# **User Manual**

(DSP5.3 For MPC6515)

V1.2

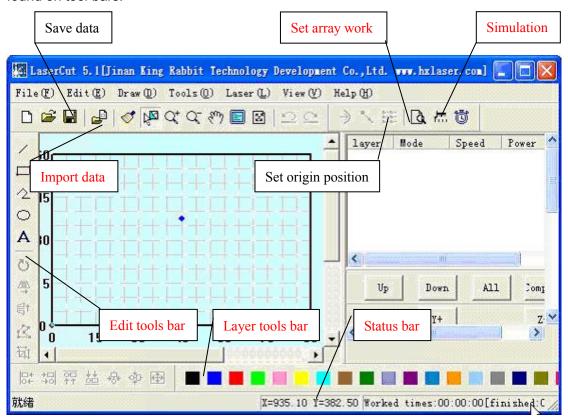
	•	Installation of the system	
		s of the system —————————	
1.2	Requirement of PC —————————————————————		
1.3	3 Installation of MPC6515 card ——————————		
1.4	Installation of the software ————————————————————————————————————		
	-	Explanation for CorelDraw edition	
2.1	Laser or	utput ————————	6
2.2	Import D	OST file —————————	10
2.3	Output f	ile —————————	10
2.4	Options		10
	-	Explanation for AutoCAD edition	
3.1	Laser or	ıtput ———————————————————————————————————	11
	•	ata ——————————	
3.3	Options		11
3.4	Unite lin	e —————————	11
Cha	apter 4	Explanation for universal edition	
4.1	File —-		12
4.2	Edit —-		13
4.3	Draw		15
4.4	Tools		18
4.5	Laser		20
4.6	View		24
4.7	Help		24
4.8	Other bu	utton on the tool bar ————————	25
Cha	apter 5	Laser output	
	•		
5.2	Test —-		31
	-	processing parameters ———————	
5.4	Downloa	ad data (Stand Alone) ————————	33
Cha	apter 6	Options	
		erface ——————————	
		le —————————	
6.3	Feeding		37
	•	. —————————————————————————————————————	
		ngrave —————————	
6.7	Hole		42

Chapter 7 PAD03 operation

7.1 Main interface of PAD03	43
7.2 Processing interface of PAD03 ———————	44
7.3 Accessory interface of PAD03 ———————	44
Chapter 8 Text display operation	
8.1 Main interface ——————————	46
8.2 Jog set interface ———————————	47
8.3 Laser set interface ——————————	47
8.4 Work interface ——————————	47
Chapter 9 Download Files	
9.1 Update MPC6515———————	48
9.2 Download processing file (*.mol) ———————	48
Chapter 10 Comments on tool programs	
10.1 Version check program ————————————————————————————————————	50
Chapter 11 Addenda	
11.1How to make AI (Adobe Illustrator) files —————	51
11.2 FAQ	51

# **Chapter 4** Explanation for Universal Edition

When run the software, the interface is as following. All system function can be found on tool bars.



Let mouse stay on an icon for a moment, and it will show the explanation of basic function of tools bar. The following is the explanation of all tool bars.

## 4.1 File

#### 4. 1.1 New

The corresponding icon is  $\Box$ .

Create a new file.

#### 4.1.2 Open

The corresponding icon is 🔁.

Load process data made by the software. The file format is ECP-EC Project File (\*.ecp).

#### 4.1.3 Save

The corresponding icon is  $\blacksquare$ .

Save the graphics data that is defined processing parameters as ECP-EC Project File (\*.ecp).

#### 4.1.4 Save As

Save a ECP-EC Project File (\* .ecp) as another ECP-EC Project File (\* .ecp).

# 4.1.5 Import

The corresponding icon is

Load data that the software supports. The software can support \* .PLT、 \* .AI、 \* .DXF、 \* .DST、 \* .BMP etc files.

#### 4.1.6 Export

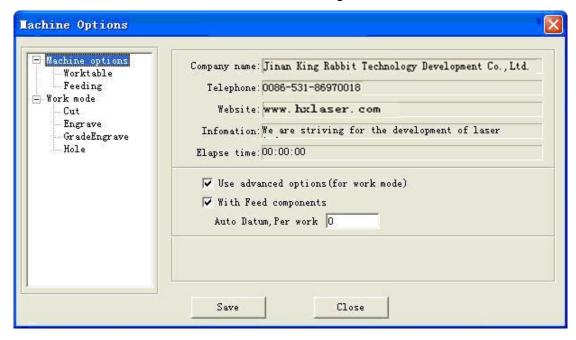
Save the vector graphics data that is in current window as a standard PLT file (\*.PLT) or DXF file.

