# TruCUT Laser Software

**Laser Engraving & Cutting Control System**

# Manual

# Content

# 1 System Installation

## 1.1 Contents of the Control System

The control System includes hardware (controller 1 piece TRUCUT CONTROL MOTHERBOARD) & control software. All in the package include software CD.

| No. | File & list | Function | Dir | Remark |
|---|---|---|---|---|
| 1 | Setup | Install package | ..\ | Including **'Setup.exe'** and other file necessary. If installation fails, file may missed or broken. Please contact us for a replacement. |
| 1 | TruCUT Laser Software | Laser Engraving &Cutting software | ..\ | Copy this folder to the directory you need, and run **TruCUT Laser Software.exe** |
| 2 | Driver | Driver of the controller | ..\ | Include USB and print driver |
| 3 | Doc | Controller manual | ..\ | TruCUT Laser Software Manual |
| 4 | Firmware | Update program of the controller | ..\ | |
| 5 | Readme | Update Record | ..\ | |

## 1.2 Installation of the System

### 1.2.1 1st Installation method

Run Setup.exe in the Setup directory，dialog box appears as below：
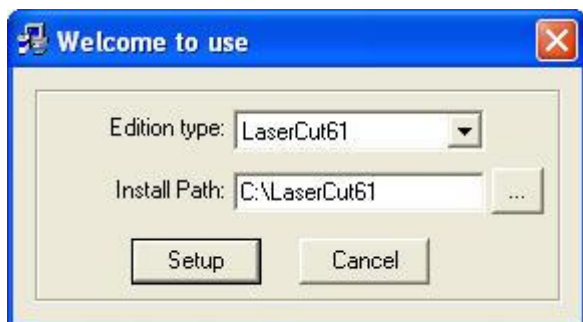


Click **'Setup'**, default install path C:\TruCUT2 Laser Software, click [...] to change the path.

### 1.2.2 2nd Installation method

Run LTUSBDrvSetup_V4.0_ENE.exe in the Diver directory to setup USB driver of the controller. If you need print output, run PrinterInstaller.exe in the Diver directory to setup printer driver of the controller. Copy the TruCUT Laser Software folder to the directory you need, and run TruCUT Laser Software.exe.

When installing the program, the following dialog box may appear:
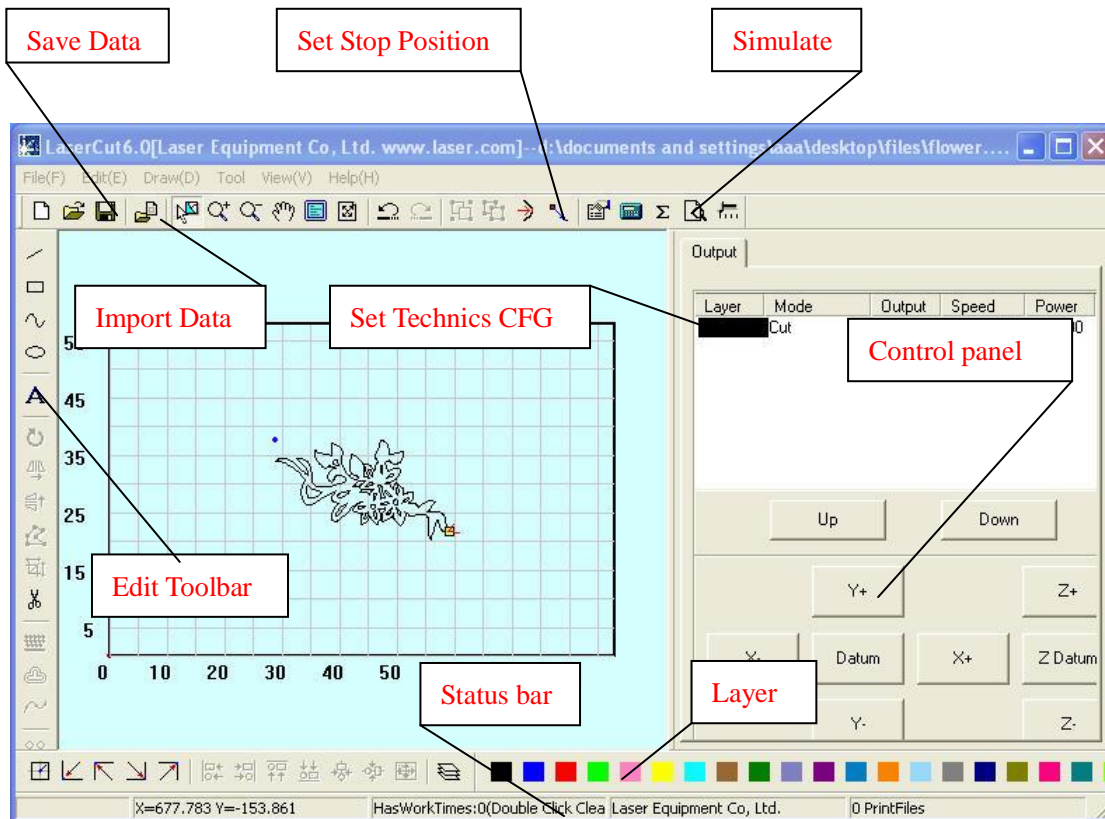


If the computer has installed USB driver before, the above menu will appear. **Uninstall route:** Start-Programs-LTUSB-Uninstall.

Click **'OK'** and the new USB driver won't be installed.

# 2. Quick Guide

## 2.1 Main Interface

Run the software, Main interface appears as below:



Functions will appear when the mouse cursor points and stays on an icon a little while.

## 2.2    Importing Data
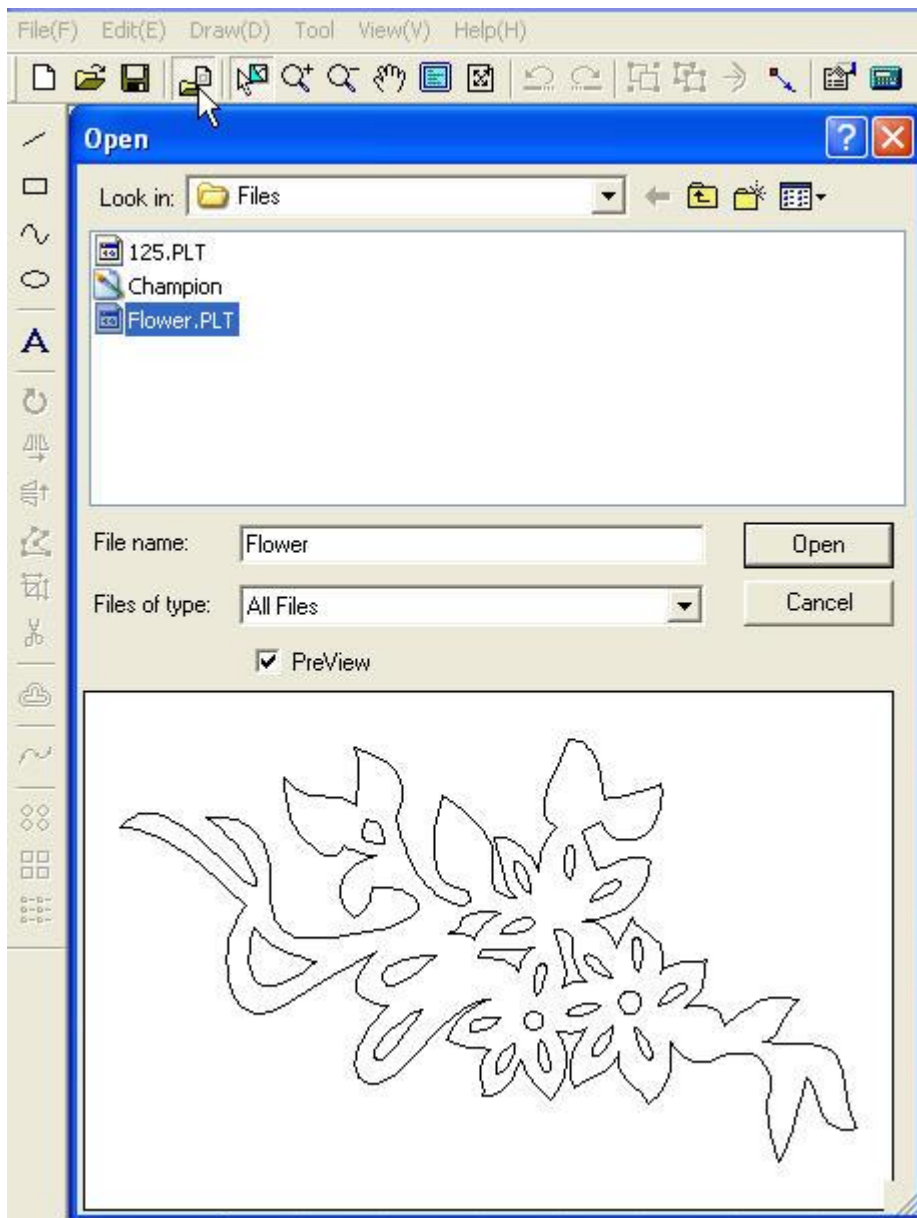


The button that the cursor indicates is **'Import'**. You can import files that the system supports.

# 2.3 Set Processing Parameter



Select the processing mode in the pull down menu. Double click and enter the processing parameter setting interface.



Input proper parameter (i.e. speed, power).

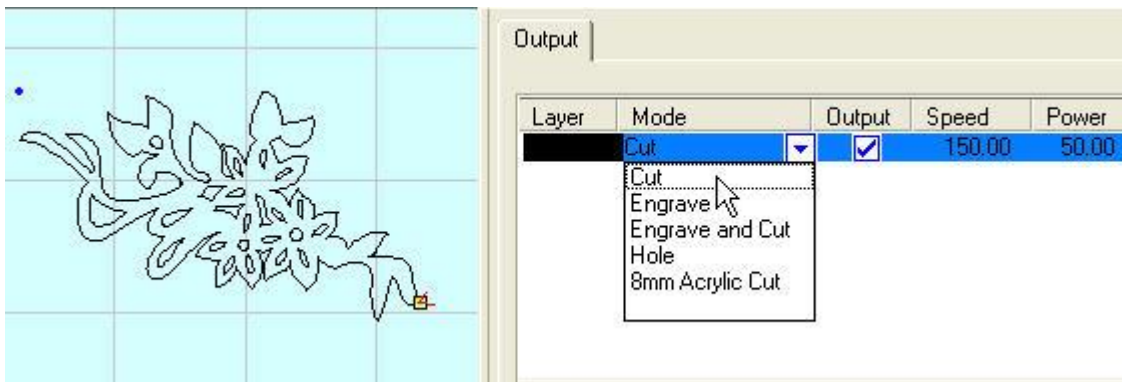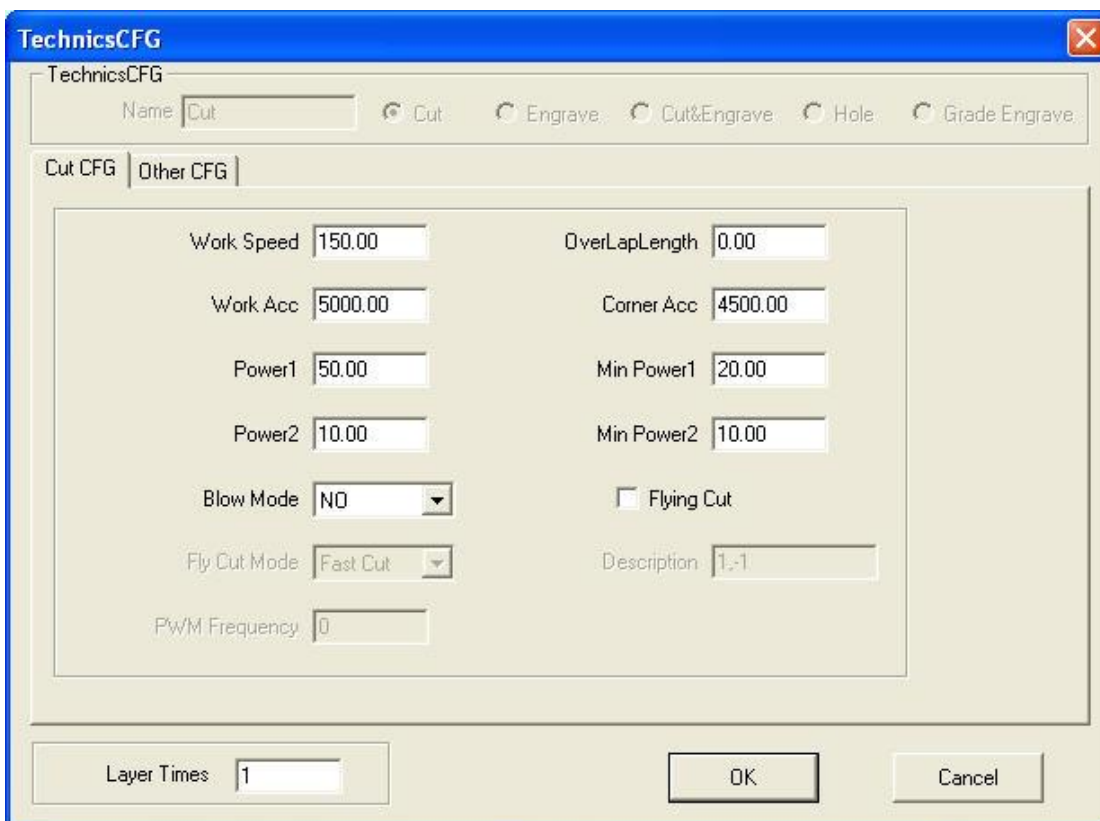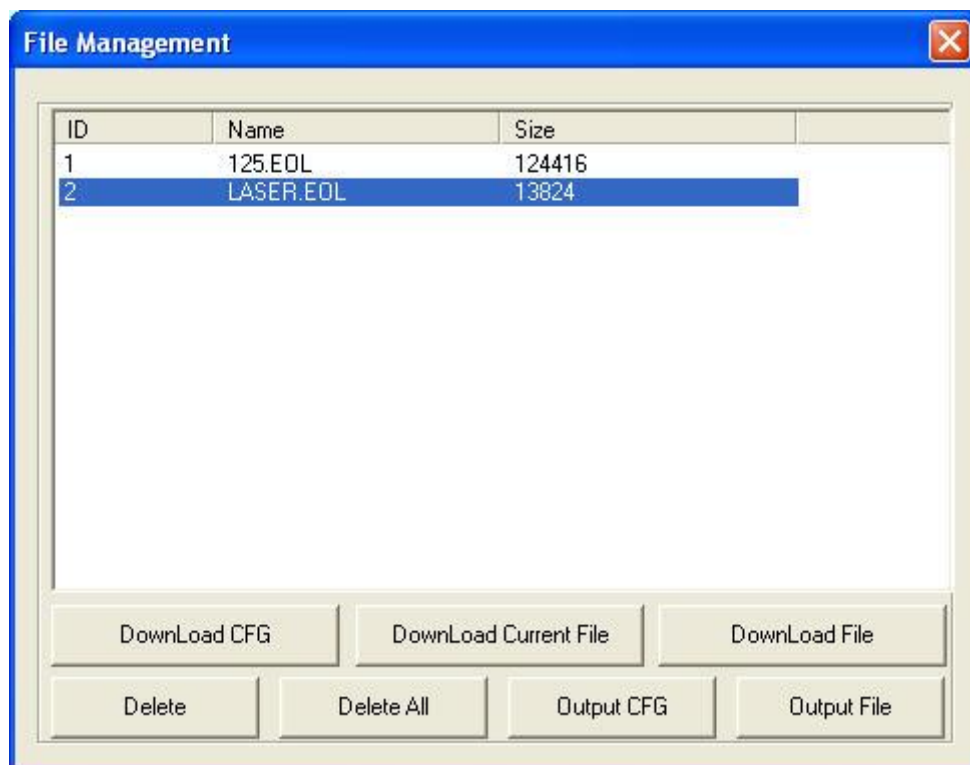## 2.4    File Download

After pressing the **'DownLoad'** button in the TruCUT Laser Software, the box below will appear.

**File Management**

| ID | Name | Size |
|----|------|------|
| 1 | 125.EOL | 124416 |
| 2 | LASER.EOL | 13824 |

| DownLoad CFG | DownLoad Current File | DownLoad File |
|---|---|---|
| Delete | Delete All | Output CFG | Output File |

You should click **'Download CFG'** when operating the system for the first time. Rename the downloading file for remembrance.

## 2.5    Process

Either clicking **'Start'** in the main interface or clicking **'Start'** on the control panel will make the processing start. The control panel will beep once the process is finished.

# 3. Software Operation Details

## 3.1    Import and Save Data

### 3.1.1 New

Click on ⬜ to create a new processing file.

### 3.1.2 Import

Click on 📂 to import software supported file format, such as *.PLT、*.AI、*.DXF、*.DST、*.BMP、NC code etc.

### 3.1.3 Save

Click on 💾 to save the current editing graph as a processing file （*.ftp）.

### 3.1.4 Open

Click on 📂 to import a processing file (*.ftp)

### 3.1.5 Export

Save the current editing vector as a **PLT** or **DXF** file.

## 3.2    Drawing Tools

### 3.2.1 Line

Click on ╱ (left side toolbar) to draw a **LINE**. After clicking the button, drag the mouse (watch cursor behavior on the screen) to draw a line. To draw a **HORIZONTAL/VERTICAL LINE**, you will have to press **'Ctrl'** at the same time as you drag the mouse.

### 3.2.2 Rectangle

Click on ▭ (left side toolbar) to draw a **RECTANGLE**. After clicking the button, drag the mouse (watch cursor behavior on the screen) to draw a rectangle. You hand movement will determine the size of the shape you're drawing. To draw a **SQUARE**, you will have to press 'Ctrl' at the same time as you drag the mouse.

### 3.2.3 Ellipse

Click on ⬭ (left side toolbar) to draw an **ELLIPSE**, and immediately drag the mouse (watch cursor behavior on the screen) to draw an ellipse. To draw a **CIRCLE**, you will have to press **'Ctrl'** at the same time as you drag the mouse.

### 3.2.4 Bezier Curve

Click on ∿ (left side toolbar) to draw a **BEZIER CURVE,** and immediately drag the mouse (watch cursor behavior on the screen) to draw a Bezier Curve.

### 3.2.5 Text

Click on **A** on the left side toolbar and drag the mouse (watch cursor behavior on the screen). The following dialog box will appear:
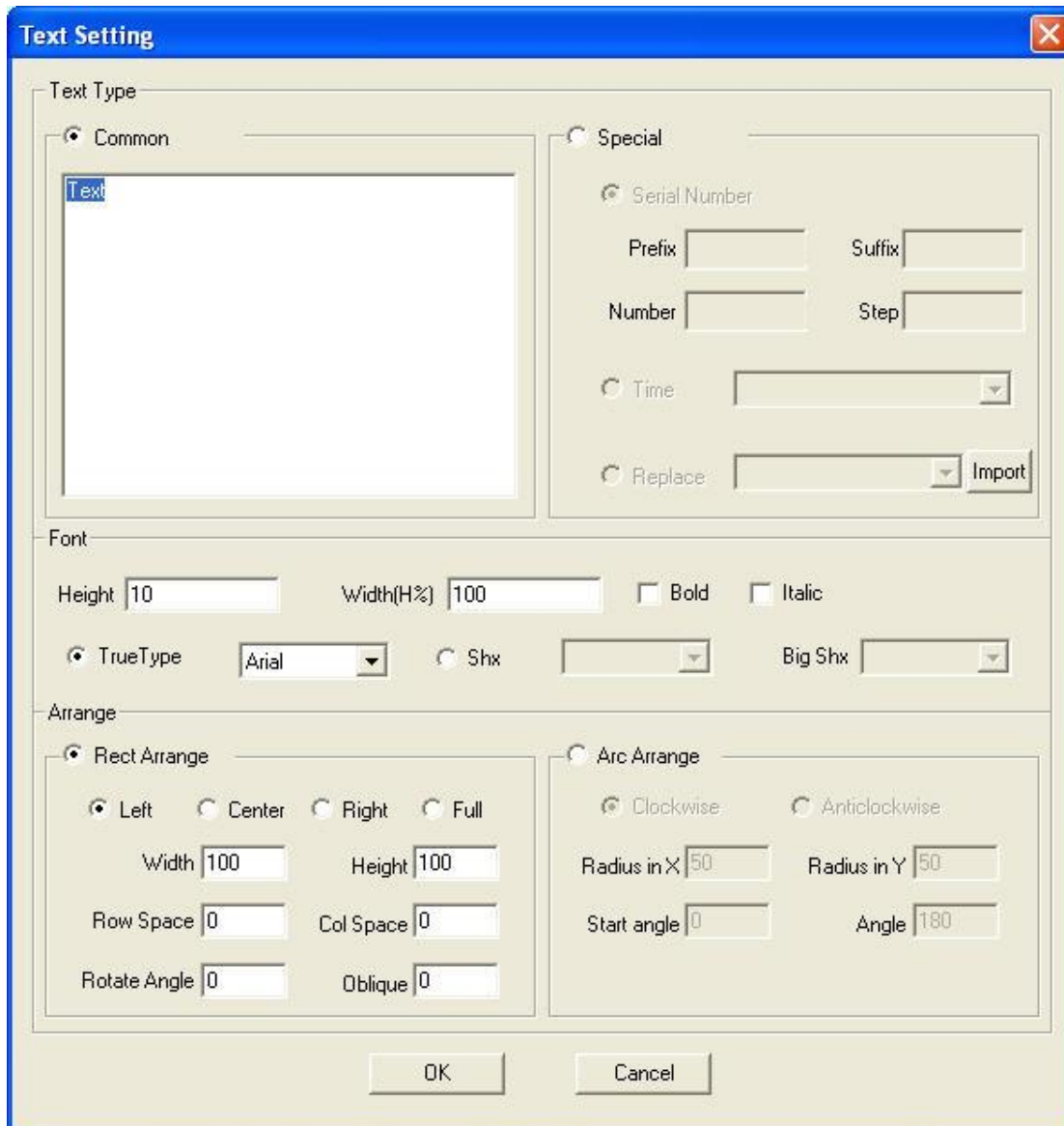


Text cannot be processed. It has to be converted to curves first (Drawing - convert to curves). You can also set **'Auto Convert Text to Curve'** in Machine CFG.

