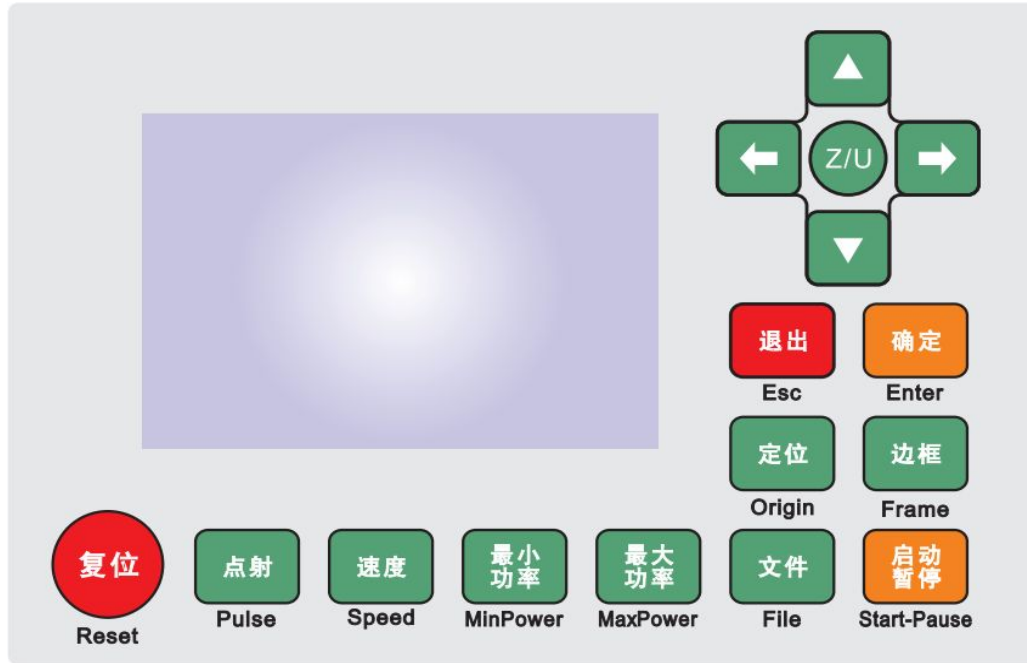


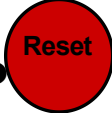
I Chapter 3 the Operating Instruction of Panel

3.1 Introduction to the Panel and Keys

3.1.1 The whole panel



3.1.2 Introduction to the Keys

-  :Reset the whole system
-  :Set the relative origin;
-  :Let the Laser to splash;
-  :To track by the current file's frame;
-  :The management of the memory and U disc files;
-  :Set the speed of the current running layer, or set the direction keys'

Move speed;

-  :Set the max laser power of the current running layer, or set the power of “Laser” Key;
-  Set the min laser power of the current running layer
-  :To start or pause the work;
-   :To move the X axes or the left/right cursor;
-   :To move the Y axes or the up/down cursor;
-  :The Z/U key can be pressed when the system is idle or the work is finished. On pressing this key, it will show some entries in the interface, each entry includes some functions, Z axes move, U axes move, each axes to go home etc.;
-  :To stop work, or to exit to some menu;
-  : Validate the change;

3.2 Introduction to the Main Interface

3.2.1 The main interface

When the system is powered on, the screen will show as below:

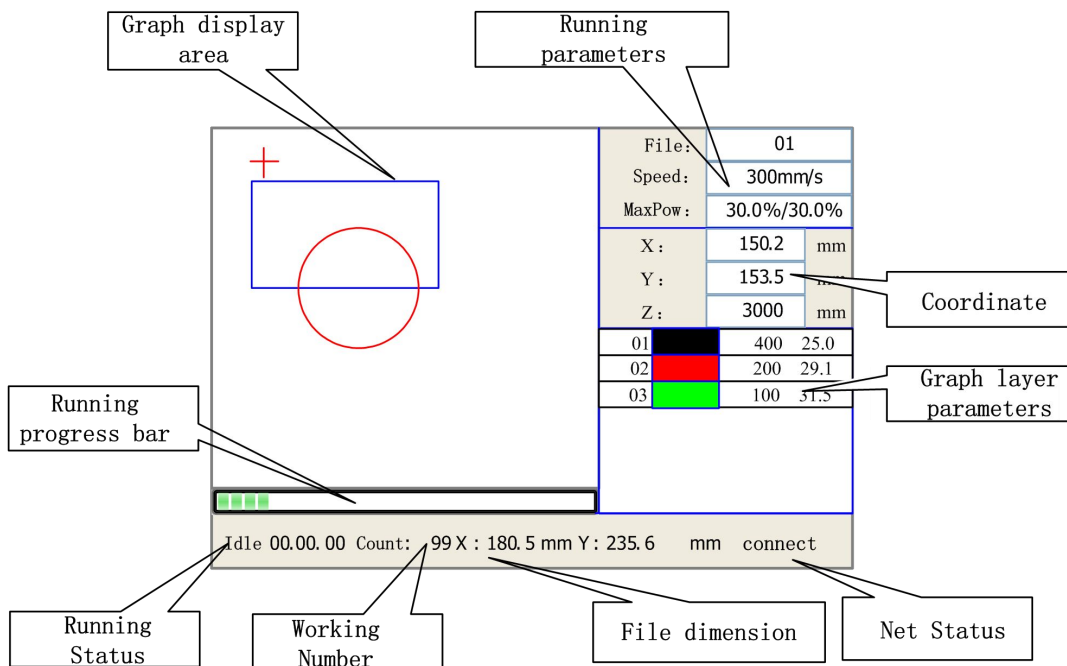


Figure 3.2-1

- Graph Display Area: To display the whole file's track, and display the running track.
- Running parameters: To display the running file's file number, speed, max power etc.;
- Coordinate: To display the current coordinate of X,Y and Z axes
- Graph layer parameters: To display the layers' information of the current file, such as max or min power, speed etc.. When system is idle, dblclick the layer, then users can change the layer's parameters and the changing would be saved.
- Running Status: To display the current status of the machine, such as Idle, Run, Pause, Finish, etc.;
- Running Progress Bar: To display the progress bar of the current running file;
- Working Number: To accumulate the work number of the current file.
- File Dimension: To display the dimension of the current file;
- Net status: To display the connecting status of the Ethernet.