#### 4.1.7 Relink machine

When the PC failed to link with MPC6515 control card, click this button and relink PC with the control card.

## 4.1.8 Options

Click this button, and the interface is as following.



Any change of these parameters will change the performance of the machine. Before changing the parameter, you should consult the supplier.

Details please refer to "Chapter 6"

# 4.1.9 Exit

Click this button, and the software will close.

#### 4.2 Edit

# 4.2.1 Undo

The corresponding icon is  $\square$ .

# 4.2.2 Redo

The corresponding icon is ......

#### 4.2.3 Refresh

The corresponding icon is .

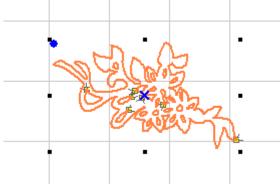
Click this button, and you can refresh the screen.

#### 4.2.4 Pick

Select graphics. Select graphics or a part of the graphics. You can delete, move, change layers of the graphics you select.

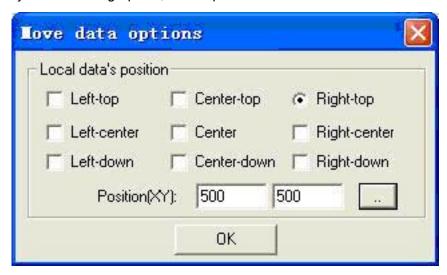
There are other functions about this button.

Click this button, and select the graphics.



Move the mouse to the nodes, then drag the mouse, you can change the shape of the graphics as you prefer.

After you select the graphics, click "Spacebar".



Input the coordinate of the X-axis and Y-axis, you can change the position of the graphics.

#### 4.2.5 Zoom in

The corresponding icon is \(\mathbb{Q}^\tau.\)

Enlarge showing graphics. Click this button, then click your graphics with mouse and the graphics can be enlarged.

#### 4.2.6 Zoom out

The corresponding icon is .

Reduce showing graphics. Click this button, and the graphics can be reduced.

# 4.2.7 Pan

Move screen. Click this button; press the left button of your mouse continuously, and move your mouse to any place of the screen, then you can see any part of the screen.

#### 4.2.8 Room to table

The corresponding icon is .

Show the whole processing area within the scale of reference frame.

#### 4.2.9 Room to all object

The corresponding icon is .

Show the processing date in max on screen.

#### 4.2.10 Center to table

When the data is input, it may be out of the reference frame. Click this button and you can move data to reference frame. If you select a graphics and click this button, the selected graphics will be moved to the center of the reference frame.

#### 4.3 Draw

#### 4.3.1 Line

The corresponding icon is /.

Click this button, move mouse on the screen, and you can draw straight lines freely. Press "Ctrl" key, and move mouse on the screen, you can draw horizontal lines.

# 4.3.2 Rectangle

The corresponding icon is .

Click this button, move mouse on the screen, and you can draw rectangles of various sizes. Press "Ctrl" key, and move mouse on the screen, you can draw square.

#### 4.3.3 Draw poly-line

The corresponding icon is 2.

Click this button, move mouse on the screen, and you can draw poly-line of various sizes by clicking mouse. If you click "C" key, the line will be closed. Press "Ctrl" key, and move mouse on the screen, you can only draw beeline.

#### 4.3.4 Ellipse

The corresponding icon is .

Click this button, move mouse on the screen, and you can draw ellipse of various sizes. Press "Ctrl" key, and move mouse on the screen, you can draw circle.

### 4.3.5 Bezier

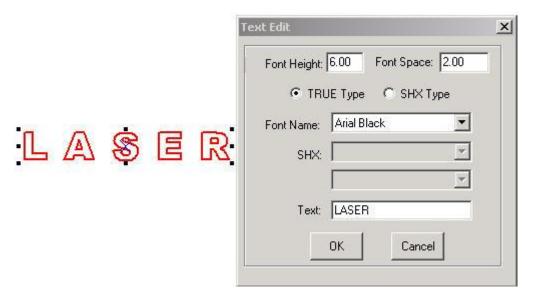
The corresponding icon is ...

Click this button, move mouse on the screen, and you can draw bezier of various sizes.

#### 4.3.6 Text

The corresponding icon is A

Click this button, and drag mouse.



If you want to edit the text, please click this button and drag mouse on the text.