# 3.3    Editing

### 3.3.1 Rotation

Click on [icon] (the *select* button ) first, to select the graph you need rotated. Then click on [icon] (the *Rotate* button) on the left side toolbar to rotate the graph. This dialog box will appear:
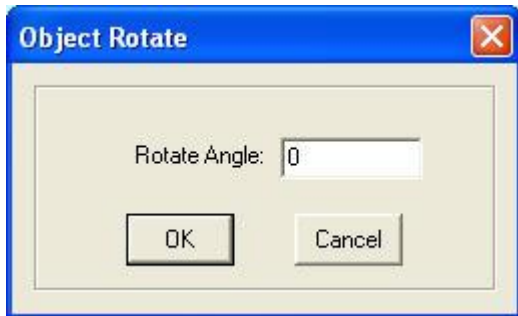


A precise rotation angle can be made by inputting relevant digits and clicking **'OK'**. Click 'Cancel' to discontinue rotating. Any rotation can be made by dragging the mouse as shown below:
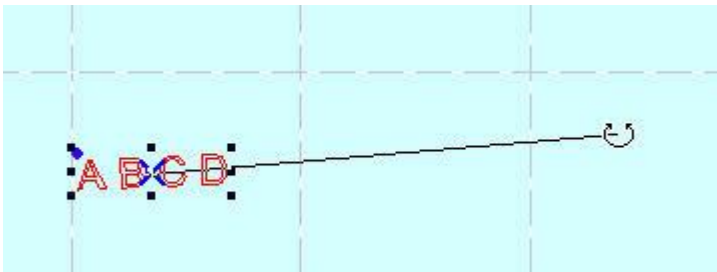


### 3.3.2 Mirror

Click the select button [icon] first to select the graph to be mirrored, and then click the **'Vertical Mirror'** button [icon] on the left side toolbar to vertically mirror the graph.

Click the select button [icon] first to select the graph to be mirrored, and then click the **'Horizontal Mirror'** button [icon] on the left side toolbar to horizontally mirror the graph.

### 3.3.3 Node Edit

Click the button [icon] on the left side toolbar to edit the node of the vector graph selected. Click the button and nods on the vector graph selected will be shown in the form of small box. The nodes should resemble the image below:



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Move the mouse on the node and drag the mouse to change the shape of the graph. The mouse cursor changes into a cross when you move the mouse on the graph. Double clicking the mouse will add a new node. Moving the mouse on the node and clicking **'Delete'** will delete a node.

### 3.3.4 Size

Click the ⛶ button to change the size of the graph. Click the ⬀ (select button ) first to select the graph to be changed, and click the ⛶ button. The dialog box below appears:

**Set Size**

Current Size(X): 400.0000    Target Size(X): 400.0000
Current Size(Y): 228.4495    Target Size(Y): 228.4495

☑ Lock Aspect Ratio    OK    Cancel
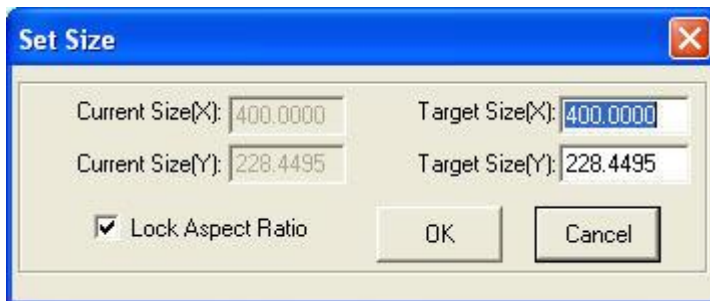
Input the target size on the X, Y axis, and click **'OK'** to change the size of the graph. Select **'Lock Aspect Ratio'** and input the length of X or Y, and the size will change with the same proportion.

### 3.3.5 Cutting

Click the ⬀ (select button ) first to select the graph to be cut, and click the ✂ button on the left side toolbar and move the mouse to the graph. Left click on the mouse and the curve will be cut into two parts.

### 3.3.6 Smooth Curve

Click the 〰 button on the left side toolbar to smoothen the curve. By doing so, **Speed and Stability** of the cut process will be improved. Select the data that needs processing, and click the button. The dialog box below will appear:

**Smooth Curve**

Level: High
Standard
Medium
High
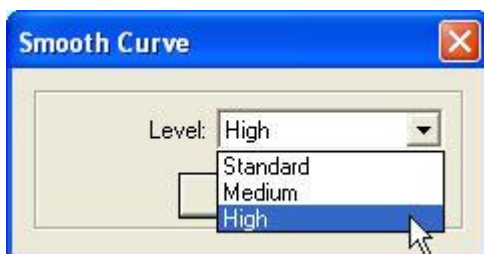
It will give you three level options: **Standard, Medium and High.** The graph will be bigger after being smoothened.

### 3.3.7 Generate Parallel Lines

This is used to **Expand** or **Reduce** the vector graph. First click the select ⬀ button to select the graph to be processed.

Then click the ☁ button on the left side toolbar, after which the following dialog box appears:

Select the needed option to generate parallel lines on a new layer, as shown below:
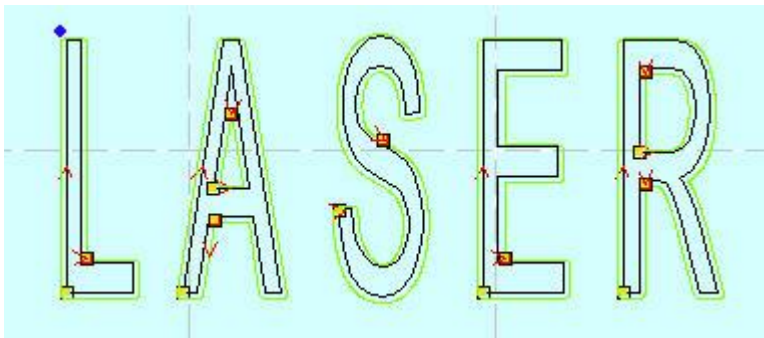


You can select the type of **Corner** (either circular or sharp edge) of your choice around the object. Select the circle. The lines will be smoother, but you will note small distortions at the corner.

**Combining:** It is only used when **'Double Outer'** is selected. Here's a sample below:
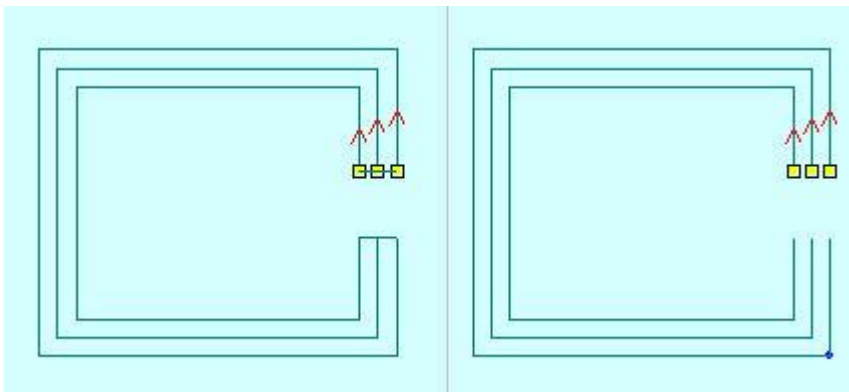


The **LEFT** side is the result when **'Double Outer'** and **'Connect'** are selected.

### 3.3.8 Invert The Color of Bitmap

Click the ⌨ button on the left side toolbar to invert the color of the BMP image. The process result will be **Intaglio** or

**Anaglyph,** as shown as below:

### 3.3.9 Array

**Array Copy**: Click the  (select button) first to select the graph, and then click the  button on the left side toolbar, to introduce the below dialog box:
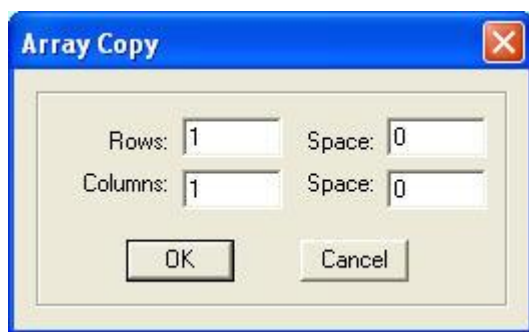


Inset relevant parameters. The result will be the appearance of the intended graph with the number of the **Lines and Columns** on the screen. The space between the graph will be determined by the **'Space'** options in the dialog box **above.**

**Virtual Array**: Click the  button on the left side toolbar to avail the dialog box below:
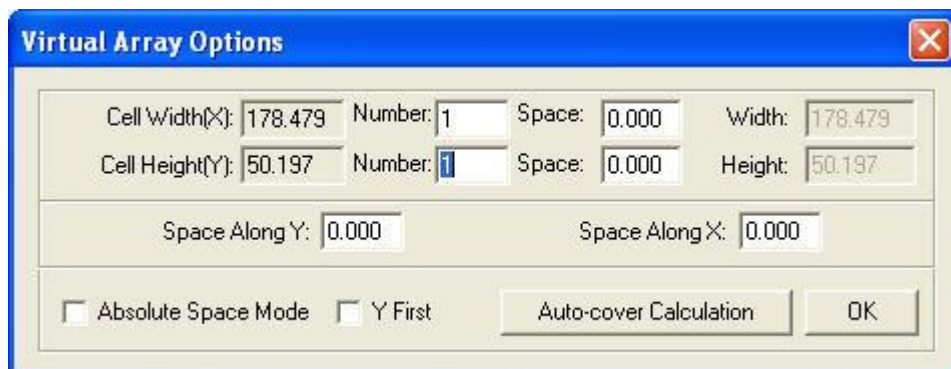


**Cell Width (X)**: Original size of the graphics.
**Cell height (Y)**: Original size of the graphics.
**Number**: Lines or columns needed for the output data.
**Space**: Space between lines or columns.
**Width**: Width of the whole data after virtual arraying.
**Height**: Height of the whole data after virtual arraying.
**Space Along Y**: Space of the dislocation between adjacent columns.
**Space Along X**: Space of the dislocation between adjacent rows.

**Absolute Space Mode**: If the space is 0, select **'Absolute Space Mode'**, and the graph will be overlapped completely.

**Y First**: The cut route will process **along** the Y direction.

**Auto-Cover Calculation**: Click the button, and the dialog box below will appear:
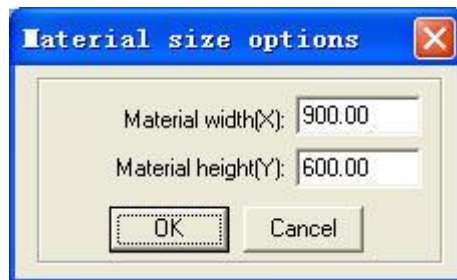


**Material Width**: Width of the materials to process (default as the width of the worktable).

**Material Height**: Length of the materials to process (default as the length of the worktable).

The rows and columns needed to cover the material will be calculated automatically according to your parameters, as shown below:
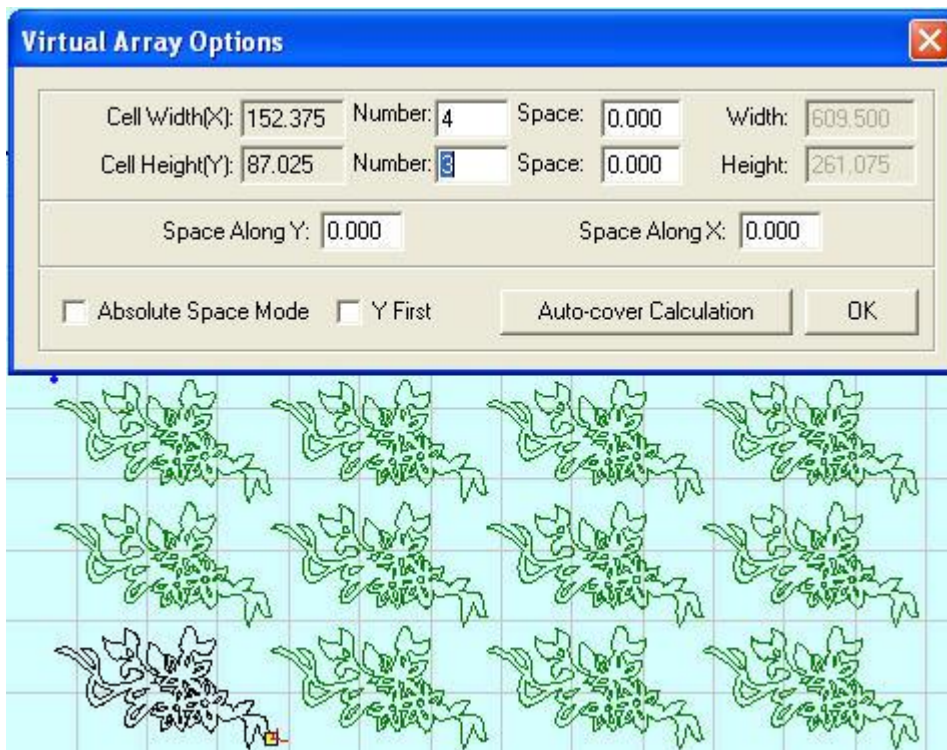


**Part Virtual Array**

If a graph is made up of many graph entities, an entity of the graph can be virtual arrayed. Select the unit and click 88 on the left side toolbar to show the dialog box below:

### 3.3.10 Light Guide Plate Design (LGP design)

Corresponding icon is ▦ on the leftside toolbar. Click the button to display the dialog box below:

3.3.10.1 Size of the LGP



The outline of LGP can be set as a **Rectangle** or an **Ellipse.**

3.3.10.2 Type and size of the dot



There are four types of **Dots:** Line, Rectangle, Ellipse and Grid. When engraving, a dot will process as a short line whether it's a rectangle or an ellipse. Advisably, make certain to set the type as rectangle for improved calculation speed.

3.3.10.3 Change of gradient of the dots



Consider the position of the light source as a reference point. There are 4 directions: Left-up, Right-up, Left-down and Right-down.

**W** implies change of size on the **horizontal direction** (X);

**H** implies change of size on the **horizontal direction** (Y);

The size of the dots will change according to the value of the parameters. If the light source is on the left middle, the parameters on the *right-up* and *right-down* will work.

3.3.10.4 Space of dots



Set the starting value of the space of dots.

3.3.10.5 Change of **Gradients** of the space
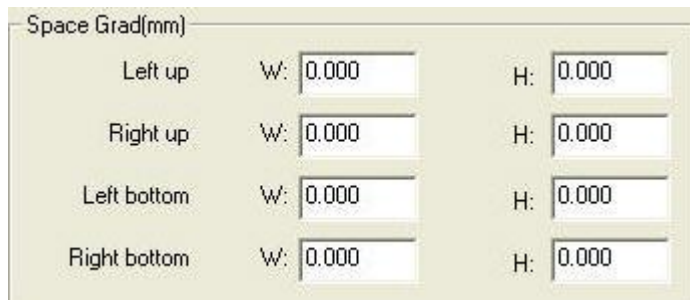


Have your **Reference Point** as the position of the light source. There are 4 directions: Left-up, Right-up, Left-down and Right-down.

**W** implies the change of space on the **horizontal direction** (X);

**H** implies the change of space on the **horizontal direction** (Y);

The space of the dots will change according to the value of your parameters. If the light source is in the up middle, the parameters of the **Left-down** and **Right-down** will work.

3.3.10.6 Position of the light source



There are 3 options for each of X and Y (see above dialog box): Left, Middle and Right. These 3 options will help you can set the position of the light source. Examples of dots designed by **Different Positions of The Light Source** are shown below:

Light source on left middle                    Light source on right middle
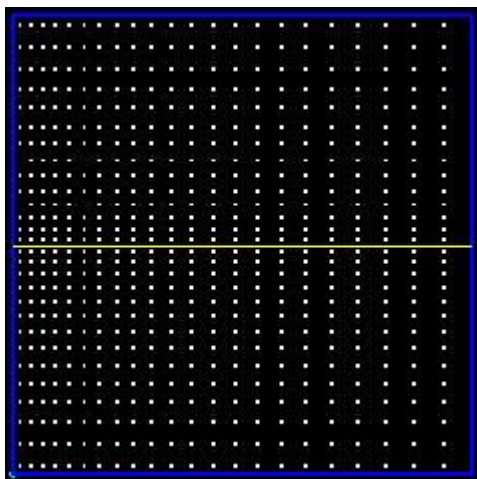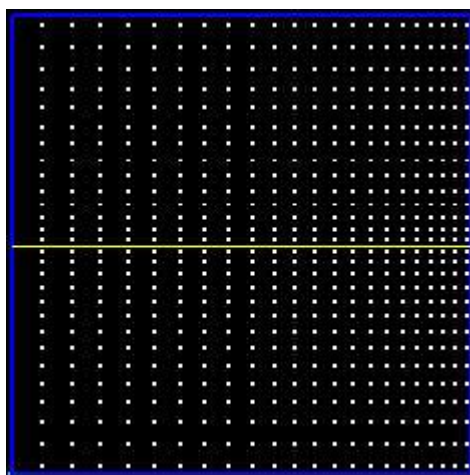
Light source on upper middle          Light source on bottom middle
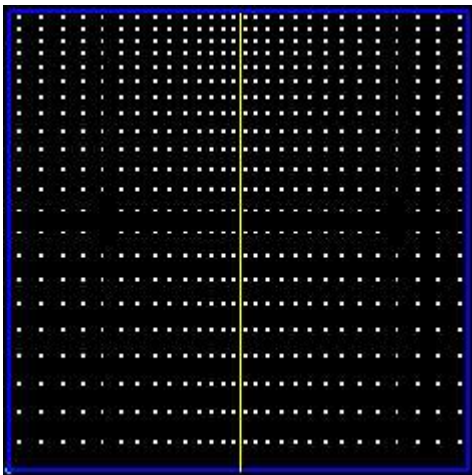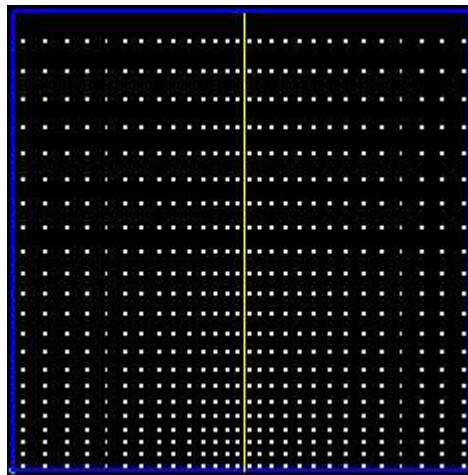


Inset your intended values and click on **'Apply'** to show the output result. Then click on the **'Export data'** button to import the dots to working range.