When work is Idle or finished, all keys can be pushed, users can select a file to run, set some parameters, preview to a select file etc. But, when work is running or paused, some keys don't respond when they are pushed.

3.2.2 Speed key

Push the “Speed” key when the screen is on the main interface, it will show as below:

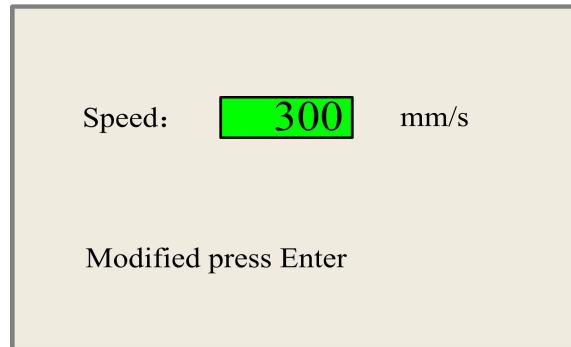


Figure 3.2-2

Push the “X+/-“ Keys to move the cursor in the numeral area, and push the “Y+/-” keys to change the value, then push the “Enter” key to save the change, push the “Esc” key to invalidate the change.

3.2.3 Max/Min power keys

Push the “Max Power” or the “Min Power” keys when the screen is on the main interface, it will show as below:

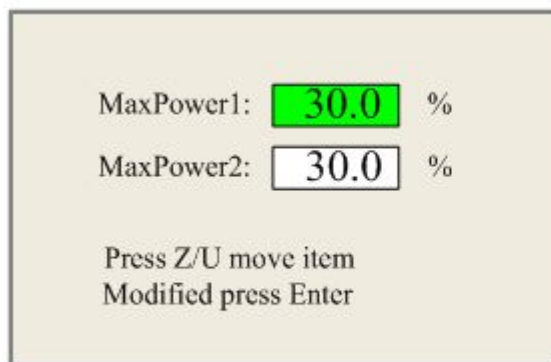


Figure 3.2-3

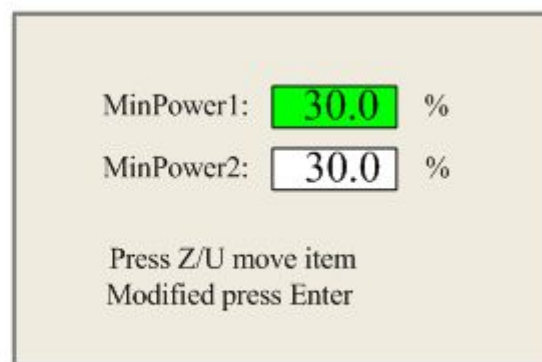


Figure 3.2-4

When “Z/U” key is pushed, the green block can move up and down to denote the changing item, then “Y+/-” keys and “X+/-” keys can be used to change the value.

3.2.4 Set the layer parameters

After selecting a file to preview on the main interface, user can push “Enter” key to let the cursor move to the first layer, then “Y+/-” Keys can be pushed to select the intent layer, on that time, user can push “Enter” key to check the selected layer’s parameters, show as below:

01		400	25.1
02		200	29.1
03		100	31.5

Figure 3.2-5

Layer0: 

Speed: mm/s

MinPower1: %

MinPower2: %

MaxPower1: %

MaxPower2: %

Press Z/U move item
Modified press Enter

Figure 3.2-6

User can push “Z/U” Keys to move the green block on the intent parameter, then he could change the parameter if needed. “OK” to validate the change, and “Esc” to invalidate the change.

3.3 Z/U Key

The Z/U key can be pressed when the system is idle or the work is finished. On pressing this key, it will show some entries in the following interface:

Z move

U move

Axis reset+

Manual Set+

Laser Set+

Origin set+

Set Fact Para

Def Fact Para

Auto Focus

Language+

IP setup+

Diagnoses+

Screen Origin+

Figure 3.3-1

Push “Y+/-” keys to move the green block to the anticipant item, and then push the “Enter” key to display the sub menu.

3.3.1 Z move

When the green block is on “Z Move” item, “X+/-” keys can be used to move the z axes.

3.3.2 U move

When the green block is on “U Move” item, “X+/-” keys can be used to move the u axes.

3.3.3 Axis reset+

When the green block is on this item, push the “Enter” key to show as below:



Figure 3.3-2

Push the “Y+/-” Keys to move the cursor to one of the entry, then push “Enter” key to restart the selected axis, the screen will show some information when resetting.