Before you change the size of the text, the text should be changed to curve. The "To curve" button is located in "Tools-- To curve". When the text changed to curve, the content of the text can't be changed.

# 4.3.7 Copies

The corresponding icon is ...

Click "select" button, and choose the graphics you want to array copy. Then click this button.



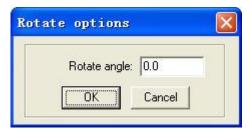
Input relative parameters, then a number of graphics are copied as "rows X columns".

Gap means the distance between two adjacent rows or columns.

#### 4.3.8 Rotate

The corresponding icon is **O**.

Click "pick" button , and choose the graphics you want to rotate. Then click this button, you can rotate the graphics. Click "Spacebar" key after you click , you will see following dialog box.

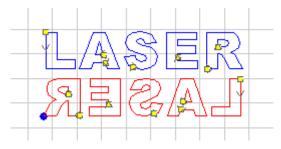


Input the number you want, and you can control the rotate angle.

# 4.3.9 Mirror (vertically)

The corresponding icon is

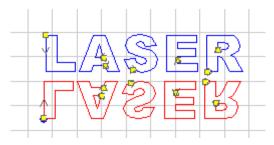
Click "pick" button and choose the graphics you want to edit. Then click this button, you can change the shape of the graphics. The following is a sample. The upper is original graphics, and the other is edited.



# 4.3.10 Mirror (horizontally)

The corresponding icon is

Click "pick" button and choose the graphics you want to edit. Then click this button, you can change the shape of the graphics. The following is a sample. The upper is original graphics, and the other is edited.



#### 4.3.11 Size

The corresponding icon is ¼.

Change the size of graphics. Click "pick" button then select the graphics you want to edit. Click this button.



Now, input the number you prefer on X and Y-axis. Click "OK", the size of graphics can be changed. If you don't want to change the proportion of X and Y-axis, you can input one of the number (X or Y), then click the button.....

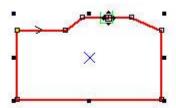
# 4.3.12 Align

There are 7 options for aligning.

# 4.3.13 Edit node

The corresponding icon is

Edit the nodes of the selected vector graphics. Click this button, the nodes of the selected graphics will show as small squares.



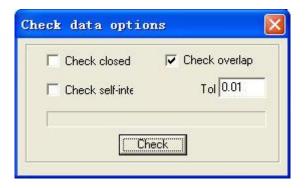
Move mouse to the node, and you can change the shape of the graph by dragging mouse.

Move mouse to the graphics, the mouse will change to a crisscross. Dblclicking mouse will add a node. Move mouse to the node and click "Delete" key, the node will be deleted.

#### 4.4 Tools

# 4.4.1 Data check

Click this button.



This can check if the data is closed, overlap or self-intersect.

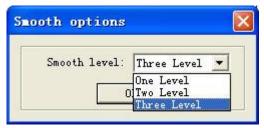
Tol: overlap error of dots.

When the data is input two times or more, it can't be processed properly. So if you find something is unusual such as you can't engrave a graphics data, please use this tool to check overlap or others. Click "Check" and it will inform which part of the data is in trouble by red it. Then click "Delete" key and you can delete unwanted data. Before you click "Delete" key, you have to click ".

#### 4.4.2 Smooth curve

The corresponding icon is ~.

This tool can smooth curves. This can improve the cutting speed. Select the graphics you want, and click this button.



There are 3 options. Compared with "One Level" and "Two Level", "Three Level" is smoother. But the distortion is bigger than the others.

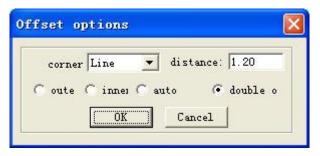
#### 4.4.3 Unite line

This tool can unite several lines that are intersecting as one line. This is usually used for DXF files.

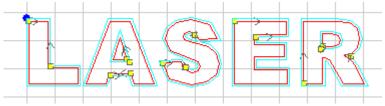
#### 4.4.4 Offset curve

The corresponding icon is \_\_\_\_\_.

This tool can expand or reduce the data. Select the data you need and click this button.



Input parameters you need you will get a parallel data and the new data will be set as another layer. The following is a sample.

