

# **THUNDER LASER SYSTEMS LaserGRAV**



## **USER'S MANUAL**

**Version 2.1**

[www.thunderlaser.com](http://www.thunderlaser.com)

[tech@thunderlaser.com](mailto:tech@thunderlaser.com)

The operation mode and settings may differ due to upgrades of software.

Any differences are subject to the software

# Contents

Chapter 1 - Introduction.....	3
Chapter 2 - Install USB Driver and Software.....	4
Chapter 3 - Settings of LaserGRAV .....	9
Main Window .....	9
System Settings.....	10
Open and Save File .....	12
Import and Export File.....	14
Tools for Drawing and Editing .....	16
Select Object .....	19
Edit Object .....	20
Advanced Tools .....	23
Default Parameters.....	30
Chapter 4 - Laser Process Settings .....	31
Relative Position .....	31
Array Mirror Image .....	32
BIOS Settings .....	34
Extra Settings.....	38
Rotary Axis .....	40
Save/Load System Settings .....	41
Control Panel .....	42
Machine Control .....	47
Chapter 5 - CorelDRAW Plug-in.....	55
Chapter 6 - AutoCAD Plug-in .....	61

# Chapter 1 - Introduction

## How to Use This User's Manual

Thank you for purchasing a Thunder laser system. Your Thunder Laser system has been designed to be easy to operate, but you will utilize it to its fullest potential by taking some time to read this user's manual prior to use. You will be ready to use the Thunder laser system as soon as you read this manual.

## Software Versions

- ✧ LaserGRAV
- ✧ CorelDraw Plug-in
- ✧ AutoCAD Plug-in

## Supported Formats

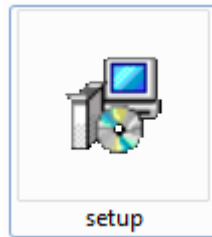
- ✧ Vector format: dxf, ai, plt, dst, dsb etc.
- ✧ Bitmap format: JPG,PNG,BMP, GIF,MNG,TIF,TGA,PCX,JP2,JPC,PGX,RAS,PNM,SKA,RAW

## Suggested PC System and Software

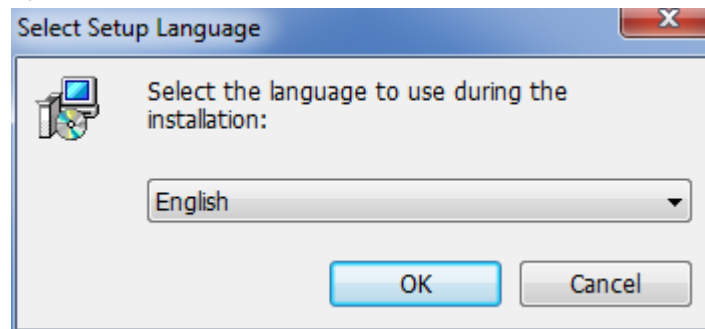
- ✧ Above PIII or PIV recommended
- ✧ Memory, above 1G recommended
- ✧ Windows2000/XP/VISTA/WIN7
- ✧ CoreDrawX1-X5 and AutoCad 2004-2012, and other Cad software

## Chapter 2 - Install USB Driver and Software

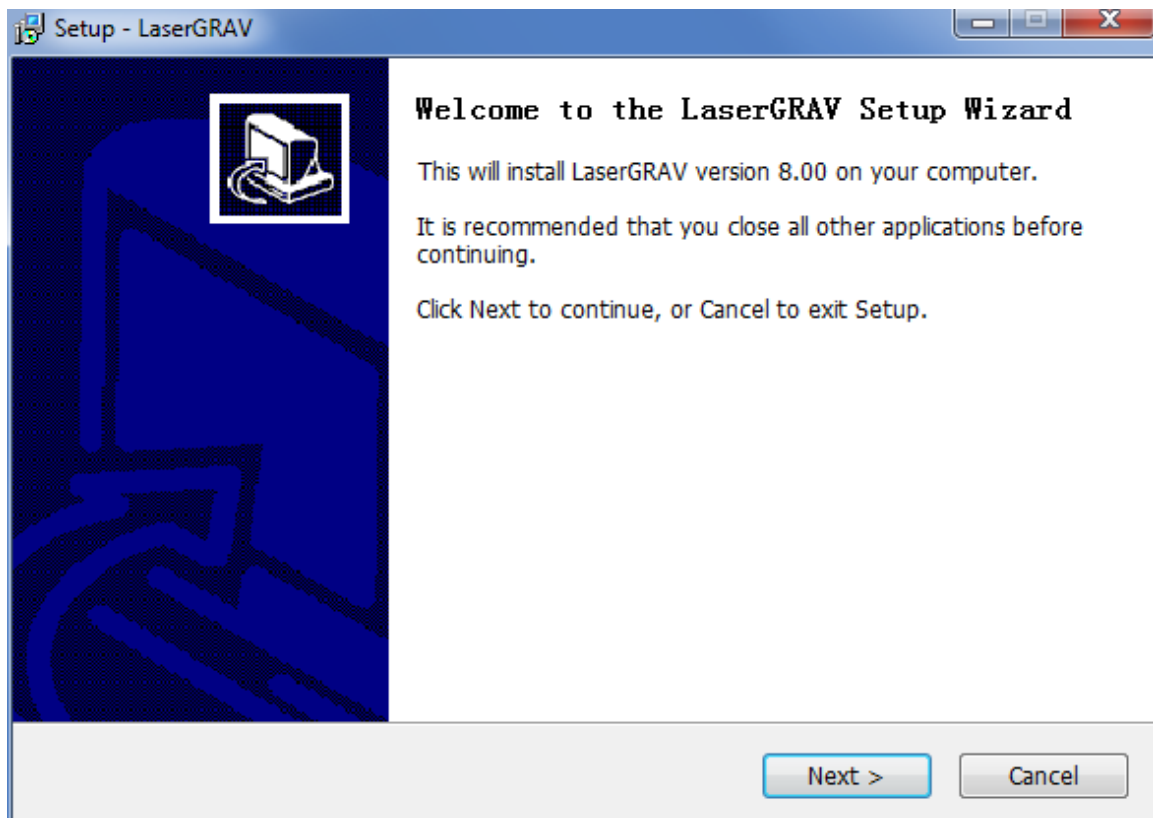
Insert the Thunder Laser software DVD. Open the file named "LaserGRAV" and then double click "Setup.exe"



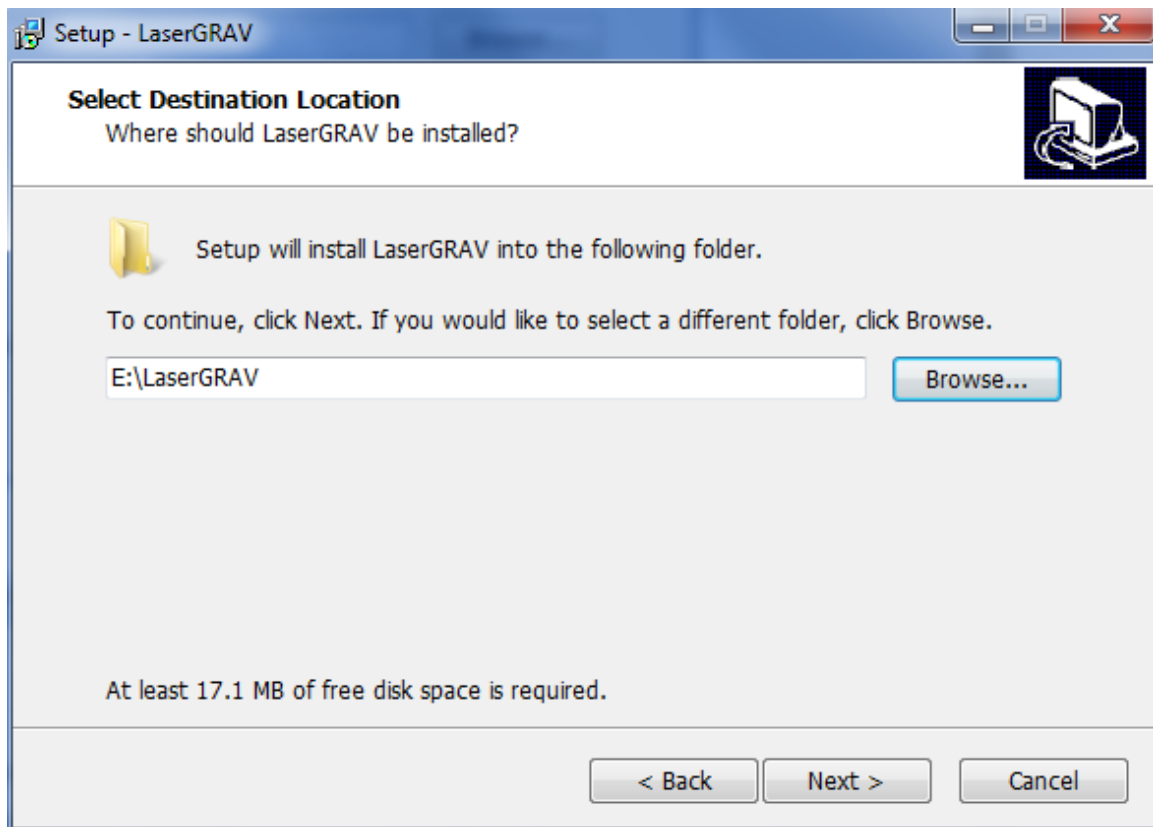
Select the installing language:



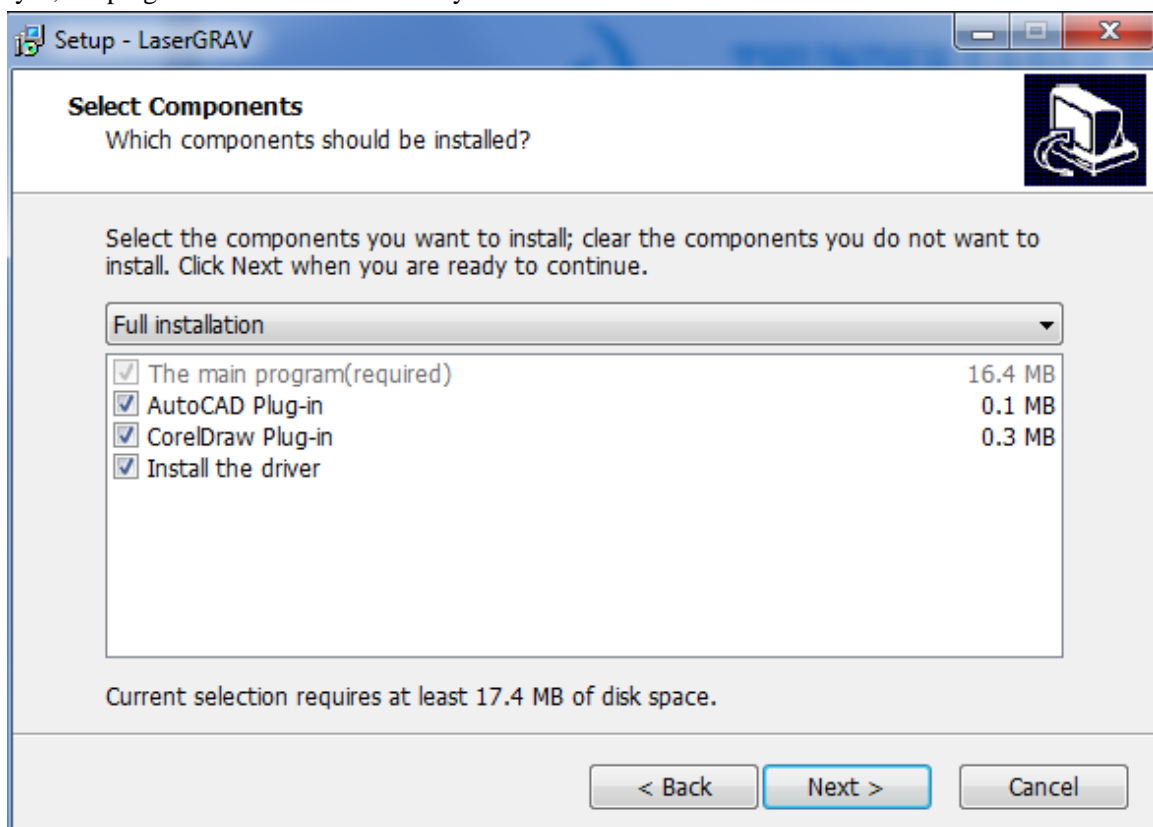
Now Click Next to continue.