3.3.4 Manual set+

When the green block is on this item, push the “Enter” key to show as below:

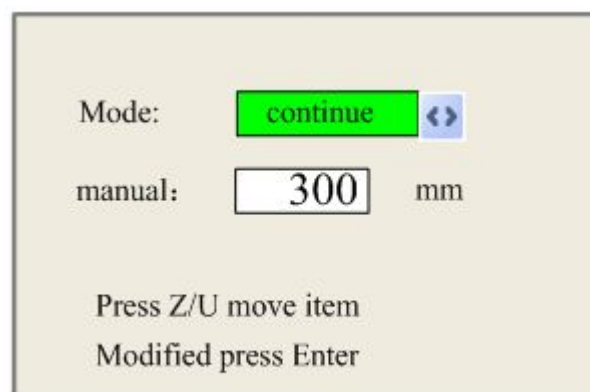


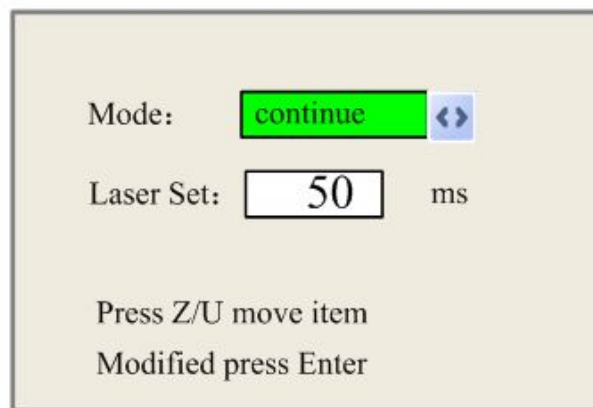
Figure 3.3-3

Push “Z/U” key to move the green block, and when the green block is on the “Mode” item, push “X+/-” keys to select the anticipant value, “Continue” or “Manual”. When “Continue” item is

selected, then the “Manual” item is not valid, on that time, push the direction keys to move the corresponding axes, and when the pushed key is loosed, then the corresponding axes will finish moving. When the Mode item is “manual”, then pushing the direction key one time, the corresponding axes will move a fixed length, unless the scope is overstepped.

3.3.5 Laser set+

When the green block is on this item, push the “Enter” key to show as below:



Mode: continue ↔

Laser Set: 50 ms

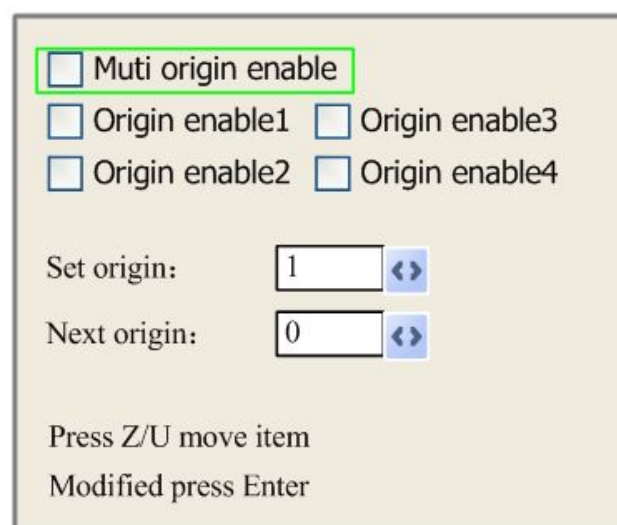
Press Z/U move item
Modified press Enter

Figure 3.3-4

Push “Z/U” key to move the green block, and when the green block is on the “Mode” item, push “X+/-” keys to select the anticipant value, “Continue” or “Manual”. When “Continue” item is selected, then the “Laser Set” item is not valid, on that time, push the Laser key to splash the enabled lasers, and when Laser key is loosed, then the lasers will finish splashing. When the Mode item is “manual”, then pushing the Laser key one time, the enabled lasers will splash a fixed time.

3.3.6 Origin set+

When the green block is on this item, push the “Enter” key to show as below:



☐ Multi origin enable

☐ Origin enable1 ☐ Origin enable3

☐ Origin enable2 ☐ Origin enable4

Set origin: 1 ↔

Next origin: 0 ↔

Press Z/U move item
Modified press Enter

Figure 3.3-5

Push “Z/U” key to move the green block to the anticipant item, and when the green block is on “enable” items, push “Enter” key to enable or disable the item, when enabled, the small diamonds is green, and when disabled, the small diamonds is grey. When the green block is on the “Set origin” item or the “Next origin” item, push the “X+/-” keys to select the value.

Pay attention to if when the green block is on the “Set origin” item, push the “X+/-” keys to select a value, then, “Enter” key must be pushed to valid the change, or, the change is invalid.

Each item introduced as below:

- Multiple Origins Enable: “Yes” or “No” can be selected. If you select “No”, the system will use the single-origin logic. You can press the “Origin” key and set the origin, and only this origin can become valid. If you select “Yes”, the system will use the multiple- origin logic and the “Origin” key on the keyboard become invalid. In such a case, the parameter of each origin must be set in the menu as follows.
- Origin Enable1/2/3/4: after the multiple-origin logic is enabled, the four origins can independently be prohibited and enabled.
- Set Origin 1/2/3/4: after the multiple- origin logic is enabled, you can stop the cursor at “Set as Origin 1/2/3/4”. Press the “Enter” key on the keyboard and the system will take the coordinate figures of current X/Y axles as the corresponding ones to the origin 1/2/3/4.
- Next Origin: there are such five digits as 0~4 for option, which are the origins to be used for the next figure. Origin 0 means the origin set by the “Origin” key on the panel in the single-origin logic. 1~4 means the serial number of the origins in the multiple- origin logic. Next origin can be modified to any one of origin 1~4, so as to control the start location of next work (the premise is that the origin is enabled), but it can’t be modified to origin 0.