**NB:** Please tick the **'LGP'** option in the interface of engraving parameters to improve the processing efficiency.
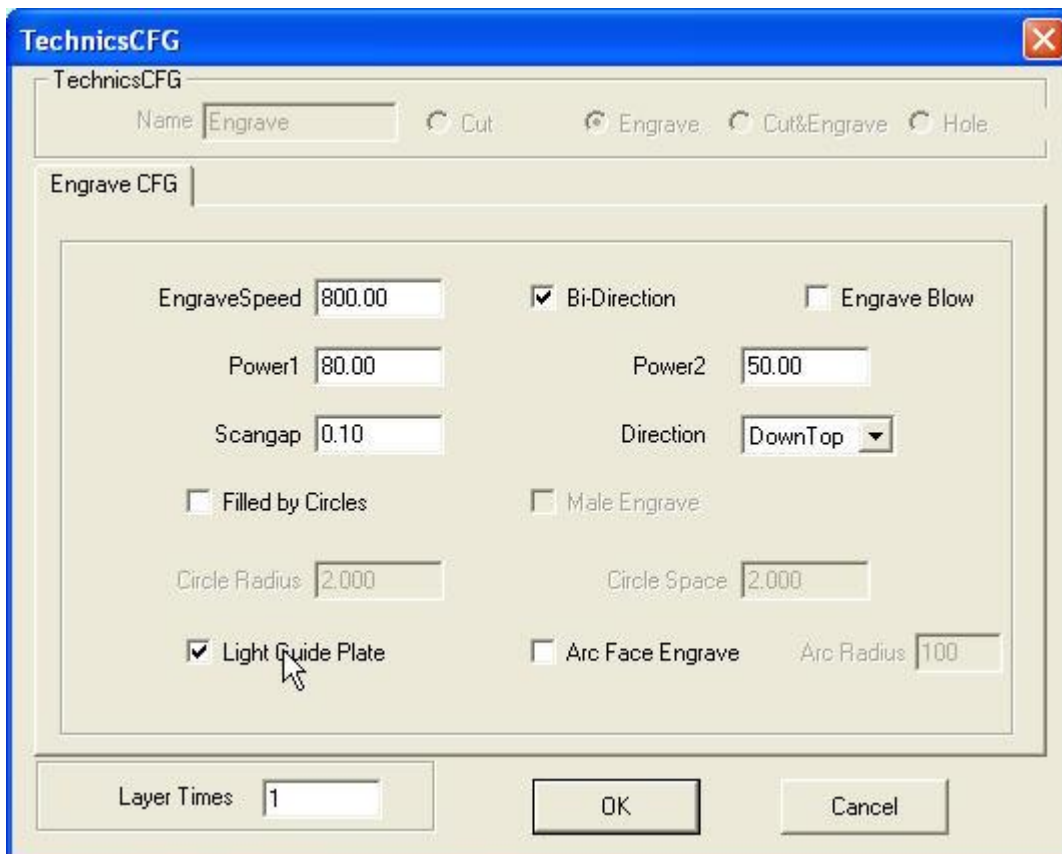


### 3.3.11 Grouping and Ungrouping

Select the graph entity you wish to group. Then click the 🔲 (group) button. The graph entity will be grouped. Select the grouped graph, and then click the 🔲 (ungroup) button, and the graph will be disassembled to several graph entities.

### 3.3.12 Layer Property

This is the corresponding icon , and is found on the grounded toolbar.
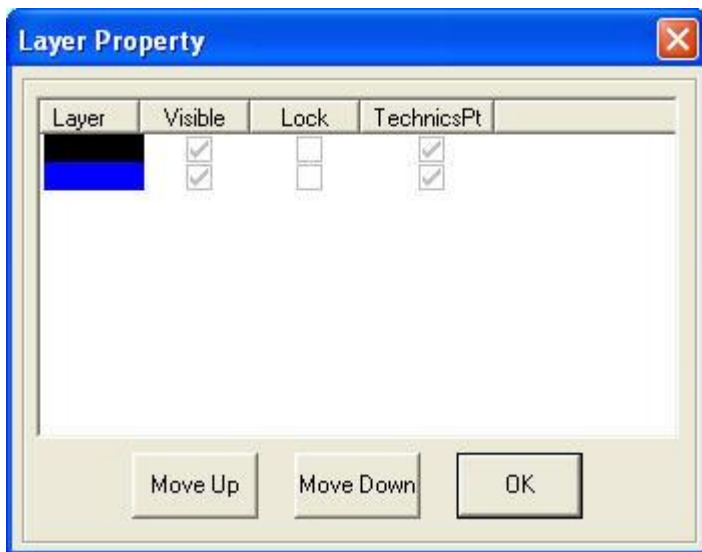


**Visible:** The layer is visible or not.
**Lock:** When a layer is locked, it cannot be edited.
**TechnicsPt:** The technique ports are shown or not.

### 3.3.13 Aligning

Here is the corresponding icon on the grounded toolbar: .

### 3.3.14 Quick Move Data

The corresponding icon on the grounded toolbar is: . Move the selected data to corners of the drawing area.

### 3.3.15 Unite lines
**Location:** Tool ➔ Unite lines.



Connect the several lines linked end to end into one. Select the lines to be processed and click the button.

### 3.3.16 Check Data
Location: Tool ➔ Check Data.

Click the tool, and dialog box below will appear:
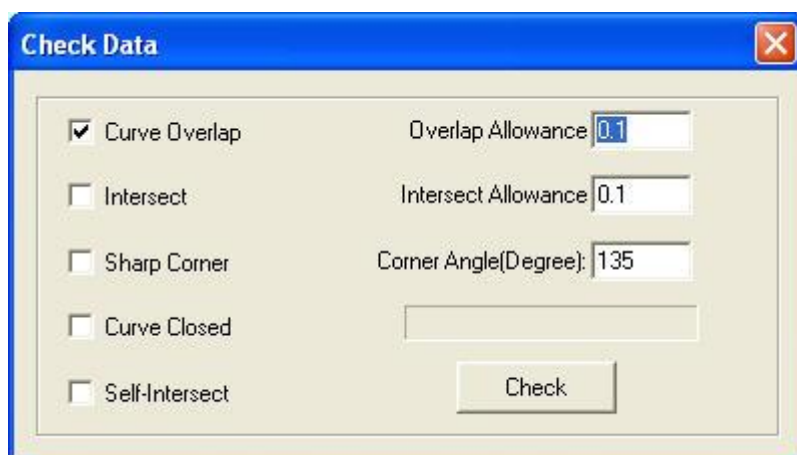


If abnormal phenomenon appears in the processing (such as '**Failed to Engrave'** or **'Cut twice'** for example), use the tool to check all the data. Abnormal data checked will be shown in red colour. You can then delete it or edit the node and proceed.

### 3.3.17 Delete Doubled One
Select the graph and click **'Delete Doubled One'.** The overlapping lines will be deleted as shown below:
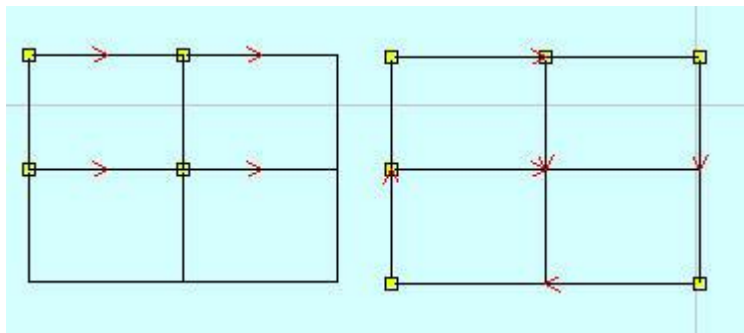


The **Left** side is made up of 4 **Rectangles** and the right side is processed. There are only 6 lines. This is very useful for array copy rectangles to improve the processing efficiency.

# 3.4 Technics Process

### 3.4.1 Setting the Stop Position of the Laser Head

The corresponding icon is ![icon] on the toolbar. The laser head will move to the point after the data is processed. Click the button and the mouse cursor will change to a **Circle**, followed by the appearance of the dialog box below:
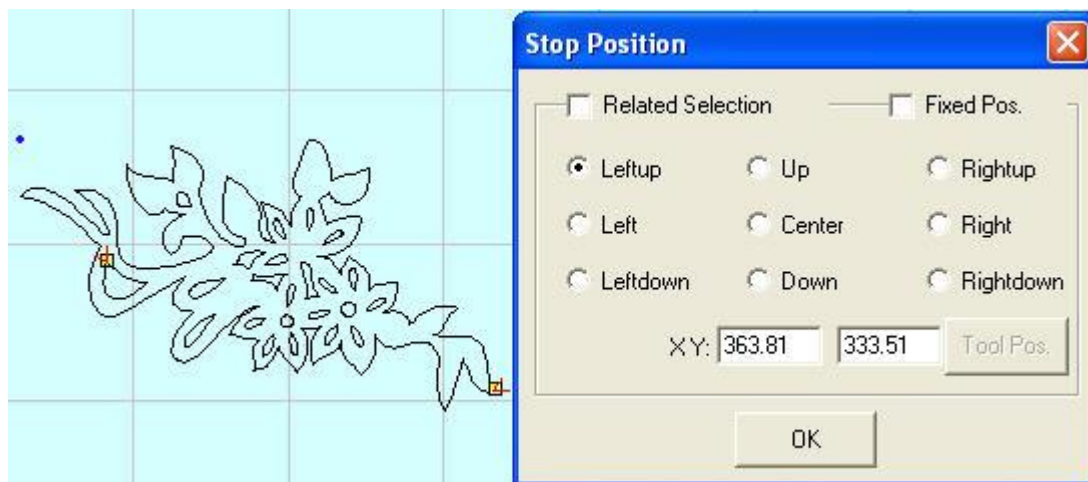


There are 4 modes:

**Related selection**：First select part of the graph. Select the **'Related Selection'** option, and select a relative position of the graph (i.e. Left up, Right down).

**Relative whole graph:** Without selecting the **'Related Selection'** option, select a relative position of the graph (i.e. Left up, Right down).

**Fixed Position**：Select **'Fixed Pos'** and input the coordinate value to set the **Stop Point** precisely.

**Anywhere**：Move the mouse to any point and set the **Stop Position** as you need.

### 3.4.2 Set Start Point

This is the corresponding icon: ![icon] on the toolbar. The system will automatically define the start point (usually the crossed point of two lines) and the direction of cutting process. Select the vector graph. Click this button, move the mouse to the vector graph, and the mouse will change to a **Cross.** Click the mouse on any position of the vector graph. The point will be the start point of cutting. Click on **'F'** to invert the direction. Here is how it will appear:
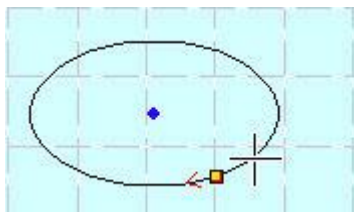
### 3.4.3 Set Lead-in/Out line

**Location:** Tool ➔ Set lead-in/out line.



**Lead Pos**: Set the parameters for adding lead line.

**Lead Dir**: Set the cutting direction (clockwise or counter-clockwise).

**Lead in/out Setting**: Set the shape and size of lead in/out lines.

**Cut Mode**: Choose **'Female Cut'** or **'Male Cut'** in the drop-down list to define whether the lead-in/out line is in the outline of the figure or not.

**Overlap**: Defines the sealing distance of the process vector graph.

**Apply to**: Set the overlap to apply to the entire graph, outer boundary or inner boundary.

**Gap Offset**: Set the compensation parameters.

⟩⟩ : Set the same parameter for the lead out line as those of the lead in line.

### 3.4.4 Auto divide

This function only applies to a machine with **Feeding** axis. When the length of the figure exceeds the range of **Y axis,** the figure will be divided into several parts. When the first part is finished, the feeding axis will move a certain distance and the second part will begin immediately.
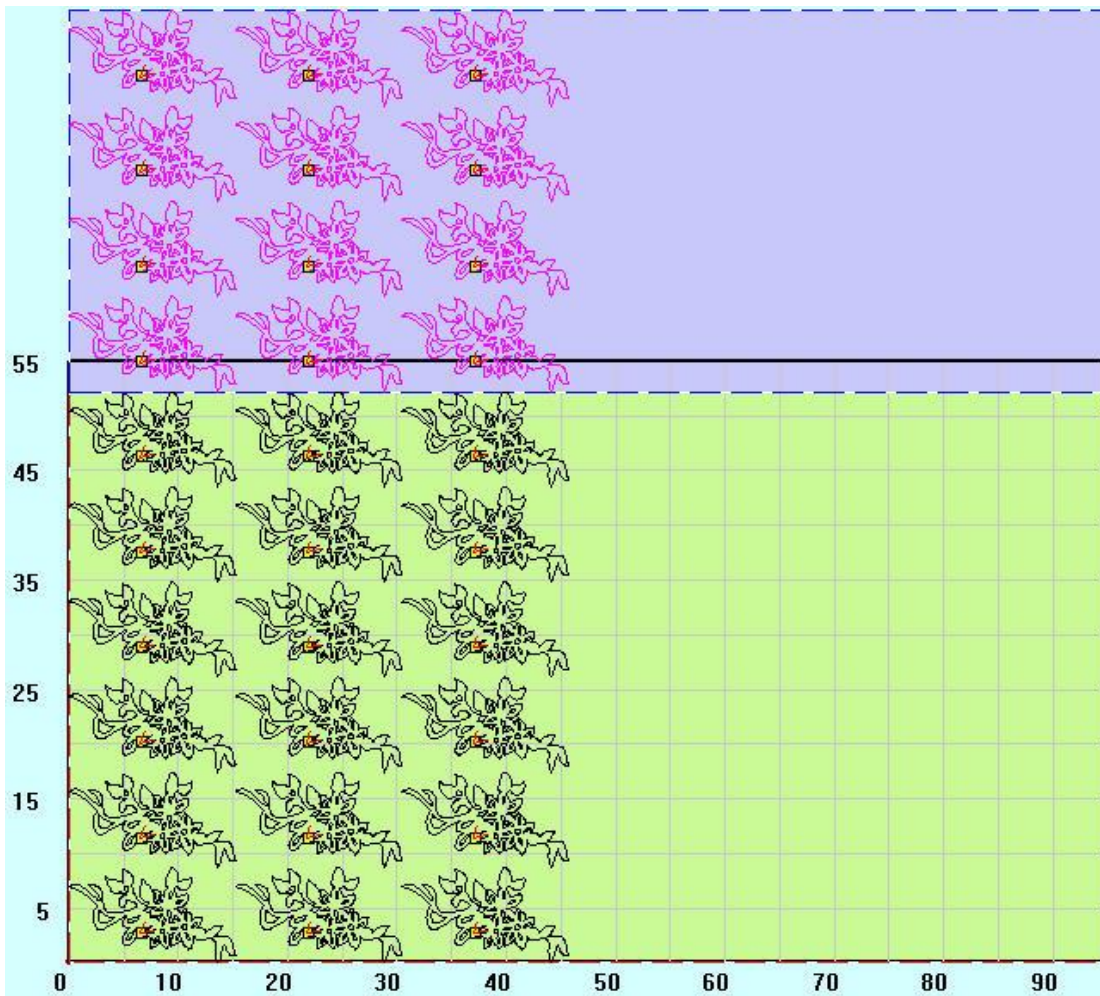
## 3.4.5 Set Output Sequence

**Auto sort:**

**Location:** Tool  ➔   Auto sort

**Grid Sort:** Mainly applies to a graph that **HAS** an array relationship;

**Nearest Sort:** Mainly applies to a graph that **HAS NO** array relationship.





**3.4.5 Set Output Sequence**
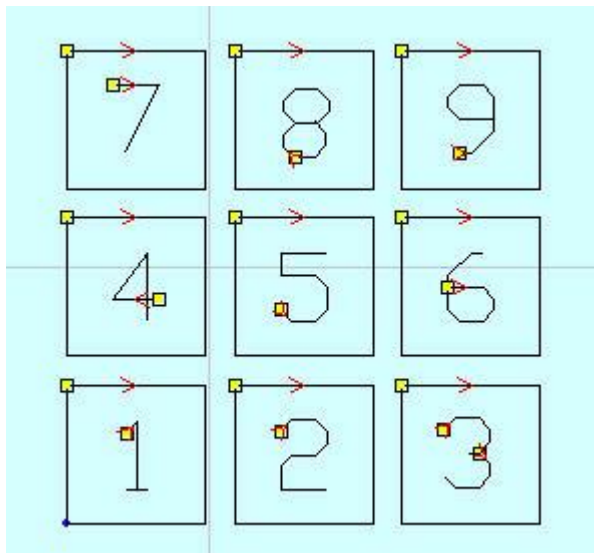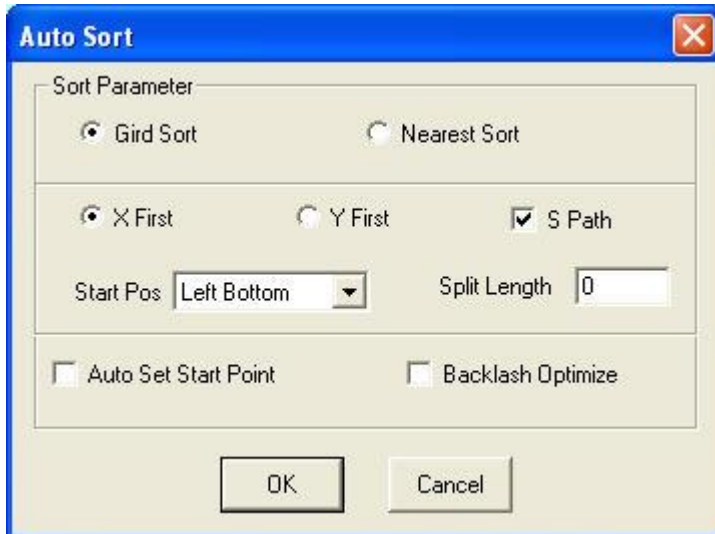
As shown above. there are **NINE** (9) rectangles. Select different parameters and the cutting sequence like in the dialog boxes below:
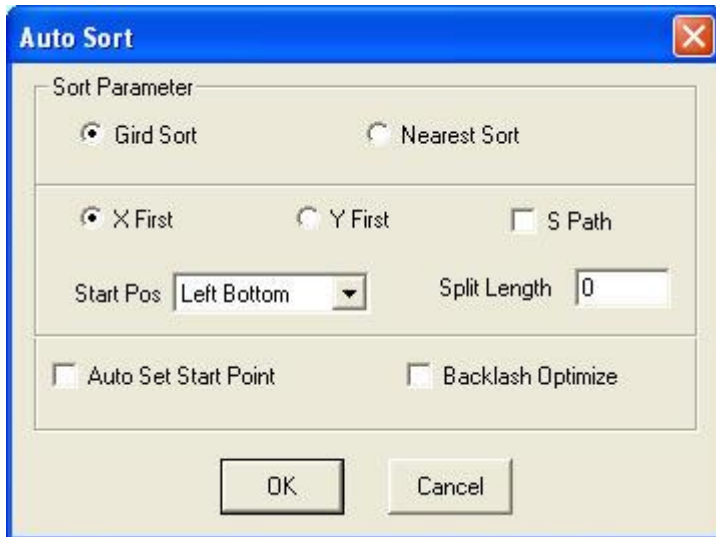


The sequence is: 1→2→3→4→5→6→7→8→9.
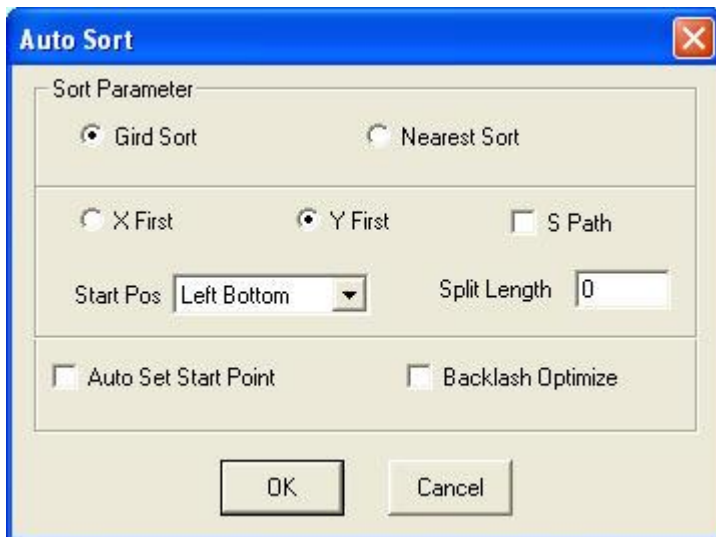


The sequence is: 1→4→7→2→5→8→3→6→9.
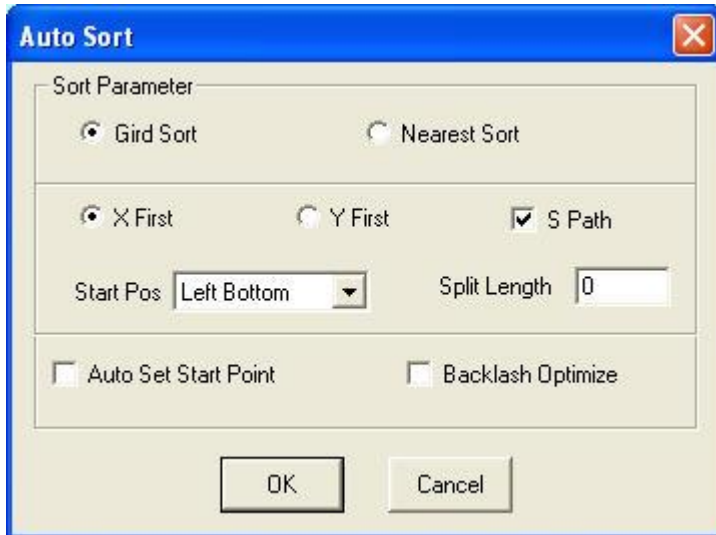
The sequence is:  1→2→3→6→5→4→7→8→9.
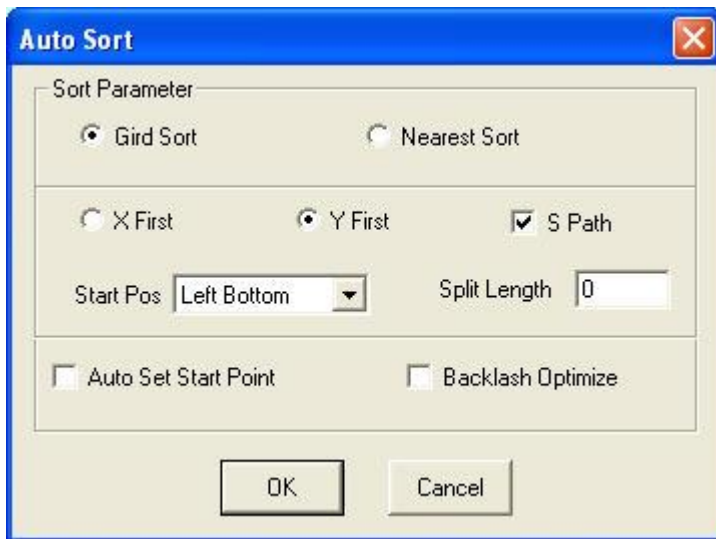


The sequence is: 1→4→7→8→5→2→3→6→9.

