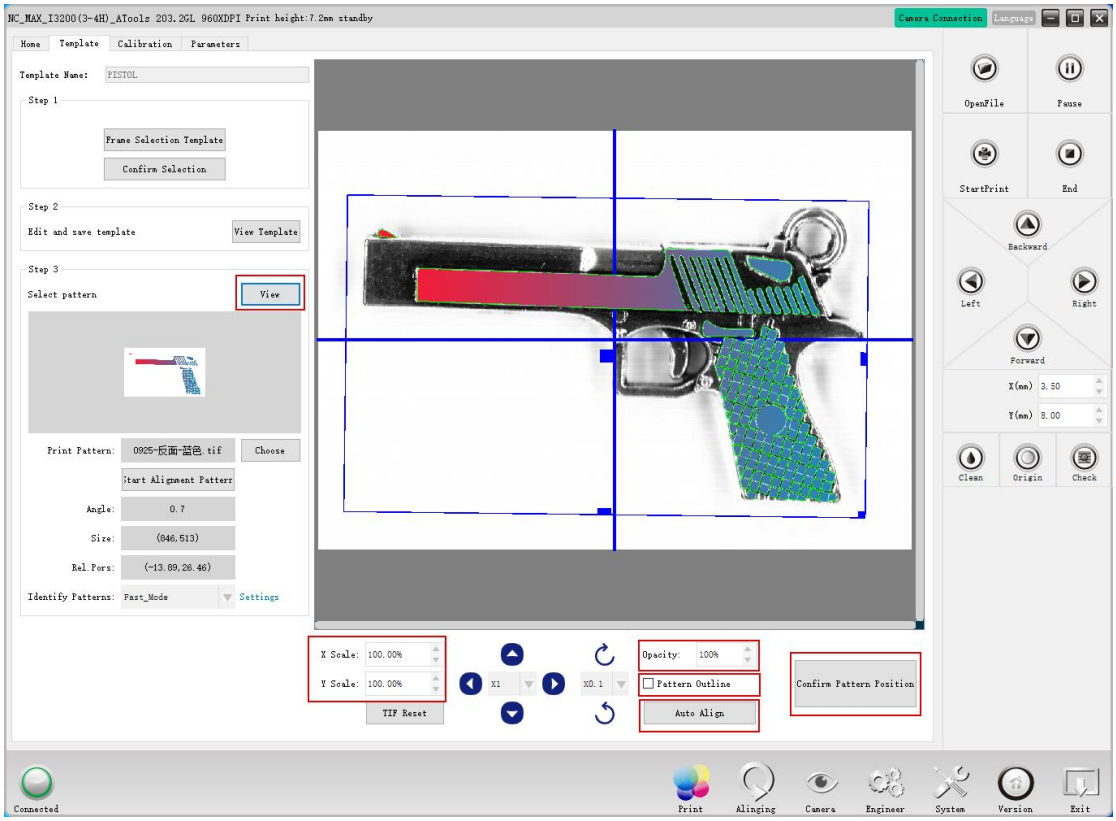


Figure 5-8 Pattern Alignment

Identify and Locate:

8、Confirm that the recognition score and angle are appropriate, then click【Identify and

locate】, and wait for the location to complete. Generally, the recognition score should not be lover than 10 to avoid lag caused by excessive calculation. If the location is insufficient, reduce the recognition score; if there is an incorrect location in blank areas, increase accordingly.

The recognition score and angle for some typical materials are provided in the next chapter.

9、Steps for location ：

①Click【Frame select】to select the single or multiple patterns that need confirmation or deletion.

②Click【Confirm】to retain only the location patterns within the framed area.

③Click【Delete】to remove the patterns within the framed area.

④Click【Undo】to restore all deleted patterns.

10、Click【local and print】and after the image is generated, it will be sent to the set hot folder directory for processing by the RIP software.