 Prompt	Once the multiple- origin logic is selected and if the serial number of the next origin is 1 and four origins are enabled, when the memory file function is started or the processing file is uploaded into the PC and this file selects “Take the Original Origin as current Origin”, the work started for each time will use different origins. The rotation order of origin is 1->2->3->4->1->2.....
--	---

3.3.7 Set Fact Para

After the “Set Fact Para” is selected and the Enter key pressed, the interface will show the specific password to be entered when set as default parameter.



Figure 8.3-6

Push “X+/-” keys and “Y+/-” keys to select the characters, and push the “Enter” key to valid the characters, when finishing enter the password ,that is to say, the six characters, if the password is error, it prompts there is some error, or, all parameters are stored.

 Prompt	After the manufacturer regulates all parameters of the machine well (including all manufacturer parameters and user parameters), this function can be used to store the well-regulated parameters to help users to recover the original parameters (including all manufacturer parameters and user parameters) through selecting “Recover Para” when they regulate parameters improperly.
---	--

3.3.8 Def Fact Para

After the “Def Fact Para” is selected and the Enter key pressed, the “Successful Recovery” dialog box will pop up to prompt that all manufacturer parameters and user parameters are recovered successfully. You can return to the previous menu by press the Enter key.

3.3.9 Auto Focus (Laser machine with Optional function)

When the cursor stops at “Auto Focus”, press the Enter key to search for the focus(When there is z axes, and the z axes reset function is enabled, the auto focusing is valid); press the Esc key to return the prior menu.

3.3.10 Language

The item “Language” helps you to select a appropriate language which is displayed on the pane:



Figure 8.3-7

3.11 IP Setup

When the green block is on this item, push the “Enter” key to show as below:

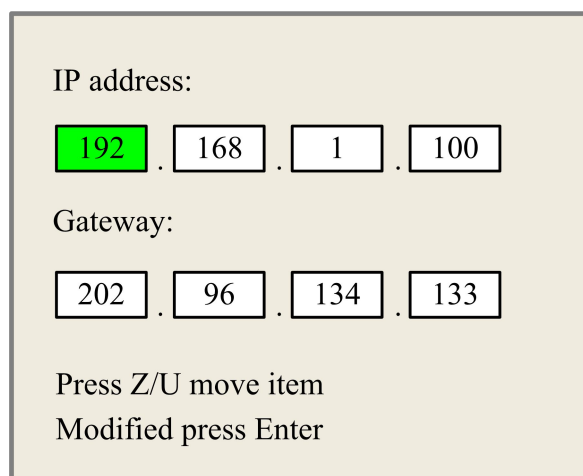
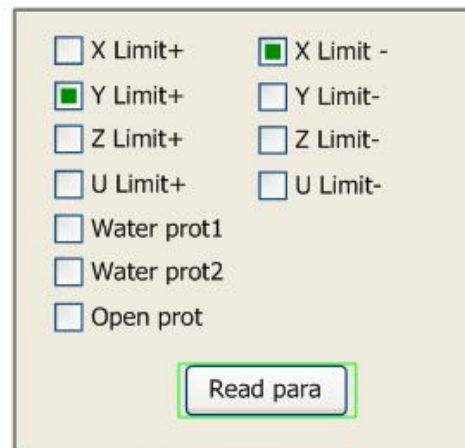
A screenshot of the IP Setup screen. It has a light beige background. At the top, it says 'IP address:' followed by four input boxes containing '192', '168', '1', and '100', separated by dots. The '192' box is highlighted with a green background. Below this, it says 'Gateway:' followed by four input boxes containing '202', '96', '134', and '133', separated by dots. At the bottom, there is instructional text: 'Press Z/U move item' and 'Modified press Enter'.

Figure 3.3-8

Push “Z/U” key to move the changing item, then push “X+/-” keys and “Y+/-” keys to change the value, when all the IP value and the Gateway value are changed, push “Enter” key to validate the change, or “Esc” key to invalidate the change.

3.12 Diagnoses

If the “Diagnoses” item is pressed, the system will show as below:



The interface displays a list of system input information with checkboxes for each item:

- ☐ X Limit+
- ☒ X Limit -
- ☒ Y Limit+
- ☐ Y Limit-
- ☐ Z Limit+
- ☐ Z Limit-
- ☐ U Limit+
- ☐ U Limit-
- ☐ Water prot1
- ☐ Water prot2
- ☐ Open prot

A button labeled "Read para" is located at the bottom of the list.

Figure 3.3-9

This interface shows some system input information, such as limiter status, the status of the water protecting, and the status of the foot switch etc.. When the input is validated, the color frame will be green, otherwise it's gray.

3.13 Screen Origin

If the “Screen Origin” item is pressed, the system will show as below:



The interface shows the "Origin locat:" label followed by a green button labeled "Top left" and a blue button with a double arrow icon. Below this, the text reads:

To modify press ← / →
Modified press Enter

Figure 3.3-10

There are four entries to be selected: Top Left, Top Right, Bottom Left and Bottom Right. When one is selected, the previewed graph on the screen would be enantiomorphous based on X or Y direction.


 注意
 Caution

This item is only used to preview the file on the screen, and it is no meaning to the machine's movement.

