
**Online visual laser control
software**

- Operation instruction -

-

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Upper software operation instruction

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Chapter 1 Driver and software of installation

1.1 CNC system software profile

PowerCut ordinary laser cutting control software is a laser cutting CNC quality goods, which is carefully orchestrated by famous R&D team with many years' industry experience in company. This software is easy to learn , with mature and steady movement control arithmetic , complete cutting process, friendly man-machine interface, and it can be applied in garment, acrylic, furniture and other non-metal laser cutting controls.

1.2 composition of the control system

The control system is composed of hardware(motion control card and parts) and software.

Softwares'contents and file instruction:

File or child directory name	Contents	Instructions
PowerCut folder	Control system installation procedure	Copy
Driver folder	visual driver	

Form 1.1.1.1 software contents and file instruction

Hardware equipment composition:

Item	Quantity	Instruction
Control card	1	Display and main board
USB cable, network cable	1	USB cable 1、 Net cable 1
Camera	1	Including camera, lamp, transmission line and other parts

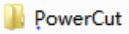


Form 1.1.1.2 hardware equipment composition

1.3 Driver and software of installation

Hardware requirements : CPU Celeron more than 2.1G memory :more than 1G hardware :more than100G


Software requirement: Microsoft Windows operation system (WinXP、WIN7)


1.3.1 vision driver MIL installation and uninstallation

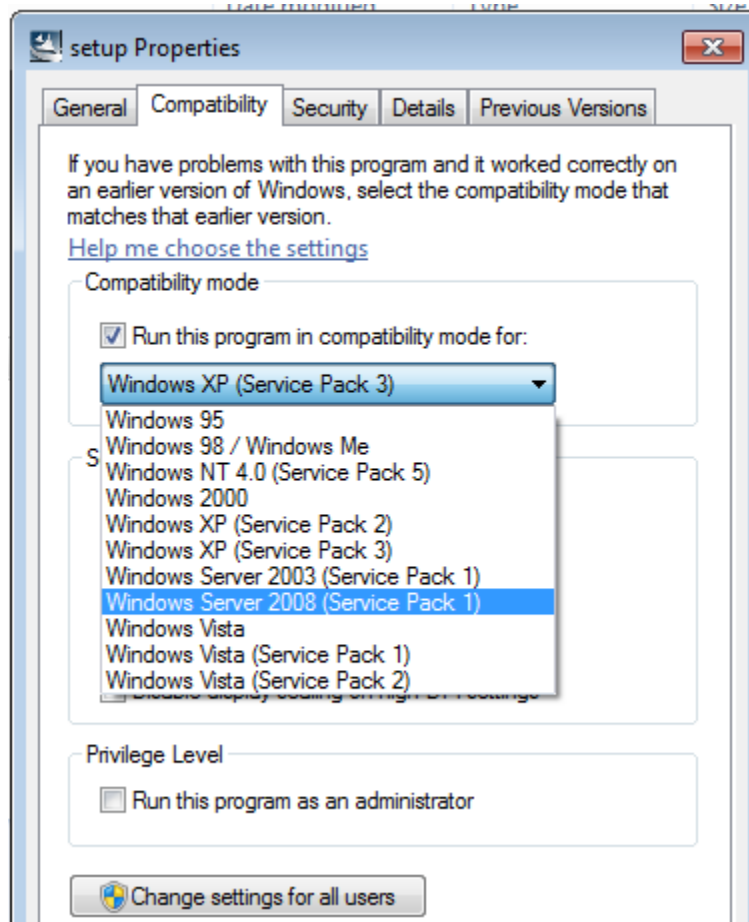
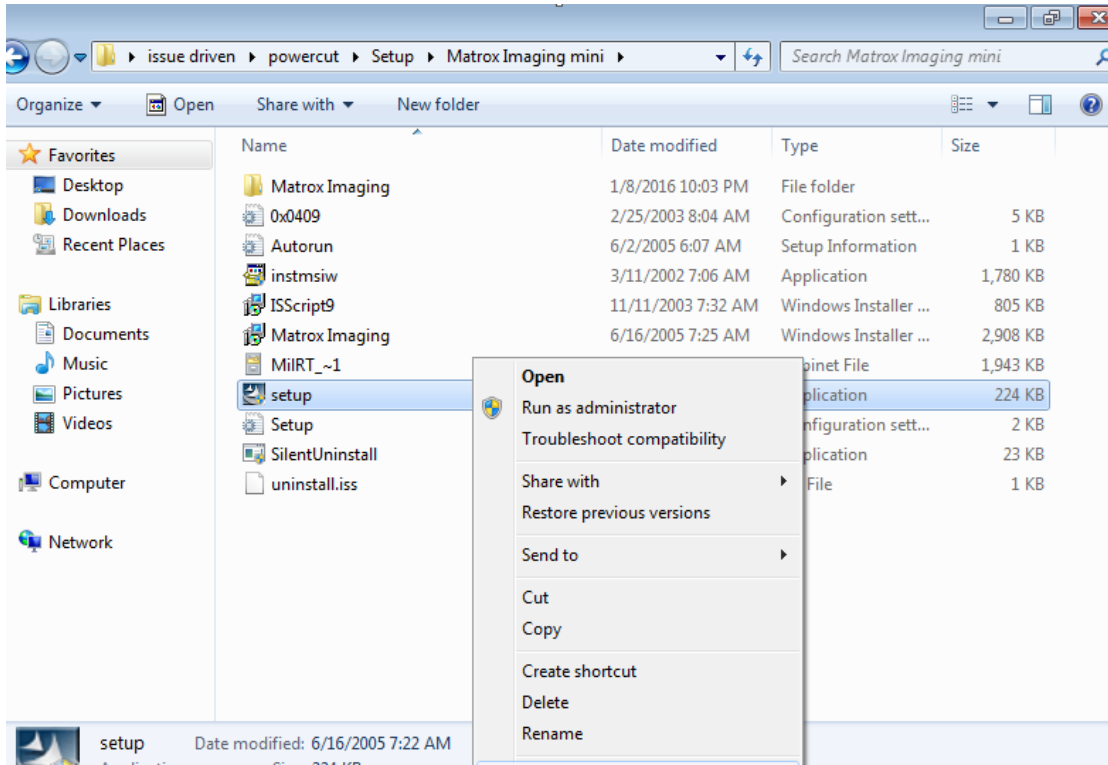
Click the  PowerCut then  Setup will appear the two folder  Clean is the uninstallation file

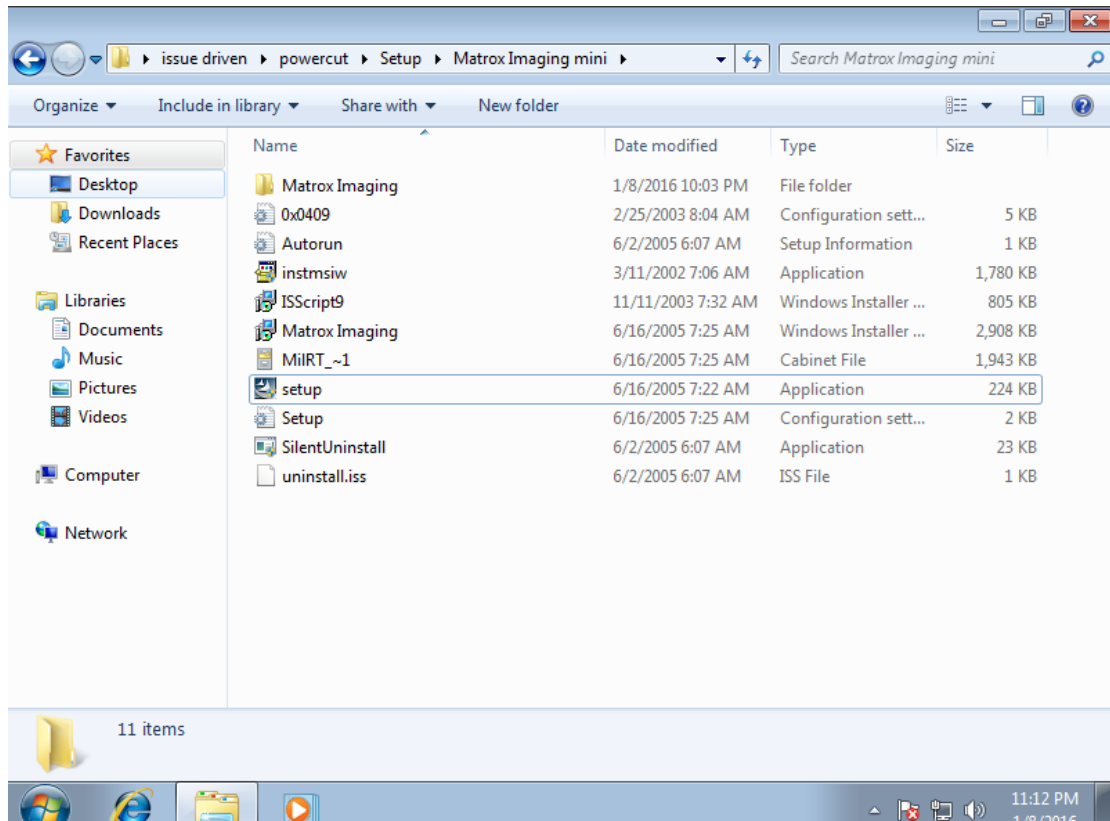
Open this folder  Setup


➤ MIL of installation

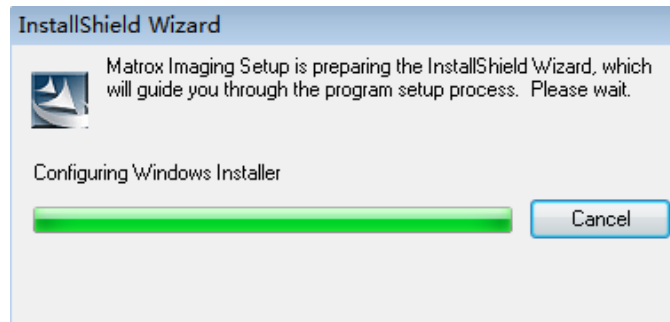
 Setup double click this folder , please change the compatibility before installing

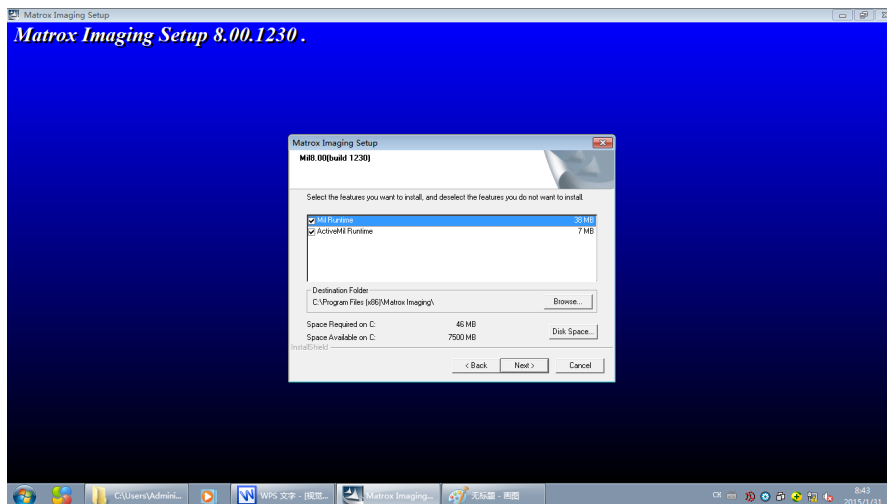
 , select this `setup.exe` then click the right button of mouse to choose the compatibility :





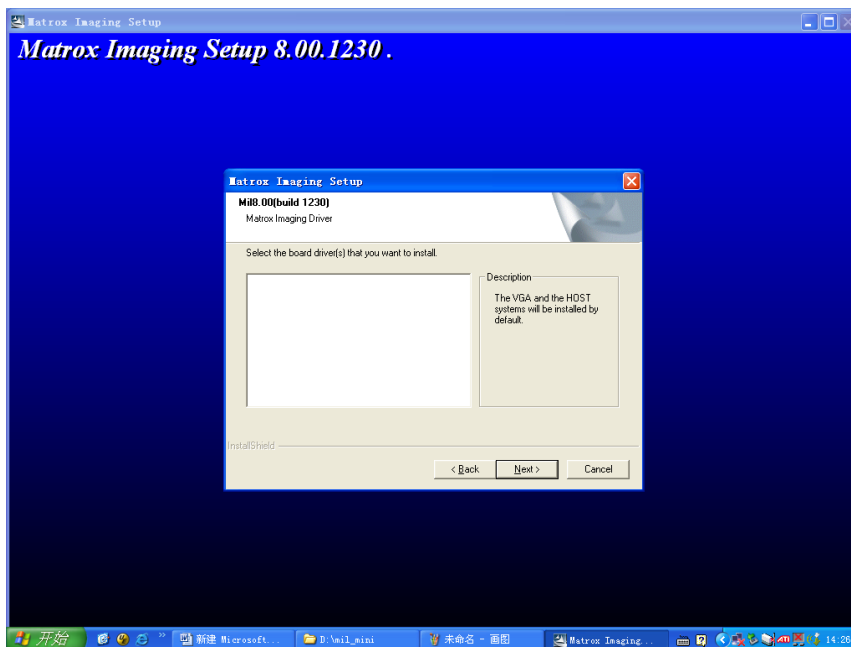
Double click  to install it ,as shown below picture:





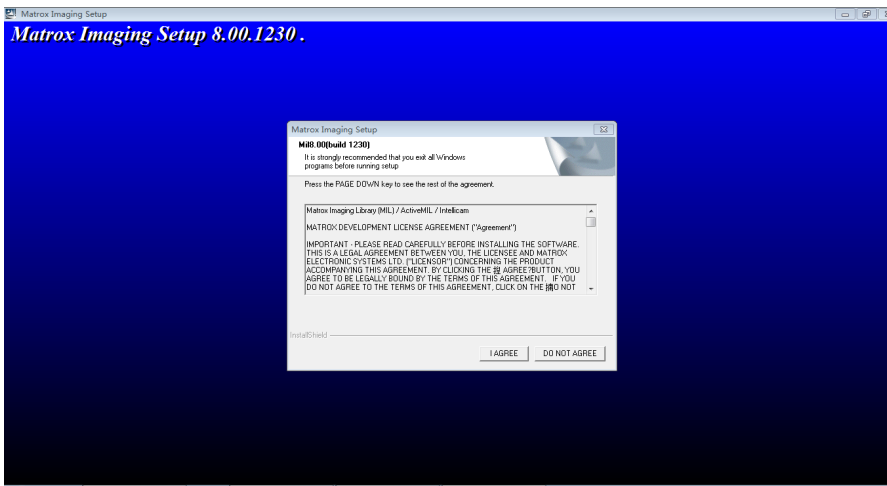
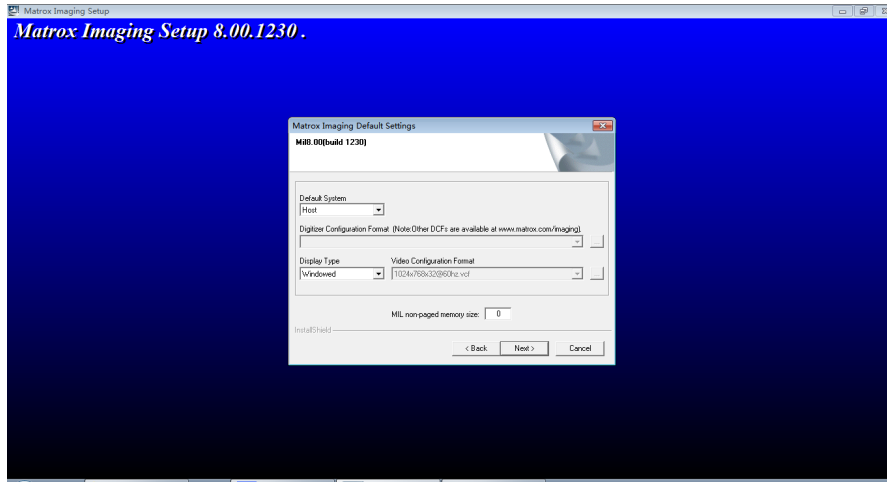
1.1.2.4.2 installation interface 1

Click Next, go to the next step :



1.1.2.4.3 installation interface 2

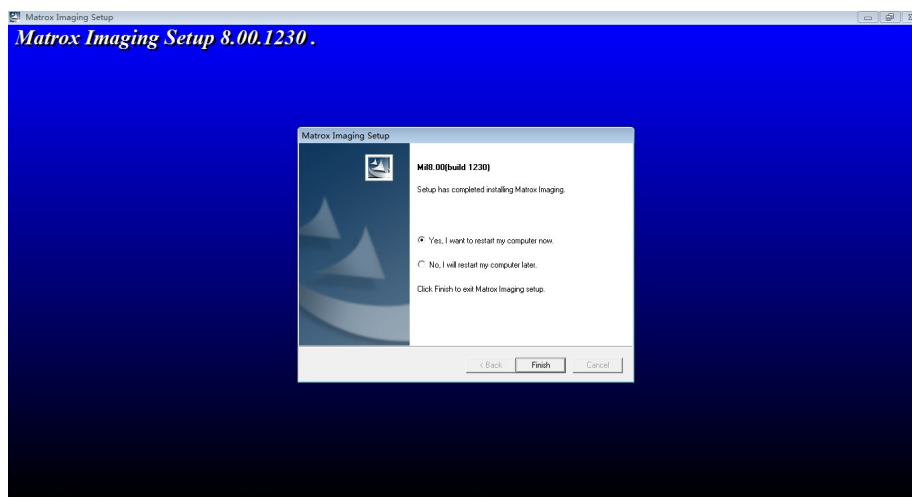
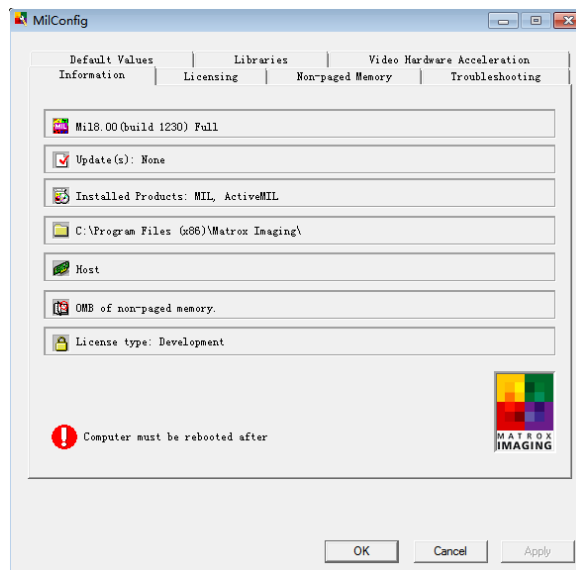
Click Next go to next step :



installation interface 4

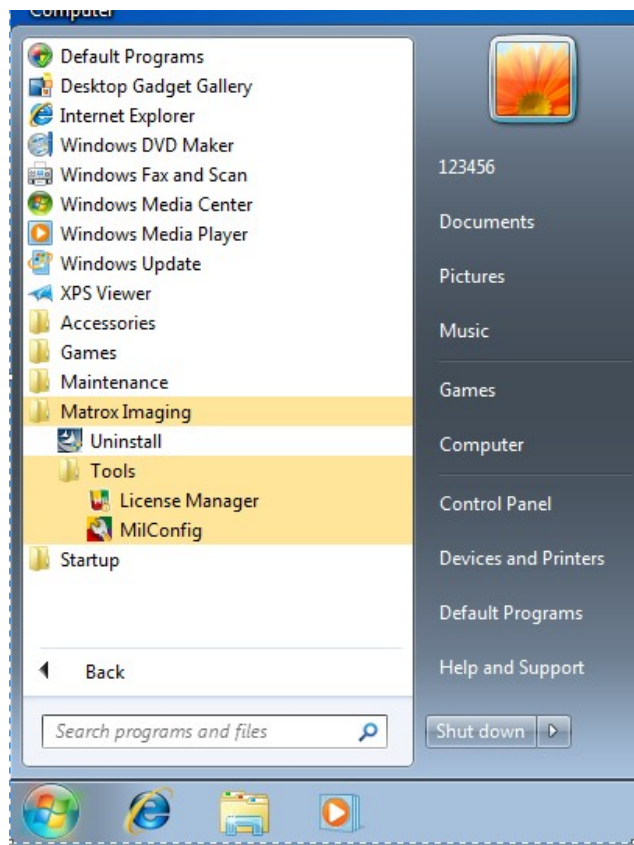
Click I AGREE, when you finished it and you must be restart your computer

:



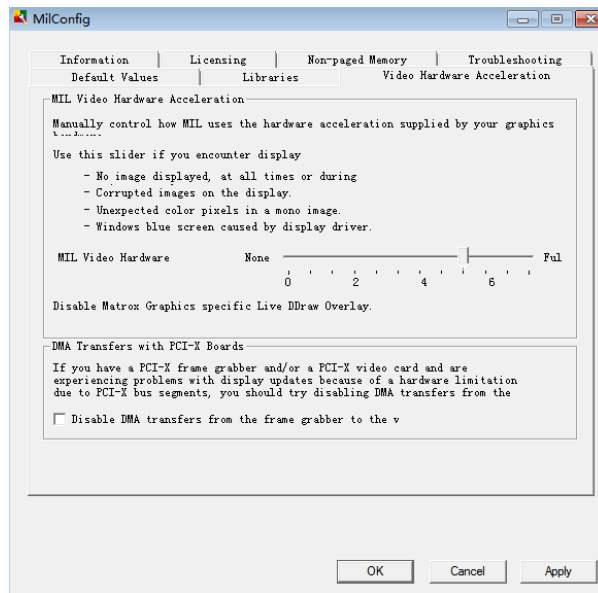
installation interface 5

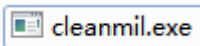
Click Finish, Matrox Imaging mini of installation, restart the computer to select

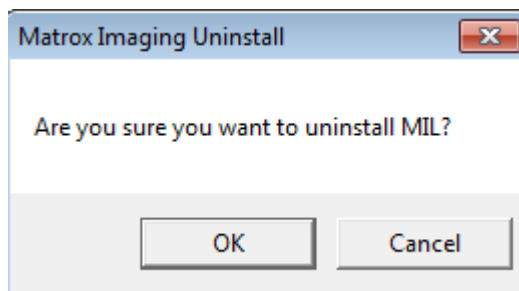
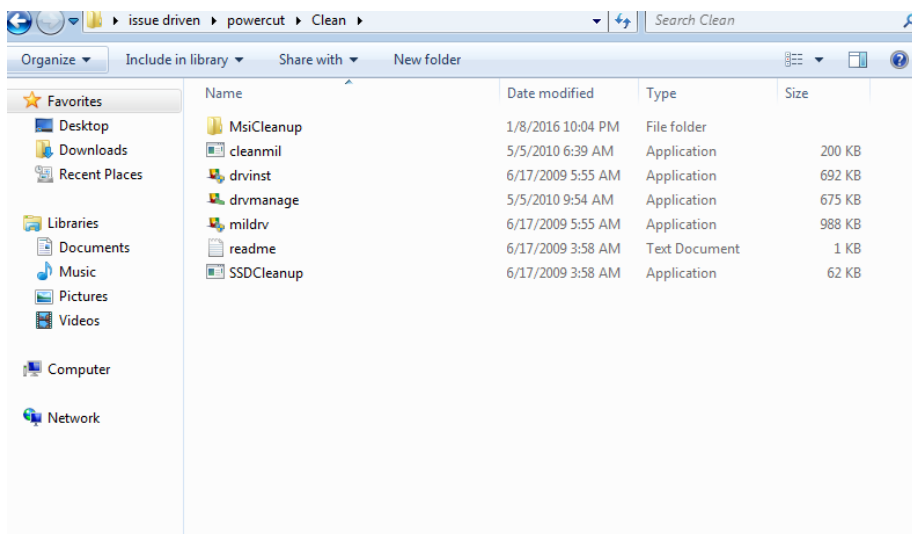


Video Hardware Acceleration

choose 4 to 6 ,then click "OK".



