# User manual for LCD control panel

## Contents

# 1 Function of the Buttons



-  Arrow buttons: Control the movement of the laser head.(also can be used to change the parameters in the control panel);

-  Z/U button: Includ Z axes move,Auto focus and Language setting;

-  Reset button: Reset the laser head;

-  Pulse button: Control the laser tube to emit laser beam;

-  Speed button: Set the laser head' move speed;

- **Min-Power**    Min-Power button: This button is invalid;

- **Max-Power**    Max-Power button: Set the power of "Pulse" button;

- **File**    File button: The management of the memory and U disc files;

- **Start-Pause**    Start-Pause button: Run/pause the current job;
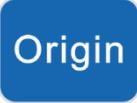
- **Origin**    Origin button: Set the starting point for the laser head;

- **Frame**    Frame button: To check the working are of current job;

- **Esc**    Esc button: To stop work, or return to the last menu;

- **Enter**    Enter button: Confirm your selection;

# 2 The main interface

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

| | |
|---|---|
| Graph display area | Running parameters |

| | | |
|---|---|---|
| File: | 01 | |
| Speed: | 300mm/s | |
| MaxPow: | 30.0%/30.0% | |
| X: | 150.2 | mm |
| Y: | 153.5 | mm |
| Z: | 3000 | mm |

Coordinate

| 01 | | 400 | 25.0 |
|---|---|---|---|
| 02 | | 200 | 29.1 |
| 03 | | 100 | 31.5 |

Graph layer parameters

Running progress bar

Idle 00.00. 00 Count: 99 X : 180. 5 mm Y : 235. 6    mm   connect

| Running Status | Working Number | File dimension | Net Status |
|---|---|---|---|
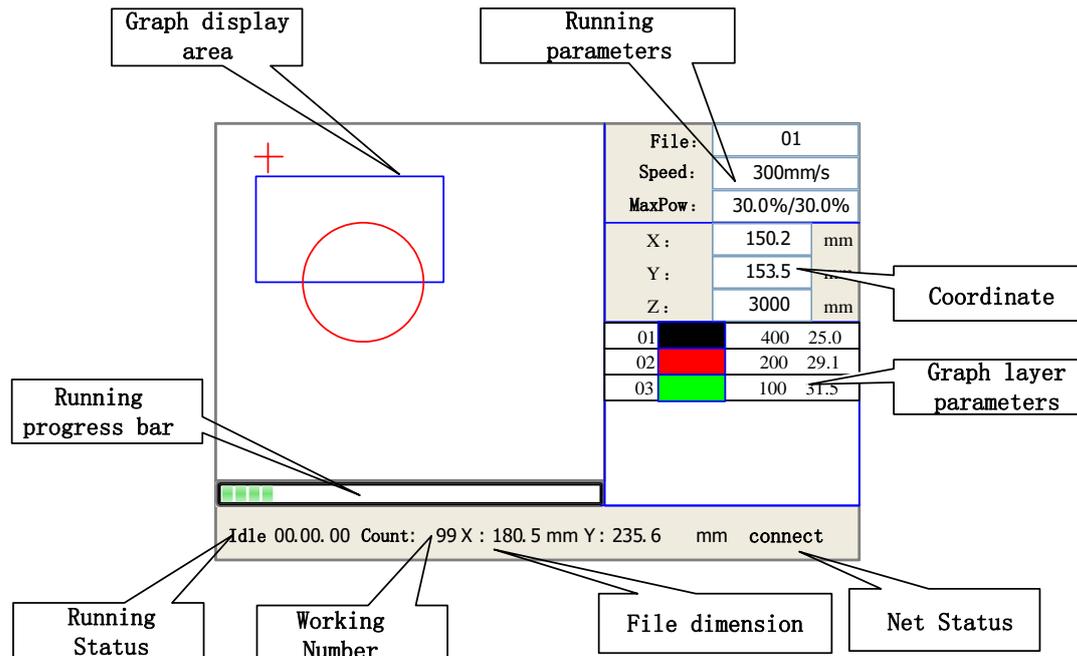
- Graph Display Area: To display the whole file's track, and display the running track.
- Running parameters: To display the running file's file number, speed, max power etc.;
- Coordinate: To display the current coordinate of X,Y and Z axes
- Graph layer parameters: To display the layers' information 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.

