1.8KW Router

User Manual

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Directory

1. Summary

This instruction is for R&D testers, factory testers, and engineer. The main content is 1.8KW milling cutter automatic router bit changer debugging instructions

2. Caution

Press E-stop button when a security risk appeared.

3. Mandatory list for 1.8KW debugging

Model	List
1	1.8KW router
2	Router bit library
3	TK3S AKI
4	DSP version：2.2.8-6A180903M
5	CutterServer version：V4 - 2019.9.4.51
6	IBrightCut version：V3 - 2019.9.10.194
7	D 9+10mm Stick for initialization
8	9 router bit with rings
9	Test file and configuration.

4. Inspection before test running

4.1. Brush

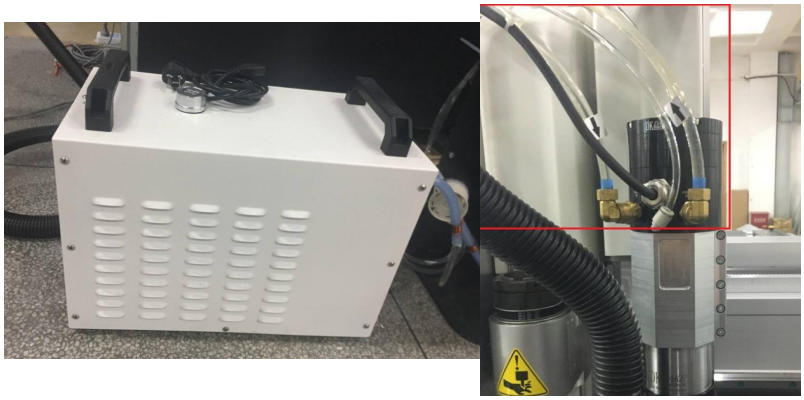
No brush on spindle when test run.

4.2. Collet

There must be router bit or stick on spindle, run spindle without stick or router bit is not allowed.

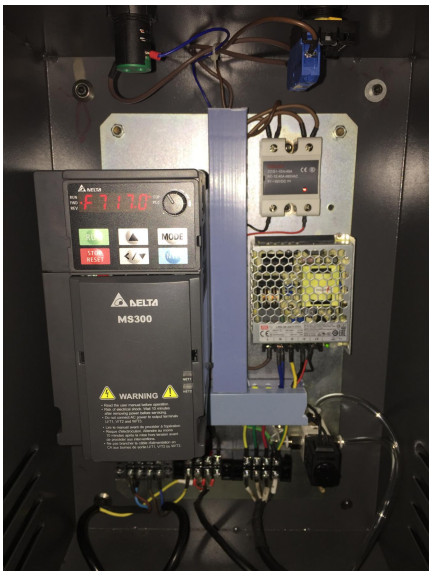
4. 3. **Electric and air circuit**

Make sure correct router cable, control cable, air tube connect before test run.
Water cooler: Circulate cooling water inside 1.8kw through inlet and outlet pipes



4. 4. **Check router cable**

Check router power, controller,(shown in image 1)



(image 1)

4. 5. **Check control cable**

Run testmillingcutter.exe, click START button. Control cable is good if spindle running, if not, check the connectors.

4. 6. **Check air circuit.**

Main air pressure: 0.8Mpa.
Air pressure for spindle collet: 0.8Mpa
Air pressure for Router bit library: 0.6Mpa
Air pressure for cooling: 0.1Mpa

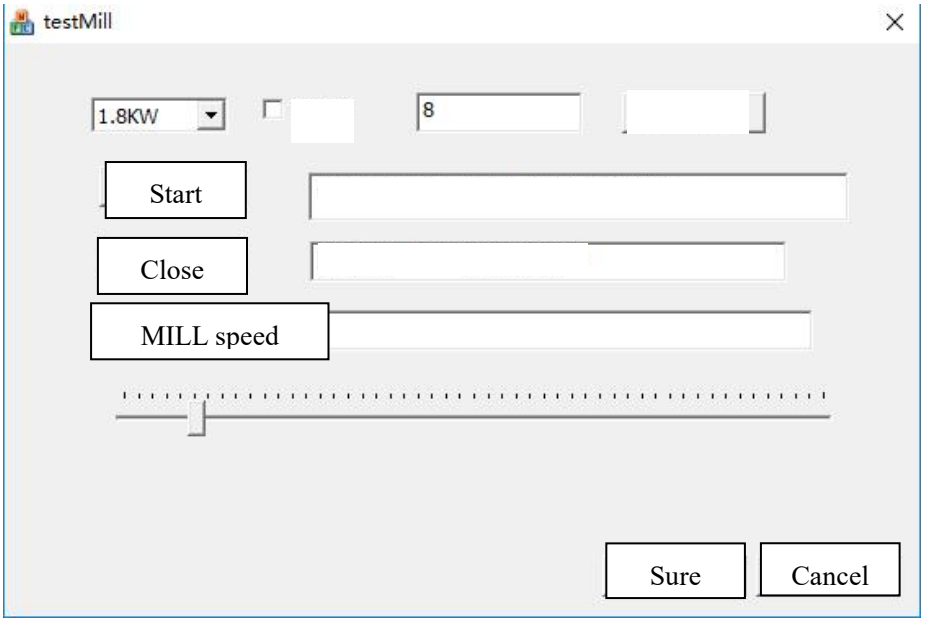
4. 7. Test run for 1.8kw spindle.

Run testmillingcutter.exe, (shown in Image 2)

(Image 2)

- Parameter setting for software

1. Choose 1.8kw router and select correct serial port.
2. Set the parameter in testmill page, click ON button, spindle run; click OFF button, spindle closed, set the rotation speed in software, then spindle rotation speed changed accordingly. (shown in image 3)
3. Do not stop during test run, click Close button to finish test run.



(image 3)

5. Parameter setting

Find extension parameter in Cutterserver (shown in image4)

IO Function Redefine	Change the knife (4 steps, 1			
The IO function redefines 1	Material thickness detection			
Both sides of the knife	Both sides of the knife(2 + 2			
beam zone	0.000	mm	2.000 ~ 500.000	
Select Tracks	☐			
Motor to track down	error			
A slant cruising altitude	☐			
Enable tool changing speed	☑			
Turn on automatic tool change	☑			
Brush drop depth	47.980	mm	0.000 ~ 55.000	
Cleaning plate brush fine tuning	0.000	mm	0.000 ~ 6.300	
MillBlade Control way	PC			
ChangeTool way	4041(Auto Tool Change)			
Brush down again depth	0.000	mm	-12.700 ~ 12.700	
Altitude Cruise Setting	Prohibition of high cruising			
Feeding acceleration	0.000	G	0.000 ~ 0.256	

(image 4)

1. IO Function Redefine: define the function of buttons on table.

Change the knife(4 steps: 1. Brush rise; 2. Loose the bit;3. Install router bit; 4. Finish, Brush down)

2. The IO function redefines 1: define the function of buttons on table.

Material thickness detection: After define this function, brush will detect material thickness once when press the button on table.

3. 2 AKI mode: TK model must be set 2 AKI model(2+2 model), BK model should be set 2 AKI model (1+1model)

4. Enable tool changing speed: Control cleaning, speed during tool change.

Tick it means select working speed, use for normal running speed.

Untick it means select testing speed, use for testing, all speed is much lower than working speed.

5. Turn on automatic tool change: Confirm if this model have automatic tool change or not(select accordingly), after turn on automatic tool change function,

machine will go AKI automatically after initialization(Current cutting head no allowed to be empty)

6. Brush down again depth: this configuration control brush down depth when cutting, it will affect cutting, dust collection a lot. (The configuration could be modify by cutter material thickness detect -B MTD)

7. Fine-tune height of brush when cleaning cover: control brush down compensation when cleaning the cover.

8. Milling blade control way: 1.8KW router use PC, 350W router use C board.

9. Change tool way: 4041 (auto change)/4040(manual change)/4064 (3.6KW router.)

- 1kw router/1.8kw router/3.6kw router

 For change the router bit, correction shifting.