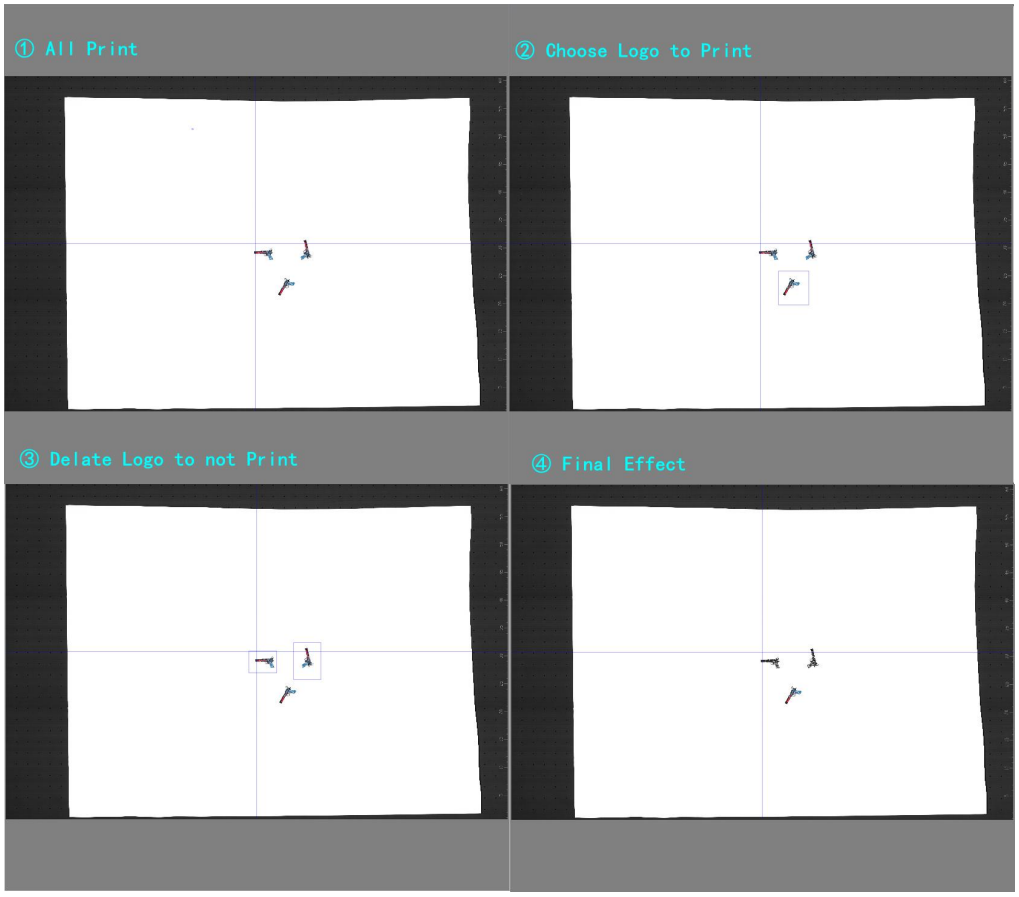
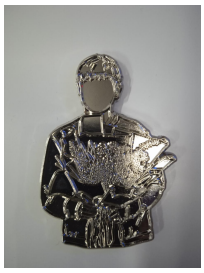


Figure 5-9 Location

Typical Material Usage Parameters

Table7-1 Recommended Parameters for Typical Materials

Material	Material Type	Color/Reflection	Exposure	Grayscale	Repetitive Rate	Recognition Score	Recognition Mode
	Metal 1	Gold/Weak reflection	110	240	10	30	Standard mode
	Metal 2	Silver/Weak reflection	95	220	20	25	Standard mode
	Metal 3	Silver /Strong reflection	85	180	10	23	Standard mode
	Acrylic 4	Transparent/Non-reflection	110	200	5	40	Simple badge
	Plastic 5	Black/Non-reflection	240	255	50	25	Simple badge

	Plastic 6	White/Non-reflection	200	65	10	70	Simple badge
	Resin 7	White/Non-reflection	160	80	5	20	Standard mode

Common Errors

No.	Errors	Causes and Solutions
1	Visual tool can not be found in the driver	1. Install Ares camera software. 2. 2. Insert the visual dongle.
2	Camera fails to connect	1.The PCIE camera acquisition card is not properly connected, or the Camera Link cable is loose. 2.The npcap-1.75 runtime environment is not properly installed.
3	Camera not lighting up	1. The external trigger of the camera is not properly connected to the signal line or incorrectly setup. 2. If the camera is occupied or disconnected, click the green “Camera Connection”button in the upper right corner of the printer driver, then click the red “Camera Disconnect”button after confirm that the camera is reconnected.
4	Some areas are missing or appear as black blocks when camera is capturing.	1. Data loss during camera transmission, Camera Link cable is loose, reinsert it to ensure a tight connection.

5	Camera lights up normally, but fails to capture images.	1. Ensure the camera's grating cable is in good condition, and plug is tightly connected. 2.the position settings for triggering the start and end of camera capture is larger than the format. 3. The camera's movement range is larger than the capture area.
6	Camera X-direction Scanning Parameter Settings	Movement area>Lighting area>format height 1.Currently, the camera dpi =1200, and the single pixel size=0.02116mm/pix. 2.If the format height of a single camera image is set to71000pix, the actual scanning width=71000×0.02116=1502.36mm. 3.The moving distance of the cart X axis from the trigger position should be greater than 1502.36mm.
7	Camera scanning image distortion	Ensure the camConfig_CL.arfc file is normal, and check the camera's X direction scanning speed.
8	Abnormal printing of calibration graphic	1.the size of calibration graphic is 1300mm×1300mm. Adjust the carrier start position and white edge to print it in the center position, preventing it form exceeding the normal printing area. 2.Incorrect use of calibration graphic. Please use the built-in calibration graphic file. 3.Print calibration graphic with high-speed and low softening defaults. Pre-set the color to ensure the accuracy of the output image for convenient calibration calculation.
9	Abnormal scanning imaging of calibration graphic	1. Printing the calibration graphic on adhesive tape causes blurry line acquisition. 2. When printing calibration graphic, please flatten the paper and turn on suction to ensure the lines are not bent.
10	Calibration graphic calculation fails to return results	1.Incorrect calibration frame. Please frame from the top-left to the bottom-right to ensure all lines are included. 2.Lines are unclear. Please scan with an exposure value of around3-6.