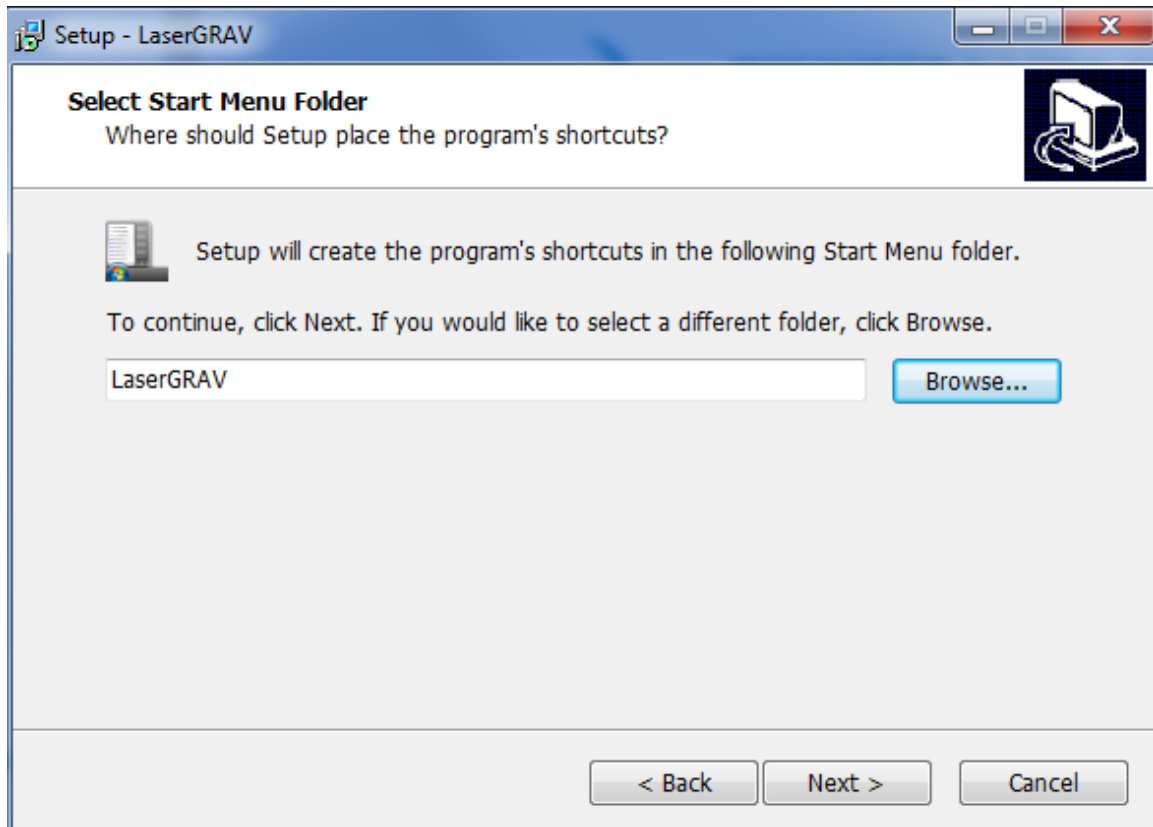
## Set the Installation Path



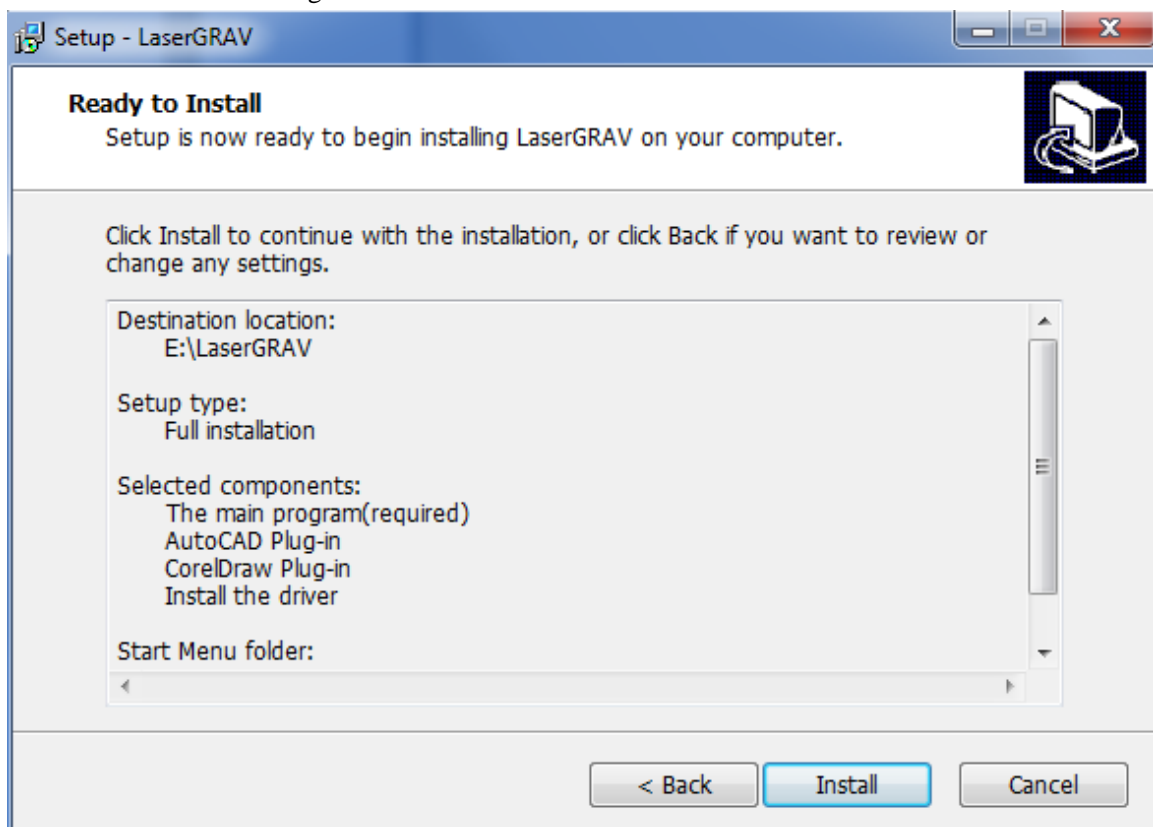
User can select Full installation directly. The software will detect if you have AutoCAD and CorelDraw in your PC. If yes, the plug-in will be installed directly.



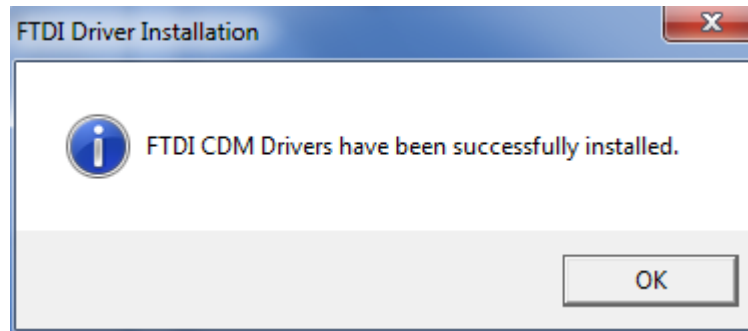
Choose where to put the shortcut and then click Next



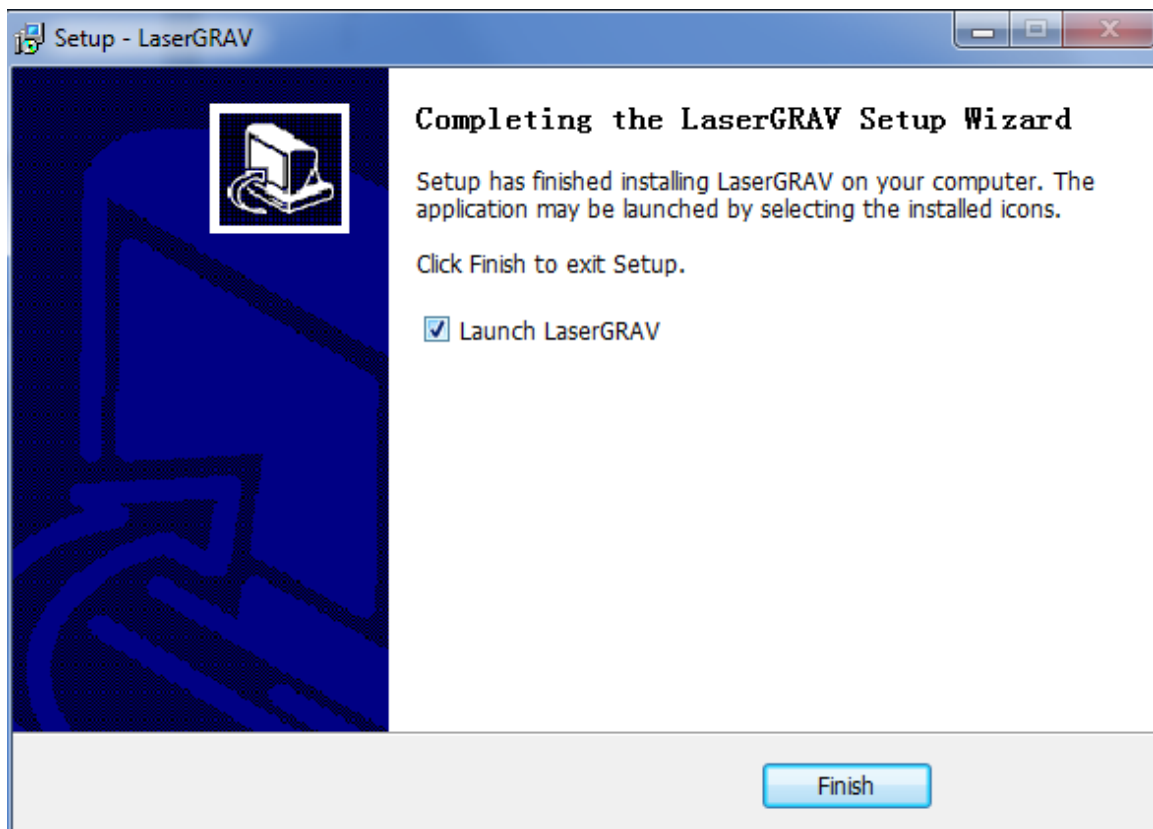
Click Install to continue installing



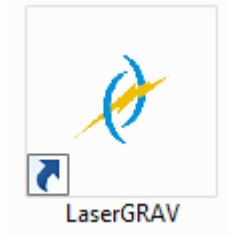
The below information means the USB driver is installed successfully



Choose if to launch the software and then click Finish







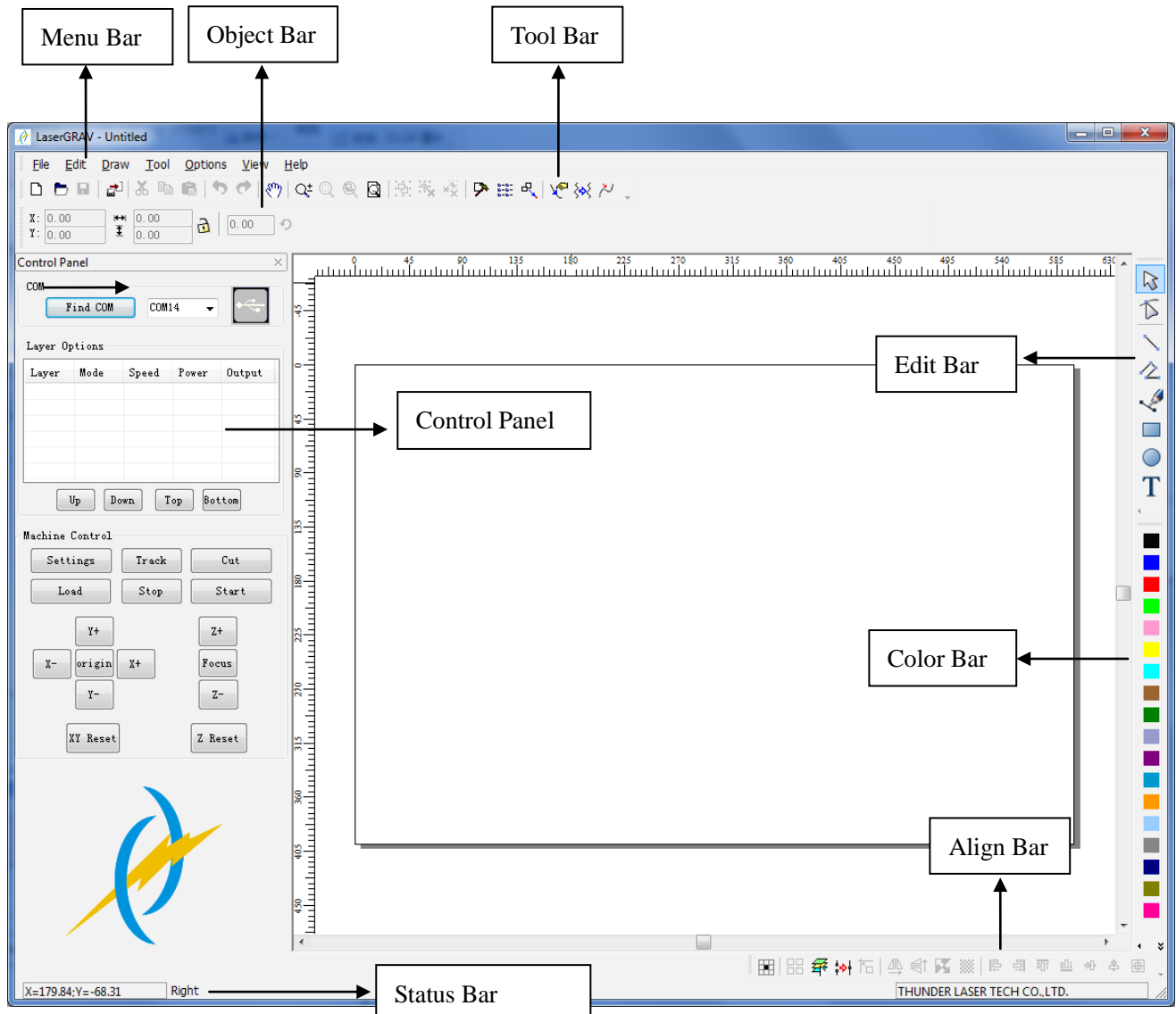
Click the icon to start the software, a welcome page will show up:



# Chapter 3 - Settings of LaserGRAV

## Main Window

Most job is done in the main window. It is suggested to read this section carefully before using the software.



**Menu Bar:** the major functions of the software will be achieved by the following orders:

File, Edit, Draw, Tool, Options, View and Help.

**Tool Bar:** Some frequently used tools.

**Object Bar:** adjust the selected objects.

**Edit Bar:** editing tools used to draw lines, circle, square and adding text etc.

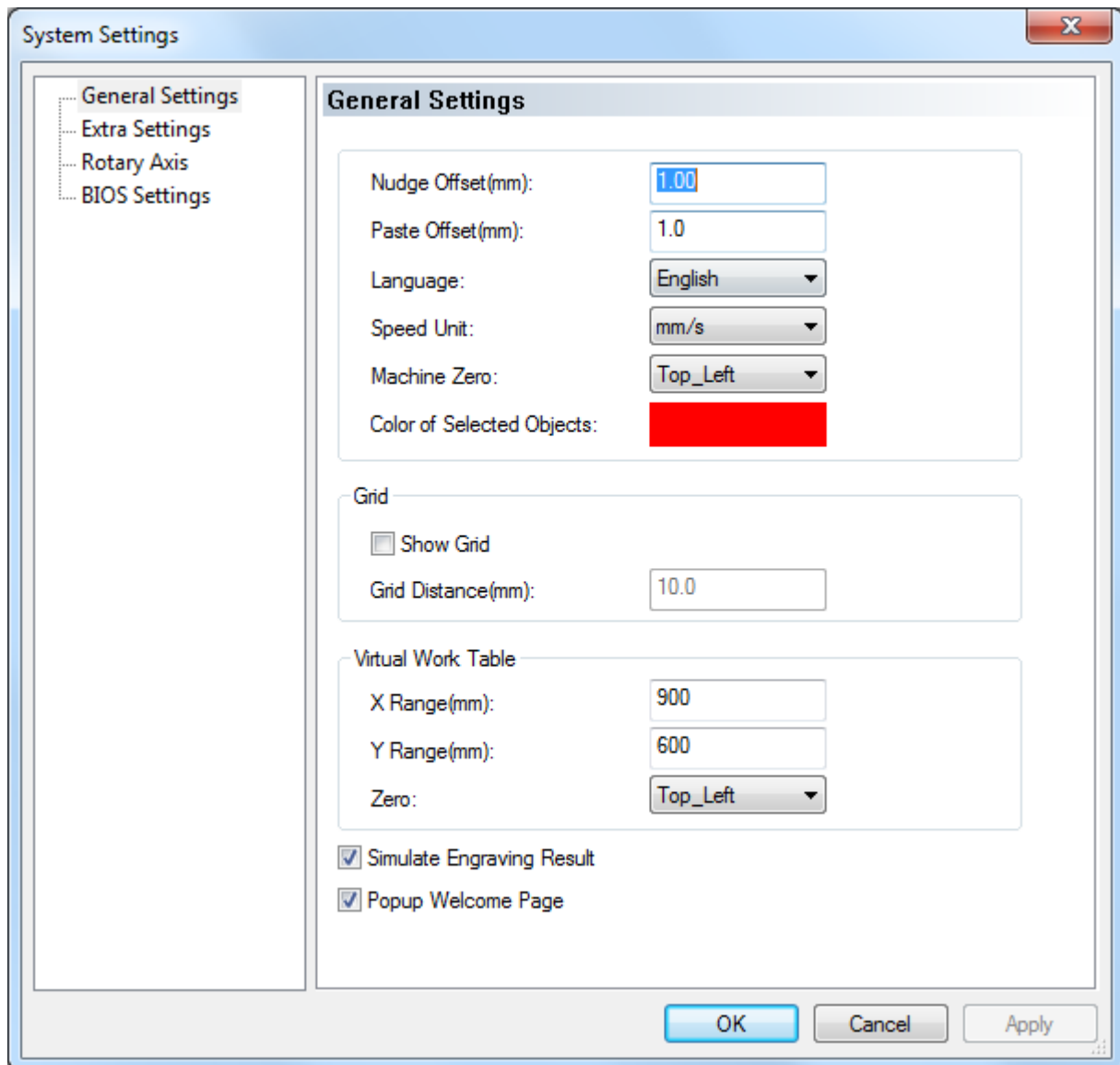
**Align Bar:** tools used to align multiple objects.