3.4 File Key

3.4.1 Memory File

On the main interface, if “File” key is pressed, it will show as below:

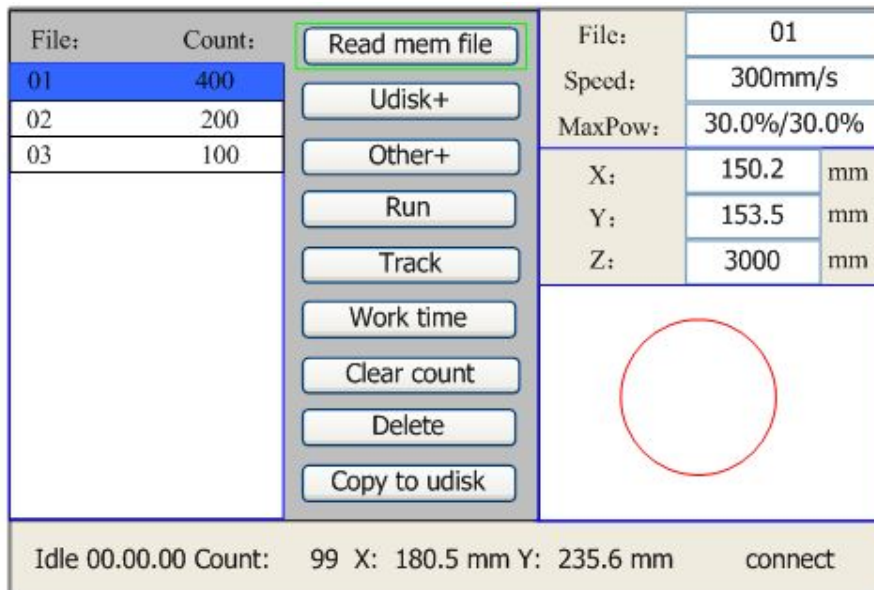


Figure 3.4-1

When showing this menu, the system would read the memory file firstly, the file name and the work times would be listed in the area, and the selected file is previewed in the bottom right area. “Y+/-” keys could be used to move the cursor on the file name list. When the cursor is on a target file name, presses the “Enter” key, the selected file will be previewed on the main interface, and then if “Esc” key is pushed, the preview will disappear.

“X+/-” keys could be used to move the cursor left and right. All the item show as below:

- **Read mem file:** read the memory file list;
- **Udisk:** read the U disk file list;
- **Other:** the other operation of the memory files;
- **Run:** To run the selected file;
- **Track:** To track the selected file, and the track mode is optional;
- **Work time:** To forecast the running time of the selected file, and the time is accurate to 1ms;
- **Clear count:** To clear the running times of the selected file;
- **Delete:** To delete the selected file in the memory;
- **Copy to Udisk:** To copy the selected file to Udisk;

If the “Other” entry is pressed, the system will show as below:

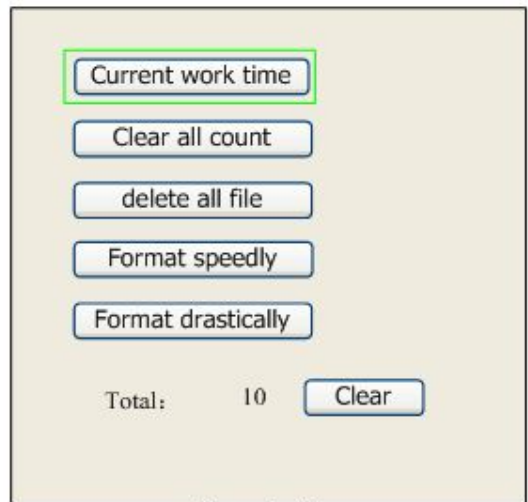


Figure 3.4-2

- **Current work time:** To forecast the running time of the current file(the current file No. is showed on the main interface), and the time is accurate to 1ms.
- **Clear all count:** To clear the running times of every file in the memory
- **Delete all file:** To delete all memory files
- **Format speedily:** To format memory speedily, and then all the files in memory will be deleted.
- **Format drastically:** To format memory drastically, and then all the files in memory will be deleted.
- **Total:** the total running times of all the files.

3.4.2 U Disk File

If the “Udisk” entry in figure 3.4-1 is pressed, the system will show as figure 3.4-3, and the operation method is all the same as figure 3.4-1.

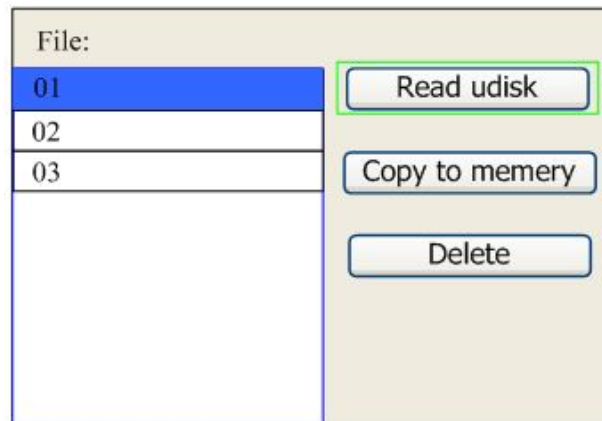


Figure 3.4-3

- **Read Udisk:** read the file list in the Udisk;
- **Copy to memory:** copy the target Udisk file to the memory;
- **Delete:** delete the selected Udisk file;

 Prompt	This system supports such file formats of Udisk as FAT32 and FAT16, but it can identify them when the files are put under the root directory of Udisk. The file name of more than 8 characters will automatically be cut out by the system. The file name that has only English letters and digits will not show when they are copied to the mainboard. The files copied from the mainboard to Udisk will be placed under the root directory of Udisk.
--	---

3.5 Introduction to some alarm info

When users are operating the system, or when the machine is running, some alarm information such as water protecting error maybe shows as below:

