

# Oscillating Knife Cutting Machine

## 振动刀操作说明书

# USER'S MANUAL

(Please Read Carefully Before Installation)



济南达克希数控设备有限公司

JINAN DEKCEL CNC EQUIPMENT CO.,LTD

目录

<b>1.Machine Introduction.....</b>	<b>3</b>
1.1 Power and cable requirements.....	3
1.2 Machine introduction.....	3
<b>2.Parts Installation.....</b>	<b>4</b>
2.1 Power distribution box.....	4
<b>3.Software installation. Network configuration and software operation.....</b>	<b>9</b>
3.1 Software introduction.....	9
3.2 Software installation.....	9
3.3 Network configuration.....	10
3.4 Software and operations.....	12
<b>4. Introduction of control system.....</b>	<b>37</b>
<b>5.Panel interface.....</b>	<b>38</b>
5.1 Screen saver interface.....	38
5.2 Work page and buttons description.....	38
5.3 Adjust page and buttons description.....	41
5.4 Speed page.....	43
5.5 Config(configuration) page and buttons description.....	45
5.6 Test page.....	47
<b>6.Parameters debugging (for example: vibrating knife).....</b>	<b>50</b>
6.1 Setting the knife depth.....	50
6.2 Debugging initial angle.....	52
6.3 Adjusting the offset between the vibrating knife and the laser lamp.....	54
6.4 Adjusting the offset between vibrating knife and mark pen.....	55
<b>7.Tools installing and debugging.....</b>	<b>56</b>
7.1 Oscillating cutting tool (SP4, head1) .....	56
7.2 Pneumatic oscillating cutting tool (SP4, Head1) .....	57
7.3 Driven rotary tool (SP4, Head1) .....	58
7.4 Universal cutting tool(Drag knife)(SP4, Head1; SP2, Head2).....	59
7.5 Kiss cutting tool (SP4, Head1; SP2, Head2).....	59
7.6 Creasing Wheel Tool (SP2, Head2) .....	61
7.7 Milling Tool (SP6,Head3).....	62
7.8 V-cut tool (Big Knife SP number: SP3, Small Knife SP number: SP5, Head2) .....	62
7.9Punching Tool (SP2).....	64

# 1. Machine Introduction

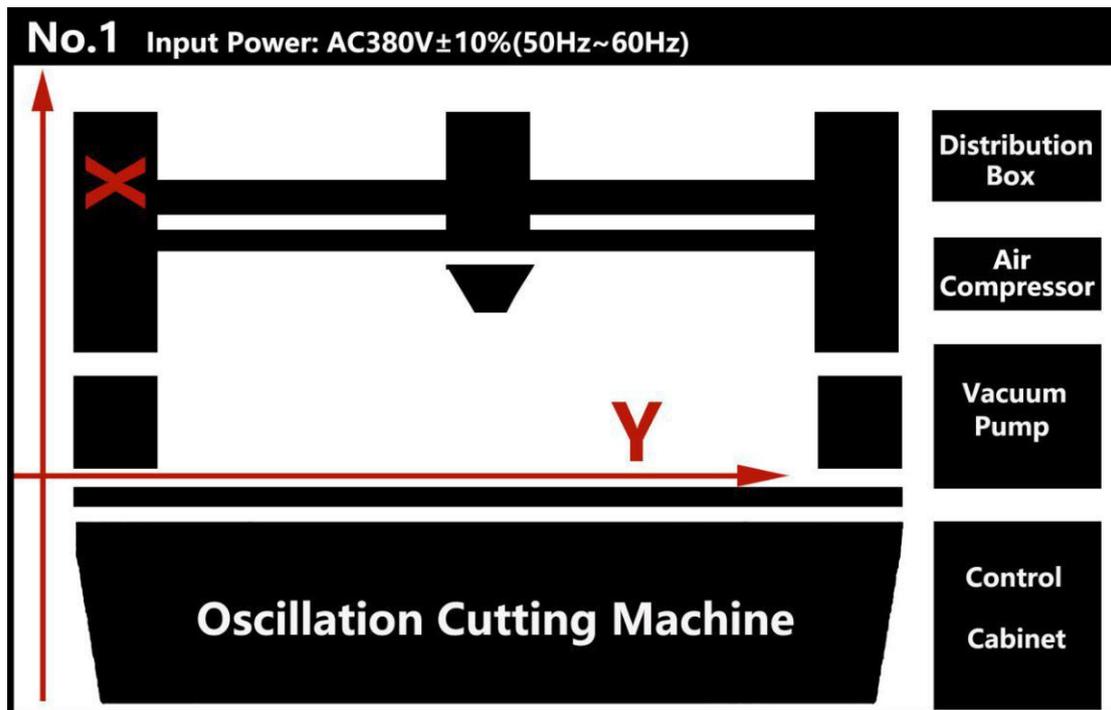
## 1.1 Power and cable requirements

In view of the power of the vacuum pump is different, electric power at 220V or 380V can be used according to the actual situation. The total power of the machine is at least 14KW, so the cable cross section requires at least 8mm<sup>2</sup>.

Items	Peak power
Machine	3KW
Vacuum Pump	11KW
Air compressor	1.2KW

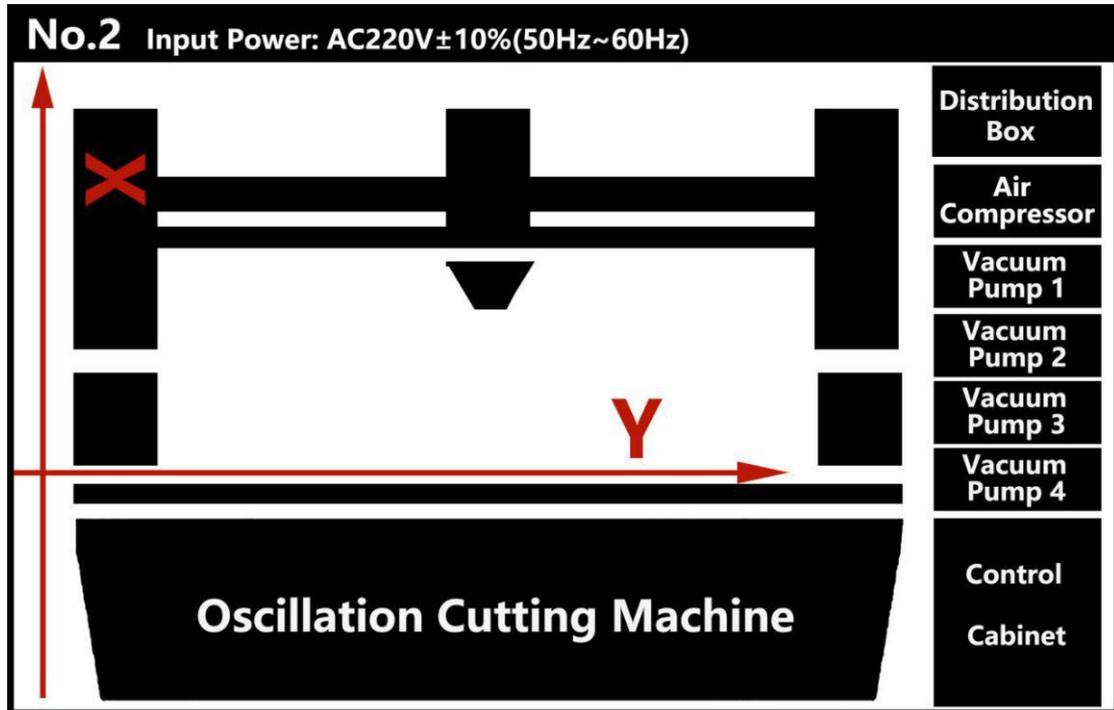
## 1.2 Machine introduction

### (1) AC380V



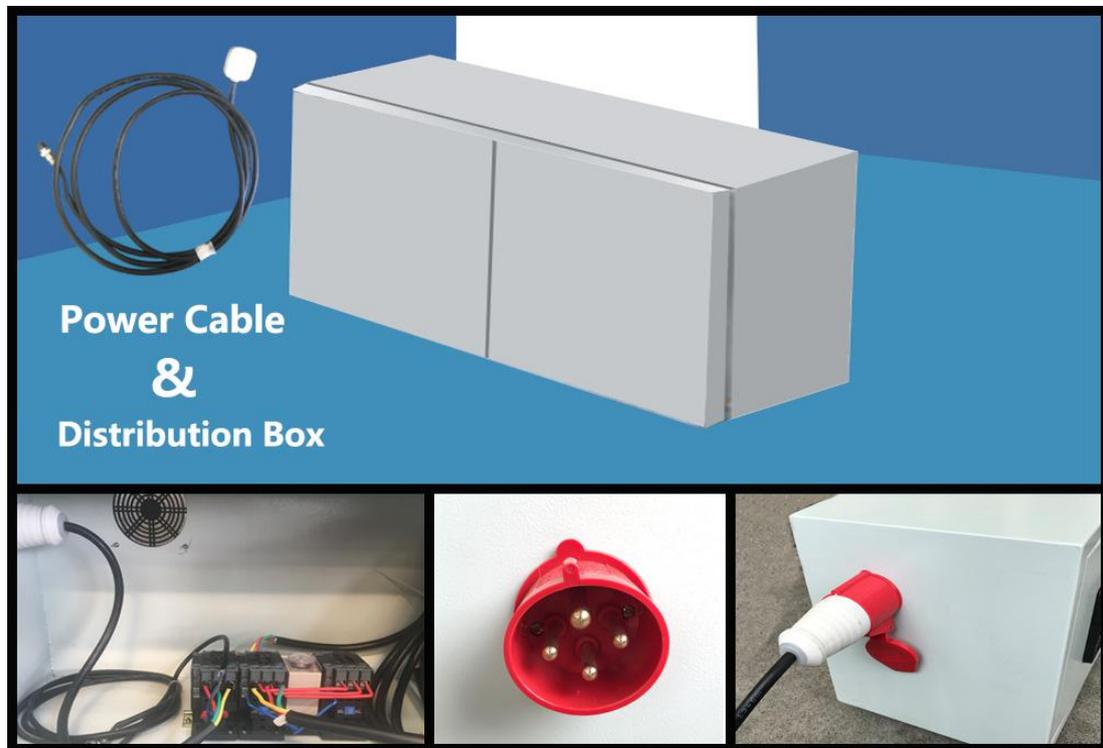
(Note: Three-phase electric power only needs three live wires and doesn't need the null wires.)

(2) AC220V



## 2.Parts Installation

### 2.1 Power distribution box



#### (1) Input

Take the aviation plug apart and connect the three live wires of the three-phase electric power to L1.L2.L3 respectively.

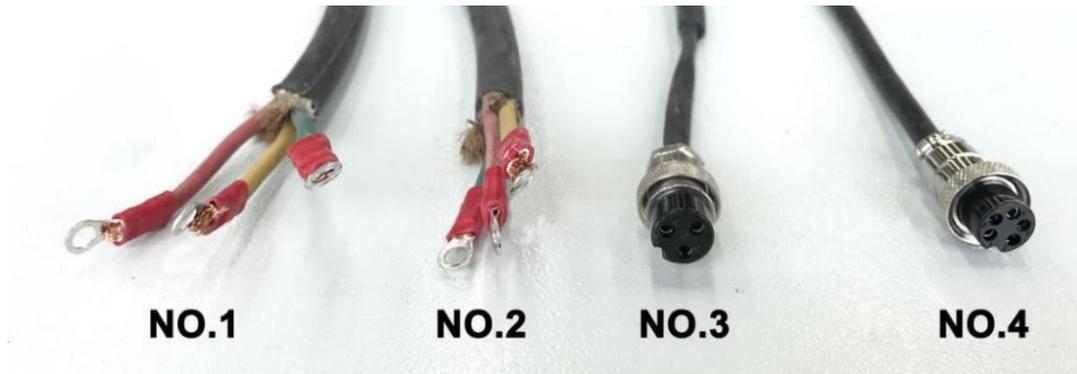


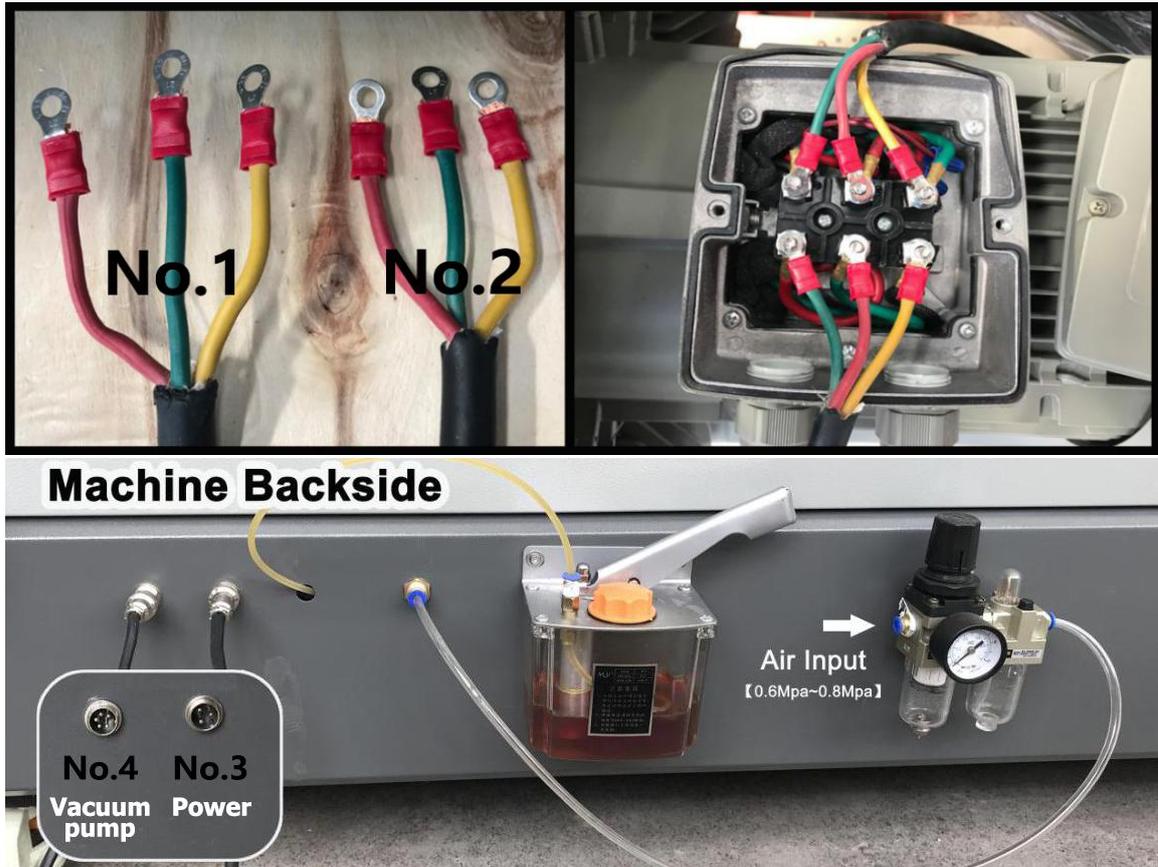
## (2) Output

There are three cables come out of the output port of the distribution box, NO.1 and NO.2 cables are used for vacuum pump,

NO.3 (Power cable, it doesn't come out of the distribution box. It's a single cable.) is the 220V cable used for the machine.

NO.4 (Vacuum pump start and stop signal cable) must be connected correctly according to the port on the machine.



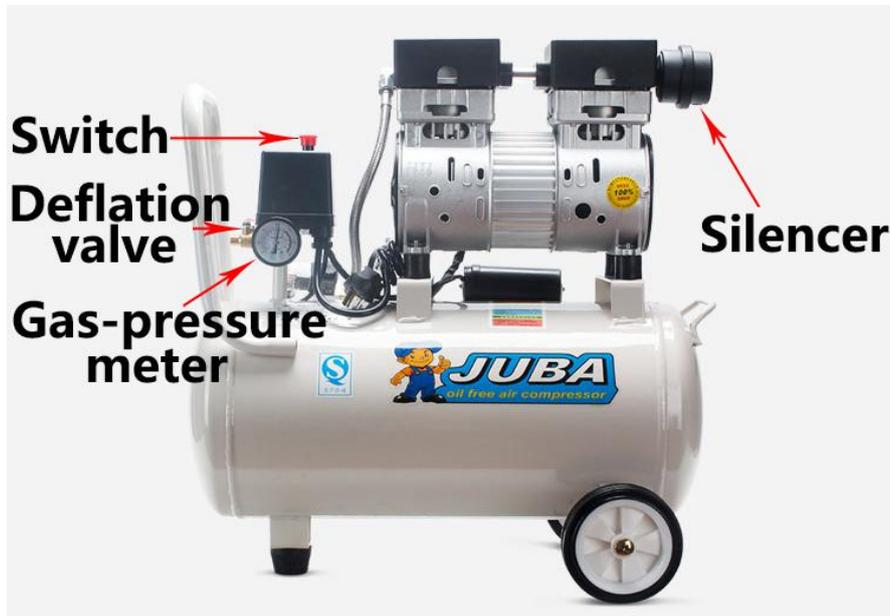


(Note: When you connect the NO.1 and NO.2 cables to the vacuum pump, the color of the cables must correspond, red to red, green to green, yellow to yellow. If the fan is reversed, you can switch any two wires of the three-phase electric power cord.)

Lubricating oil: Engine oil or sewing machine oil.

### (3)Air compressor

(Note: Pneumatic oscillating cutting tool needs at least 7.5KW air compressor, the gas meter needs more than 0.6MPa.)



**( 4 ) Return air box and vacuum pump (non-feeder model does not match return air box)**

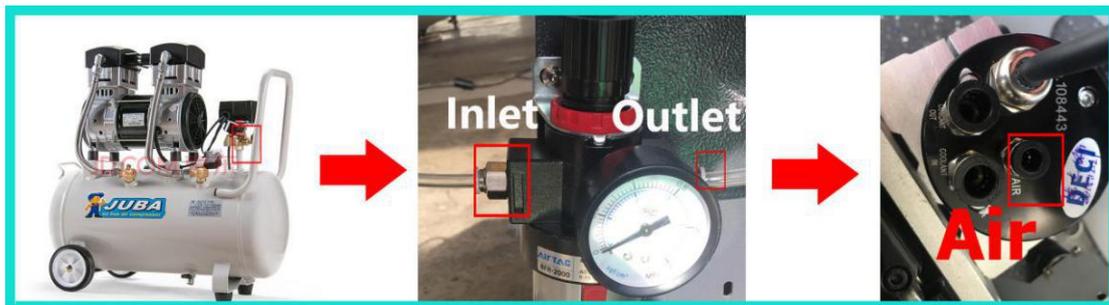
- A. Install exactly as shown
- B. The arrow in the left picture means that the nozzle is the air inlet of the vacuum pump, and the black cylinder in the left picture is the silencer.
- C. The part in the middle picture is the return air box. Connect the cable which comes out of the return air box solenoid valve to the machine according to the number of pins (8 pins).



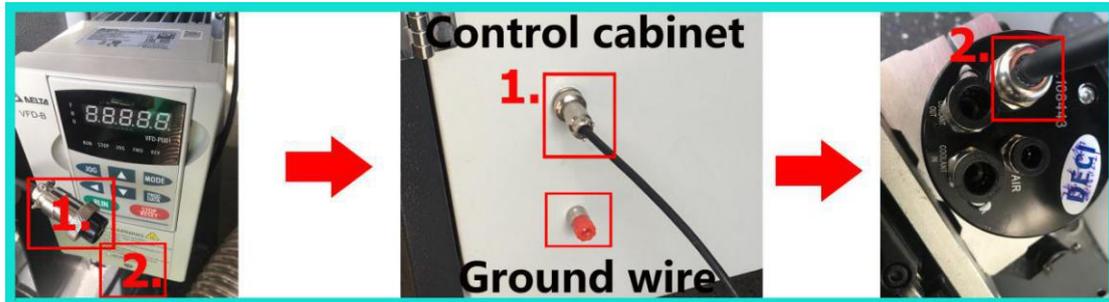
**(5) Parts of the milling tool**



**A.No.1 Oil-water separator**



### B.No.2 Inverter



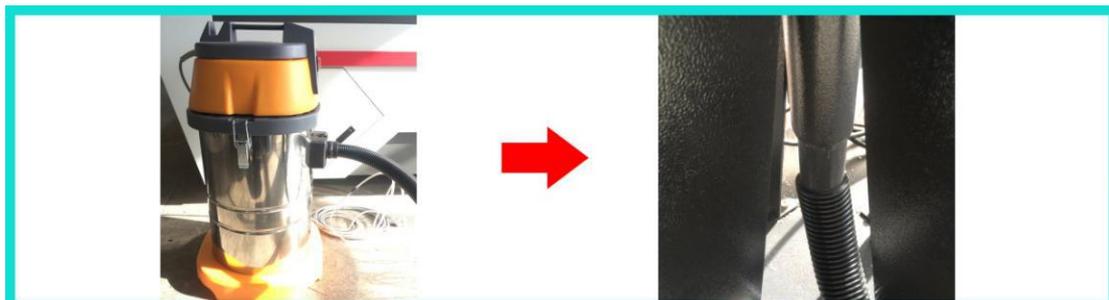
### C.No.3 & No.6 Dust pipe and fixed pipe



### D.No.4 Water pump



### E.No.5 Vacuum cleaner



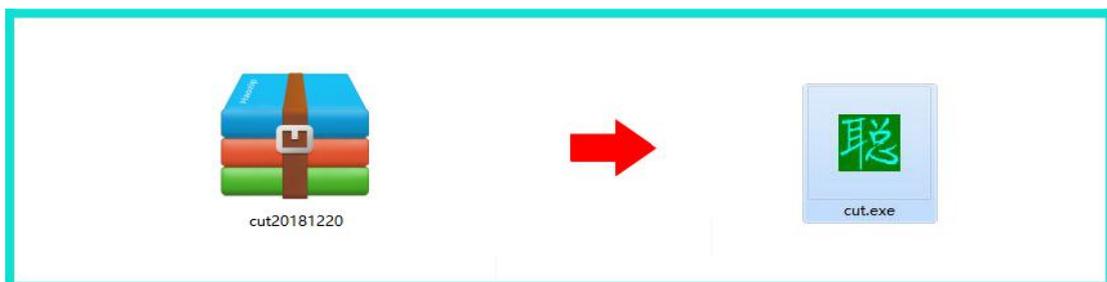
## 3. Software installation. Network configuration and software operation

### 3.1 Software introduction



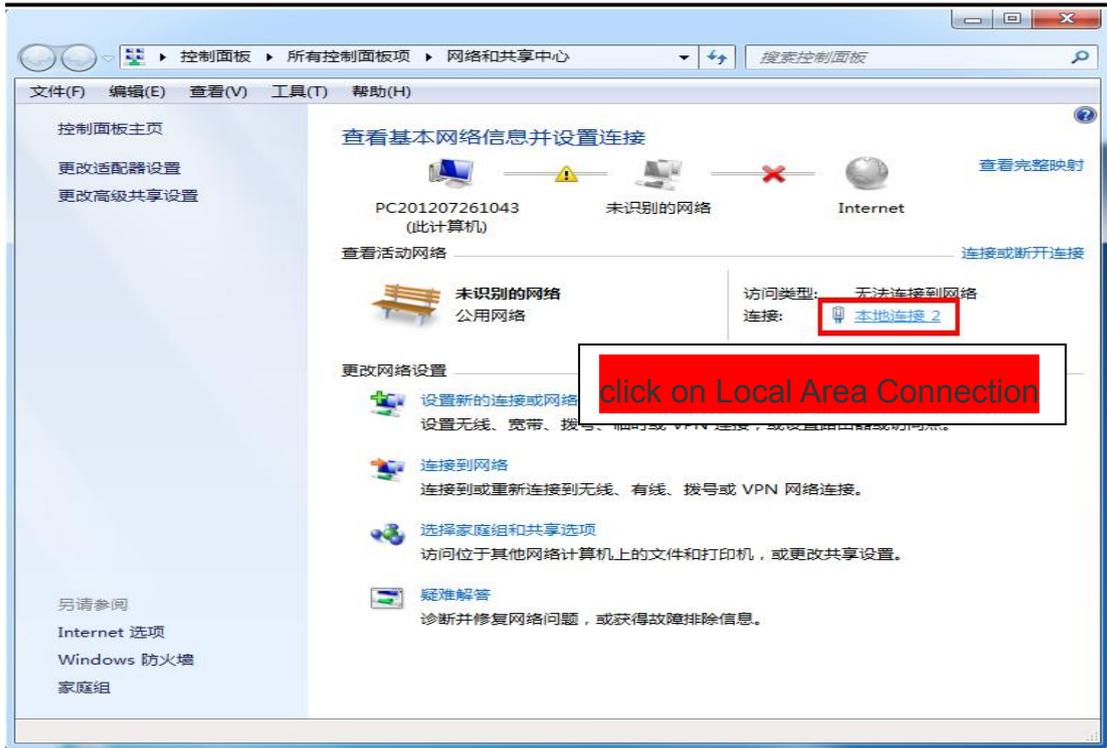
Cut is a cutting service software for editing and cutting tasks. It can be well matched with mainstream graphic design software. The software can be used for drawing simple graphs. You can also use CAD, CorelDraw and other graphic design software. Then send graph to the machine for cutting via Cut.