**Color Bar:** change the color of the selected objects.

**Control Panel:** set the cutting speed and power and other important settings for the job.

## System Settings

Click options/system options or click , the following dialog will pop up



**Nudge Offset:** moving distance of the selected object when press arrow“←”, “→”, “↑”, “↓”

**Paste Offset:** shift distance of the pasted object.

**Language:** change into other languages.

**Speed Unit:** set the velocity unit used in the software.

**Machine Zero:** zero point of the machine(limit point) must be correct, or you will have reverse engraving.

**Color of Selected Objects:** border color of the selected object.

**X Range:** set the X Range of the Virtual Work Table, the default size is the same as the X-axis Range.

**Y Range:** set the Y Range of the Virtual Work Table, the default size is the same as the Y-axis Range.

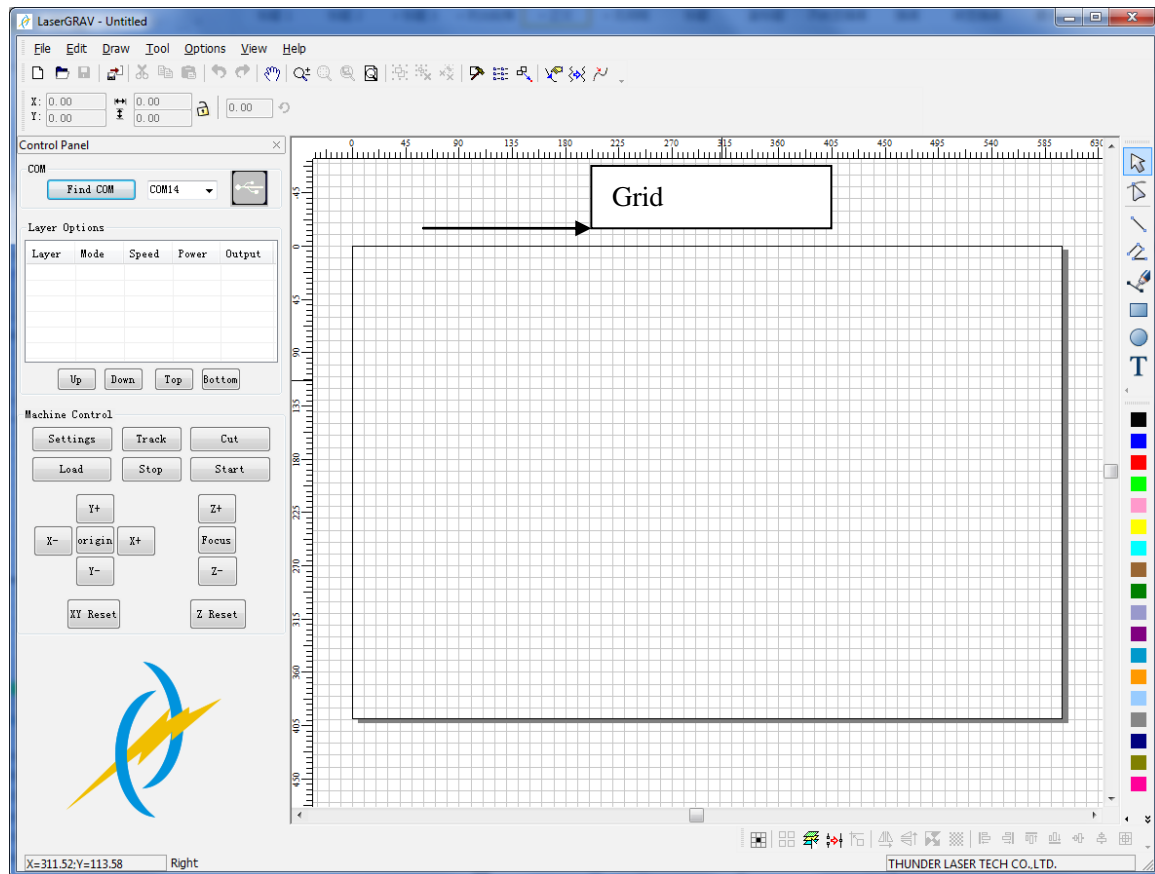
**Zero:** set the zero point of the Virtual Work Table, the default setting is the same as the machine's zero point.

**Simulate Engraving Result:** showing the final engraving result of the image.

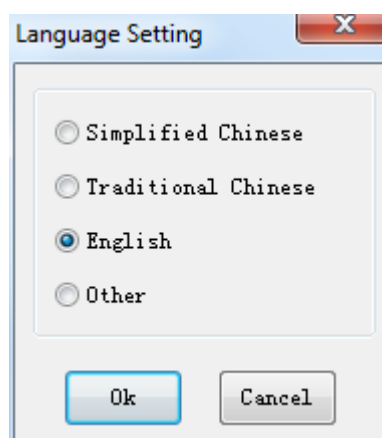
**Popup Welcome Page:** Always show the welcome screen when launching the software.

**Grid Distance:** set the size of the grid you need.

**Show Grid:** tick “show grid”, the work area will be filled with grid as showed below:




**Language Setting:** click Help/Language Settings to change the language directly.  
there're four selections, the third one is English.

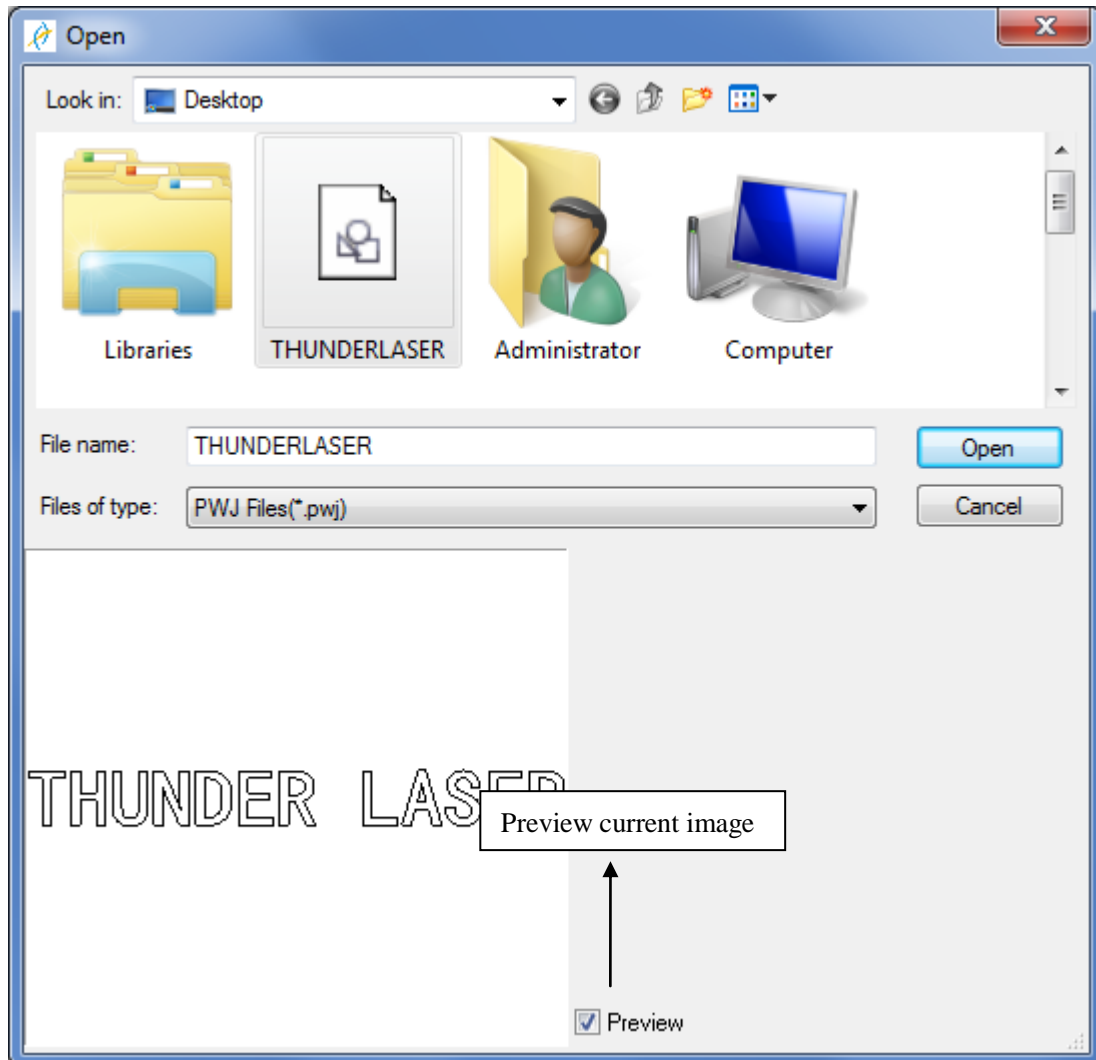



## Open and Save File

All the information,including parameters of the layers and orders will be saved in the pwj file.

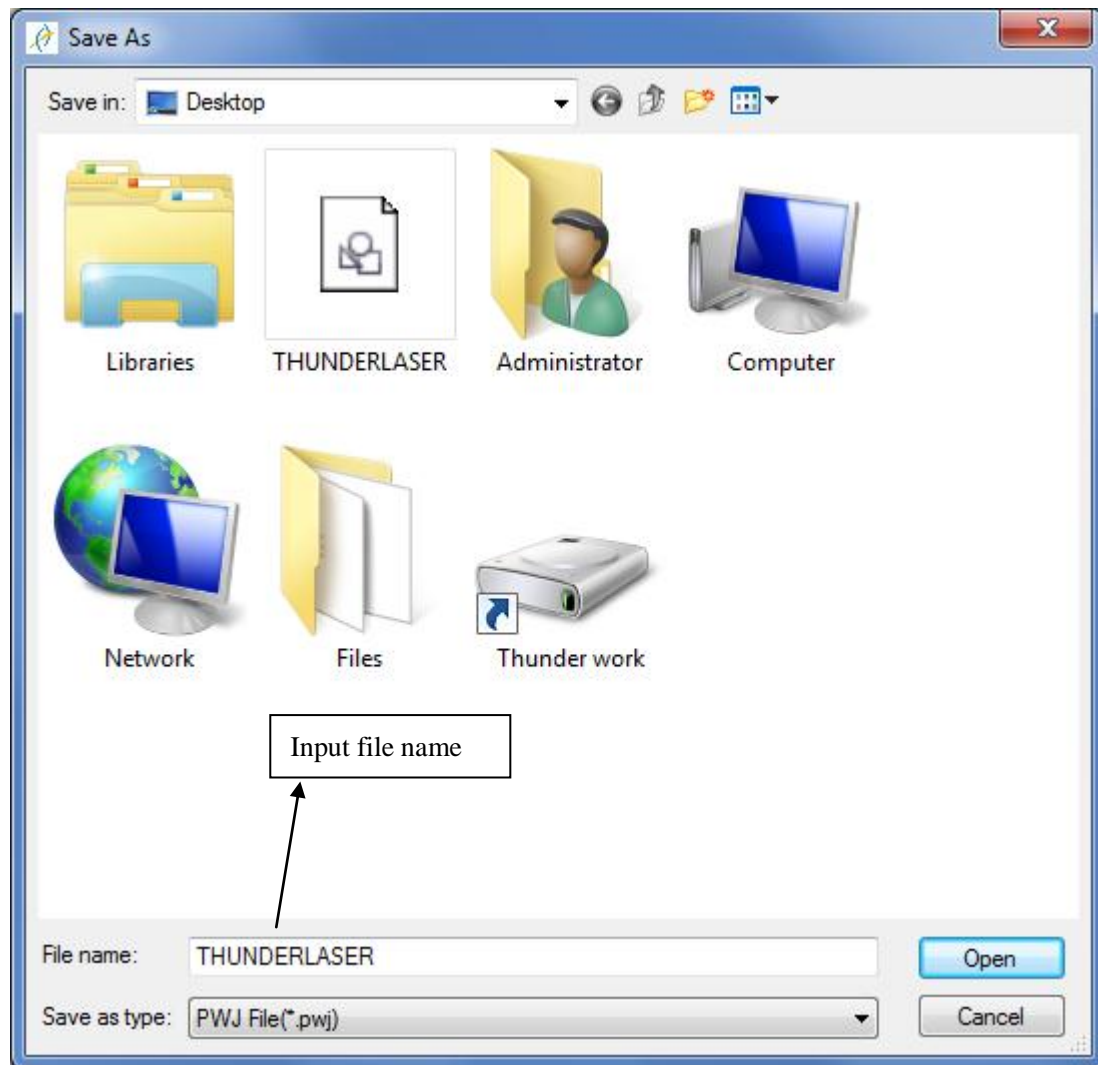
Click File/Open or click , the following dialog will pop up:

Select the file you want to open(ex:THUNDERLASER.pwj)and click open.