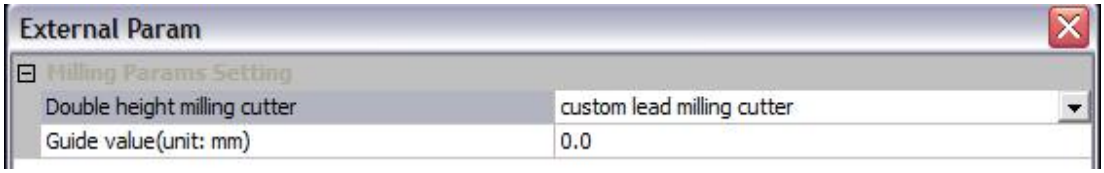
- 4040 (Manual change)

make manual change, material thickness detect

- 3060 (350w): No icon shown.

10. Brush re-depth: After the material thickness is detected, the height of the brush is compensated (range 0-12.7mm).

External parameter settings (Image 5)



(image 5)

6. Manual change router bit (4041)

Move the tool head to manual change position (Shown in image 6):

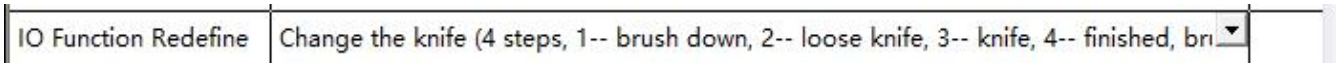
(image 6)

7. Software setting

7. 1. Extension parameter

Modify as follow

Caution: Make sure current head is milling head before manual change.



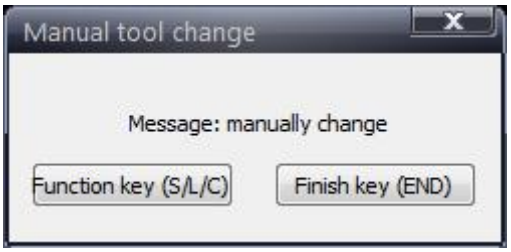
(image 7)

7. 2. Button

TC SLC

Press TC SLC button on table, S: Start; L: Loose; C: Clamp

1. One press, brush down, manual change page pop-up in cutterserver(shown in image 8).
   Remark: The button here have same function as button on table.
2. Two press: The collet loose, take router bit out.
3. Three press: Change router bit, push to bottom, release when clamp.
   Click END in cutterserver page after change bit, then brush move on.



(image 8)

8. Manual change router bit (4040)

Set parameter: modify extension parameter
Click manual change ICON, the following window pop-up.

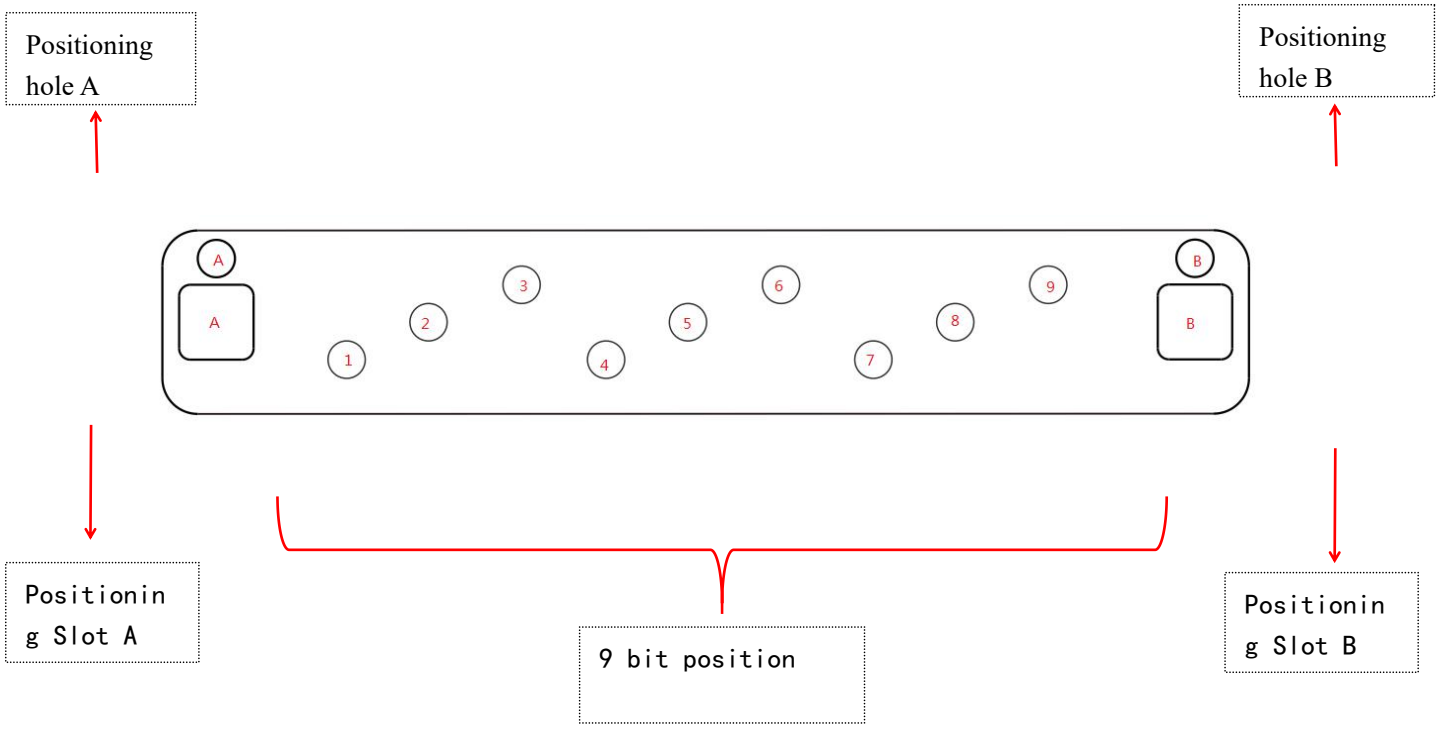
1. Click【Down brush】, the brush will go down, use wrench to disassembly the bit.
2. Click END in cutterserver page after change bit, then brush move on.
   Caution: DO NOT use software during manual change router bit.

(image 9)

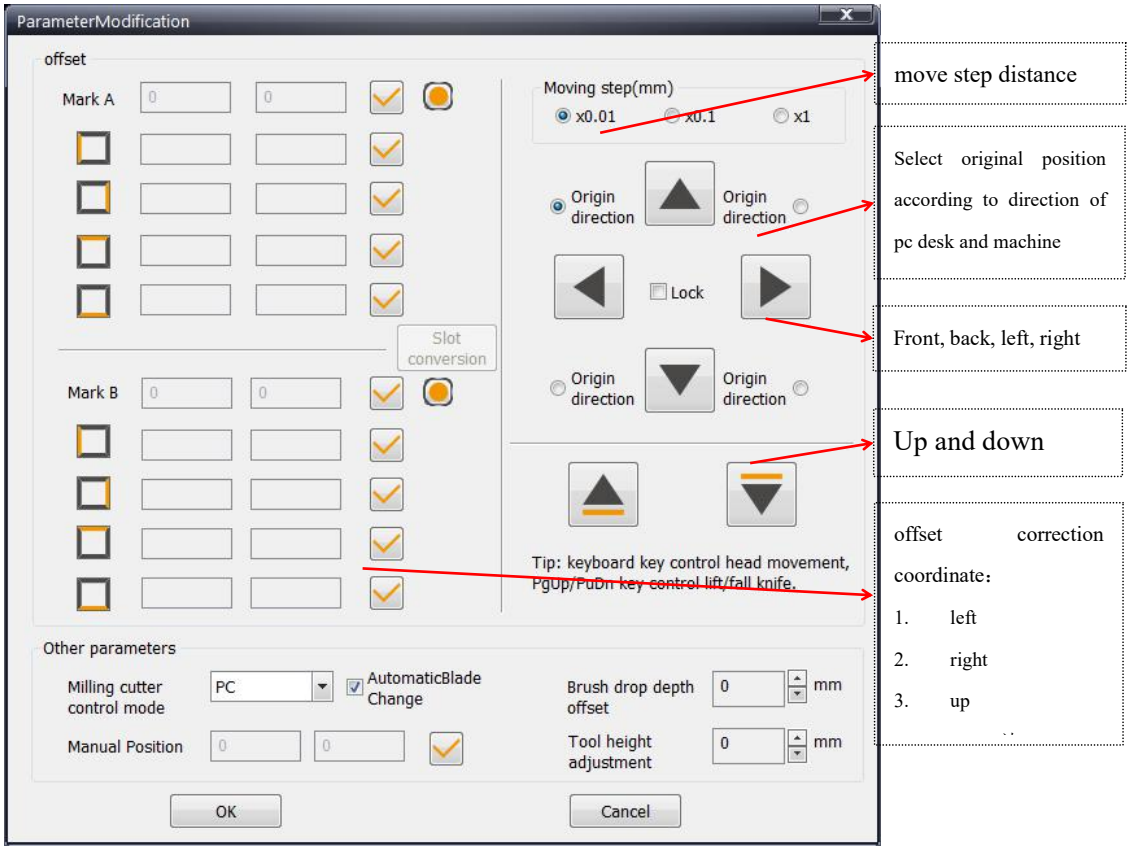
9. Router bit library shifting correction