### 3.2 Software installation

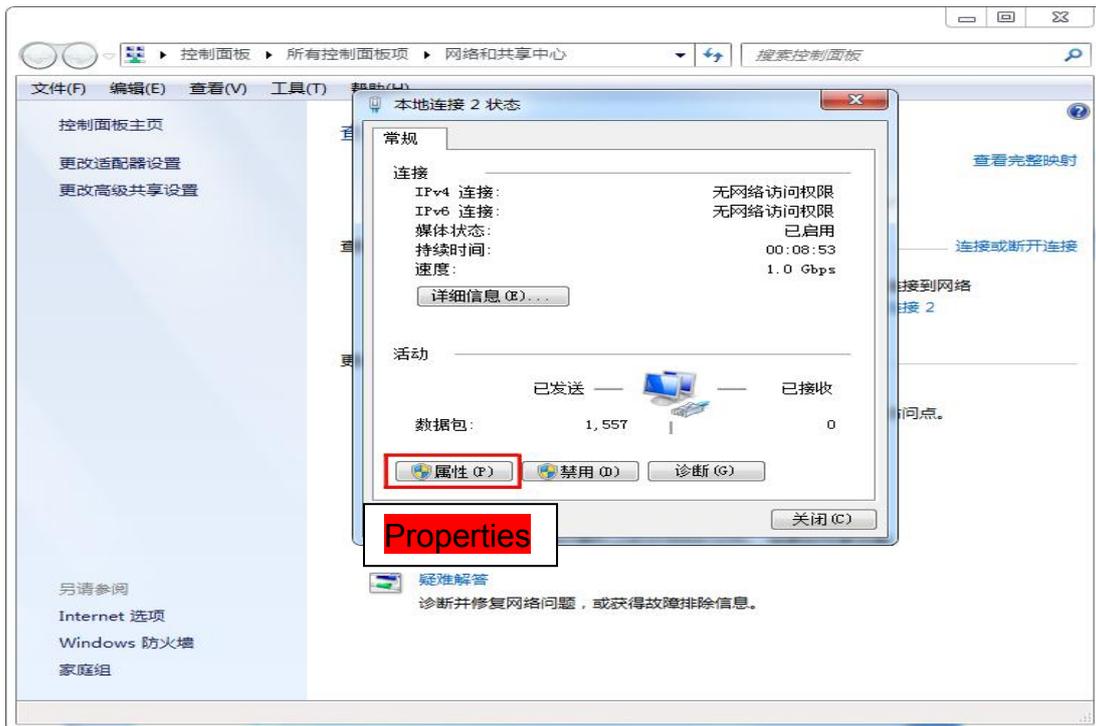


### 3.3 Network configuration

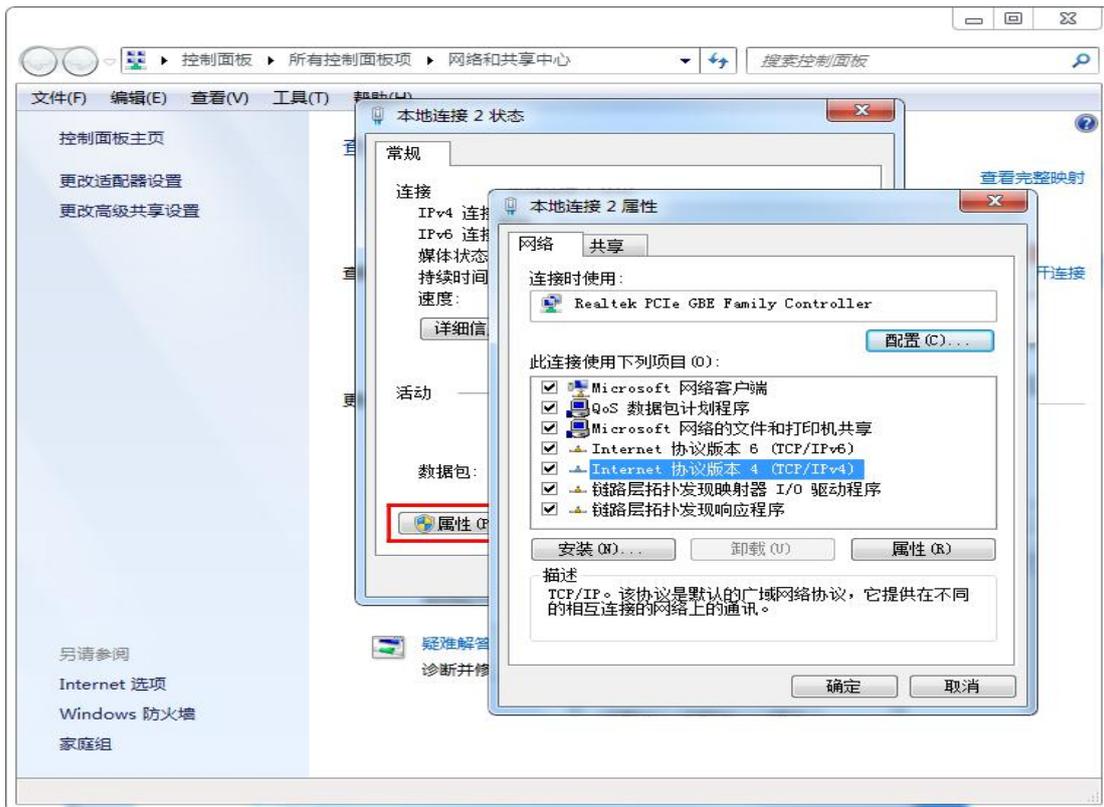
(1) Right click on the mouse - Network and Sharing Center, click on Local Area Connection



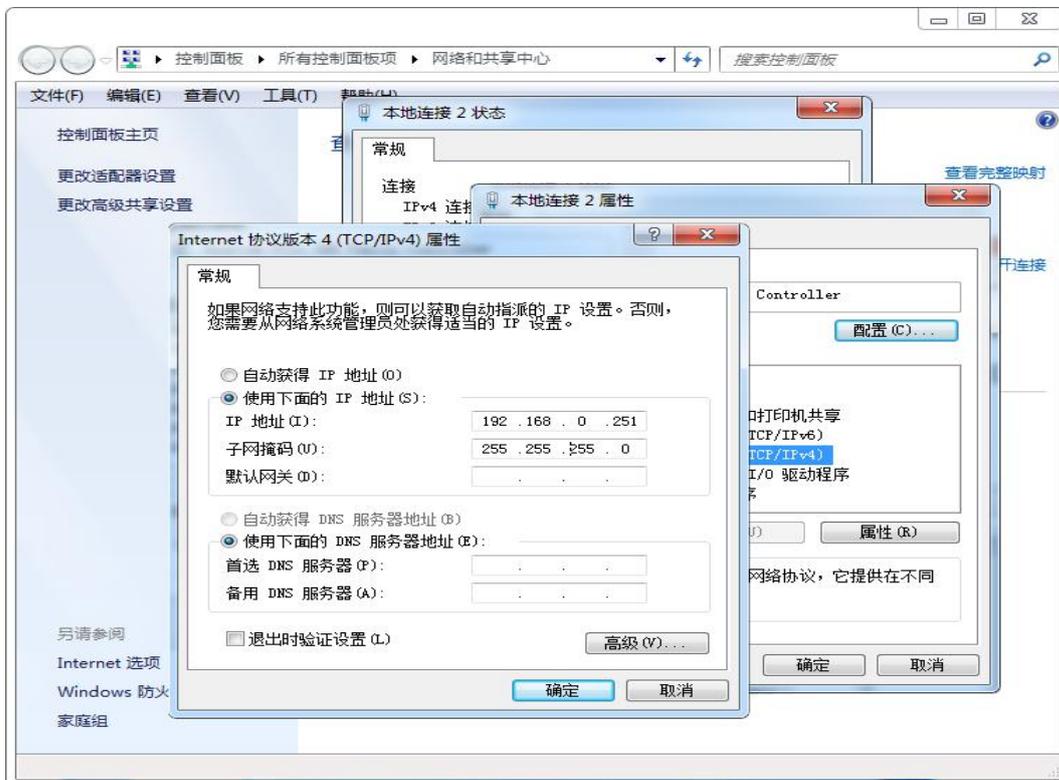
(2) Click on Properties



(3) Double-click on Internet Protocol Version 4 (TCP/IPV4)



(4) Click on use the following IP address to change the IP as shown below:



(Note: Because the IP of the machine is 192.168.0.252, the last IP in the protocol version 4 cannot be the same as the last IP of the machine, so the last

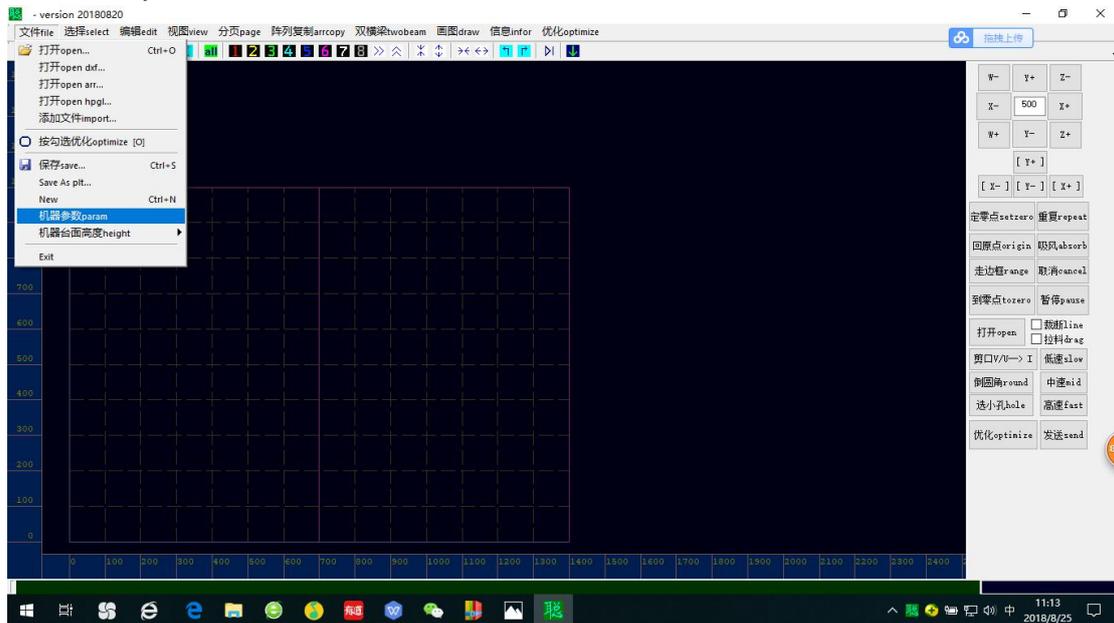
IP can be larger or smaller than the IP of the machine, 253 or 251 are okay.)

(5) Then click on OK and the network IP configuration is complete.)

### 3.4 Software and operations

#### (1) Basic operation

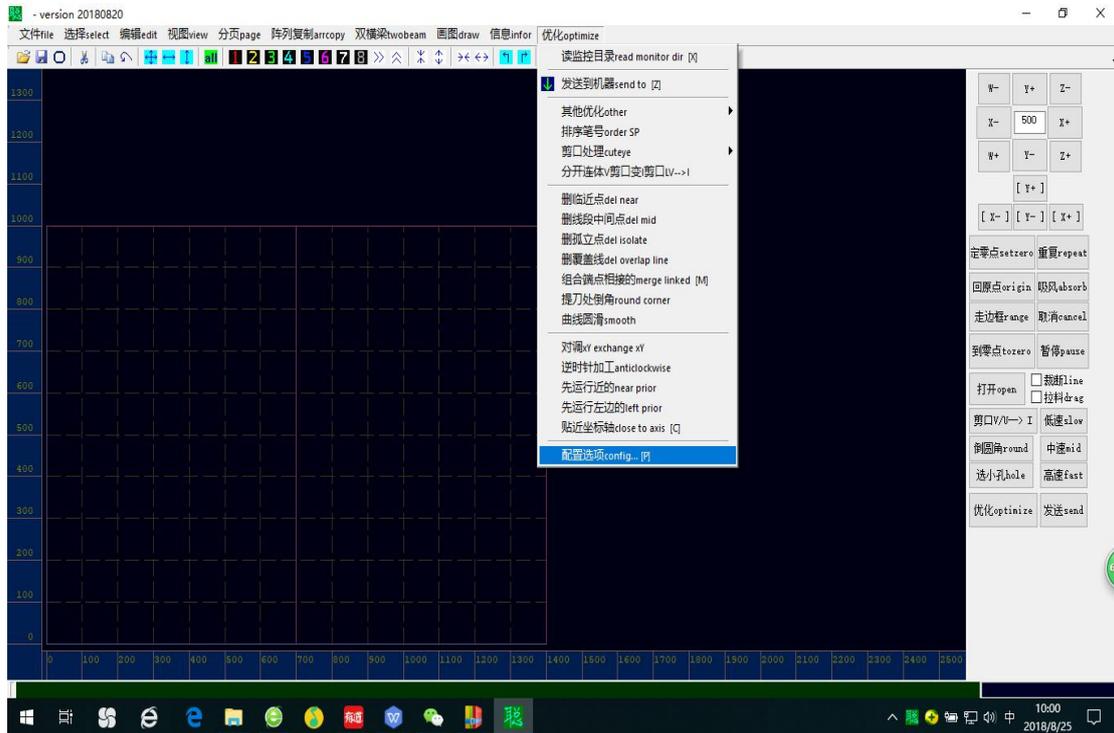
A. Software configuration options, double-click to open the software, click "File" → "param", as shown below:



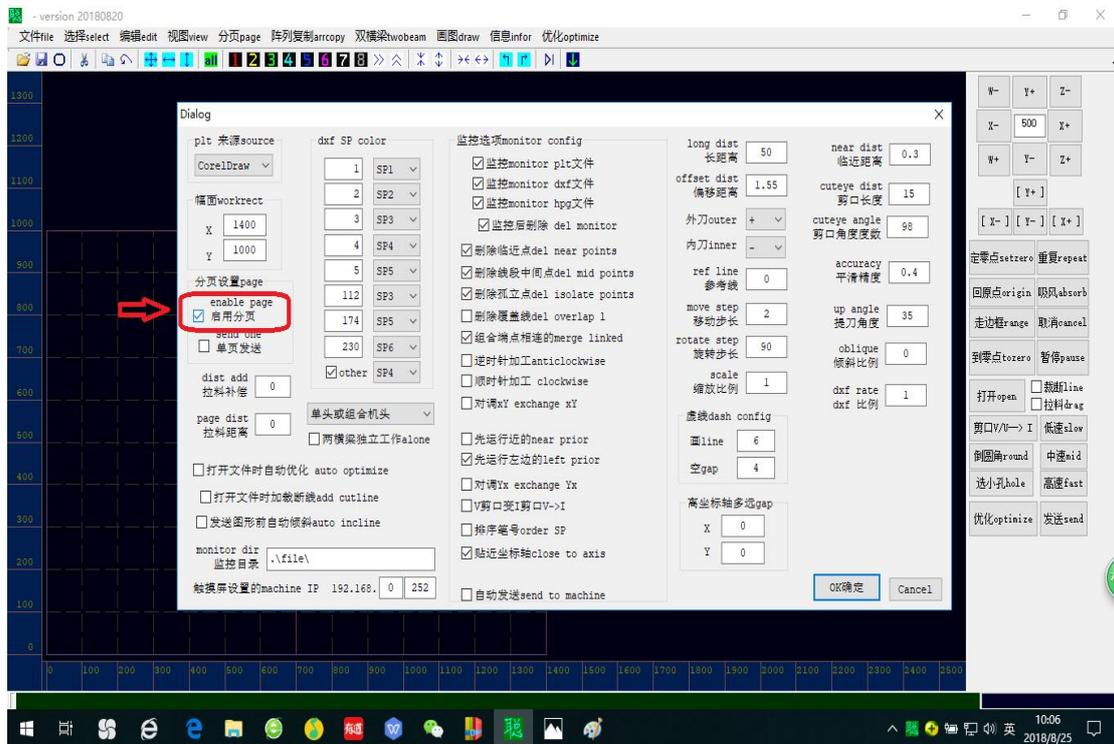
B. Click on "get machine to computer", the software will read all the parameters of the machine from the controller .



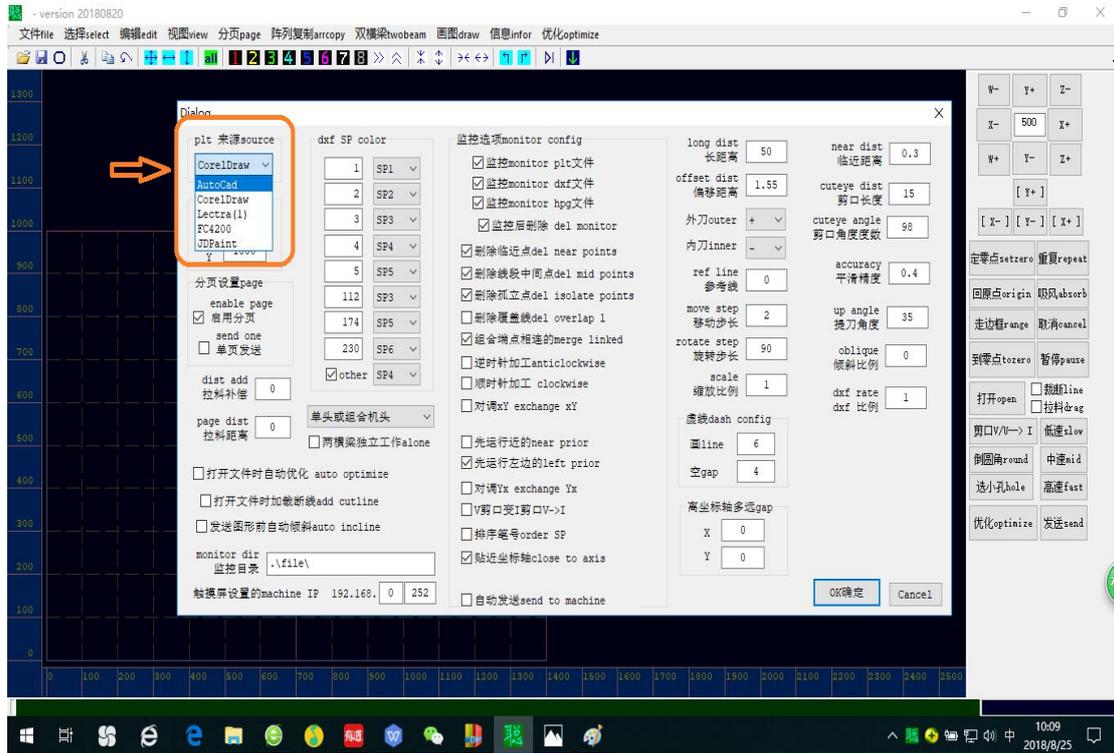
C. Click on "Optimize" → "Configuration Options" as shown below:



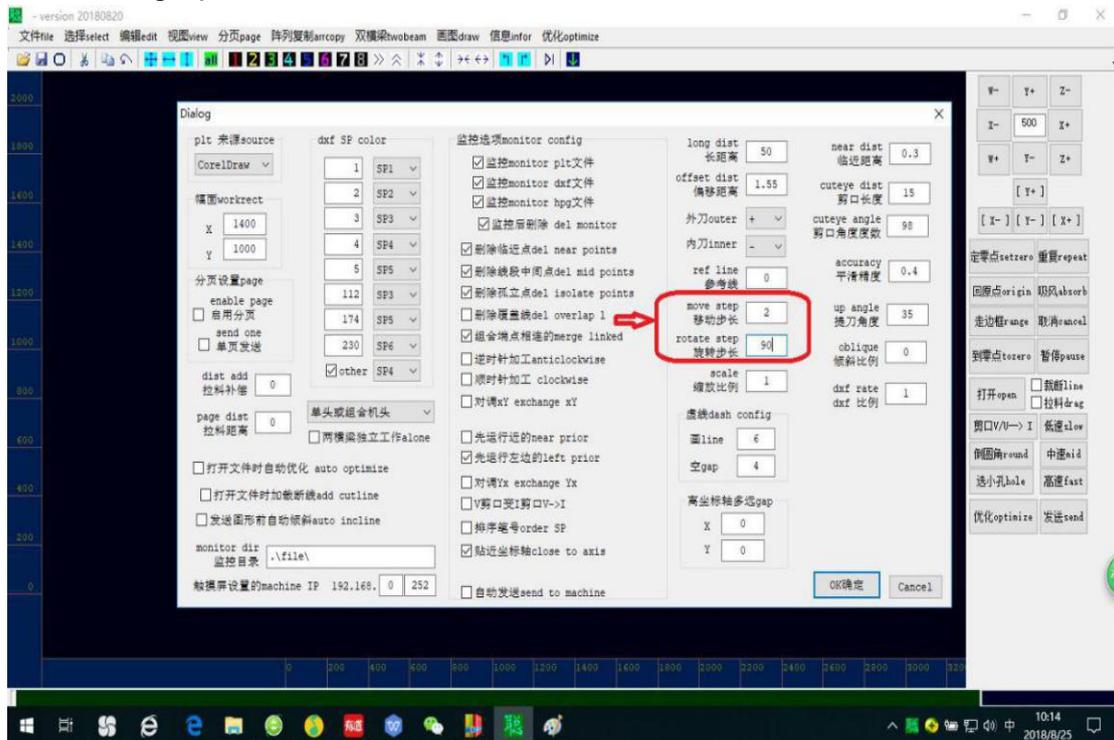
D. For machines that are automatically fed, you must tick the "Enable Paging" option:



E. Click on “plt source” to select the “JDPaint”:

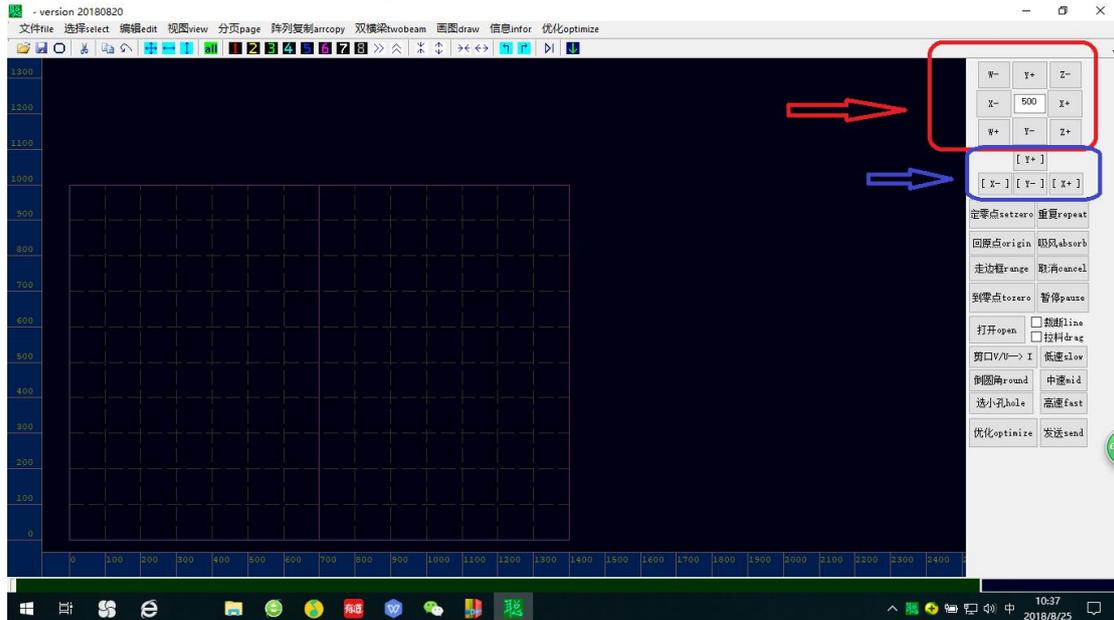


F. Changing the value of “moving step” determines the distance that the graph moves once; changing the value of “rotating step” determines the angle at which the graph is rotated clockwise or anti-clockwise, as shown below:



## (2)Common functions and operations

**A.** This area is for control the movement of cutter head. X+、X- for control cutter head forth and back move. Y+、Y- for control cutter head right and left move. W+、W- for control cutter head anti-clockwise and clockwise rotation. Z+、Z- for control cutter head up and down. [X+]、[X-]、[Y+]、[Y-] will Move the cutter head to the border of the working area.



**B.B1 Origin:** When the machine is turned on, the coordinates will be initialized to 0, but the actual coordinates of the machine head inside the machine may not necessarily be 0, so it is necessary to return to the origin. The purpose of returning to the origin is to make the coordinates of the software same to the actual correct mechanical position. When returning to the origin, the machine head will go to a certain direction until it hits the corresponding sensor switch (origin signal). The four axes return to the origin together, but the Z axis will be pulled first. After returning to the origin is successful, the coordinates of the axis returning to the origin in the positive direction become the size of the working area, and the coordinates of the axis returning to the origin in the negative direction become 0.

**B2 Repeat:** When there is a graph in the mother board, press the repeat button to re-process the current graph. It is equivalent to the start of other systems.

**B3 Set Zero:** Set the position of the laser (or the location of the cutter head)

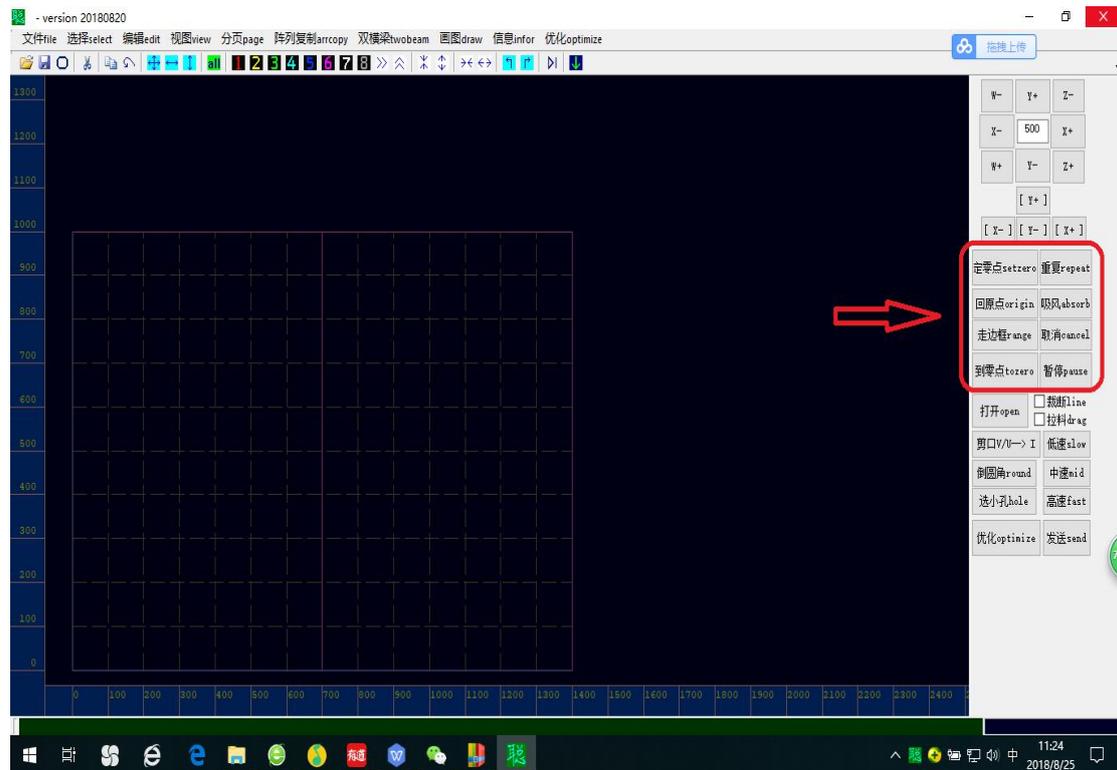
as a new zero point, here you need to set the offset of the laser light and the knife accurately.

**B4 To Zero:** If the zero point is not fixed, then the zero point will move to the coordinate (0,0) position. If the zero point has been set, then it will move to the last set zero position. If the machine has received the graphic, then the second Pressing to the zero point will move to the farthest point of the graph to view the processing range of the current graph.