Click , the following dialog will pop up:

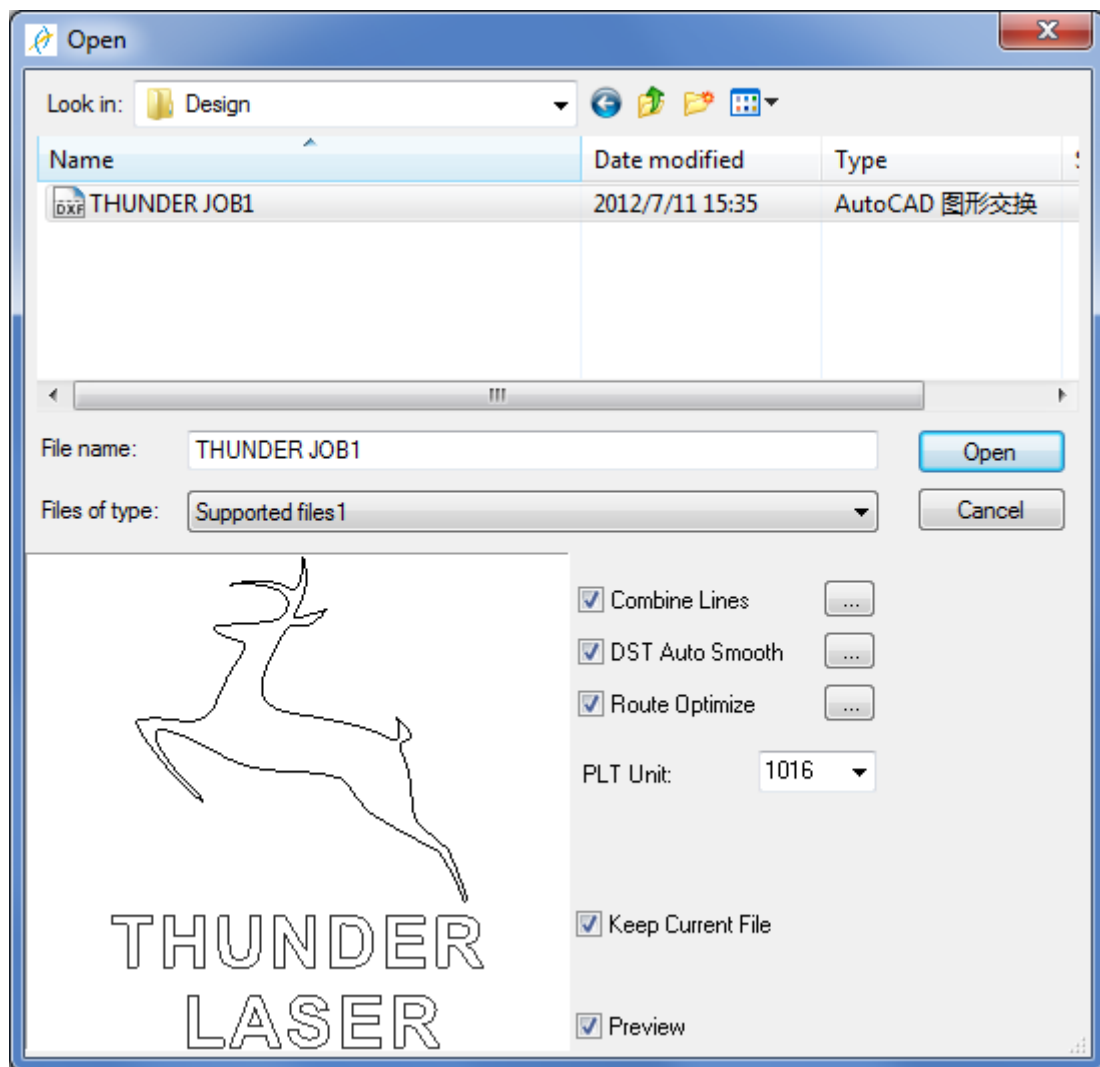
Input the file name in the edit box and then click save.




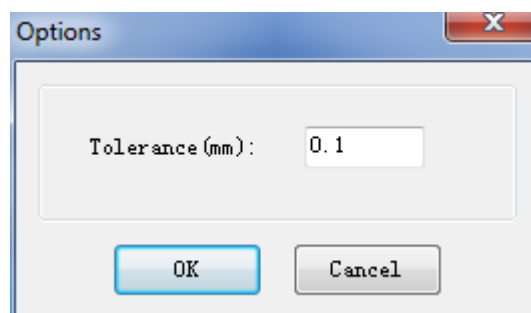
## Import and Export File

The software use pwj format to save files, therefore when you need to use other formats, you have to use import function. The supported formats are: dxf, ai, plt, dst, dsb, JPG,PNG,BMP, GIF,MNG,TIF,TGA,PCX, JP2,JPC,PGX,RAS,PNM,SKA,RAW etc. And you can also export files as plt format.

Click File/import or click , the following dialog will pop up. select the object and click open.



**Combine Lines:**when importing graphs, the software will combine the adjacent lines as one. You can click  to set tolerance as the following picture:



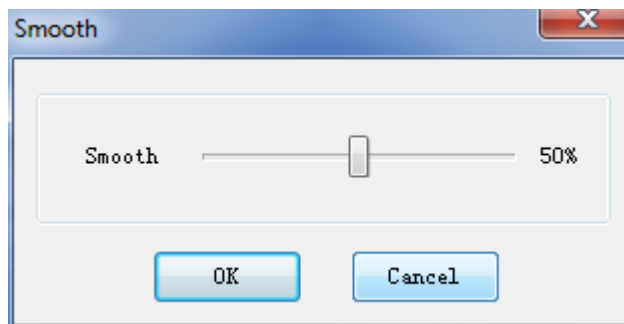
**Tolerance:** when the distance between adjacent lines is less than the combination tolerance, the lines will be combined as one.

**PLT Unit:** length unit, the size of the imported graphs will be differ according to the setting of the PLT unit.


**Keep Current File:** reserve the current document data, when you import another file, the former file will be reserved.

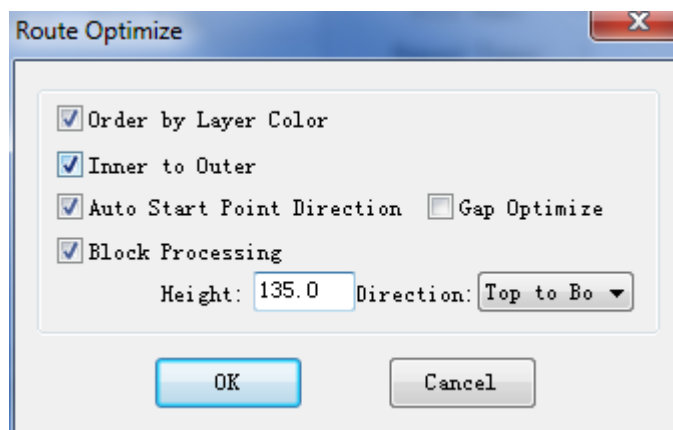
**Preview:** preview the file you select.

**DST Auto Smooth:** when impoting DST/DSB formats, the graphic data will be optimize (smooth the graphs to make the laser work more smooth)



**Smooth:** set the smoothness of the graphs, the smoother the graph is, and the more anamorphic it will be.

**Route Optimize:** arrange graphs orderly when importing files (thus the laser will work orderly). click  to set the rules of arrangement as the following picture.



**Order by Layer Color:** layers of the same color will be lasered in succession (the machine will first process layer of the same color and then process another color)

**Inner to Outer:** the laser machine will cut from Inner to Outer.


**Auto Start Point Direction:** the machine will set the starting point and direction for the target graphs automatically.

**Block Processing:** the laser machine will process the whole job block by block. (Height is the height of each block. Direction is the processing direction)



## Tools for Drawing and Editing

### Draw a line

Click menu or click  in the edit tool bar, now you can draw lines in the work Area. If you press “ctrl”, you can draw straight line.

### Draw polyline

Click polyline in draw menu or  in edit tool bar to draw polyline.

### Draw Bezier

Click Bezier in draw menu or  in edit tool bar to draw bezier.


### Draw Rectangle

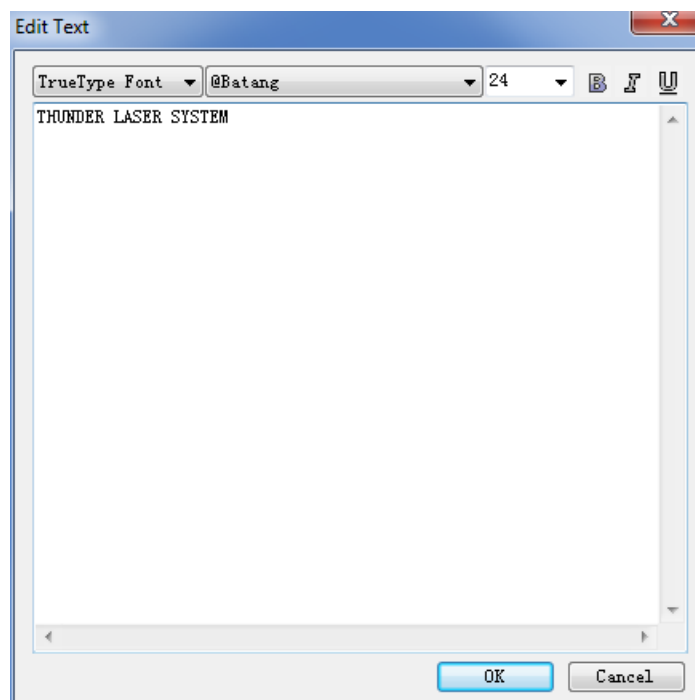
Click Rectangle in draw menu or  in edit tool bar to draw Rectangle. Press “Ctrl” to draw square.

### Draw Ellipse

Click ellipse in draw menu or  in edit tool bar to draw ellipse. Press “Ctrl” to draw circle.

### Edit text

Click text in draw menu or  in edit tool bar, and then double left click the mouse, the following dialog will pop up



Choose font and choose the size of the character and then input the text then click ok.

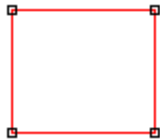
## Edit Node

Click edit node in draw menu or click , these buttons  (add node)  (delete node)  (connect node)

 (separate node) in the edit object bar will be activated.

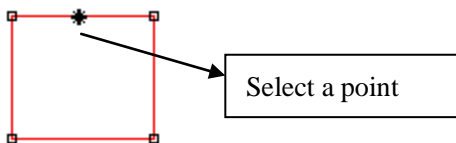
## Select Object

Click object to select it. The "□" is the node of the selected object. A selected rectangle is as below:

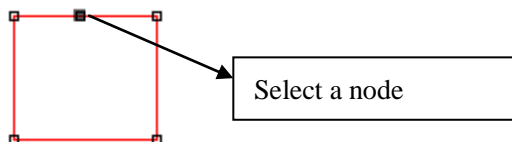


## Point in the selected object

Click the line of the selected object to edit a point "✱"



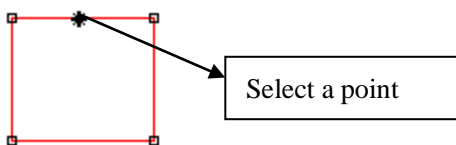
Click the node "■" of the selected object as below




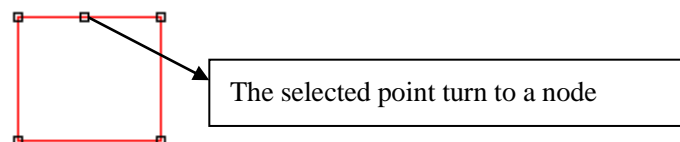
PS:press "shift" to select more than one node.

## Add Node

Select a point as below:

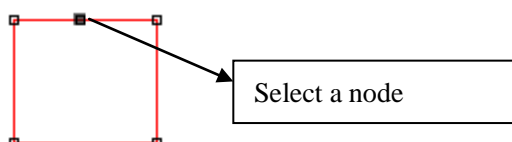



Then click add node in edit menu or click  in edit object bar to add a node as below:

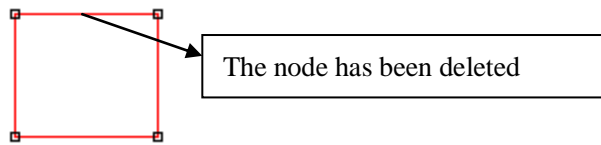


## Delete Node

Select a node as below:

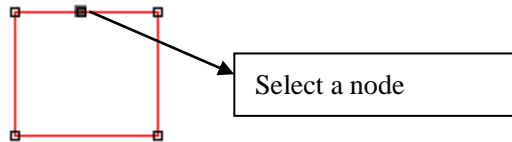



Then click delete node or  in the edit object bar to delete a node as below:

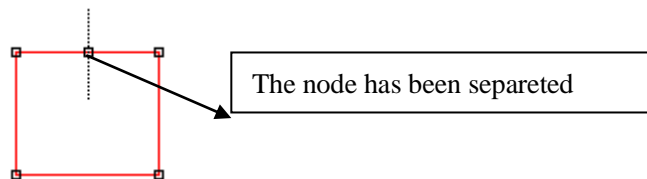


### Separate Node

Select a node as below:




Then click separate node or  in the edit object bar to separate a node as below:

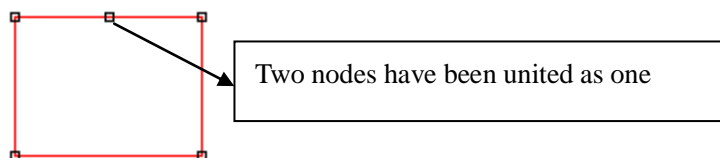


### Unite Node

Select two node as below:




Then click unite node or  in the edit object bar to unite two node as below:



## Select Object

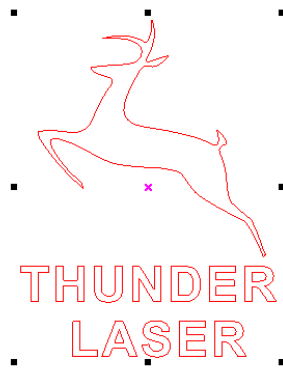
When the object is selected, there is a "x" in the center of it and 8 control points in the corner and the color of it's frame will turn to the default color.

Click select in draw menu or  to switch to select mode. Below are five ways to select an object:

Click select all in edit menu or "Ctrl+A" to select all objects.

Click mouse to select a single object

Click the object as below:




**Select multiple objects:** press mouse and draw a rectangle to select multiple objects.

**Add selected objects/reduce selected objects:**

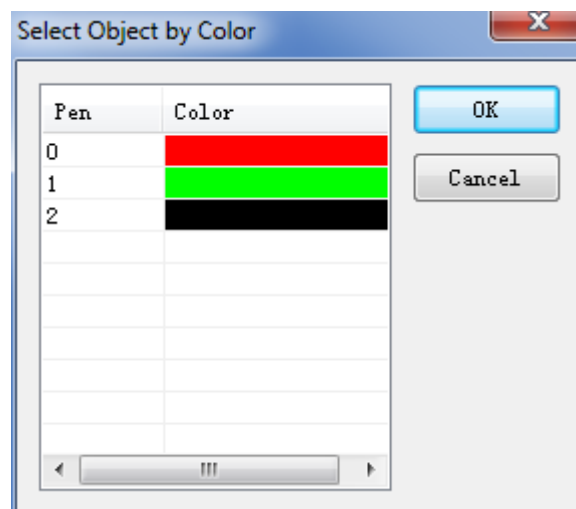
**Add:** select an object and then press shift and hold it down and then click other objects to select more.

**Reduce:** press shift and hold it down and then click an object to release it

**Select an object by color of the layer:**

Click  in edit object bar and a dialog will pop up as below:

Select the color and then click ok, all objects of the same color will be selected.



## Color of an Object

Select an object and then choose of the below color to change the color of an object.





## Edit Object

This will only change an object's position,direction,size and quality.

### Flip



Flip an object horizontally or vertically

Click  in edit object bar to flip an object horizontally

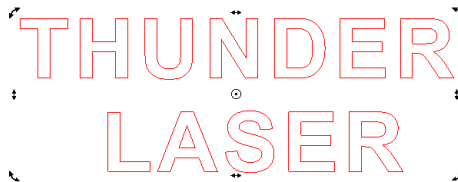
Click  in edit object bar to flip an object vertically

### Rotate an Object

There are two ways to use this function:

use   in edit object bar, input the number and then click  to rotate the object.

double click an object and the object will be as below:

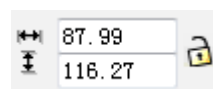


Move the mouse to the arrows and draw the object to the destination as below:



Move the right place and release mouse.