Sample of **'Divide Height'**. There are 6 sections (20mm*20m), and each includes 8 triangles.
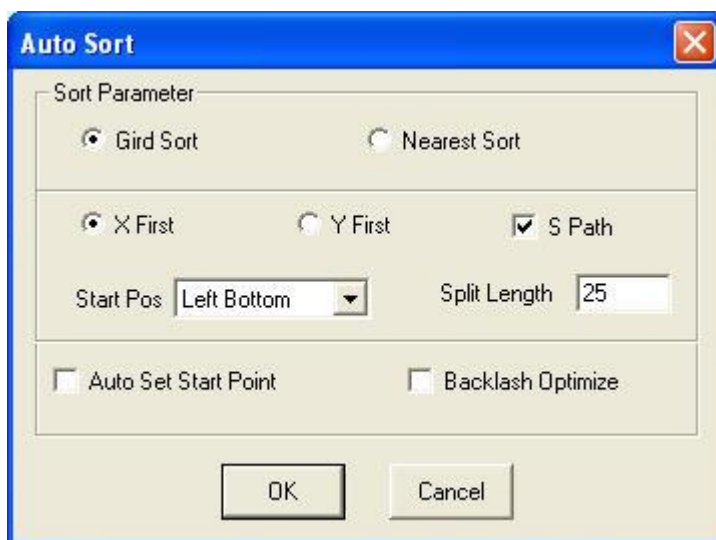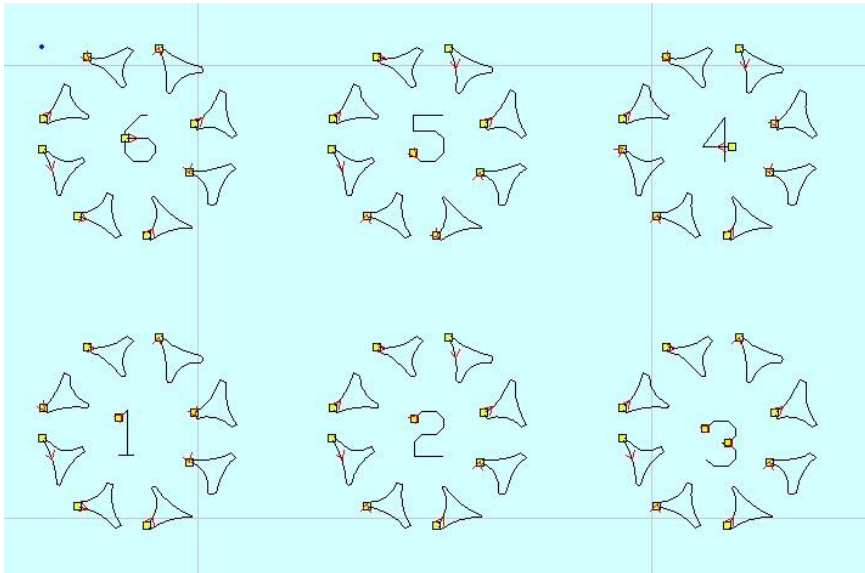




Divide height value **25** means the whole graph is divided into 6 sections (25mm*25mm). The 6 area run along    1→2→3→4→5→6.

**Start Pos:** This is the **Start Position** of the cutting route. There are 4 options: Left Bottom, Right Bottom, Left Up, and Right Up.

**Auto Set Start Point:** Check this option and the system will adjust the start point to get shortest path.

**Backlash Optimize:** Check this option and the system will automatically define cut direction to compensate the backlash in cutting. But it will increase the idle movement. Generally, this option won't be checked.

**Manual Sort:**

**Location:** Tool ➜ Manual Sort
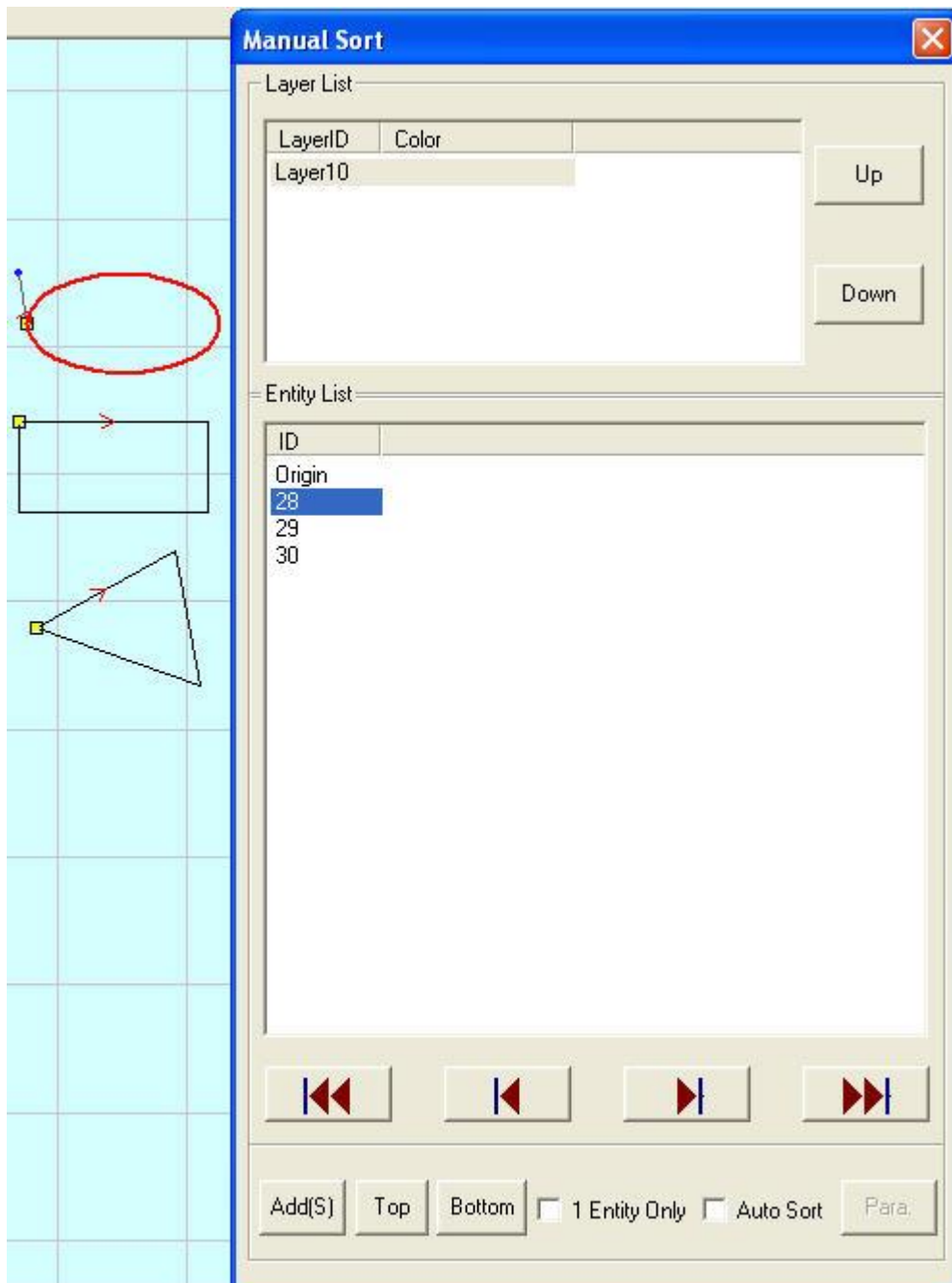


As shown above, the graph is made up of 3 entities: A **circle** (28), a **rectangle** (29) and a **triangle** (30). The default sequence is circle (28), rectangle (29) and triangle (30). Click **2** in graph list. Then and select the triangle. Click **'Add(S)'** to change the sequence to: **Circle** (28), **Triangle** (30), and **Rectangle** (29).

**Add(S)**: Add the selected entity to **graph list.**

**Top**: Add the selected entity to the **head.**

**Bottom**: Add the selected entity to the **end.**

**1 Entity Only**: Select this option. Only one entity can be selected.

**Auto Sort**: Select this option and the system will set the sequence according to the parameters in **'Para'**. If there are many layers, **'Up'** and **'Down'** can change the sequence of the layers. The graph can be re-selected, and the re-selected part will be arranged at the initial time of selection.

**Knife mold sort:** When you check the **'Knife mold'** as the auto sort mode in **Machine CFG,** the **'auto set'** interface will be shown as bellow.



Bridge Length: it is determined when drawing the file. Input the value and click on **'OK'**.

### 3.4.6 Dividing Layer

Layer toolbar: 

If the graph has many colors, the system will divide it to many layers automatically. If the graph has only one color, select some figures and click on the colour on the layer toolbar, and the system will divide the graph to as many layers as you want.

## 3.5 Setting Processing Parameters

### 3.5.1 Layer Management



Process sequence is from the top to the bottom of the layer list. Select one line in the list and click on [ Up ] or [ Down ], and the process sequence will be changed. Process mode can be selected in the drop-down list of the **'Mode'** column. This is what will appear (below):

Outputting the layer or not can be set in the **'Output'** column. Ticking this box:  will opt for output, and leaving the box un-ticked:  will not opt for output. Double click one line in the list and set processing parameters.

**3.5.2 Setting Cut Parameters**
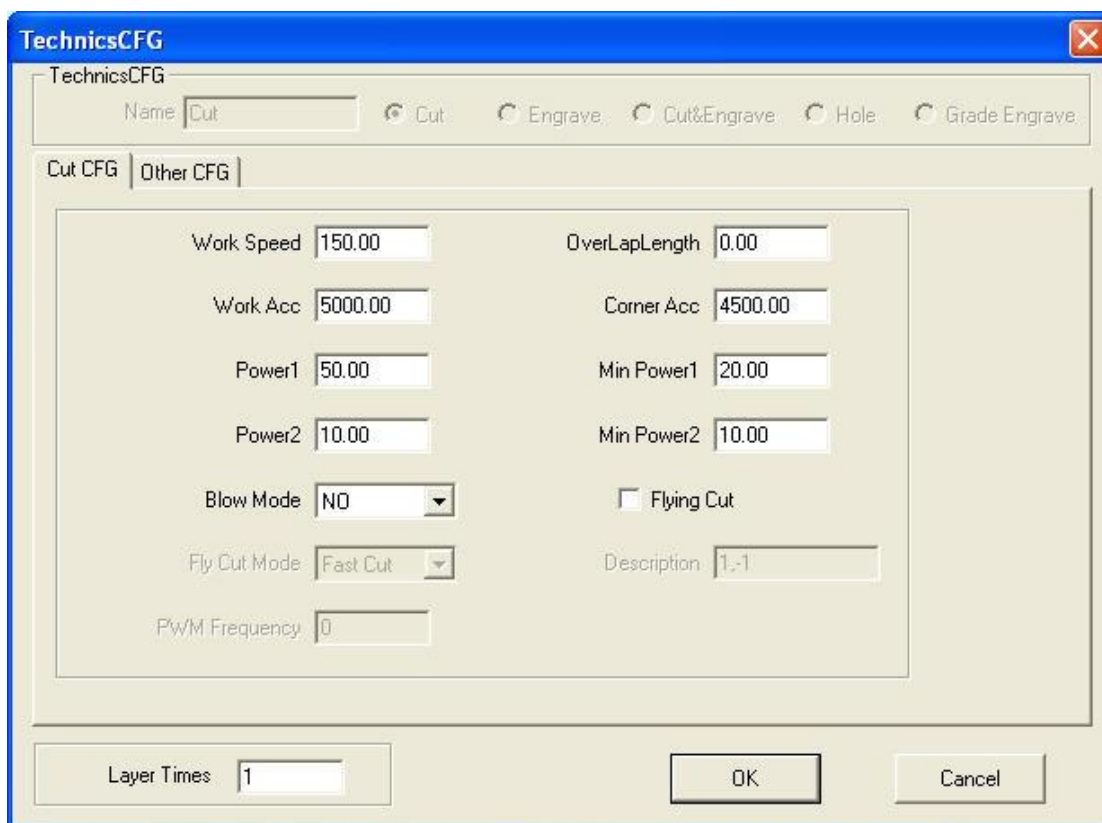


**Work Speed**: Cutting speed of the laser head in cutting.

**Work Acceleration**: Acceleration of the movement on the X, Y-Axis.

**Corner Acceleration**: Whenever the laser head moves to the corner of the curve, it has to decrease the speed. If the value is too large, the machine will shake intensively when the laser head moves into the corner and create saw tooth. If it is too small, the process efficiency will be decreased. It is generally 2 times the value of the acceleration.

**Power1/2**: Adjust the laser power (unit: %).

**Corner Power1/2**: Adjust the laser power head when the speed is the minimum in the variable speed motion. (Adjustment

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of the power and corner power can ensure an unchanged strength of the laser in the process).

**Overlap Length:** Closed graph may not to be cut down due to a mechanical error. This parameter helps to solve the problem, but it should not be too large. This implies that a **Mechanical Assemble Precision** is needed to solve the problem.

   **Blow Mode:**

   **Not Blow**: Not to blow in the process.

   **Cut Blow**: Blow when laser is on, and stop blowing when laser is off. This function needs hardware support.

   **Always blow**: Blow immediately the laser head begins to move, and close at the end of the process. This function needs hardware support.


   **Flying Cut**: Select this option and the system will cut in a fast moving mode.

   **Flying Cut Mode**:

   Dotted Line: Cut the line to dotted line. 1,-1 describes the dotted line.

   Jump for Fast: this mode can increase cutting efficiency and quality, but it's only useful when the graph is being processed by **'Part Virtual Array'**.


   **Layer Times**: a layer can be processed many times. Log in your intended values.



**Delay before laser on**: Set the delay before the laser is on

**Delay after laser on**: Set the delay after the laser is on.

**Delay before laser off**: Set the delay before the laser is off.

**Delay after laser off**: Set the delay after the laser is off.


**3.5.3 Setting Engraving Parameters**
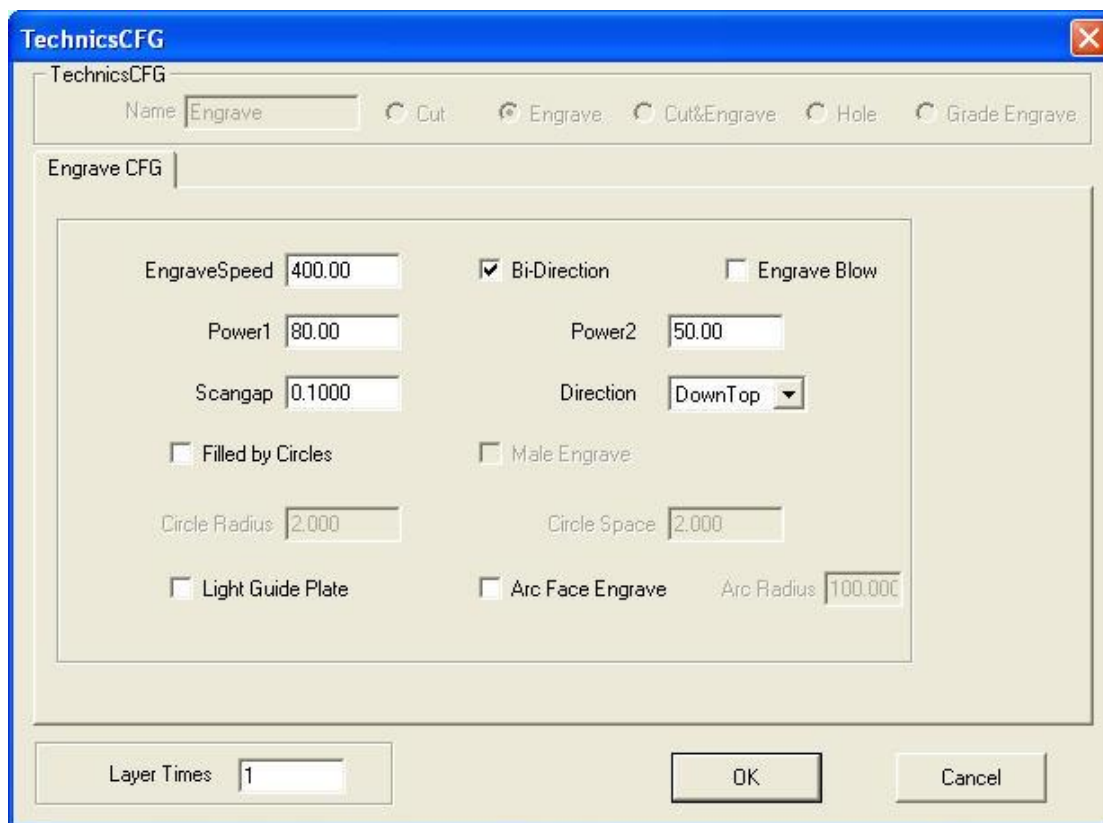
**Engrave Speed**: Engraving speed on the X-axis.

**Power1/2**: Adjust the laser power (unit: %).

**Scan gap**: Movement distance on the Y-axis when engraving a row on the X-axis.

**Bi-direction**: Laser is **ON,** both on positive and negative X-axis when this parameter is chosen. The efficiency is high, but if you need a **high process precision,** do not choose this option. The efficiency will be cut by/to half.

**Engrave Blow**: To blow (when selecting) or not to blow (when not selecting) this option.

**Direction:** This is the engrave direction.

**Filled by Circles**: Select the option and the graph will be filled by circles with the radius you set.

**Male Engrave**: Define the engraving pattern way of the circles.

**Circle Radius**: Radius of the circle.

**Circle Gap**: Space between the circles.

**Light Guide Plate: C**hoose this option and the system will convert the data to **dot matrix data** for light guide plate.

**Layer Times**: a layer can be processed many times. Input your intended value.

**3.5.4 Set Cut and Engrave Parameters**

Please refer to **3.5.2** and **3.5.3**.