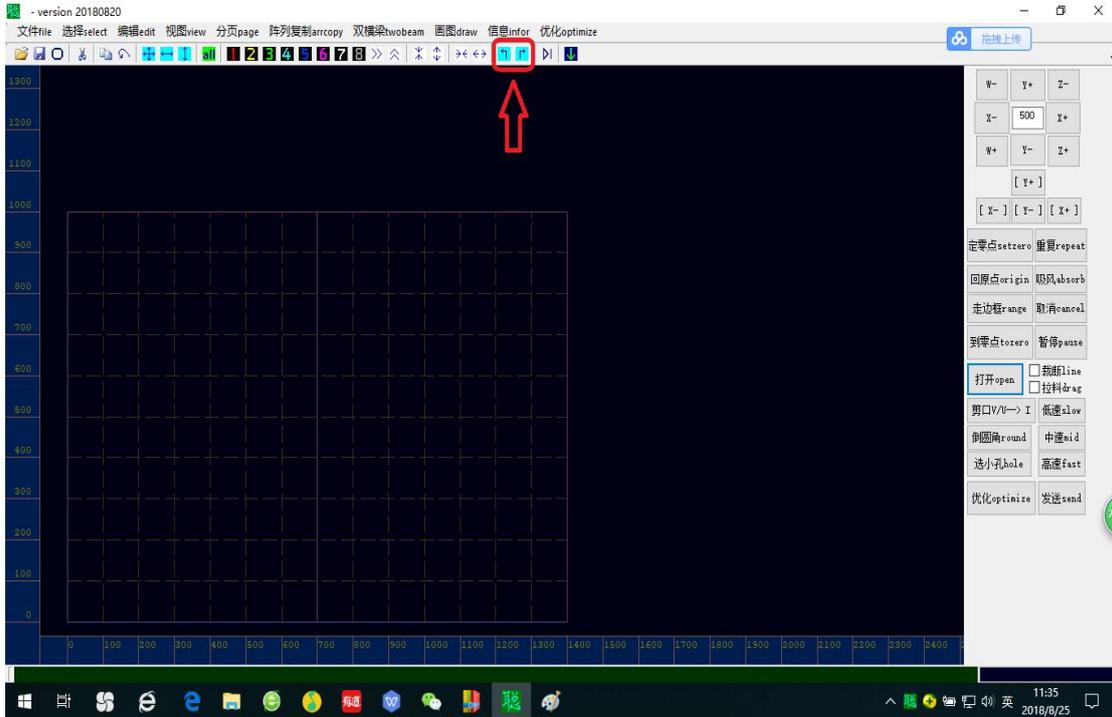
**B5 Range:** Cutting head just move around the four boundaries of the processed graphs.

**B6 Cancel:** The machine will stop processing and the Z axis will return to the zero coordinates, and the vacuum pump will be turned off.

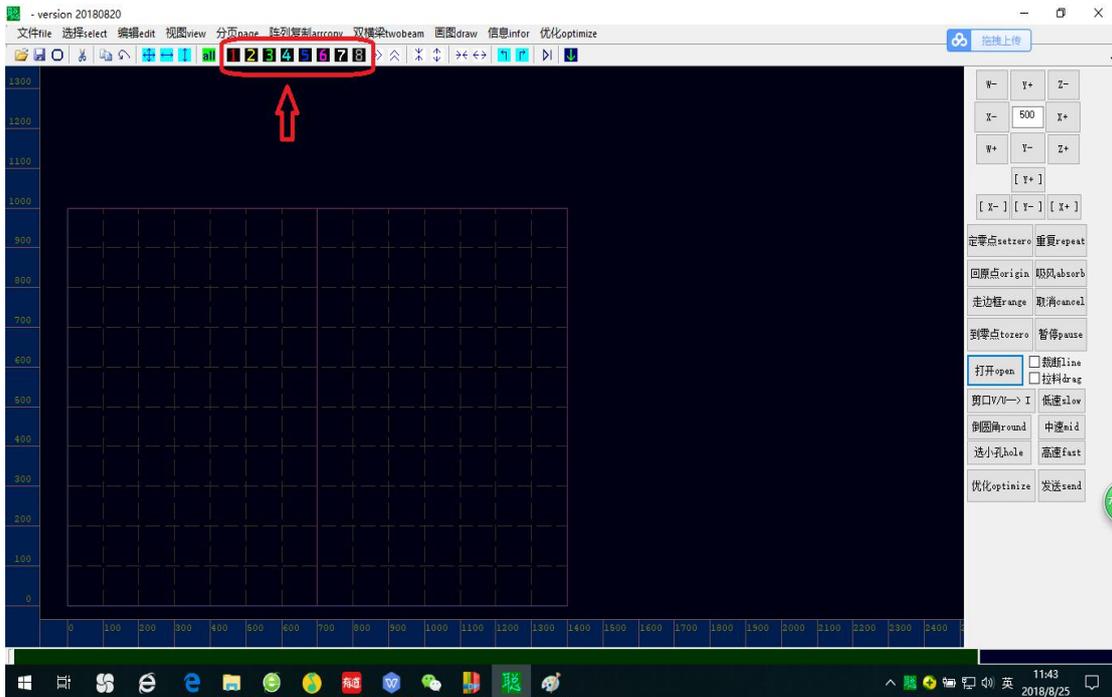
**B7 Pause:** Pause processing, but it will remember the current machining status. If you want to continue to process, press “Pause” again. If you want to stop machining, press “Cancel”.



C. The buttons shown in the picture are used to control graph anti-clockwise and clockwise rotations, use this function with "Rotate Step" in "Configuration Options".



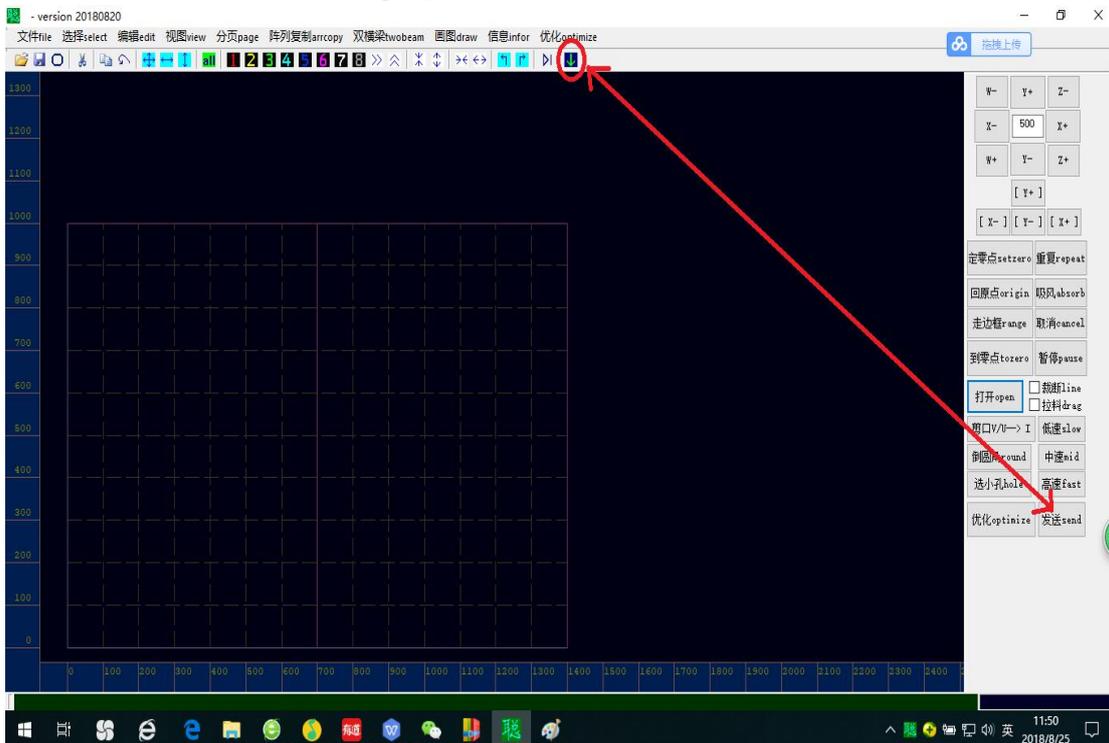
D. The numbers shown in the red frame of the picture is to determine use which head to cut the graph.



F.Open: Open the graph which needs to be cut.

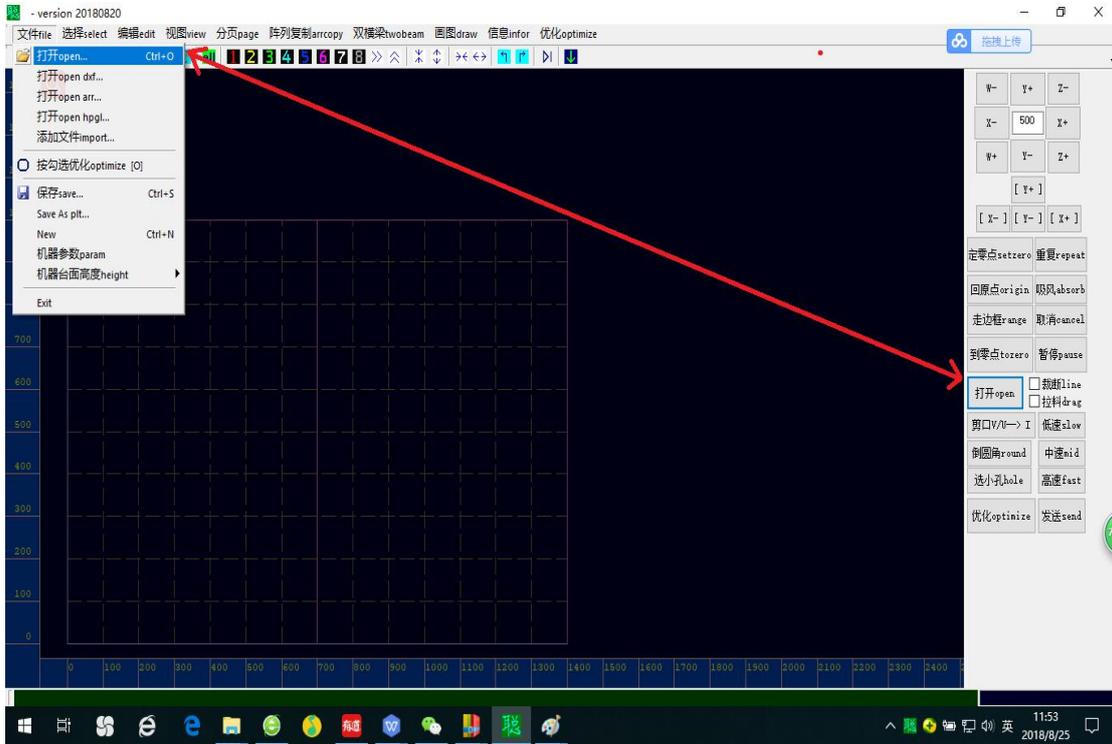


E.Send: Send the edited graph to the machine.

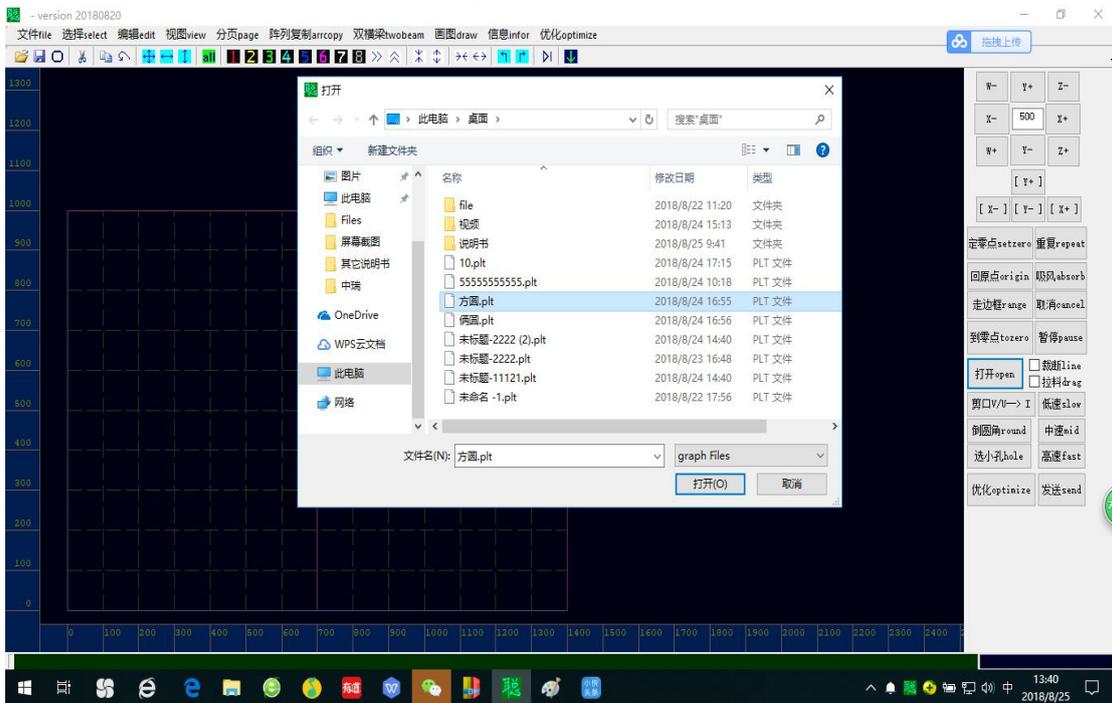


### (3) Import graph into the software

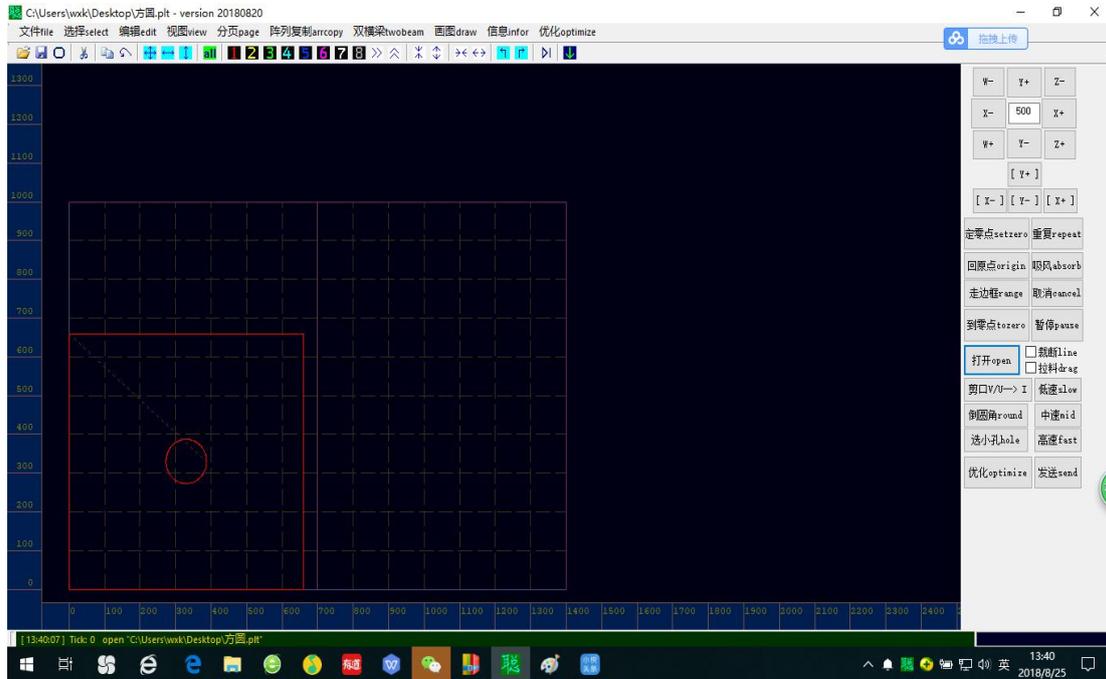
#### A.A1. Click on "file" → "open"



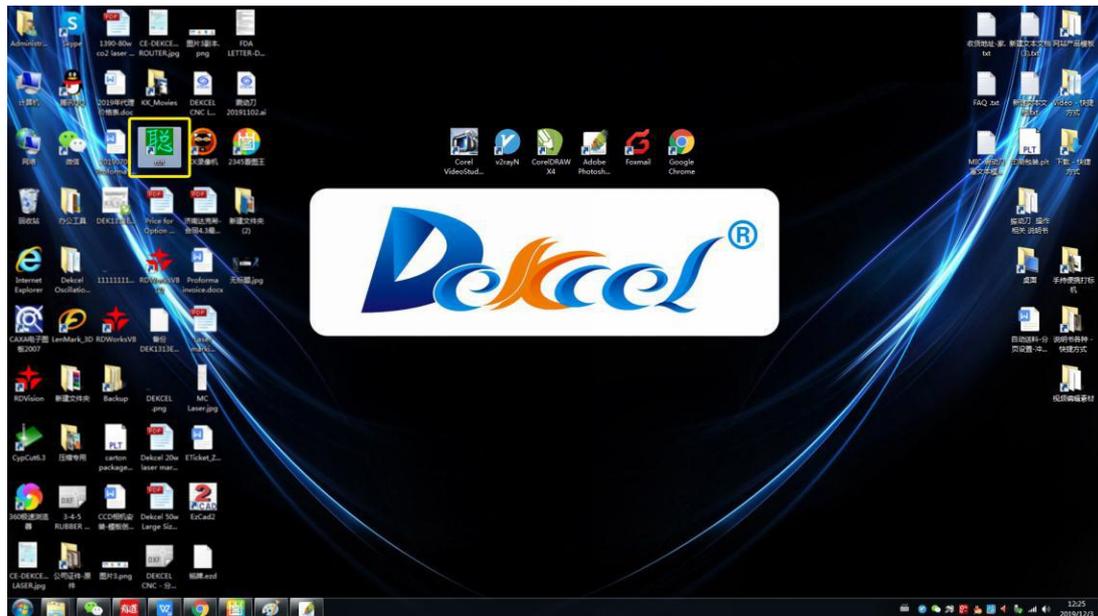
#### A2. Click on "Open" after selecting the graph.



A3.If the graph is not in the original position (zero position), you need to select the graph first and then press C on the keyboard to move the graph to the zero position.



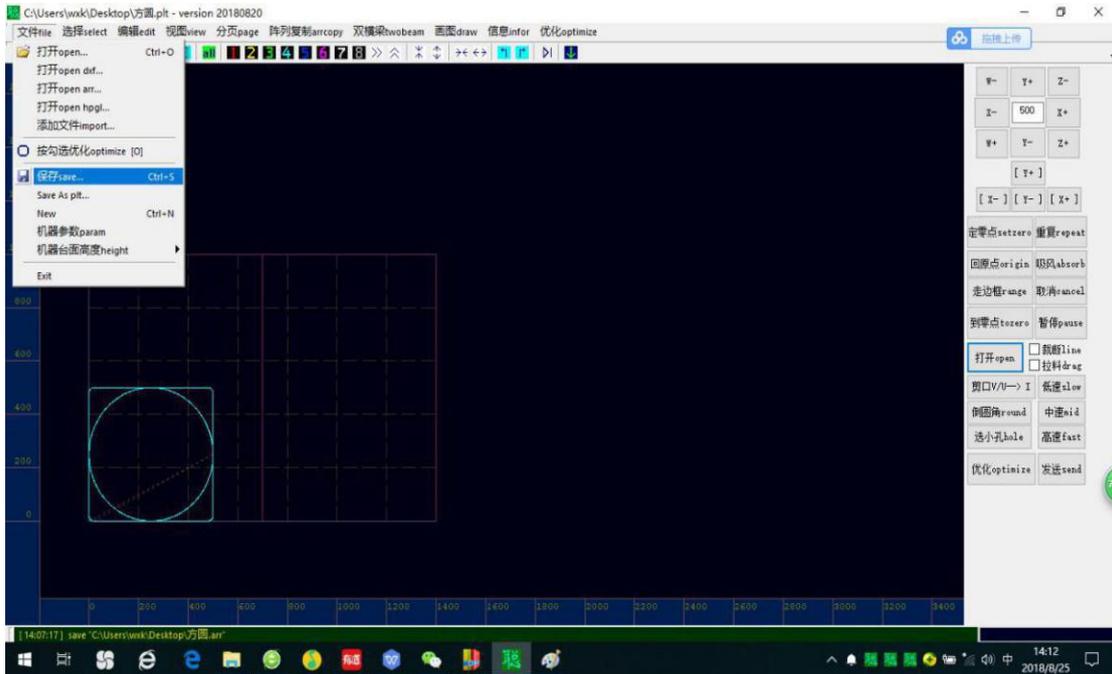
B.Select the required graph file and drag it directly into the Cut software. :



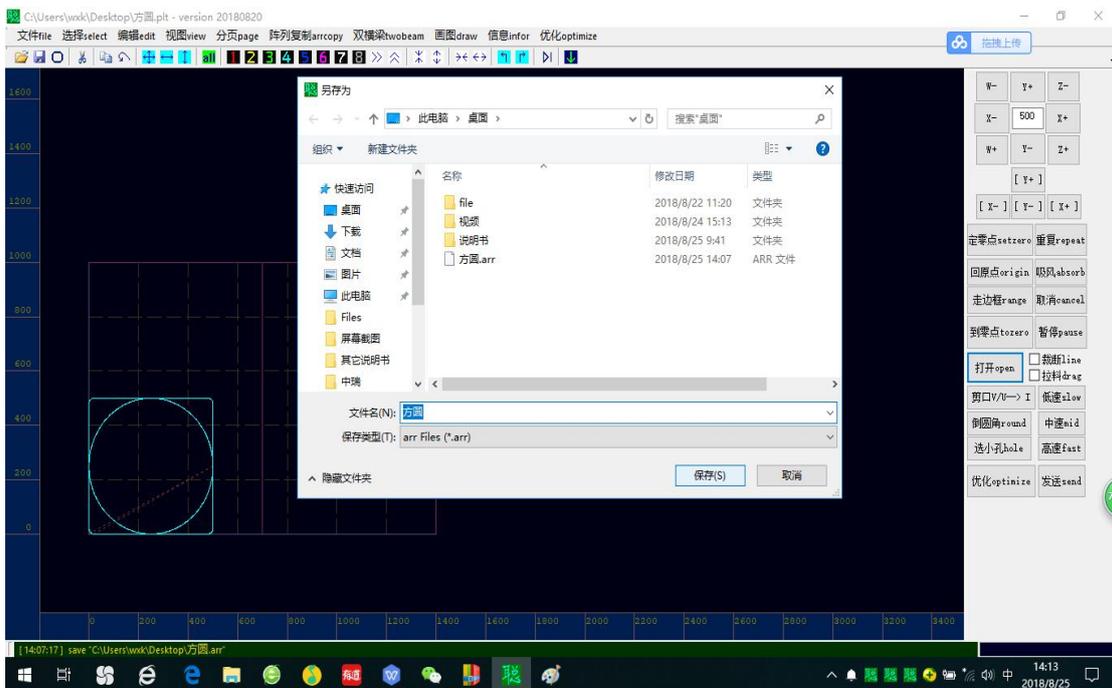
## (4) Save the file

(Note: Files can be saved in both arr and plt formats)

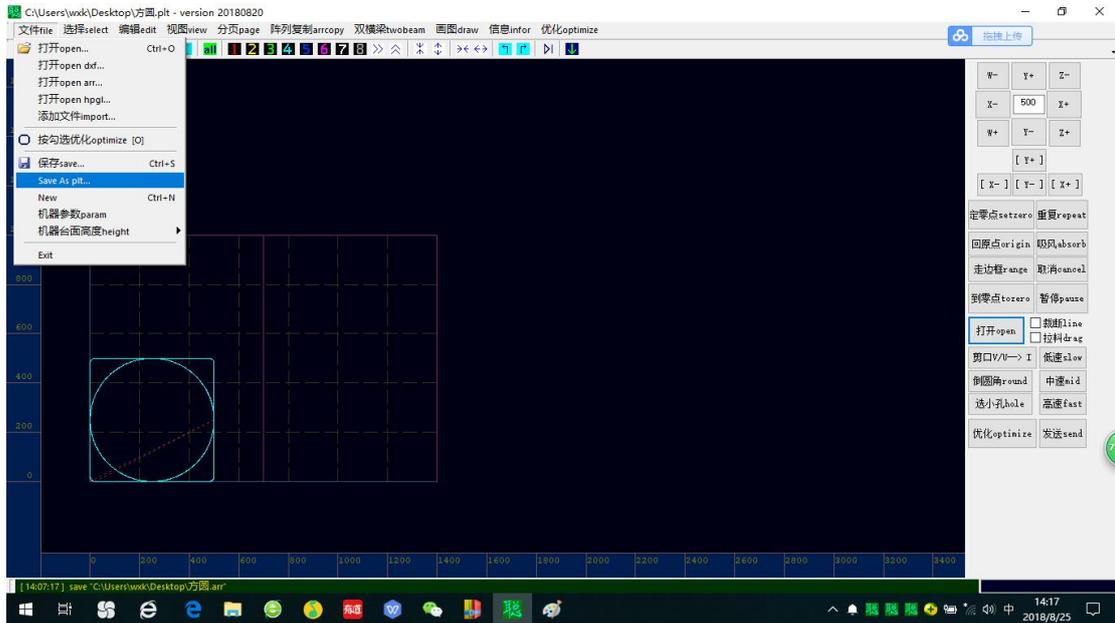
A. A1. Click on "file" → "save"



A2. After selecting the file, click on "Save" to save the graph as arr format.



**B. B1.**Click on “file”→“save as plt...”



**B2.**After selecting the file, click on "Save" to save the graph plt format.

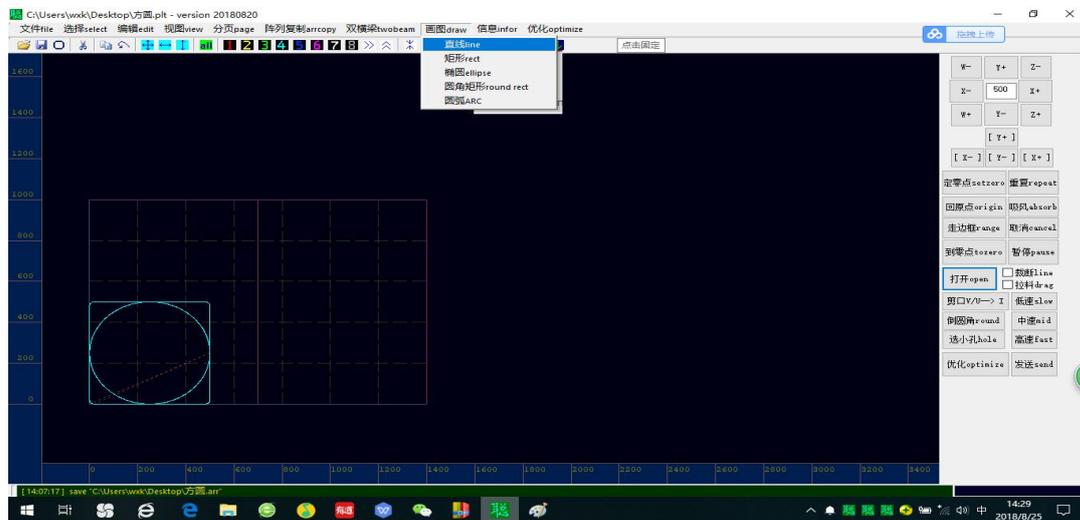
(Note: Must connect to the machine to do this job, otherwise you will not be able to save the graph as plt format.)