### Change the Size of an Object




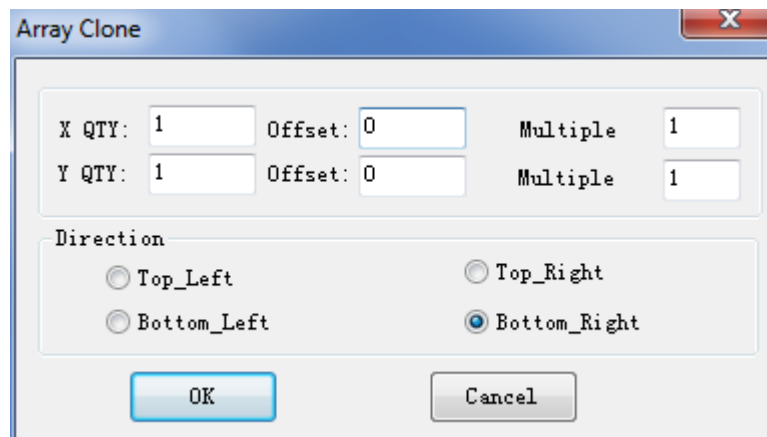
You can drag an object directly to change the size or you can click

in edit object bar and input the size of the object and then press Enter.

When the lock is ticked, the size of the object will be changed in equal proportion.

## Array Clone

Select an object and then click  in manage object bar, a dialog will show as below:



**QTY:** number of objects you like to clone.


**Offset:** distance between the original object and the clone object.

**Multiple:** distance between each clone objects will be enlarge by times.

**Direction:** relative position of the clone objects.

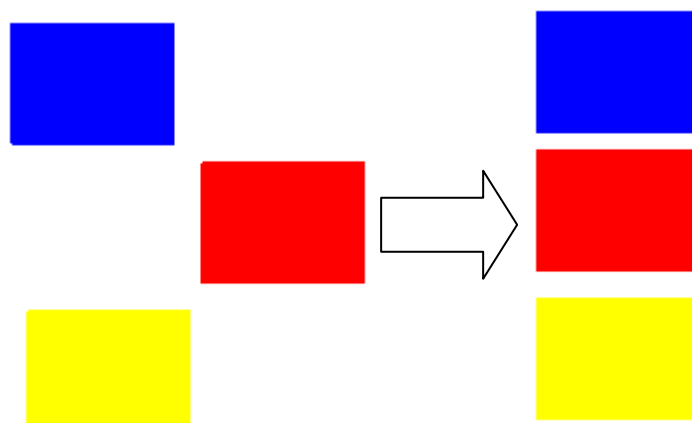
Input the number you need and click ok.

## Move an Object to Original Position

Select an object and click  to move the object to original position.


## Align Objects

Select multiple objects and click  to align the objects as below:





## Group Objects


User can group multiple objects as one object as below:  
select the objects


click  in tool bar to group the objects


now objects of the same group will move together.


PS: you can ungroup objects and then group with other objects again by using  or .

## Zoom In and Zoom Out

Click  in tool bar and right click mouse to zoom out or left click mouse to zoom in.

Click  to view the whole object.

Click  to view all objects.

Click  to view the whole page.

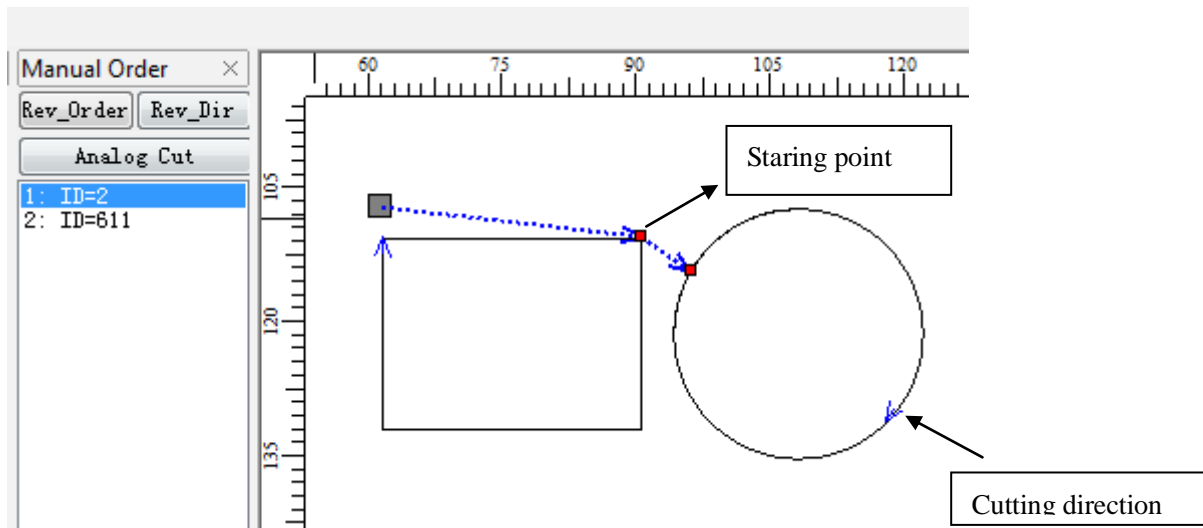
Rolling the scroll wheel of the mouse allows you to zoom in or zoom out.

## Advanced Tools

Below are some useful tools to make your work more convenient.

### Manual order

User can arrange the cutting order of an object by using this function. Click manual order in tool menu as below:



### Change the cutting order

Drag the item in the order list to change the cutting orders.

Click Rev\_Order to reverse the order.

### Change the starting point of cutting

The starting point is showed as "■". You can click the object to change the starting point.

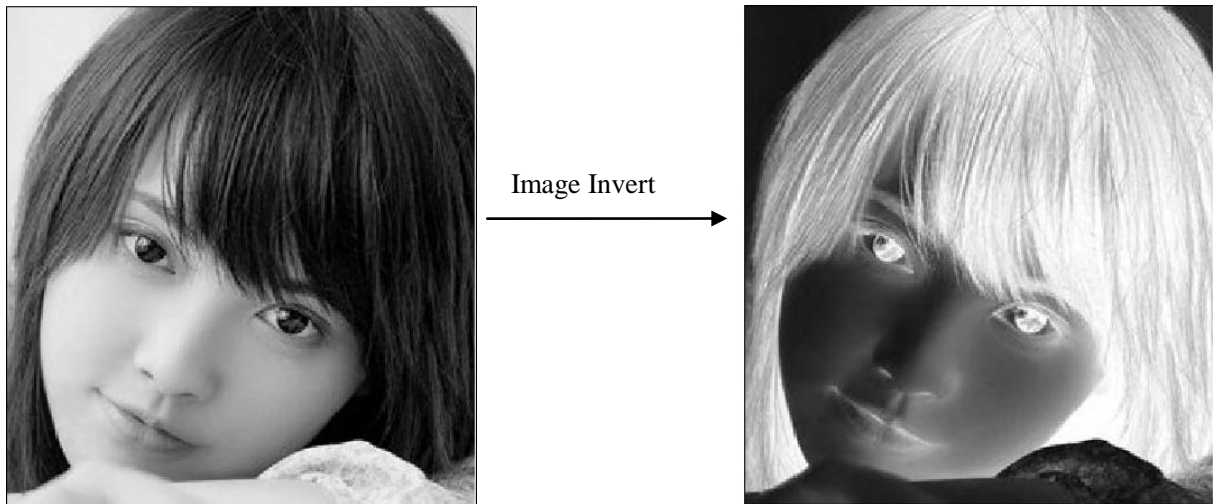
### Change the cutting direction

The cutting direction is showed as "↩". User can click Rev\_Dir to change the direction.




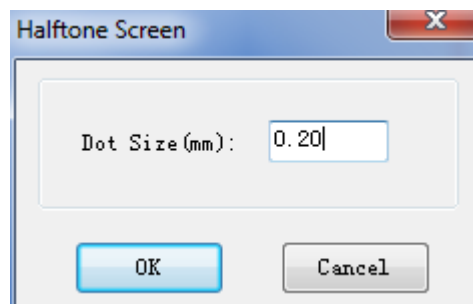
## Image invert

Select the image and then click  in Align Bar to invert the image:

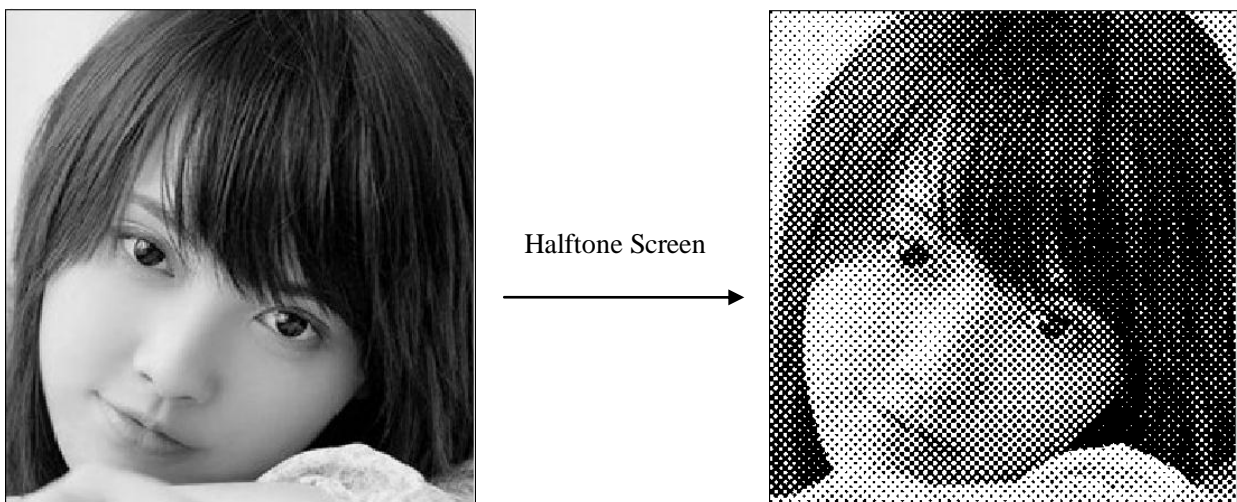


## Halftone Screen

Select the image and then click  in Align Bar and a dialog will pop up:

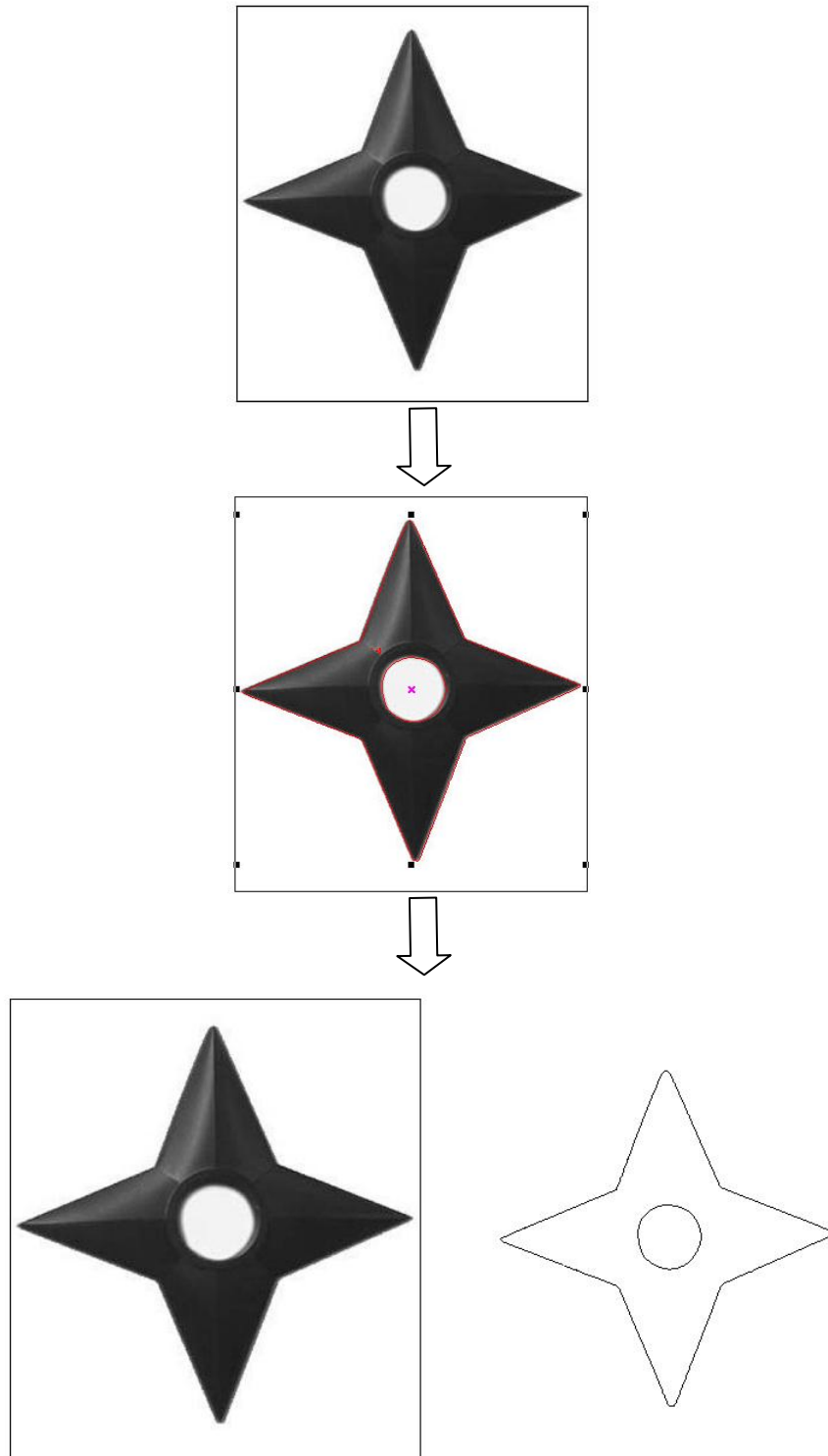


Input the Dot Size you need(the smaller the higher resolution) and then click OK.