## 2.1 Speed Key

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

Speed： 300 mm/s

Modified press Enter
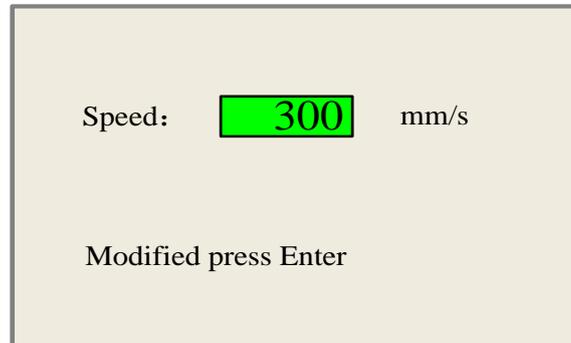
The speed is set from 0 to 1000mm/s, Push the "X+/-" Keys to move the cursor in the numeral area, and push the "Y+/-" keys to change the value, then push the "Enter" key to save the change, push the "Esc" key to invalidate the change.

## 2.2 Max Power Keys

Push the "Max Power" keys when the screen is on the main interface, it will show as below:

MaxPower1: 30.0 %

MaxPower2: 30.0 %

Press Z/U move item
Modified press Enter
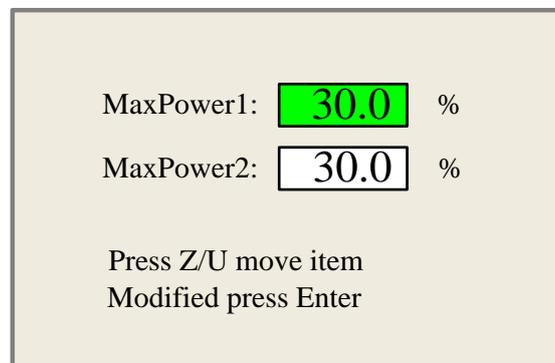
MaxPower1 is the power setting for the current laser tube; MaxPower2 is spare.

## 2.3 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 |

Layer0：  ⬛  ‹›

Speed：  400 mm/s

MinPower1：  22.0  %

MinPower2：  30.0  %

MaxPower1：  30.0  %

MaxPower2：  30.0  %

Press Z/U move item
Modified press Enter

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.

## 2.4 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 | Language+ |
| U move | IP setup+ |
| Axis reset+ | Diagnoses+ |
| Manual Set+ | Screen Origin+ |
| Laser Set+ | |
| Origin set+ | |
| Set Fact Para | |
| Def Fact Para | |
| Auto Focus | |

Press up and down arrow keys to move the green block to the anticipant item, and then push the "Enter" key to display the sub menu.

### 2.4.1 Z Move

When the green block is on "Z Move" item, to move the Z-axis table up and down by press left and right arrow keys, then press ESC to go back to normal x & Y axis control.

### 2.4.2 U Move

Thunder laser machine does not use the U axis function.

### 2.4.3 Axis Reset+

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

```
XY axis reset
X axis reset
Y axis reset
Z axis reset
U axis reset
```
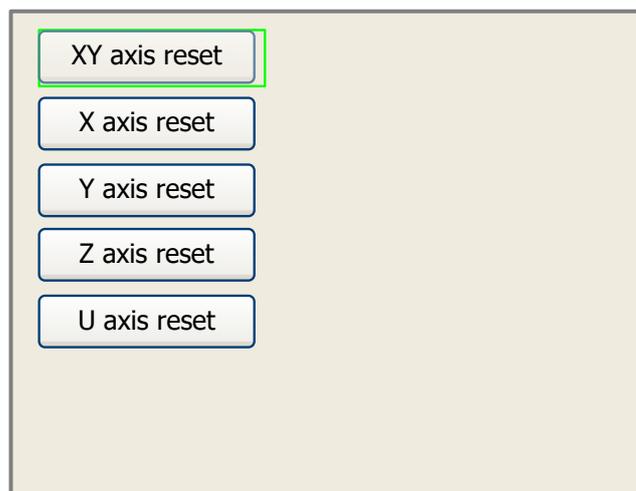
Press up and down arrow keys to move the cursor to one of the entry, then push "Enter" key to restart the selected axis, the screen will show some information when resetting.