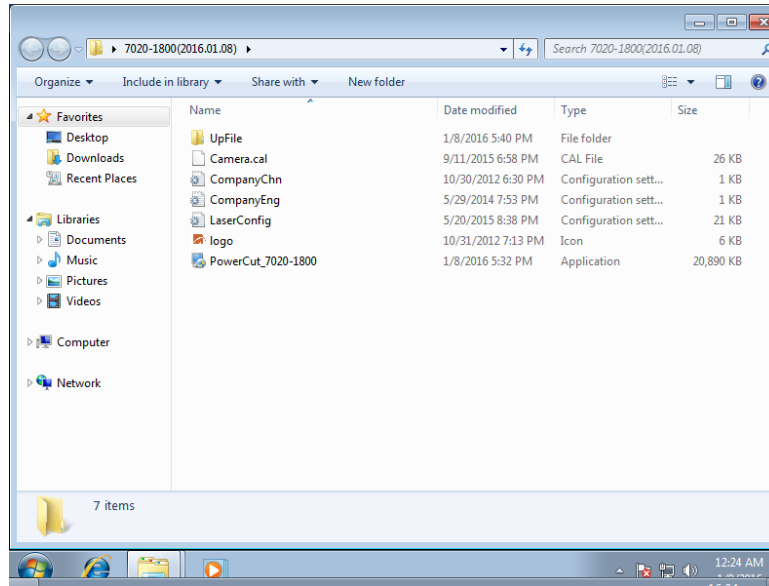
- MIL of uninstallation : when you the first installation of vision driver fails, you need to reinstall the vision driver , please double click  , after the uninstall is complete computer system will be reboot ,please install the vision driver again.




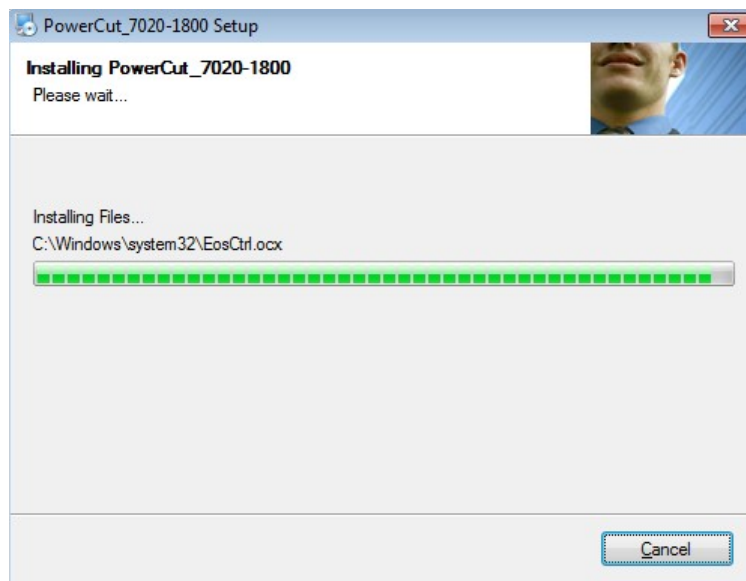
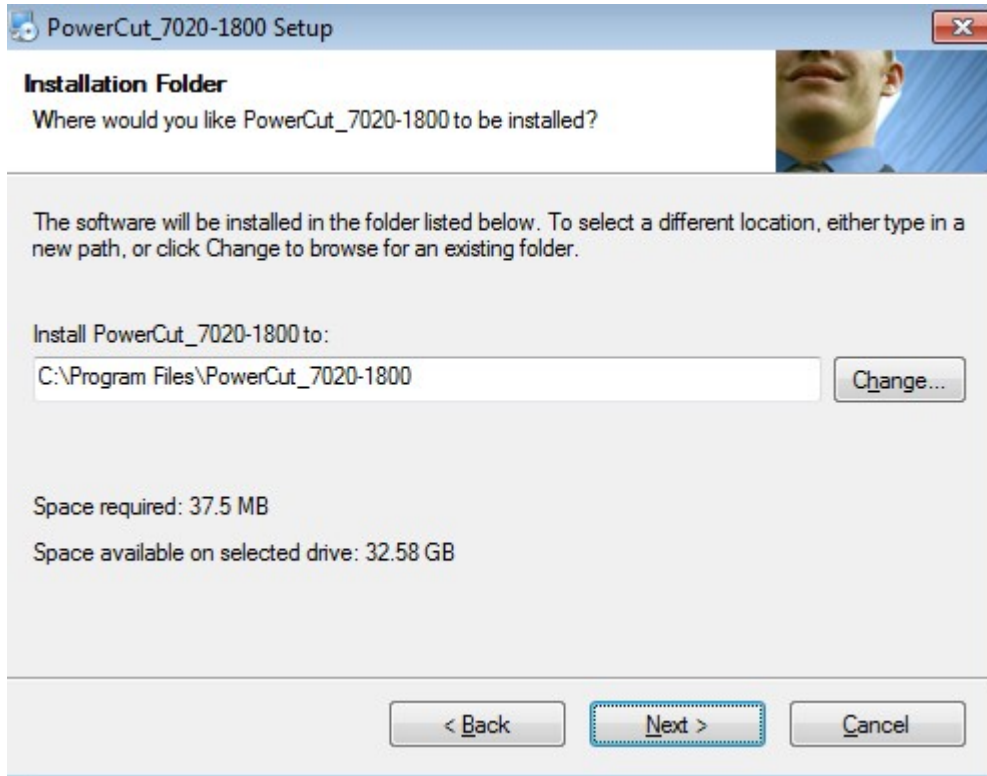
1.3.2 vision software of installation

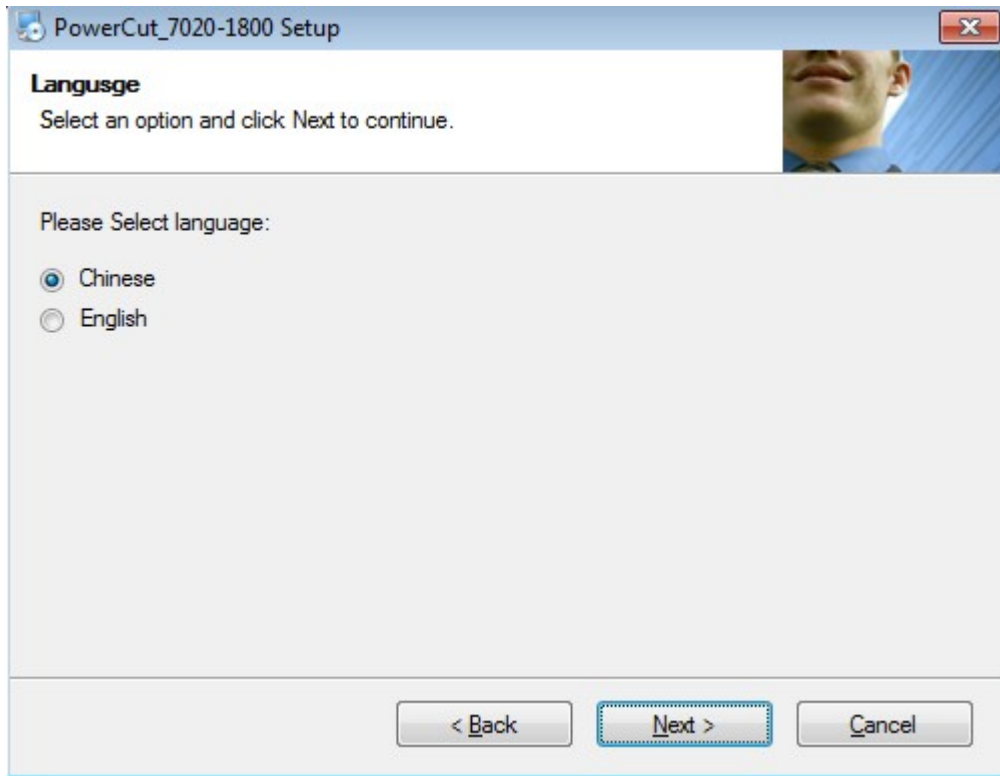


Install the PowerCut software, double click , as shown below picture.

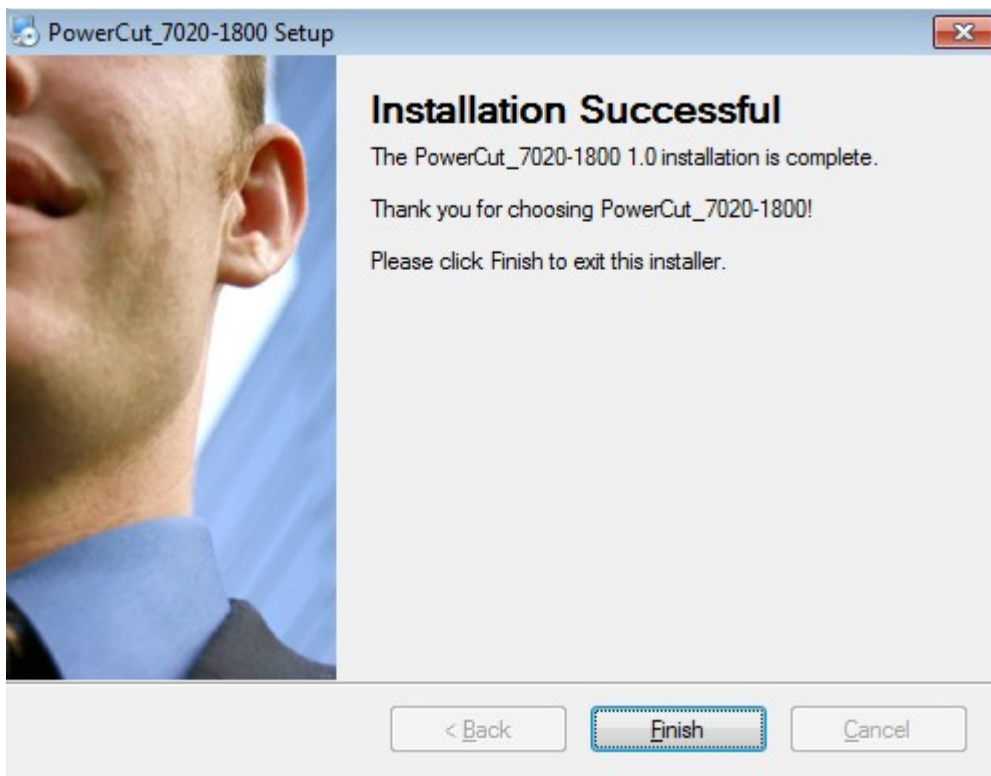


Double click  **PowerCut_7020-1800.exe** installation package , enter the installation interface click on the “next” to complete the installation .





Select the appropriate language and click “next” to complete the installation.

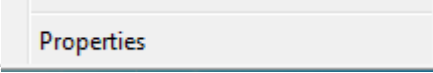


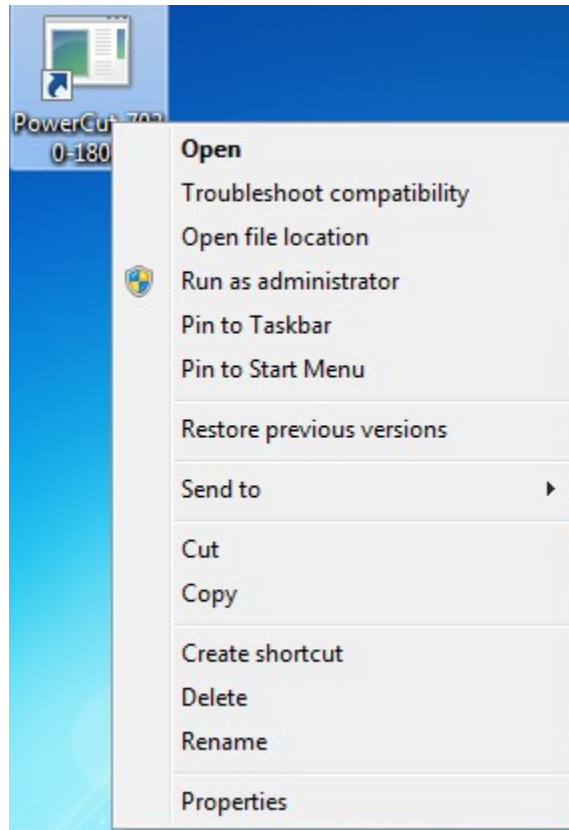
Program will be generated on the desktop ,after installation is complete .please send

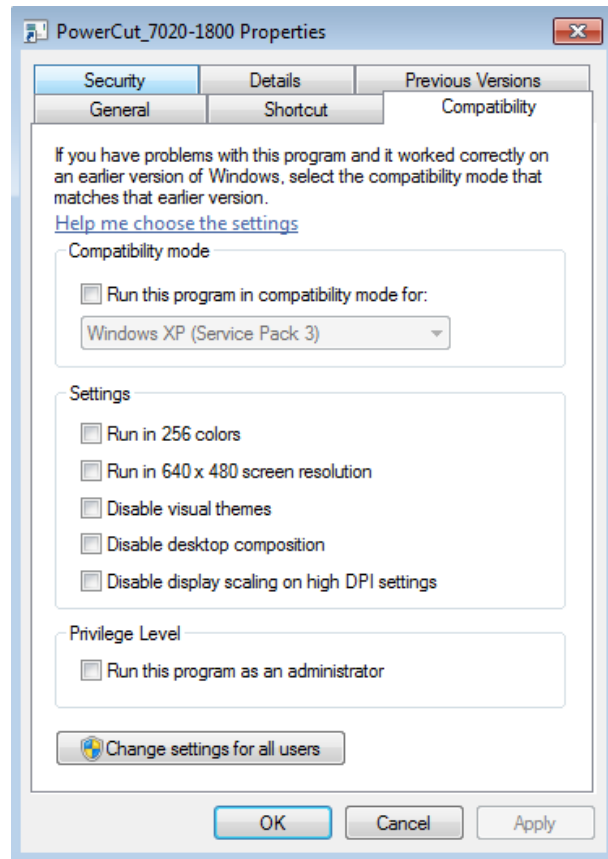


the shortcut to the desktop.

Please click the right button of the mouse, please click on the pop-up dialog box with the

mouse  In compatibility mode ,select wind XP be compatible ,otherwise the software can be opened ,as shown below .





1.4 Software features

- Large-format automatic recognition
- Automatic boundary cutting function.
- The interface is friendly, easy to learn and convenient to operate.
- The AI, BMP, PLT,DXF,DST and other many kinds of graphics data formats are all compatible.
- It can make simple graphics and words. And it can edit and mark the lead-in data.
- It can do multistage stratified processing and definite the output sequence.
- It can set the machining process and precision personalization, and has the laser head operation trajectory simulation display.
- It has a variety of path optimization functions and pause function during the processing process.
- A variety ways of graphics and processing parameters and its repeated usage,
- Unique double laser system intermittent work and their respective independently

work and motion trajectory compensation control function.

- Set the processing starting point, working path, laser head dock position, etc., according to the different needs of processing
- It can be compatible with many kinds of communication mode. Users can adopt USB port communication or network communication according to the actual situation.
- Play the function of adjusting speed during the processing process.
- It has power-off protection function. System can remember the breakpoint if it is power-off suddenly during the processing.while restoring the power, system can find this breakpoint and continue to process.

1.5 SLR using step

1.switch on the SLR , select“ON”,Camera mode as“P”files 。 (P files: Program Auto Exposure) as shown below :

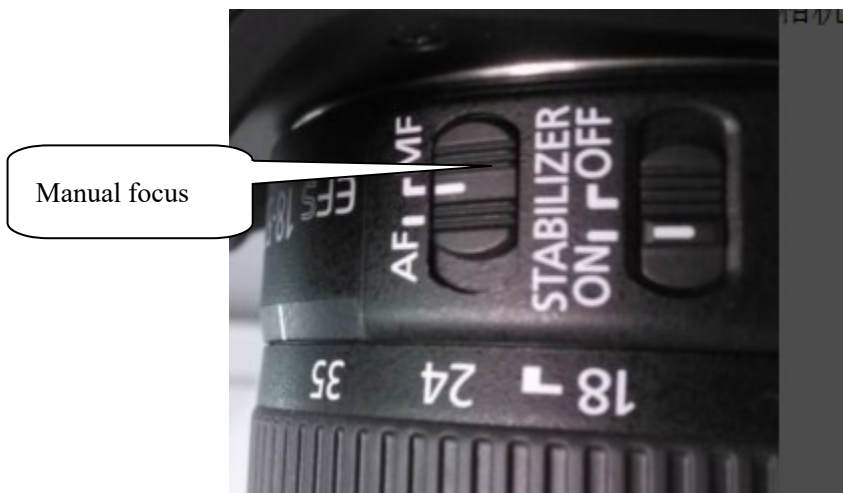


2.Found on the camera lens AF (Auto focus) , MF (Manual focus) and STABILIZER(Anti-shake switch) , The first to select “AF” Auto focus files , Anti-shake switch as“ON”.As shown below :

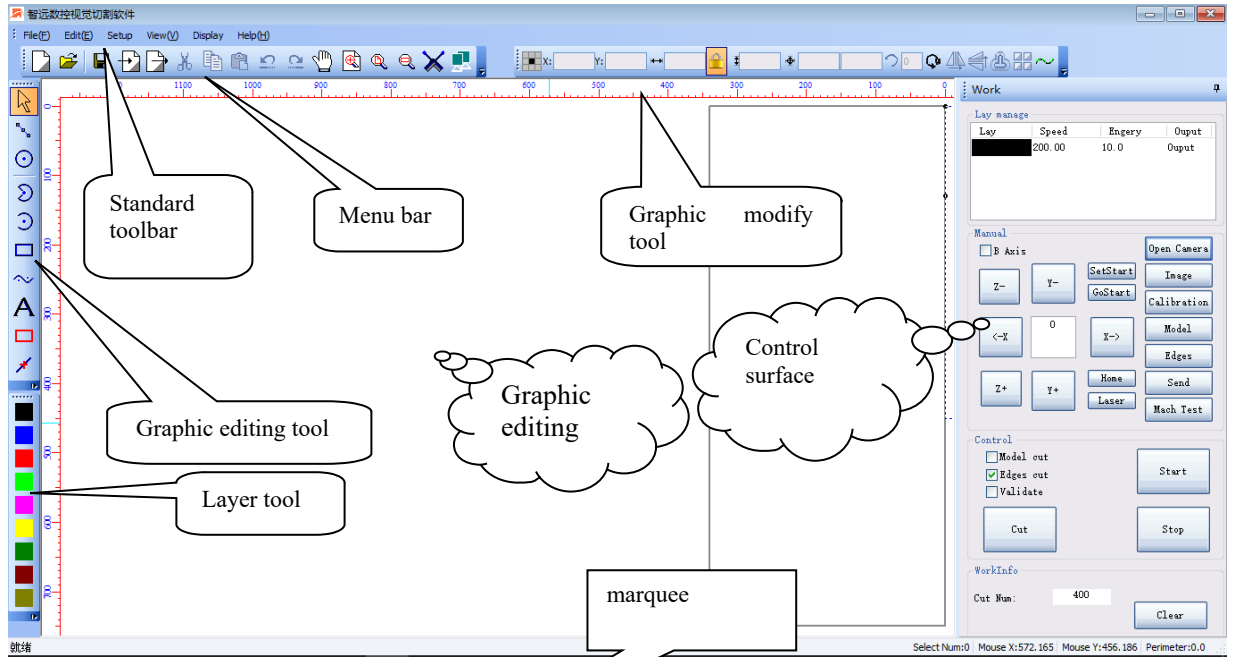


3. open the vision software, click on Open Camera button, pop-up dialog box camera Then manually rotate the camera lens while observing whether the shooting range of the camera dialog and equipment consistent format.

4. After the scope and equipment consistent format camera , click on the button of Calibration , pop-up dialog , then click on the button of Photograph , then the camera lens automatically rotates autofocus, after completion of observation to be photographed picture clarity, if meet the requirements, you need to select the camera mode as MF” manual focus .




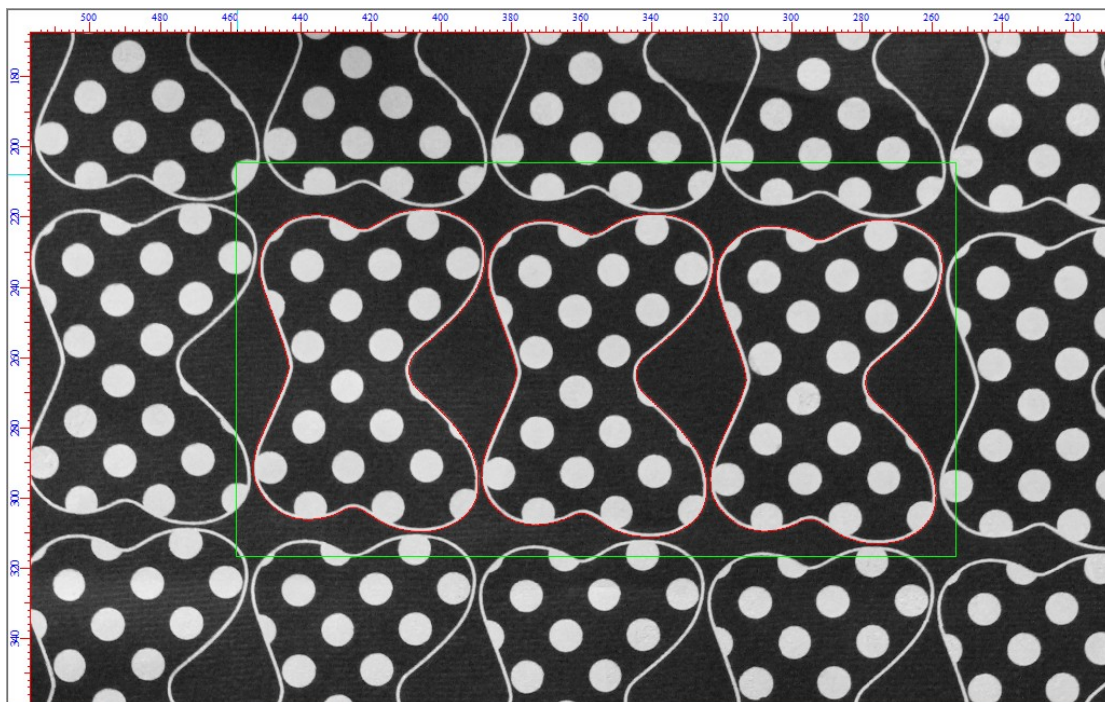
1.6 Interface instruction




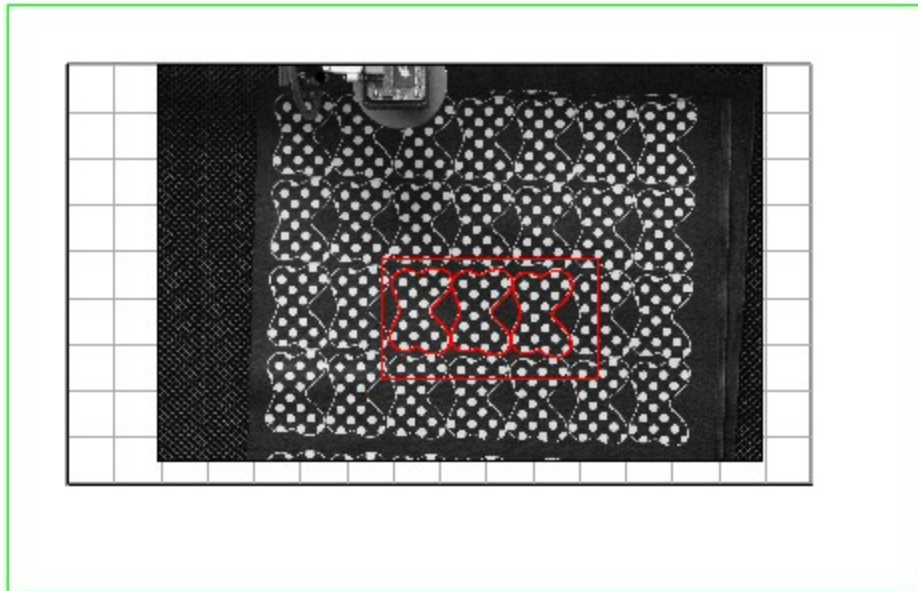
➤ Marquee match valid area :



➤ Marquee: click on the button of  , On a piece of the whole format marquee to match the effective area , only match the marquee area by software ,as shown below (green area) .