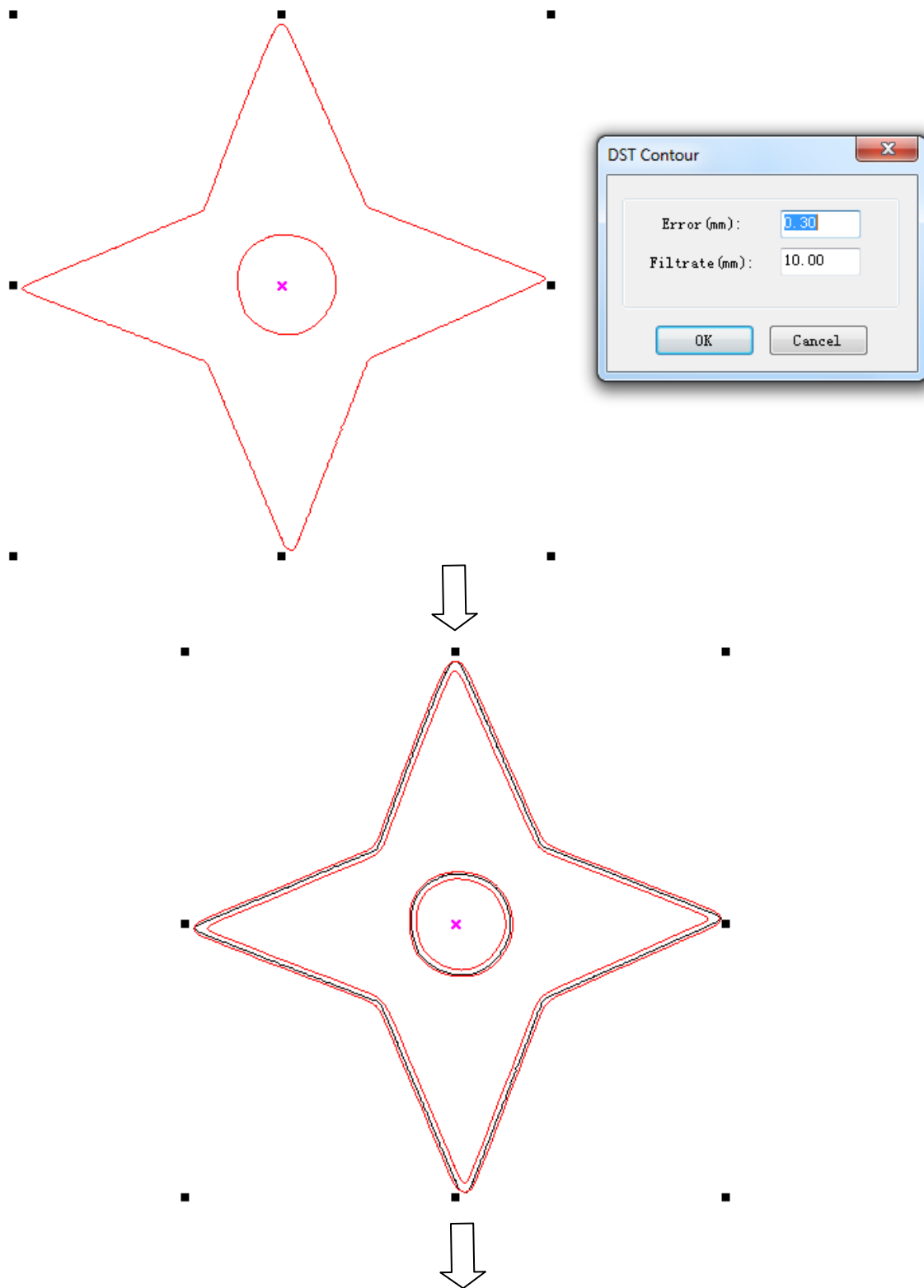
**Create Image Outline**

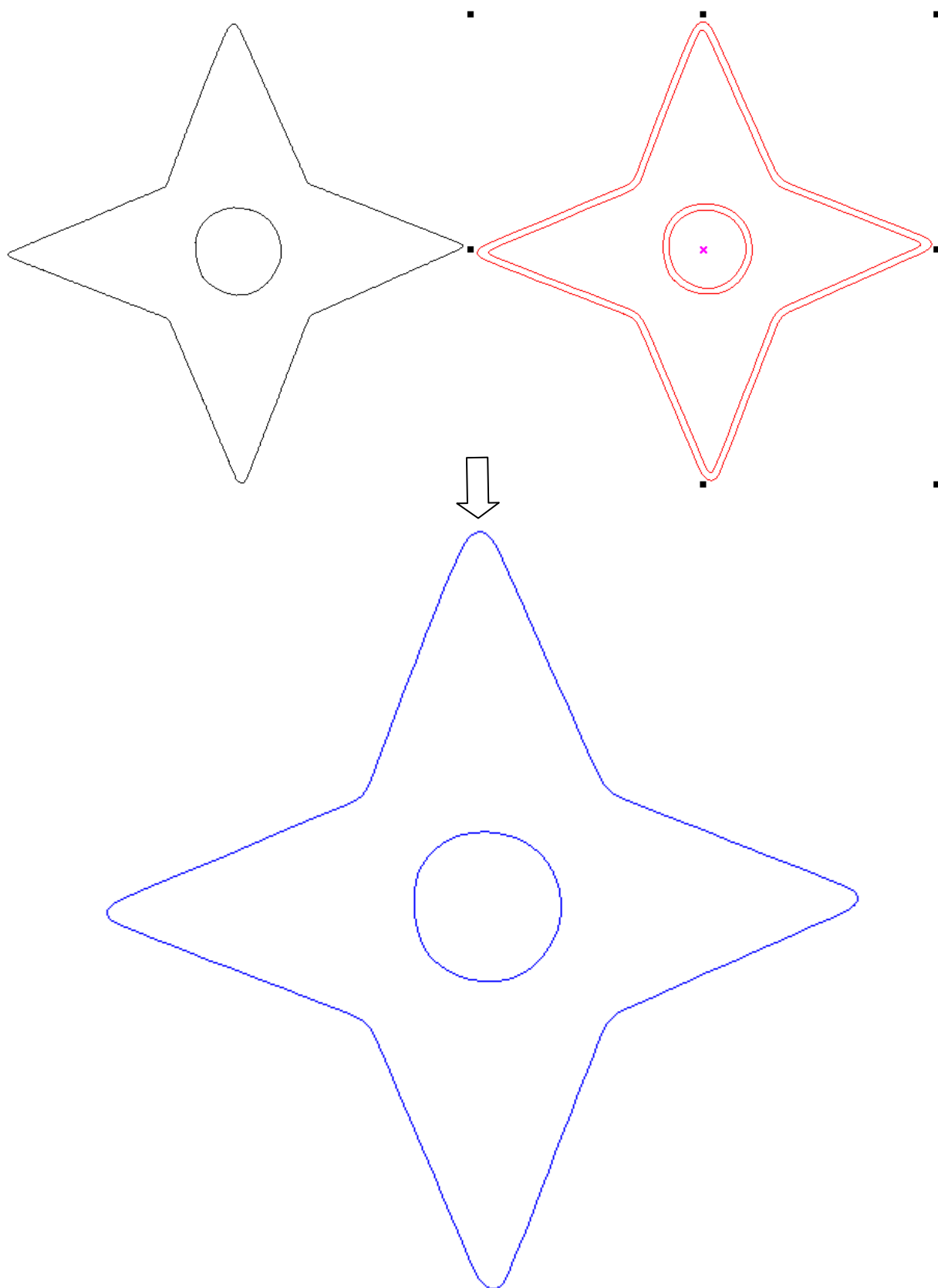
Import a Picture and then click Tool/Create Image Outline to get a vector outline of the image.




**DST Contour**

If the vector file is not so perfect, you can use the DST Contour function to make it more smooth.  
Click Tool/DST Contour to create a more smooth file.



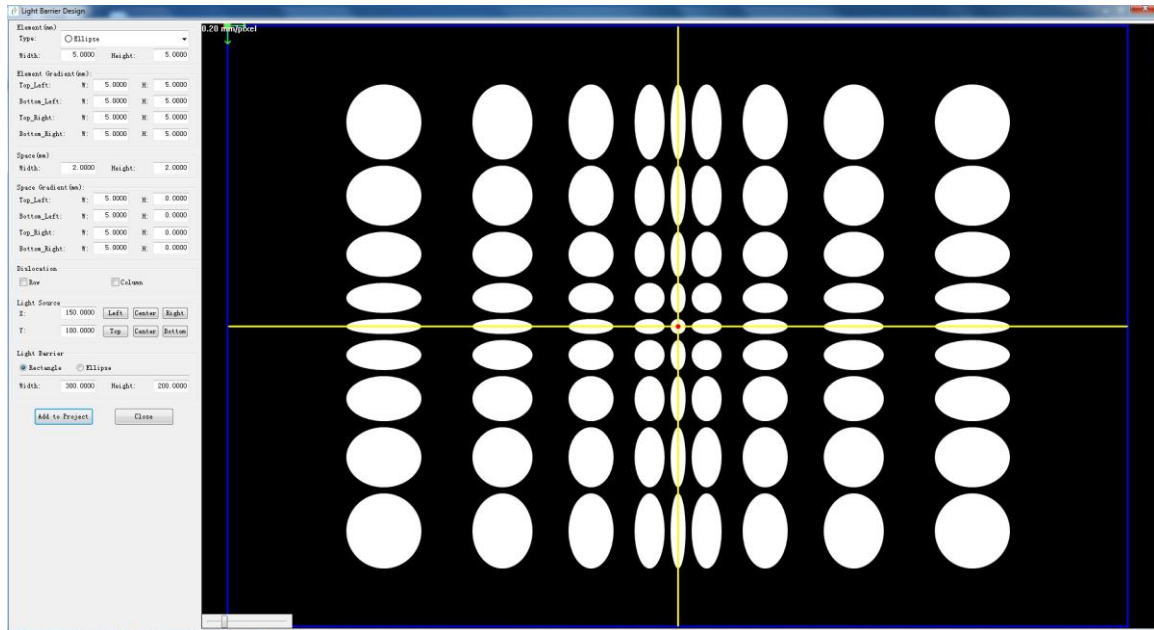


## Light Barrier

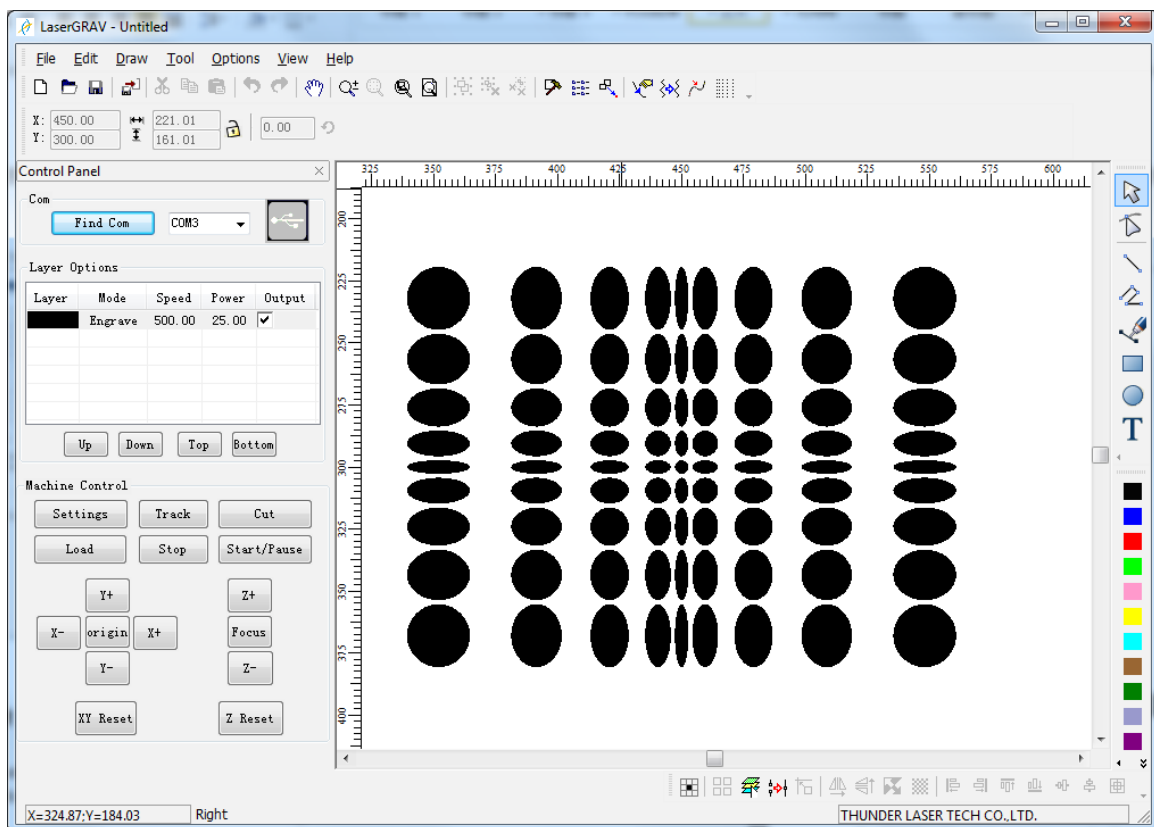
Click  on the tool bar to use the light barrier function.

This function is usually to draw the designs engraved on acrylic to make light barrier.

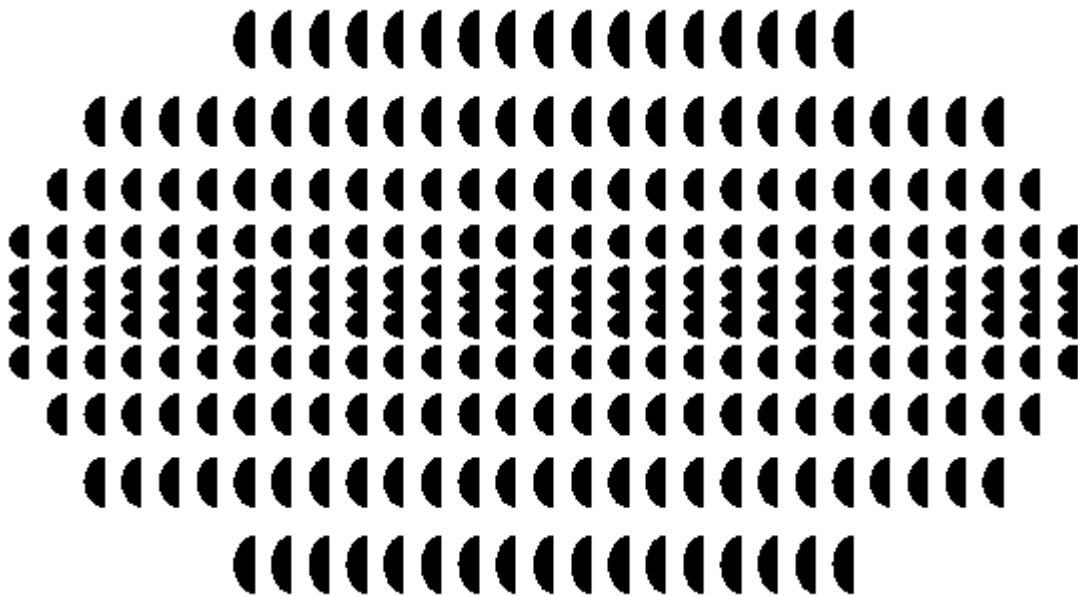
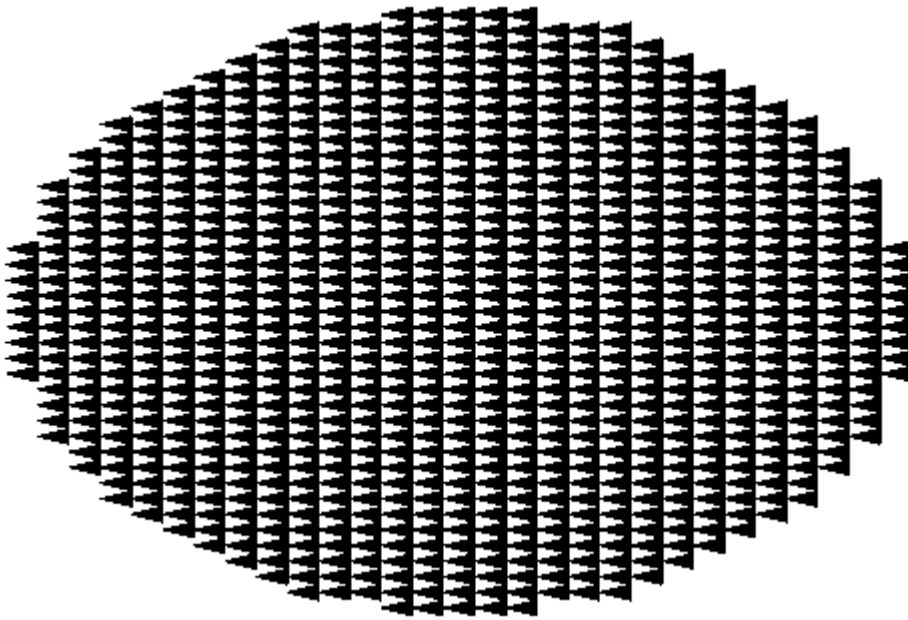
User can change the different settings to make the design freely.