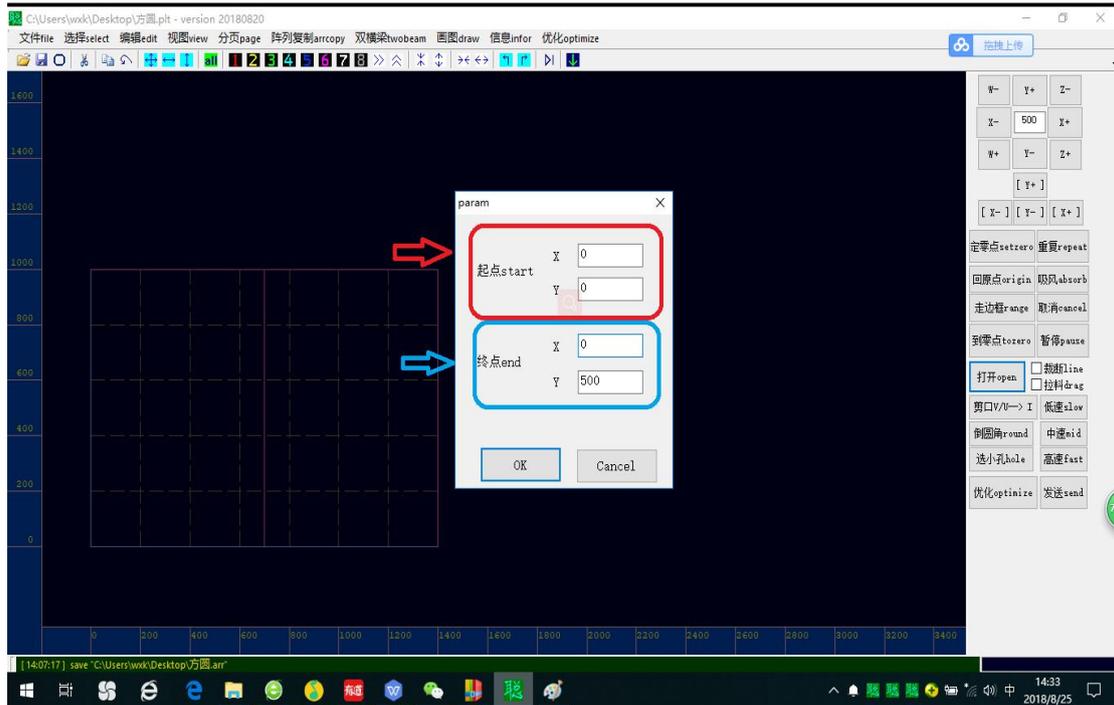
**(5)Graphic editing**

(Note: The cut software is not a professional graphic software, only the following 5 simple graphs can be drawn)

**A.Drawing straight line**

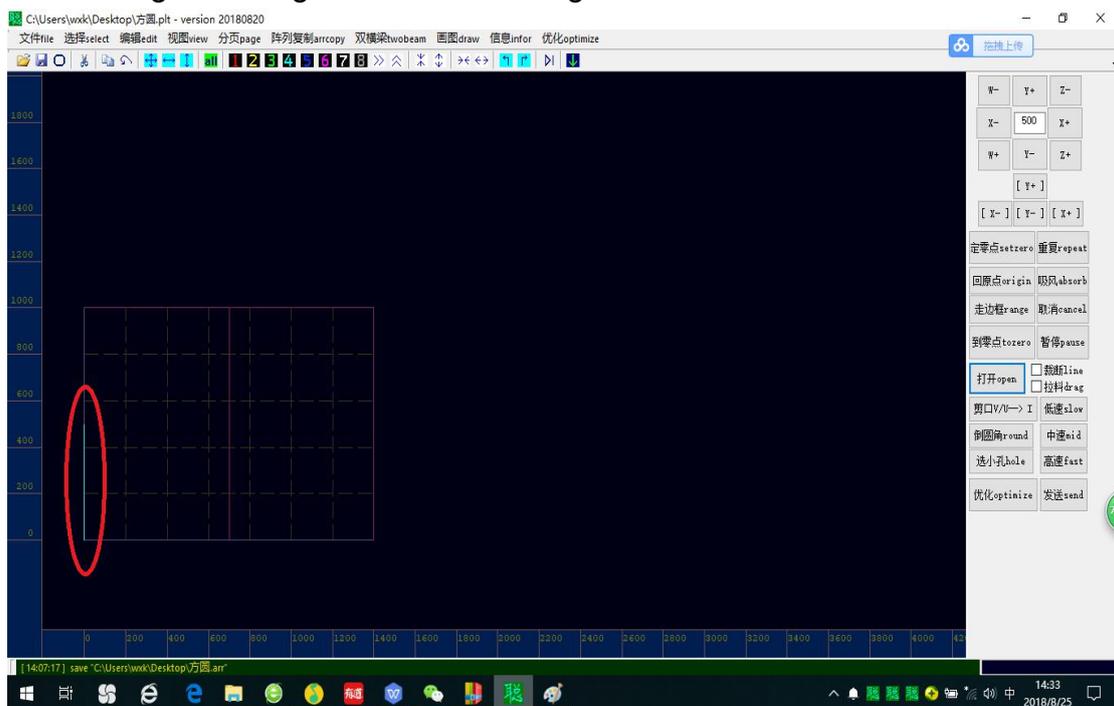
**A1.**Click on “Drawing”→“line”





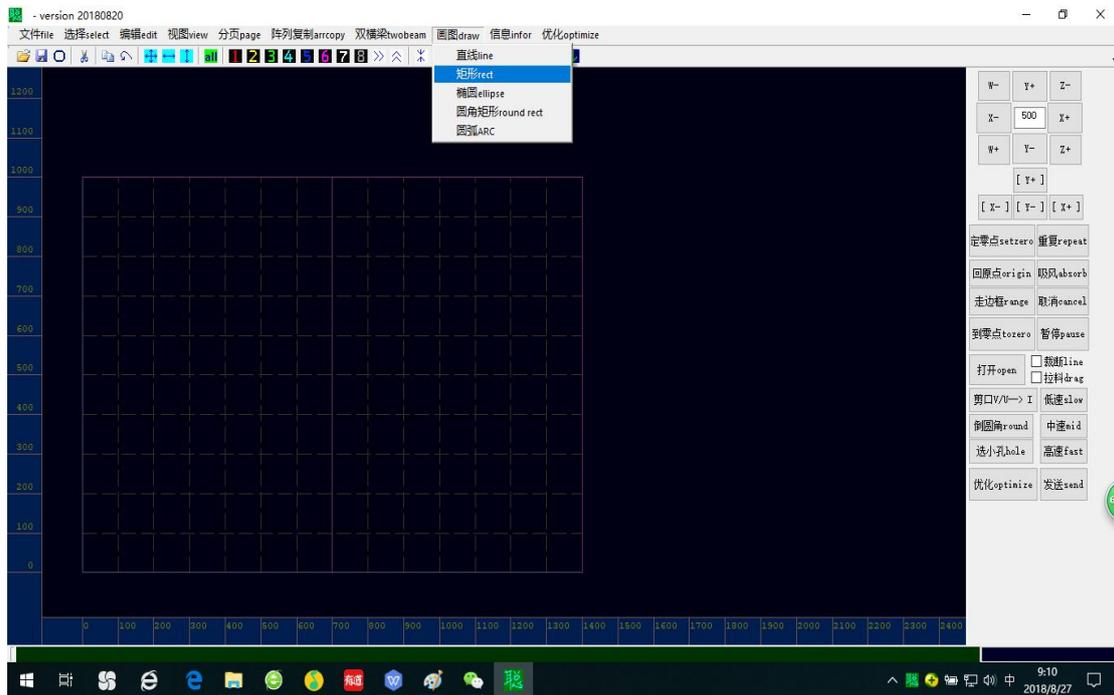
**A2.** The starting point is the starting position of the graph. Generally, the default is 0. The ending point is the farthest point of the graph, which is the size of the graph.

**A3.** For example, the starting point is zero, the ending point X is 0, and Y is 500 then we'll get a straight line with the length of 500 mm.



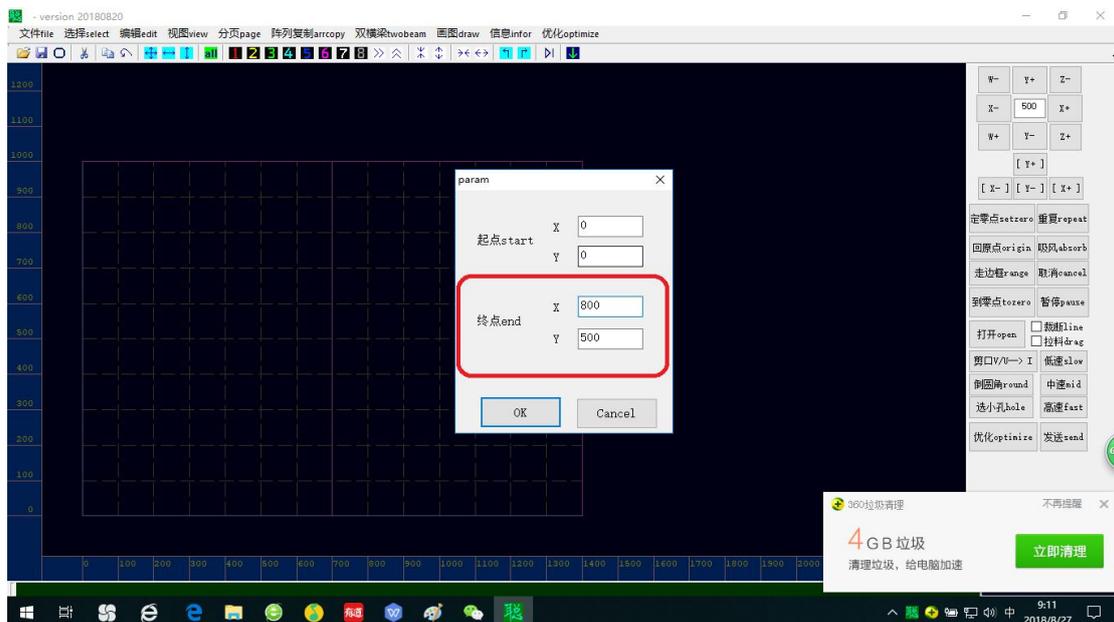
## B.Draw rectangle

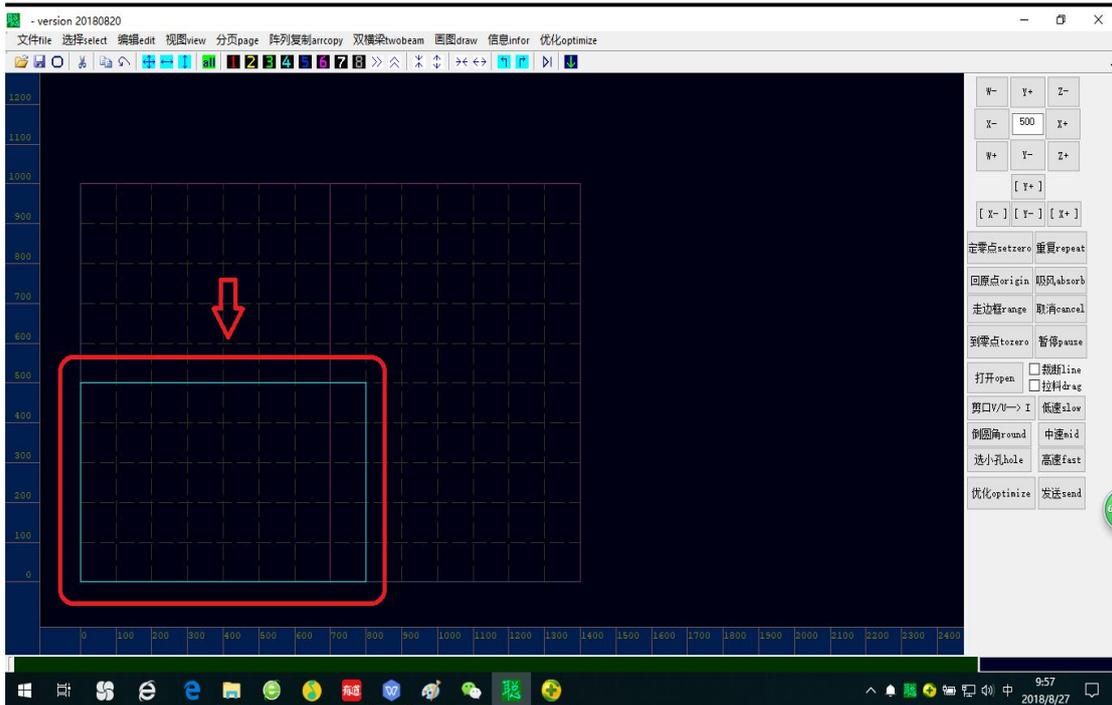
### B1.Click on “draw”→“rect”



**B2.**Typing the end point of the desired rectangle, X, Y, the size of the desired rectangle, length and width.

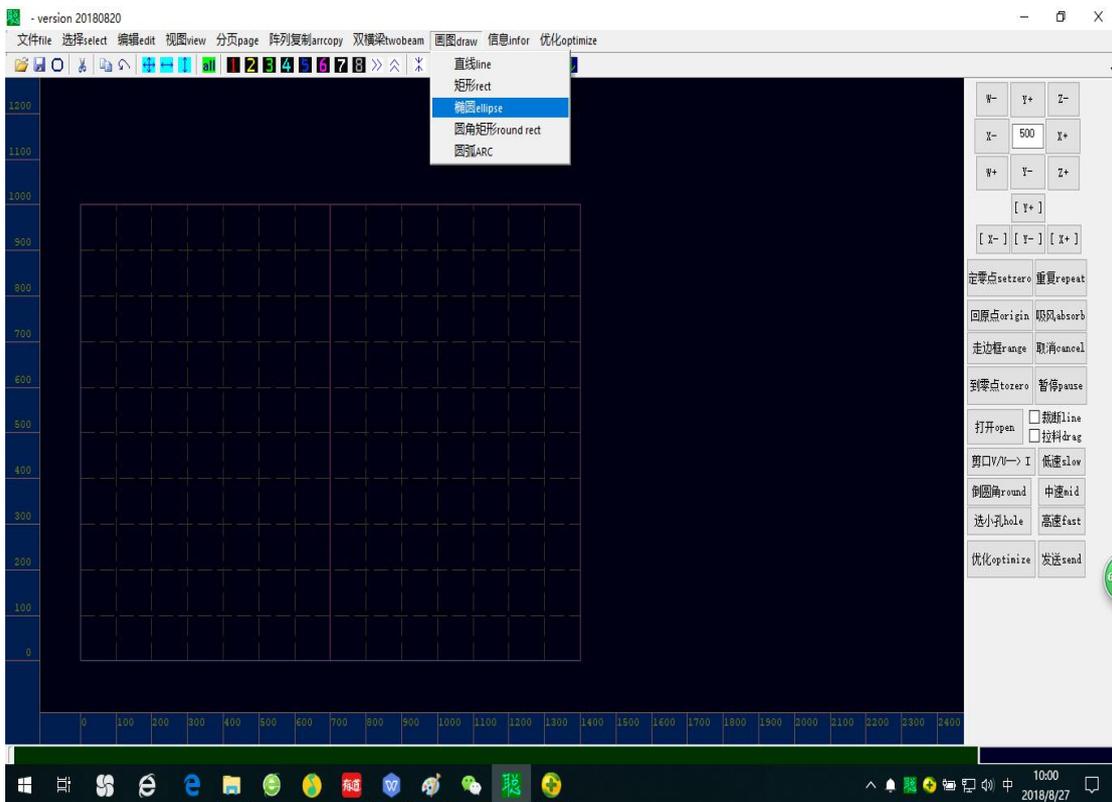
**B3.**For example: The starting point is zero, the ending point X is 800, and the Ending point Y is 500, then we'll get a rectangle with the length of 800mm and the width of 500mm.





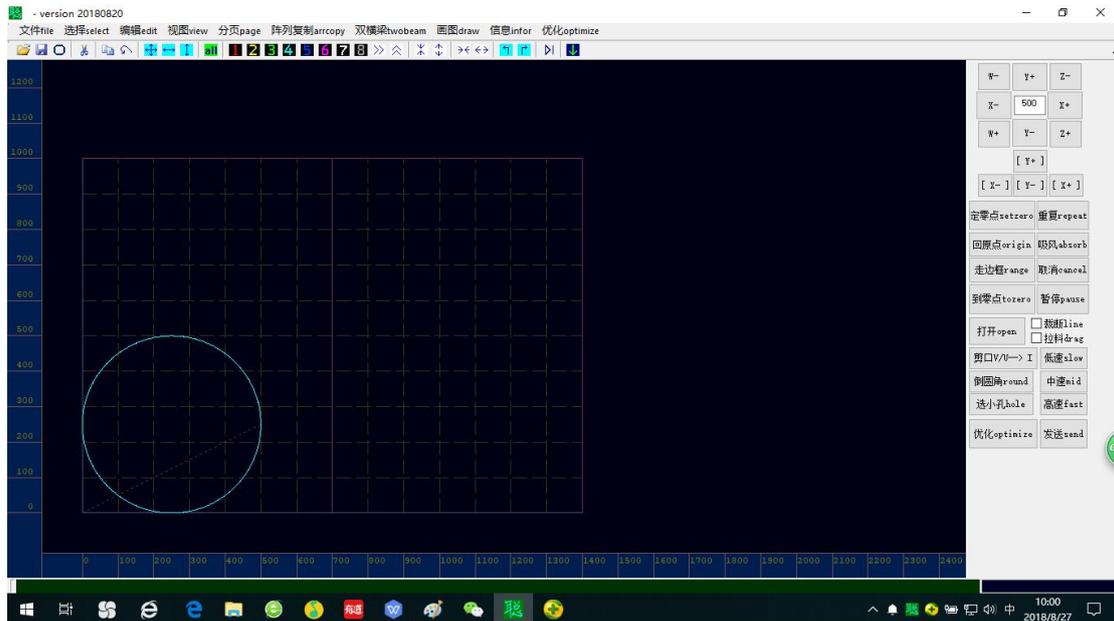
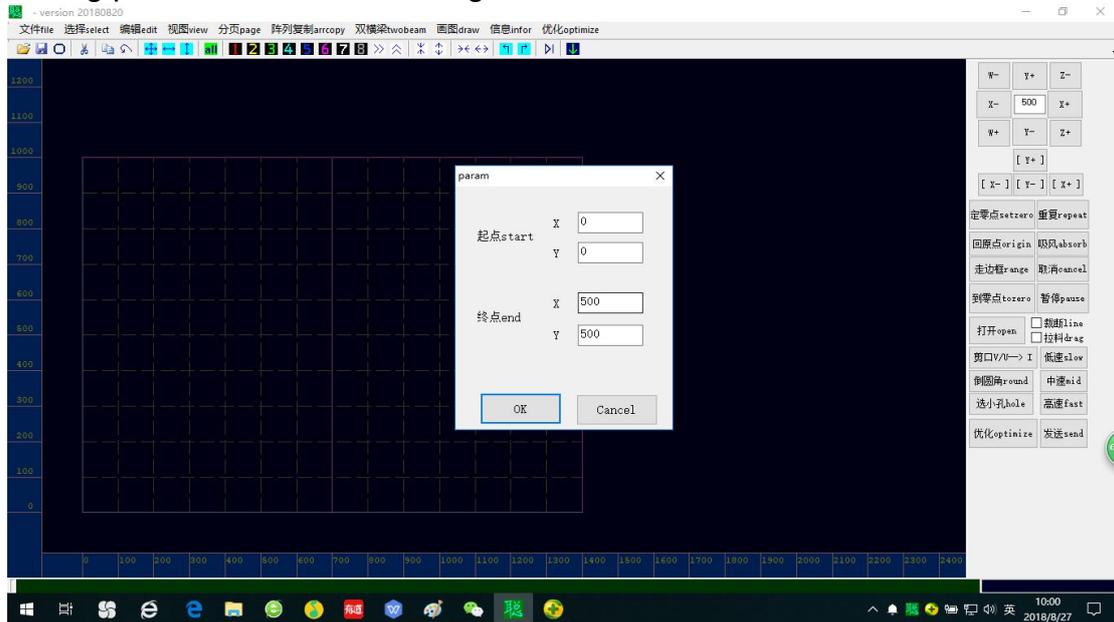
## C.Draw ellipse

### C1.Click on “draw”→“ellipse”



C2. Typing the size of the desired ellipse, which is the end point of X and Y.

C3. For example: The starting point is 0, the ending point X is 500, and the ending point Y is 500, then we'll get a circle with the diameter of 500mm.

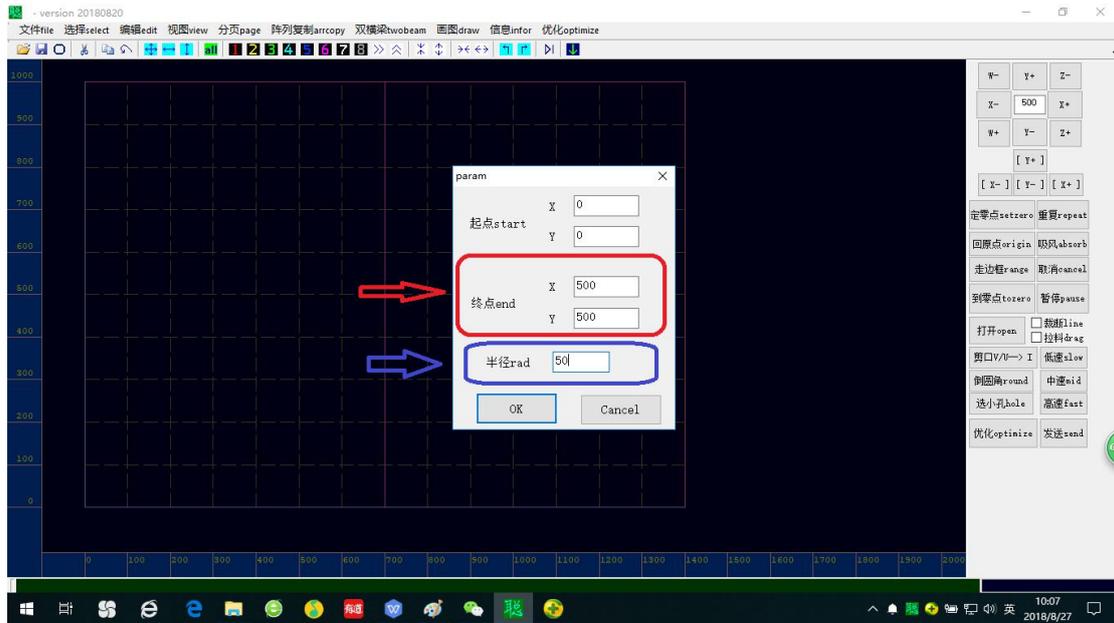


D. draw a rounded rectangle

D1. Click on "Draw" → "Round Rect"

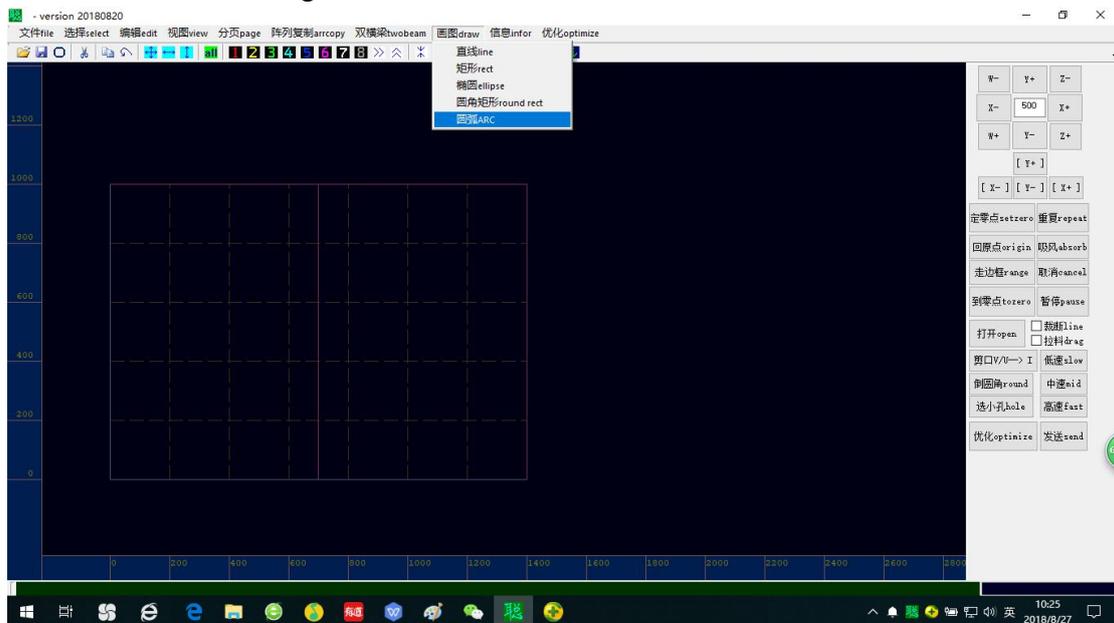
D2. Typing the length and width of the desired round rectangle and the radius of the desired fillet

D3. For example: The starting point is 0. The end point X and Y are both 500. The fillet radius is 50. The round rectangle has the length and width of 500mm and the fillet radius of 50mm.



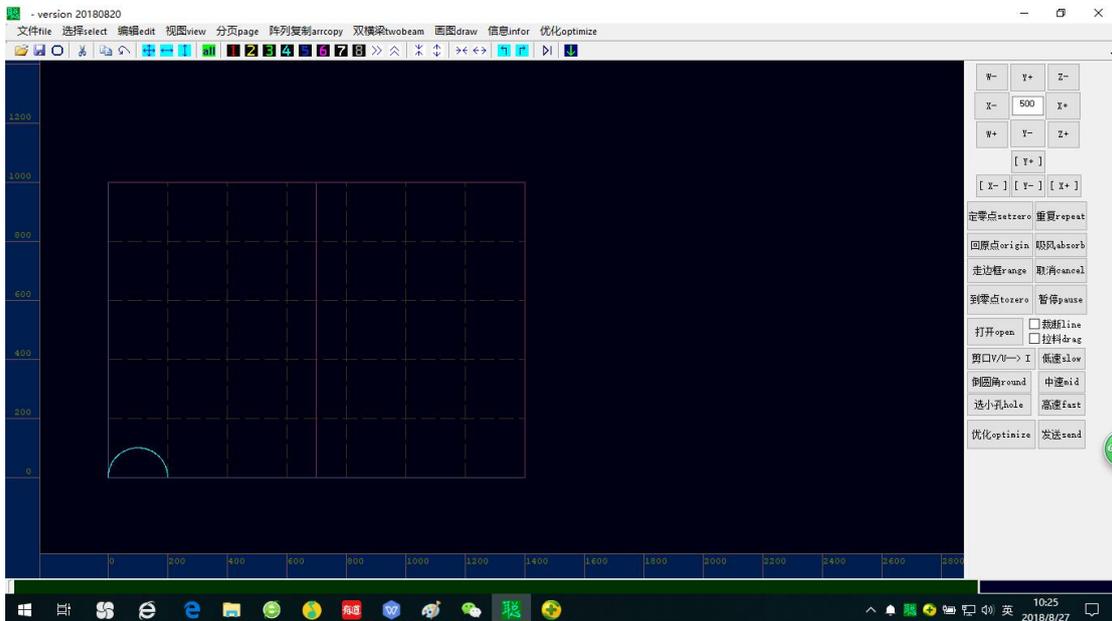
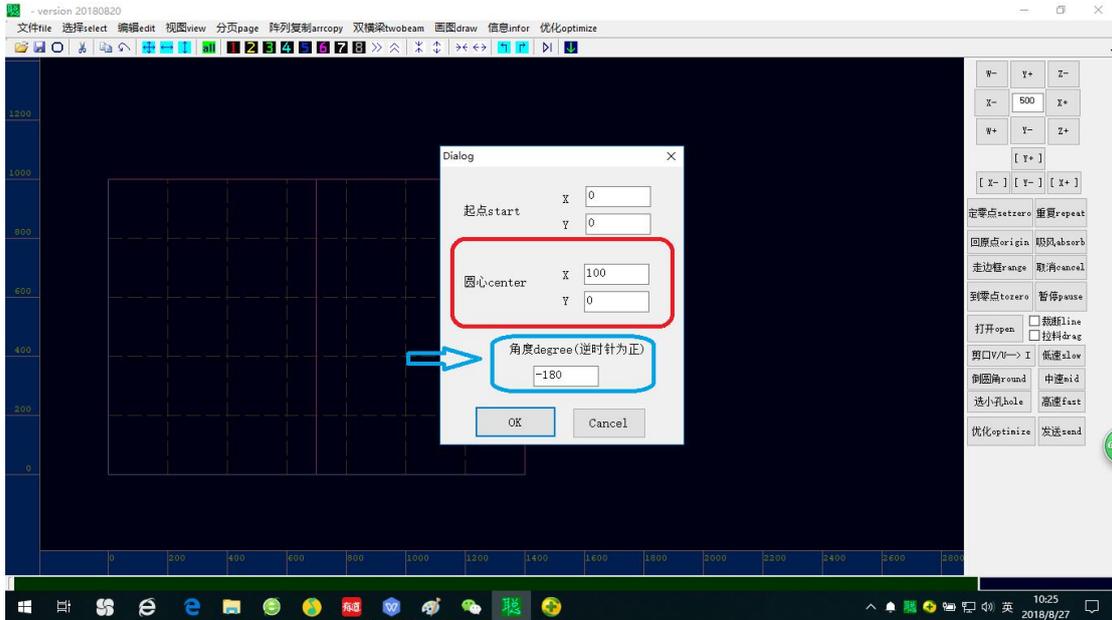
E. Draw an arc

E1. Click on "Drawing" → "Arc"



E2. Typing the center of the desired arc, is the center of the X or Y position, and the degree of the desired arc

E3. For example: The center X is 100, Y is 0, and the arc with an angle of  $-180^\circ$  means an arc with a position of 100 in the X-axis direction and an angle of  $-180$  degrees.