11	Large error of calibration graphic; missing grids or coordinates in the calibration graphic	1.The camera is not calibrated to the proper position and needs to be recalibrated. 2.The start position of Y axis is incorrect, resulting in the front side nor being calibrated. 3.Re-frame the calibration area, and slightly expand the selection range. 4.If the image if overexposed, adjust the exposure value. After scanning, you can adjust the exposure to 5 if necessary, and adjust the image light source to about 200.
12	The camera lights up on the first scan but not subsequently	Reconnect the camera after disconnect and restart the driver.
13	Blurred material imaging	1.The camera needs to be recalibrated. 2.the Z-axis is too high. Readjust the Z-axis height under the premise of ensuring the printhead safety. According to the camera's depth of field, the general adjustment range is 0-0.5mm.
14	Many mosaics appear in imaging	Caused by excessive acceleration and deceleration during scanning, which exceeds the camera's line frequency. Adjust the acceleration/deceleration area, acceleration and X-axis scanning speed.
15	When creating/modifying a template, the process fails to proceed normally after the material.	The calibration file does not match the current scanning width. Frame-select is not possible if current scanning width>calibration width), or calibration has not been performed.
16	Poor selection of template feature	1.Adjust the grayscale level, clear feature and re frame-select 2.Change the exposure time and scan the material.

17	Offset despite repeated adjustments of pattern alignment	The size of the original image does not match that of the material. Adjust the X and Y scale of the image.
18	“Fail to locate” when locating according to the template	1.The plate is not well-made. Re-select feature, and ensure that the exposure value used for making the template is the same as that for scanning the material. 2.The recognition score and angle are inappropriate. An excessively high score and small angle may result in failure to recognize the material.
19	Low location recognition rate	1.When frame selection, it should be slightly larger than the material. Too much blank space will lead to low recognition rate. 2.The feature is not ideal. Re-select the features. 3.Lower the score and it is recommended to be around 30. Adjust the recognition angle according to the actual placement. Relocate. If the recognition rate is still low, the score can be further lowered. 4.Increase the repetitive rate when selecting features. Adjustments are needed when materials are dense, as an excessively low repetitive rate will reduce the recognition rate.
20	Incorrect recognition of location in blank areas.	1.The recognition score is too low, and needs to be slightly increased. 2.When number of misrecognitions is small, use the location deletion function to manually delete the incorrectly recognized patterns.
21	The number of recognized items is significantly higher than the actual number of materials	1.Repetitive rate is too high that needs to be reduced. 2.Feature selection is inappropriate, and needs to select continuous, clear and unique lines.

22	Offset occurs between the location and the actual material	1.inappropriate feature selection leads to incorrect recognition of feature areas. For example, for symmetrical materials, try to select asymmetrical feature areas. 2.The selected recognition mode is inappropriate. Choose the appropriate mode according to the instructions. 3.When the quantity is small, manually delete misplaced patterns.
23	Printer driver crashes when printing location	The image format does not meet the specified requirements for drawing; CMYK color mode,1234 four-color channels, and TIF image should not save image transparency.
24	The generated image cannot be found for printing location	Check if the hot folder settings are effective. Confirm that “retain after receiving”or “auto-open”is enabled.
25	Relatively large position offset of printout	1.Confirm the material alignment effect of the template production. 2.Check whether there is a possibility that the material is moved during printing. 3.Confirm whether XY white edge values are the same as those used during calibration.
26	Regular offset in the position of printout	X:For offset caused by resetting the trigger position, re-calibrate; for offset caused by changed carrier start position, re-calibrate; for offset caused by replaced waveform, re-calibrate or ass X-axis offset. Y: For offset caused by changed carrier start position, re-calibrate. Camera: The camera is loose, and has shifted relative to the position where it was installed and calibrated for printing.
27	White ink and varnish in the printout are too light/too thick	Adjust the proportion and frequency of white ink and varnish in the driver.

28	The hollow-out parts of the material are blocked	1.Do not save transparency when saving TIF file. 2.Set white ink inward contraction in RIP software. 3.Pattern offset causes blocking of the hollow-out parts.
29	Repeated errors occur when using the upgrade program of the printer driver	1. Click Confirm or close the error pop-up window. It can be upgraded normally after several consecutive attempts. 2. If method 1 is ineffective when upgrading keypad program sources: First uninstall Npcap 1.75, install Winpcap 4.1.3, and after the upgrade is completed, uninstall Winpcap 4.1.3, reinstall Npcap 1.75for the camera to use.