**Engrave and Cut Mode** means that when processing a graph, you need to engrave first and then cut.

## 3.5.5 Setting Hole Parameters
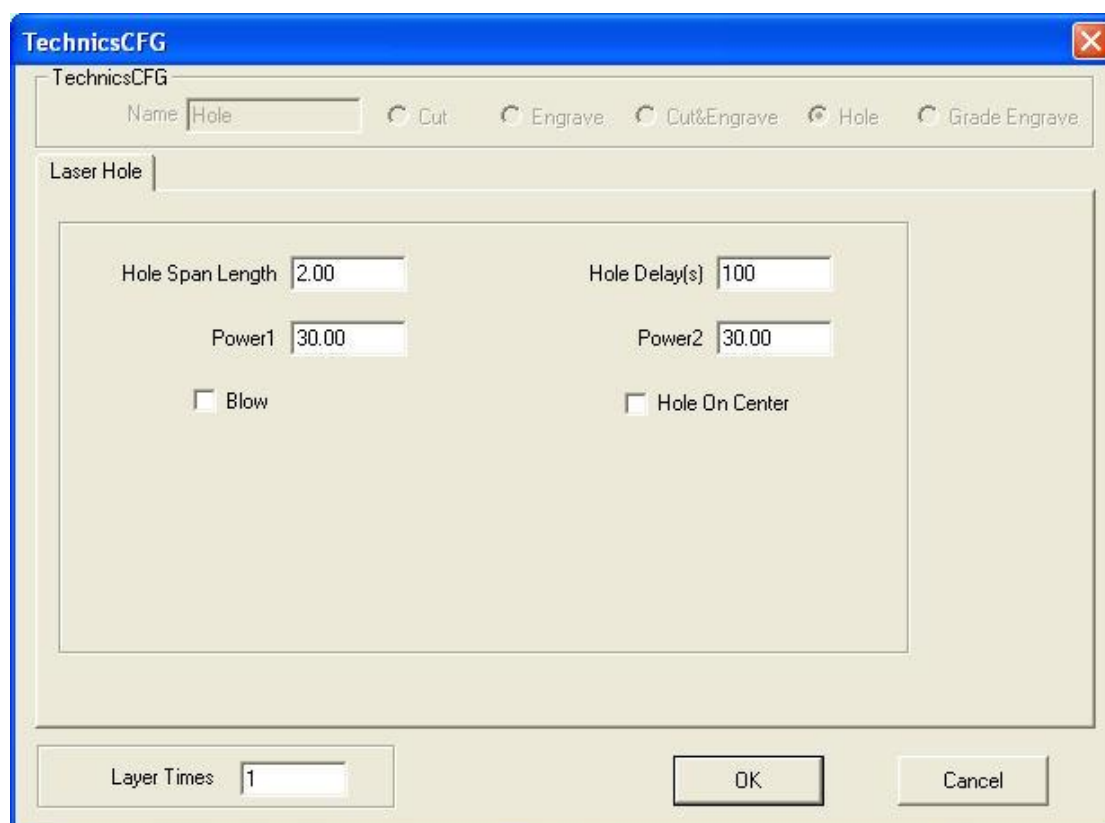


**Hole Span Length**: The distance between two adjacent holes.

**Power1/2**: Adjust the laser power (unit: %).

**Hole Delay**: Delay time of the laser head in punching a hole (unit: seconds).

**Blow**: To blow (when selecting) or not to blow (when not selecting) this option.

**Hole on Center**: punch a hole on the center of each closed vector graph.

**Layer Times**: a layer can be processed many times. Input your intended values.

**3.5.6 Setting Grade Engrave Parameters**
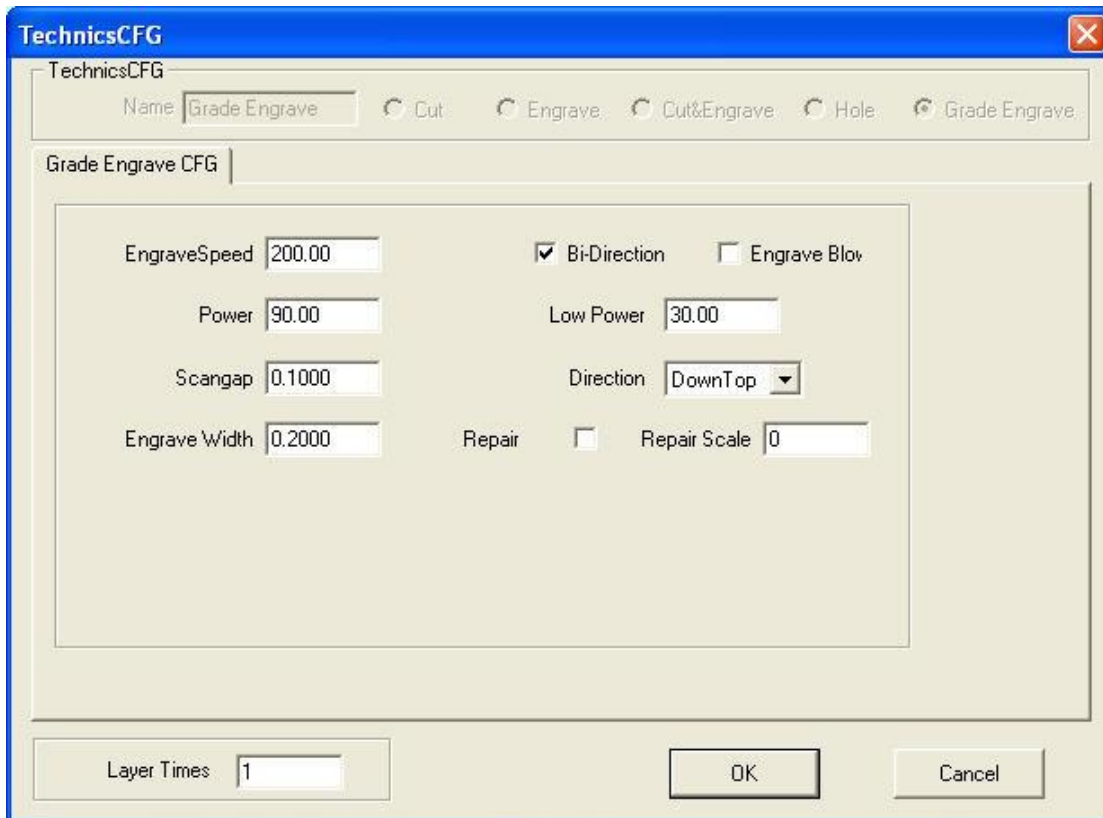


A **sketch map** (looking like one below) of a grade engrave will appear.
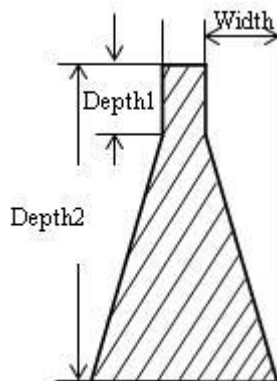


**Speed**: Scan speed of the X-axis in engraving.

**Power:** Maximum of the laser power (unit: %). It determines the depth of engraving.

**Min-Power:** Minimum of the laser power (unit: %). It determines the depth of the slope.

**Scan gap**: Movement distance on Y-axis when engraving a row on the X-axis.

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

**Repair:** Tick this option and the engraved letters will be clearer by repairing the slope results between lines of a small gap. The repair proportion can be adjusted as needed.

**Direction:** This is the engraving direction.

**Bi-dir:** The laser will go **ON** when both the positive and the negative X-axis are on, when this parameter is ticked. The efficiency is high, but if you need a high process precision, do not tick this parameter. The efficiency will be cut by/to half.

**Blow:** To blow (when selecting) or not to blow (when not selecting) this option.

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### 3.5.7 Setting Fixed Parameters

The corresponding icon: ▤ is on the toolbar.

**TechnicsCFG**

| Mode Title | Speed | Acceleration | Power | Delay Before Laser On | Delay After Laser On |
|------------|-------|--------------|-------|----------------------|---------------------|
| Cut | 150.00 | 2000.00 | 50.00 | 0.00 | 0.00 |
| Engrave | 800.00 | 1000.00 | 80.00 | 0.00 | 0.00 |
| Engrave and Cut | 800.00 | 2000.00 | 60.00 | 0.00 | 0.00 |
| Hole | 1.00 | 800.00 | 30.00 | 0.00 | 0.00 |
| 8mm Acrylic Cut | 20.00 | 2000.00 | 90.00 | 0.00 | 0.00 |

Default: Cut    Default CFG    LayerTechnicsCFG    Import    Export

Add    Delete    Modify    Close
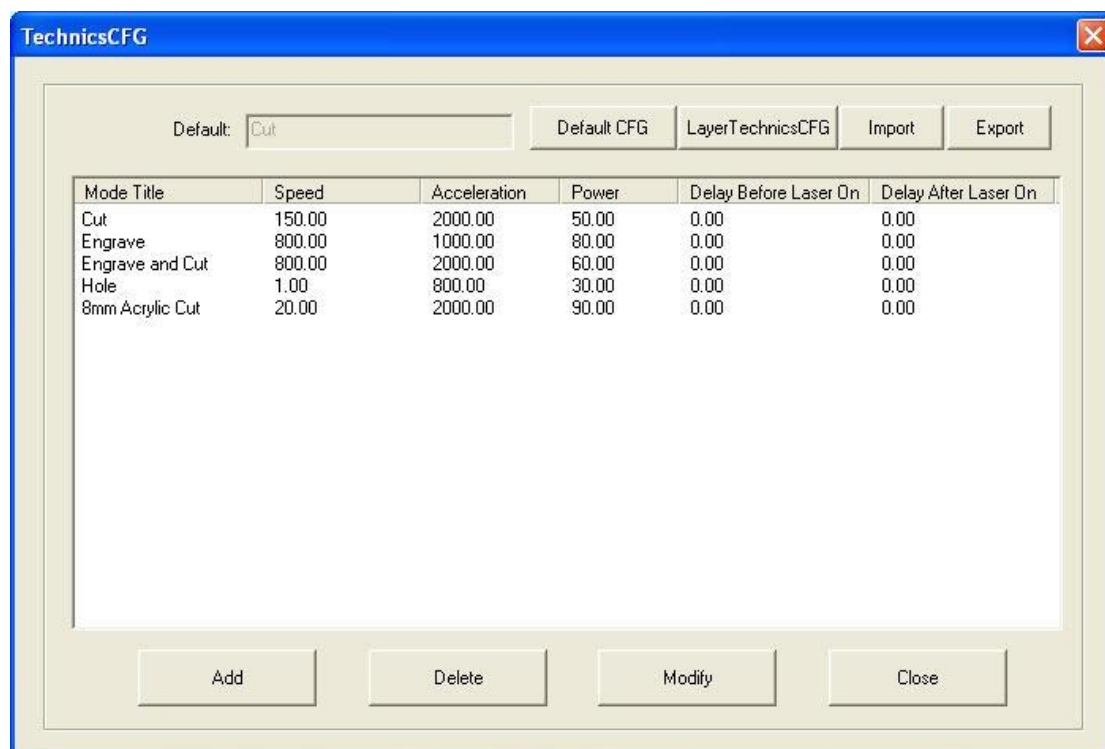
**Default CFG**: If **'Cut'** is set to be the default CFG, the system will set the process mode as **'Cut'** automatically when creating a new file. You can fix the parameters of some material that you regularly use. When the same material is processed, choose the mode in the **drop-list** and the parameters will be proper.

### 3.5.8 Feed Parameters

**Feed**

Feed Setting

Length: 0.00

Delay: 0.00    Speed: 10.00

OK    Cancel
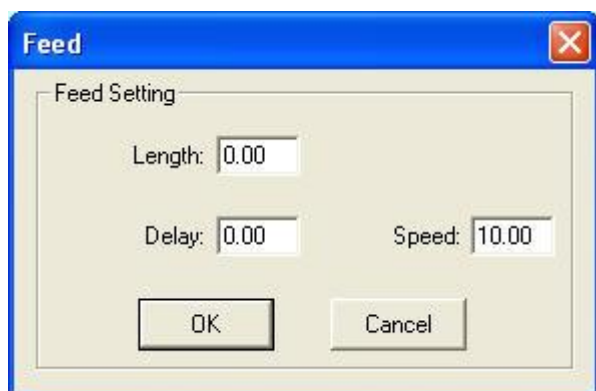
**Length**: After each processing, the Z-Axis will feed a relevant distance for the feeding of the materials.
**Delay**: The machine will delay a certain time for feeding after processing.
**Speed**: The feeding speed of the Z-Axis.

### 3.5.9 Auto 2-Head
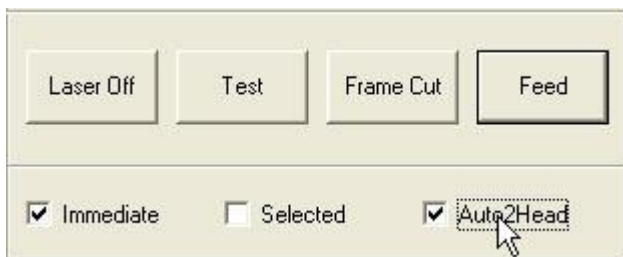


If the machine has an **automatic separation** function, select this option and the space between the two laser heads will adjust automatically; or the space between the two laser heads won't adjust and the machine will be used as a simple double laser head machine.

### 3.5.10 Immediate Output



The system will process the data according to their **coordinates** in the worktable range when the option is **NOT** selected. The system will process the data from where the laser head is, when the option is selected. Relevant relations between the stop position and the processing data will remain unchanged.

### 3.5.11 Selected Output
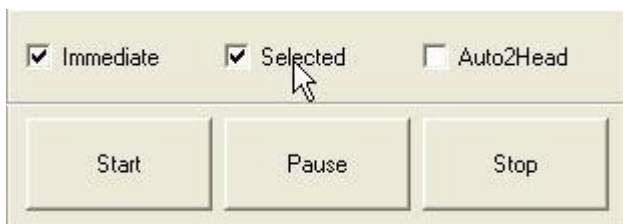


When selecting this option, the system will only process the graph selected.

# 3.6    Output

### 3.6.1 Download File

Click on the **'Download'** button, and this dialog box (below) will show up:
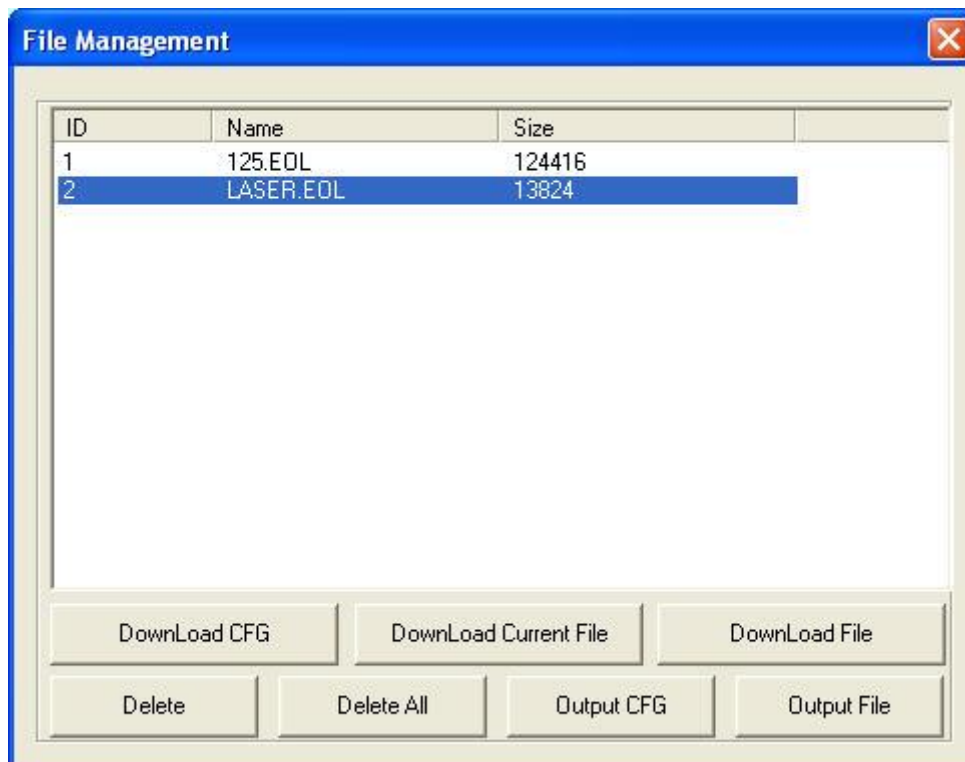


**Download CFG**: Download parameters of the machine to the controller.

**Download Current File**: Download the current processing data to the controller.

**Download File**: Download the processing files (**\*.eol**) which have been generated to the controller.

**Delete**: Delete the selected file.

**Del All**: Delete all the files in the controller.

**Output CFG**: This will generate a \*.eol file which includes all the parameters of the **'Machine Setting'**. The file can be downloaded to the controller using a USB disk. **Note:** After the file is downloaded into the controller, you should select the file and click on **'OK'** to take the new parameters into effect. This function is similar to the one at **3.6.1** (Download CFG).

**Output File**: This will generate a \*.eol processing file with all the well-set parameters. This file can be downloaded to controller by a using disk. This function is similar to the one at **3.6.1** (Download Current File). The difference is that files can be downloaded without connecting the computer.

### 3.6.2 Test

Click the button, and the laser head will move a rectangle contouring the data with the laser off. This function is used to define the position of the materials to be process.

### 3.6.3 Frame Cut

Set the parameters of cutting the work pieced well-processed off the materials.

Click the button after the process is finished, for the following dialog box to surface:
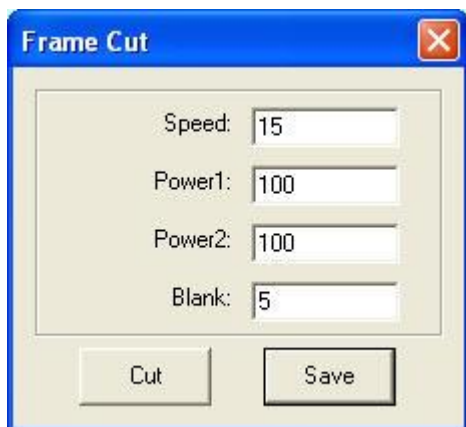
**Speed**: The operating speed of the **laser head** when cutting. Varying speeds can be set according to the materials. It is better to define proper speed through testing.

**Power1/2:** Power of the laser in cutting.

**Blank**: Distance between the processing figure and the **edge** of the work piece cut down.

**Cut**: Click the button to cut the piece.

**Save**: Click the button to save the parameter in case of future use.

The parameters will be effective only when the processing data is re-downloaded.

# 3.7 Machine Setting

**3.7.1 Axis Parameter**



**3.7.1.1 Range:**

Maximum range of the laser head's movement (unit: mm).

**3.7.1.2 Pulse Unit:**

It controls the distance the laser head will move when the control system outputs/makes a pulse. Click the button to release the below dialog box:

**Pulse Unit Calculation**

Move Length: 40.384001    Measure

Need Pluse: 6400

OK
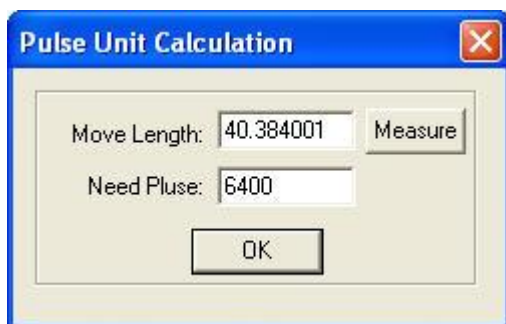
**40.384001** in the picture above means the distance of the laser head moves every round of the motor is 40.384001 mm. 6400 is the pulse every round of the motor needs. The **Pulse Unit** can be set by measuring. Then click on **'Measure'** to introduce the dialog box below:

**Adjust Pulse Unit**

WorkpieceLength: 90.000

Software Length: 100.000

OK    Cancel
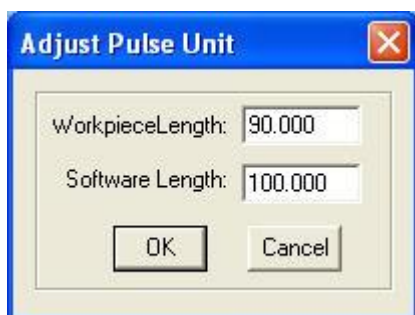
Taking the example of the above dialogue, you will have to draw a line whose length is 100mm in the software, and then and do the cutting. Measure the work piece. The actual length of the line has to be 90mm. Input the value, and the system will calculate the pulse unit automatically.