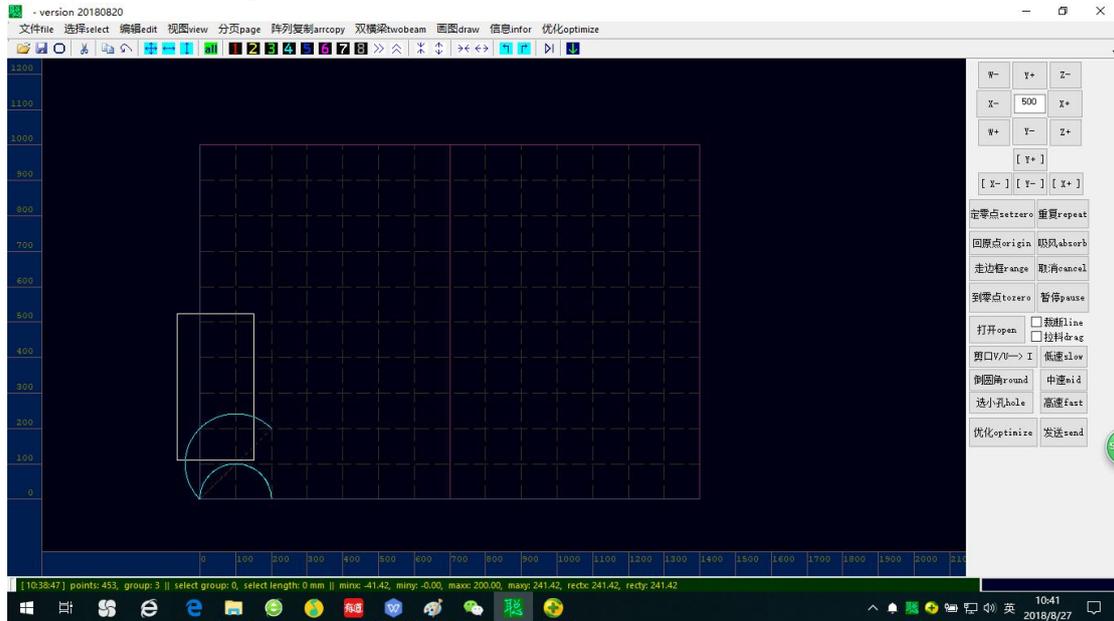


(Note: The drawn graph size cannot be modified.)

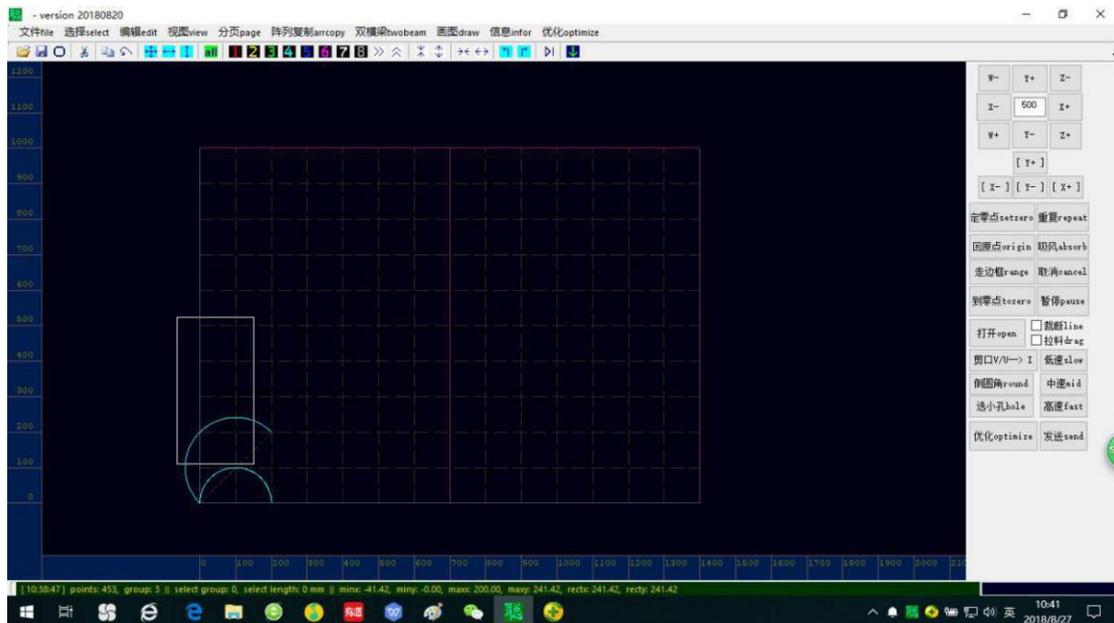
## (6) Editing graph

### A. Graph selection and deletion

A1. If you want to select a graph, you need to hold the left button of the mouse and pull a rectangle in the blank space.



A2. As shown below, the selected graph line will become thicker.

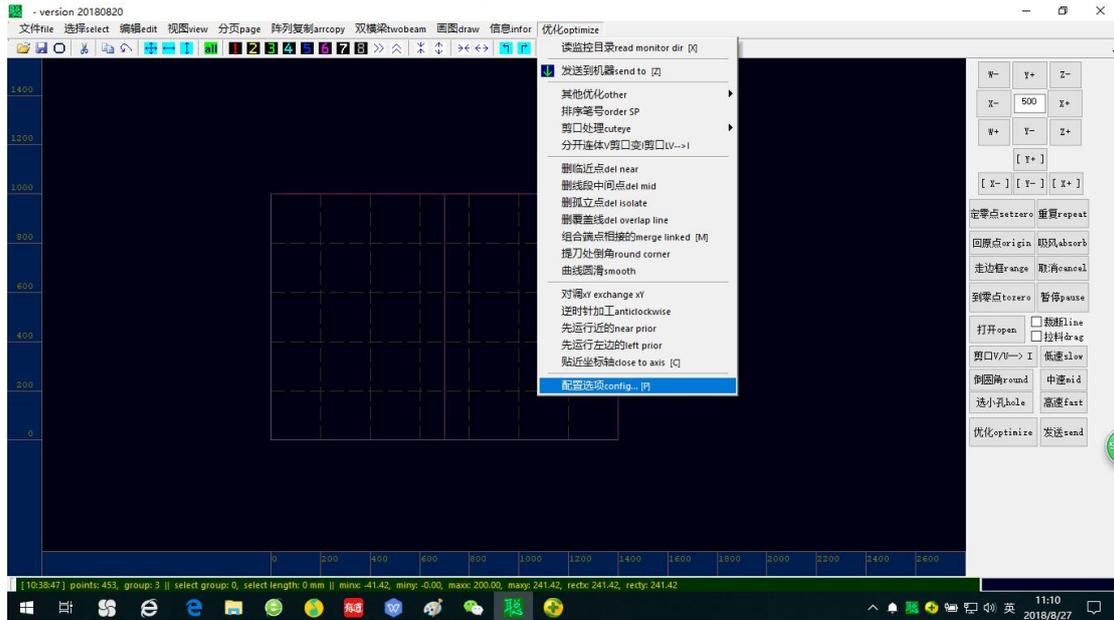


### A3. Delete a graph

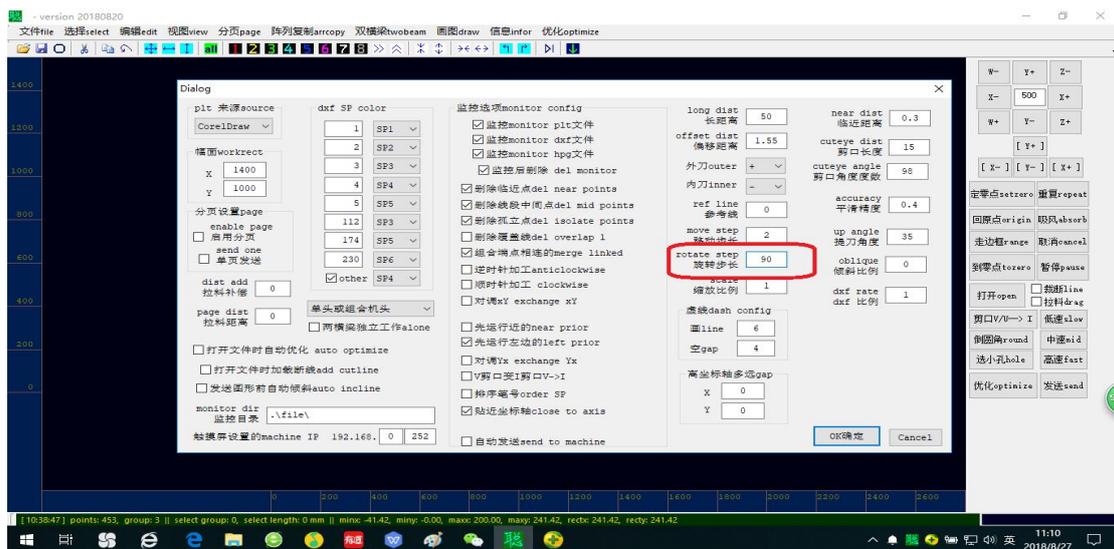
First ,select the graph you want to delete (long press the left mouse button to draw a rectangle on the graph), then press the "delete" button on the keyboard to delete the graph.

### B. Graphic rotation

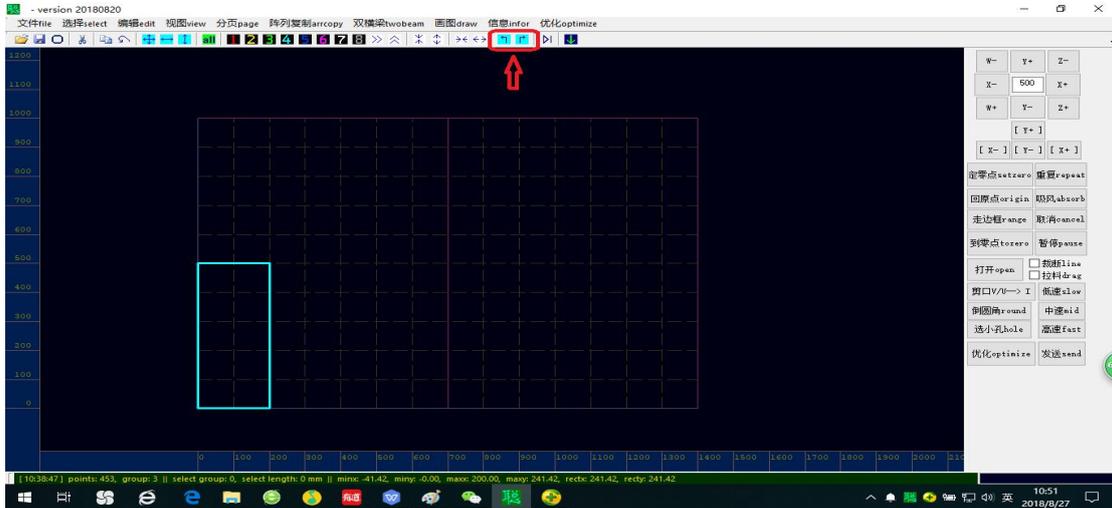
#### B1. Click on "Optimize" → "Config..."



#### B2. Change the "rotate step" to the degrees you need to rotate.

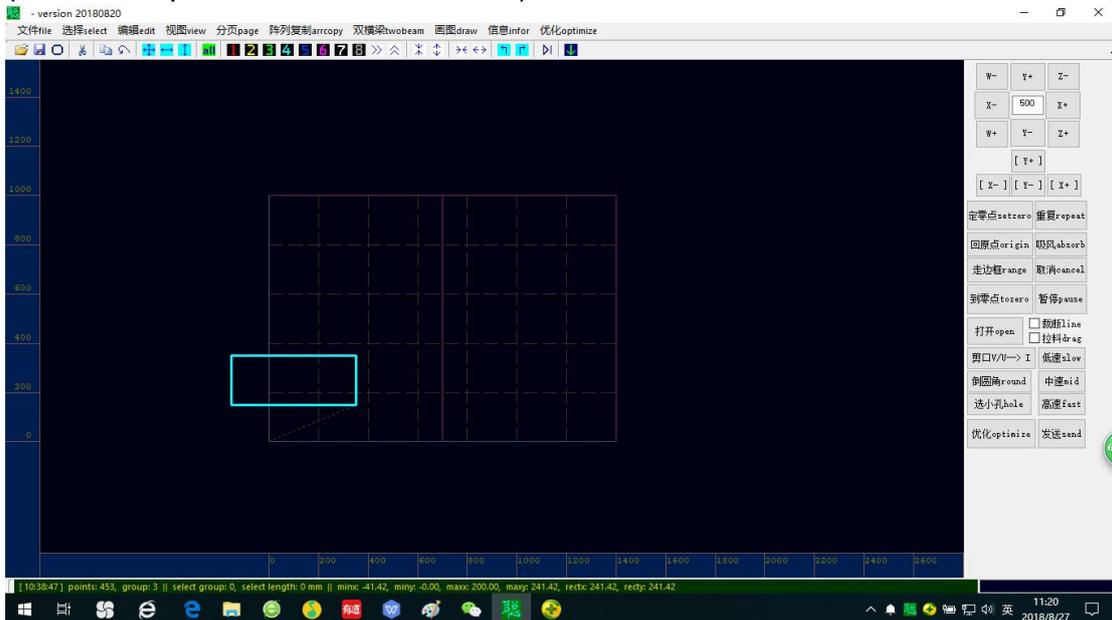


**B3.** Select the graph you want to rotate ,then click the graph rotation button as shown below:

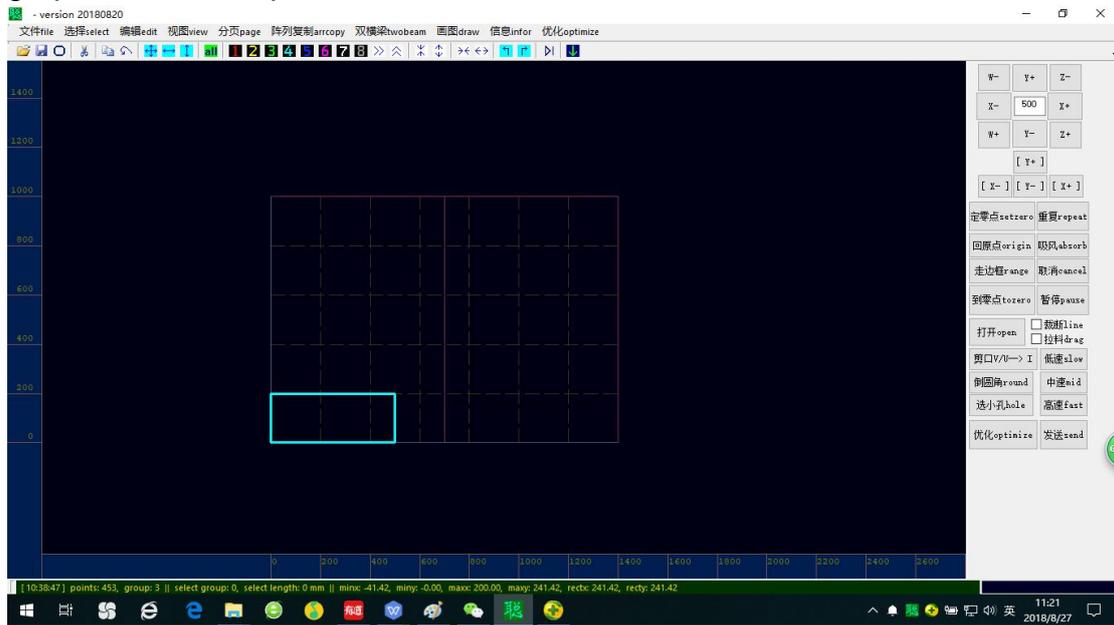


### C. Graphic movement

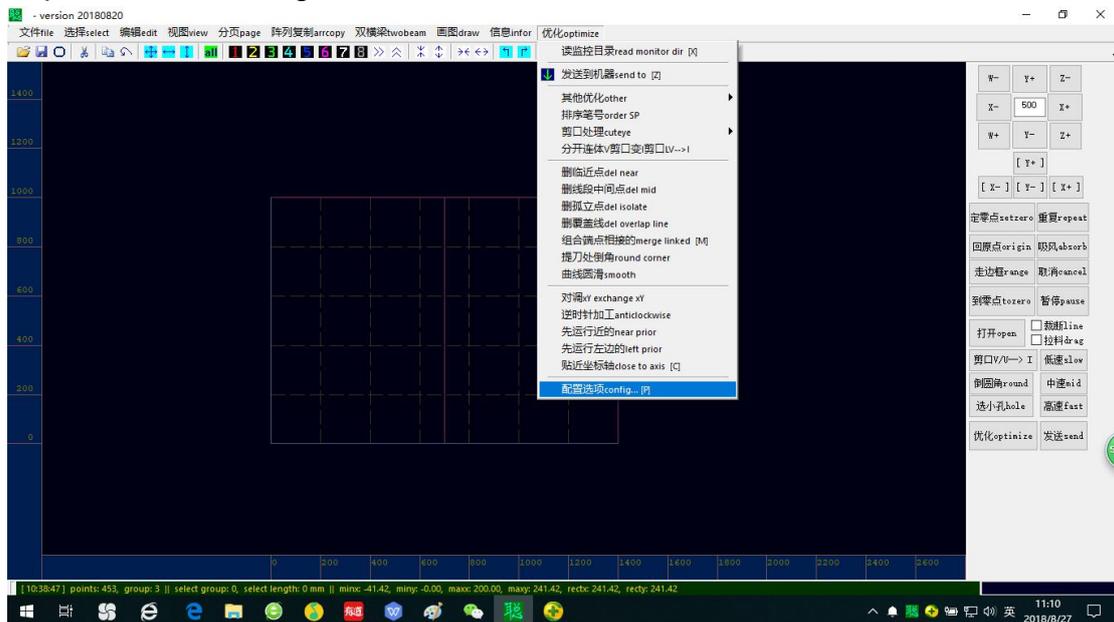
**C1.** After opening a graph, if the graph is not at the initial position of the page (initial zero position as shown below):



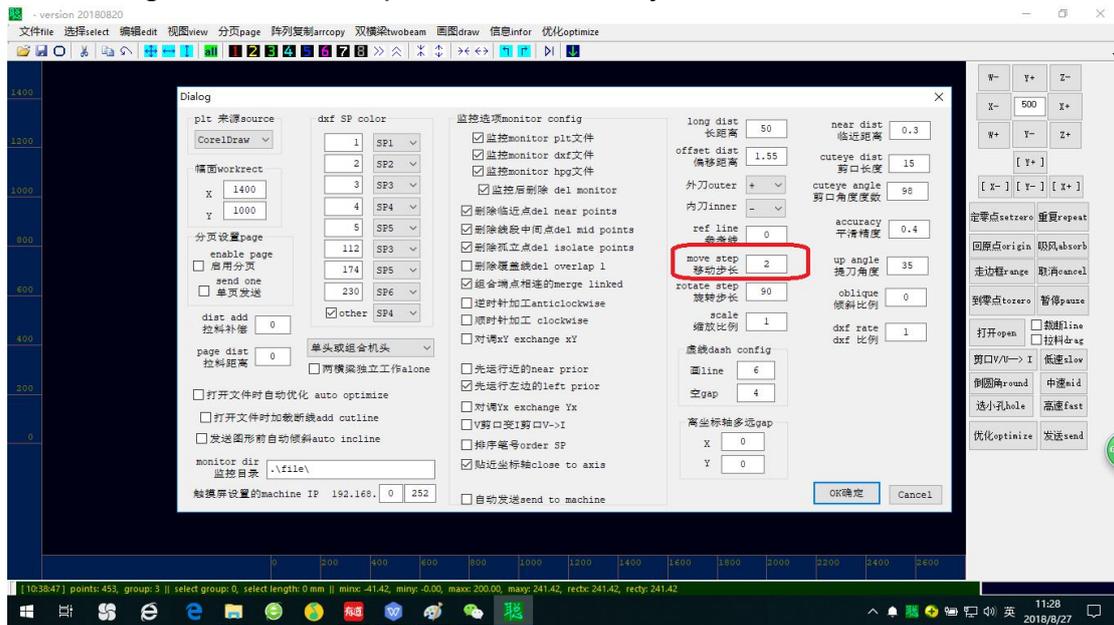
C2. Select the graph and press the "C" key on the keyboard, it can move the graph to the initial position as shown:



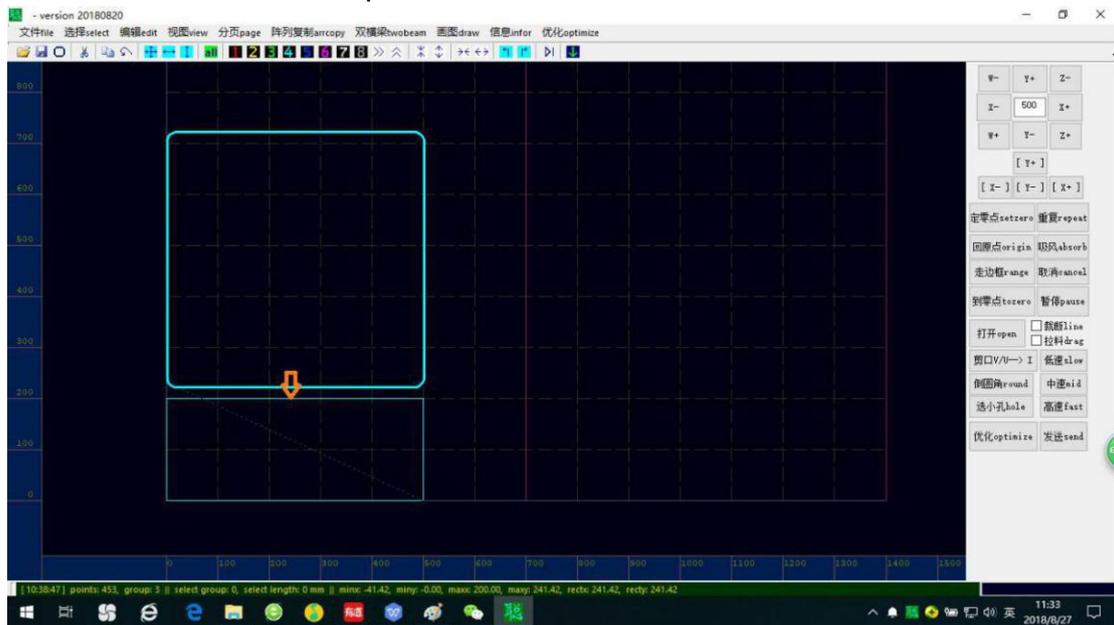
C3. If you want to move the graph up, down, left or right, you need to click on "Optimize" → "Config..."



**C4.** Change the "move step" to the distance you want to move



**C5.** Then select the graph you want to move, and press the arrow keys on the keyboard to move the selected graph, and the distance moved once is the value edited in "move step".