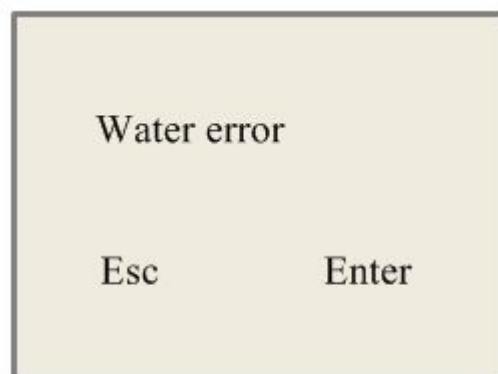
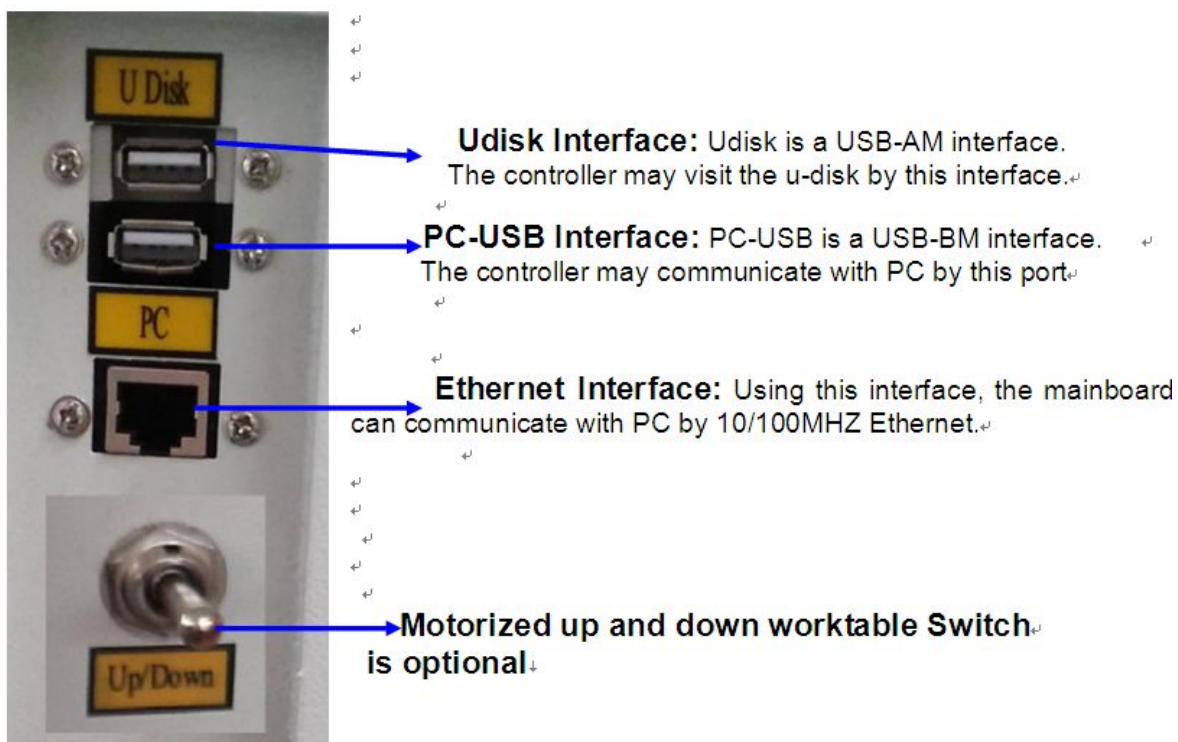


Figure 3.5-1

Push “Enter” key or “Esc” key, the system will execute some relative steps.