### 2.4.4 Manual Set+

When the green block is on this item, push the "Enter" key to show as below:
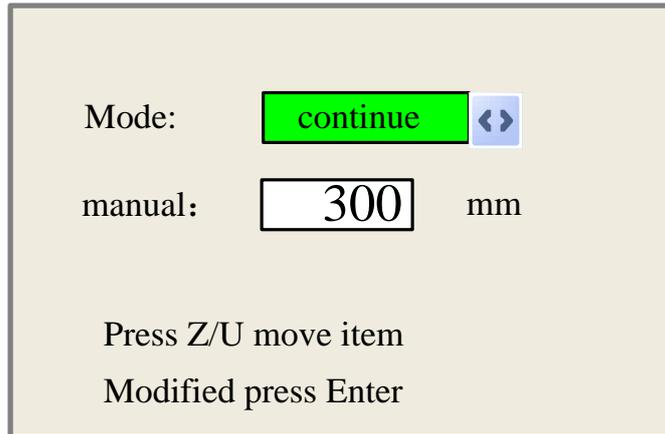
```
Mode:        continue      ◄►

manual：      300       mm


        Press Z/U move item
        Modified press Enter
```

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.

## 2.4.5 Laser Set+

When the green block is on this item, push the "Enter" key to show as below:
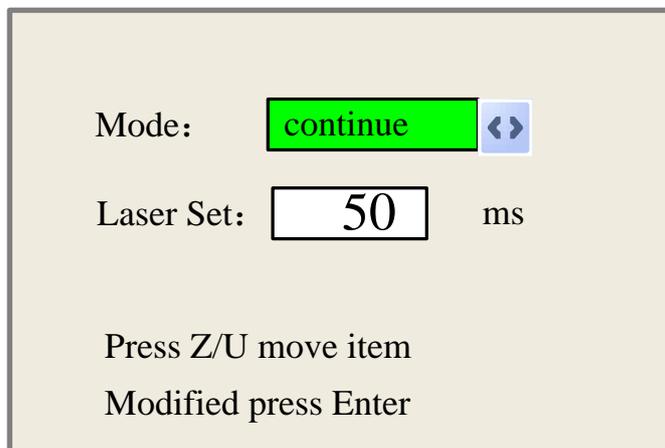
```
Mode：        continue      ◄►

Laser Set：     50       ms


        Press Z/U move item
        Modified press Enter
```

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.