### 3.7.1.3 Home/Datum Dir
The right of the X-Axis and upside of the Y-Axis are **POSITIVE** directions. Ensure the correspondence of the switch position on the original point and the setting of this option.

### 3.7.1.4 Home/Datum Offset
After datum, the laser head will move a distance along the reverse direction of the origin switch.

### 3.7.1.5 Home/Datum Speed
The speed of the laser head going when back to the original point. It **SHOULD NOT** be too large, or the switch of the original point may be damaged.

### 3.7.1.6 Slow Jog Speed
The **test speed** of the laser head, when **'Auto datum'** is not chosen.

### 3.7.1.7 Fast Jog Speed
The **test speed** of the laser head, when **'Auto datum'** is chosen.

### 3.7.1.8 Jog Acceleration
It is the acceleration **FROM** start speed to jog speed.

### 3.7.1.9 Max Change Speed
It is the maximum speed of changing the directions of the X or Y axis. The **SMALLER** the value is, the better the quality is, but the **lower** the efficiency of the processing will be.

### 3.7.1.10 Backlash
It is used to compensate the backlash in cutting.

### 3.7.1.11 Z-Axis
The Z-axis should be enabled. The Z-axis can be used as **auxiliary** head of a 2-Head machine, feeding axis and the Z axis (lifting the worktable).

### 3.7.1.12 FeedEx

If the machine has an automatic separation 2-head, the Z-axis should be used as a 2-Head and the feedex can be used as feeding axis.

### 3.7.2 Controller Parameter

3.7.2.1 Controller Model

| MotionCard | |
|---|---|
| MotionCard Type | TRUCUT CONTROL MOTHERBOARD ▼ |

It is determined by the controller in the machine. For the **TRUCUT CONTROL MOTHERBOARD,** choose the **TRUCUT CONTROL MOTHERBOARD** in the drop-down list of the Controller Model. Please replace the DLL of the controller when changing the controller model.

3.7.2.2 Coordinates System

| Coordinate System | |
|---|---|
| Space Speed | 500.000 |
| Space Acc | 6000.000 |
| StartSpeed | 10.000 |
| AccAcc | 50000.000 |

a). **Space Speed:** It is the **highest** speed of the laser head in the process when the laser is off.

b). **Space ACC:** It is the **acceleration** when the machine is moving on quick speed.

c). **Start Speed:** It is used for **space** moving and cutting.

d). **ACCACC:** It is the **acceleration of the acceleration** when space moving and cutting.

3.7.2.3 Signal CFG

| Signal CFG | |
|---|---|
| Home Limit IO Level | Low Level Effective ▼ |
| Laser Frequency | 20000 |
| Laser power control mode | Db Laser Analog ▼ |
| MaxLaserPower(%) | 100.0 |

a). **Home Limit IO Level:** Sets the effective level of the original signal.

b). **Laser Frequency:** It controls the **PWM Frequency** of the laser power. It can be adjusted between **200Hz－200KHz.**

c). **Laser Power Control Mode:** Sets the **Mode** of the laser power control. It includes:

<div style="text-align:center">

1). Single Analog Quantity,

2). Double Analog Quantity, and

3). PWM Control.

</div>

d). **Max Laser Power (%):** It is used to **Restrict the Maximum Output** of the laser tube. If the value is **80%,** when processing power is **100%,** the actual output is going to be **100%\*80%=80%.**

3.7.2.4 Advanced CFG

| AdvancedCFG | |
|---|---|
| Enforce go home before work | ☑ |
| Enable Breakpoint Protect | ☐ |
| BreakPoint Back Distance(mm) | 2.0 |
| Enable Water Protect | ☐ |
| MinCloseBlowLength(mm) | 0 |
| Feed Dir | Positive |
| Feed Compensate | 0.0 |
| Output Type | Output By Layer |
| Curve Disperse Accuracy | 0.30 |
| Enable Adjust Small Circle Speed | ☑ |
| Set Adjust Small Circle Speed | Set |
| Set Engrave Parameters | Set |

**a). Enforce go home before work:** It determines whether the laser head *automatically goes back* to the original point when putting the power system **ON**. Without choosing this option, the *jog speed* of the laser head is relatively *slow.* This will avoid it striking the machine. Or the jog speed will be *quicker* and you need not worry about the laser head striking the machine.

**b). Enable Breakpoint Protection:** When choosing this option, the system will *record* the coordinates value of the laser head when the power is **OFF**. When the system is *re-powered,* the system will remind user to continue with the process or otherwise.

**c). Breakpoint Back Distance:** This is effective when the *break-point resume* function is selected. The laser head will move back a certain distance when *re-powered*, to ensure the line can *join* smoothly with the other line before the power went off.

**d). Enable Water Protect:** You tick this option to *detect* the water protect signal. The system will pause the processing.

**e). Min Distance of Blowing Off:** The system **WILL NOT** close the blowing when the space between two graphic units is less than the value.

**f). Feed Dir:** This function is used to set the moving direction of the feed axis.

**g). Feed Compensate:** It is the *additional distance of feeding*. A positive value means *feeding more* and a negative value means *feeding less*.

**h). Output Type:**
a). Output by Layer: When there are **MANY** layers, the system will process the graph *layer by layer.*
b). Output by Object: When there are **MANY** layers, the system will *set the process sequence* as one layer while the processing parameters of each graphic unit (i.e. speed, power) will *refer* to the processing parameters of the layers.

**i). Curve Disperse Accuracy:** The **SMALLER** the value is, the more **PRECIS** the figure is, but the **SLOWER** the **COMMUTATION SPEED** is. And it will influence the *process speed* also. Generally, you can choose a relatively small number to cut *synthetic glass,* and please make certain to use the **DEFAULT VALUE** when cutting other materials.

**j). Enable Adjust Small Circle Speed:** When enabling this option, the system will **RESTRICT** the speed for best quality when cutting *small circles* that the diameter is in the range.

*Parameter of Small Circle Speed:* It defines the cutting speed of small circles. If it is suitable, the quality of the small circles (when cutting) will increase dramatically.
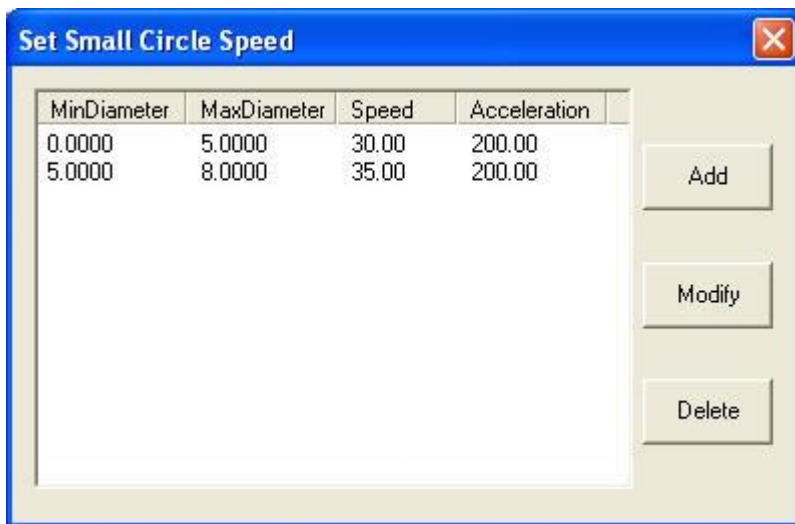


Following the **above** dialog box, **DOUBLE CLICK** on either option (MinDiameter. MaxDiameter, Speed or Acceleration) or select just one option and click **'Modify'**). The result will be the dialog box below:



**a). Min diameter, Max diameter**: Range of the circle's diameter.
**b). Speed**: Cutting speed of the circle within the range.
**c). Acceleration**: Acceleration of cutting with the speed. Click **'OK'** to set the *cutting speed* of the circles with different speed ranges. Please ascertain that the *maximum diameter* is **NO MORE THAN 3.**

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**Set Engrave Parameter:**
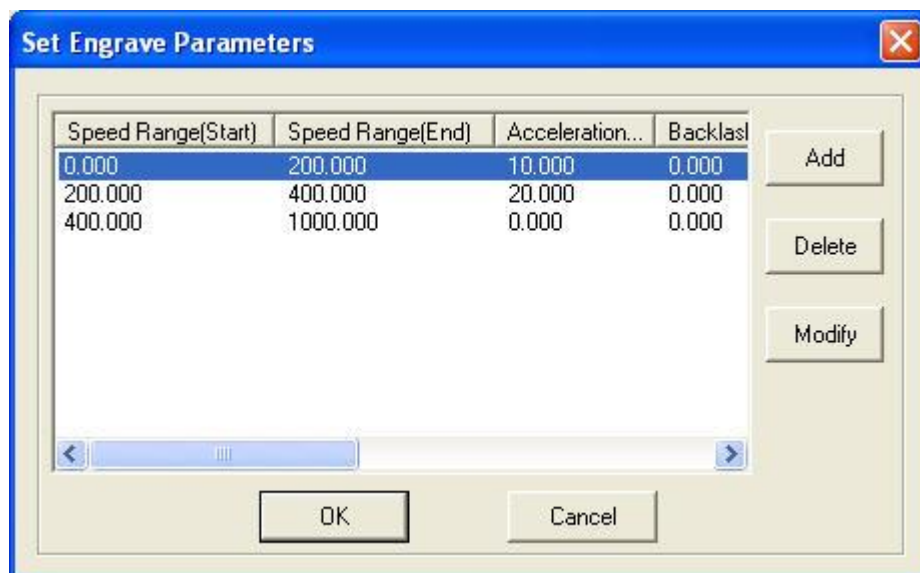


Following the **above** dialog box, **DOUBLE CLICK** on either option (Speed Range(Start), Speed Range(End), Acceleration or Backlash) or select just one option and click **'Modify'**). The result will be the dialog box below:



**a). Speed Range (Start)**: Sets the *start point* of the speed range.

**b). Speed Range (End)**: Sets the *end point* of the speed range.

**c). Acceleration Distance**: Sets the *acceleration length* of the laser head during the time when speed accelerates from the jump speed to the operating speed.

**d). Backlash**: It's used for *compensating mechanical gaps*. If the engraving edge is not orderly, please set a number in **'Backlash'**. This number can be positive or negative. Please find more details at **'5.5' of Chapter 5.**

**e). X Start Speed**: Start speed of the laser head in engraving. Too large value will lead to the *malposition of the engraving* while too small value will **decrease** the process efficiency dramatically.

**f). X Acceleration**: It's the **acceleration** of the X-axis from the start speed to the operating speed.

**g). Y speed**: It is the maximum of the laser head speed on the Y-axis. *If the number is too large, the machine will shake*

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*intensively.*

**H). Y Acceleration**: It's the **acceleration** of the Y-axis from the start speed to the operating speed.

**i). X Offset**: It's applied only to a **Servo Motor.** When servo motor is chosen, *offset* will be generated between the engraving and the cutting positions. It is to compensate offset on the X-axis in engraving.

**j). Y Offset**: It's applied only to a **Servo Motor.** When servo motor is chosen, *offset* will be generated between the engraving and the cutting positions. It is to compensate offset on the Y-axis in engraving. Click **'OK'** to set different process parameters according to different speed ranges.

### 3.7.3 Application Parameter

3.7.3.1 Import Data Parameters

| Import data parameters | |
|---|---|
| Auto combinecurve | ☐ |
| Auto sort | ☐ |
| Auto cal lead | ☐ |
| AutoConvertTextToCurve | ☐ |

In the above dialog box, select (tick) an option and the system will implement a relative operation when importing data.

3.7.3.2 Auto sort mode

| Auto Sort Mode | |
|---|---|
| Auto Sort Mode | Inside first ▼ |
| Double | Inside first |
| | Knife mold |
| DbLaser Machine | ☑ |

a). **Inside first:** The inside graph will be cut first and then the outer.

b). **Knife mold:** This mode is only applied for the knife mold machine.

3.7.3.3 Auto Separation 2-Head

| Double Laser | |
|---|---|
| DbLaser Machine | ☑ |
| DbLaser Mode | Laser2 Right ▼ |
| DbLaser Min Space Length | 100.000 |
| DbLaserType | Auto ▼ |
| MoveLaserHeadSpeed | 200.000 |

a). **Auto Separation 2-Head Machine:** This option can only be chosen when the machine is an automatic separation machine.

b). **2-Head Mode:** Choice of the **location** of the auxiliary laser head is on the **LEFT** or **RIGHT** according to the structure of the machine.

c). **Min Distance between 2 Heads:** Input the distance of the two laser heads according to the structure of the machine.

d). **Separation Type:** There are 2 options: **Auto** and **Semi-Auto.**

e). **Speed of Separating Head:**

3.7.3.4 Auto Separation 2-Head

| Table Display CFG | |
|---|---|
| Grid Height | 50 |
| Grid Width | 50 |
| Text Font Height | 20 |

Set the size of the worktable grid and the font size in the above dialog box.

### 3.7.4 Open CFG File

Click **Open CFG File** button, and open the configuration file. All the parameters of the machine's settings are saved in this file, which is named *syscfg.ini.* This file is found at the **C DRIVE** (local drive), at **C:\TruCUT2 Laser Software.** Please save the file as a **BACKUP** file. When *re-installing* the software or parameter error, replace the configuration file in **C:\TruCUT2 Laser Software.**

# 3.8 Machine Checking

## 3.8.1 Machine IO Checking

| Machine Diagnosis | | |
|---|---|---|
| **X** | | |
| Negative limit | | ☐ |
| Positive limit | | ☐ |
| Home | | ☐ |
| Enable Alarm | | ☐ |
| **Y** | | |
| Negative limit | | ☐ |
| Positive limit | | ☐ |
| Home | | ☐ |
| Enable Alarm | | ☐ |
| **Z** | | |
| Negative limit | | ☐ |
| Positive limit | | ☐ |
| Home | | ☐ |
| Enable Alarm | | ☐ |
| **FeedEx** | | |
| Negative limit | | ☐ |
| Positive limit | | ☐ |
| Home | | ☐ |
| Enable Alarm | | ☐ |
| **Input IO** | | |
| 1(IN1) | | ☐ |
| 2(IN2) | | ☐ |
| 3(IN3) | | ☐ |
| **Output IO** | | |
| 1(OUT1) | | ☐ |
| 2(OUT2) | | ☐ |
| 3(OUT3) | | ☐ |
| 4(OUT4) | | ☐ |

[ IO Enable ]   [ Cancel ]

a) **Input:** If there is signal input, that will be shown with a tick in the box: ☑.
b) **Output:** If there is signal output, that will be shown with a tick in the box: ☑.

### 3.8.2  Version Checking
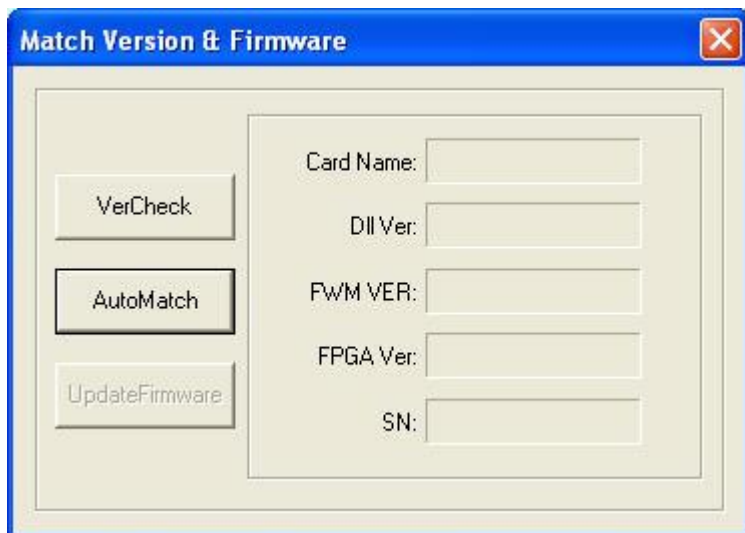


a). Power the controller **ON**, and ensure it communicates with the computer correctly.

b). Click on the **'Version Check'** button, and the system will show the *version information* of the controller and DLL.

c). Click on the **'Auto Match'** button. The system will match the correct DLL according to the controller.

### 3.8.3  Firmware Update

Power the controller **ON**, and ensure there is proper communication with the computer. Click on the **'Firmware Update'** button. The system will update the controller to the *latest version* automatically (please ensure that the computer has the latest software).

**Notice:** If the machine powers off during the updating, you have to update the controller from a **USB FLASH DISK.**

# 4. Control Panel

## 4.1 Overview of Control Panel

### 4.1.1 Face of the Control Panel
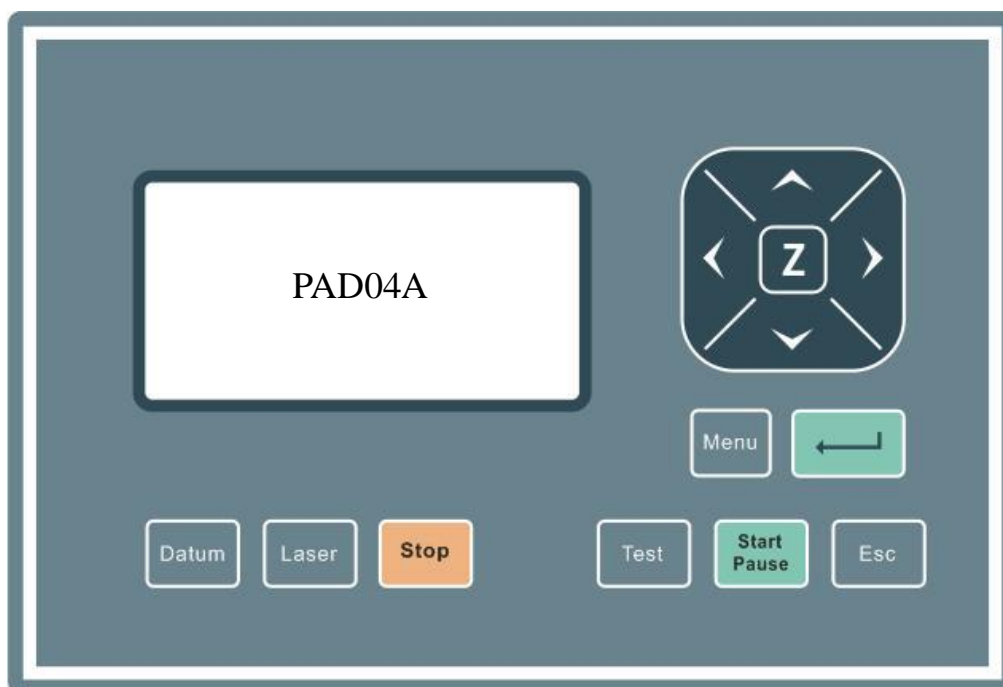


### 4.1.2 Function of the Keys

**Datum:** Laser head moves to the **Original Point** of the machine slowly. It is mainly used to estimate a possible cumulative error. Make sure that the application of datum switches, and lead the switch signal to the controller.

    **Laser:** Laser on/off.

    **Stop:** Stop operation.

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

    **Start/Pause:** For starting or pausing the processing operation.

    **Esc:** For escaping the current status window.

    **Menu:** Enter supporting interface.

Click on this button: and switch to Z status (PAD04 has individual Z keys). Click '∧' '∨' to move the Z axis. This function needs hardware support.

The follow by pressing on the Enter: button.

## 4.2  Start Interface

When the system is started, this is what it will show you:

```
SYSTEM STARTING
  PLEASE WAIT
     Vx.x.x
```
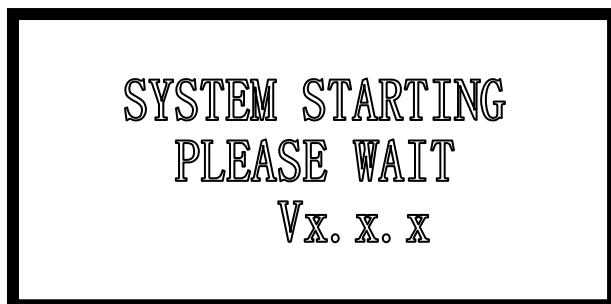
## 4.3  Main Interface

If there's no communication problem with the **TruCUT Control System,** the main interface will display the following menu:

```
FILE：XXXXXXXX
SPEED：XXX%
POWER：XXX/XXX%
PIECES：XXX    DEL
```

### 4.3.1    Description of Parameters

a). **File:** Processing file name.

b). **Speed:** Percentage of the processing speed.

c). **Power:** Percentage of the processing power. The first one is the power corresponding to **low speed.** The second one is the power corresponding to **high speed.**

d). **Pieces:** Repeat times of a processing file.