9.1. Component

Router bit distribution as follow:



CutterServer Auto changer bit page, select shifting correction(router bit library will open automatically).



(Image 11)

Function parameters	Meaning
Positioning hole A, positioning hole B	Coordinate of current saved positioning hole on table.
Movement step distance	Tool head movement distance each click.
Coordinate direction	Relationship between movement button and tools movement.
Router control method	1.8KW router must select"PC control"
Start auto change	Select for current model if with auto changing.
Position for manual change	If user find the bit not in router bit library when cutting, move to this position and do manual change

Brush down compensation	After the brush detect material thickness, it will make down compensation (range 0-12.7mm)
Router bit change fine-tune	Spindle down compensation when change router bit (to make extra 2mm down)

9. 2. Stick & paper to correction router bit library offset

Preparation

1. Put stick on spindle

2. Cut some 10*40CM paper sheet.

9. 3. Read left coordinate of positioning slot A

Set stick to the central position of slot, make sure it fully touch with each side of slot except bottom side.

Select step distance “x 1mm”, move the stick approach to left side of slot; change to step distance”x0.1mm”, put paper between stick and left side of slot, keep moving stick till paper can’t move up and down, then back 0.1mm, change to step distance”x0.01mm”, keep moving when paper can’t be move up and down, read the coordinate.

Read the coordinate and click 

9. 4. Read right coordinate of positioning slot A

Set stick to the central position of slot, make sure it fully touch with each side of slot except bottom side.

Select step distance “x 1mm”, move the stick approach to right side of slot; change to step distance”x0.1mm”, put paper between stick and right side of slot, keep moving stick till paper can’t move up and down, then back 0.1mm, change to step distance”x0.01mm”, keep moving when paper can’t be move up and down, read the coordinate.

Read the coordinate and click 

9.5. Read front coordinate of positioning slot A

Set stick to the central position of slot, make sure it fully touch with each side of slot except bottom side.

Select step distance “x 1mm”, move the stick approach to front side of slot; change to step distance”x0.1mm”, put paper between stick and front side of slot, keep moving stick till paper can’t move up and down, then back 0.1mm, change to step distance”x0.01mm”, keep moving when paper can’t be move up and down, read the coordinate.

Read the coordinate and click 

9.6. Read back coordinate of positioning slot A

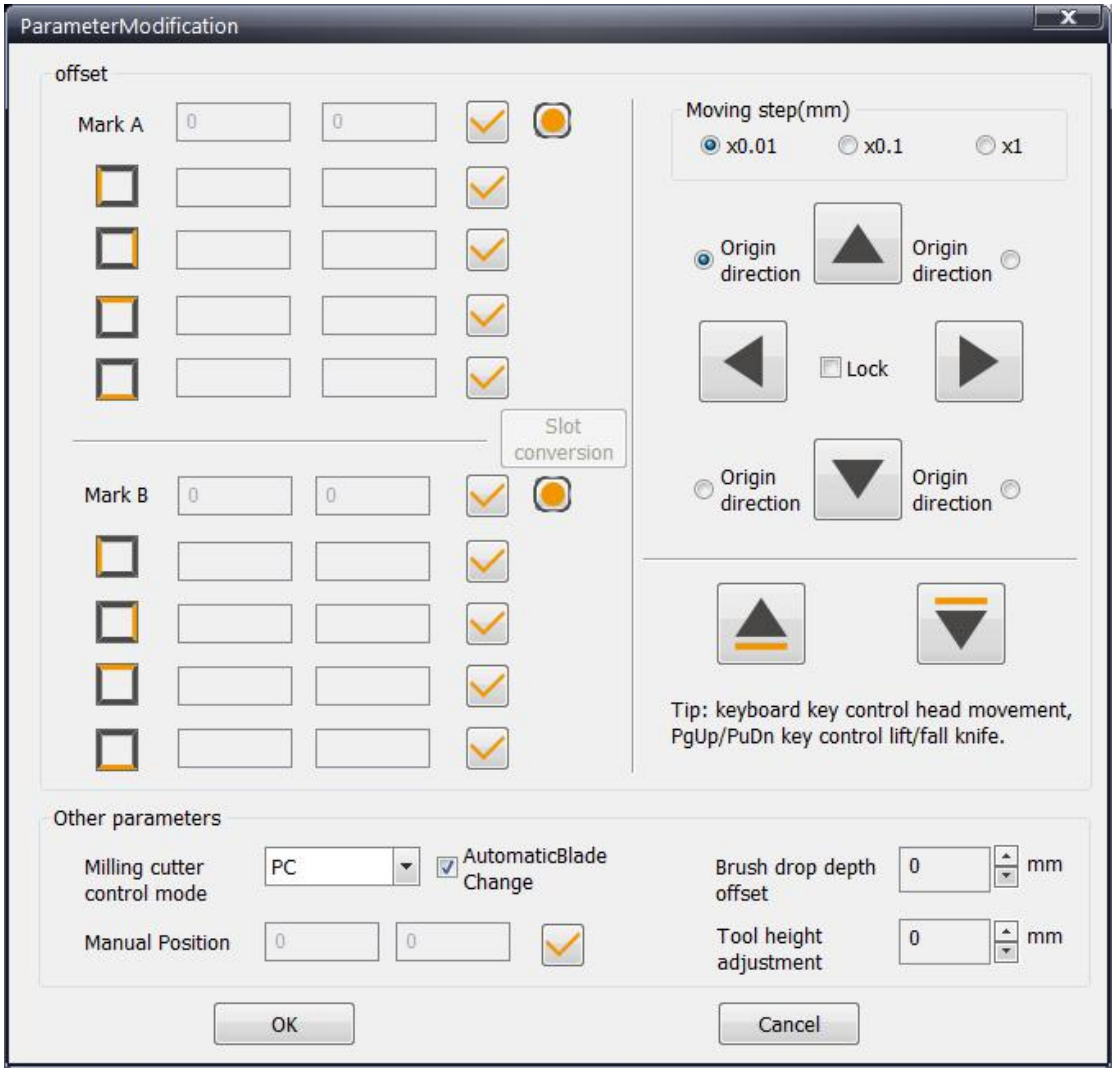
Set stick to the central position of slot, make sure it fully touches with each side of slot except bottom side.

Select step distance “x 1mm”, move the stick approach to back side of slot; change to step distance”x0.1mm”, put paper between stick and back side of slot, keep moving stick till paper can’t move up and down, then back 0.1mm, change to step distance”x0.01mm”, keep moving when paper can’t be move up and down, read the coordinate.