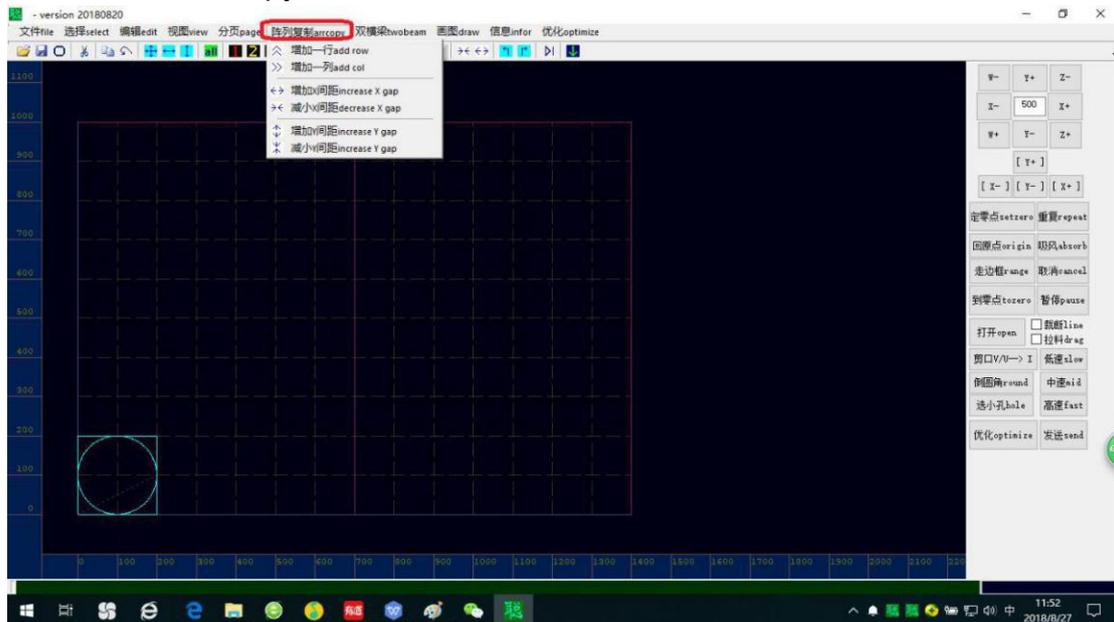


**C6.** Press the down arrow key on the keyboard to move the graph down



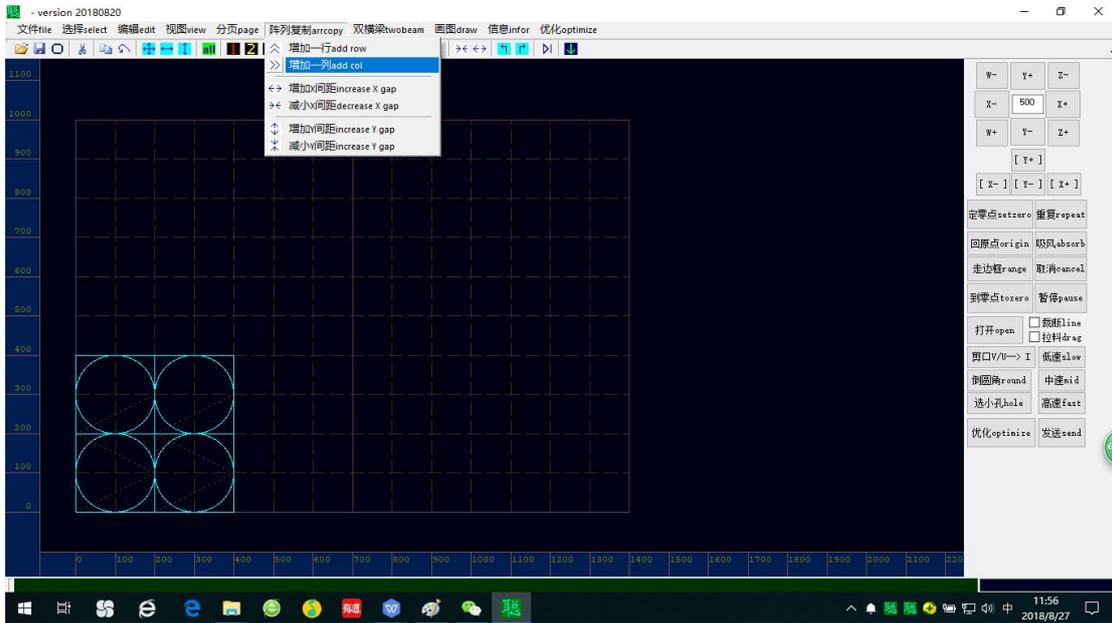
**D.** Graphic replication

**D1.** Click on "arrcopy" in the red frame as shown below:



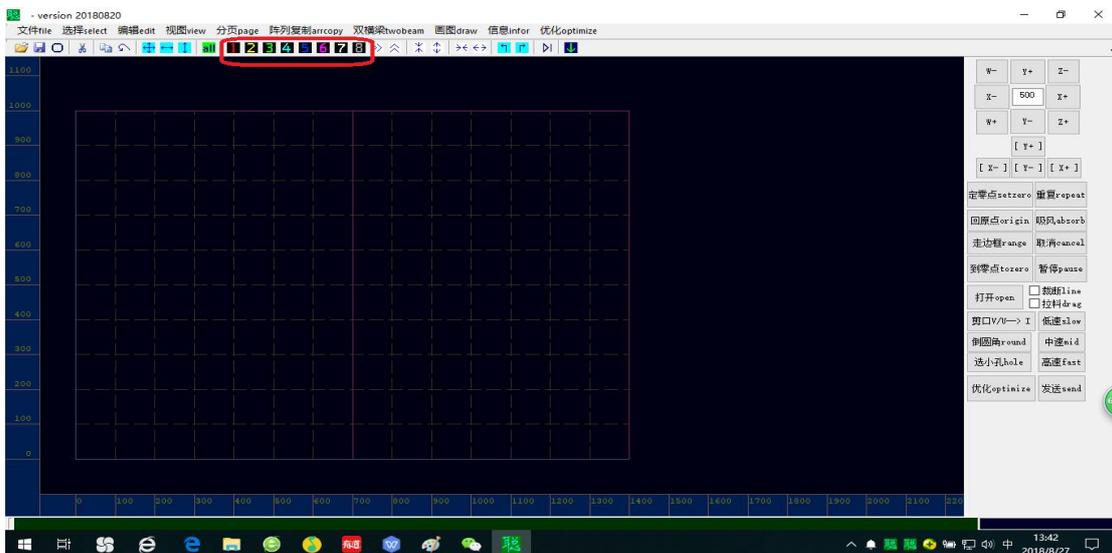
**D2.** Click on "Add row" and "Add col" according to the quantities of graph required.

**D3.** For example: Click on “Add row” once, click on “Add col” once, then the graph will be copied into 4 graphs.

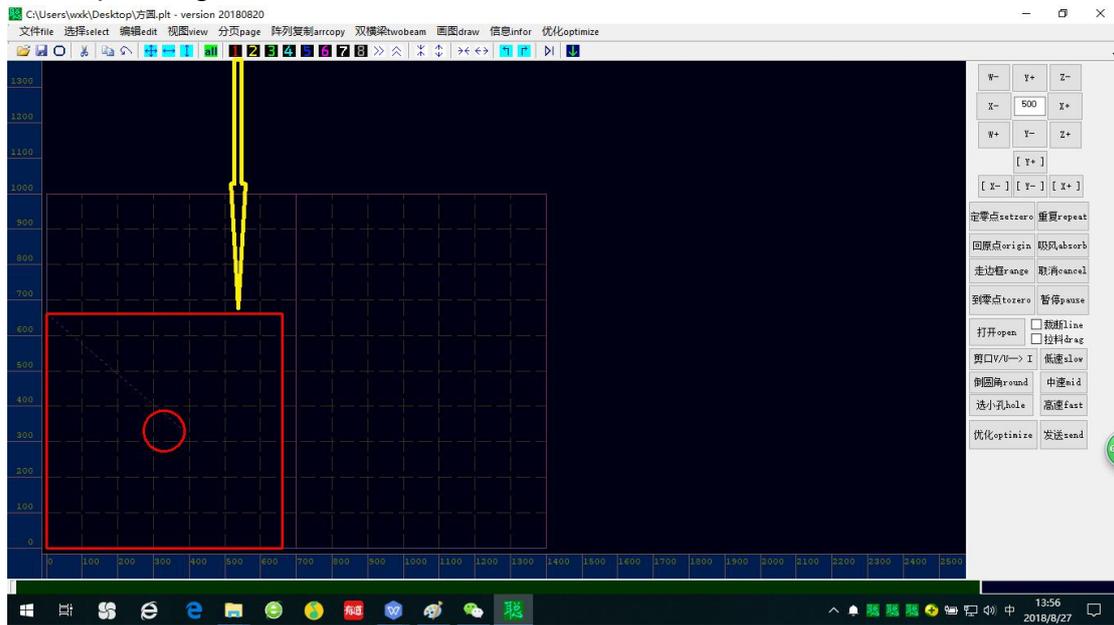


**E.**Change the SP number

**E1.** Before importing the processing graph into the cut software, choose the corresponding SP number to achieve the different cutting effects with different cutting tools. There are 8 SP numbers(SP1 SP2 SP3 SP4 SP5...) in software, the SP number and the corresponding knife depend on the actual machine model and function. Oscillating cutting tool and driven rotary tool are usually SP4, marking pen is SP1, creasing wheel tool or punching tool are SP2,V-cut tool is SP3/SP5.



E2. For Example: open a graph, the graph is shown in red, and the corresponding SP number is SP1, as shown below:



## 4. Introduction of control system

Controller	ARM7 + STM32 + FPGA (Running away from the computer)
Operation way	Touch screen + Graphic optimization output software
Display way	Chinese and English touch screen man-machine interface (Buke 7 inch screen)
Graphics transmission way	Ethernet port
Support for graphic formats	HPGL(plt) 和 DXF
Controller memory	30M
Supported number of axis	X, Y, Z, W, Z1, W1, A total 7 axis

There are generally four motors in the ordinary machine, which are called X-axis, Y-axis, Z-axis, and W-axis. Oscillating knife's rotary is controlled by W axis, up and down direction is controlled by Z axis motor. Pen control up and down and export IO signal. If machine includes creasing wheel, then has extra 2 motors: Z1 and W1, which control up &down and rotary of creasing wheel. Final one A axis, generally use to control the up&down function of milling knife or the rotary angle of punching, X axis motor drag the moving of beam, Y axis motor drag the moving of knife seat, along the moving of beam. It means , the coordinate system of machine is defined as follows: Y axis is parallel to the beam, X axis is perpendicular to the beam, and the unit of coordinate system is mm.

## 5.Panel interface

### 5.1 Screen saver interface

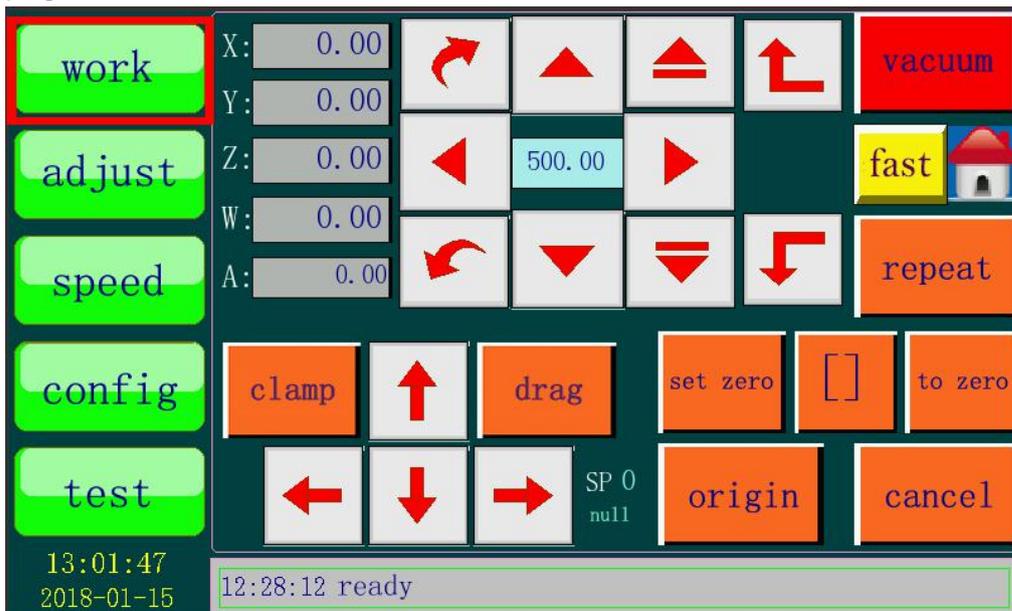
After the machine is turned on, the touch screen will enter the screen saver interface, and the machine will enter the screen saver interface even if it has not been operated for a long time.



(Note: The screen saver interface is used to prevent the operator from accidentally touching the touch screen buttons, so there is no button in the screen saver interface. You can only press the upper left corner to wake up the screen and enter the work interface.)

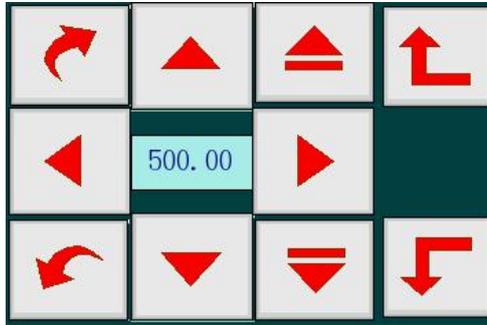
### 5.2 Work page and buttons description

(1) Click the "work" button on the left side of the screen to enter the work page



(2) The work page is used to make the machine start working. The buttons in the page can control the movement, lifting and rotation of the cutter head, and

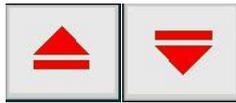
select the appropriate position to be the zero point. And control the adsorption and pull function of the fan (this function is only for machines that pull the material automatically)



(3) This area controls the movement, lifting and rotation of the cutter head.



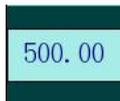
(4) These two buttons are used to control the rotation of the cutter head.



(5) These two buttons are used to control the lifting of the cutter head.



(6) This kind of arrow buttons controls the front, back, left and right movement of the cutter head.



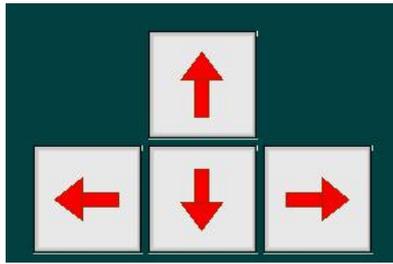
(7) The value in the rectangle means that the distance the cutter head moves when the movement direction button is not released. For example,

the value in the rectangle is 500, press , do not release your finger, the cutter head will move 500mm to the right.



(8) These two buttons are used to switch the speed of the

head movement. Click  once becomes , moving speed will be slower, easy to move a short distance.



(9) These buttons can move the machine heads to the border of the working area.



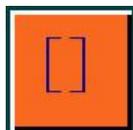
(10) When the machine is turned on, the coordinates will be initialized to 0, but the actual coordinates of the machine head inside the machine may not necessarily be 0, so it is necessary to return to the origin. The purpose of returning to the origin is to make the coordinates of the software same to the actual correct mechanical position. When returning to the origin, the machine head will go to a certain direction until it hits the corresponding sensor switch (origin signal). The four axes return to the origin together, but the Z axis will be pulled first. After returning to the origin is successful, the coordinates of the axis returning to the origin in the positive direction become the size of the working area, and the coordinates of the axis returning to the origin in the negative direction become 0.



(11) When there is a graph in the mother board, press the repeat button to re-process the current graph. It is equivalent to the start of other systems.



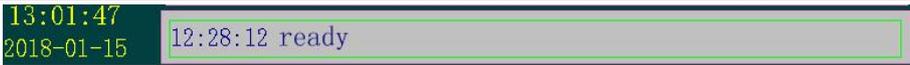
(12) Set the position of the laser (or the location of the cutter head) as a new zero point, here you need to set the offset of the laser light and the knife accurately.



(13) Walking the border is to walk around the four boundaries of the processed graphic, to see the processing range of the current graphic.



(14) The machine will stop processing and the Z axis will return to the zero coordinates, and the vacuum pump will be turned off.

(15)  pause

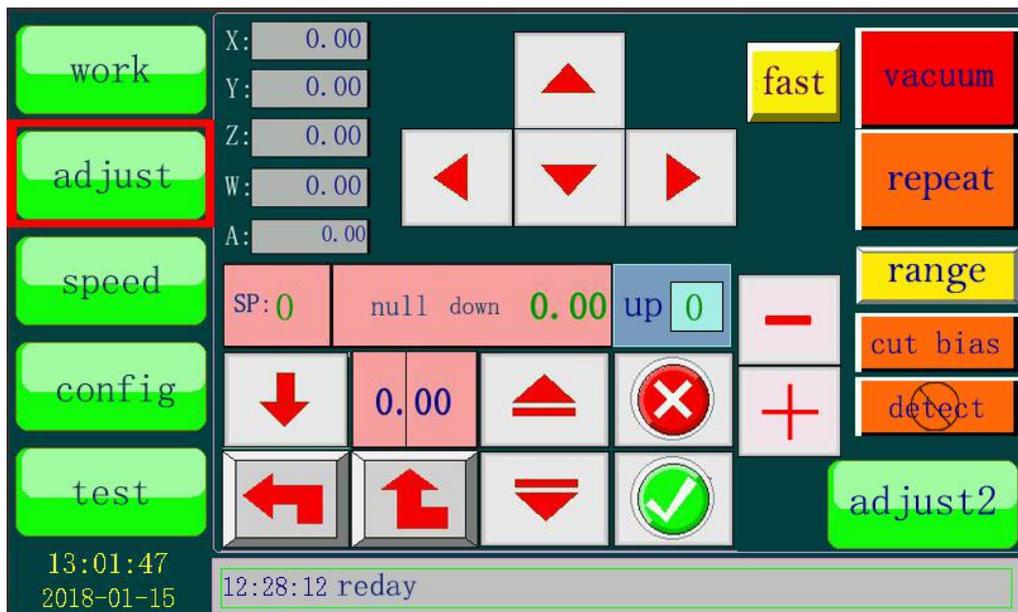
During running the graph, pressing the bottom row of the touch screen shown in the above picture, the machine will pause, and the current state will be remembered after the pause. If you press this area again, it will continue to work. If you don't want to continue, press the cancel button. If the pause area is not pressed while the graphs are not running, it is equivalent to pressing the cancel button.

(16)  Click this button to turn on the vacuum pump. Make the vacuum pump to draw air back before starting to cut. After the cutting material is sucked, click "Repeat" to start cutting. (Click "Repeat" and the vacuum pump will automatically draw the air back, and the machine will start cutting. This way is only for materials that are difficult to adsorb)

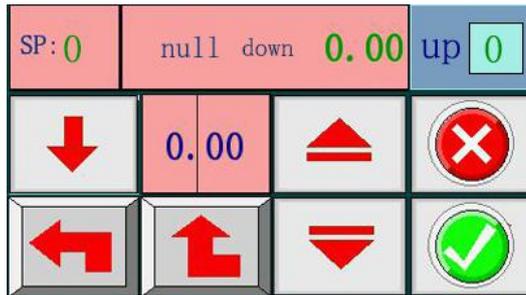
(17)  Click on the "clamp" and the clip on the beam will fall down to clamp the material. Click "drag", clip will clamp the material automatically, and the cutting beam will move forward to pull the material.

### 5.3 Adjust page and buttons description

(1) Click the "Adjust" button on the left side of the panel to enter the adjust page.

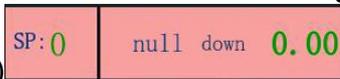


(2) The adjust page is used to adjust the depth of the knife. The machine with multiple cutters can also switch the cutter heads on this page. The angle and offset of the knife can be adjusted on adjust2 page.



(3) The buttons in this area are used to

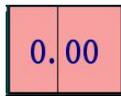
adjust the depth of the knife. There are 8 SP numbers in the machine, SP1~SP8, and the knife depth of each SP number can be set. When the tool corresponding to the type of a SP number is not controlled by the motor, the knife depth is invalid. **Knife depth means that when the machine works with a certain SP number, the depth which it need.** (The concept of the SP number comes from the HPGL language)



(4) This button is used to switch the SP number of the cutter head. Click the SP on the left to switch to the SP number to be adjusted.



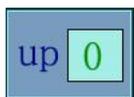
(5) If the estimated depth of the knife to be set is very close to or deeper than the previous depth, press this button to move the Z axis to the previous knife depth position at one time. **Attention! You should consider whether press it or not when changing a longer knife, because it may pierce the felt or working platform and break the knife if the depth is not suitable.**



(6) This button is used to switch the step distance of making the head down



(7) This button controls the up and down of the cutter head.



(8) This button is used to control the position of the head in the non-cutting process of the machine during cutting.



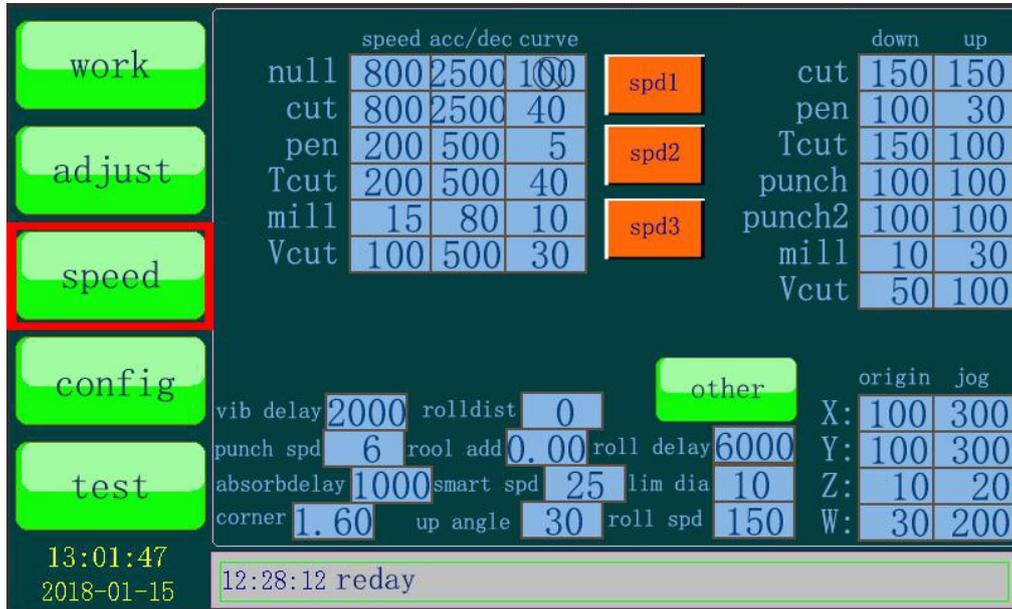
(9) If you want to give up the adjustment, click this button.



(10) This button is used to save the data of the new knife depth.

## 5.4 Speed page

(1) Click the “Speed” button on the left of the screen to enter the speed page.



(2) The speed page displays follow information: **null** (the machine's speed in non-cutting process during cutting), cutting speed (spd 1 < spd 2 < spd 3), acceleration/deceleration, curve speed, drag speed, speed of draw the air back and delay parameters and so on. You can also change the speed and parameters in this page.

	speed	acc/dec	curve
null	800	2500	100
cut	800	2500	40
pen	200	500	5
Tcut	200	500	40
mill	15	80	10
Vcut	100	500	30

(3) The values shown in this area are the speed corresponding to the different cutter heads of the machine. If you want to change, enter the value of the required speed in the corresponding box.

	down	up
cut	150	150
pen	100	30
Tcut	150	100
punch	100	100
punch2	100	100
mill	10	30
Vcut	50	100

(4) The values shown in this area are the speed of different cutter heads fall and rise during cutting.

	origin	jog
X:	100	300
Y:	100	300
Z:	10	20
W:	30	200

(5) The values shown in this area means the speed of the machine's four axes moving to the origin and the speed of the movement.

(6) **roll delay 6000** It means drag delay, the interval between after cutting of a set of pattern and the next drag action of the machine.

(7) **roll spd 150** It means the speed of drag material.

(8) **rolldist 0** It means the distance of drag material, and the distance depends on the length of the processed pattern. For example, if you need to cut the pattern with a length of 2400mm, the machine will drag 2400mm distance. If you cut a square with side length of 100mm, the machine will drag 100mm distance.

(9) **rool add 0.00** It means the distance difference between the theoretical drag distance and the actual drag distance. For example, cutting a square with side length of 1000mm, the theoretical drag distance is 1000mm, and the actual distance is 990mm which is 10mm distance difference. Enter the distance difference in this box and it will work normally.

(10) **up angle 30** It means the angle between the knife and the present straight line when it is about to turn. If the actual angle is larger than the set angle, the knife will lift and rotate the degree of the corner and then fall and cut. If the actual angle is less than the set angle, the knife will not be lifted and will be turned directly for cutting.

(11) **corner 1.60** It means the accuracy of the corner during the cutting process, which is generally set according to the machine's curve speed. For materials with higher requirements, the corner accuracy is generally set at about 1.5.

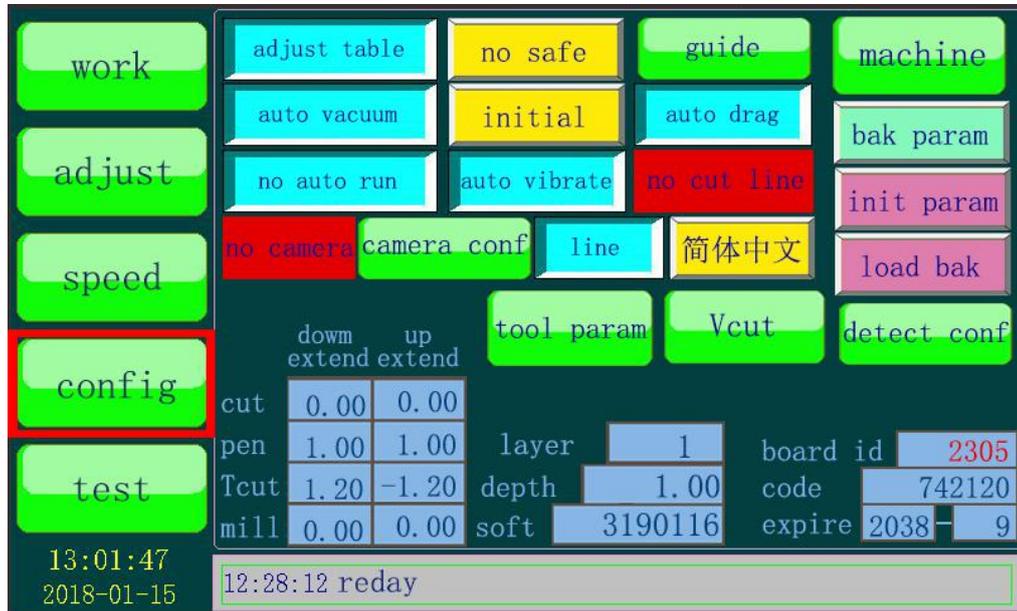
(12) **vib delay 2000** It means the interval between the cutter head vibrating and start cutting after the "repeat" button is clicked.

(13) **absorbdelay 1000** It means the interval between the vacuum pump starts to work and after the "repeat" or "vacuum" button is clicked.

(14) **punch spd 6** It means the rotational speed of the punching knife.

## 5.5 Config(configuration) page and buttons description

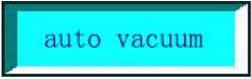
(1) Click the "Config" button on the left of the screen to enter the config page.

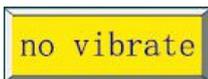


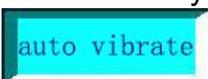
(2) Some functions of the machine can be set or changed in the config page, and the corresponding code can be got according to the motherboard id displayed on this page to unlock the extended use period of the machine.

(Note: Regarding the time limit. The use of the machine is time-limited. This time precisely counted by month. The motherboard will be reserved for two months when it leaves the factory, which is convenient for the factory to produce and test the machine. After this time, an authorization code is required to extend the life span. Different motherboard number and service period, the authorization code is different. Assume that the motherboard is reserved for use until August 2017, and is now June 2017. Before September 1, 2017, this motherboard does not require an authorization code. Starting from August 1st, 2017, every time machine return to the "origin", the touch screen will prompt that the use period is approaching. After September 1st, after press the "origin", the touch screen will prompt that the machine's use period has expired, So that the machine can't run. If you enter the 12-month authorization code in the touch screen at this time, after machine to the "origin", the use period will until August,2018. If the machine does not need to limit the period of use, just enter an authorization code of 240 months (20 years).

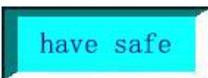
(3)  Before the machine working, the vacuum pump won't work automatically. It can be changed to "auto vacuum" by pressing it.

 Vacuum pump will work automatically before the machine cutting.

(4)  The vibrating knife will not vibrate during cutting, which is equivalent to unplugging the signal line of the vibrating knife. It can be changed to "auto vibrate" by pressing it.

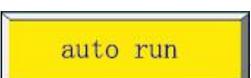
 The vibrating knife will vibrate automatically during cutting.