### 4.3.2    Cursor Appears (Initial Status)

a). Press ‹ › to move the *cursor* and select the option want to modify;

b). Press ∧ ∨ to set the values of the selected option, including *processing speed, power corresponding to low speed, power corresponding to high speed* and *pieces.* Stepping=1;

c). Press ∧  ∨ to select a file when the cursor is on **'File'**. If there's no file in the controller, no name of file will be displayed.

d). To delete a file: Move the cursor to **DEL**, and press **ENTER**;

e). To process a file: Press **START**.

Note: Press **ENTER** to confirm the settings on *speed, power* and *pieces.* The parameters will not lose when power goes off.

### 4.3.3    Cursor Disappear

Press **ESC** and the cursor will disappear instantly.

Press  〈  〉∧    ∨    to move the laser head.

### 4.3.4    Laser

Press **LASER** to beam according to the settings of shooting;

### 4.3.5    Test

Press **TEST** to make contouring motion:

```
CONTOURING
PLEASE WAIT
```

When contouring finished, system will return to the main interface. **\*\*IMPORTANT\*\*:** When contouring, only **START**
and **STOP** can be used.

## 4.4  Process

### 4.4.1    Process Interface

Press **START** to start the processing:

```
FILE:XXXXXXXXX
SPEED:XXX%
POWER:XXX/XXX%
TIME:XX-XX-XX
```
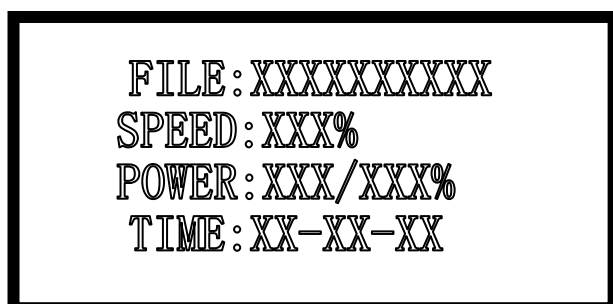
**Parameter descriptions are as follows:**

b). **File:** Processing the file name.

c). **Speed:** Percentage of the processing speed.

d). **Power:** Percentage of the processing power. The **FIRST** one is the power corresponding to **LOW SPEED.** The second
one is the power corresponding to **HIGH SPEED.**

e). **Time:** Processing time spent.

### 4.4.2    Process Control

a). During the process, only the following buttons can work: **START**, **STOP**, 〈, 〉, ∧ , ∨ :

b). These buttons: ∧  and ∨ are used to change the processing speed. Stepping=1. The value ranges from **0** to **100.**

c). These buttons: 〈  and 〉 are used to change the power corresponding to high speed. Stepping=1. The value ranges from **0**

to **100.**

d). Press **START** for odd times. It will enter the **PAUSE** interface and show the display before:

```
+--------------------------------------------+
|                                            |
|                 PAUSED                     |
|        PRESS START TO CONTINUE             |
|                                            |
+--------------------------------------------+
```
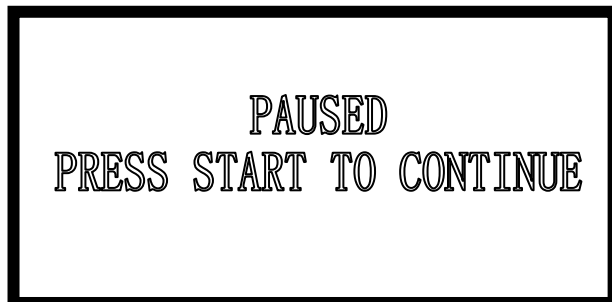
a). In this interface, only **START** and **STOP** buttons can work;

b). Press **START** for even times during processing. It will return **FROM** pause interface **TO** process interface.

c). Press '**STOP'** during processing and it will stop the processing.

### 4.4.3    Download with USB Flash Disk

When a USB flash disk is plugged into the controller, the main interface will display this:

```
+--------------------------------------------+
|                                            |
|                                            |
|       DETECTING USB FLASH DISK             |
|                                            |
|                                            |
+--------------------------------------------+
```
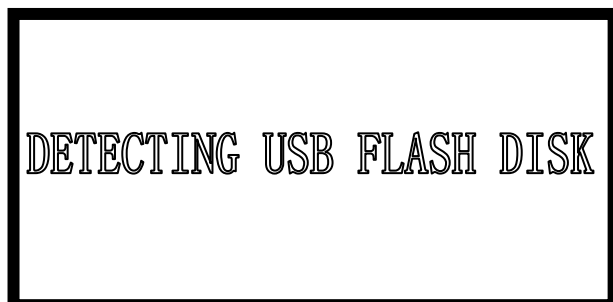
The controller starts to choose the process files once the USB flash disk is detected. The interface displays this:

```
+--------------------------------------------+
|               CHOOSE FILE                  |
|                  ALL                       |
|                 XXXX                       |
|                 XXXX                       |
|                                            |
+--------------------------------------------+
```
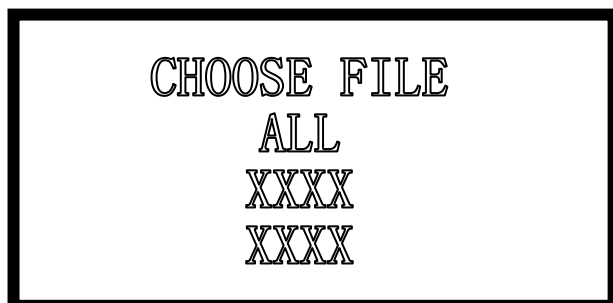
Press ∧ , ∨ . Choose your intended file and press **ENTER** to download the file. Presses **ESC** to exit the download processing.

```
DOWNLOADING
STATUS:XXX%
```
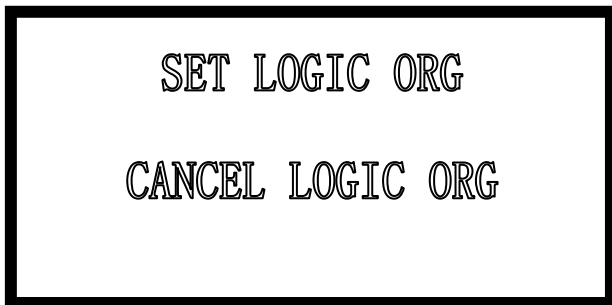
Once it's done downloading, the interface starts showing:

```
DOWNLOAD COMPLETED
REMOVE USB FLASH DISK
```

#### 4.4.4    Setting and Cancelling Logic Original Point
Press **ENTER** on PAD03/PAD06 (**ANCHOR** on PAD04) in the main interface, and set the logic original point, or cancel the logic original point.
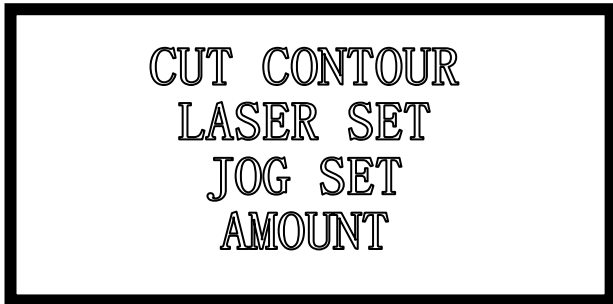
```
SET LOGIC ORG

CANCEL LOGIC ORG
```

Press ‹ › and move the cursor to your option. Then press **ENTER** to confirm and return to the main interface. This operation can set the current piont as the **logic original point,** and the coordinates will be saved. But it is only effective after the machine has successfully reset (there's no 'reseted' in English, please!) and '**Immediate Output'** is selected.

## 4.5 Supporting Interface
Press **MENU** once, to enter the supporting interface, which displays as follows:

```
CUT CONTOUR
LASER SET
JOG SET
AMOUNT
```

Press **MENU** twice to enter another supporting interface, which displays as follows:

```
IP SET
SCREEN PROTECT
LANGUAGE
```

a). Press ⟨ ⟩ to move the cursor;

b). Press **ENTER** to confirm;

c). Press **ESC** to return to main interface.

### 4.5.1    Cutting Contour

Select CUT COUNTOUR using the mouse and the press **ENTER**:

```
CUTTING CONTOUR
  PLEASE WAIT
```

When the machine is cutting **CONTOUR,** only the **START** and the **STOP** buttons can be used. It will return to the main interface once the motion is completed.

### 4.5.2    Laser Set
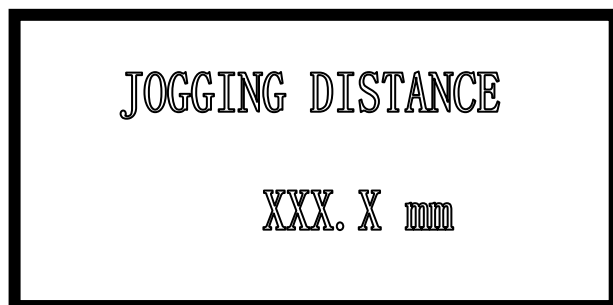
Select LASER SET using the mouse and press **ENTER**:

```
TIME:
  XXXXXms
POWER:
  XXX%
```
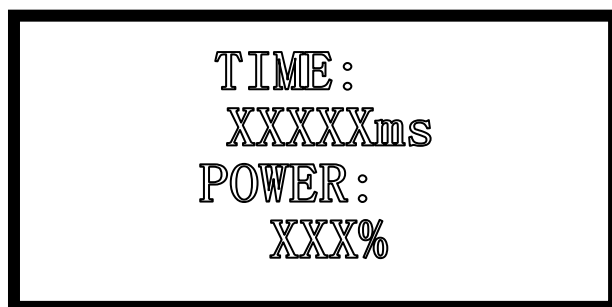
a). The default value of **TIME** is **0 ms,** while the default **POWER** value is 100％.

b). Press ⟨ ⟩ to move the cursor and to choose *Time* or *Power.*

c). Press ∧ ∨ to set parameters. Correct setting = 1.

d). Time ranges from **0** to **99999ms.** Power ranges from **0** to **100%.** Press **ENTER** to make the settings effective.

e). Press **ESC** to return to supporting interface without activating entered settings.

f). If the time = 0, the laser will be **ON** immediately upon pressing the **LASER** button, and be off when you stop pressing. If the time is set to a fixed value, the laser will be **ON** a certain time for each press.

### 4.5.3    Jog Set
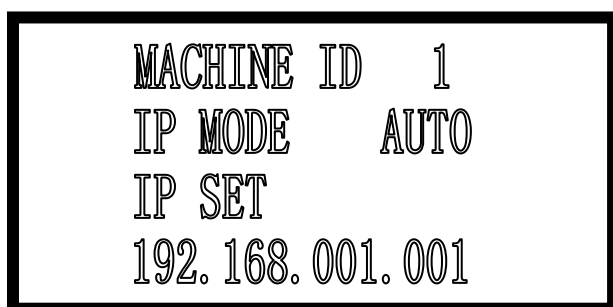
Select JOG SET and press **ENTER**:

```
JOGGING DISTANCE

XXX.X mm
```

Press ∧ ∨ to set parameters. Press **ENTER** to confirm and return to the supporting interface. The default value (0) starts moving upon pressing 〈 〉∧ ∨ , and stop when stop pressing. If the value is not 0, laser head starts moving a fixed distance at high speed.

### 4.5.4   IP Set

```
MACHINE ID    1
IP MODE      AUTO
IP SET
192.168.001.001
```
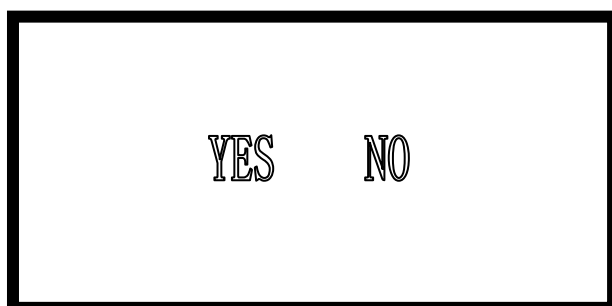
a). Press 〈 〉to move the cursor and press  ∧∨to set parameters, setting=1.

b). **Machine ID:** When several machines are controlled by one software, the **Machine ID** should be set on the **PAD panel.** Advisably, the IDs for the different machines should be different.

c). **IP Mode:** There are *2 modes* to set the **IP address** of the controller: **Auto** and **Static/Manual. 'AUTO'** is the default.

d). When the mode is **'STATIC/MANUAL'**, you can input any number to identify different machines.

e). By 'STATIC/MANUAL' mode, the computer can communicate with the controller in 1 second; and by 'AUTO' mode, it should pick the machine in approximately 10 seconds.

f). If there is a router between the computer and the controller, the computer will be able to liaise with the controller in 1 second whether the mode is 'AUTO' or 'STATIC/MANUAL'.

### 4.5.5   Screen Protect
Select SCREEN PROTECT by with the mouse and press **ENTER**:

```
YES    NO
```

Press ∧ ∨ to set parameters. Press **ENTER** to confirm. You have the option of pressing **ESC** to return to the supporting interface without activating the settings.

### 4.5.6    Language Options

Select LANGUAGE and press **ENTER**:

```
┌─────────────────────────────┐
│                             │
│          简体中文             │
│          繁体中文             │
│          ENGLISH            │
│                             │
└─────────────────────────────┘
```

Press ∧ ∨ to set parameters. Press **ENTER** to confirm. You have the option of pressing **ESC** to return to the supporting interface without activating the settings. The system will choose the language and return to the supporting interface automatically in 5 minutes if the button is not pressed to set a language.

### 4.5.7    Alarm Time

Select ALARM TIME by cursor and press **ENTER**:
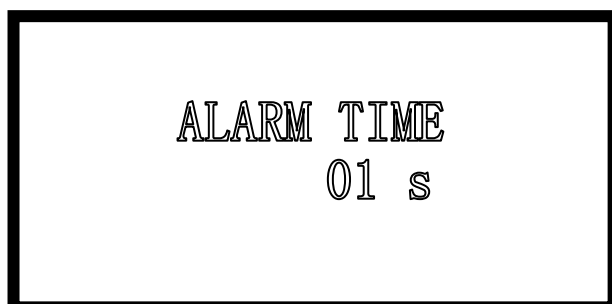
```
┌─────────────────────────────┐
│                             │
│        ALARM TIME           │
│           01 s              │
│                             │
└─────────────────────────────┘
```

Press ∧ ∨ to set parameters. Press **ENTER** to confirm. You have the option of pressing **ESC** to return to the supporting interface without activating the settings.

# 4.6 Error Alarm Interface

Should the system fail, **PAD\*\*** will display the error, alerting the user of the error immediately.

### 4.6.1    Soft Limit Error

```
┌─────────────────────────────┐
│                             │
│                             │
│         SOFT STOP           │
│                             │
│                             │
└─────────────────────────────┘
```
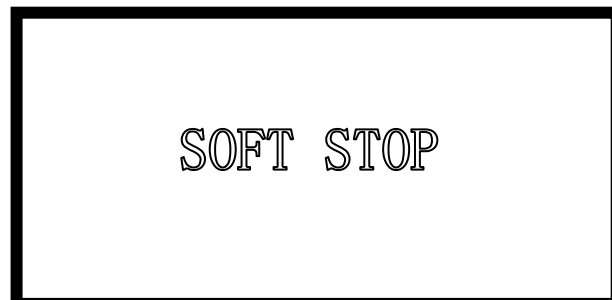
**Cause:** The system detected that the process data size **exceeds** the workplace range.
**Solution:** Move the laser head to the correct place and run again.

**4.6.2    Limit Switch Error**

```
┌─────────────────────────────┐
│                             │
│                             │
│        LIMIT STOP           │
│                             │
│                             │
└─────────────────────────────┘
```

**Cause:** The machine has not been reset and the user chose the **'Immediate Output'** mode.
**Solution:** Move the laser head to correct the place and run again.

**4.6.3    Memory Alarm**

```
┌─────────────────────────────┐
│                             │
│                             │
│       OUT OF MEMORY         │
│                             │
│                             │
└─────────────────────────────┘
```
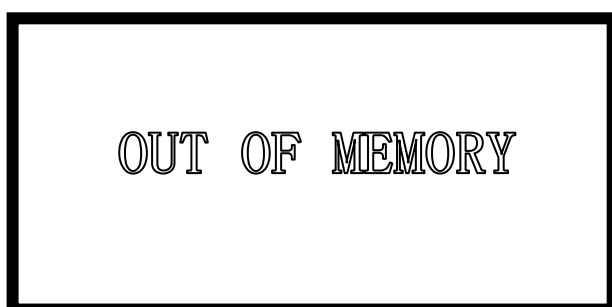
**Causes:**

1.    These are **more than 32 files** in the controller.
2.    All the files in the controller **EXCEED 128M.**

**Solution: Delete** some files **and re-download** the process file.

**4.6.4    Configuration doesn't Match the Firmware**

```
┌─────────────────────────────┐
│                             │
│      INVALID CONFIG FILE    │
│     RE-DOWNLOAD CONFIG      │
│            FILE             │
│                             │
└─────────────────────────────┘
```
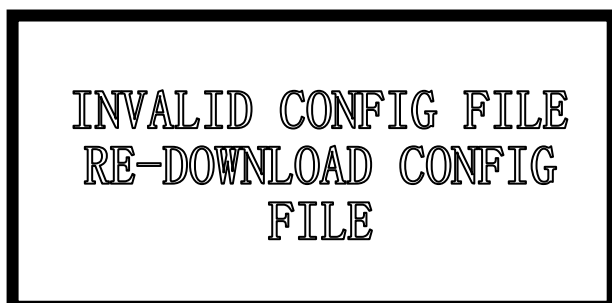
**Cause:** Process file or configuration file doesn't match with the firmware version.
**Solution:** Replace the DLL with the correct one matching with the firmware version, and download the configuration file.

### 4.6.5    Dll Version doesn't Match with the Firmware
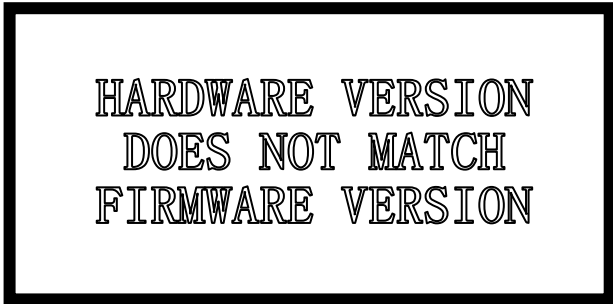
```
┌────────────────────────────────┐
│                                │
│         DLL VERSION            │
│       DOES NOT MATCH           │
│      FIRMWARE VERSION          │
│                                │
└────────────────────────────────┘
```

**Cause:** Incorrect DLL has been used in the software.
**Solution:** *Replace* with the correct DLL, **delete all** the files in controller, and *re-download* the process files.

### 4.6.6    Dll Version doesn't Match with the Firmware

```
┌────────────────────────────────┐
│                                │
│       HARDWARE VERSION         │
│       DOES NOT MATCH           │
│      FIRMWARE VERSION          │
│                                │
└────────────────────────────────┘
```

**Cause:** Incorrect firmware file (**\*.fmw**) has been downloaded to the controller.
**Solution:** Re-download a correct firmware file.

# 5  Appendixes

## 5.1  IP Set

There are **2 IP modes: AUTO** and **STATIC (MANUAL).** The default is 'AUTO'.

```
MACHINE ID    1
IP MODE      AUTO
IP SET
192.168.001.001
```

When the mode is on **'STATIC (MANUAL)',** you can input any number to identify different machines. When on 'STATIC (MANUAL)' mode, the computer will **instantly** communicate with the controller (in approximately 1 second). When on **'AUTO'** mode, it will take about **10 seconds** to communicate with the controller. If a **router** is connected to the system, the computer communicates with the controller in 1 second no irregardless of the mode.

## 5.2  Controlling Several Machines in One System

**IMPORTANT: \***One computer will control **ONE** machine at a time.\*

### 5.2.1 General Info

Both **NET** and **USB** modes are all supported. TruCUT Laser Software will acquire the machine ID and load the **CFG** (configuration) file automatically when the computer communicates with ONE machine at a time.