Read the coordinate and click 

9.7. Read coordinate positioning slot B

After read coordinate of four side, click “W”to lift the stick to top, move tool head to positioning B slot, read coordinate of four side with same way, lift the stick to the top(shown in image 12)



(image 12)

9. 8. Transfer value from positioning slot to hole.

After read coordinate of 8 side of two slot, click OK, the software will calculator and transfer value from positioning slot to hole, click OK save to DSP.

9. 9. Positioning hole A/B correction

Open offset correction page again, click the ICON behind of positioning hole A, tool head will move to the top of positioning hole A and down slowly, check if the 10mm stick could fit the hole completely, if yes, lift the tool head and correct positioning hole B offset. After correct offset of AB coordinate then do auto change test. (If any offset during correction, need to correct A and B slot coordinate or fine-tune hole coordinate)

10. Auto change bit test.

Cutterserver setting

10. 1. Speed selection

There are two speed in auto change setting, normal running speed and test speed; untick working speed in extension parameter, then it will be test speed.

10. 2. Router bit library initialization.

1. Select router head and click CT ICON, select modify router bit page (router bit library will open)

2. Put router bit into library, select right bit number in software with accordingly.

(image 13)

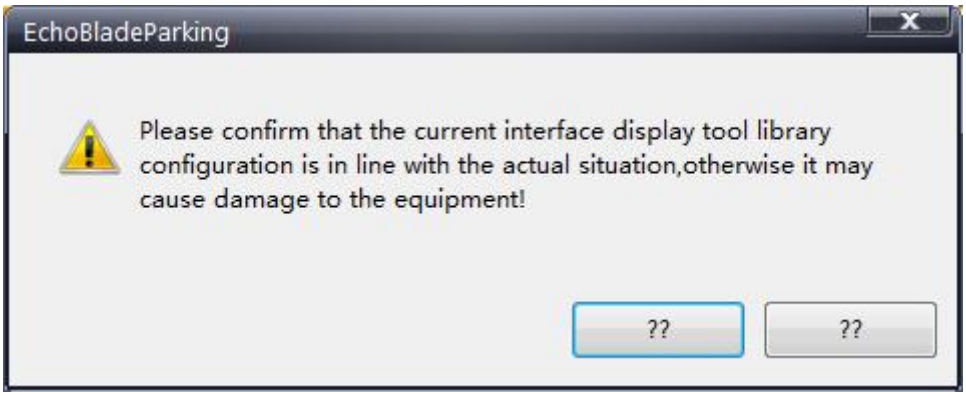
② Other operation

(image 14)

③ Instruction for image in library

Image	Meaning
	Means no.1 holder is current holder, and ER1 blade on current holder, new router bit not allowed to put on this holder.
	Means No.2 holder is not empty, with router bit ER62.1
	Means No.4 holder is empty and could set any router bit.

④ Click SAVE after configure finished, click OK to finish router bit library initialization after make sure all configuration correct.

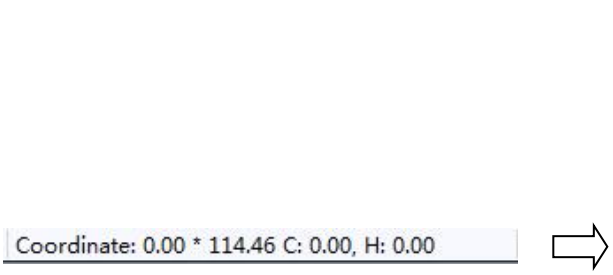


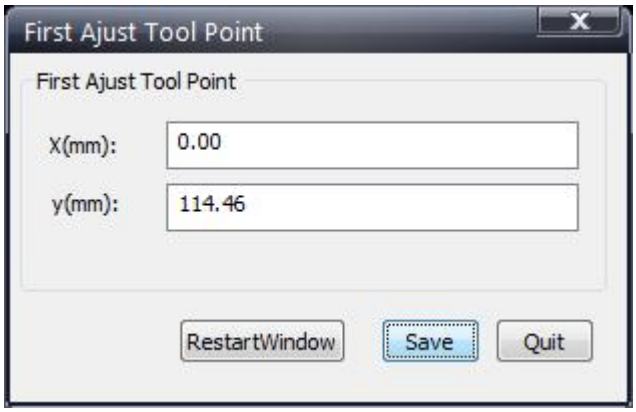
(image 15)

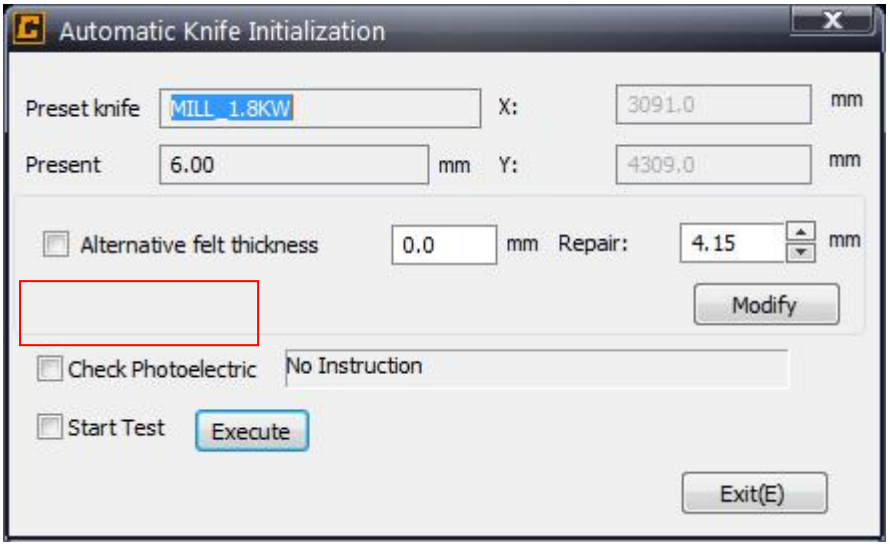
11. Automatic adjust depth, router bit and pen coincide setting.

11. 1. Reading the coordinates of the initialization point

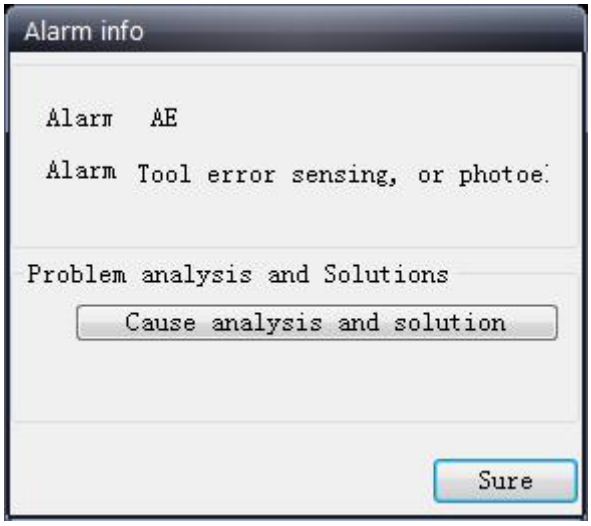
1. Select router head, open CT to offset correction page.
2. Move tool head to AKI position, and down router bit to confirm.
3. Write down current coordinate (X,Y), then quit CT page.
4. Choose system configuration-AKI-first AKI point, move router head to (X, Y) position.
5. After click SAVE, use AKI testing, start adjust the cutting depth after confirm the position.(Tick"Check sensor before adjustment "when first adjustment) . Use finger to shade the AKI back and forth after tick it.