## 2.4.6 Origin Set

When the green block is on this item, push the "Enter" key to show as below:
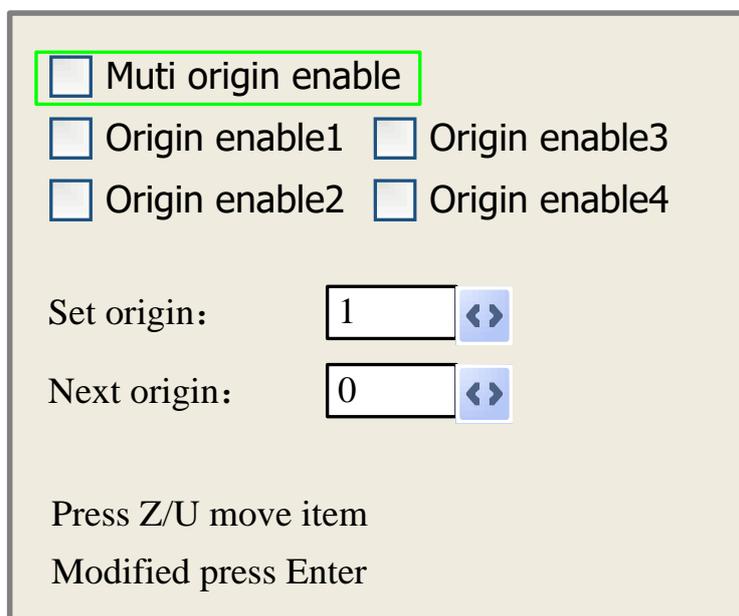
```
┌─────────────────────────────────────────┐
│                                         │
│     ┌──┐                                │
│     │  │ Muti origin enable             │
│     └──┘                                │
│     ┌──┐              ┌──┐              │
│     │  │ Origin enable1  │  │ Origin enable3│
│     └──┘              └──┘              │
│     ┌──┐              ┌──┐              │
│     │  │ Origin enable2  │  │ Origin enable4│
│     └──┘              └──┘              │
│                                         │
│                    ┌──────┐            │
│     Set origin：   │  1   │  ◄►        │
│                    └──────┘            │
│                    ┌──────┐            │
│     Next origin：  │  0   │  ◄►        │
│                    └──────┘            │
│                                         │
│     Press Z/U move item                │
│     Modified press Enter               │
│                                         │
└─────────────────────────────────────────┘
```

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.

<table>
<tr><td rowspan="2">**Prompt**</td><td>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…….</td></tr>
</table>

## 2.4.7 Set Fact Parameters

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.

Password: 123456

Password error

0 1 2 3 4 5 6 7 8 9
A B C D E F G H I J
K L M N O P Q R S T
U V W X Y Z

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.

<table>
<tr><td rowspan="2">**Prompt**</td><td>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.</td></tr>
</table>

## 2.4.8 Def Fact Parameters

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.

## 2.4.9 Auto Focus

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.

## 2.4.10 Language

The item "Language" helps you to select a appropriate langue which is displayed on the pane:



## 2.4.11 IP Setup

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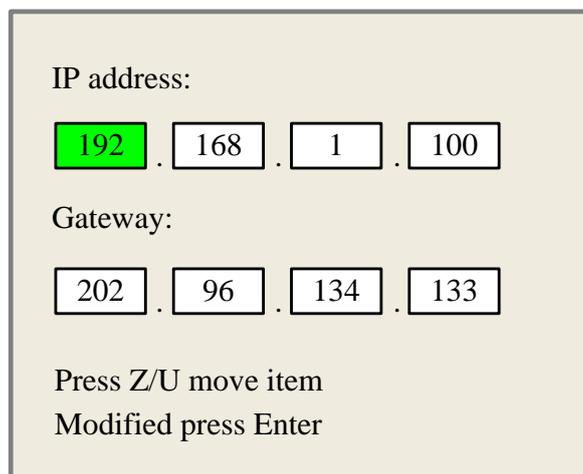


Push "Z/U" key to move the changing item, then push "X+/-" keys and "Y+/-" keys to change the value, when all the IP value and the Gateway value are changed, push "Enter" key to validate the change, or "Esc" key to invalidate the change.

## 2.4.12 Diagnoses

If the "Diagnoses" item is pressed, the system will show as below:
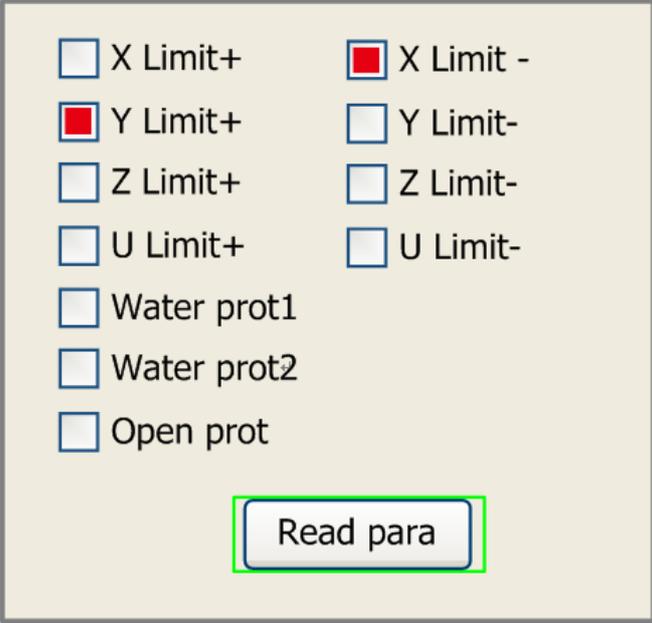
| | |
|---|---|
| ☐ X Limit+ | 🟥 X Limit - |
| 🟥 Y Limit+ | ☐ Y Limit- |
| ☐ Z Limit+ | ☐ Z Limit- |
| ☐ U Limit+ | ☐ U Limit- |
| ☐ Water prot1 | |
| ☐ Water prot2 | |
| ☐ Open prot | |