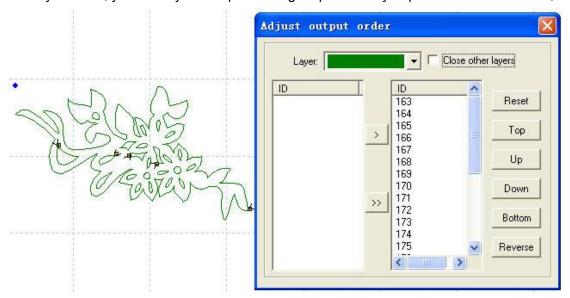


#### 4.4.5 To curve

Convert the text to curve.

#### 4.4.6 Output order

By this tool, you can layout the processing sequence as you prefer. Click this button,



Each ID number represents a separate graphics. Change the sequence of the ID number, and the processing sequence will be changed.

#### 4.4.7 Invert colors

The corresponding icon is \_\_\_\_\_.

This is only for BMP. Click "pick" button , and choose the graphics you want to edit. Then click this button, the black part will be changed to white and white to black. The following is the sample.

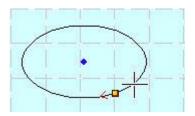


#### 4.5 Laser

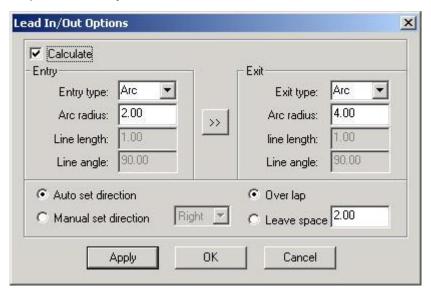
#### 4.5.1 Define cut route

The corresponding icon is .

This software will define the starting point and direction automatically. Generally, the point is on the corner. When you need to change the starting point and direction, you can click this button, and then move mouse to the graphics. The mouse will change to be a crisscross. Now click the left key of mouse on any point of the graphics, and this point will be the new starting point. You can change the direction by clicking "F" key. The following is a sample.



Click "Spacebar" and you can set lead in/out line.



Calculate: select this option and you can set lead in/out lines.

Entry/Exit type: type of lead in/out lines. There are 2 types: arc and line.

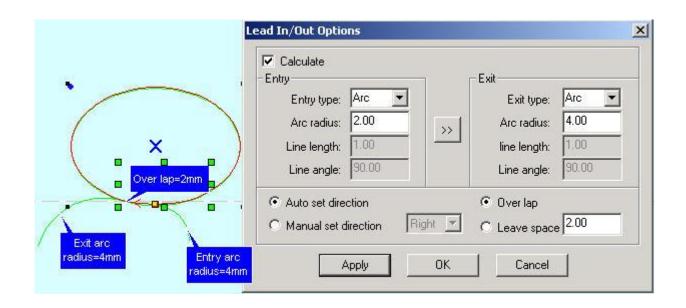
Arc radius: radius of lead in/out arc. Line length: length of lead in/out lines. Line angle: angle of lead in/out lines.

: set the exit parameters as same as that of entry.

Auto set direction: this software will set where the lead in /out lines are (in or out of the graphics outline) automatically.

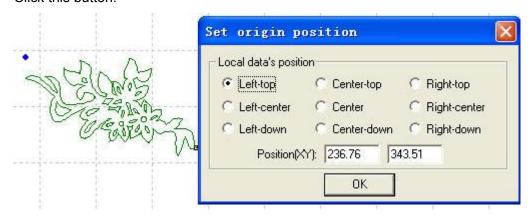
Manual set direction: set where the lead in /out lines are.

Over lap/leave space: this option determines whether the processing effect is closed. The length of over lap (or leave space) is set by the input number beside this option.



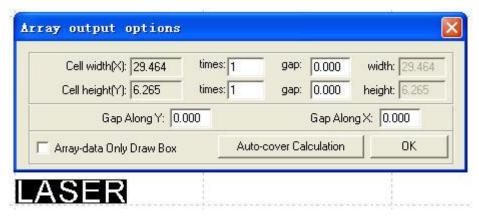
# 4.5.2 Set laser origin

The corresponding icon is ... Click this button.



You can set origin point anywhere as you prefer.

# 4.5.3 Array output options



Cell Width(X/Y): It is the original size of the data.

**Times:** It is the number of rows and columns you need.

Gap: It is the space between two adjacent rows or columns.

**Width:** It is the width of whole data. **Height:** It is the height of whole data.

**Gap along Y**: It is the space along Y axis between the first and second column.

**Gap along X:** It is the space along X axis between the first and second row.

**Array-data Only Draw Box:** If you select this option, there will be only one data on screen; others will be shown as rectangles.