(image 16)

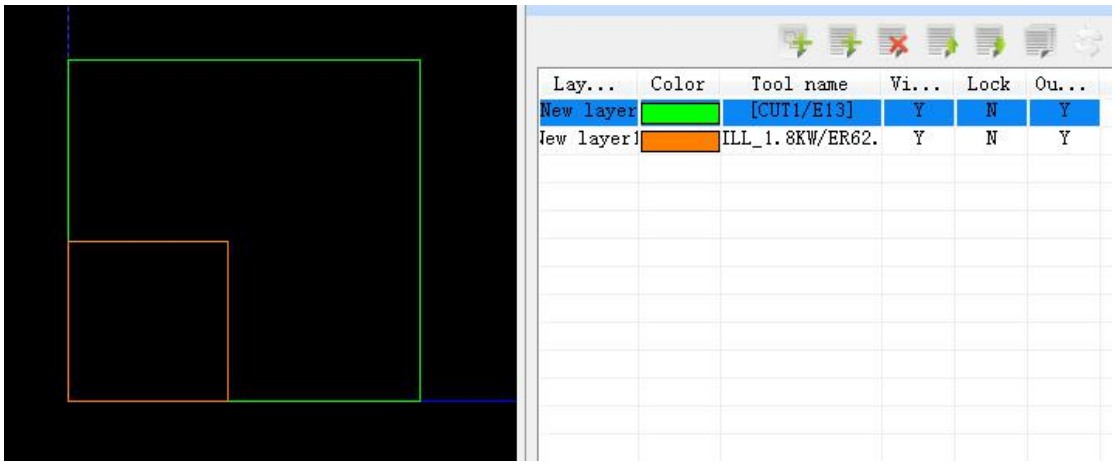


(image 17)

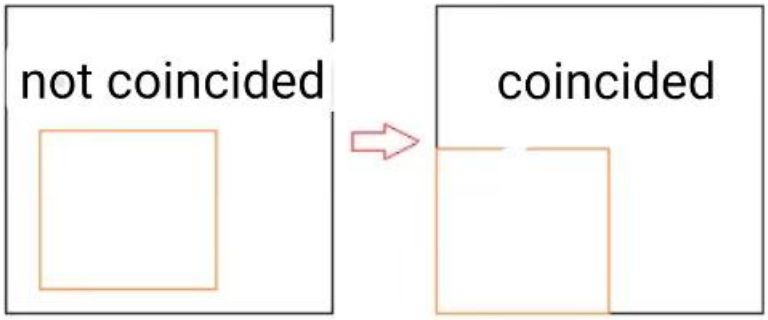
11. 2. Router bit and pen coincide

1. Use chamfering bit when test coincide of router bit and pen.
2. Open coincide test file(shown in image 18)
3. Output the file and cut, modify the offset parameter to correct position(shown in image 19).

Remarks: Do not modify router head offset because it will affect the AKI position, router change position etc.)



(image 18)



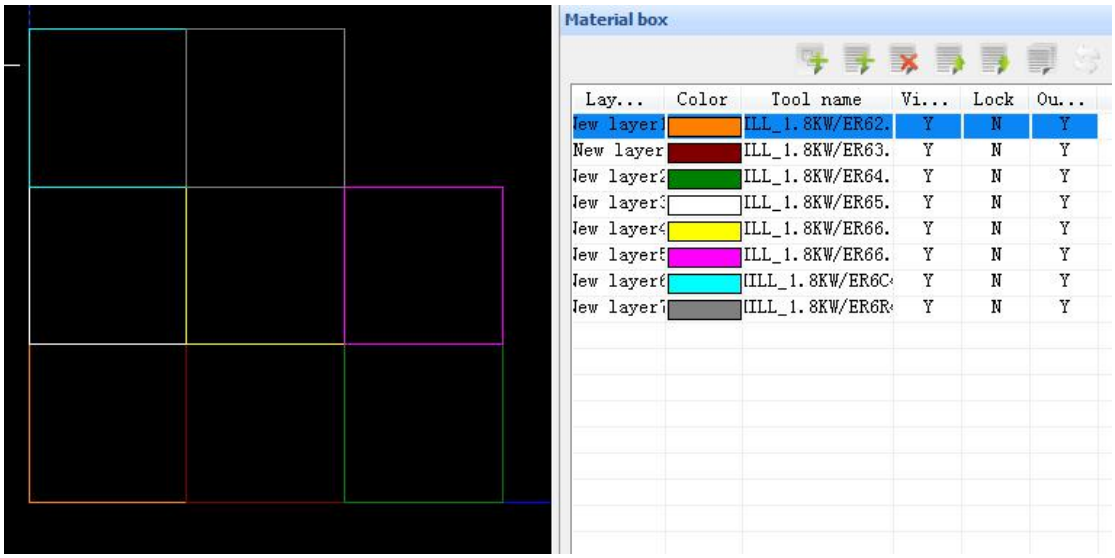
(image 19)

12. Automatic Tool Changer

Send file, click the start button, perform automatic tool change, observe whether each milling cutter blade is changing normally. If it is dangerous, press the emergency stop button immediately.

Testing method:

Open the test data in IBrightCut, including 9 blade automatic tool change data, use manual to start cutting, such as (image 20):



(image 20)

Set the 9 blades name of Tool library in CutterServer, to match the layer blades name in test cutting files with tool library.

13. Dust cleaner

As part of the 1.8 kW milling cutter, the dust cleaner achieves a dust-free production environment and is a very important and critical component. For detailed instructions, please refer to the cleaner independent instruction manual. The following are detailed instructions and tips for vacuum cleaners and equipment.

13. 1. Dust cleaner and Router linkage

In the 1.8KW Router with auto bit changing system. Dust cleaner is linked with router operation. Dust cleaner start running when Router works, no need open dust cleaner manually.

Please make sure of the following two points before running

1. MAN / O / AUTO, Keep the button at MAN position

2. Keep the button at MAX level

13. 2. Dust cleaner operation test

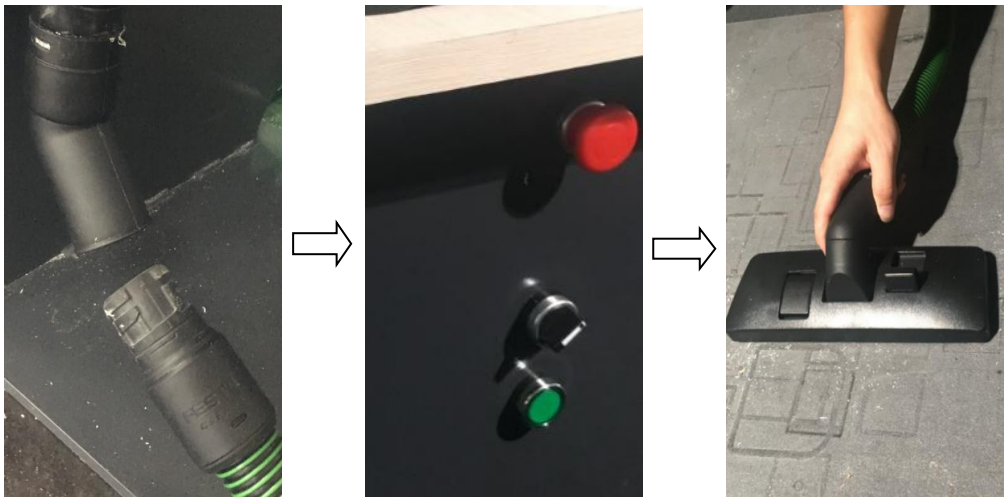
Set router MAX. Cutting depth. As 10mm before running, in case break table and felt after second drop.

Test method: import cutting file, start cutting , dust cleaning. the vacuum cleaner will be turned on during cut, and it will be turned off after cutting (the vacuum cleaner is closed during the router bit changing).

13. 3. Others

The main function of the vacuum cleaner is to clean the Scraps from the materials in milling processing. It can also clean the cutting table and surrounding debris. The specific operations are as follows:

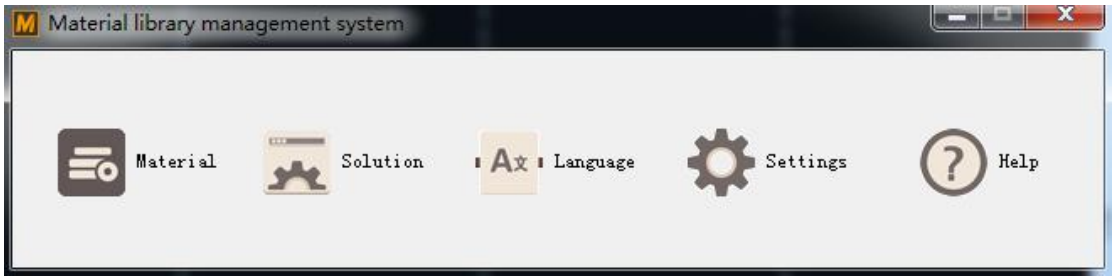
Remove the vacuum cleaner hose, install the ground brush, and open the vacuum cleaner control switch on the desk, to clean the dusts.