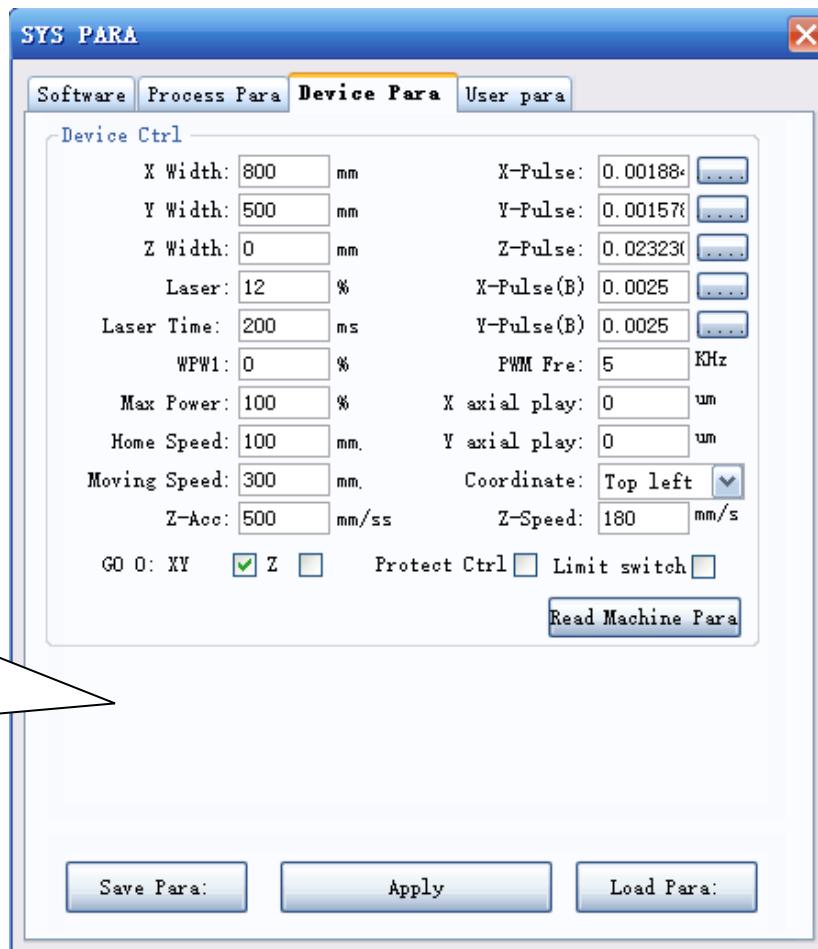


Revocation the marquee area : click on the button of , marquee the whole area, click the left button of the mouse to revocation ,as shown below (green area)。



Chapter2 Equipment parameter setting

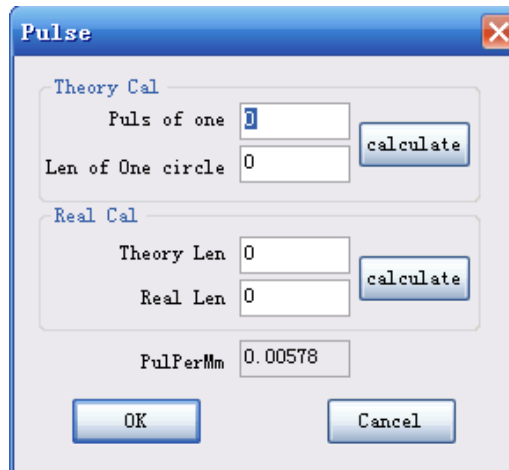
2.1 Equipment parameter tabs: 



The software detects the function when the asynchronous control system is displayed

Equipment control:

- Machine format X: refer to the movement range of table X axis, that is, the max range of the laser head lateral movement(mm).
- Machine format Y: refer to the movement range of table Y axis, that is, the max range of the laser head longitudinal movement(mm).
- Machine format Z : refer to the movement range of the table Z axis. Mainly used to left and right push board machine. The Z axis range is effective push board length minus the X axis format(put X axis as an example, unit mm), continous feeding machine is out of the limitation of this parameter.
- X axis pulse equivalent : Relative to the each pulse singal, the displacement of the machine moving parts are called pulse equivalent. Also it is called smallest setting unit. Click to set pulse equivalent, just as the following picture:

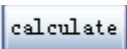



There are two ways to calculate the pulse equivalent: The theoretical calculation and practical calculation.

A、 theoretical calculation:

The pulse quantity of one circle of motor: step motor: put the 1.8°, 32 subdivision driver as an example, the pulse quantity of one circle of motor: $360/1.8 \times 32 = 6400$ (pulse). Servo motor: put the panasonic servo motor A5 as an example, The motor turns a circle while the PR008 parameter default epistatic machine send ten thousand pulse.

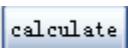

The real go length of motor tuning one circle: This value has been confirm, while the machine is designed. Ask the value from the machine design department.

Click , calculating the pulse equivalent automatically. Click , set this value to the X axis pulse equivalent.

B、 Practical caculation:

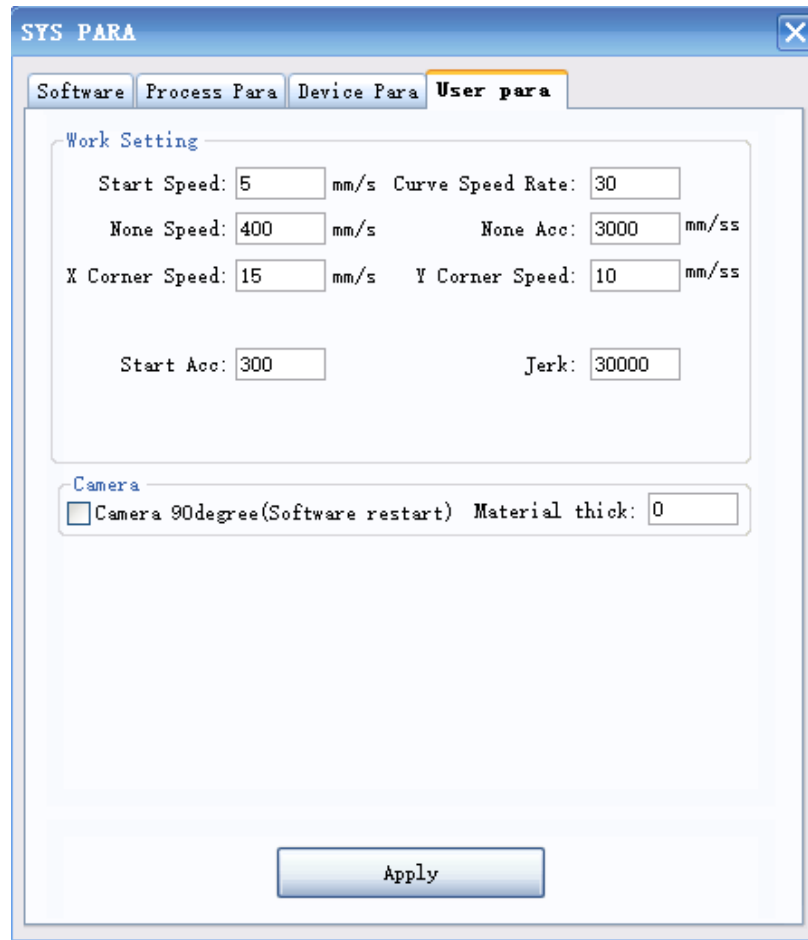
Theoretical length: draw a 100mm straight level. The theoretical length is 100mm to form processing file's cutting.

Real length: Actual length measured by the measuring instruments. Such as 50mm.

Click , caculate the pulse equivalent automatically. Click , set this value to X axis pulse equivalent.

- Y axis pulse equivalent : the caculating method is the same as the X axis pulse equivalent.
- Z axis pulse equivalent : the caculating method is the same as the X axis pulse equivalent.
- Fixed fire power: set the preset(fixed power) power percentage.

-
- Fixed fire time: set the preset (fixed power) optical time.
 - Pre-drive 1: set the laser tube 1 pre-drive power percentage.
 - Pre-drive 2 ; set the laser tube 2 pre-drive power percentage.
 - The max power: set the laser tube max power percentage.
 - PWM frequency: set the PWM wave frequency. Pls set it according to the laser machine's features.
 - Back to original point speed : set the speed of backing to the original point.
 - Board going speed: set the board going speed.
 - Back to the zero axis: set backing to the zero axis.
 - Water conservation: check the water conservation while checking, or do not check.
 - Read the equipment parameters: read the setting parameters in the control device.
 - Double head independent control: when the software detects the asynchronous control system is enabled when the function, and vice versa is not enabled:
 - At the same time check the AB platform in the process of processing AB platform at the same time work enabled, if only check one of the platform is only one beam work.
 - asynchronous shaft: According to the different structure of the machine, sub-double Y double X axis to select the appropriate machine structure.
 - Origin Offset: After setting the asynchronous axis to the origin, whether the origin position between the asynchronous axes is at the same horizontal position is not necessary. If you want to set the offset value, you do not need to set it.
 - minimum spacing: set the asynchronous axis back to the origin, the minimum distance between the asynchronous axis.
 - efficiency priority: in the cut when the graphics automatically interrupt, asynchronous axis at the same time to improve work efficiency.
 - balance: both efficiency and not splicing, when the cutting graphics do not splicing processing, will lead to another head can not process any graphics, then this time I will interrupt the graphics splicing.
 - not stitching: no stitching is as long as a head can be processed, then it will not interrupt

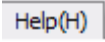


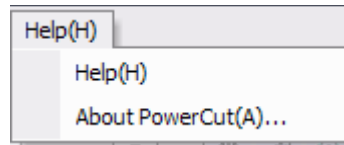
Process setting:

- The movement speed(fast): set the speed of movement by hand.
- Coordinate system: choose the coordinate system(original point switch place, at the upper left or upper right).
- Start-up speed: set the start-up of the motor.
- Curve rate; set the curve's speed ratio. Bigger this value, faster the cutting curve. Otherwise it is slower.
- Travelling speed: set the machine's empty running speed.
- X axis corner speed: set the speed when X axis go through the corner.
- Y axis corner speed: set the speed when Y axis go through the corner.
- Z axis speed: set the movement speed of Z axis.
- Z axis acceleration: set the acceleration when the Z axis moves.
- Save the parameter files: click this command, save the parameter files to the appointed place.
- Application: click this command, download the already parameters to the controller(must control the controller, otherwise, it will display wrong.)
- Read the parameter files: read back the parameters files saved

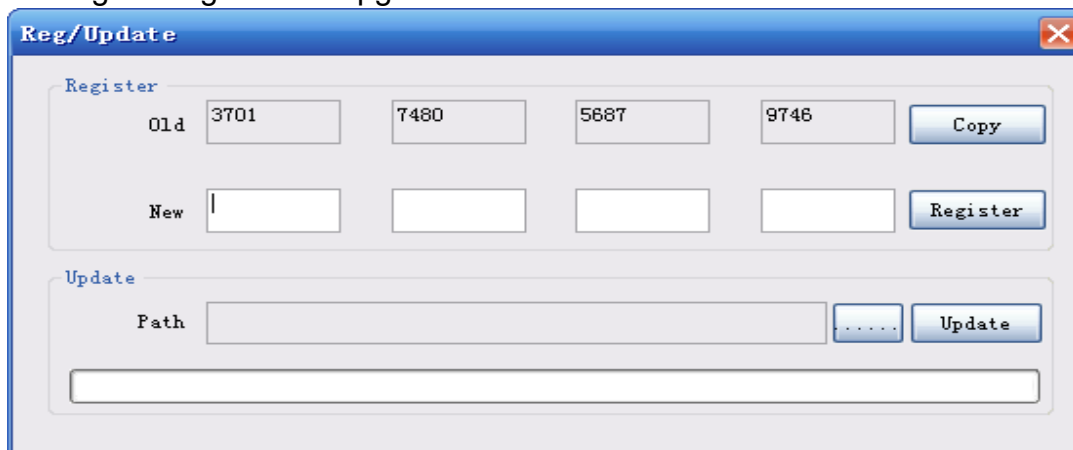
before to the control system.



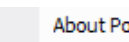
2.2 “Help” menu items

Click the  icon on the menu bar to open the “Help” pull-down menu.



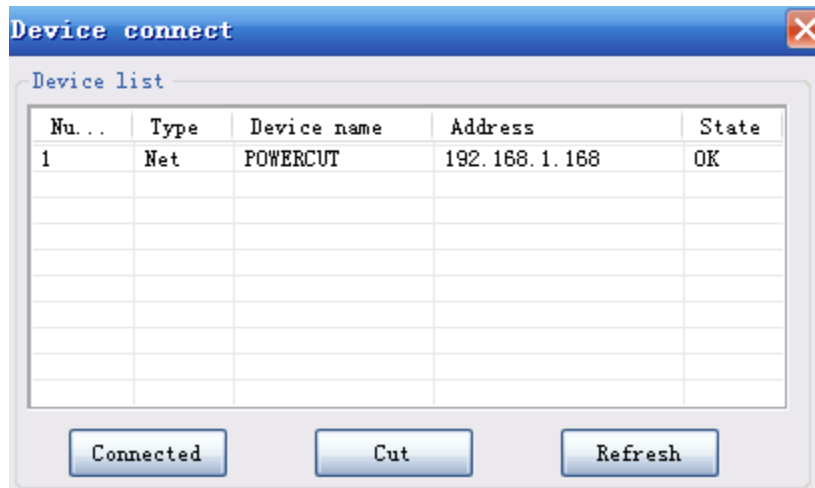
Choose , Pop-up registration/upgrade window, showing the registration/upgrade information.



- Registration method: After the original registration code expired, acquiring the new registration code from the manufacture. Input the new 16 bits registration code into the box, and then click “register”.
- Upgrade method: Acquire the update documents from the manufacture , and then save to the computer appointed position. Click  while updating to find the updated file which deposited in the appointed place, and then click . Choose , pop out “about” window, which showing the company’s related information.


2.3 Machine connection

Click on the button of  appear the device connection dialog: as shown below



- Device list: machine mode 、 machine name IP address condition the
- Click on the button of **Connected** , connect to this machine .
- Click on the button of **Cut** , disconnect to this machine .
- Click on the button of **Refresh** , refresh this machine connection .

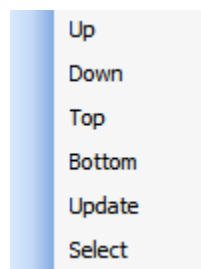
Chapter3 working face plate

The work panel includes the contents of the options, layer management, device control and manual control. The working face tab can be fixed or automatically hide the red box for the working panel by clicking  on the right side.

3.1 Layer management

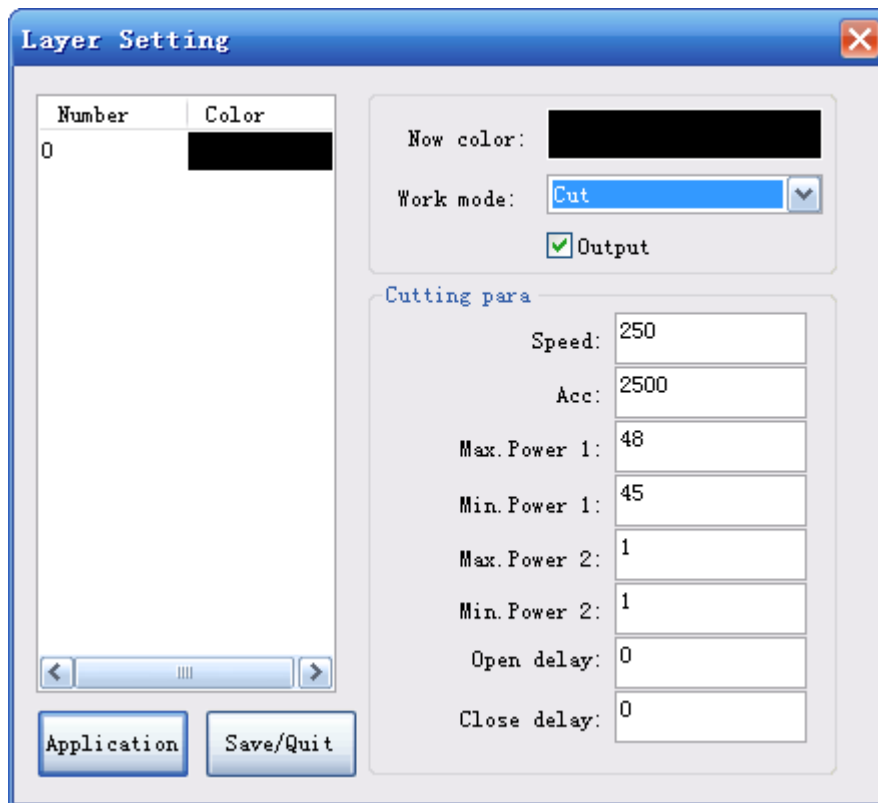
Lay	Speed	Engery	Ouput
Black	250.00	48.0	Ouput
Red	300.00	20.0	Ouput
Green	150.00	30.0	Ouput

Layer management including the color, processing mode, speed, power, whether the output and other information and click on the right mouse button will have a prompt box to move up, down, top, bottom, select and so on the operation command button.



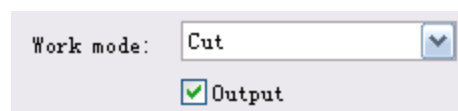
Click a color layer, the layer information is highlighted, click **Up** button, The layer moves up one layer; click **Down** button, The layer moves down one layer; click **Top** button, The layer moves up to the top; click **Bottom** button, The layer moves down to the bottom of the; click **Select** button, The color layer object is selected.

- Tip: the order of the processing sequence is based on the order of the layers, and the order of the layers is changed .Double click a color layer to open the layer of information, set the box, as shown below:





Layer information setting box on the left side of the display of all the layers and the order, the right side of the display of the current layer related information

- Current layer color: the selected current layer colors, the mouse click on the left side of the different layers, the corresponding changes in the current layer.
- The working mode, as shown below:

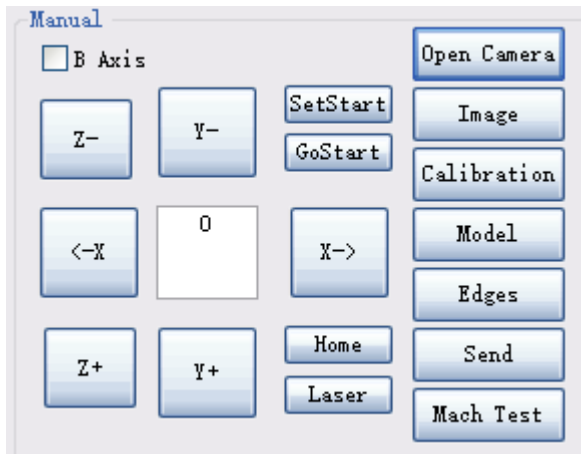





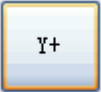
Output: check the output. Output, Output of the layer object when generating laser processing. Do not check the output, the layer object is not output, the processing process of the layer object is not processed.

- The cutting parameters:
 - processing speed.: The processing speed of the graphics object
 - processing acceleration: processing, laser, laser head acceleration operation.
 - Laser energy 1: percentage of laser energy laser power laser tube highest speed corresponding processing time.

- corner laser energy 1: laser power percentage of laser tube a corner speed corresponding processing time
- click  button ,click  button, Exit layer information settings.

3.2 Manual control

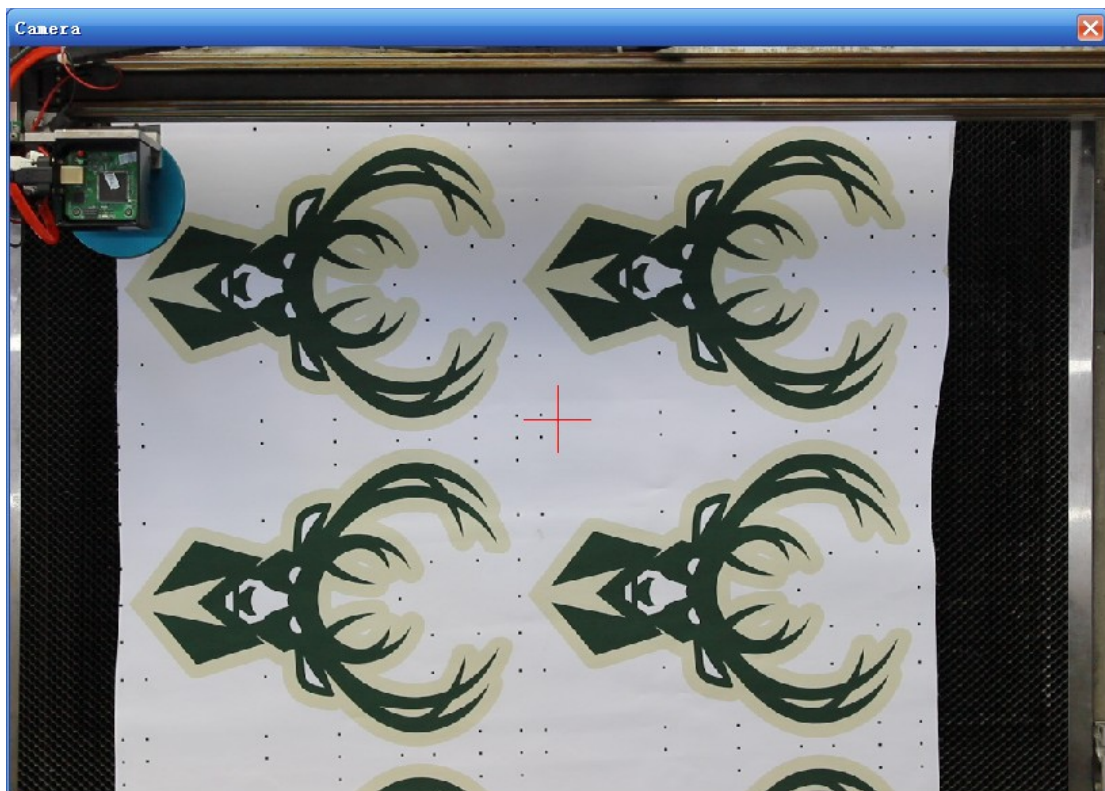


-  ,  : Click the button to control the X axis and the reverse movement.
-  ,  : Click the button to control the Y axis and the reverse movement.
- B Axis : According to the different system control system, the software checks to the asynchronous cutting control system, the function keys will be enabled and displayed, check the mouse point after the XY can control the B platform to move.
- Z+、Z-: click this button to control the Z axis is mobile, reverse.
- The precise movement: In this input value and then press the direction key, the laser head in the direction of accurate movement.