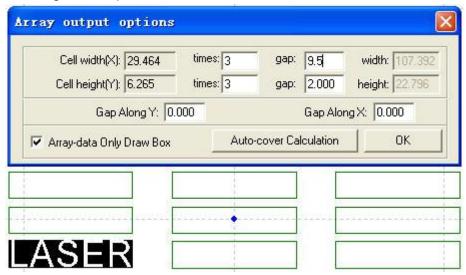
**Auto-cover Calculation:** This can calculate the number of row and column that can cover the whole material according to the parameter you input. Click this button,



**Material width(X):** It is the width of the work piece (the default is the worktable's width).

**Material height(Y):** It is the height of the work piece (the default is the worktable's height).

The following is a sample.



#### 4.5.4 Calculate

When the graph and processing parameters are changed, this button should be clicked to save the processing parameters in processing file.

# 4.5.5 Clear log

Click this button; the system will clear the log.

#### 4.5.6 Simulate

The corresponding icon is .

When parameters set is finished, please click this button. It can simulate the

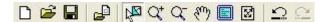
procedure of output for checking the result of output.

Click "Esc" on the keyboard and you can cancel the simulation process.

#### 4.6 View

#### 4.6.1 Toolbar

File toolbar: Click this button, you can display or hide the following bar.



Output toolbar: Click this button, you can display or hide the following bar.



Edit toolbar: Click this button, you can display or hide the following bar.



Layers toolbar: Click this button, you can display or hide the following bar.



Click "pick" button and choose a certain part of graphics on screen (after been chosen, the outline become gray), then click any color button you prefer on the layer bar. Now a new layer will be added in the layer list automatically.

Align toolbar: Click this button, you can display or hide the following bar.



#### 4.6.2 Status bar

Click this button, you can display or hide the following bar.



The status bar show the coordinates of the position that mouse stay on. It also shows the name and website of the manufacturer.

# 4.7 Help

#### 4.7.1 Help

Click this button, and you can see the manual of the software. You can get any information about how to operate the software.

#### 4.7.2 About

Click this button, and you can see the following dialog box.



It shows information of the software and our phone number. If you have any question, don't hesitate to call us.

# 4.8 Other button on the tool bar

# 4.8.1 Set simulate speed

The corresponding icon is 📶 .

Click this button.

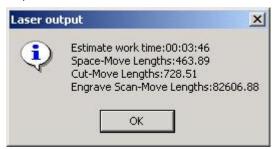


By this tool, you can adjust the simulate speed.

# 4.8.2 Estimate work time

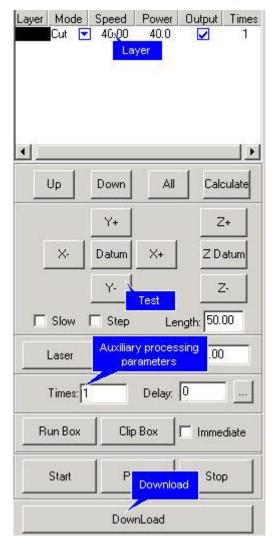
The corresponding icon is .

Click this button, it will show the work time.



# Chapter 5 Laser output

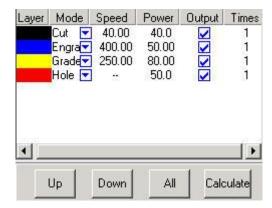
There are 3 parts in this interface as following.



# 5.1 Layer

5.1.1 Main interface of "Layer"

Layers management is shown as below:

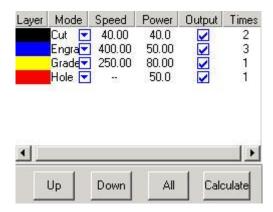


When there are many layers, the processing sequence is from the top down. Select

When there are many layers, select one row and click and all the processing parameters of the other layers can be set as the layer that has just been selected.

When changed the graphics or parameters, please click to save the processing parameters in processing file.

In the "Mode" column, work mode can be selected as following.

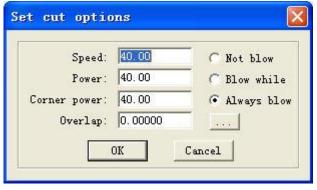


In the "Output" column, you can select that the current layer is output or not.

In the "Times" column, you can input processing times for the current layer.

# 5.1.2 Interface of "set cut options"

Dblclick the color bar on the "Layer" column, and the dialog box as shown below.



Speed: vector speed on X-Y axis

**Power:** the laser power when the layer is processed

Corner Power: the laser power when laser head runs on corners

Because when laser head runs on corners, the speed will slow down, if the power is constant, the corners will be cut deeper than others.