After doing the settings, click “apply to project” to confirm the settings and draw the design.

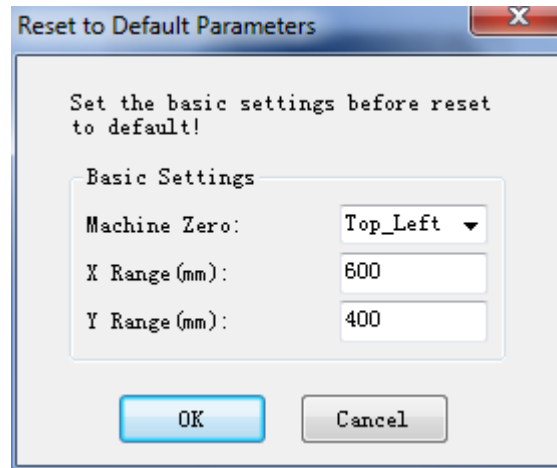


User can use this function to make many different designs.



## Default Parameters

When the software parameters are in a mess, user can use this function to set the software parameters back to default. Click default parameters in Options Menu to reset the parameters as below:




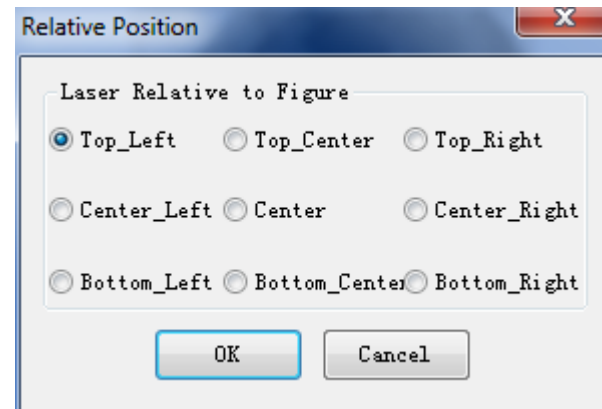
Select machine zero point and set X/Y Range, then click ok.

## Chapter 4 - Laser Process Settings

### Relative Position

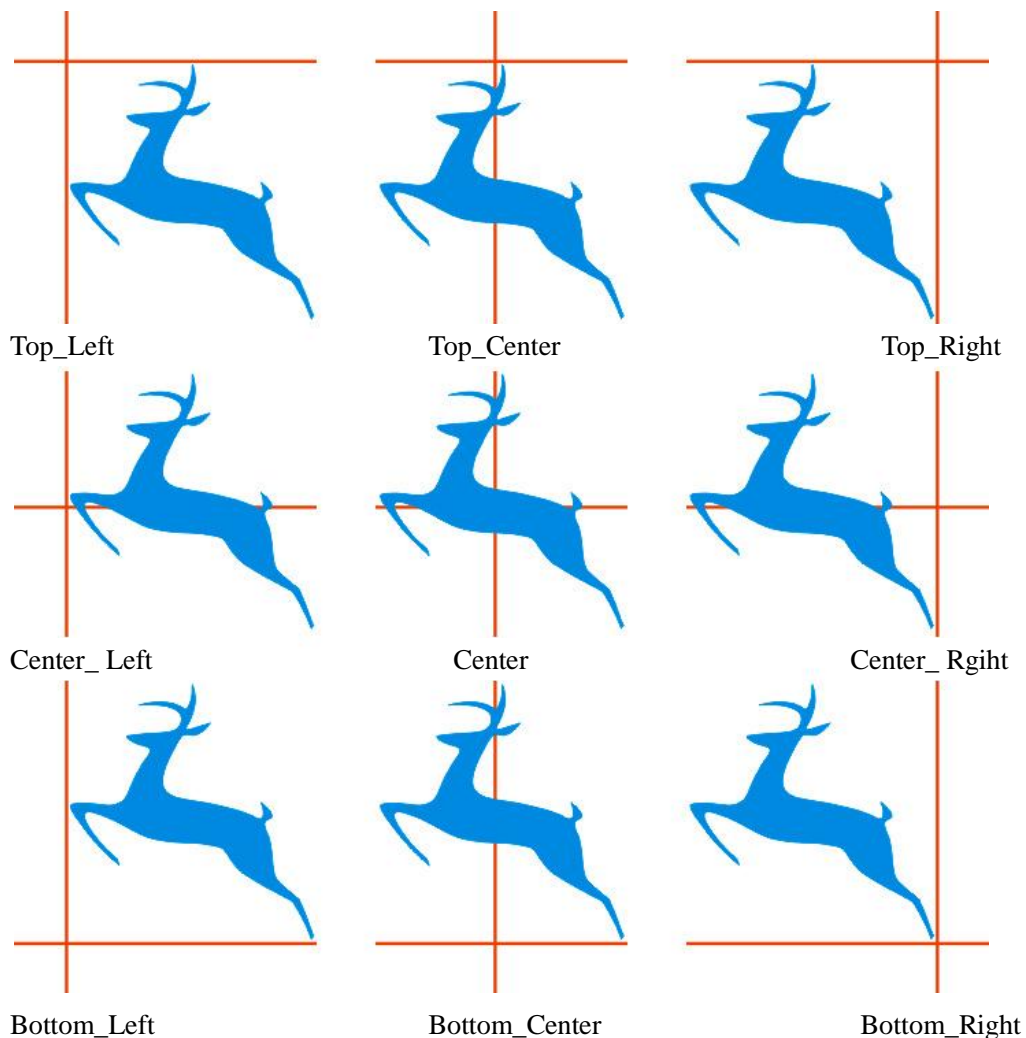
The laser head's relative position to the figure.

Click  to set relative position for the laser head as below:




Choose the relative position to fit your work. The default relative position is the same as machine zero point.

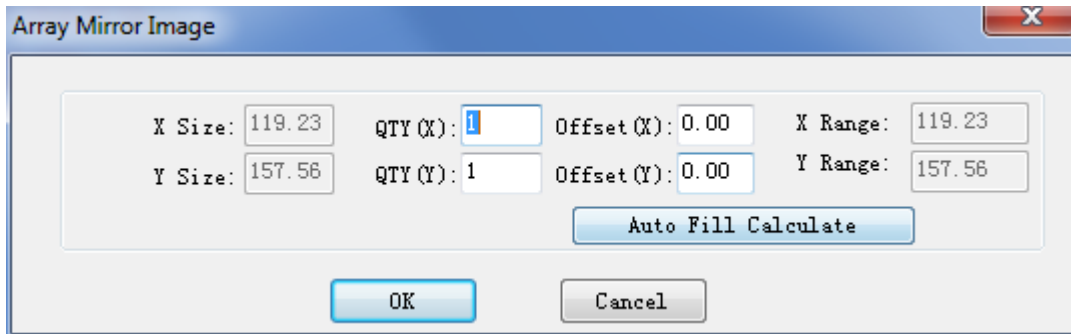
Look at the following examples to set relative position (the crossing point is the laser):





## Array Mirror Image

Click  to set array parameters as below:



Array Mirror Image

X Size:	119.23	QTY (X):	1	Offset (X):	0.00	X Range:	119.23
Y Size:	157.56	QTY (Y):	1	Offset (Y):	0.00	Y Range:	157.56

Auto Fill Calculate

OK Cancel

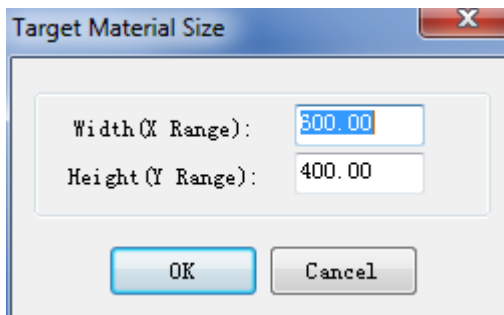
**X Size/ Y Size:** size of the object.

**QTY:** number of the object you need.

**Offset:** interval of each object.

**X Range/ Y Range:** size of the whole work.

**Auto Fill Calculate:** machine will fill the work area with max objects.



Target Material Size

Width (X Range):	300.00
Height (Y Range):	400.00

OK Cancel

**Target Material size:** size of the material you're going to cut.

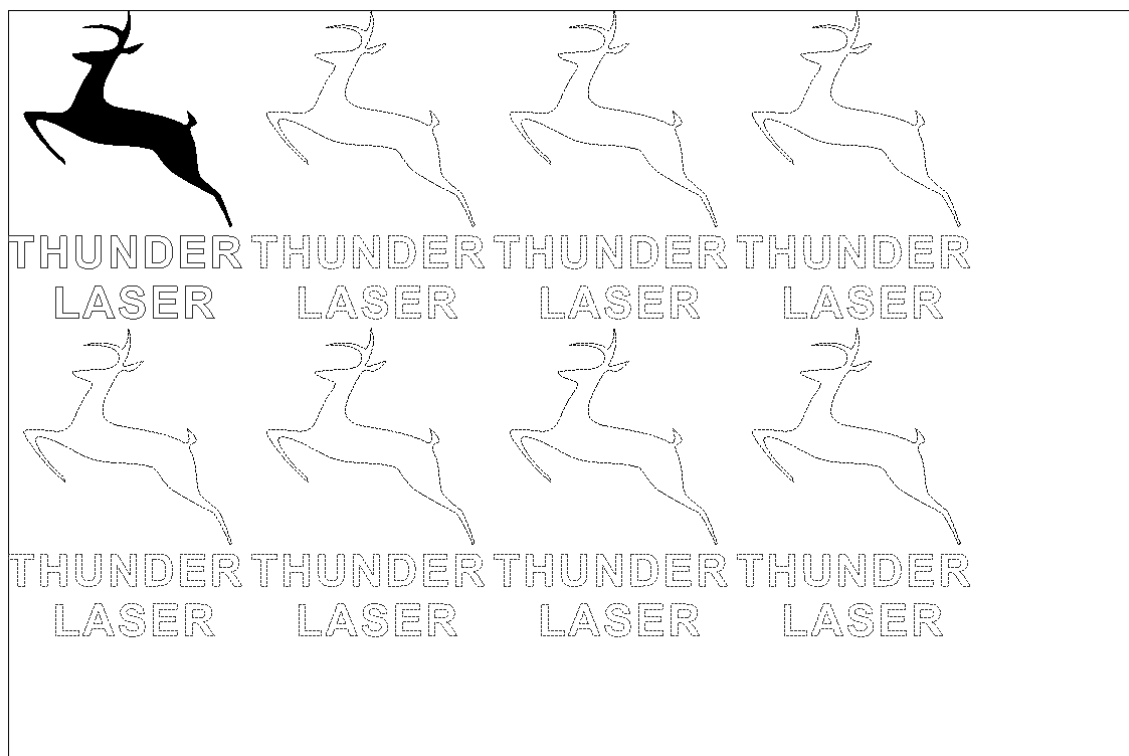
Look at the following example:

**Array Mirror Image** X

X Size:	124.51	QTY (X):	4	Offset (X):	5	X Range:	513.04
Y Size:	164.53	QTY (Y):	2	Offset (Y):	5	Y Range:	334.05