Read para

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 red, otherwise it's gray.

## 2.4.13 Screen Origin

If the "Screen Origin" item is pressed, the system will show as below:
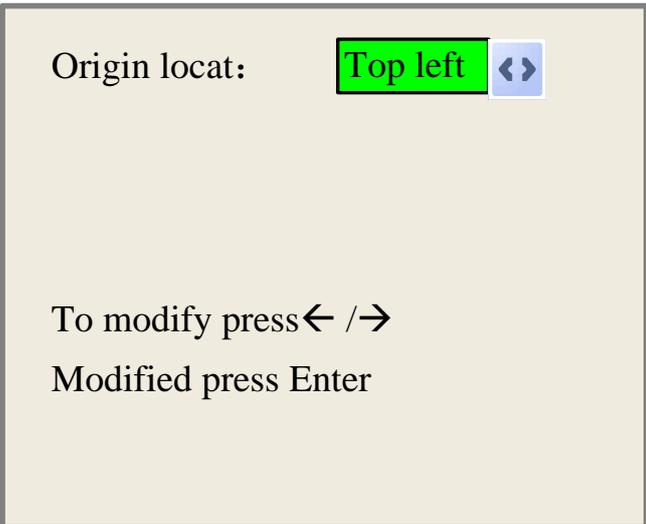
Origin locat：      Top left  ◀▶

To modify press← /→
Modified press Enter

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.

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

# 2.5 File Key

## 2.5.1 Memory File

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

| File: | Count: | | File: | 01 |
|-------|--------|--|-------|----|
| 01 | 400 | Read mem file | Speed: | 300mm/s |
| 02 | 200 | Udisk+ | MaxPow: | 30.0%/30.0% |
| 03 | 100 | Other+ | X: | 150.2 mm |
| | | Run | Y: | 153.5 mm |
| | | Track | Z: | 3000 mm |
| | | Work time | | |
| | | Clear count | ◯ | |
| | | Delete | | |
| | | Copy to udisk | | |

Idle 00.00.00 Count:  99  X:  180.5 mm  Y:  235.6 mm        connect

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:

```
┌─────────────────────────────────────┐
│                                      │
│        ┌─────────────────────┐       │
│        │  Current work time  │       │
│        └─────────────────────┘       │
│                                      │
│        ┌─────────────────────┐       │
│        │   Clear all count   │       │
│        └─────────────────────┘       │
│                                      │
│        ┌─────────────────────┐       │
│        │    delete all file  │       │
│        └─────────────────────┘       │
│                                      │
│        ┌─────────────────────┐       │
│        │   Format speedly    │       │
│        └─────────────────────┘       │
│                                      │
│        ┌─────────────────────┐       │
│        │  Format drastically │       │
│        └─────────────────────┘       │
│                                      │
│         Total：   10   ┌───────┐     │
│                        │ Clear │     │
│                        └───────┘     │
│                                      │
└─────────────────────────────────────┘
```
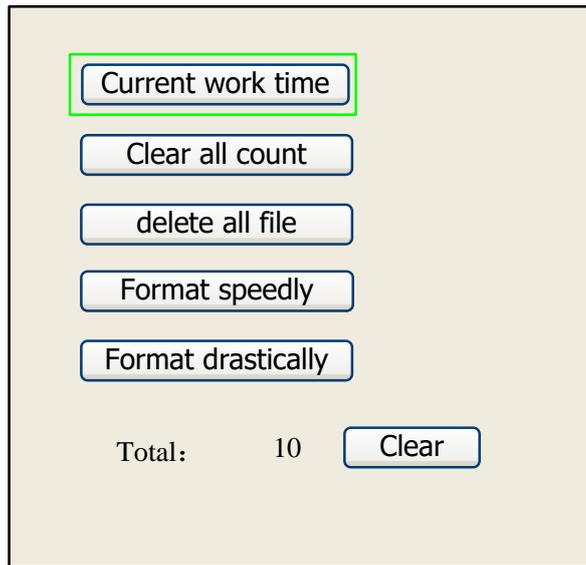
- **Current work time**: To forecast the running time of the current file(the current file No. is showed on the main interface), and the time is accurate to 1ms.
- **Clear all count**: To clear the running times of every file in the memory
- **Delete all file**: To delete all memory files
- **Format 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.