14. Software

14. 1. Material library

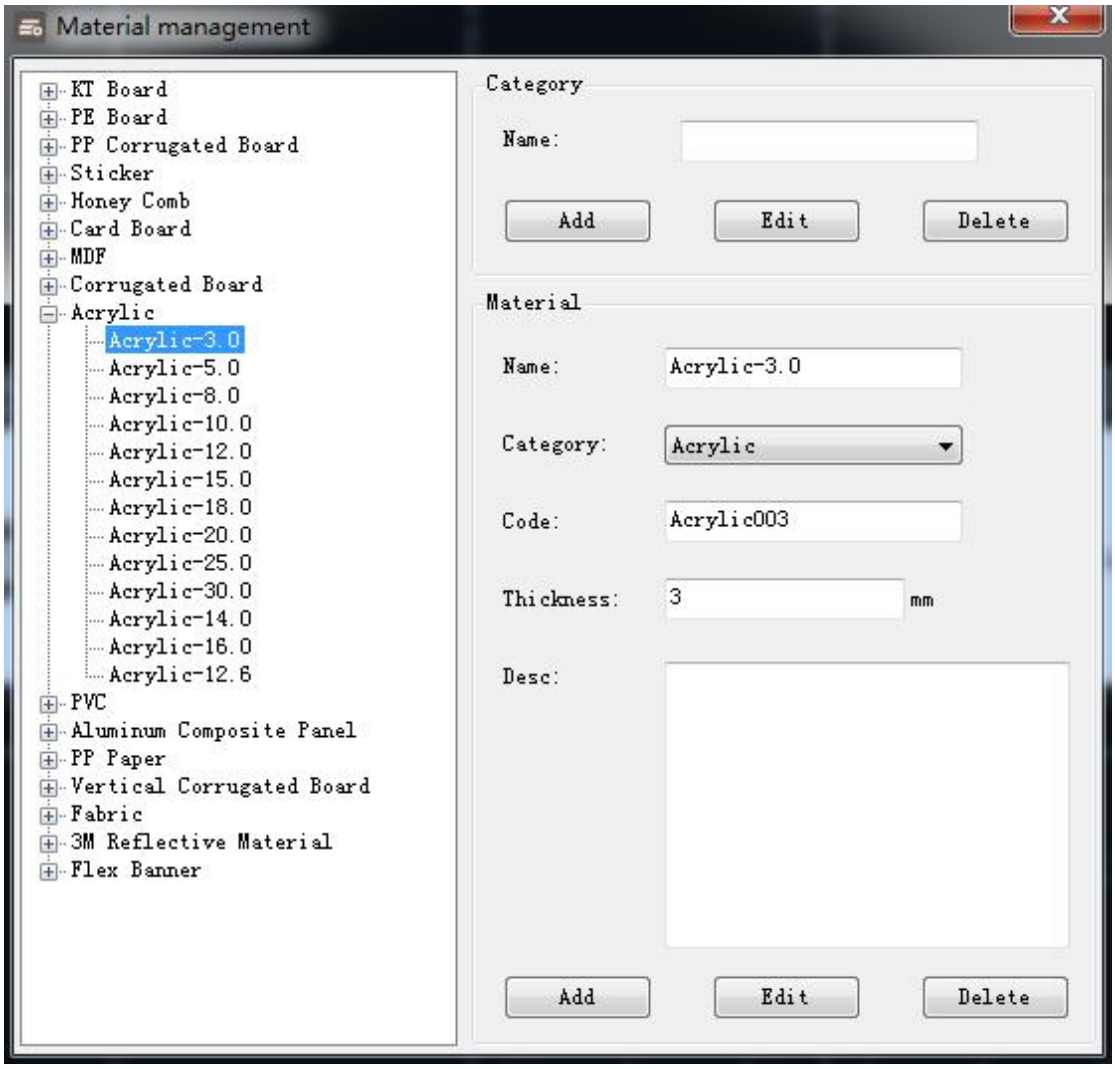
The material library management system window is shown in (image 21).



(image 21)

14. 2. Material

Add, modify, and delete material and material classification information.

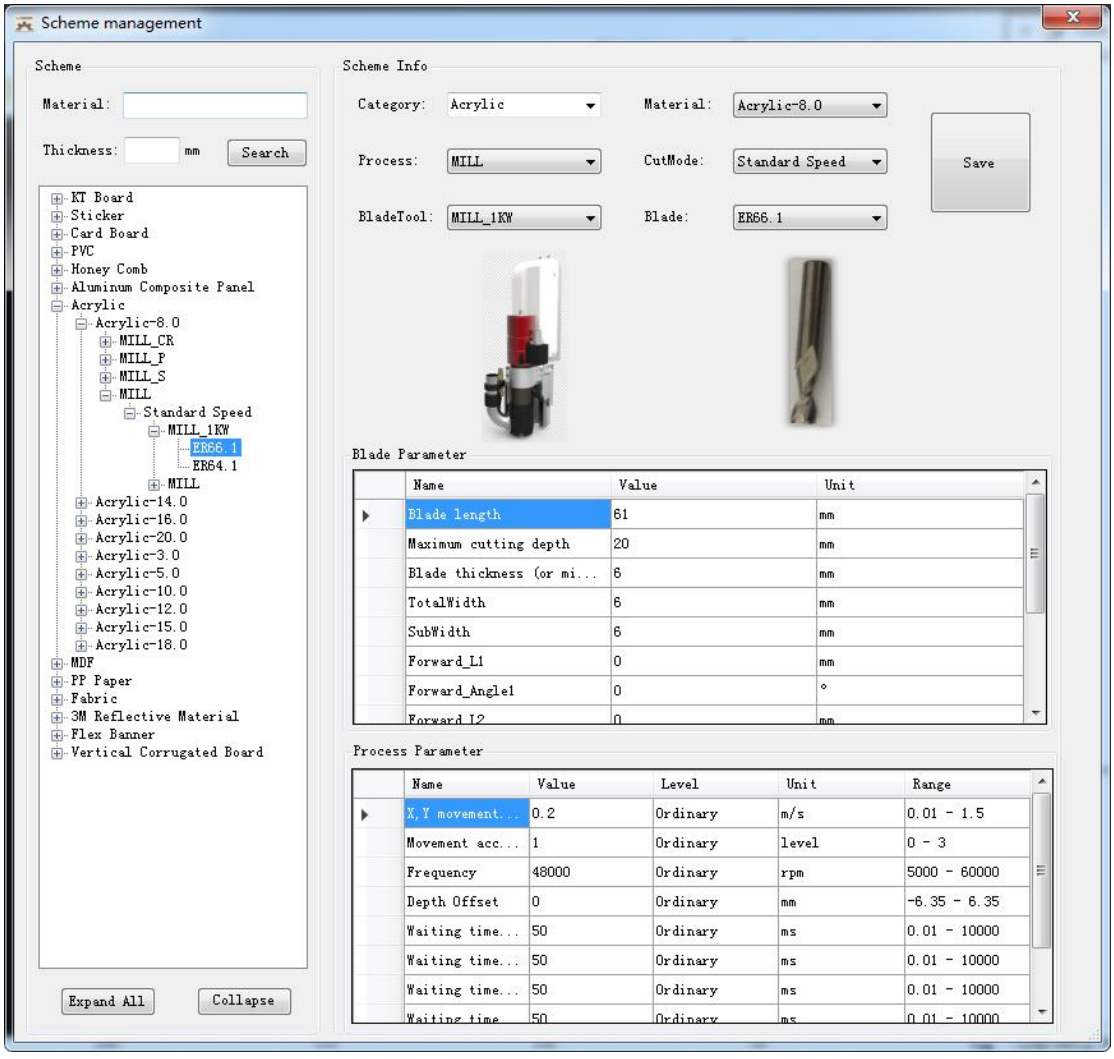


(image 22)

14. 3. Solution

Add, modify, and delete cutting Program based on existing materials.