### 5.2.2 Setting machine ID

```
MACHINE ID    1
IP MODE      AUTO
IP SET
192.168.001.001
```

Setting the machine's ID is done in the supporting interface of the **PAD panel.** The TruCUT Laser Software will not allow the machine's ID to be duplicated.
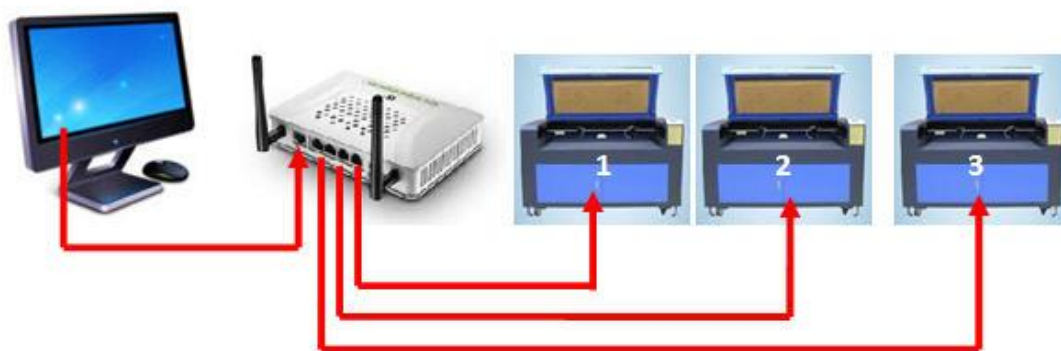
### 5.2.3 Machine setting

When TruCUT Laser Software acquires the machine's ID, a **CFG file** will be generated accordingly. Input your intended parameters and **SAVE.** Then download to the controller.

### 5.2.4 Downloading The Job File

It is the same as the single machine operation.

## 5.3 Controlling Several Machine in One Software (In this case, several machines are connected to the computer )

### 5.3.1 Wiring Diagram



When several machines are connected, **ONLY** the *NET Mode* is supported. The cable class is equal to or higher than the **Unshielded Twisted Pair (CAT5).**

### 5.3.2 Setting IP Mode

Set the IP mode as **AUTO** in the supporting interface of the PAD panel.



```
MACHINE ID    1
IP MODE      AUTO
IP SET
192.168.001.001
```

### 5.3.3 Setting Machine ID

Set the machine's ID in the supporting interface of the PAD panel. The TruCUT Laser Software will not allow the computer to have the machine's ID duplicated.

### 5.3.4 Identifying the Machine ID

Power the machines **ON** and run the TruCUT Laser Software. The software will acquire each machine's IP address automatically. The different ID numbers will be shown in the drop-down menu.

### 5.3.5 Machine Setting

Choose the machine ID you want to control, a CFG file will be generated accordingly. Input proper parameters and save, then download to the controller.
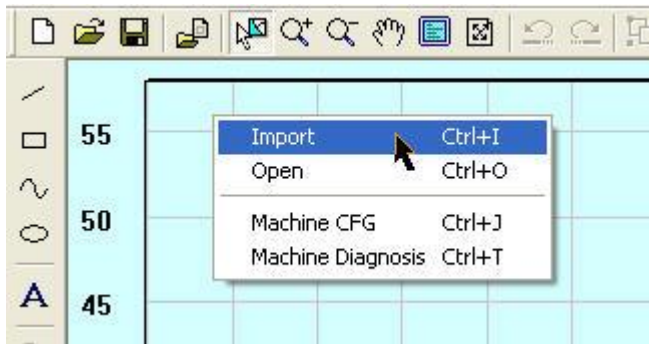
### 5.3.6 Choose Machine ID and Download Data

Before proceeding with **'DownLoad'**, you should select the machine's ID first.

# 5.4 Quick Operation

### 5.4.1    Click Right Button of Mouse

Clicking the **RIGHT** button of the mouse will enable and pop-up a **Quick Operation Box** showing three (3) dialogs as indicated below:



In the graph:
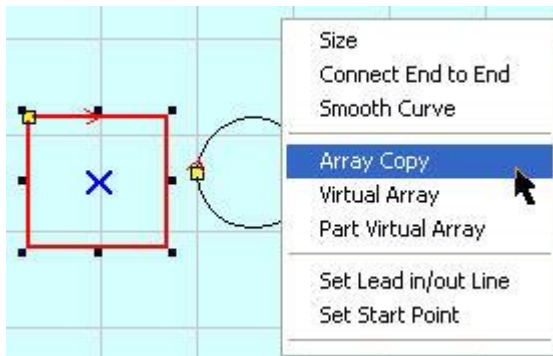


In the blank area when graph exists:
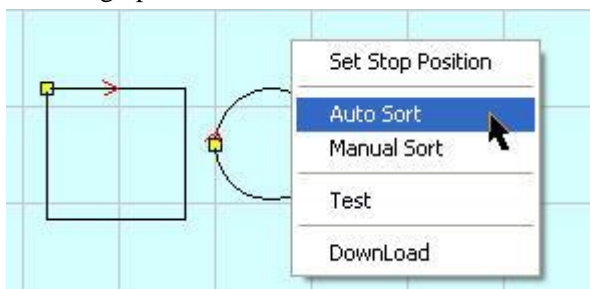


### 5.4.2    Ctrl+A

This is to **SELECT ALL** the graphs in the drawing area.

### 5.4.3    Ctrl+Y

This action will **MOVE** the selected graph to the center of the drawing area. Without selecting any graphics, the whole graph will be moved to the center of the drawing area.

# 5.5 Description of Auto Separation 2-Head Machine

### 5.5.1    Working condition

The TWO laser heads are **fixed** on ONE belt.

There are **2 laser heads** on the X-Axis and they are fixed on one belt.

### 5.5.2    Set the machine parameters

Set the Z-Axis as '2-Head' in the **'Axis CFG'**.

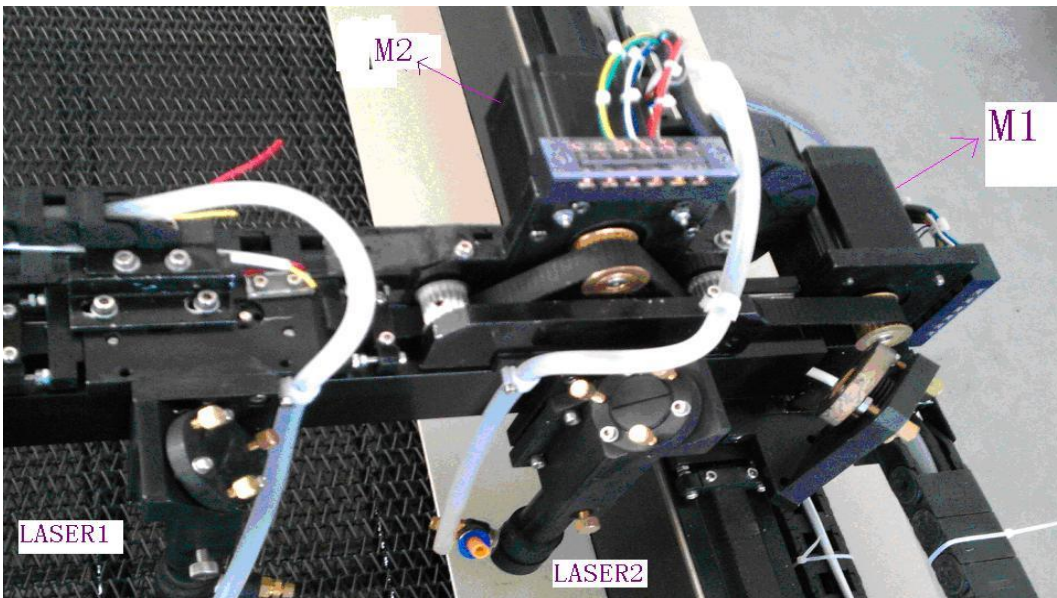| Z | |
|---|---|
| Enable | ☑ |
| ZAxisUserFor | 2-Head ▼ |
| Range | 2-Head |
| | Feed |
| One Pulse Move Distance | Z |
| Home/Datum Dir | N ▼ |

Set the **'Power Mode'** as **'Double Laser Analog'** in the **'Motion Card CFG'**.

| Signal CFG | |
|---|---|
| Home Limit IO Level | Low Level Effective ▼ |
| Laser Frequency | 20000 |
| Laser Power Control Mode | Double Laser Analog ▼ |
| Advance | Double Laser Analog |
| | Single Laser Analog |
| Auto Datum | PWM |

Set parameters about auto separation 2-head in **'Application CFG'.**

| Double Laser | |
|---|---|
| DbLaser Machine | ☑ |
| DbLaser Mode | Laser2 Left ▼ |
| DbLaser Min Space Length | 100.000 |
| DbLaserType | Auto |
| MoveLaserHeadSpeed | 200.000 |

a). **2-Head Mode**: Auxiliary head (Laser1) is the one controlled by the **motor (M2).** So *'Laser2 Left'* should be selected.

b). **The min Distance between 2 Head**: The distance between the two laser-heads after datum. The value should be measured accurately.

All changes will be effective after download is made to the controller.

### 5.5.3    Graph typeset operation

This function is only used for cutting *vector graphics.*

5.5.3.1    Select the **'Auto 2-Head'** mode

| Laser Off | Test | Frame Cut | Feed |
|---|---|---|---|

☑ Immediate    ☐ Selected    ☑ Auto2Head
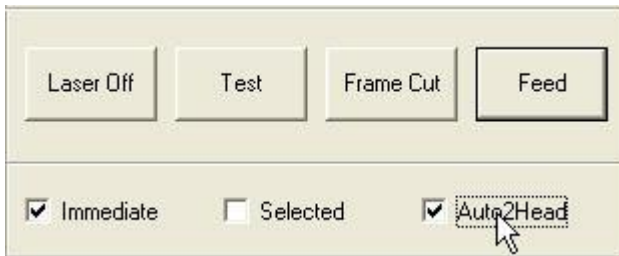
5.5.3.2    Import Data and Set Processing Parameters

Import data and set layers. Set the processing parameters of each layer.

| Output |
|---|

| Layer | Mode | | Output | Speed | Power |
|---|---|---|---|---|---|
| ⬛ | Cut | ▾ | ☑ | 150.00 | 50.00 |
| 🟦 | Cut | ▾ | ☑ | 150.00 | 50.00 |
| 🟥 | Cut | ▾ | ☑ | 150.00 | 50.00 |
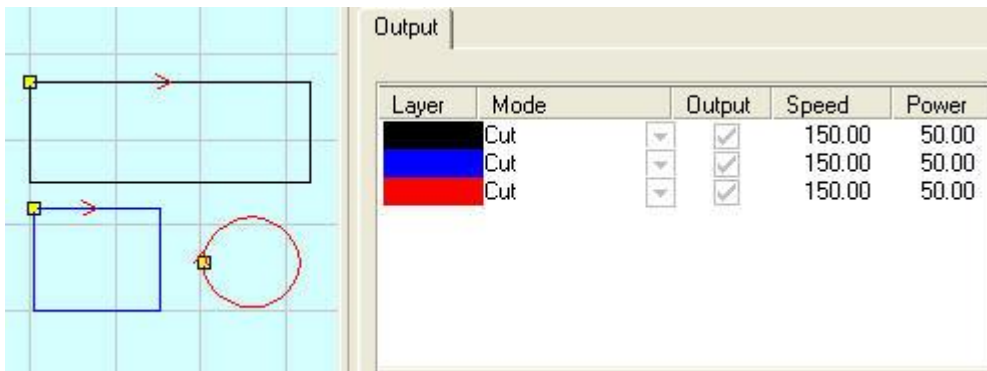
### 5.5.3.3 Group the graphics

Group the graph entities into one graphic unit.
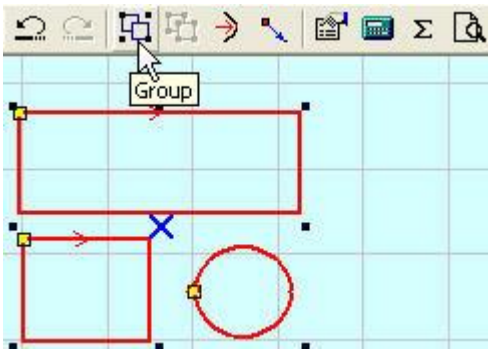


### 5.5.3.4 Virtual Array



Set virtual array parameters.

5.5.3.5    Download processing file

Download the processing file to the controller and start the processing.

## 5.6  Making AI File

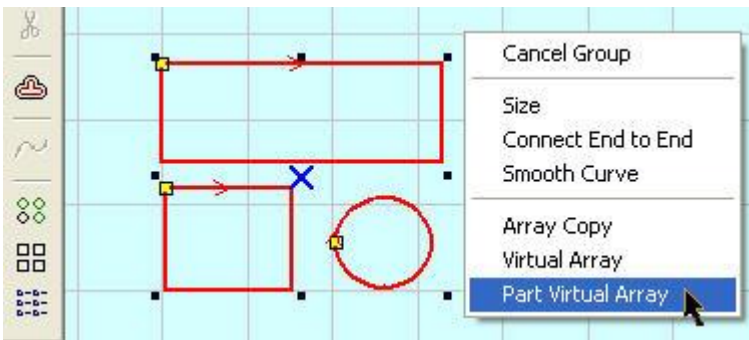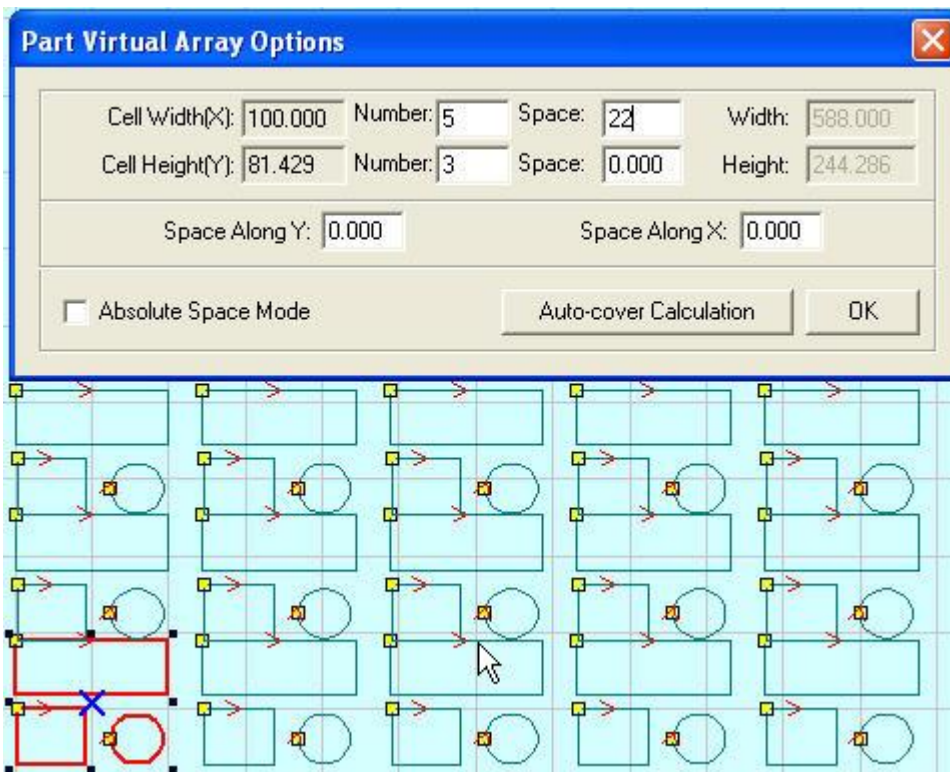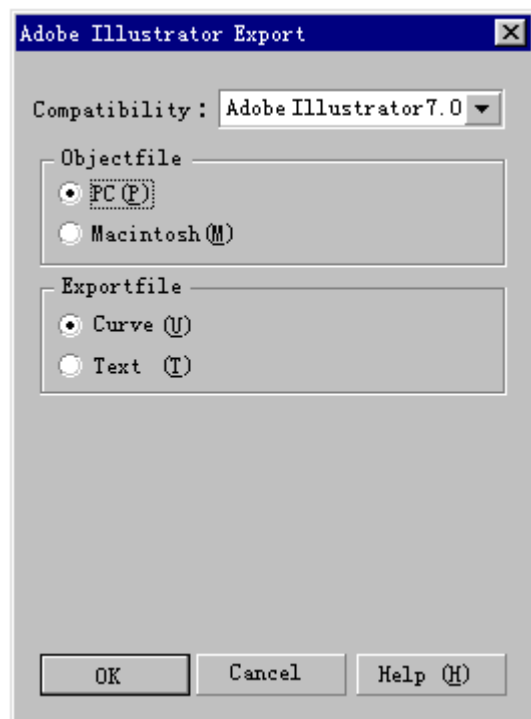Cutting the AI Format usually works smoother and makes less mechanical strikes. Advisably, make use of the **AI Format File** as much as possible, especially in the constant speed. Should there perhaps be some obvious strike when cutting at varied speeds, and the figure is distorted, **please change the file to PLT.**



## 5.7  Backlash Adjustment in Engraving

When engraving at **high speeds,** a possible **BURR.** Please see below.
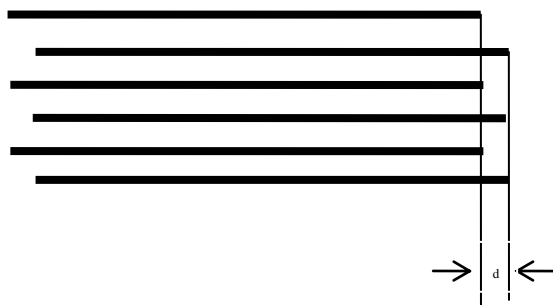


There is **Backlash Compensation** set in the *Engrave Set* of the **Machine CFG.** The backlash can be *negative* or *positive* value. Change the engrave step to *2mm, backlash 1mm,* and *start processing.* If **d** increases, change it to a *negative* value; if **d** decreases, *increase* the number. Gradually **d** will near *0* after several adjustments. The value of the Backlash Compensation *differs* from different speed; you should set it according to different speed ranges.

## 5.8 Frequently Asked Questions

### 5.8.1    Processing file can't be download to the controller

The memory block of the controller might be damaged and it should be formatted.



### 5.8.2    PLT figure can't be engraved

The graph is unclosed or overlapped. Please use the **'Check Data'** tool to check if there are such occasions.

### 5.8.3    Size of the output of engrave/Cut is not the same with the graphics

Please adjust the **'Pulse Unit'**.

### 5.8.4    When engraving, the edge is not in order

It is mainly caused by the backlash. You can adjust it like this:

a). Draw a **rectangle,** set the 0.5mm in **'Laser Engrave'** and **'Engrave Step'**. Theoretically, the engrave result will be okay, that is, edges of the odd lines will be in order and edges of the even lines will be in order. But odd lines and even lines **MAY NOT** be in order.

b). Open **'Set Engrave Options'.** There are different processing parameters for different speed ranges. But set values in the **'Backlash'** are all **0** (zero). You can set the value according to the actual situation, both negative and positive.

c). If you require a better engrave result, choose one direction laser on. Un-ticking/un-marking the **'Bi-Dir'** will do. But this will decrease the process efficiency.

### 5.8.5    Axis doesn't move (TRUCUT CONTROL MOTHERBOARD)

A). Set direct voltage **5V by a multimeter.** Measure the voltage between *PUL* and *GND*. An example with the **Y-AXIS:** Press **up** or **down** button. The normal value is about **2.8V.** If it is not, the controller is damaged. **Please change the controller.** If the normal value is **2.8V**, step on.

b). Change the **OUTPUT TERMINALS** of the two drivers, and press **up** or **down** button. If X-axis is right, then the Y-axis motor is *damaged.* **Please replace Y-axis motor.** If X-axis does not move, then Y-axis driver is damaged. Please replace Y-axis driver.

### 5.8.6    Axis can only move to one direction (TRUCUT CONTROL MOTHERBOARD)

Set direct voltage **5V by a multimeter.** Measure the voltage between *DIR* and *GND*. An example with the **X-AXIS**: Press the **left** button, followed by the **right** one, to see if there are changes in the voltage **(higher than 2.8V** or **lower than 0.8V).** If not, the controller is damaged. **Please replace it.** If there are changes in the voltage, check if the driver is okay.

### 5.8.7    Laser always off (TRUCUT CONTROL MOTHERBOARD)

a). Set direct voltage **5V by a multimeter.** Test the voltage between *LAS* and *GND*. Press **'Laser'** on the control panel to see if there are changes in the voltage **(higher than 2.8V** or **lower than 0.8V).** If there is no change whatsoever, the

controller is damaged, **please replace it.**

b). Moreover, set **0ms** in the **'Time'** of the laser in the *control panel PAD* (laser time after you stop pressing the laser **ON** button). Adjust the **power (0%~100%).** Press **'Enter'** and press the **'Laser'** button. Measure the voltage change between *DA* and *GND.* It should vary between **0~5V.** If there is no change, that can only mean one thing: **the controller is damaged. Please replace it.**

c). If the controller is okay, the **laser power supply is damaged. Please replace it.**