### 2.5.2 U-Disk File

If the "U-disk" entry in figure 8.4-1 is pressed, the system will show as figure 8.4-3, and the operation method is all the same as figure 8.4-1.
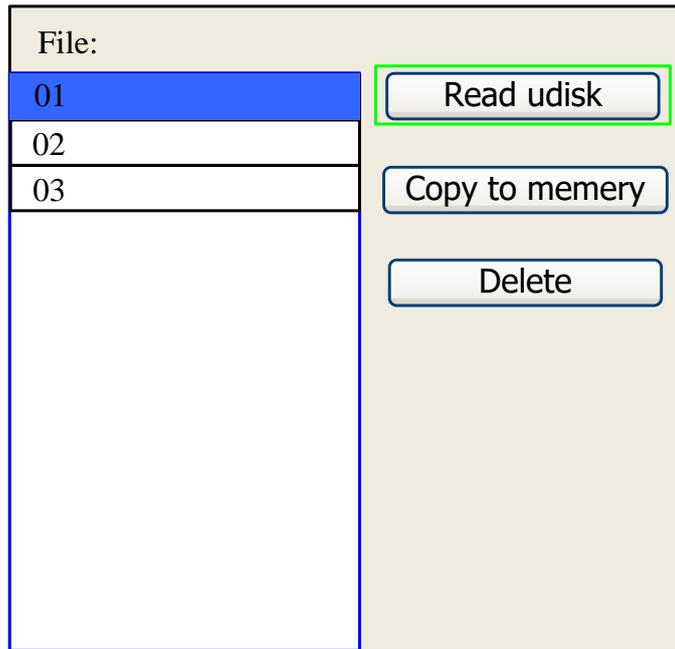
- **Read Udisk**: read the file list in the Udisk;
- **Copy to memory**: copy the target Udisk file to the memory;
- **Delete**: delete the selected Udisk file;

| | |
|---|---|
| ✎ 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. |

## 2.6 Alarm Information of Display

When users are operating the system, or when the machine is running, some alarm information such as water protecting error maybe shows as below:
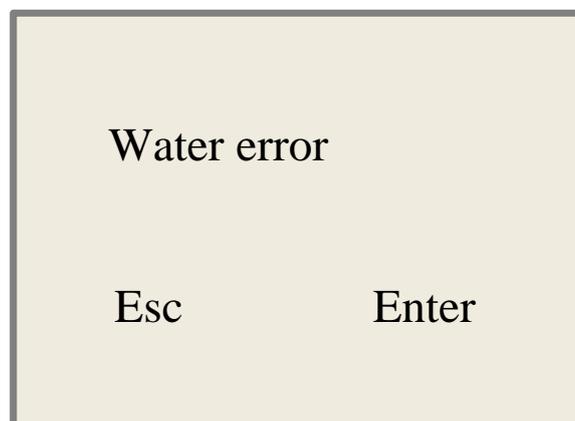
Push "Enter" key or "Esc" key, the system will execute some relative steps.


**End**