3.6Interface

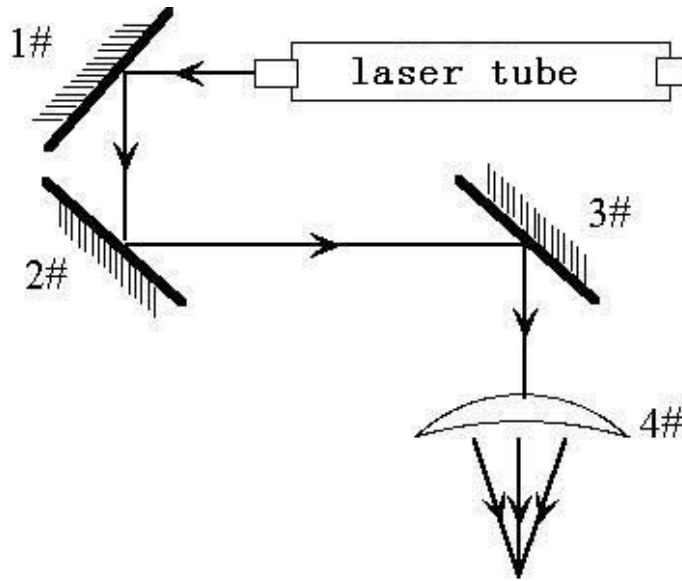


I Chapter 4 Alignment Standards of Optical Path

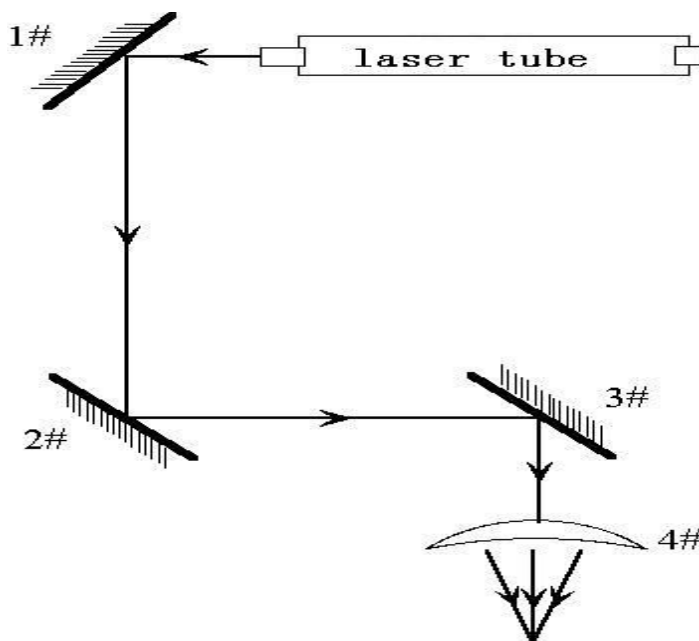
During common use, there may appear some deviation with the optical path, resulting in no laser or light path is abnormal, then please refer to the following method to adjust the optical path:

Step 1: First to ensure laser beam from laser tube to the center of 1# reflector mirror.

Step 2: Affix multi-storey double sticky tape paper on the 2# reflector (Or other objects can be marked on), move laser beam to closest location of laser tube, press pulse(choose suitable power), get a spot on the paper(with special attention: In order to prevent the laser radiation wounding, with a piece of cardboard first to test the approximate location of the spot, and then adjust).



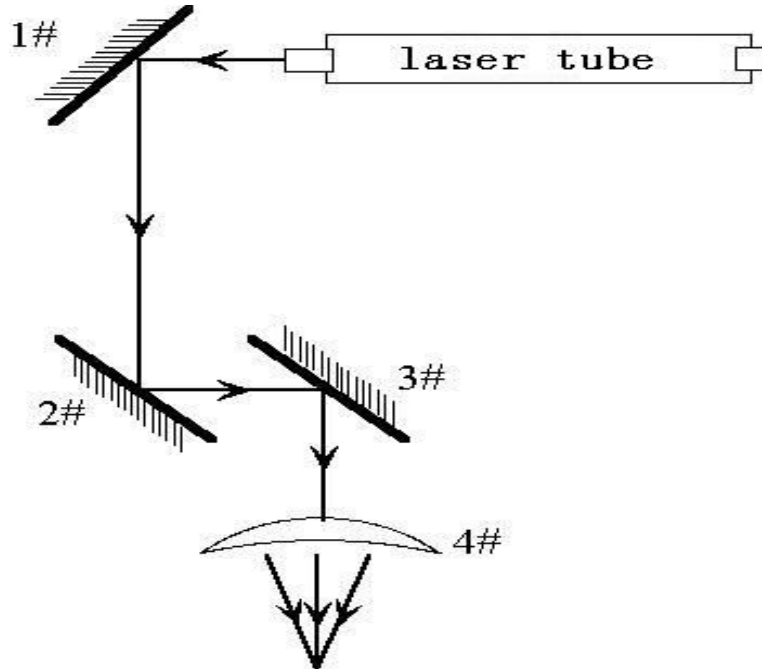
Step 3: Move away the beam to the position far from the laser tube, press pulse, get another spot on the paper.



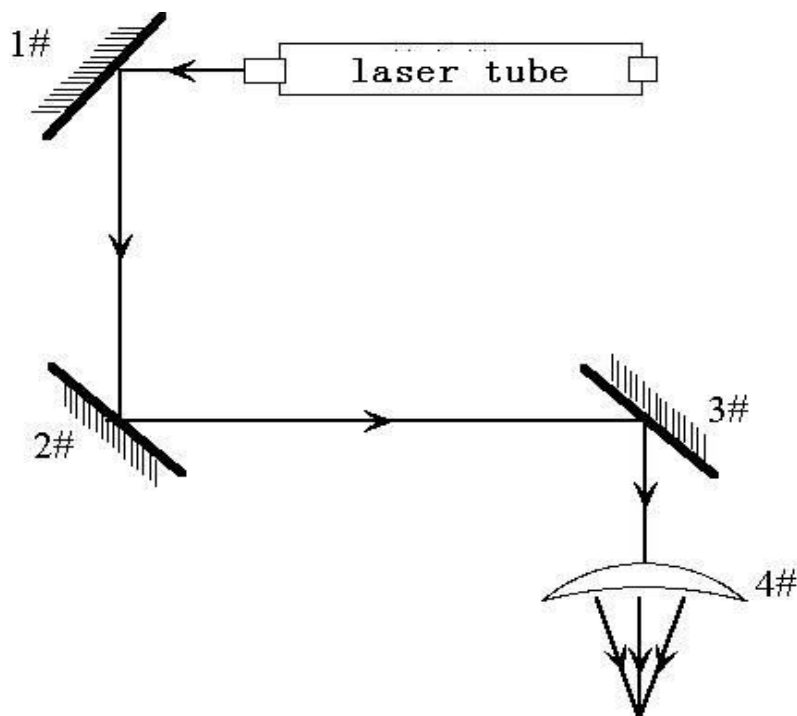
Step 4: If the two spots are not superposition, adjust the screws on the back of the 1#mirror to make the laser fire on the same position as the first spot.

Step 5: Repeat the second to the fourth steps until the two spots overlap completely. Moreover, the spots should be in the center of the hole.

Step 6: Affix multi-storey double sticky tape paper on the 3# reflector ,move laser head to the nearest position from 2# mirror, press pulse(choose suitable power),get a spot on the paper.