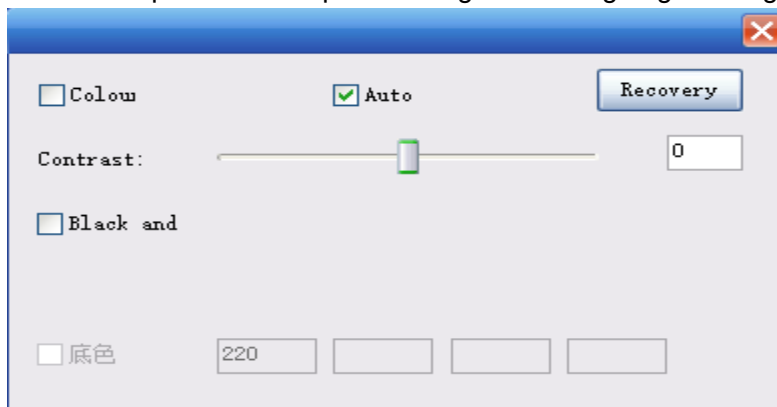
Starting point: the current position is the location of the laser head as the starting point, the user is to set up a processing starting point in the laser

head to the best starting point for you to start the process **SetStart**, The laser head will be back to the starting point after processing, **GoStart**

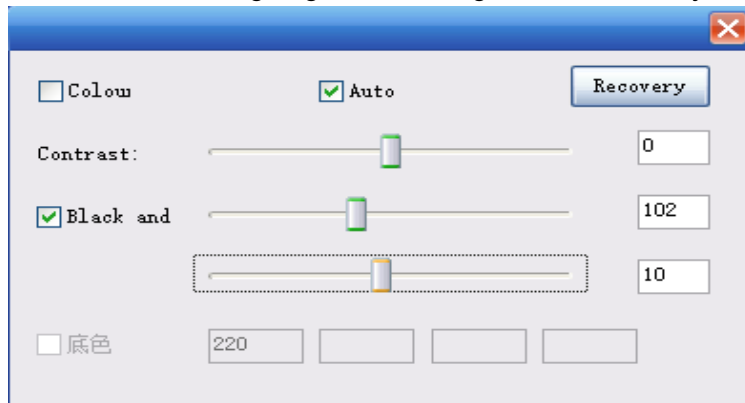
- Is to return to the starting point.
- The return to zero: refers to the laser head back to X, Y, axis is zero.
- The laser spot: Click **Laser** Button, laser burst command execution device.
- Open the camera : Click **Open Camera** Button, bomb to frame as below. In order to prolong the life of the camera, in the confirmation after opening the camera off camera on the frame.



- picture quality: click on the button, sub-color and automatic two, according to the material color contrast contrast ratio of different reasonable choice, by adjusting the image contrast to improve the template cutting and finding edge cutting probability

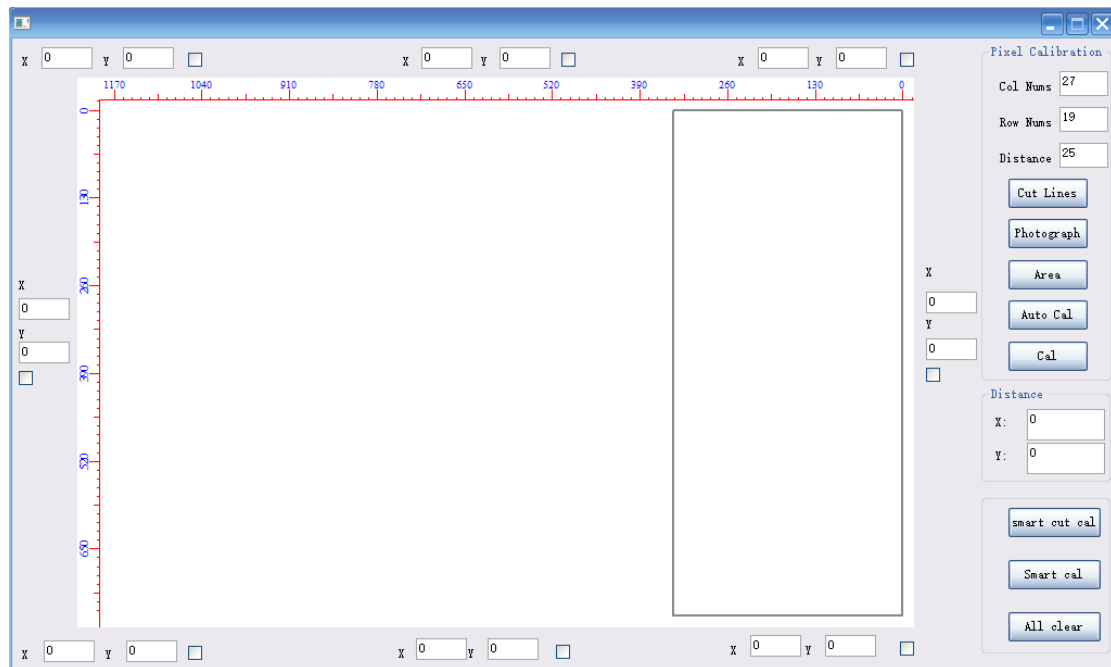


, With the mouse to move the slider to operate, the limit black and white is used to cut the
 lace material cutting edge with, through the slider to adjust.



3.2.1 Calibration management

Click **Calibration** Button, bomb to frame as below.



The number of columns: width to equipment calibration divided by the spacing equal to the number of columns.

The number of rows: long distance divided by the format equipment calibration is equal to the number of rows to.

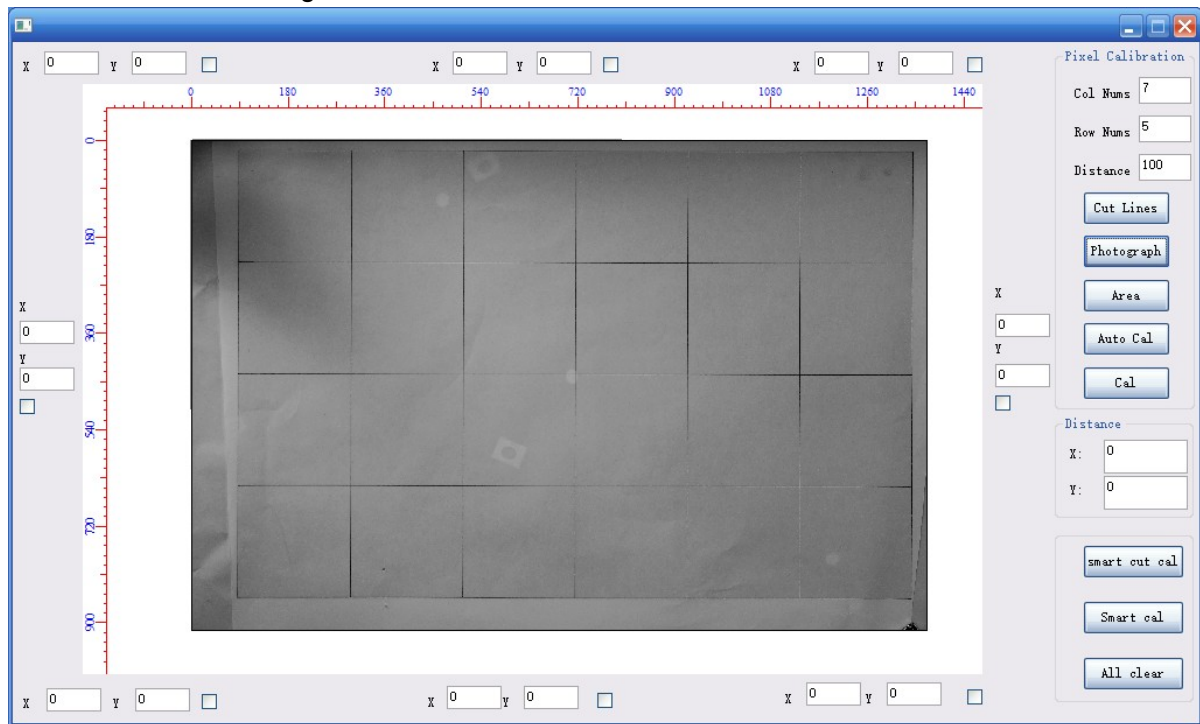
The pitch: the rows, columns of the distance between. (The proposal 30MM--50MM)

To draw the line: the number of columns, rows, spacing after count, click

Cut Lines

The button, immediately began to draw equipment model calibration line.

- The photo: after the line is completed, click **Photograph** The button, pop-up on the frame. The following chart.

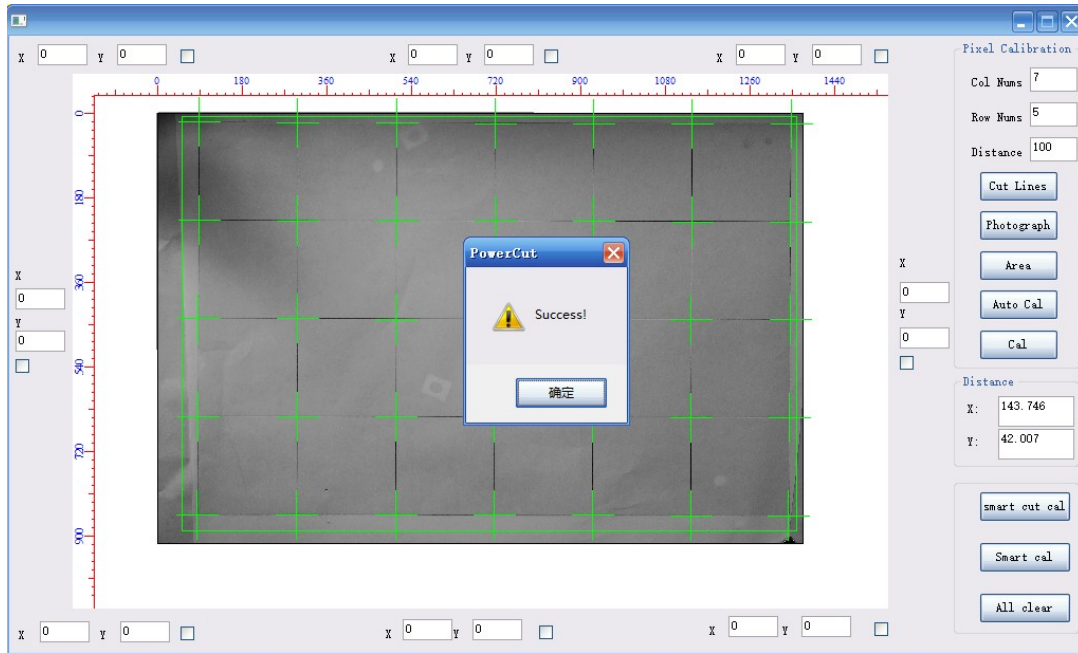



- The designated area: **Area** to select the format calibration equipment. Figure. Green area is the effective area of calibration.

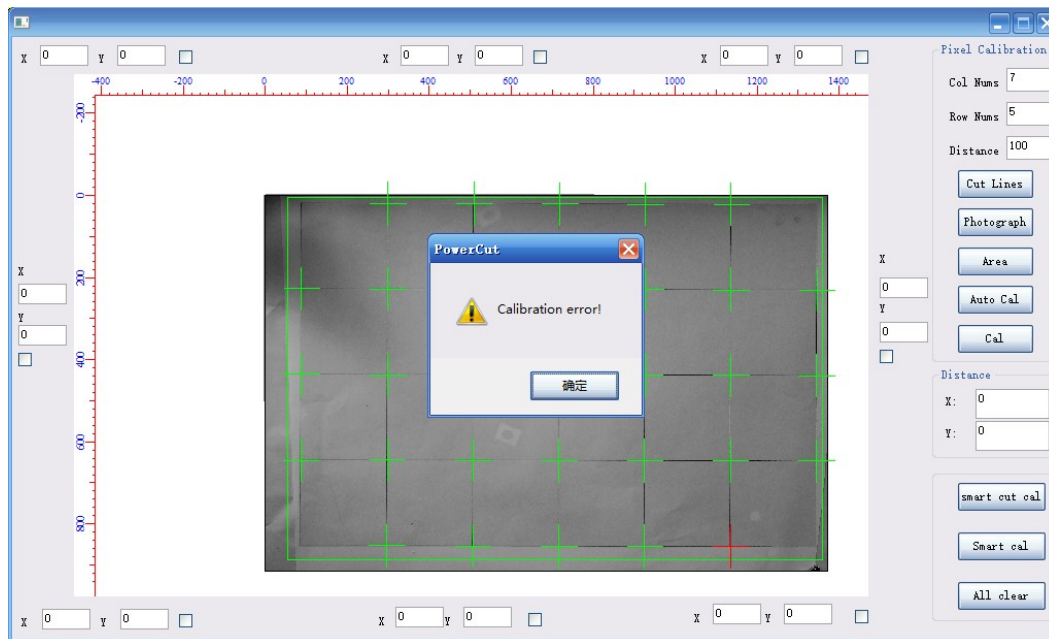
Auto Cal

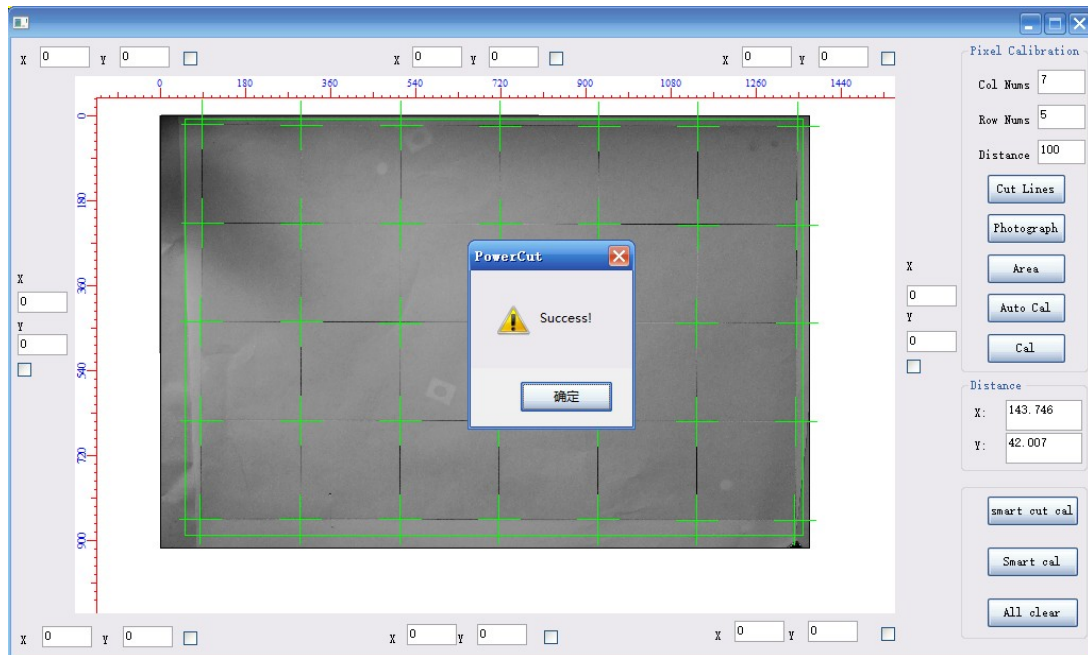
The automatic correction: click on the designated area

- Button As shown in the following figure, is the success of the calibration.
- If automatic correction is not successful, it will appear as shown below. So you need to manually double click the left button to add the feature points to the missing.
Press Delete key to delete the extra points.





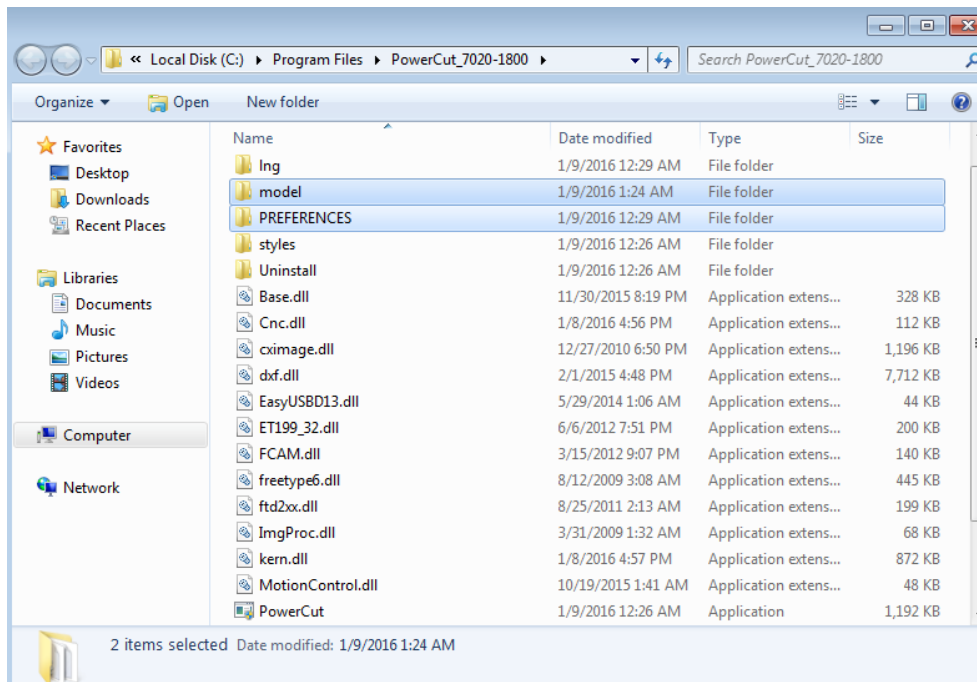
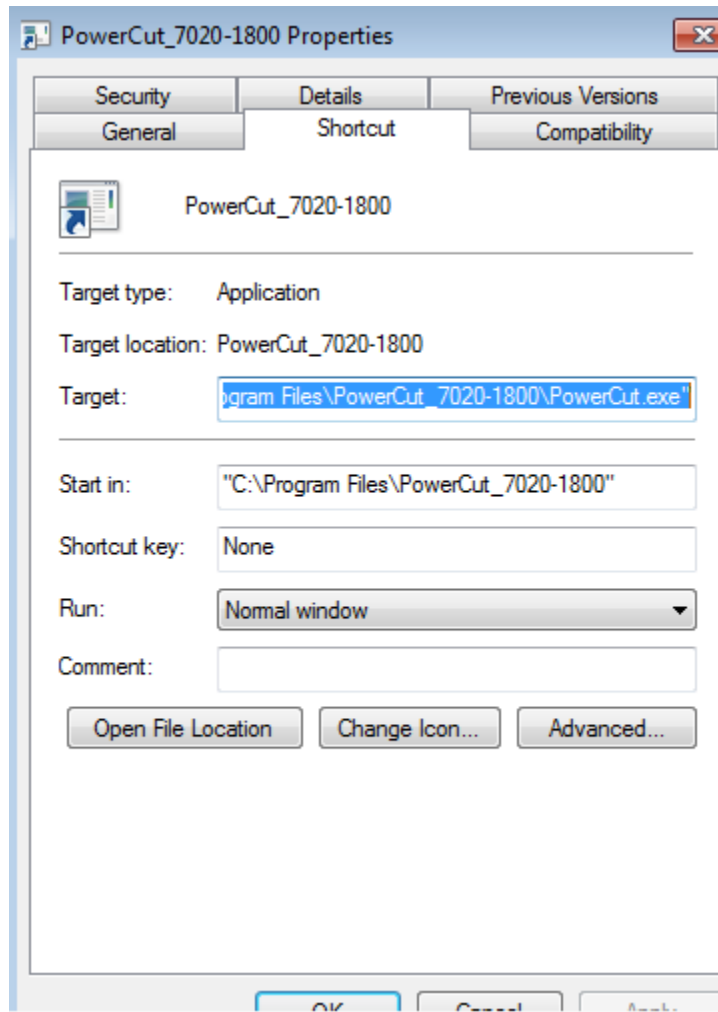
- Manual correction: after the confirmation of the target site added, then press  button , Will appear as shown in the following figure, the manual correction of success.





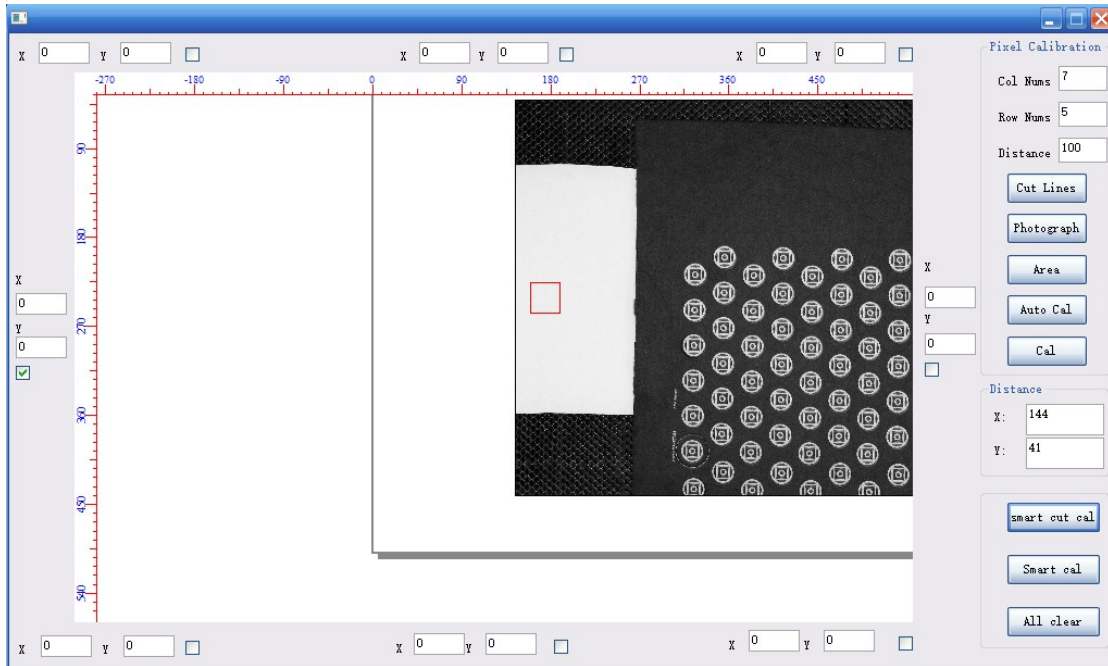
Tip: after the completion of the correction is best to backup the next software to prepare for the next time the software update, so that you can avoid the next need to re-correction, the method is to use the right mouse button to click on the desktop shortcut

icon select properties, click [Open File Location](#) find  model and  PREFERENCES Copy it, and then cover the two files directly to the installation file after the next installation:

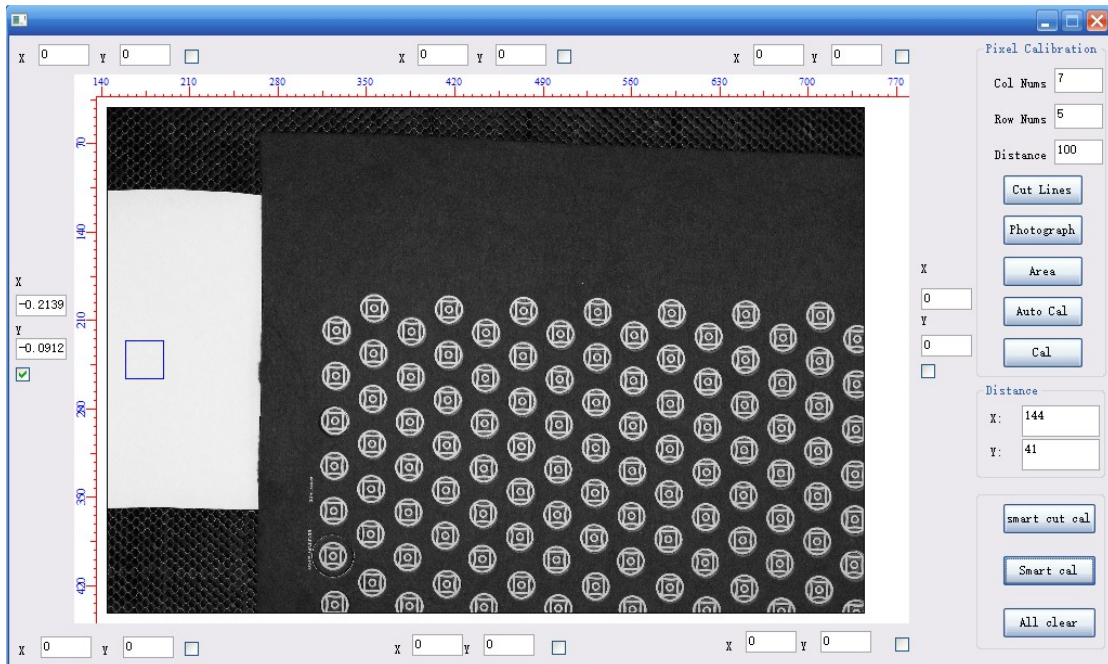


➤ correction offset: sometimes in the edge cutting and template cutting in the machine

closer to the location of the four sides of the machine cutting is not very accurate, through the intelligent cutting correction correction cutting accuracy, here is the camera calibration of the effective area is divided into eight effective areas, The location of the cut when the offset with the mouse to the corresponding location check box tick, point (in the position to be modified to pull the white paper, the laser head will cut a mark need to use), mark cut out after the point, The camera will take pictures to match, automatically get the offset value, each region has a corresponding coordinate value input number box.