`



(image 23)

【Find】

① 【Material】-【Find】: Fuzzy search existing Program by entering part of the material name.

② 【Material thickness】-【Find】: The existing Program can be searched by inputting the material thickness.

【Solution items】

① 【Material classification】: Select in the existing classification, to add new ones.

② 【Material】: Select the materials to be added in the material classification 。

③ 【Processing method】: Select the processing technology of the current material。

④ 【Cutting mode】: Select cutting model of current material。

⑤ 【Cutting tool】: Select cutting tool for current material.

⑥ 【Cutting blade】: Select cutting blade for current material.

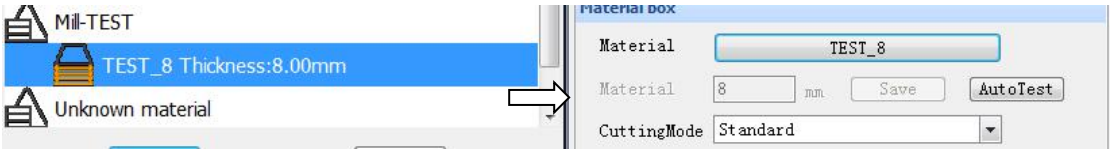
⑦ 【Blade parameter】: The parameter information of the currently selected blade can only be viewed.

⑧ 【Cutting parameter】: Set the main cutting parameter for current material.

15. IBrightCut

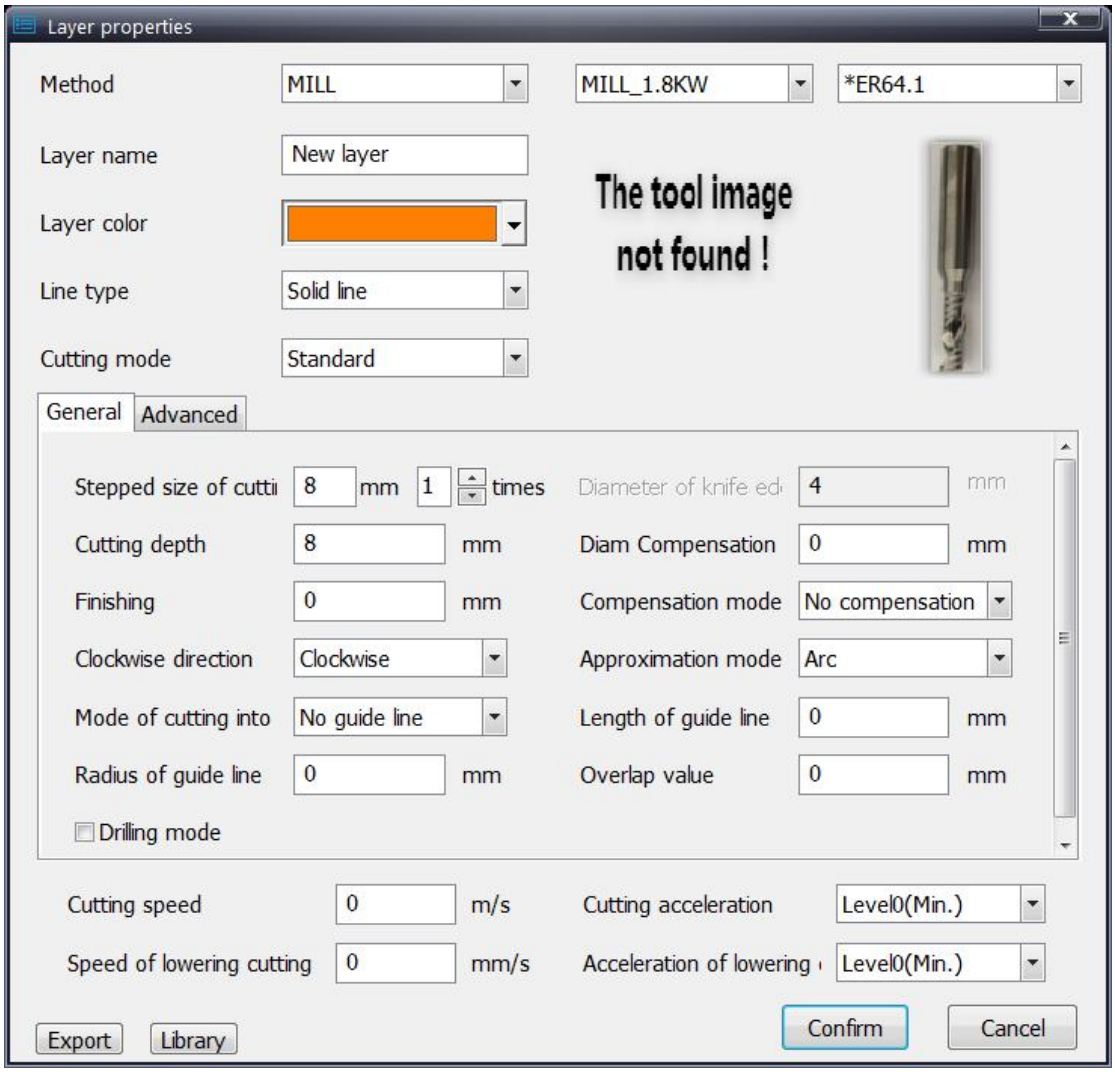
Material library loading

Select [Material Settings], click on the current material (TEST_8), pop up the material selection dialog box, double-click the material to select the material.

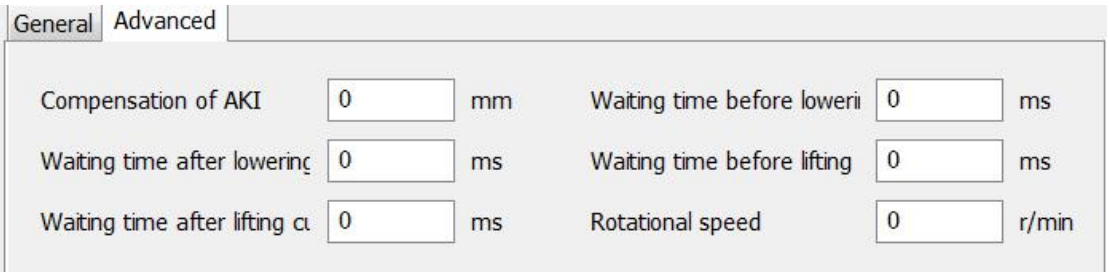


(image 24)

Add a layer and open the layer properties as shown in image 25.



(image 25)



(image 26)

① ER1: The blade used for the current layer. If the machine includes the automatic tool change function, when blades of multiple layers are inconsistent, the tool will be automatically changed (the blade with * is the recommended blade in the material library).

② Cutting step: the depth of each knife falling in cutting.

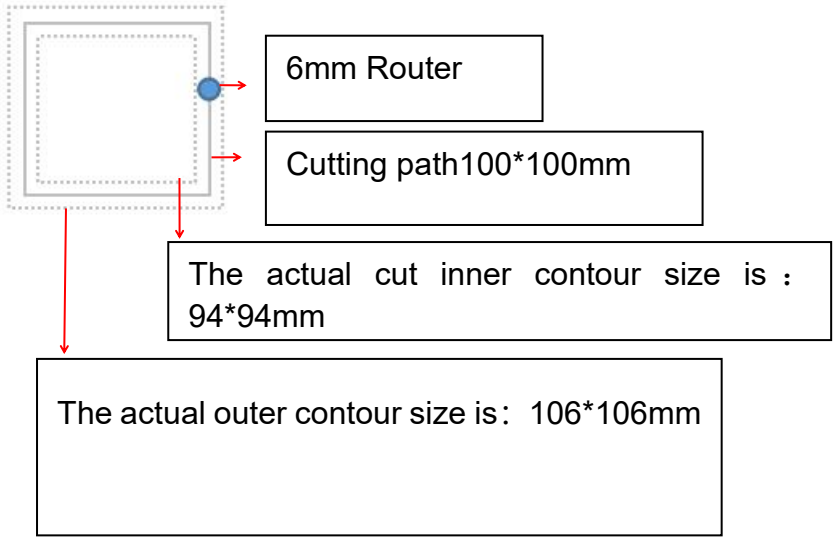
③ Cutting depth: Controls the cutting depth of the tool.