**Overlap:** When a close graphics can't be cut as it is (close), adjusting this parameter can avoid it. This may be caused by mechanical gaps. The best way to avoid this problem is improve the mechanical precision of the machine.

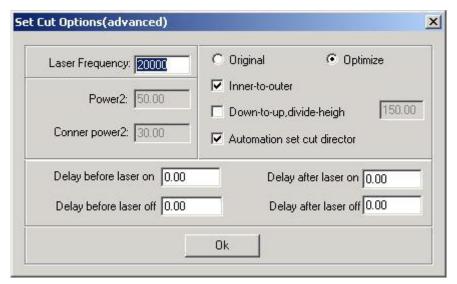
Not Blow: blowing function is closed.

**Blow with Laser:** blowing when laser on. Stop blowing when laser off. This function needs hardware support.

Always Blow: blowing when laser head moves and stop blowing when processing

procedure finished.

: This is advanced layer options. Click this button.



**Laser:** This is the PWM frequency.

**Original:** The machine draws the graph according the route as it is been made.

**Optimize:** The software will calculate the route to improve processing efficiency. If you select this option, there are 2 options.

**Inner-to-outer:** cut from inner to outer.

**Down-up:** cut from down to up according the number of "divide-height".

**Automation set cut direction:** The software will confirm the direction automatically. If you need to change the direction, please cancel this function.

**Power2:** laser power of the second laser head. This needs hardware support.

**Corner power2:** corner power of the second laser head. This needs hardware support.

If you need to set output order, "Original" should be selected.

Delay before laser on: delay before laser on.

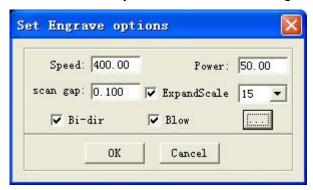
Delay after laser on: delay after laser on.

Delay before laser off: delay before laser off.

Delay after laser off: delay after laser off.

5.1.3 Interface of "set engrave options"

Dblclick the color bar on the "Layer" column, and the dialog box as shown below.



**Speed:** engraving speed on X-axis.

**Power:** the laser power when a layer is processed.

**Scan gap:** movement distance on Y-axis when engrave a row on X-axis.

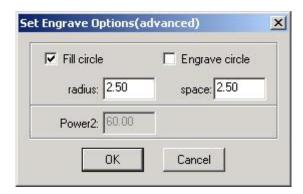
Bi-dir: when engraving, laser emit on both negative X-axis and positive X-axis.

When cancel this function, laser emit on only one direction.

**Blow:** blow or not. This function needs hardware support.

**Expand scale:** when engraving small letters, the width of transverse stroke may be smaller than the actual size. Adjusting this parameter can compensate it.

: This is advanced layer options. Click this button.



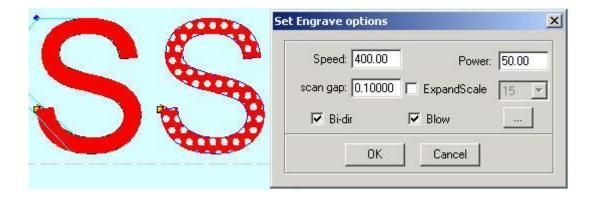
**Fill circle:** select this option, and small circles will fill in the graphics. **Engrave circle:** this option determines the circle will be engraved or not.

Radius: radius of the circle.

Space: space between the circles.

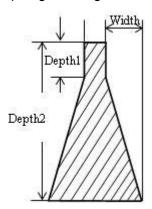
**Power2:** laser power of the second laser head. This needs hardware support.

Select this option and small circles will fill in the graphics as following.

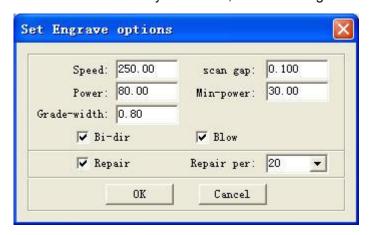


The right "S" is the result of selecting "Fill circle". You can change the radius and space by inputting different parameters.

# 5.1.4 Interface of setting grade engrave options Sketch map of grade engrave as following.



Dblclick the color bar on the "Layer" column, and the dialog box as shown below.



**Speed:** engraving speed on X-axis.

**Scan gap:** movement distance on Y-axis when engrave a row on X-axis.

**Power:** the laser power when a layer is processed. This parameter determines the depth of the slope.

Min-Power: the lowest laser power when grade engraving.