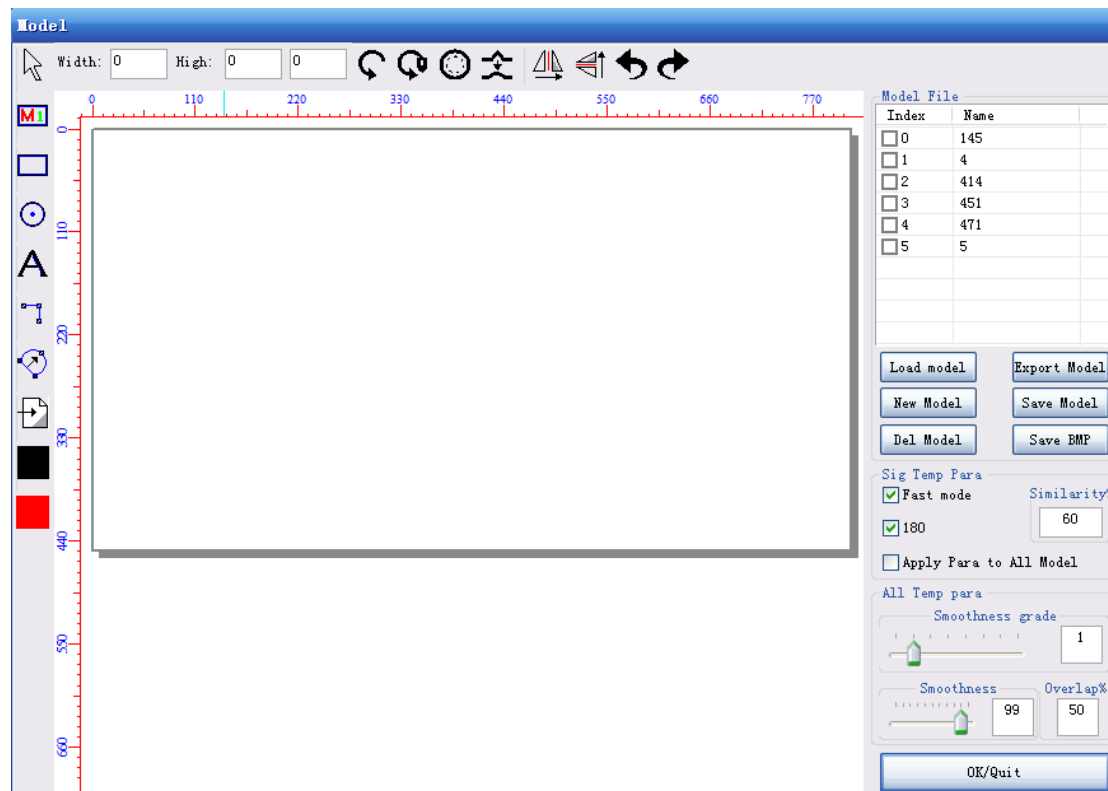
Check and focus on intelligent cutting effect



Point Smart Correction Get the coordinates automatically

3.2.2 Template cutting settings Template Management: click on the control panel of the

software. Model Enable template management functions as follows:



In the template management interface New Model, The view area in a picture of the current camera position by making the new bitmap, edges after cutting border line directly into.Ptl/.dxf file sets, in no cutting border line cases, the stroke function is enabled, the stroke function introduction is as follows:

Stroke operation process:

The first step, click the left mouse button to select "stroke" button, in the template of the bitmap corresponding location, click the left mouse button create a node. (node can create multiple)

The second step, when the node is created, click the right mouse button once to generate a control point.

Third step, move the mouse to the control point, press the left mouse button to drag the control point, the corresponding edge data will automatically follow the mobile, until the edge of the data is satisfied when the left mouse button, so that each of the control points can be edited to obtain satisfactory edge data.

The fourth step, completed after the third step, click the right mouse button once, then you can create a second stroke object nodes, if do not need to create a node, then click the right mouse button once can exit the stroke function.

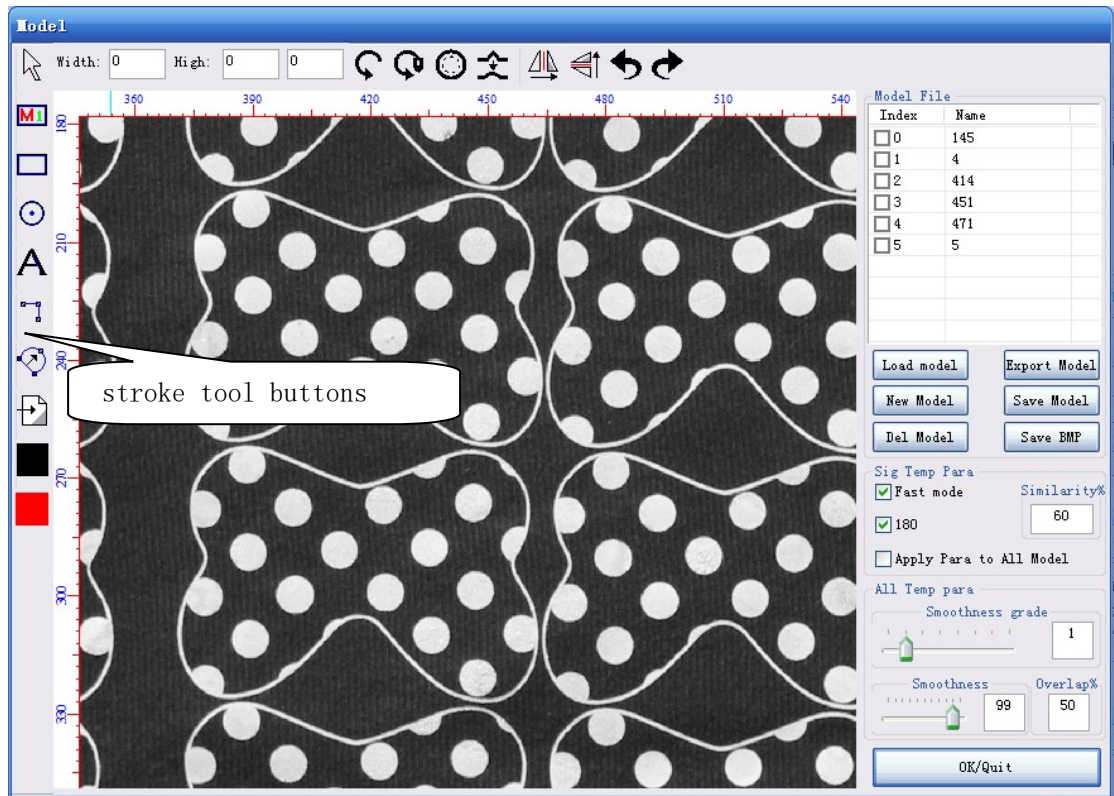
Edit stroke data flow:

The first step, if the completion of the stroke, the stroke data not satisfied need to modify please click the left mouse button and select "Edit" button, then edit function of stroke data enabled. In view of the data editing on stroke need to click the left mouse button can be selected for this object. Note: only click the left mouse button to select stroke data objects, select or non stroke objects cannot be selected.

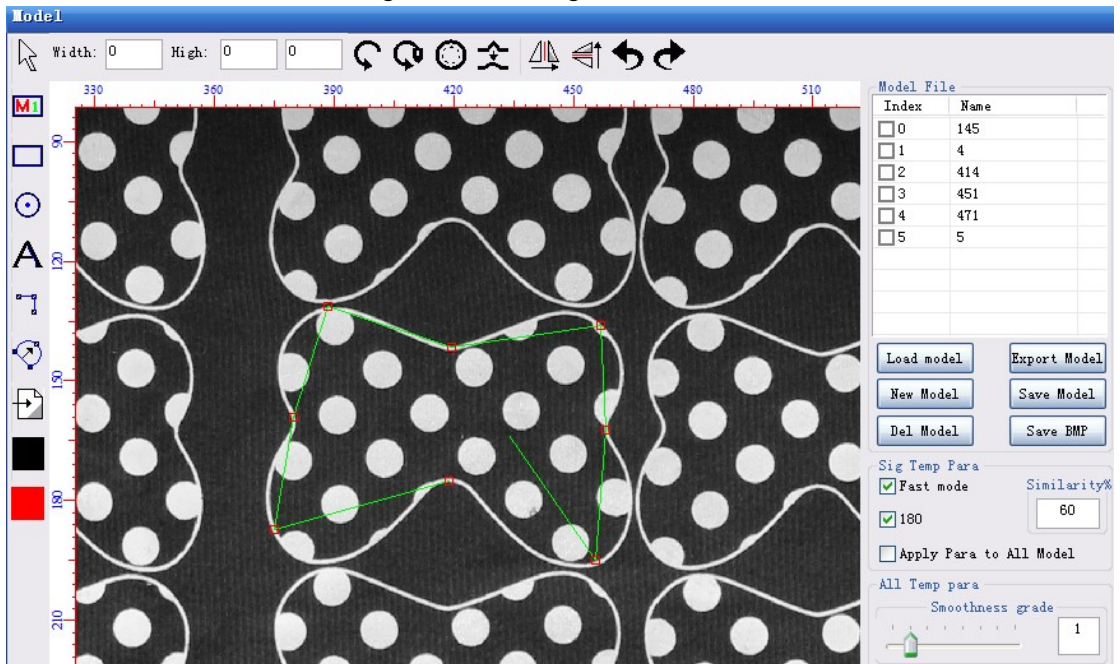
The second step and elected stroke object after that object of this stroke control points will be automatically displayed, this time using the stroke in the operation process of the third step to edit, when finished editing, click the right mouse button once. At the same time, choose another need to edit the stroke of the object editor. If all the editing has been completed, then again, click the right mouse button to exit the "Edit stroke data" function.

The following is a detailed description of each step of the operation:

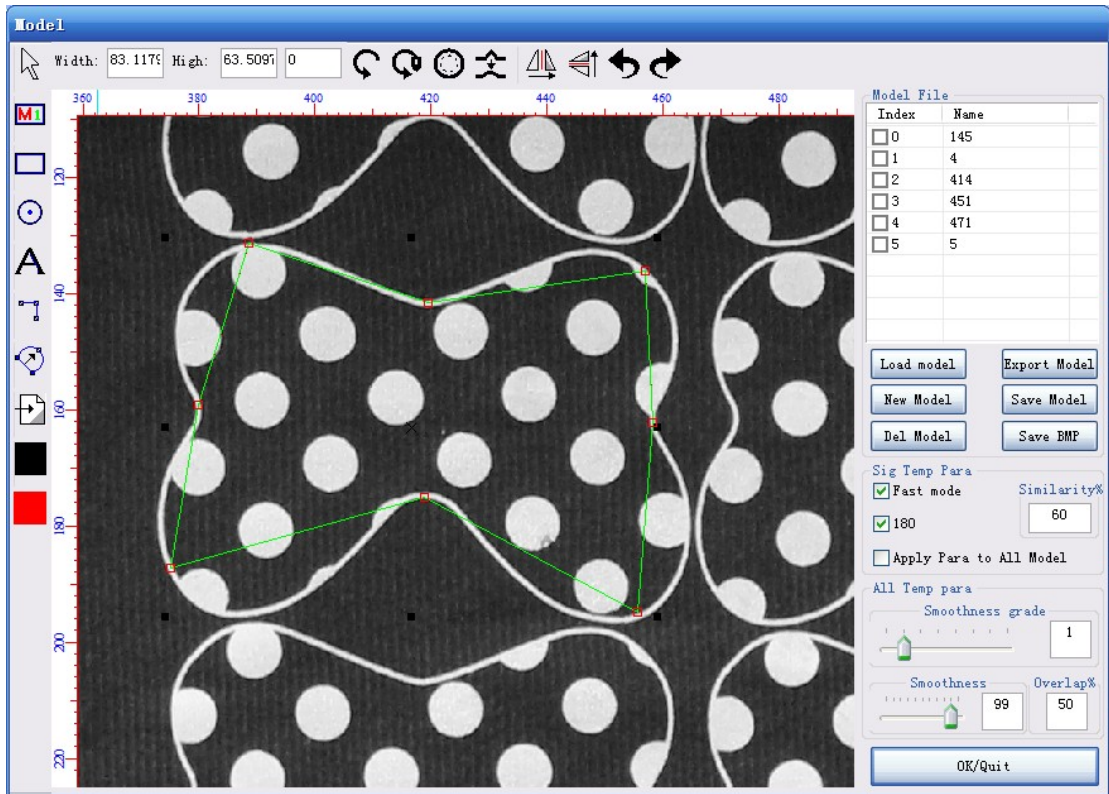
The stroke function, stroke edge feature of trademark template manually painted, template data users need to cut. When the user through the establishment of a template to get the required template model.bmp (bitmap) can be in the trademark cutting software, the view of the manual, graphics are as follows:




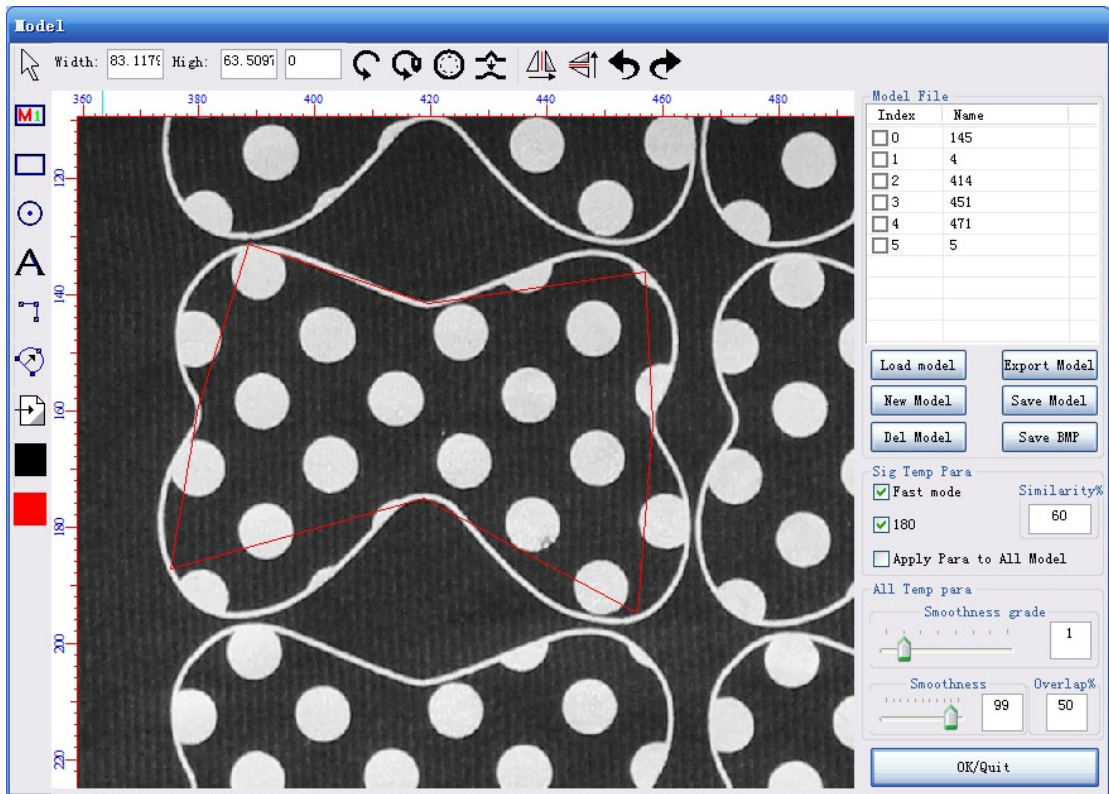
Click on the picture to stroke tool buttons and in view of the bitmap template click the left mouse button to create nodes, generate cutting line.



The following figure is a good graphics node



Control points are edited by the method above the right click the right mouse button two times or click the mouse button to select the function keys are also available  , We get the template edge data that we need, the software automatically put the template data as the red layer, the image is the final generated edge data.

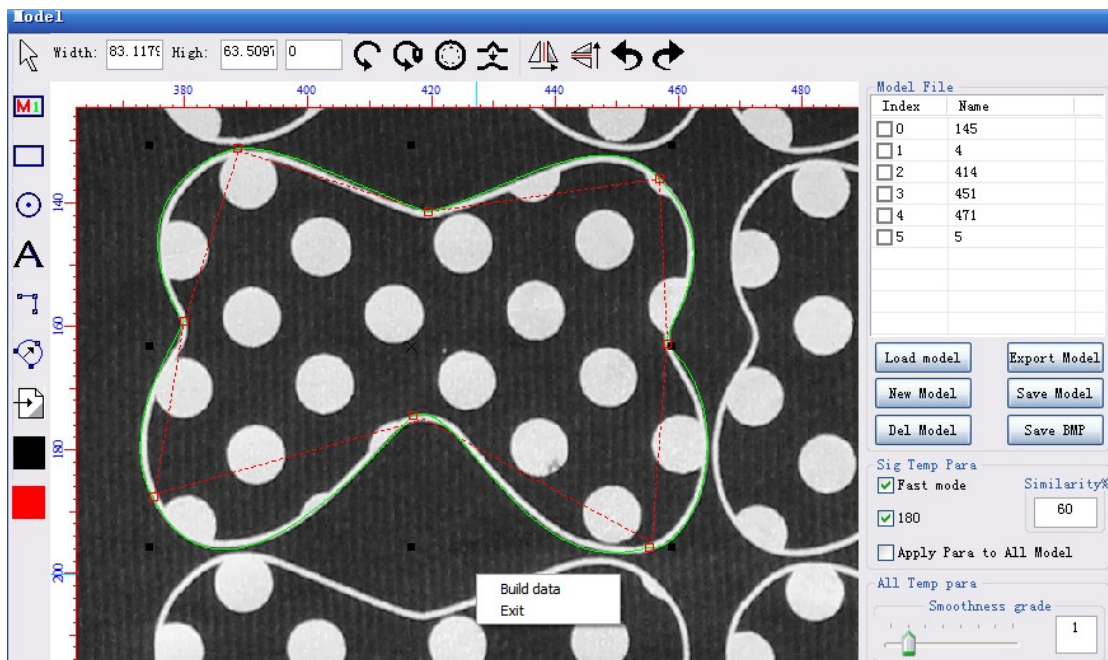
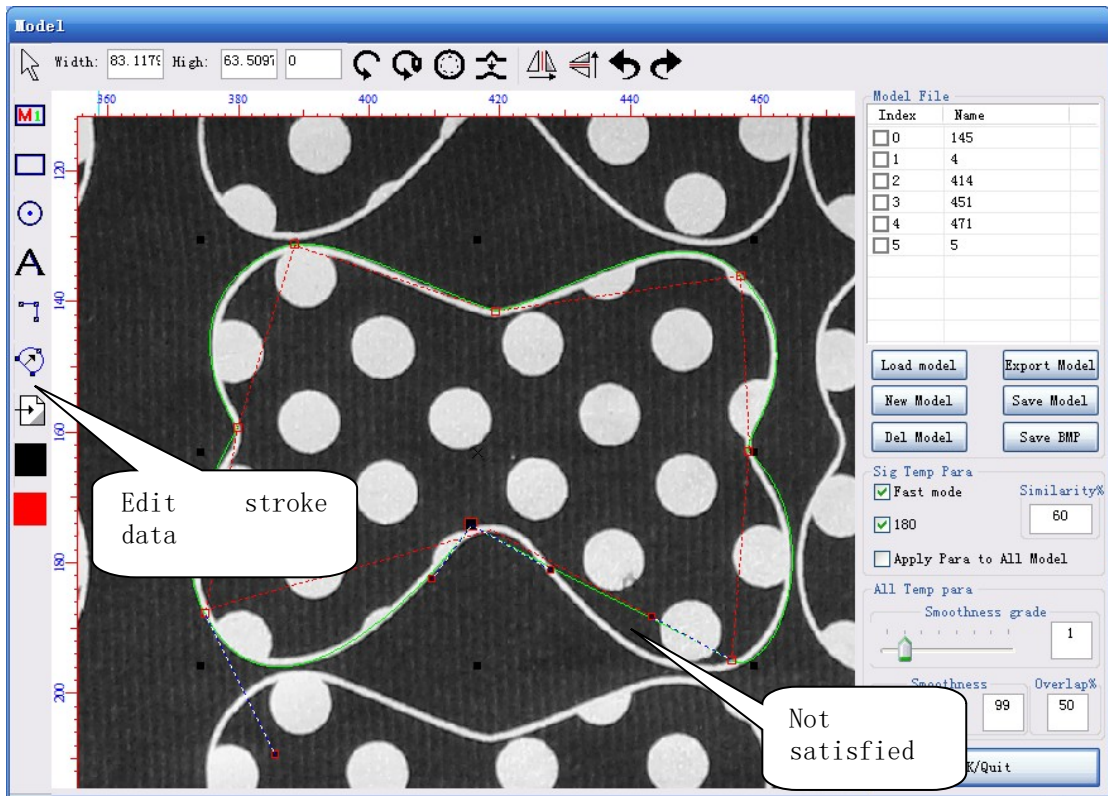


❖ Stroke data editing:

If to stroke out the template data are not satisfied with the need to modify (shown in Figure in the red region), by using the "Edit stroke data" button click the left mouse button below violet region of the, and then to view to edit the stroke data using the mouse to click, then the node will re displayed in the node using the mouse to click to edit the node will appear two control points that need to be revised from time to time use the mouse to drag the node or control point to edit (shown in Figure 2). After the completion of the editing, click the right mouse button to get the satisfaction of the template data two. (shown in Figure 3)