④ Fine Cutting: Control the last time cutting depth.

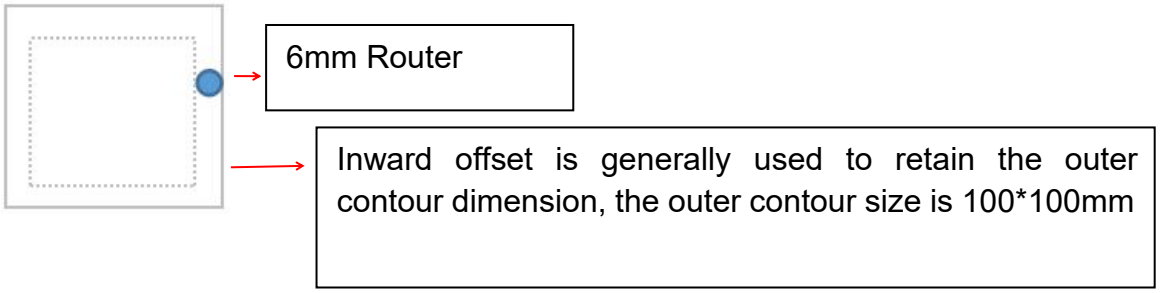
⑤ Compensation method: no compensation, inward offset, outward offset, control the positional relationship between the cutting path and the data, as shown in (Figure 27).

e.g. : 6mm blade to cut 100*100mm rectangle

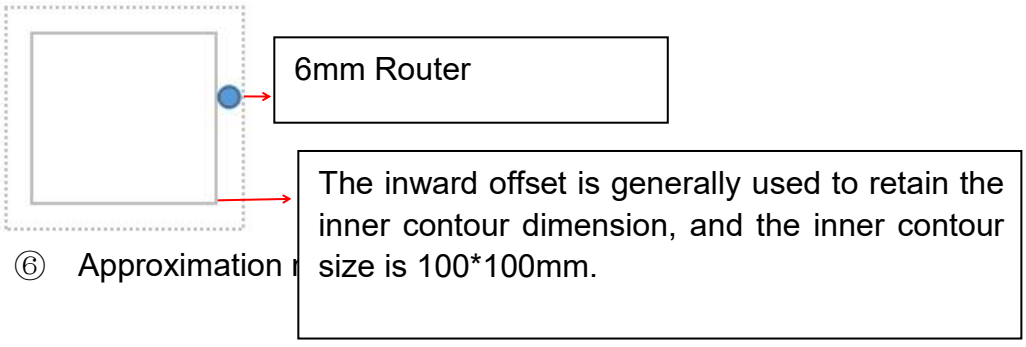
No compensation



Inward offset



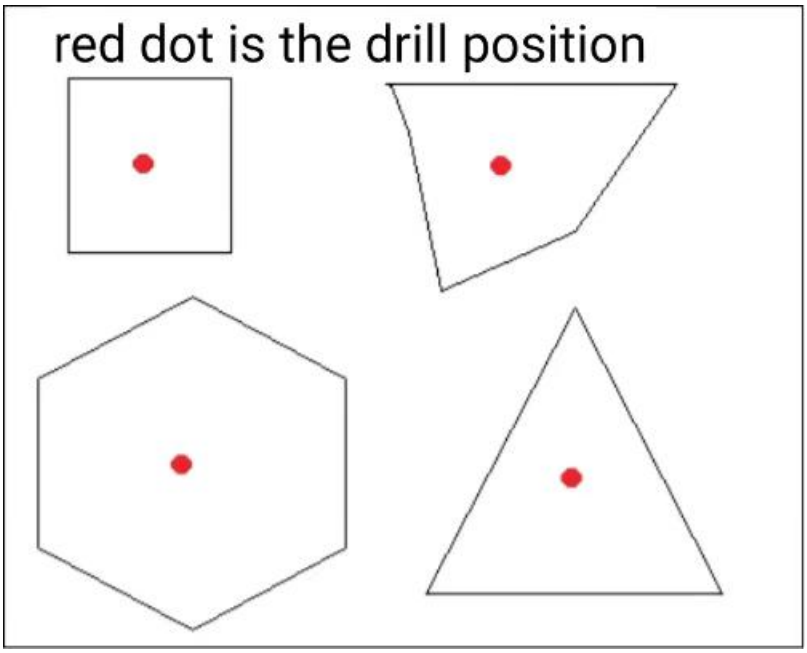
Outward offset



⑥ Approximation r

⑦ Cutting direction: clockwise, counterclockwise, to control the direction of the cut.

⑧ Drilling mode: drill a hole in the center of the circumscribing rectangle of this contour, as shown in image 28.



(image 28)

⑨ Compensation value: It affects cutting path, which is invalid in the no compensation mode.

⑩ Automatic tool setting compensation: The current blade compensation value (range ±6.35).

⑪ Speed: Controls the spindle rotating speed (range 10000-50000r/min).

⑫ Cutting speed, falling speed: Control the cutting speed, the maximum speed can not be bigger than the speed set in CutterServer.

⑬ Cutting acceleration, knife falling acceleration: Control the cutting speed during cutting.

⑭ Export: Export the current material cutting program, which can be imported using the material library software.

16. Export cutting file

Export cutting file, to start cutting.

17. Blade

Milling cutters can be used for acrylic milling, engraving, chamfering, etc. Different functions and materials require different Router blades.

(image 29)

Place the blades in order, recommend blades refer material library and cutting file.

(image 30)

18. Troubleshooting

18. 1. Emergency stop

Fault: On the emergency stop status, click "OK" and the machine restarts.

Solution: This is a function of the machine. You can set the emergency stop and restart mode in the software parameters. Two types: restart after restarting the power, and press the “OK” button to restart. The software settings are as follows:

When machine Alarm error, press keyboard Ctrl+Shift+Alt+M,to change parameters.

18. 2. Router cannot be started.

Fault: When using the milling cutter in Cutterserver, the milling cutter does not rotate, and popped error "The milling tool cannot be started".

Solution: Open the computer-management-device manager-USB serial COM number, which matches the serial port number of the cutter in CutterServer.

18. 3. Router cannot start

Fault: When using the milling tool, the milling tool does not work, and Alarm the error 53 ,router fault.

Solution: Reconnect the cutter alarm line.

18. 4. Software serial port in dark status

Fault: Under the Win10 system, the software is not connected, and the serial port is gray.

Solution: Open Computer-Management-Device Manager-Universal Serial Bus Controller, reconnect the two COM serial ports, match the COM value in the CutterServer installation directory to the serial port value in the computer manager, and restart the computer.

In addition, re-plug the serial cable and check the serial port connection in the DSP board.

Run in win7 compatibility mode and run as an administrator.

18.5. The tool library cover is not smooth

Fault: manually turned on and off the tool library, opened and closed, the cover, there is collision sound or the speed is obviously slow.

Solution: Adjust the protective cover valve.

18.6. Blade fall in the tool library

Fault: Because it is 6+3 model in the 9 tool holder library, the 6 common tool holders are smaller than 3 chamfering tool holders, and the normal blade will fall into the large tool holder.

Solution: Clip the blade with tweezers.

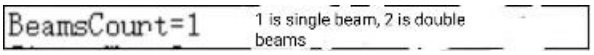
19. Software Update

19.1. Serial port connection

After updating the software, you need to reconfigure the Cutterserver serial port.

19.2. Interface configuration

Configure the single beam and double beam interface (modify the parameters in the SysConfig configuration file in the Cutterserver directory).



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