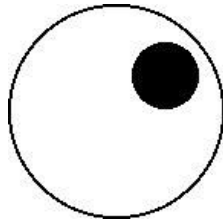
Step 7: Move away the laser head to the position farthest from the 2# mirror, press pulse(first to detect the approximate location of laser with a piece of cardboard to prevent wounding),get another spot .



Step 8: If the two spots are not superposition, adjust the screws on the back of the 2# mirror to make the laser fire on the same position as the first spot.

Step 9: Repeat the sixth to eighth steps until the two spots overlap completely. Moreover, the spots should be in the center of the hole.

Step 10: Affix multi-storey double sticky tape paper on the 3# reflector, press pulse, get a spot on the paper. If it is in the center of light hole, then pass.



Step 11: If the laser light is not in the center of light hole, as below figure:

In the left Figure, the spot is upper and right biased.

Top to bottom bias: can only raise or lower the laser tube.

Inside and outside bias: only move the laser tube in or out to adjust.

In this case, it is essential to lower the laser tube(here refers to low-voltage side of the laser tube),and then, from the beginning of all the re-adjustment of the first step.

Note: The operator can't do the above working until after the professional training. Otherwise, the operator do this working must with the help of the professional .The operator must pay attention to security when adjusting, to prevent the laser radiation wounding.

I Chapter 5 Daily Maintenance and Common Faults

The stable working of the machine is inseparable with normal daily operation and maintenance. Here are some common daily maintenance and common faults analysis:

5.1 Daily maintenance

1. Replacement of the cooling water (clean water tank and replace recycled water once a week are recommended):

Quality and temperature of the cooling water can affect the lifetime of laser tube directly, suggest use purified water or distilled water, and water temperature should be below than 35 °C. When higher than 35 °C, please replace cooling water, or add ice cubes to lower the water temperature, (cooling device is recommended, or use two water tanks).

Note: To ensure that the laser tube full filled with cooling water before machine working.

2. Cleaning of Water Tank

First of all, turn off power, disconnect the water inlet pipe, let the inside water of the laser tube flow into the water tank automatically, open water tank, take out the water pump, clean water pump and water tank, put the pump back to water tank, insert the water pipe which connect water pump to water inlet mouth of the machine, finish all joints, then replace cooling water. Turn on the water pump power supply is lately, let the pump run 2-3 minutes (make laser tube full filled with water).

3. Cleaning of Exhaust Fan

After long time using, inside of fan will accumulate much solid dust, so the exhaust fan will make a great noise, and it is not conducive to the exhaust. When the exhaust effect become poor, we have to clean the fan and smoke pipe. Firstly, turn off the power supply, remove the two pipes from the fan, clean dust inside of the pipes, and then clean the dust inside of the fan.

4. Cleaning of Lens (daily cleaning is recommended before work, equipment must be in shutdown state)

As we have talked before, engraving machine has three reflector mirrors and one focus lens (1# reflector mirror is near the light outlet mouth of laser tube, the upper left corner of the machine, 2# reflector mirror is at left side of the beam, 3# reflector mirror is on the top of laser head, the focus lens is located in the bottom part of the laser head), the laser is send out by the mirror reflecting and focus lens focalizing. Mirror is easy to be dirty, resulting in laser loss and mirror damage, you needn't remove 1#, 2# and 3# mirror when cleaning them, Just using a cotton bar to dip some cleaning solution (acetone or alcohol), swab carefully by rotating from central to edge of the lens.

Take out the focus lens from the laser head, using the same method clean it, after cleaning, put it back.

Note: ① you should wipe the lens carefully, can not damage the surface coating; ② you should do that lightly, to prevent falling; ③keep concave side downward when install the focus lens.

5. Cleaning of Guideway (suggest cleaning every two weeks, equipment must be in shutdown state)

First of all, move the laser head to the far right (or left), wipe with a dry cloth until shiny clean, together with a little oil (sewing machine oil is recommended), push the laser head several times slowly along the guide, so that lubricant can be evenly distributed. Clean and lubricate the Y axis two guideways is the same as X axis.

Note: Please prepare for cleaning Guide - dry cotton cloth, lubricating oil.

6. Optical path inspection

Optical path system of the laser engraving machine is completed by the mirror reflection and focus lens focusing, and there is optical path bias with the focus lens, but the three mirrors is fixed by the mechanical part, optical path bias is very possible for them ,although there is no optical bias normally, we still suggest you check optical path before working.

Please get detailed explanation from I Chapter 4 "Alignment Standards of Optical Path "

5.2 Common Faults Analysis

N o.	Phenomena of Malfunction	Analysis method	Solution
1	Open the machine but no movement	Check power supply of machine connects well or not	Make all power supply electrify again
		Mainboard parameter is right or not	Correct the parameters according to software operating manual
2	Working with nonstop laser	Mainboard parameter is right or not	Correct the laser parameters according to software operating manual
3	Desultory light when working	Check water circulation is swimmingly or not	Clean water tank, water pump and water pipe
		Voltage is stable or not	Add regulator for the laser machine
4	Self-test abnormal when starting	Mainboard parameter is right or not	Correct the X and Y axis direction ,limit position parameters according to software operating manual
5	After output data ,machine no action	Check whether the data port choice is correct.	Choose correct port
		Check whether turn on the machine	Turn on the machine
		Check whether connected ground wire for the machine	Connect ground wire
		check whether installed the USB driver	install the USB driver
6	No laser when working	Check whether optical path is bias	Adjust the optical path
		Check whether the cooling water is running	Ensure the water is running
7	Can't detect the laser equipment	The computer or USB communication problem	Change computer or USB line