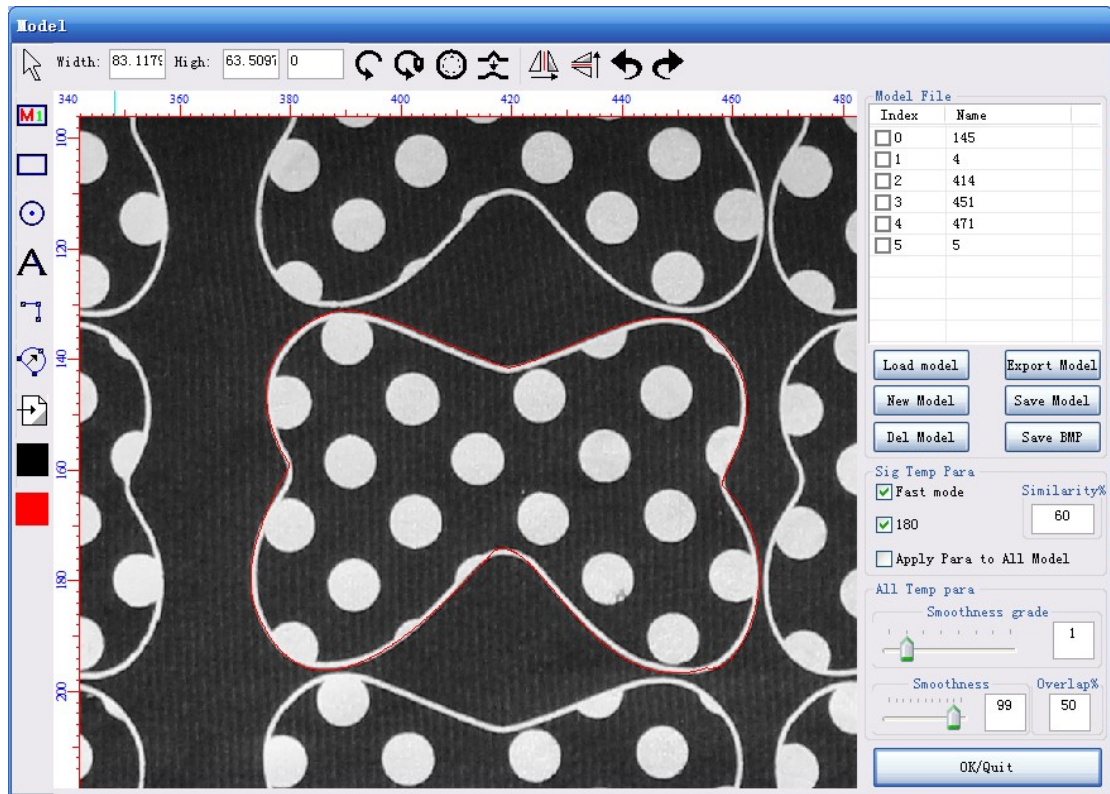
(2)

If you just want to adjust a node location can be used to click the node and then press the keyboard arrow keys to move as the following figure




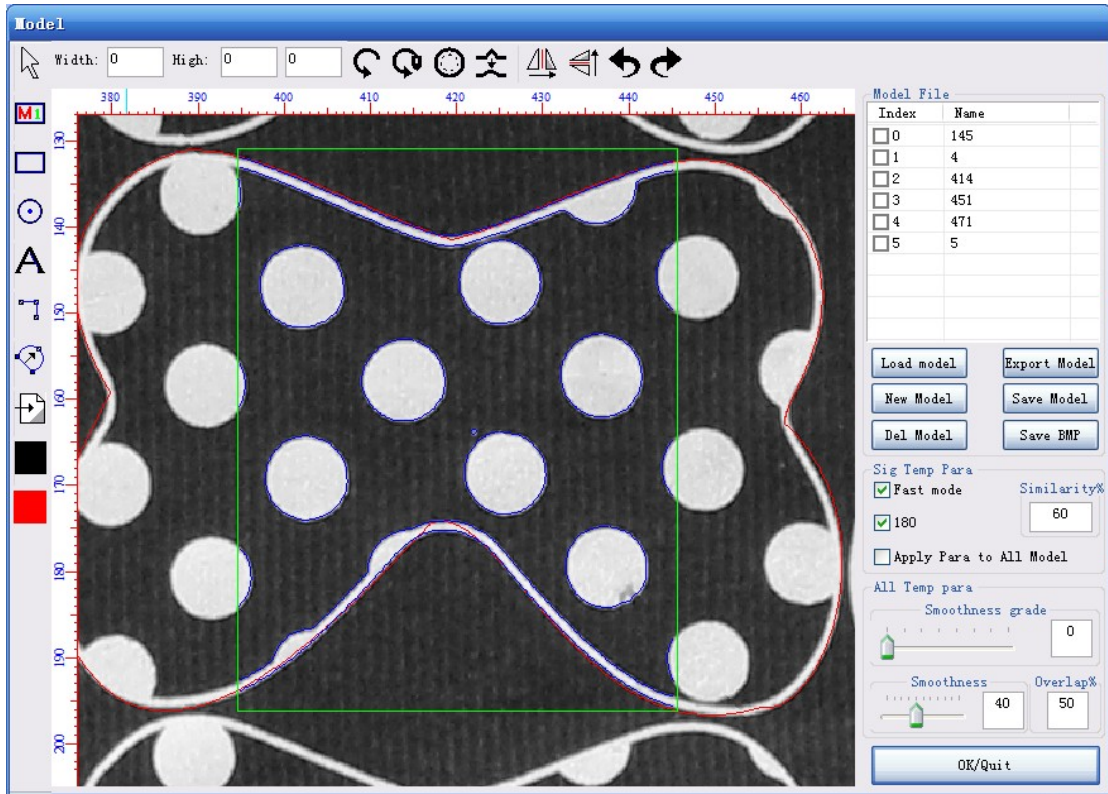
(3)

Please click the right mouse button to generate the data. **Build data** then click **Exit**, Edit the complete frame selection feature, the following red boxes become the final cut line.



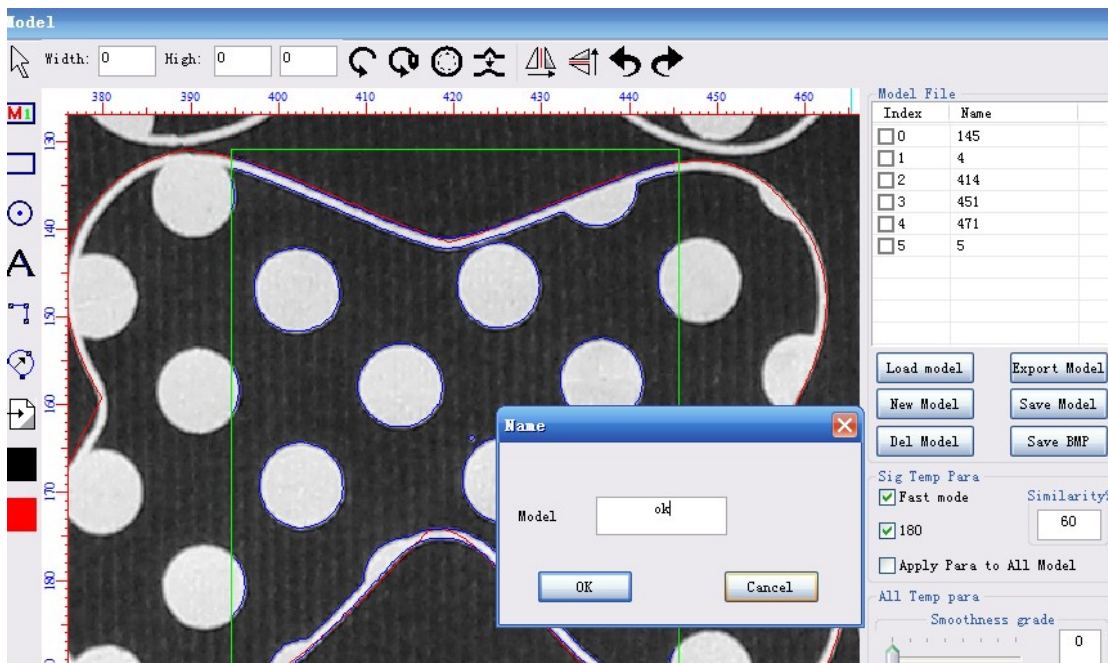
❖ And the feature definition:

Box selection panel features first with the mouse point . And then use the mouse to select the picture frame characteristics, the touch plate is used to cut the target location, the following figure in the blue lines for the extraction of the characteristics of the plate

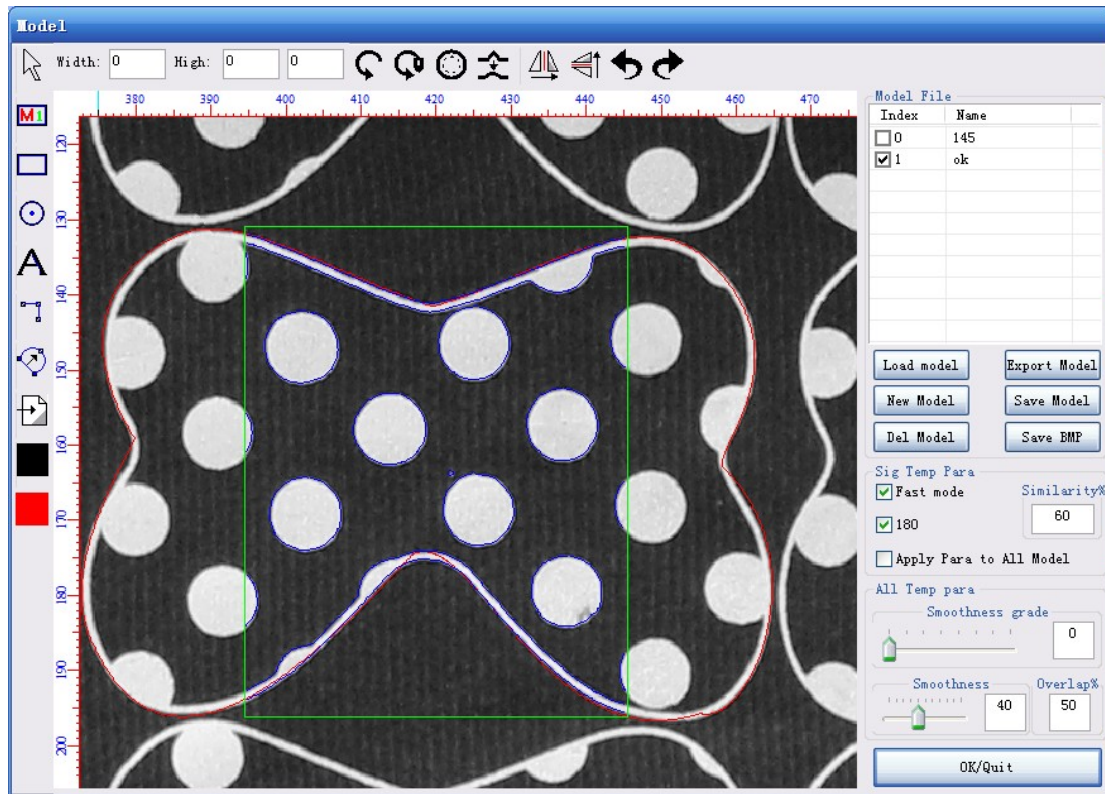


❖ And save the template:

Point save template Save Model



The input file name as 1234 arbitrary name can be as long as you don't repeat



❖ Set and template parameters:



"A single template parameter": all the parameters in the range are only applied to a single template that is currently selected.

1 "parameter is used for all templates": apply a single template parameter to the template that has been checked in all of the template lists.

2 "similarity ratio": the similar proportion of template matching, the object of which will not be able to match.

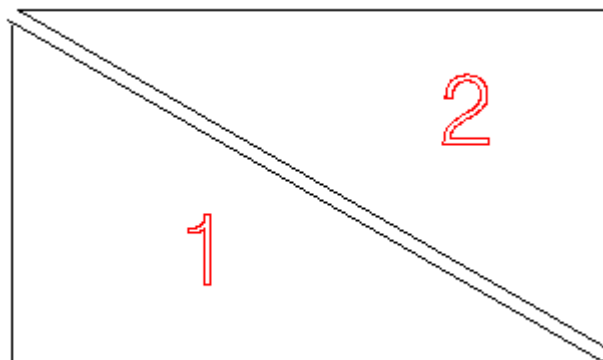
3. "Fast mode": tick refers to the match object in the counter clockwise rotation of 20 degrees clockwise rotated 20 degrees between the angle range can match, while more than the angle range of object did not match the success. General point of view control in the range of 20 to match the speed will be faster, no tick refers to the maximum rotation angle between the matching object and template. Matching objects in inverse clockwise rotation of 180 degrees clockwise rotated 20 degrees between the angle range can match in matching speed will be low.

All the template parameters: all the parameters in the range apply to the template that was checked in all the template lists.

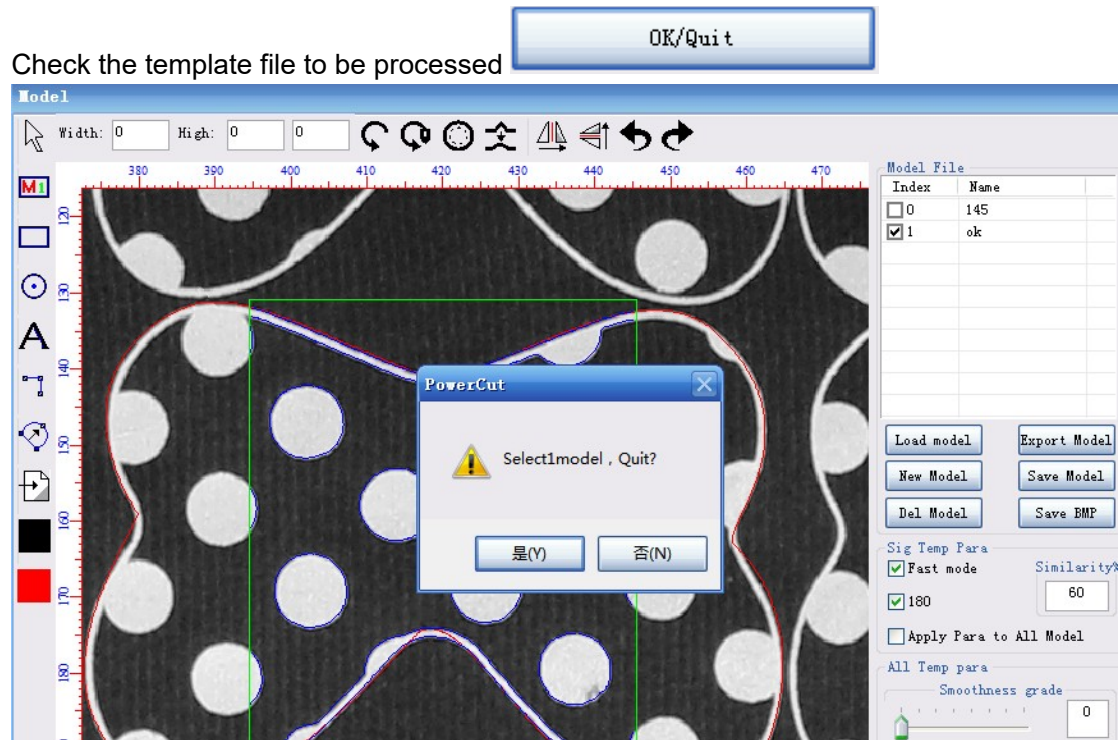
4 "positive and negative 180": when the graph is rotated 180 degrees when the speed matching

5 "smoothing coefficient": refers to the template after the definition of template characteristics of the filter parameters. The more template features, the lower the matching efficiency, so it is necessary to filter out some of the template features. Under normal circumstances is 50~70, if the template features more and more miscellaneous, this time it is necessary to improve the smooth coefficient. Drag the slider to adjust the size of the 10 integer times, but also can be manually input any integer value.

6 "overlap": refers to the need to be matched to the need to cut the template contour data and the surrounding area has been cutting the material overlap area ratio, the following figure 2 object and 1 object will need to set up 100% of the overlap ratio, otherwise the object will not be cut 2. This parameter is to prevent the object that has been cut to bad.



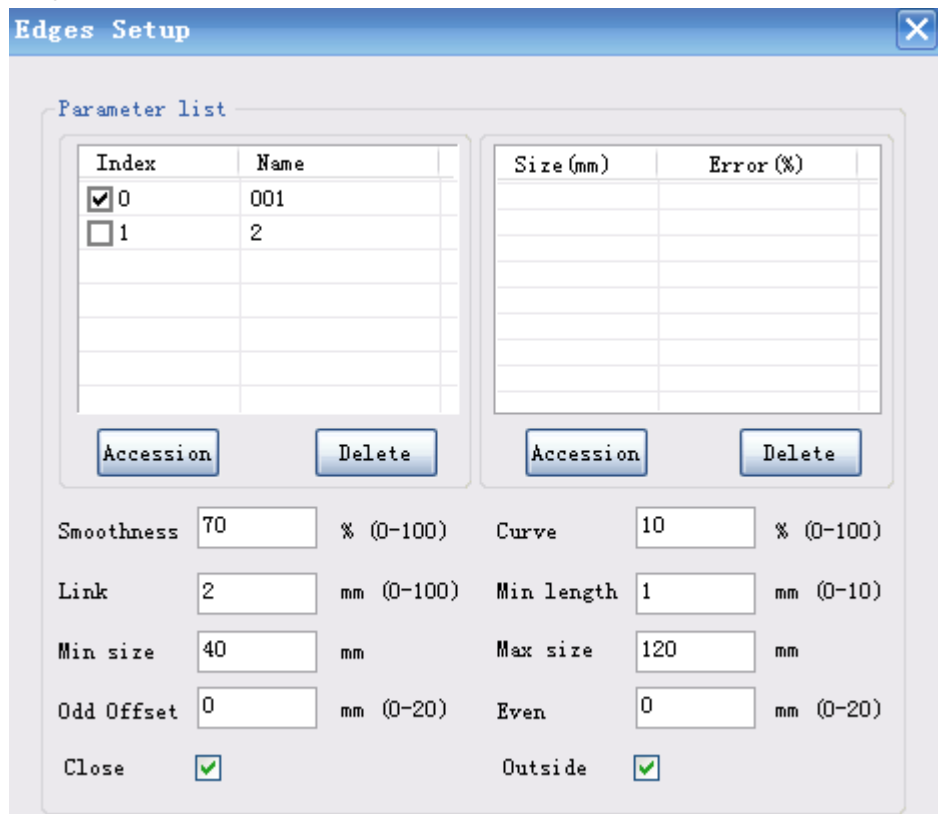
❖ Selection process template:



3.2.3 Cutting edge setting

- The profile settings: set with cutting edge contour extraction of contour parameters

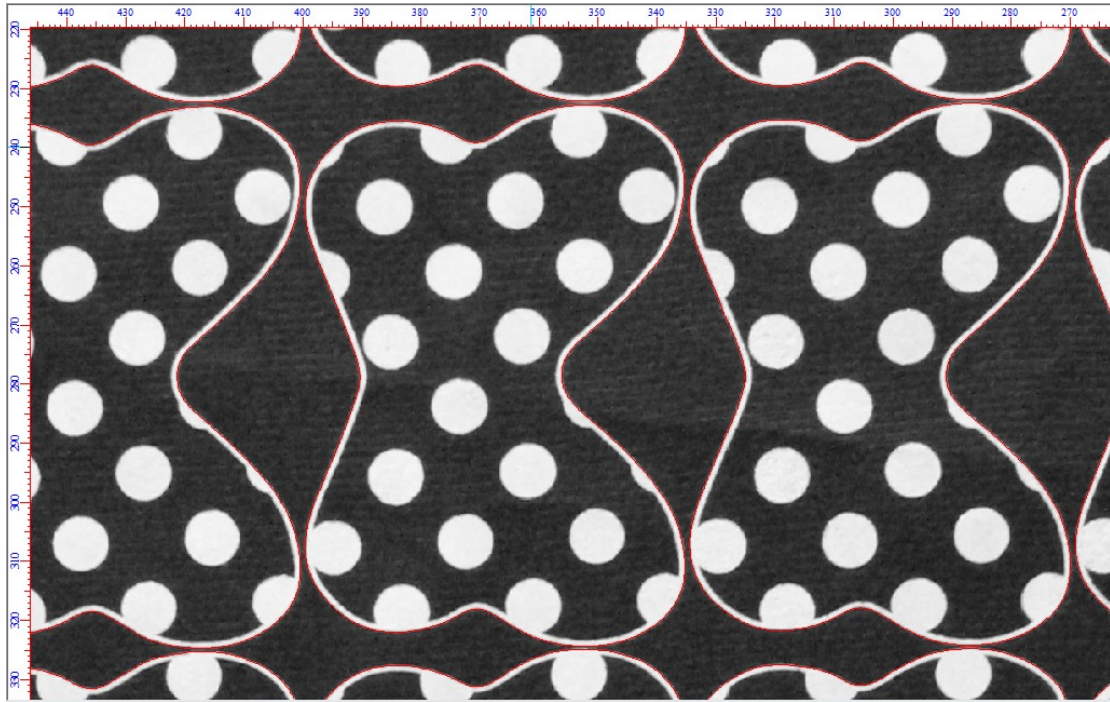
setting. Click Edges Button, pop-up on the frame as below.



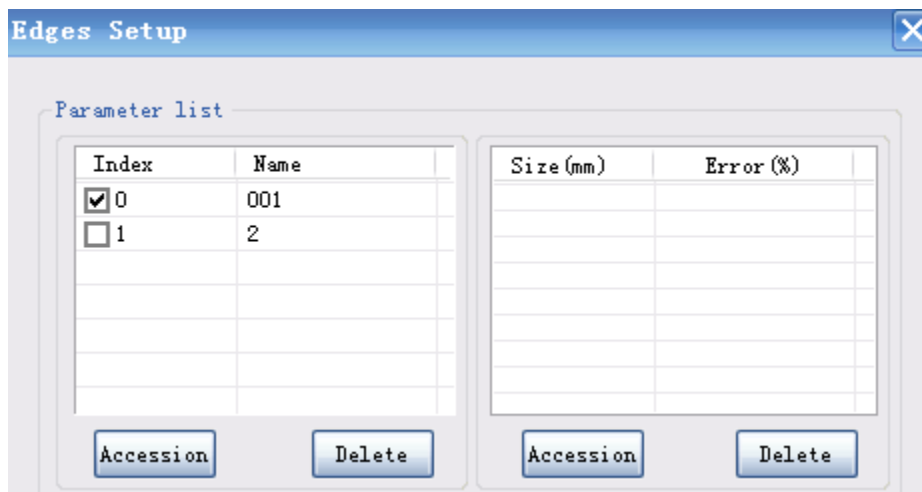
- The smoothing coefficient: refers to the filter parameters on the feature points. The

more features, the lower the matching rate, so it is necessary to filter out some of the redundant feature points. The smoothing coefficient always set for 50—70. If the feature points are more and more complex, it will be improved.


- The curve fairing: refers to the change curve of uniform, reduce the inflection point and the small line, so that the processing equipment running more smoothly.
- The connection length: when the contour line with minor damage, here filled with a suitable size, so that damage can be connected.
- The minimum wire length: the extracted edge curve between two points of minimum distance, its main role is allowed to walk in the process of equipment more smoothly.
- minimum size: in the edge searching process, the graph with the maximum diagonal size less than minimum size setting value, software will not be found.
- The maximum size: in the edge searching process, the graph with the maximum diagonal dimension is greater than the value of maximum size is set, software will not be found.
- The contraction expansion: the overall size of the original graphics to enlarge or shrink. (in the example, please fill in the negative).
- A closed contour: only the completely closed contour line extraction.
- Is the Outline: only the outermost contour graph. Figure. (the red line, in the picture is the outline).



- The outline of the parameter list:



- Index: File serial number
- Name: File name
- Size: Dimensions. The maximum diagonal dimension to be extracted from the graphics. (a file can be added to a number of dimensions).
- Error: Percent. As long as the "**Size**" is in the size of the positive and negative ten percent graphics are extracted from the contour line. (for example, the picture is in line with 90~110).