**Grade-width:** the width of grade.

**Bi-dir:** when engraving, laser emit on both negative X-axis and positive X-axis.

When cancel this function, laser emit on only one direction.

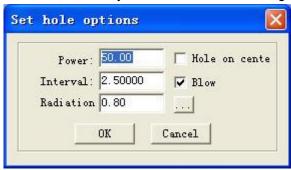
**Blow:** blow or not. This function needs hardware support.

**Repair:** select this option and the engraved letters will be clearer.

**Repair per:** change the parameter will adjust the definition of the engraved letters.

# 5.1.5 Interface of setting hole options

Dblclick the color bar on the "Layer" column, and the dialog box as shown below.



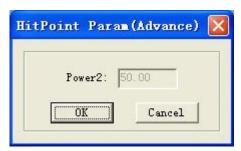
**Power:** the laser power when a layer is processed.

**Interval:** the space between two adjacent holes.

Radiation time: delay time for a hole. It determines the size of holes.

**Hole on center:** hole on all the center of the close graphs. **Blow:** blow or not. This function needs hardware support.

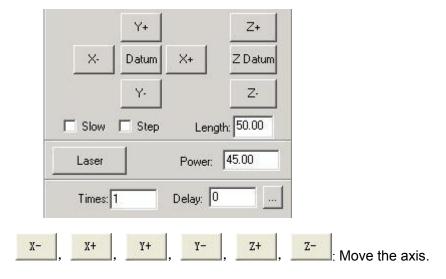
: This is advanced layer options. Click this button.



Power2: laser power of the second laser head. This needs hardware support.

All the defaults are last saved parameters.

# 5.2 Test



Datum, Click this button and the laser head (or Z) will move to the home point of the machine slowly (the speed is determined by "Datum Speed" that you can change in the Option" dialog box). Then the laser head will move to the origin point quickly (the speed is determined by "Quick Speed" that you can change in the "Option" dialog box). This can eliminate the cumulate error. Generally, the machine should be reset before processing. When run the software, it will be reset automatically (this function can be cancelled as you prefer).

Slow: No use. Step: No use. **Length:** No use.

**Power:** It determines the intensity of the laser power supply. The minimum value is 0 and the maximum value is 100.

Laser on/off.

# 5.3 Auxiliary processing parameters

In the following dialog box, some auxiliary processing parameters can be set.

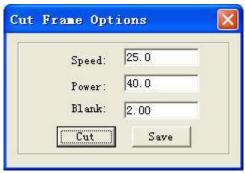


**Times and Delay:** If input 10 in "Times" and 20 in "Delay", then press "Run", you can get 10 same graphics. And it will stay for 20 seconds after every processing finished. The 20 seconds is for feeding and taking down material. Different time can be set as you need. This function can increase efficiency a lot.

**Immediate:** If this option is selected, the software will take the position that the laser head is as original point. If this option is not selected, the original point will be the position you set.

Run Box: Click this button, and laser head will move as a rectangle without laser emitting according to the size of the graphics. This function is used for confirming the location of work piece.

Clip Box: Click this button, laser head will move as a rectangle with laser on according to the size of the graphics. This function is also used for confirming the location of work piece. Click this button, and you can see the following dialog box:



**Speed:** you can choose different speed according to different material. It's better to confirm proper speed through testing.

Power: the laser power when cutting.

Blank: distance between processing graphics and the edge of cutting piece.

Save: save the parameters for next data.

: This is advanced layer options. Click this button.

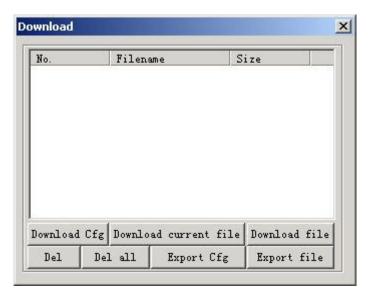


**Length (feeding length):** When input a certain number in it, feeding motor will give a certain space after every processing finished. This function needs hardware support.

Speed (feeding speed): It set the feeding speed.

**Delay:** After X-Y finished, the machine will delay a certain time before feeding.

#### 5.4 Download data



# 5.4.1 Download CFG

Download all the parameters of "Options" to MPC6515 controller. You can also achieve this by exporting a CFG file (\*.mol), and copy this file to MPC6515 by USB disk. When modify the parameters of "Options" or update the firmware, you have to reset CFG to configure the machine settings.