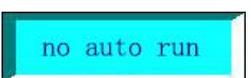
(5)  The safe switch is at the situation of being turned off. If you want to turn on the safe switch, just press it.

 The safe switch is at the situation of being turned on, and the machine will pause if the safe switch is touched during cutting.

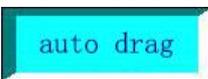
(6)  If there's a round punching knife in the punching tool, you have to set it like this.

 If you want to punch a pattern which with a direction, such as V-punching, you need to change it to "line". The direction of V is determined by the direction of the short line in the graph, so the pattern to be sent must be a line segment.

(7)  The machine cuts the graph immediately after receiving it.

 After receiving the graph, the machine will not cut automatically. Press twice "to zero" and you can check the cutting position of graph. Press "repeat" to start cutting.

(8)  For no-auto-feeding system machine, this button is set as shown above. If it is a auto-feeding machine, press this button to switch to



board id	2305
code	742120
expire	2038-9

(9) The “board id” is the number of the machine’s motherboard number. The “code” is corresponding to the certain board id. The “expire” is the deadline for use the machine.

	down extend	up extend
cut	0.00	0.00
pen	1.00	1.00
Tcut	1.20	-1.20
mill	0.00	0.00

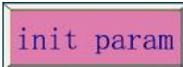
(10) The values in this area are used to control the over-cutting (It’s a phenomenon of excessive cutting in machining, which including cutting too long and too short). The extensions are the down extension and the up extension. If the extension value is a positive number, it means the machine will cut a longer distance; if it is a negative number, it means the machine will cut a shorter distance.

## 5.6 Test page

(1) Click the “test” button on the left of the screen to enter the test page.



(Note: A. In order to prevent wrong operation, some buttons and parameters are invalid by default, and there is no response in the touch screen if you touch these buttons. There are circles above these buttons, like this one , Because these buttons are more important, you need to unlock to operate.

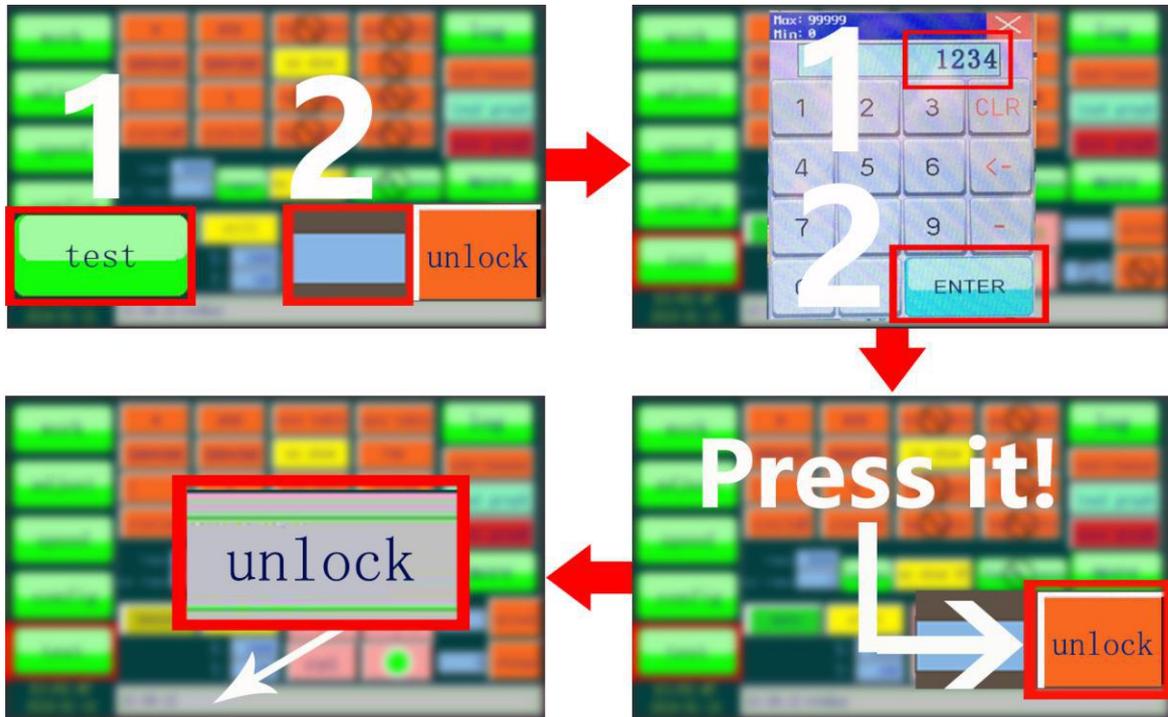
After the unlocking is successful, the circle above is gone, . B. In the case of unlocking, you can change the password. The method of changing the password is to type the new password into the left box of the

“change” button, and then click the “change” button.

c. In the case of unlocking, type a wrong password and press the “unlock” button, the buttons will be locked again.

D. The initial password is 1234. Let the person who knows the machine operate these encrypted places. )

(2)Buttons to unlock



(3)In the "times" box of this picture 

times	9000
cut times	1

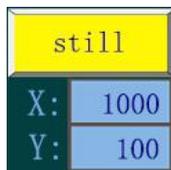
, type the number of times

you want to cut, and click this button 

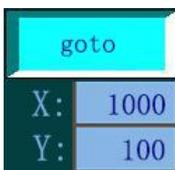
continuous
------------

, the machine will start cutting according to the set number of times. The "cut times" shows the number of times that have been cut.

(Note: the value in “times” cannot be less than the value in “cut times”)

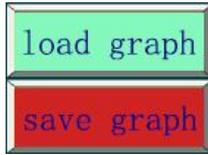


(4) After the cutting is completed, the machine will stop at the same position, press this button to switch the status.

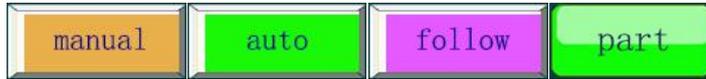


(5) After the cutting is completed, stop at the X, Y position

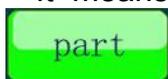
specified in the box below.

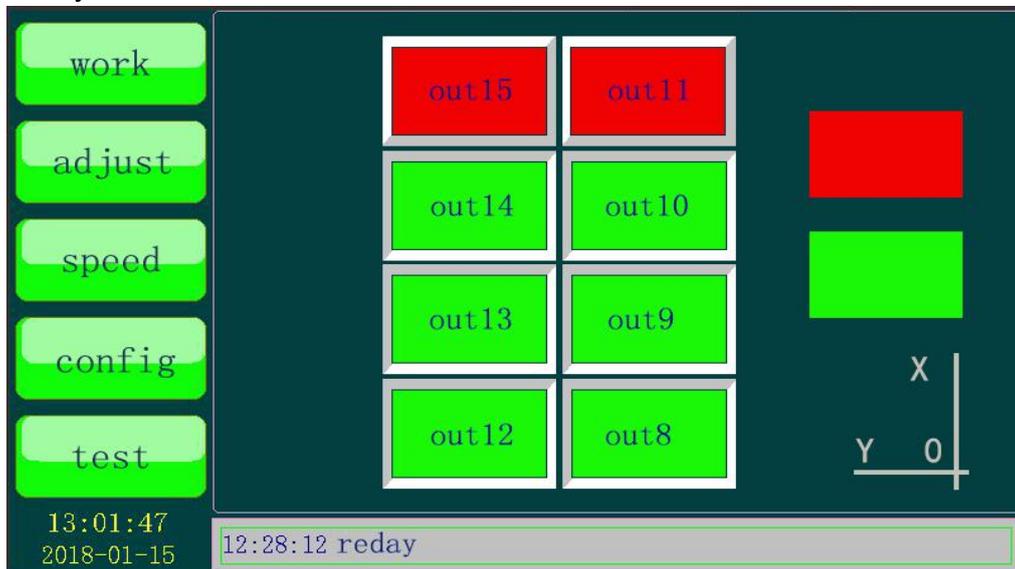


(6) These two buttons can save the current graph and it can be read and run again the next time you turn it on.

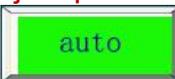


(7) These four are used for partition adsorption.

A.  It means the partition adsorption area can be selected manually. Press  button, it will show as below:



(Note: The red areas won't adsorb the material, and the green areas will adsorb the material after press the "vacuum" or "repeat" button. For example, if you don't want to let the area out14 and area out10 adsorb the material, you can just press the "out14" button and the "out10" button to close them.)

B.  It means the machine will select the suction areas automatically according to the graph which sent to the machine. For example, after a little graph which will use the area out12 and area out8 is sent to the machine, only the area out12 and area out8 will adsorb the material at the same time during cutting.

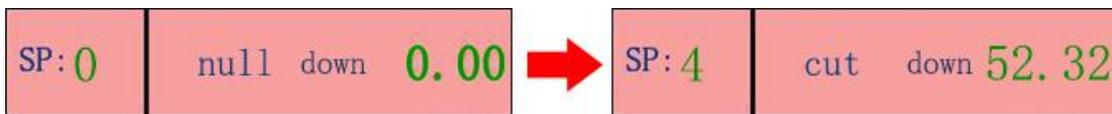
C.  It means when the cutter head moves to a certain area, the current area and the adjacent areas will adsorb the material. For example, if the cutter is at area out8, the area out8, out9 and out12 will adsorb the material. If the cutter head is at area out9, the area out9, out8, out13 and out10 will adsorb the material.

## 6.Parameters debugging (for example: vibrating knife)

### 6.1 Setting the knife depth

(1) Click  to enter the adjust page.

(2) Switch SP:0 to SP:4 by pressing the following button.

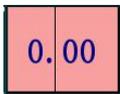


The “down 52.32” shown in the picture is the knife depth set before. If the knife depth to be set is close to or deeper than the previous knife depth,

press the button  to move the Z axis to the previous knife depth position at one time.

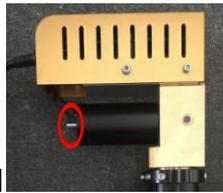
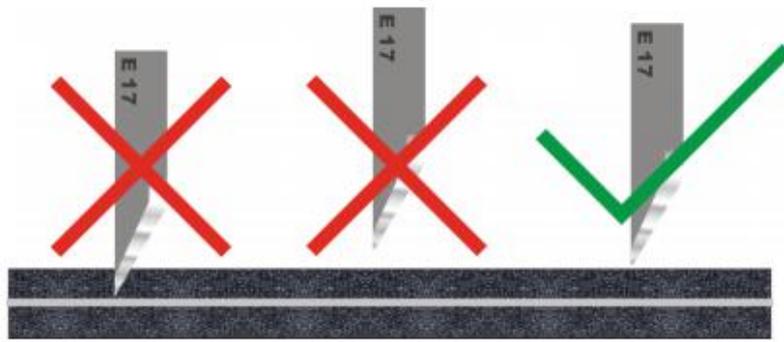
(Note: After changing the knife or tool, it is necessary to judge whether to use

the  button according to the actual situation. If the cutter head falls too deep, it may pierce the felt and platform, causing the knife to break and damage the work platform.)

(3)  and  and  should be used together, the former is the inching control of rising and falling, the latter is the distance of rising and falling each time when the head moves by inching control. There are four values of 5mm, 1mm, 0.1mm and 0.03mm for switching. Click the latter to switch the value.

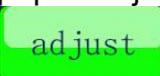
(4) Judgment of the knife depth

A. When the tool tip just touches the felt surface, the tool alignment is completed, as shown in the figure below.



**B.B1.** Rotary vibrating tool  this position, until the tip of the knife drops to its lowest position. **B2.** Place a piece of typing paper on the table and drag the paper by hand. If the paper is just cut off, then the adjustment is done.

**C.C1.** Click  then click 

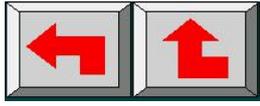
**C2.** Place a piece of typing paper on the table and drag the paper by hand. If the paper is just cut off, then the adjustment is done. Click  then click  back to the adjust page.

(5) After adjusting the knife depth, click  to save the knife depth data.

(Note:  this button is to give up the adjustment of knife depth. After clicking, the knife depth data will not be changed)

(6) According to the thickness of different materials, you can click  to change the height of the head that corresponds to the present SP number when it's working. The value should not be less than 2, otherwise the cutter head will be raised to the origin position when it's working.

(Note: Set the rising height, 1. Click the button  on the left of the screen, 2. Click the button  in the upper right corner, 3. Click the button  4.  Change the value in box to 0.)

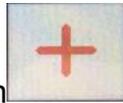


(7) Click on any of the two buttons to cut the rectangle to test if the knife depth is appropriate.

(8) If the current knife depth is slightly shallow or too deep, the following methods can be used to fine-tune the current knife depth. **Take a slightly shallow knife depth as an example:**



A. First, set the step size of the inching in this button, at this time, the step size should be set according to the thickness of the part of the material that has not been cut through. If not sure, switch it 0.1mm.



B. Click the button to add 0.1mm knife depth to the current knife depth

C. Test again. If the material is cut through and the felt is not damaged, that means the knife depth is reasonable.

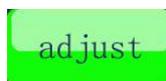
(9) Knife depth adjustment is completed, other tool depth adjustment is similar, please refer to **7. Tool installation and knife depth adjustment.**

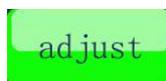
## 6.2 Debugging initial angle

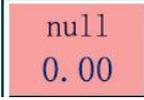
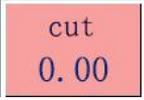
**(Note: The depth of the knife must be set well before debugging the angle. When testing the angle, the material shouldn't be cut off, only marks left is okay.)**

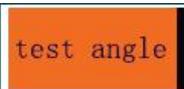
The reason for adjusting the initial angle is that the tool driven by the rotating motor, such as the vibrating knife or the creasing tool, after returning to the origin, the direction the tool points to is not in the position of 0 degree, but in an angle with 0 degree. If we set the initial angle, the machine will automatically compensate for this angle, so that the tool will automatically set after returning to the origin.

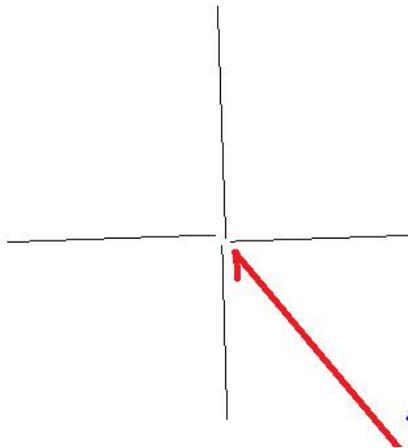
Before adjusting the initial angle, a piece of material should be laid. The material should be of a certain thickness, such as soft glass and KT board.



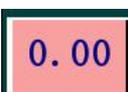
(1) Click , then click  to enter adjust2 page.

(2) A.Click  on the left of the panel to .

B.Click , vibrating knife will cut a cross,the angle of the cutter head is judged according to the effect of cutting the cross. For example:

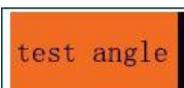


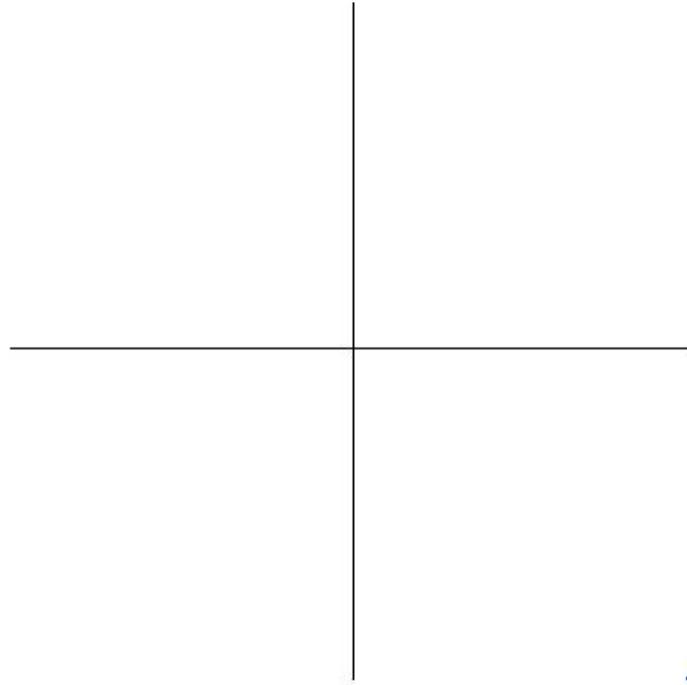
C.Each line of the cross is anticlockwise, and the angle of the knife head should be adjusted clockwise.

(3) A.Click  to change step size(The step size values are 50,10,1,0.1 and 0.03 in total, which can be switched.)

B. Click  or  turn the cutter head clockwise or anticlockwise to the 0 degree position (clockwise, anticlockwise depending on the actual situation, here should be clockwise fine adjustment).

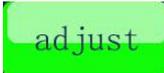
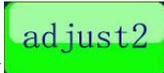
C. After the fine adjustment is completed, click the button  to save the current angle as the initial angle.

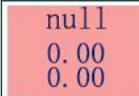
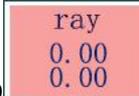
(4) Click , cut a cross and observe it, until the upper and lower , left and right sides of the cross reach the effect of the below figure.



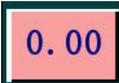
### 6.3 Adjusting the offset between the vibrating knife and the laser lamp

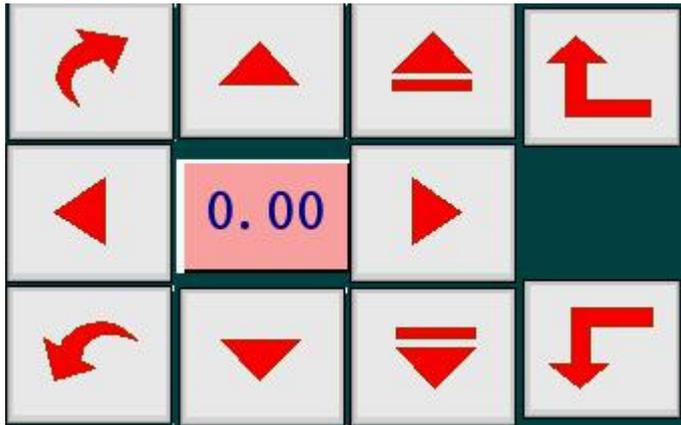
(Note: A. Before adjusting the offset, the knife depth and angle must be adjusted well firstly. B. Place a piece of material on the machine table, please refer to 6.2 Debugging Initial angle.)

(1) Click  →  to enter adjust2 page.

(2) A. Click the right of the screen  to switch to 

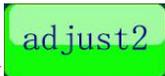
B. Click , the vibrating knife will cut a cross on the material , After the cutting, the laser lamp will move to the cross and observe if the red dot of the laser lamp is at the center of the cross.If it is not in the center, click

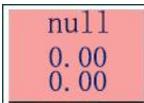
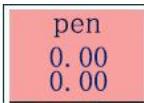
 to switch the step size. The step size is decided on the distance between the red point and the center of the cross.Then press the direction button in the figure to move the red point to the center of the cross so that it coincides with the center of the cross.



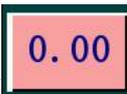
(3)After confirming the coincidence, click  to save the data, and the offset of the vibrating knife and the laser lamp is debugged.

## 6.4 Adjusting the offset between vibrating knife and mark pen

(1)Click  →  to enter the adjust2 page.

(2) A. Click  to switch to .

B. Click , the vibrating knife will cut a cross on the the material. After the cutting, the mark pen will draw a cross and see if the two crosses

coincide., if not coincide click  Switch to the moving step length, the move step length depends on the distance between two cross, and then press the button around the key direction of movement of the brush, brush will move into the center of the cross, if not determine whether moving into the center of

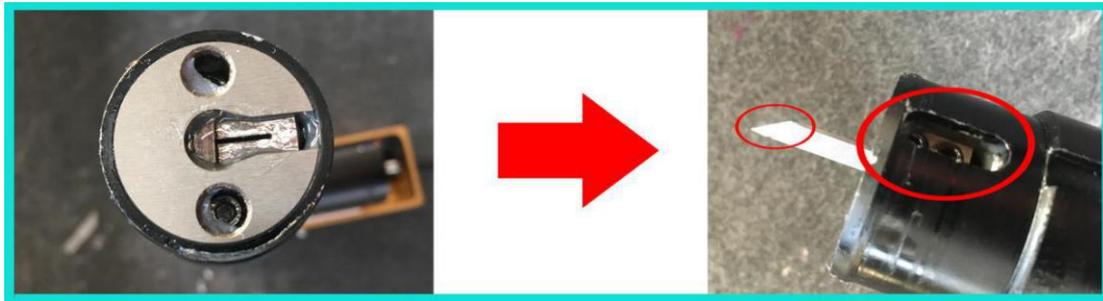
the cross is first click  save the current offset and then test it again, until the two cross overlap, vibration knife and brush debugging finishes.

## 7.Tools installing and debugging

(Note: Due to the model of single cutter head and multiple cutter heads, different SP numbers correspond to different cutter head. Generally speaking, the cutter head which near the origin is the head1, and the rest of the cutter heads are sorted in order. Among them, for the model of multiple cutter heads, the head1 can only be used with SP4, the head2 can only be used with SP2,SP3,SP5, the milling tool only can be used with SP6. The above are all the SP numbers in the panel, please be sure to distinguish them from those in the computer software. And please refer to the actual machine model)

### 7.1 Oscillating cutting tool (SP4, head1)

(1) The knife must be placed at the bottom of the groove, and the cutting edge is at the same side with the jack-screws.



(2) The cutting edge of the knife must face the direction which the X-axis goes back to origin, and tighten the circle ring in the rightmost figure.



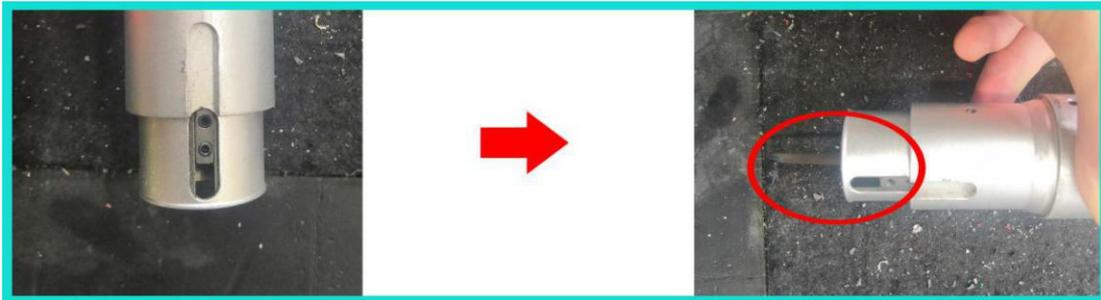
(3) Fix the black slot to the iron rod in the figure and insert the tool motor cable into the left socket.



(4) Knife depth and Angle setting please refer to [6.1 Setting the knife depth](#) and [6.2 Debugging initial angle](#).

## 7.2 Pneumatic oscillating cutting tool (SP4, Head1)

(1) The knife is placed at the bottom of the groove, and the cutting edge of the knife is at the same side with the jack-screws.



(2) The cutting edge of the knife must face the direction which the X-axis goes back to origin, and tighten the circle ring in the leftmost figure, and insert the cutter rod air pipe into the left air nozzle of the wires box.



(3) Knife depth setting please refer to [6.1 Setting knife depth](#) → (4) [Judgment of the knife depth](#) → C, the air pressure should be adjusted to about 0.5mpa which according to the cutting material.

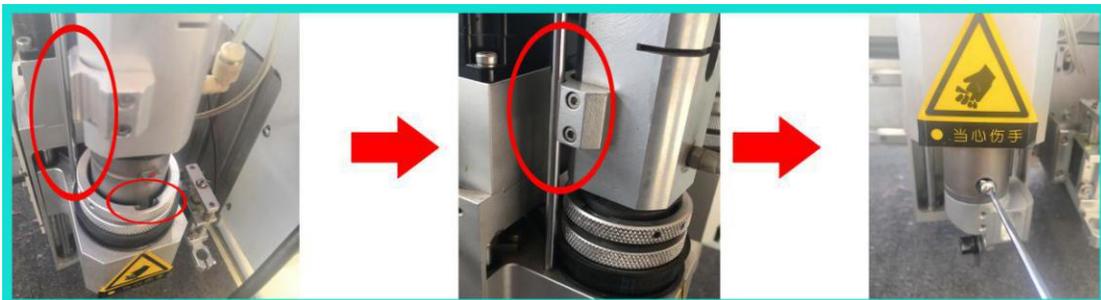
(4) Angle testing please refer to [6.2 Debugging initial angle](#).

### 7.3 Driven rotary tool (SP4, Head1)

(1) First, remove the black nut in the left picture, then insert the knife, and finally fix it with a hex-wrench and a fork-wrench.



(2) After the cutter rod is placed in the cutter holder, tighten the circle ring and fix the slot to the iron rod at the figure. Tighten the screws at the connection between the tool rod and the tool head in the rightmost figure, and insert the motor cable of the tool rod into the left socket of the wires box.



(3) Knife depth setting, drop the knife rod to an appropriate position, turn the black nut of the fixed knife by hand, and when the edge of the round knife touches the felt edge, then try cutting. If the knife depth is slightly shallow or too deep, the knife depth can be fine-tuned ([Refer to 6.1 Setting the knife depth → \(8\)](#)).

(4) Angle setting please refer to [6.2 Debugging Initial Angle](#).

(5) Over-cutting ([Refer to 5.5 Config\(configuration\) page and buttons description → \(10\)](#)), the over-cutting is controlled by extension. Extension is divided into down extension and up extension. When the extension value is positive, it means to cut a distance more. If it is negative, it means to cut a

distance less. Click  Change the data in the red box below to fine

tune

	down extend	up extend
cut	0.00	0.00
pen	1.00	1.00
Tcut	1.20	-1.20
mill	0.00	0.00

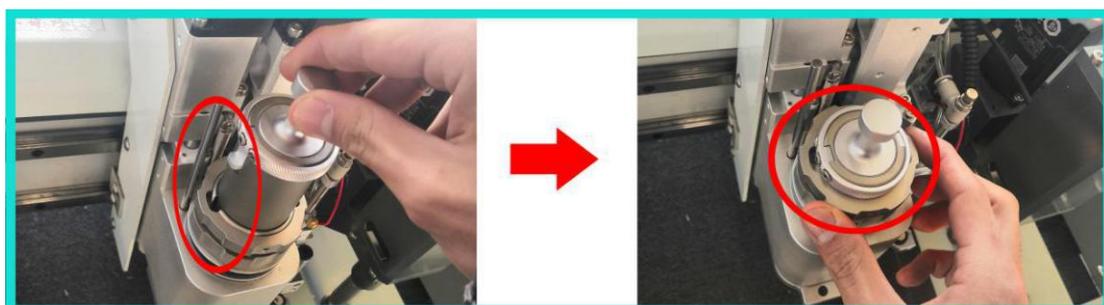
(Note: This method is also applicable if the remaining tools also have a problem of over-cutting)

## 7.4 Universal cutting tool(Drag knife)(SP4, Head1; SP2, Head2)

(1) The knife must be placed at the bottom of the groove, and the cutting edge of the knife is at the same side with the jack-screws.



(2) The cutting edge of the knife must face the direction which the X-axis goes back to origin, tighten the circle ring.