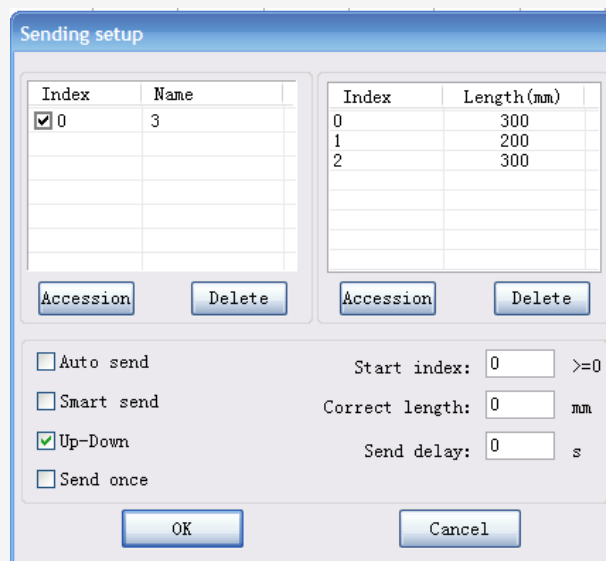
- **Matching test:** after the completion of the "template set" or "contour settings", click  , Check whether the matching to the graphics meets the requirements.

3.2.4 Cutting function to material requirements

- 1. Have the processing pattern of each edge along the edges, and the line width of not less than 3mm, the color to be separated from the background area.
- 2. At least 5mm between graphics and graphics.
- 3. cutting graphics background colors and graphics are not nearly color

3.3 feed settings

Click the button  . Figure:



Add: new file name.

Delete: Click the folder will turn blue before they can be deleted.

Automatic feeding: Check automatic feeding, the need to feed in the input size.

Tip: Automatic feeding support different lengths of feeding a cycle of several

version.

Index	Length (mm)
0	200
1	300
2	400

Starting version: Choose from the edition start feeding.

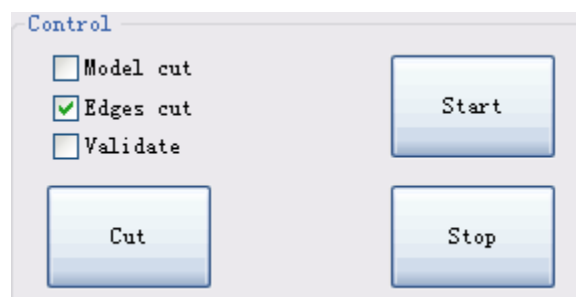
Smart Feeding: own calculation software feed length, Y-cut long to send long.

Correct length with intelligent feed applications, when the cutting insert graphics, the length of the insert portion sizes to fill in the correct form of negative numbers in length.

Single Feeding: Check single feed, feed devices send only once.

Feeding Delay: After feeding is completed, how long to stay, and then the next processing.

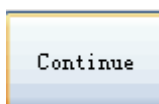
3.4 Equipment control



➤ Stencil cutting: when you need to cut the template on the hook Model cut

➤ Edge cutting: need to find the edge of the cut when the hook Edges cut

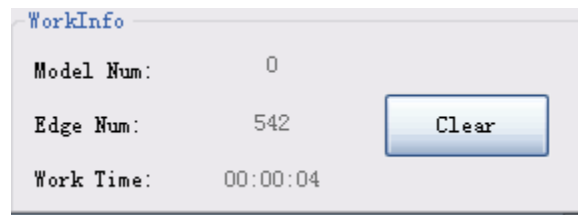
➤ Post confirmation: if checked Validate, Software will be matched to graphics, etc.



Equipment to start cutting. The following chart.



3.5 Processing information



- Template number / number of the number: processing full version of the re count.
- Working time: total processing time.

Bottom software/hardware operation instruction and line connection

Chapter 1 Summary

1.1、 System function

PowerCut laser CNC cutting system is mainly used in laser engraving , cutting and marking.

System's operation and display are all having step function window to reminder. For example: under the main window menu , after calling a certain

function, the system will bounce up this function's child window menu. Step setting according to the operation instruction.

1.2、 System features

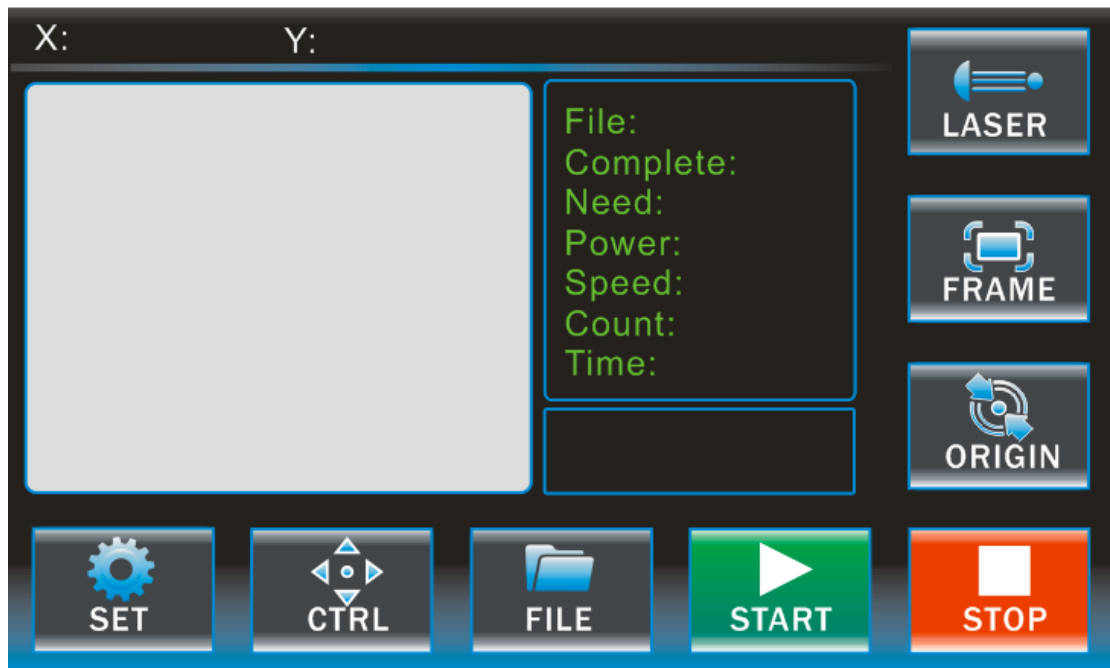
- 1: Embedded industrial host: high performance ARM processor, 4 inch high brightness industrial LCD screen, 4 inch resistance touch screen, support touch screen control.
- 2: Strong system reliability, strong anti-jamming ability
- 3: External interface: USB2.0, RS232, 100M network interface
- 4: The system provide road 2 photoelectric isolation input, and road 2 photoelectric isolation output.
 - Linkage shaft number: 3 axes
 - Working temperature: 0 °C- +40°C, atorage temperature 25°C- +60°C

1.3、 Software function

1. Use one key to switch the Sino-British double language version.
2. Support the file format cut.
3. There is power-off protection function. If it is power off during the processing , system can remember this breakpoints, and find the breakpoints to continue processing,
4. Conduct the speed adjustment function in the course of processing.
5. Registration code protection function
6. Bottom software U disk upgrate function.
7. continous feeding function.
8. left-right direction push board function.
9. double-head mutual movable function
10. network setting function


Chapter 2 Operating Instructions


2.1 Operation panel and key function introduction





(2.1 operation panel)


2.1.2 Key Function Introduction


1.  (Laser / laser) key: laser preset key, test laser use, click once, light once. Used to adjust the laser.


2.  (File / File) key: Enter the memory file information settings interface. Has been long press to enter the file information interface.



3.  (Set / Set) key: Enter the setup menu and set the parameters. Long press the set key, the “offline” and “online” switch.


4.  (U disk / U Disk) key: enter the U disk file interface.


5.  (Origin / origin) key: for the laser head back to the mechanical origin.

6.  (Frame / Frame) key: Make a border preview.

-
7.  (Exit) key: Defines the key to cancel the operation and return to the previous interface.

8.  (Stop) key: to stop the machine movement,  start button, in the device idle or suspended state click the key to start the function, in the processing state, click the key to perform the pause function.

9.  Direction) key: used to move X, Y axis, other interface can also be used to move the cursor up and down to select the menu. In the processing interface can adjust the rate in real time.

10.  Z-axis key: for Z-axis feed device before and after the move feed.

2.2 System main menu introduction

2.2.1 boot interface

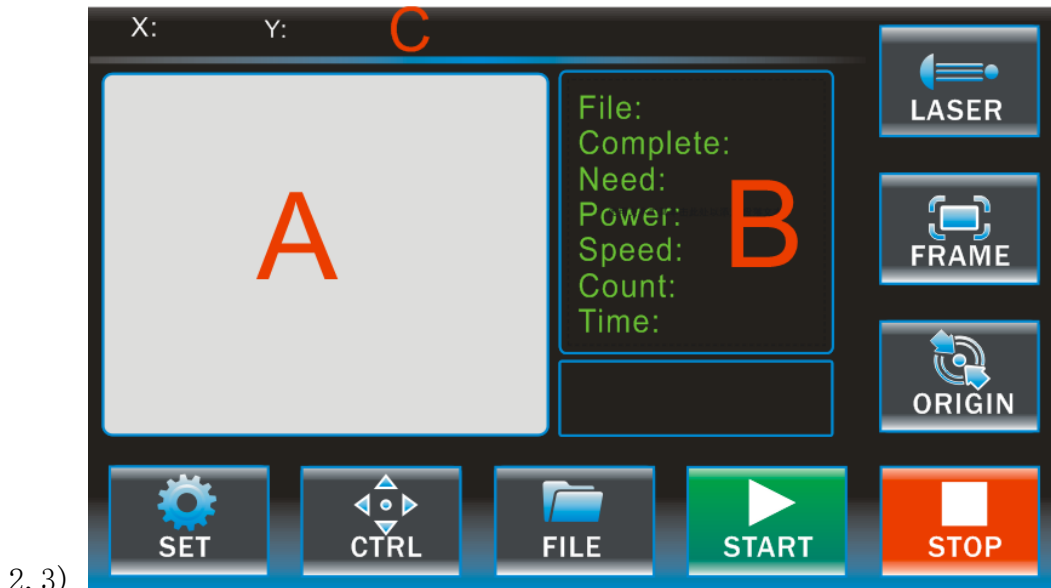
Boot interface as shown in Figure (2.2.1)



2.2.1 boot interface

2.2.2 Standby interface

After initialization, enter the standby interface (Figure



2.3)

2.3 Home Screen

Figure 2.3C shows the X / Y axis real-time coordinate values.

Figure 2.3A shows the graphics of the processed file. The working state of the system.

Figure 2.3B shows the parameters of the system processing, including the name, total, complete, interval, power, speed.

File name: The name of the file to be processed.

Completed number: The number of processing files has been completed.

Number of processing required: number of processing documents to be processed.

Power magnification: The power mode used by the laser light signal when processing the document.

Rate override: Percentage of speed when processing the file (press the X axis direction key during processing to adjust the rate in real time).

Processing count: the number of processing.

Processing time: how long has been processed?

2.2.3 File interface

Press the [File] key on the operation panel in the standby interface to enter the file interface. As shown in Figure 2.4



Figure 2.4 File community

Figure 2.4A shows the graphics of the selected file.

Figure 2.4B shows a list of the names of the files contained in the memory.

Figure 2.4C shows the size of the remaining memory stored in the file. The system currently stores the number of files.



Key to view the file, press on the operation



panel

Key to select the file directly. press



Exit in the file

interface. press



Key directly to the current file operation items shown in

Figure 2.5.



Figure 2.5 File action item

- (1) Speed ratio: Percentage of current speed, in the range of 0 to 100.
- (2) Power ratio: Percentage of current power used.
- (3) Total number of processing: the number of times the current document needs to be processed, ranging from 0 to 20000.
- (4) Completed: The number of times the current file has been processed, in the range 0 to 20000.
- (5) time interval: the current file multiple processing, the processing is completed after the next processing from the beginning of the interval, in seconds, ranging from 0 to 999 between.
- (6) start mode: the beginning of the current file processing starting point, including fixed-point, immediately, custom, origin four modes.

Fixed point: the parameter setting in the positioning point X, positioning point Y set the parameters as the starting point of processing.
 Immediately: the current location of the laser head as the starting point for processing.

Custom: the starting point of the starting point X in the file information and the starting point Y as the starting point of the machining.

Origin: the origin of the machine as a starting point for processing.

- (7) Start point X: Sets the coordinates of the starting point of the X axis when the laser head is started, in the range of 0.0 to 9999.999, and is valid when the start mode is in the custom mode.
- (8) Starting point Y: Sets the coordinates of the starting point of the Y axis when the laser head starts machining, in the range of 0.0 to 9999.999, and is valid when the start mode is in the custom mode.
- (9) docking mode: after processing the laser head docked, including the starting point, custom, origin three modes.

Start point: After processing, the laser head stops at the starting point X, the position set by the starting point Y.

Custom: After the processing is completed, the laser head is docked

- at the point where the stop point X and the stop point Y are set.
- Origin: After processing, the laser head stops at the origin position.
- (10) Stop point X: Sets the coordinates of the X-axis docked after the laser head is processed, in the range of 0.0 to 9999.999, and is effective when the docking mode is in the custom mode.
- (11) Stop point Y: Set the coordinates of the Y-axis that is docked after the laser head is processed, in the range of 0.0 to 9999.999, when the docking mode is in the custom mode.
- (12) count mode: split version of the count and a single count of two.
- Full size: Accumulated count after machining full format graphics.
- Single: A finished graphics count.
- (13) Feeding length: Feeding size of the current drawing.




2.2.4 U disk file interface


Insert the U disk in the operation panel directly by "U disk" button, directly into the U disk interface. As shown in Figure 2.6



Figure 2.6U disk interface

Figure 2.6A shows the graphic of the file
 Figure 2.6B area shows the U disk can copy the file name list
 Figure 2.6C shows the U disk: the system in the U disk state
 Number of files: Number of files that can be copied in U disk

press   Key to select the file, press  Exit this

interface. press  Key to jump out of the operation of this file, as

shown in Figure 2.7

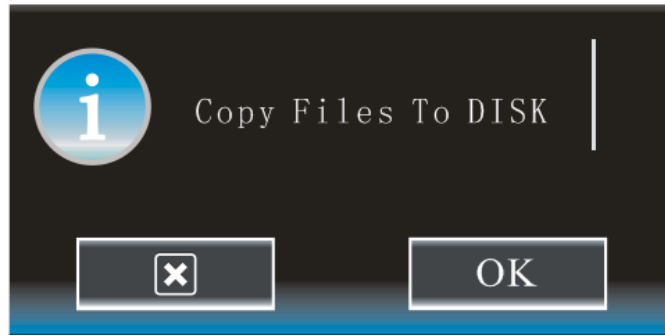



Figure 2.7 File action item

1. : That this file will be copied to the system, you can copy the current file to the file storage area, and set the current processing file.

2.2.5 Set the interface

Press the “Settings” button on the operation panel to enter the setup interface, as shown in Figure 2.8.

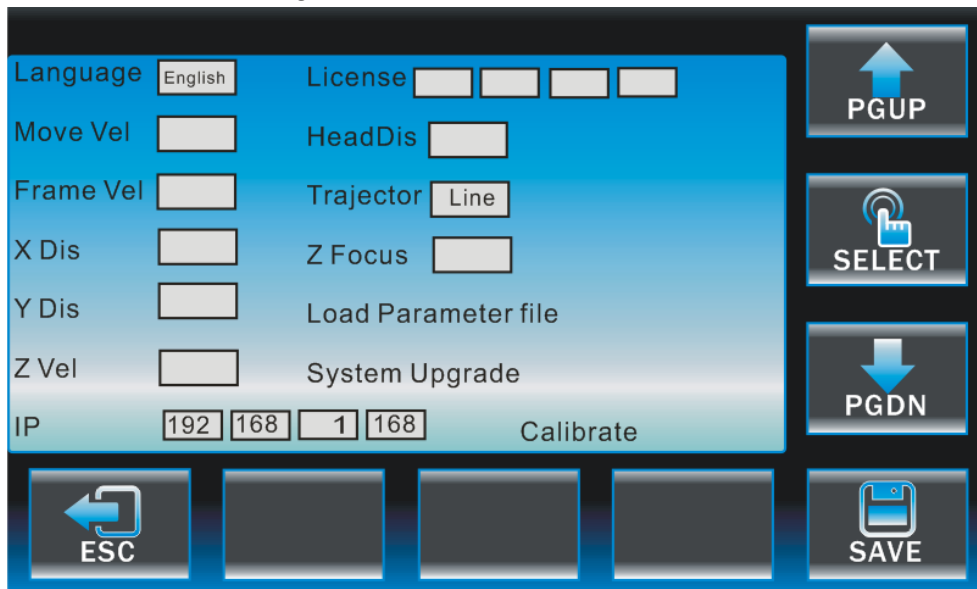


Figure 2.8 Set the first page of the interface



1. Language / Language: Replace the display language, optional “Chinese” and “ENGLISH” two.
2. Move speed: the speed of the laser head to move, the greater the value, the faster, ranging from 0 to 500.
3. Border speed: the speed used to move the border, the greater the value, the faster, ranging from 0 to 500.
4. Positioning point X: Sets the coordinates of the X-axis starting from the start of the start of the laser head, in the range of 0.0 to 9999.999, when the start mode is in positioning mode.
5. Positioning point Y: Sets the coordinates of the Y-axis starting at the beginning of the start of processing of the laser head, in the range of 0.0 to 9999.999

-
6. Z-axis speed: Z-axis movement speed, the greater the value, the faster, the range between 0 to 500, the starting mode is valid for the custom mode.
 7. IP address: The system IP address number, and the computer connection will be applied to this address number.
 8. Registration code: registration code provided by the supplier, and then enter the prompt area can be. The registration code can be developed for any period of time. After the expiration of the system will stop using, if prompted "registration code expired" to contact the supplier, to obtain a new registration code to continue to use.
 9. Double-headed spacing: the distance between two laser heads.
 10. Track display: display graphics processing side of the trajectory, divided into points and lines in two ways.
 11. Z Axis Focus: Set the focus distance of the laser autofocus.
 12. Load the parameters file: use U disk to load the upper software parameters (please refer to the upper case software instructions)
 13. System upgrade: U disk upgrade system with the current software (only for the underlying software upgrades).
- The
14. Touch screen correction: through touch screen correction to enhance the touch sensitivity.

(See Section 2.26 for Chapter 2).

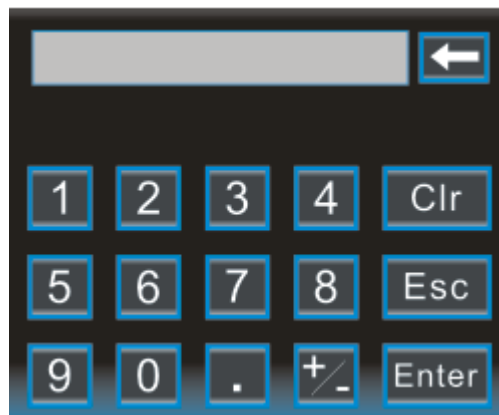
2.2.6 modify the parameters of the method

1 Modify the language class parameters

Click on  Select Chinese or English, click to change  Key to change the state of the language class parameters.

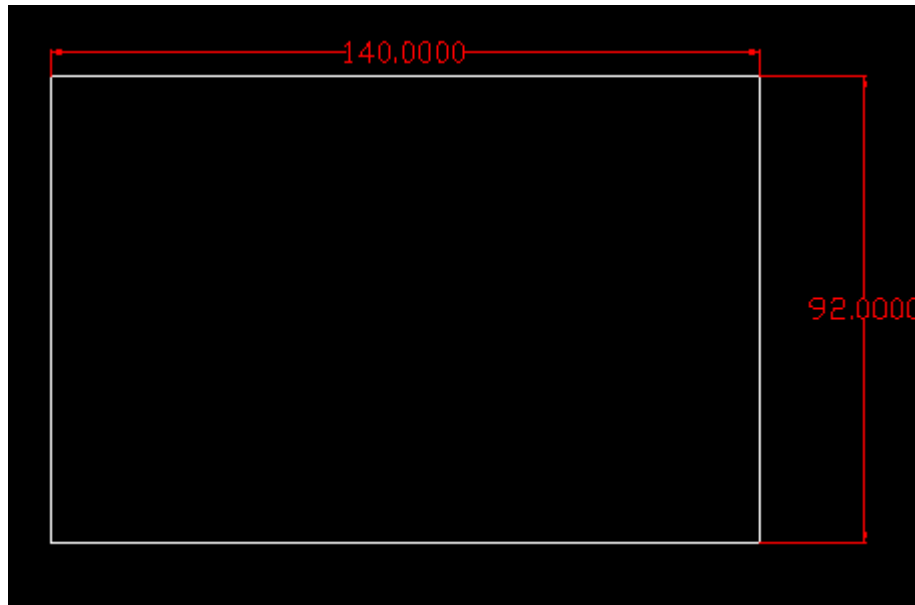
2 Modify the numeric class parameters

Double-click the dialog box to display the digital class options dialog box, as shown in Figure 2.11 Digital dialog box. At this point click on the touch screen on their own numbers, clickClick Save to change the value of the selected numeric class parameter.