#### 5.4.2 Download current file

Download the current processing data to MPC6515 controller.

#### 5.4.3 Download file

Download processing data to MPC6515 controller.

#### 5.4.4 Del

Delete the file which is selected.

# 5.4.5 Del all

Delete all the files in MPC6515 controller.

#### 5.4.6 Export Cfg

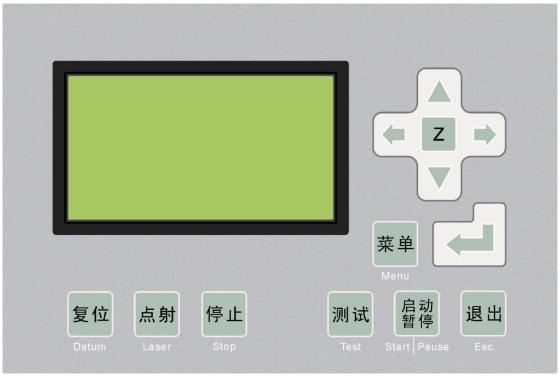
This will create a \*.mol file which includes all the parameters of "Options". The file can be downloaded to MPC6515 controller by USB disk.

#### 5.4.7 Export file

This will create a \*.mol file which includes all the parameters of a processing data. The file can be downloaded to MPC6515 by USB disk.

# **Chapter 7 PAD03 Operation**

#### 7.1 Main interface of PAD03



Datum: Laser head will move to the original point of the machine slowly.

Laser: Laser on/off.

Stop: Cease the processing operation.

Test: The laser head will run along the outline border of the processing data.

Start/Pause: Start/pause the processing operation.

Esc: Escape the current status window.

Menu: Enter accessory interface.

 ${\bf Z}$ : Click this button, then  ${\bf \triangle}$  and  ${\bf \nabla}$  can move the Z axis. This function needs hardware (machine) support.

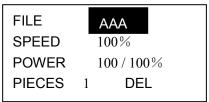


# 7.1.1 Startup interface

When power on, PAD will show" System starting, please wait".

# 7.1.2 Main interface

The main interface shows as following.



File: File names which are saved in MPC6515 controller.

Speed: Percentage of speed. When it is 100, the actual speed is the number which is set in processing data.

Power: Percentage of power. When it is 100, the actual power is the number which is set in processing data. There are two options: the former is for "Corner -Power" and the latter for "Power".

Pieces: Repeat times of a file.

Del: Delete the current file.

At first, file name is brightened (word is white and background is black).

Now.

Press (and ), and you can select the option you want to modify.

Press  $\bigwedge$  and  $\bigvee$  , and you can change the number in the selected option.

Press and all the number will be saved.

Press "Esc" and all the options will not be modified (none of the options is brightened). Now, press  $\bigcirc$   $\bigcirc$   $\bigcirc$  and you can move the laser head.

Press again and you can modify the options (file name is brightened).

# 7.2 Processing interface of PAD03

Press "Start" and the interface will show as following.

FILE AAA
SPEED 100%
POWER 100 / 100%
TIME 0 : 0 : 15

File: File name which is being processed.

Speed: Percentage of speed. Power: Percentage of power. Time: Time for processing this file.

When processing,

Press and , and you can change the percentage of power (only for Power, not for Corner -Power).

Press  $\wedge$  and  $\nabla$ , and you can change the percentage of speed.

Press "Start/Pause" and you can control the processing procedure.

Press "Stop" and you can cancel the processing procedure. The interface shows "Stopped". Press "Esc" and you can see the main interface.

# 7.3 Accessory interface of PAD03

Press "Menu" and you can see the accessory interface.



CUT BDR: Laser head will move a rectangle with laser on according to the size of the graphics.

LASER TIME SET 000000 POWER SET 000000 can move the cursor. Press  $\triangle$  or  $\nabla$  can change the number. and all the number will be saved. If this time is 0, press "Laser" key and laser on; release "Laser" key and laser off. If this time is not 0, press "Laser" key, and laser will shoot a certain time as you set. following. **DISTANCE SET** 000000 Press  $\triangle$  or  $\nabla$  can change the number. and all the number will be saved. If this number is 0, press the direction keys, and the laser head will move; release the direction keys, and the laser head will stop. If this number is not 0, press the direction keys, and the laser head will move a distance as you set. LANGUAGE: Select this option and press . The language interface is as following. 简体中文 繁体中文 **ENGLISH** Select the language as you prefer.

LAS SET: Select this option and press

The LAS SET interface is as following.