(3) Knife depth setting, please refer to [6.1 Setting the knife depth](#) →(4) Knife depth judgment →A.

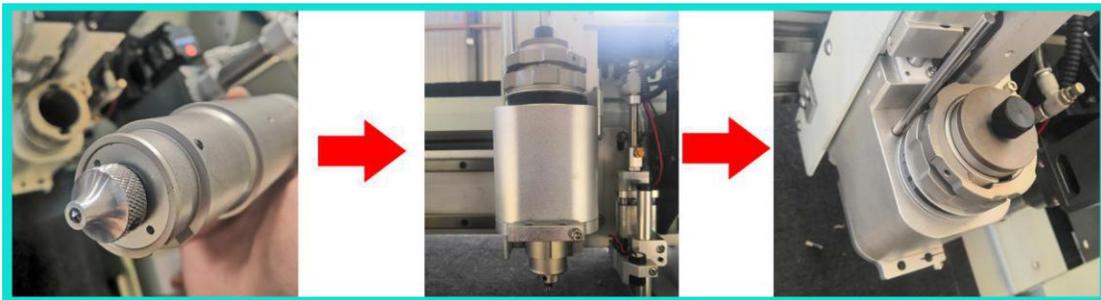
(4)Angle setting, please refer to [6.2 Debugging initial angle](#).

## 7.5 Kiss cutting tool (SP4, Head1; SP2, Head2)

(1) The thickness of the exposed part of the tool tip is the same as that of the cutting material.



(2) The side of cutter edge must face the direction which the X-axis returns point, tighten the circle ring. The position of the black knob above the knife rod should be adjusted according to the cutting effect. If the material needs to be cut through, the knob should be fully tightened.



(3) The knife depth setting, in order to achieve the effect of half-cutting, **A.** Adjust the black knob above the knife bar so that the distance of the tool head telescopic is about the same as the height of the material undulation. **B.** Drop the knife shank until the tip is in contact with the felt. When the shank falls but the cutter head does not continue to fall, the shank continues to fall about 1 mm.

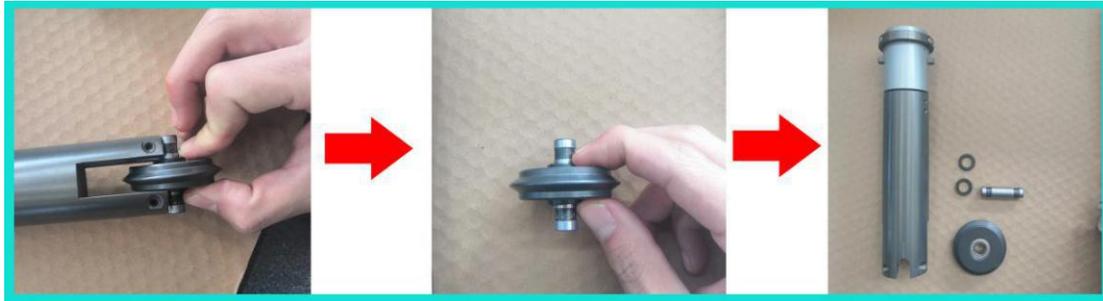
(4) The knife depth setting, if the material is to be completely cut through, **A.** Adjust the black knob above the knife bar to fix the cutter head. **B.** For the knife depth setting, please refer to [6.1 Setting the knife depth](#) → (4) [Knife depth judgment](#) → **A**

(5) Try to cut the materials, if you should adjust it for fine tuning, please refer to [6.1 Setting the knife depth](#) → (8).

(6) For the angle setting, please refer to [6.2 Debugging Initial Angle](#).

## 7.6 Creasing Wheel Tool (SP2, Head2)

(1) Introduction to the structure



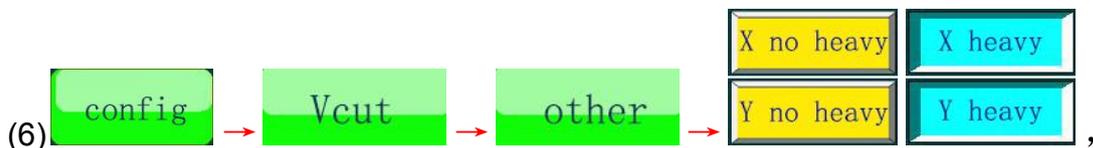
(2) Tighten the circle ring, tighten the jack-screws.



(3) When the creasing wheel is working, adjustment of the position of the creasing wheel dropping is the same as that of the knife depth setting, but the specific position is based on the actual folding effect ([Refer to 6.1 Knife depth setting and 6.1 knife depth setting \(8\)](#)).

(4) For angle setting, please refer to [6.2 Debugging initial angle](#)

(5) For testing the offset, please refer to [6.4 Adjusting the offset between vibrating knife and mark pen](#).



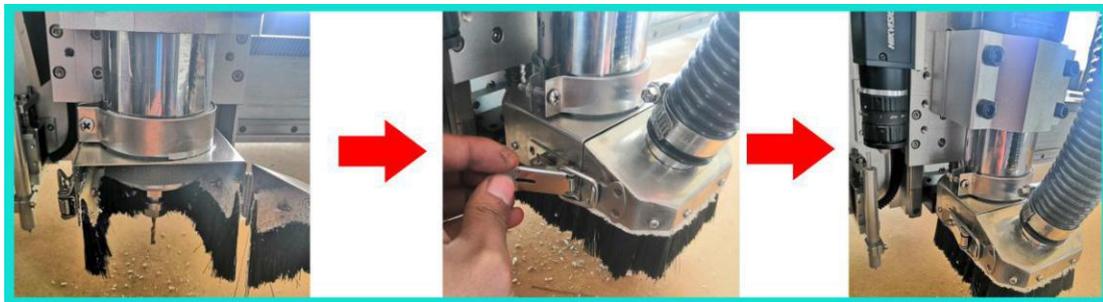
Choose the processing method according to the actual situation.

### 7.7 Milling Tool (SP6,Head3)

(1) Milling tool installation.



(2) Installation finished.

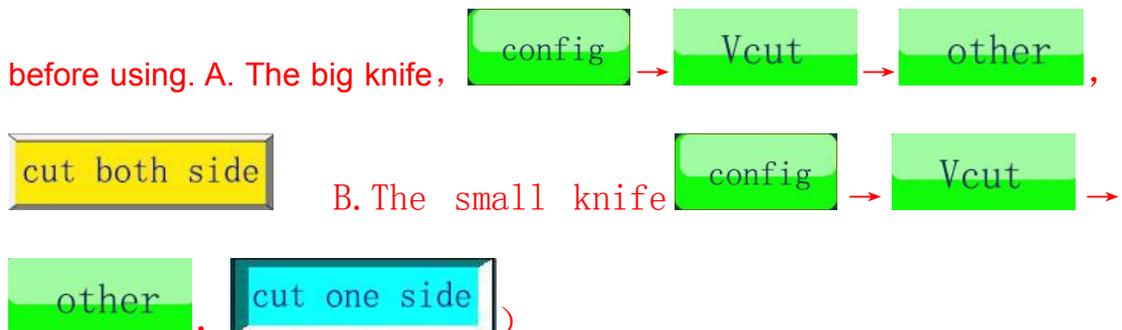


(3) Knife depth setting, the tail of the milling cutter is just in contact with the felt (Refer to 6.1 Knife depth setting and 6.1 Knife depth setting → (8)).

(4) For the testing offset, please refer to 6.4 Adjusting the offset between vibrating knife and mark pen.

### 7.8 V-cut tool (Big Knife SP number: SP3, Small Knife SP number: SP5, Head2)

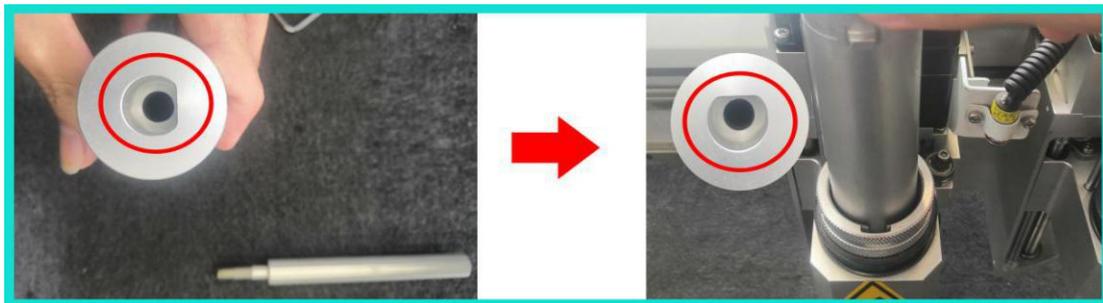
(Note: The V-cut knife is divided into two sizes, one is a big knife (cannot cut arc) and another one is a small knife (can cut arc), which needs to be changed



(1) Tools installation



(2) The flat mouth must be located near the side of the beam.



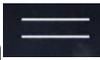
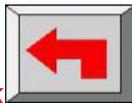
(3) Put the knife head into the cutter holder, and tighten the screw in the rightmost figure.



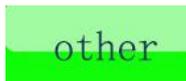
(4) Test and adjust the horizontal direction . A. Simply place the knife tip into

the KT board 0.2-0.3mm and set it to the down origin. B. Click  Test

cutting effect. C. If the cutting effect is as shown . click  Fine

tune its parameters, till the cutting effect is as shown . D.click ,

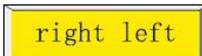
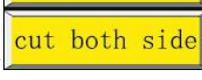
If the two lines do not coincide,click  to fine tune its parameters, until the two lines coincide.

(5) Testing offset, click  →  →  , the

 parameter must be set to  , the depth of the knife is also simply place the knife tip into the KT board 0.2-0.3mm , the next steps please refer to [6.4 Adjusting the offset between vibrating knife and mark pen](#).

(6) Knife depth setting , simply drop the tip to the thickness you want to cut. (Refer to [6.1 Knife depth setting](#) and [6.1 Knife depth setting](#). → (8)).

(7)  →  →  → 

 ,

Choose the processing method according to the actual situation.

(8)  →  →  → 

	
0.00	0.00

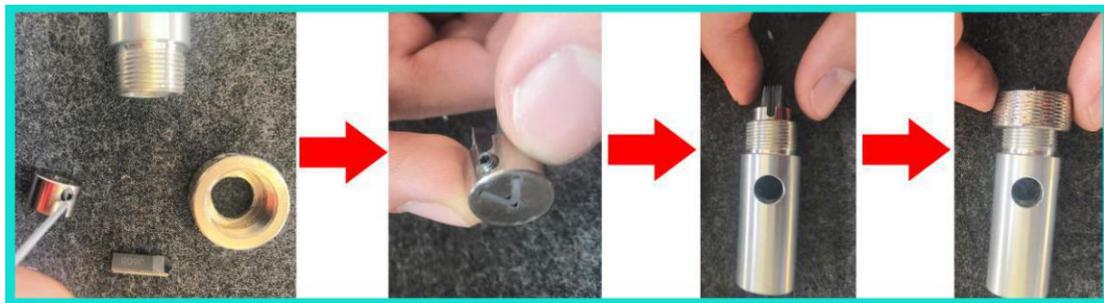
 , over-cutting

fine-tuning (Refer to [Refer to 5.5 Config\(configuration\) page and buttons description](#) → (10) and [7.3 Driven rotary tool](#) → (5) Over-cutting).

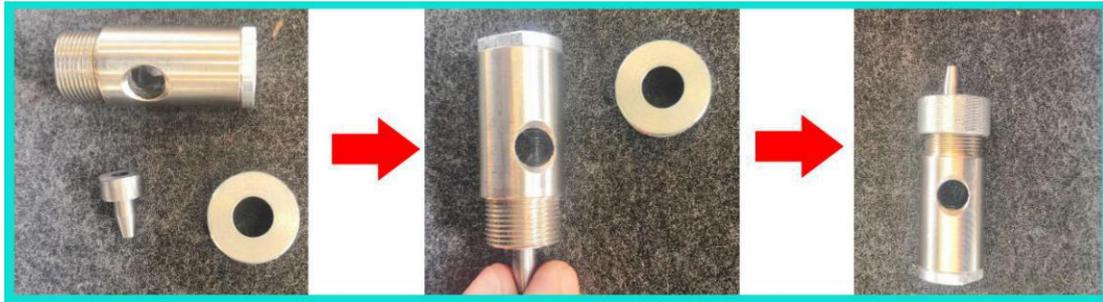
## 7.9 Punching Tool (SP2)

(Note: There are two kinds of punching knives, one V-shaped knife and one round knives. The V-shaped knife needs to be manually adjusted. And the other adjustments of these two knives are the same. The air pressure should be adjusted to 0.3-0.4MPa according to the actual situation.)

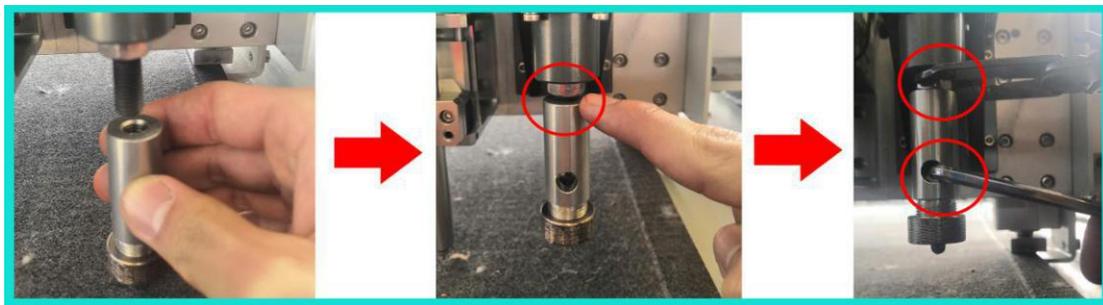
(1) V-shaped knife installation, please install in strict accordance with the following steps.



(2) Round knife installation, please install in strict accordance with the following steps.



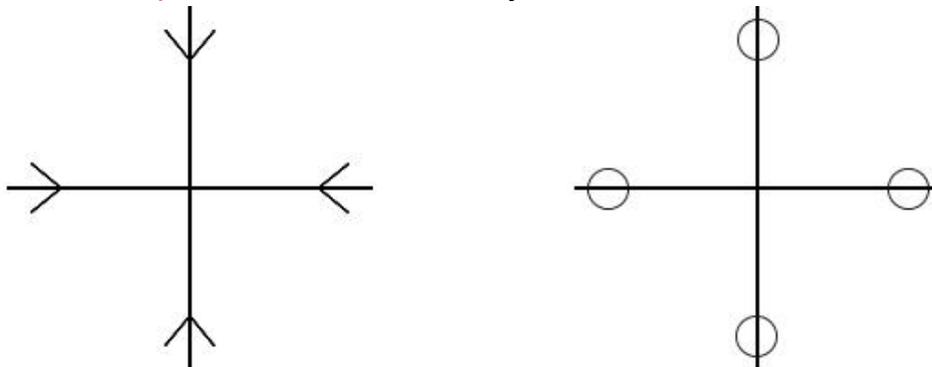
(3) The knife depth is controlled by the nut in figure2, and the opening side of the V-shaped knife must be near the side of the beam.



(4) Knife depth setting, click adjust → adjust2 → hole , Check

if the depth of the punching knife is suitable. Click the button hole again and the punching knife will lift. If the position of the punching knife is not suitable, adjust the nut referred in Figure2 of (3) by hand to change the falling depth of the punching knife.

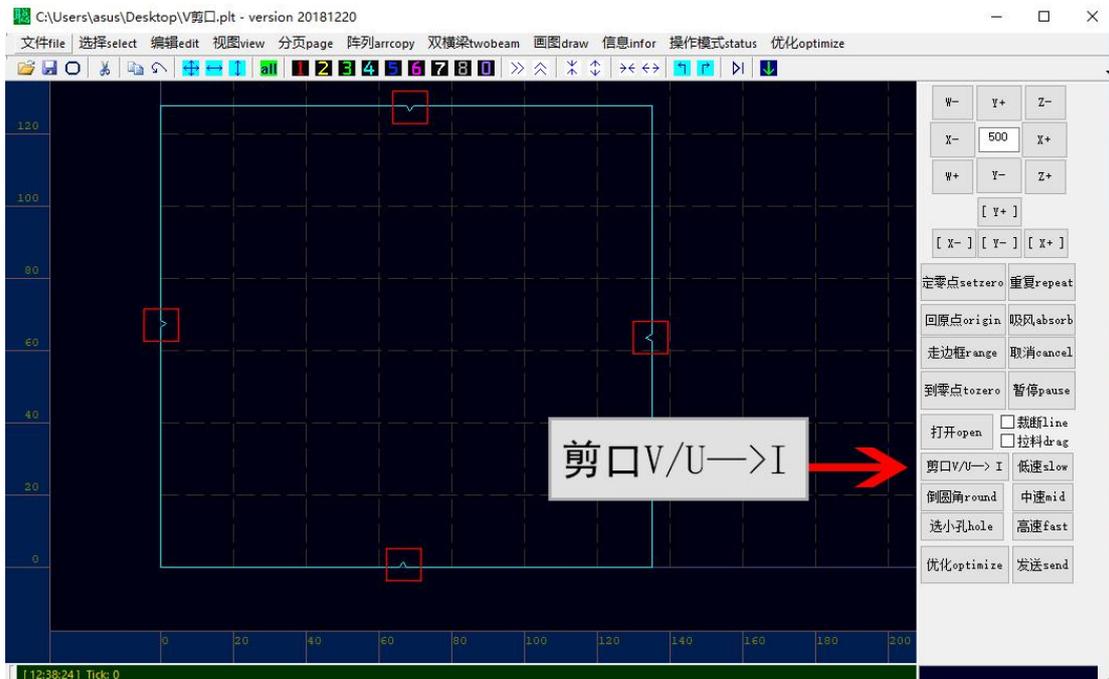
(5) Testing offset, please refer to [6.4 Adjusting the offset between vibrating knife and mark pen](#). Until the offset is adjusted as shown below:



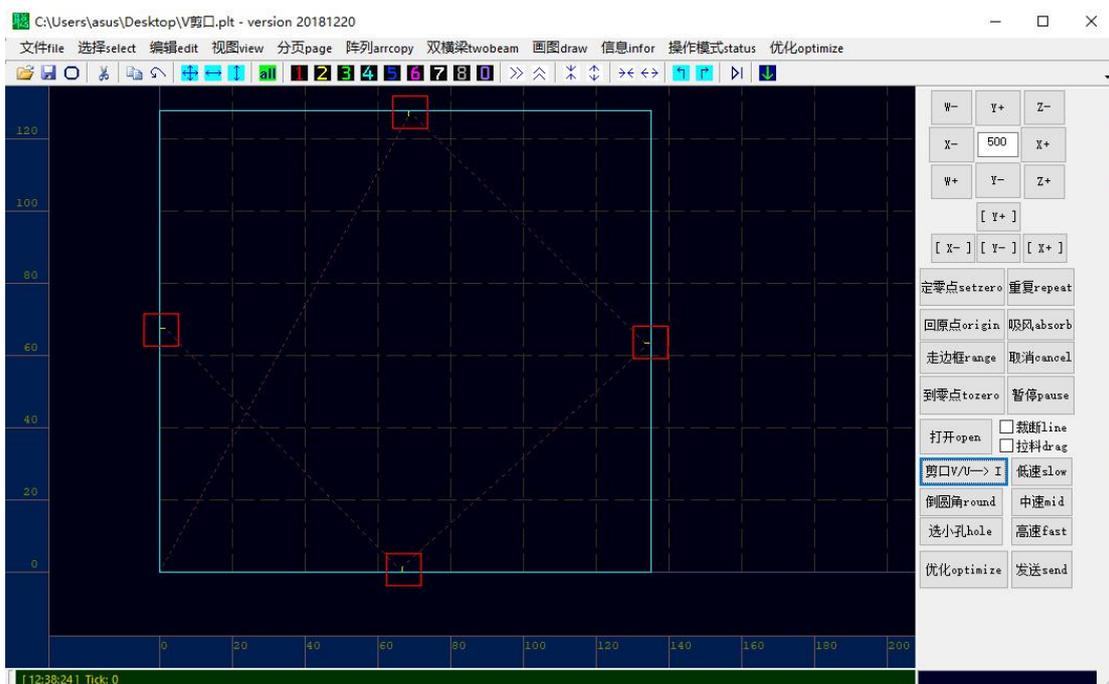
(6) Punching SP-number setting

A.A1.V-shaped knife SP-number setting, left mouse click on the bottom right of

the software 剪口V/U→I

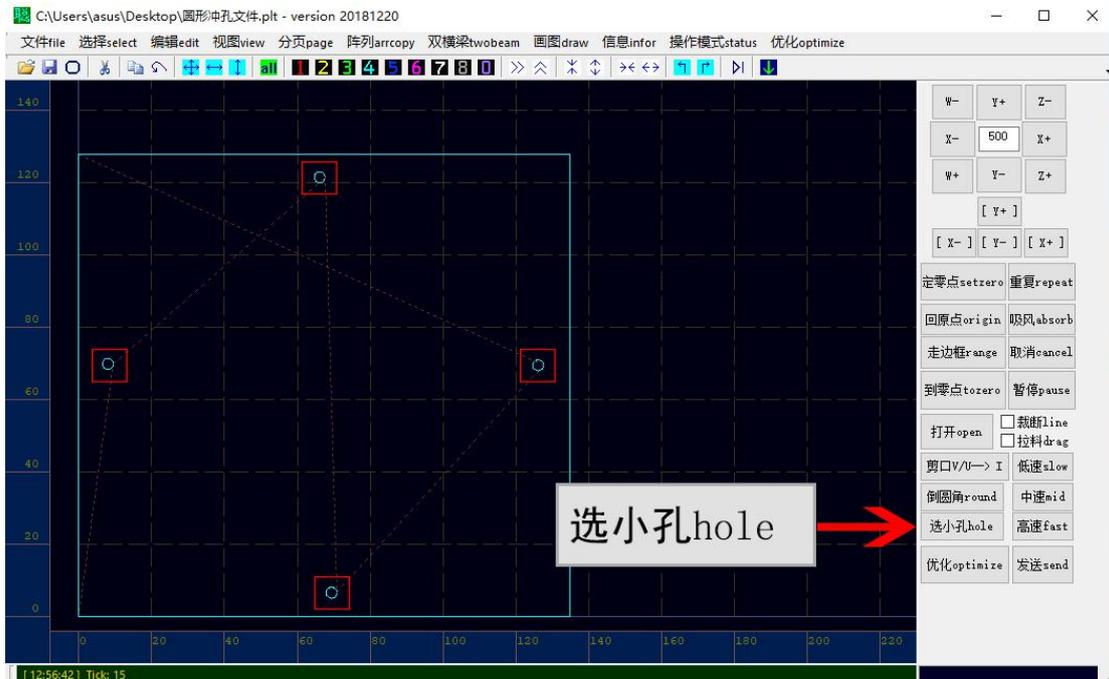


A.A2.When the V-shaped lines in the graph are changed to the yellow short lines in the red box as shown below, then it's completed.

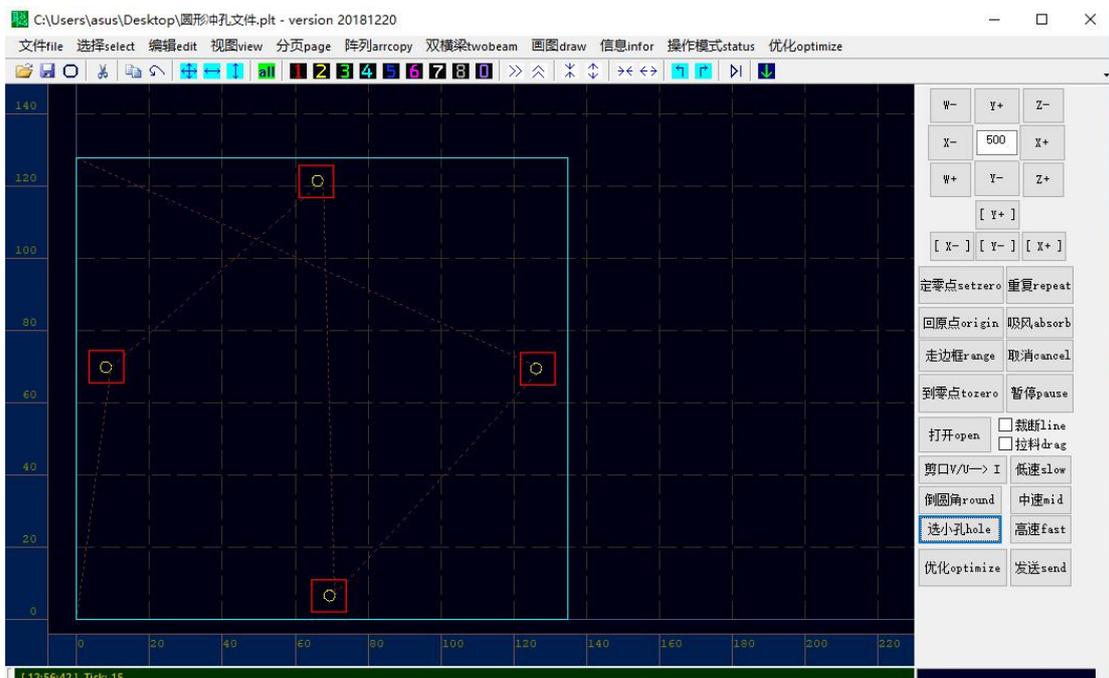


**B.B1.** Round punching knife SP-number setting, left mouse click on the bottom

right of the software 选小孔hole



**B.B2.** When the circles in the graph are changed to the yellow circles in the red box as shown below, then it's completed.



### Dekcel CNC Digital Oscillating Knife Cutter Machine Tools Use Method



Tools Changing Video : [https://www.youtube.com/watch?v=rY50X\\_Bs25w](https://www.youtube.com/watch?v=rY50X_Bs25w)

More Machines for Option

### Flatbed Cutter Plotter

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JINAN DEKCEL CNC EQUIPMENT CO.,LTD





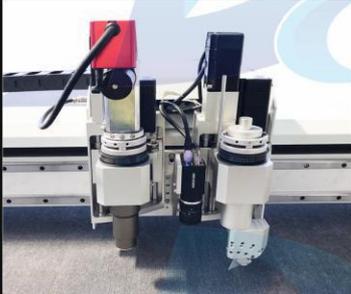
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Customized Cutting Solution for Our Clients

**Multifunctional Head**



Dekcel CNC Sincerely At your Service

		
<b>EOT - Electric Oscillating Tool</b>	<b>POT - Pneumatic Oscillating Tool</b>	<b>EOT + Pen + Kiss Cut Tool</b>
		
<b>EOT + Camera + V-cutter</b>	<b>EOT + Pen + V - Cut Tool</b>	<b>EOT + CCD Camera Pen + Creasing Wheel</b>
		
<b>EOT + Creasing Wheel + Pen CCD Camera + Spindle</b>	<b>EOT + CCD Camera Creasing Wheel + Punching Tool</b>	<b>EOT + Driven Rotary Tool CCD Camera + Spindle</b>

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*Our obligation is to meet your need ;  
our pursue is to reach your satisfaction;  
our objective is to achieve mutual benefit and win-win.*

If you have any questions, please contact us . We will deal with it immediately.