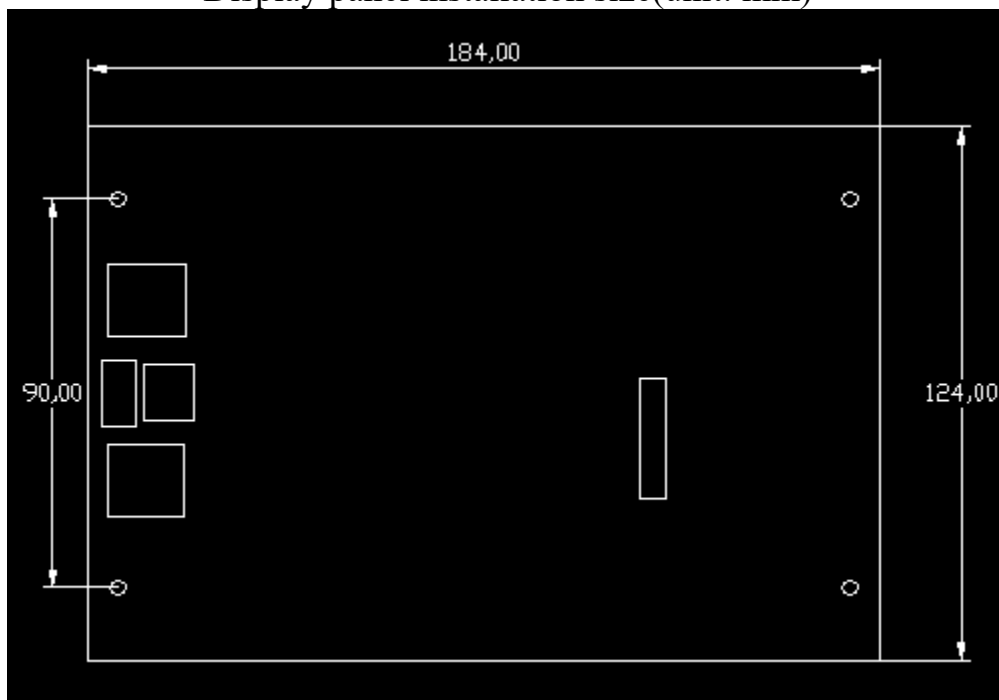


Chapter3 The instruction of the installation and wiring

3.1 Installation size



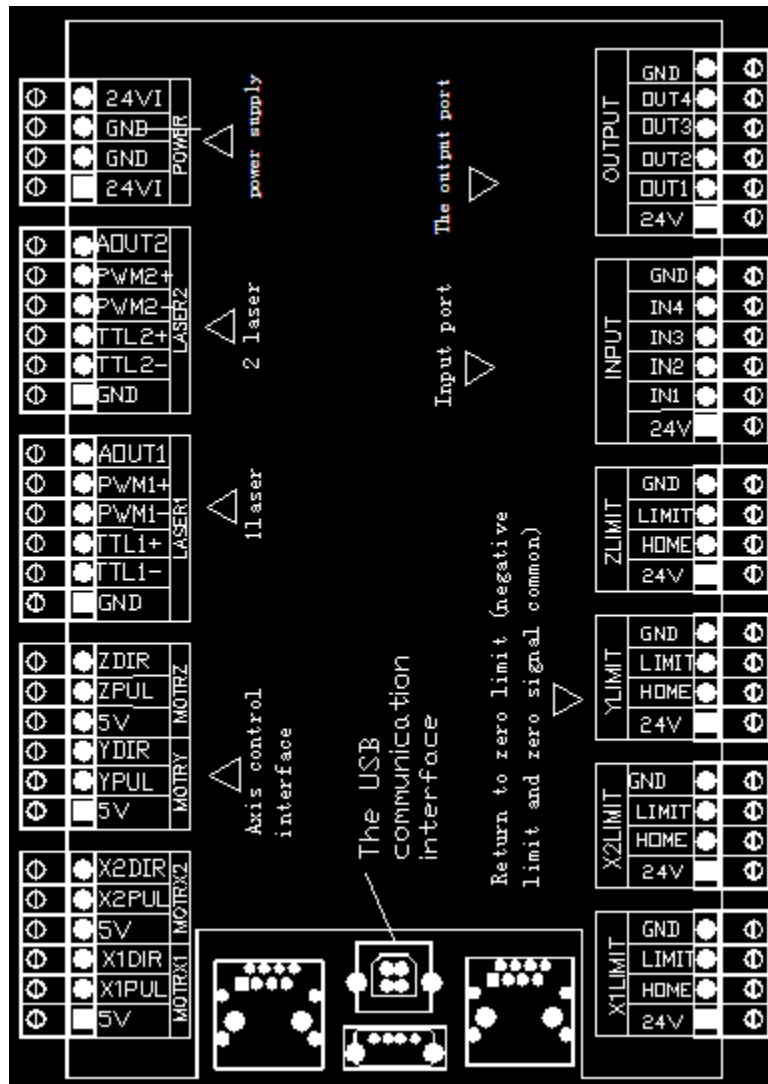
Display panel installation size(unit: mm)



Main board installation size (unit: mm)

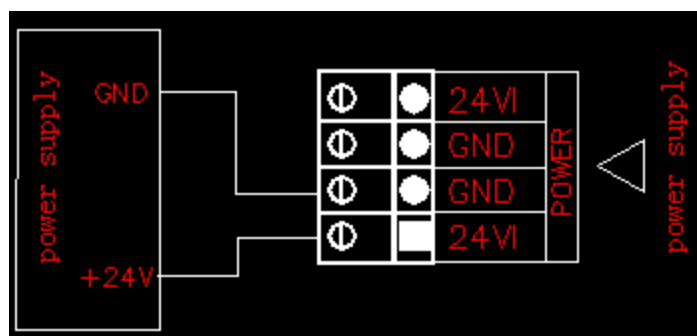
3.2 Wiring instruction

3.2.1 Interface board

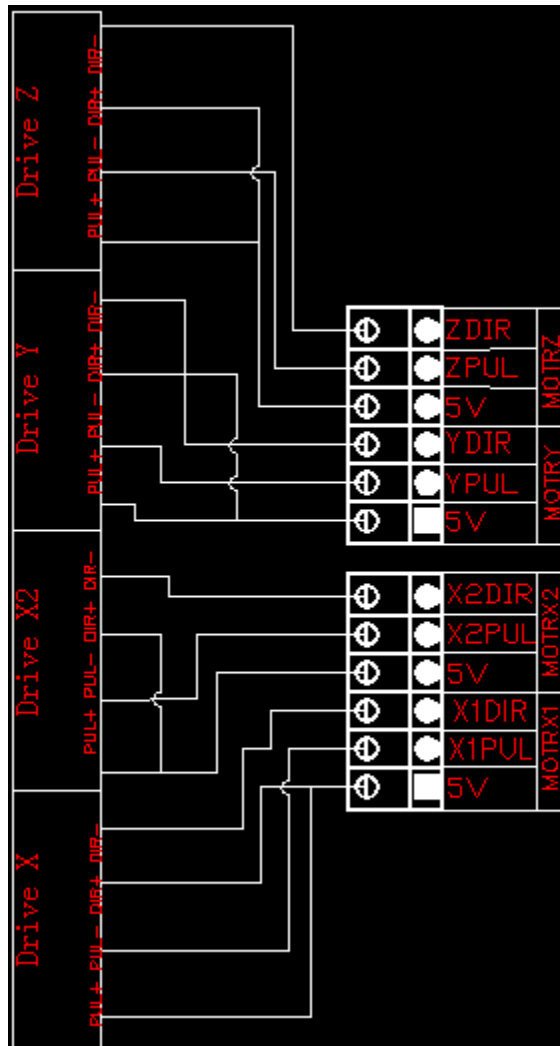


3.22 Wiring diagram

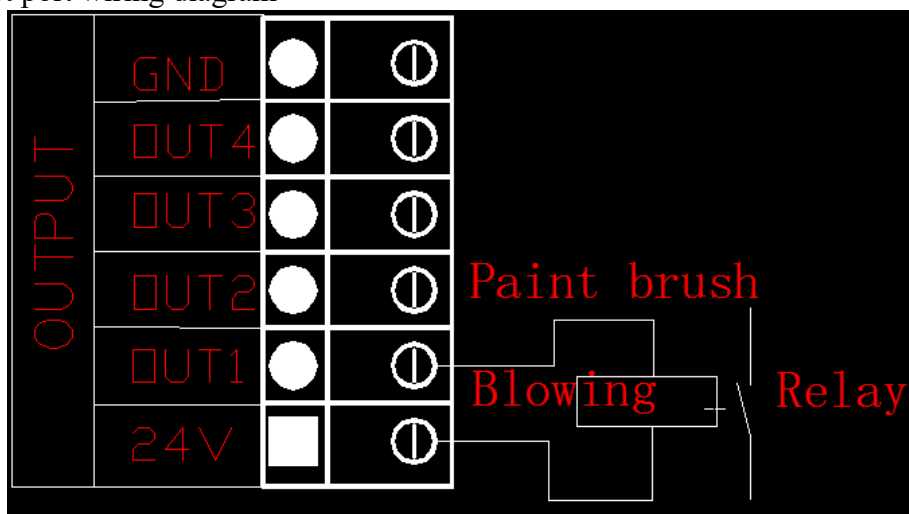
1. power supply port wiring diagram



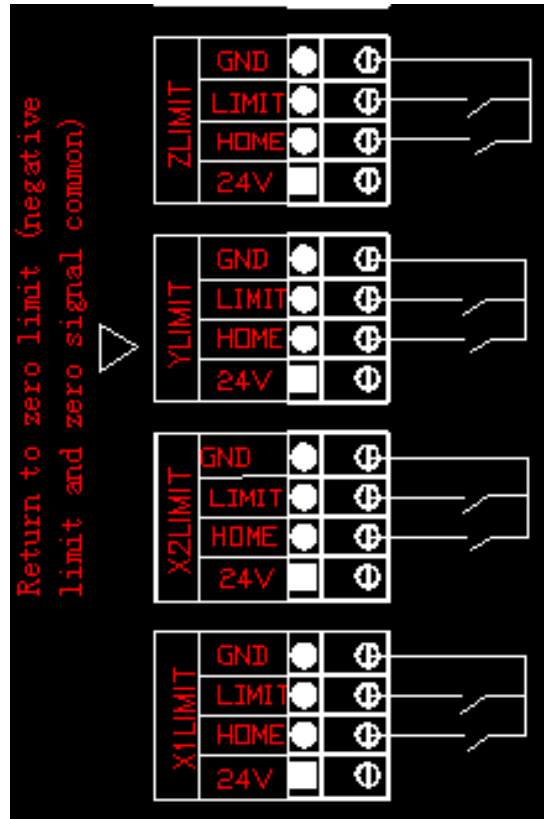
2. XYZ axis port wiring diagram



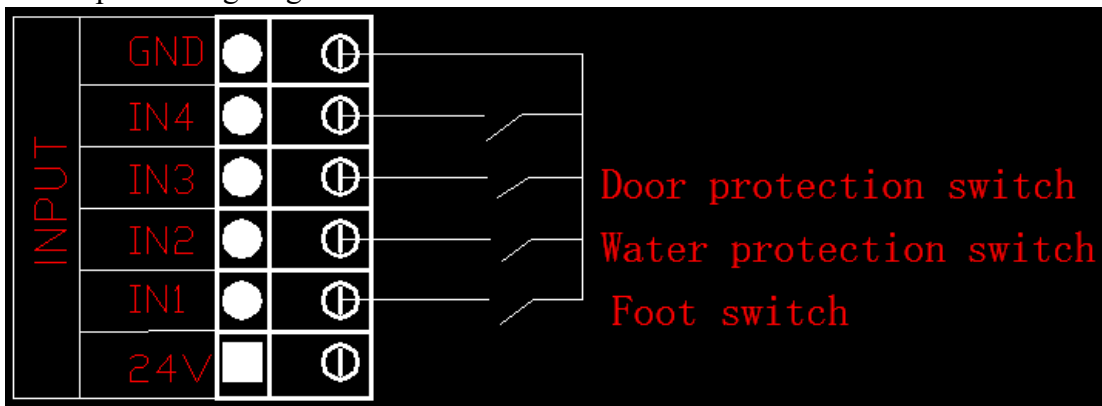
3. Outlet port wiring diagram



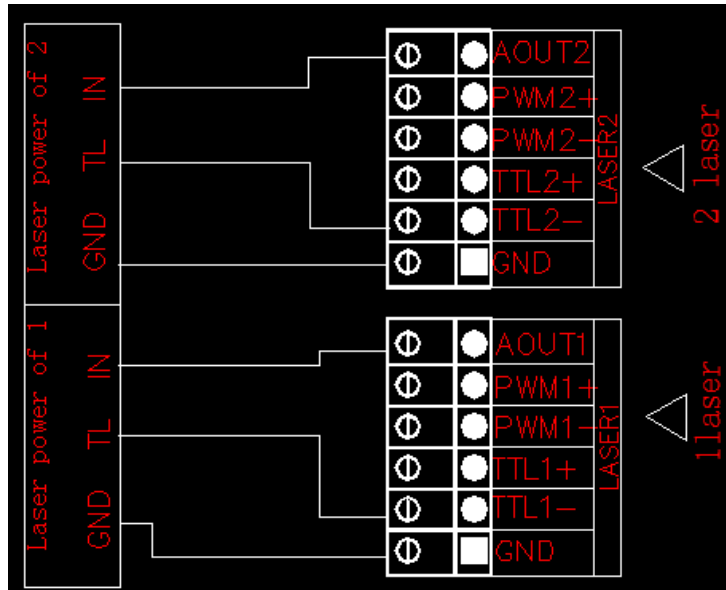
4. .Limited /Home signal port wiring diagram



5. Inlet port wiring diagram



6. laser control port wiring diagram



3.3 Port definition instruction

3.31 Power supply signal (This system adopt the direct current 24V supply the power) 。

24V power supply interface JP1 in the system (switch power supply interface port)

PIN	Definition
1	24VI Inner 24V power supply positive (input)
2	GND Inner 24V power supply negative(input)
3	GND outer 24V power supply (input)
4	24VI outer 24V power supply positive (input)

2.32 U disk interface port

Marking U-disk. You can directly insert the U disk to read and write.

2.33 PC interface port

Marking PC. You can use the USB connection wiring to connect the computer to read and write the files.

2.34 Network port

Marking the NETWORK. You can use the network cable to connect computer to read and write the files.

2.35 port definition

X port definition

PIN	Definition
1	X1 DIR X2 axis directional signal (output)

2	X1 PUL X2 axis pulse signal (output)
3	5V outer The 5V power supply positive (output)
4	X2DIR X1 axis directional signal (output)
5	X2PUL X2 axis pulse signal (Differential signal negative terminal) (output)
6	5V outer The 5V power supply positive (output)

Y axis Z port definition

PIN	Definition
1	YDIR Z axis directional signal (output)
2	YPUL Z axis pulse signal (output)
3	D5V outer The 5V power supply positive (output)
4	ZDIR Z axis directional signal (output)
5	ZPUL Z axis pulse signal (output)
6	D5V outer The 5V power supply positive (output)

OUTPUT port definition

PIN	Definition
1	24 24V Inner 24V power supply positive (output)
2	OUT1 Blowing (output)
3	OUT2 Paint (output)
4	OUT3 (output)
5	OUT4 (output)
6	AGND 24V Grounding (output)

X1axis Home/Limited port definition

PIN	Definition
1	24V (output)
2	XLM- X origin and X negative limit multiplexing signal (input)
3	XLM+ X axis positive limited position signal (input)
4	GND (output)

X2 axis Home/Limited port definition

PIN	Definition
1	GND (output)
2	X2LM- X2 origin and X negative limit multiplexing signal (input)
3	X2LM+ X2 axis positive limited position signal (input)
4	24V (output)

Y LIMIT port definition

PIN	Definition
1	24V (output)
2	YLM- Y origin and Y negative limit multiplexing signal (input)
3	YLM+ Y axis positive limited position signal (input)

4	GND (output)
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Z LIMIT port definition

PIN	Definition
1	24V (output)
2	ZLM- Z origin and Z negative limit multiplexing signal (input)
3	ZLM+ Z axis positive limited position signal (input)
4	GND (output)

INPUT port definition

PIN	Definition
1	24V 24V power supply positive (output)
2	IN1 water protection switch (input)
3	IN2 Door protection switch (input)
4	IN3
5	IN4
6	GND 24V Grounding (output)

LASER1 port definition

PIN	Definition
1	GND
2	TTL1- releasing light can show the negative signal(output) (light: 0V,light off 5V)
3	TTL1+ releasing light can show the positive signal(output) (light: 0V,light off 5V)
4	PWM1- light signal (differential signal negative port)
5	PWM1+ light signal (differential signal positive port)
6	AOUT1 The light analog signals (output) (0 to 5 v)

LASER2 port definition

PIN	Definition
1	GND
2	TTL2- releasing light can show the negative signal(output) (light: 0V,light off 5V)
3	TTL2+ releasing light can show the positive signal(output) (light: 0V,light off 5V)
4	PWM2- light signal (differential signal negative port)
5	PWM2+ light signal (differential signal positive port)
6	AOUT2 The light analog signals (output) (0 to 5 v)

Chapter 4 Common problems instruction

3.1 the computer connecting problems

The problems' performance phenomenon:

1. I remind the communication breakdowns
2. It can not read and write the parameters.;
3. The transferring files is ineffective.

Solving steps:

1. To check if the USB line is connected correctly and good. To check if the port of the USB line is connected with the PC.
2. To check if the USB driver program are installed rightly. To install the driver program again.
 1. Insert a good USB port again from the computer.
 2. Close the machine power one minute and open it again.
 3. Restart the computer, and connect equipment and the computer to the ground.
 4. Exchange a computer.

3.2 U disk reading and writing problems

Click the U disk files and showing "the U disk is blank or wrong"

Answer: U disk error

Resolution:

Step 1: check the U disk if it is correct

Step 2: replace another U disk

3.3 Camera connection problem

Problem phenomenon:

- (1) the camera is not changed after the completion of the processing;
- (2) the green light will not be fully open to the camera;

Solution method:

(1) check the interface between the camera and the USB connector is loose, and check the connection line and the computer's USB port is in good contact, check the camera connection line is broken, for the old computer, please check the computer's USB port driver is reliable, if it is to replace the computer.

(2) check the camera connection line is bad, check whether the camera is broken, for the old computer, please check the computer's USB port driver is reliable, if it is to replace the computer.

Light control problem

3.4 Problem phenomenon:

- (1) a burst but no light;
- (2) no light is produced in the process;
- (3) the size of the light can not control;

Solution method:

- (1) no burst of power or power set is too small.
- (2) no setting power or power setting is too small.
- (3) check the circuit wiring and control card with no signal output.
- (4) check the laser power supply or laser tube

3.5 Machine no action

Problem phenomenon:

- (1) the machine cannot move in the direction of the arrow keys;
- (2) after the start of the power can not automatically return to zero;
- (3) return to zero error;
- (4) move in one direction only;
- (5) the machine returns to zero after the start of the machine, and the control panel prompts the system to start up.

Solution method:

(1) check the control card has no pulse output and check the line and the driver is in good contact, the key is not failure.

(2) please check the control card back to zero switch and control card control port has no pulse output.

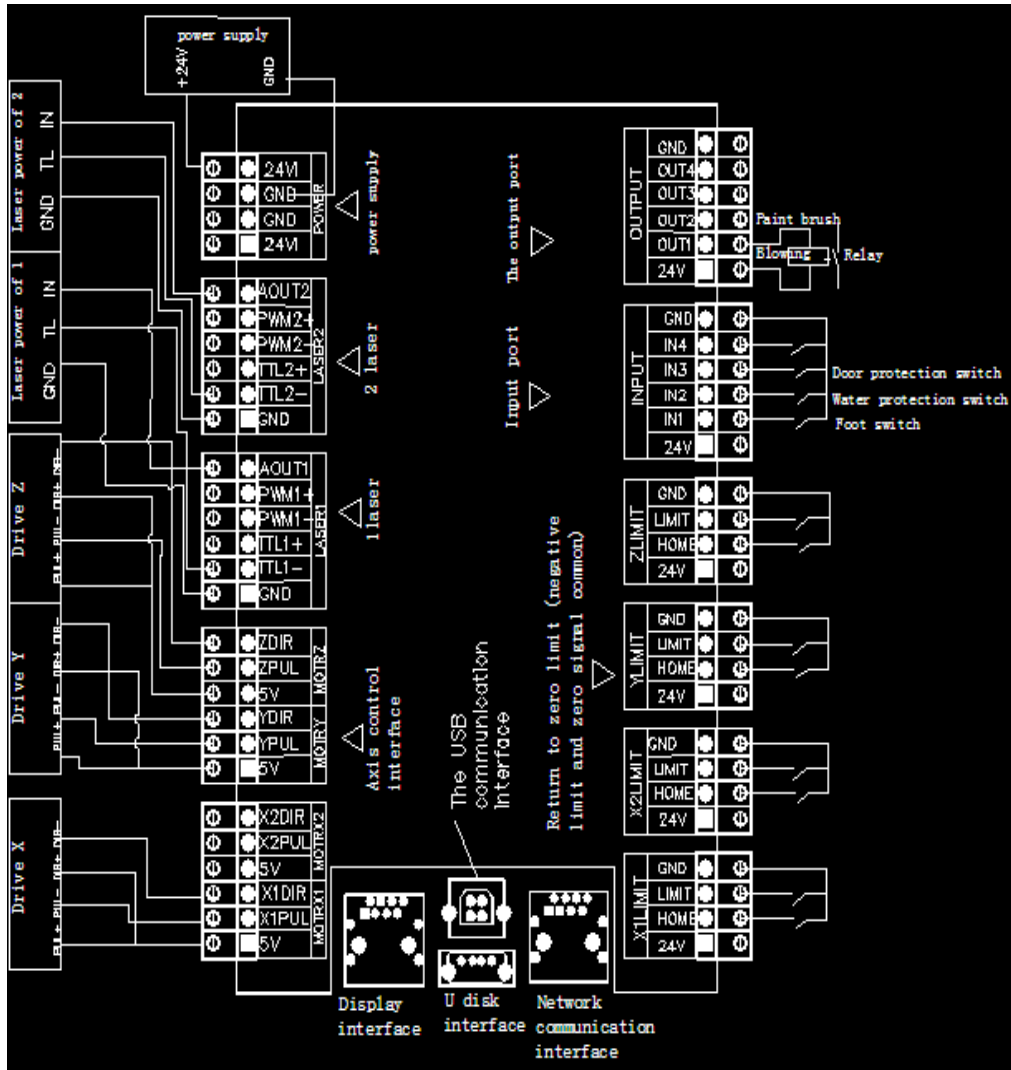
(3) check whether the return to zero has been bad.

(4) check the direction of the control card control port signal and check whether the line is in good contact with the driver

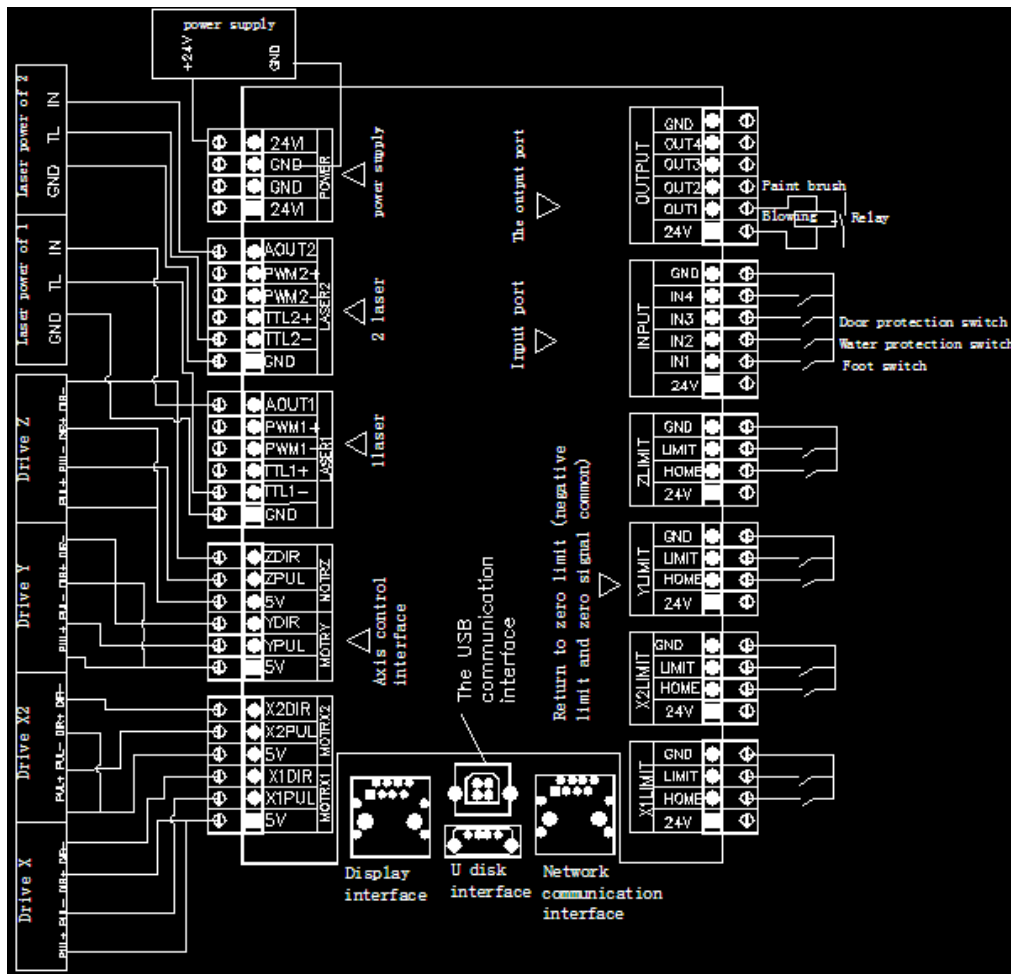
(5) check the cable port on the panel to the control card Display port link is open

Chapter 5 Classic laser cutting machine wiring diagram

5.1 Ordinary laser cutting machine wiring diagram



5.2 The wiring diagram of the double-heads mutual movable laser cutting machine



(one head wiring diagram)