**Auto Fill Calculate**

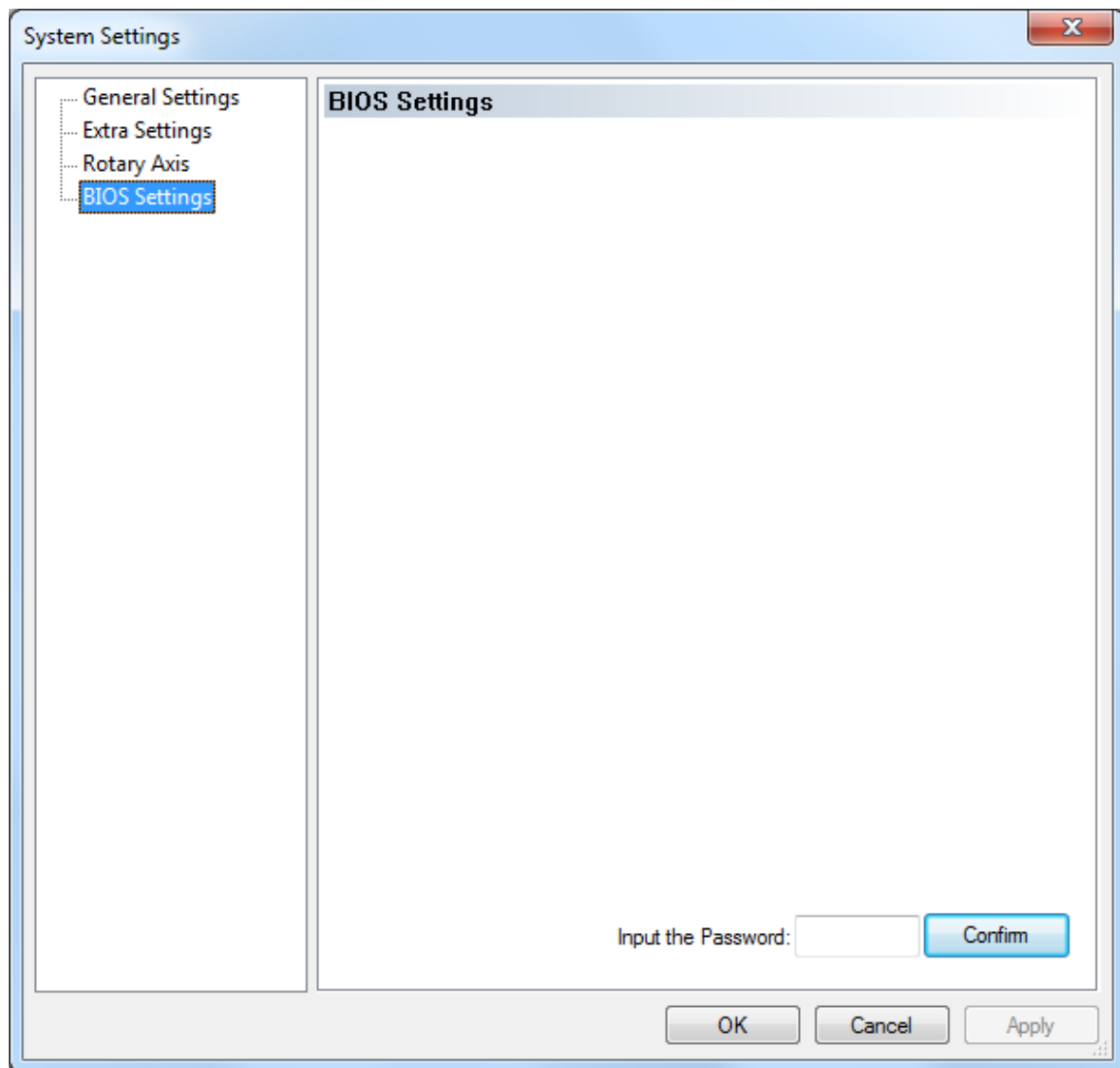
**OK** **Cancel**



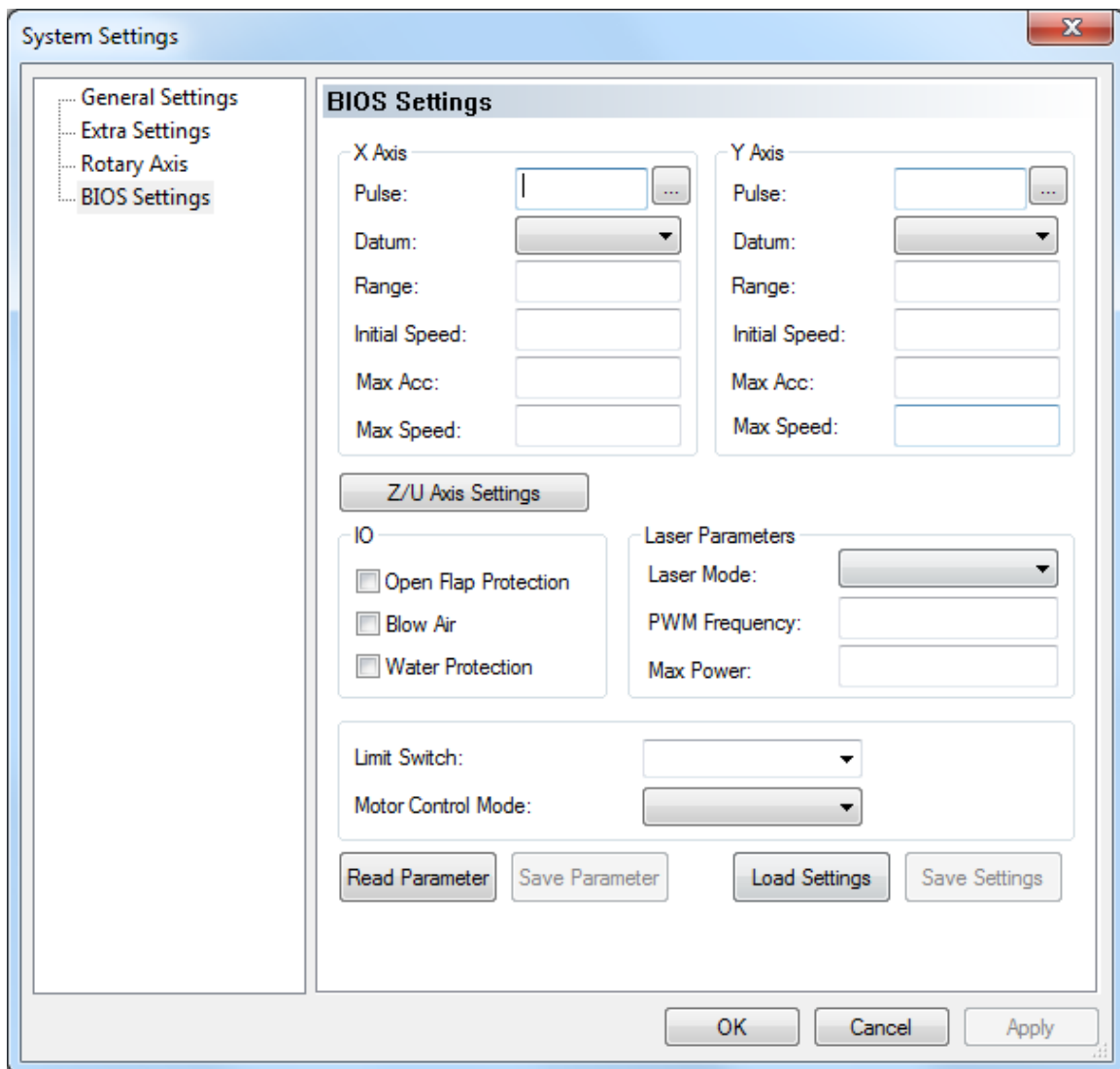
## BIOS Settings

Basic parameters of the machine. Users are not allowed to change the setting. The parameters are save in the mainboard and won't miss even reinstall the software.

Click  and a dialog will pop up, then click BIOS Settings to change the parameters. The final user is not allowed to have the password unless told by the factory.



Input the password to change the setting:



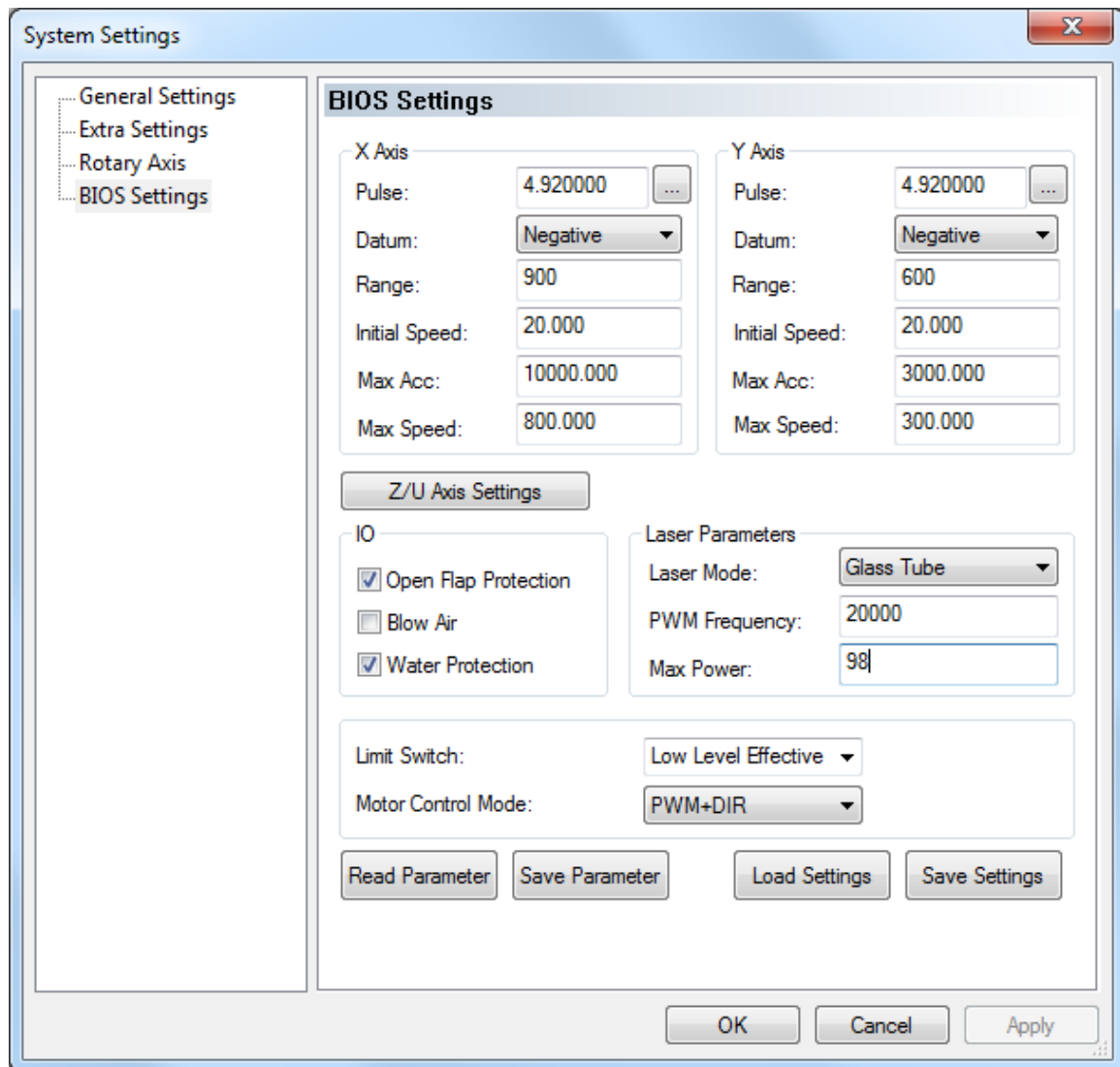
There are two ways to change the parameters:


Click Read Parameter and then change the parameters and click Save Parameter.

Click Load Settings to read parameters and then click Save Parameter.

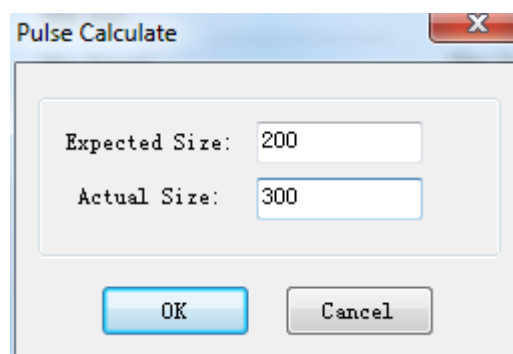
You can click Save Settings to save the parameters as a file.

Click Read Parameter to show the default parameter.



**Pulse:** send an pulse to control the machine. If this is not correctly set, the cutting size will be incorrect. If this happens, click  to change the settings, after this setting, the software will find the correct pulse.

- ✧ **Expected Size:** input the correct size that you need
- ✧ **Actual Size:** input the actual cutting size



**Datum:** rotating direction of motor, if this setting is incorrect, the laser head will move to the opposite direction.

**Range:** max range of work area

**Initial speed:** start speed of the machine.

**Max Acc:** Max accelerate speed of the machine.

**Max Speed:** Max speed of the machine.

**IO Settings:** additional settings to control some special functions. Tick to activate each function.

✧ **Open Flap Protection:** laser machine will stop working if the front cover of the laser machine is opened.

✧ **Blow Air:** air compressor will work only when laser is working. (need extra part)

✧ **Water Protection:** laser machine will stop working if the water cooling system is not working.

**Laser Mode:** three types of laser tubes are supported

✧ Glass Tube

✧ RF Laser Tube (No Preignition)

✧ RF Laser Tube (Preignition)

**PWM Frequency:** the normal frequency is between 10000~20000.

**Max power:** Set a limit for the max power of the laser tube, the default is 98%

#### Z/U Axis Settings:

✧ Z Axis: used to control the motorized table

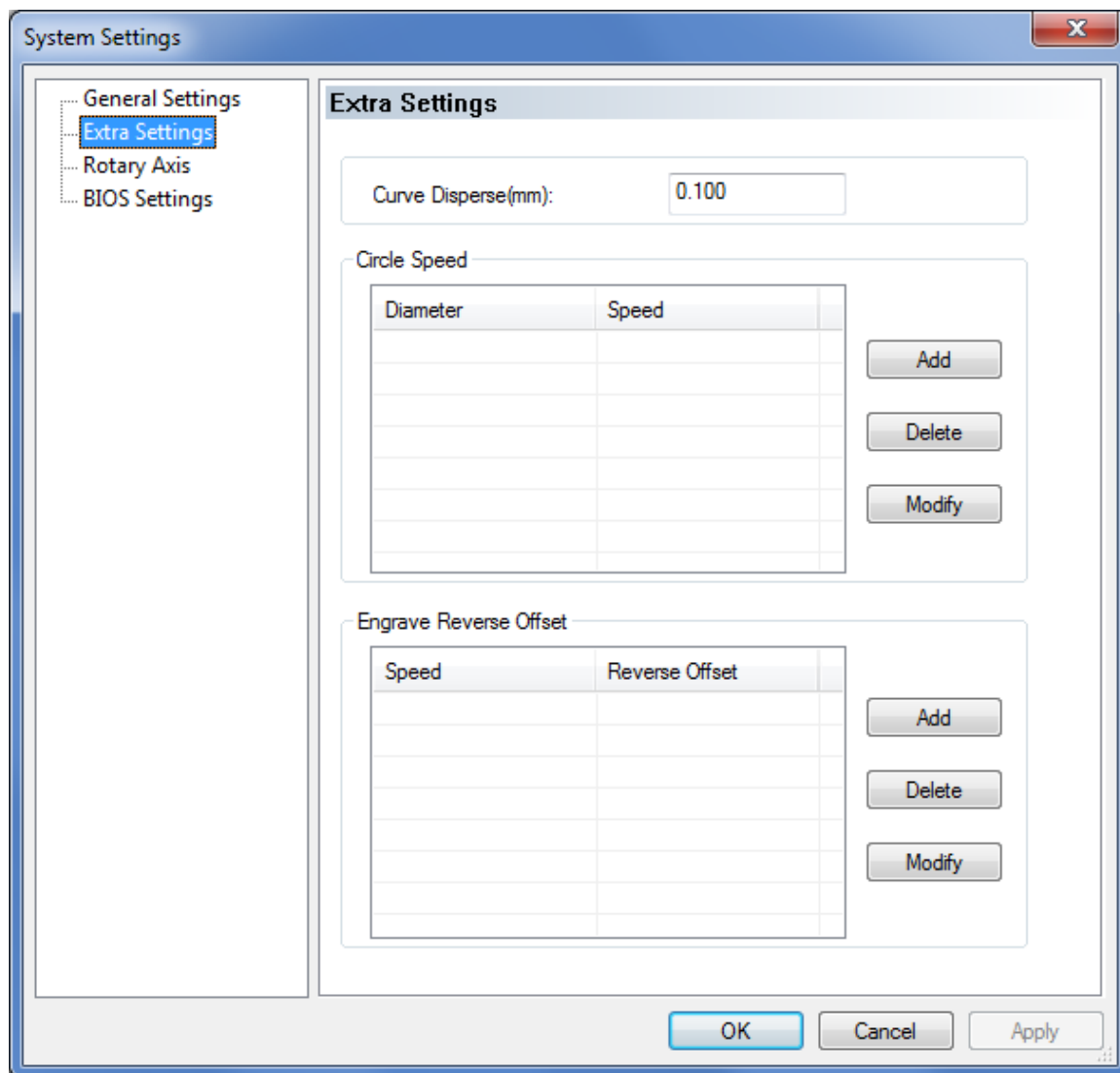
✧ U Axis: used to control the auto feeding conveyor

Z_Axis		U_Axis	
Pulse:	0.710000	Pulse:	2.510000
Datum:	Negative	Datum:	Negative
Range:	170	Range:	3000
Initial Speed:	5.000	Initial Speed:	10.000
Max_Acc:	1000.000	Max_Acc:	1000.000
Max_Speed:	10.000	Max_Speed:	300.000

OK Cancel

## Extra Settings

When the mechanical struture of the laser machine is not so perfect, you can set these parameters to fix some of the cutting/ engraving problems.



**Curve Disperse:** the smaller the number,the higher the resolution, the slower the speed.

When cut acrylics, user can set the number smaller. The default is 0.15.

Circle speed: if the circle is too small, user need to set max speed for it to improve the quality.

Circle Speed

Diameter	Speed
5.00	10.00
10.00	20.00

**Engrave Reverse offset:** The edges of figure may be unsmooth because of the extending of machine strap when the laser bilaterally scanning the picture. So we increase the reverse interval to for the amendment. There is certain reverse interval under certain speed; Generally speaking, the faster the speed is, the bigger the reverse interval is.

Engrave Reverse offset

Speed	Reverse Offset
200.00	0.30
300.00	0.50

When speed is 200mm/s, the reverse offset should be 0.30mm; when the speed is slower than 200mm/s, the speed is proportional to reverse offset. Thus, when the speed is 100mm/s, the reverse offset should be  $0.30 \times (100/200) = 0.15\text{mm}$

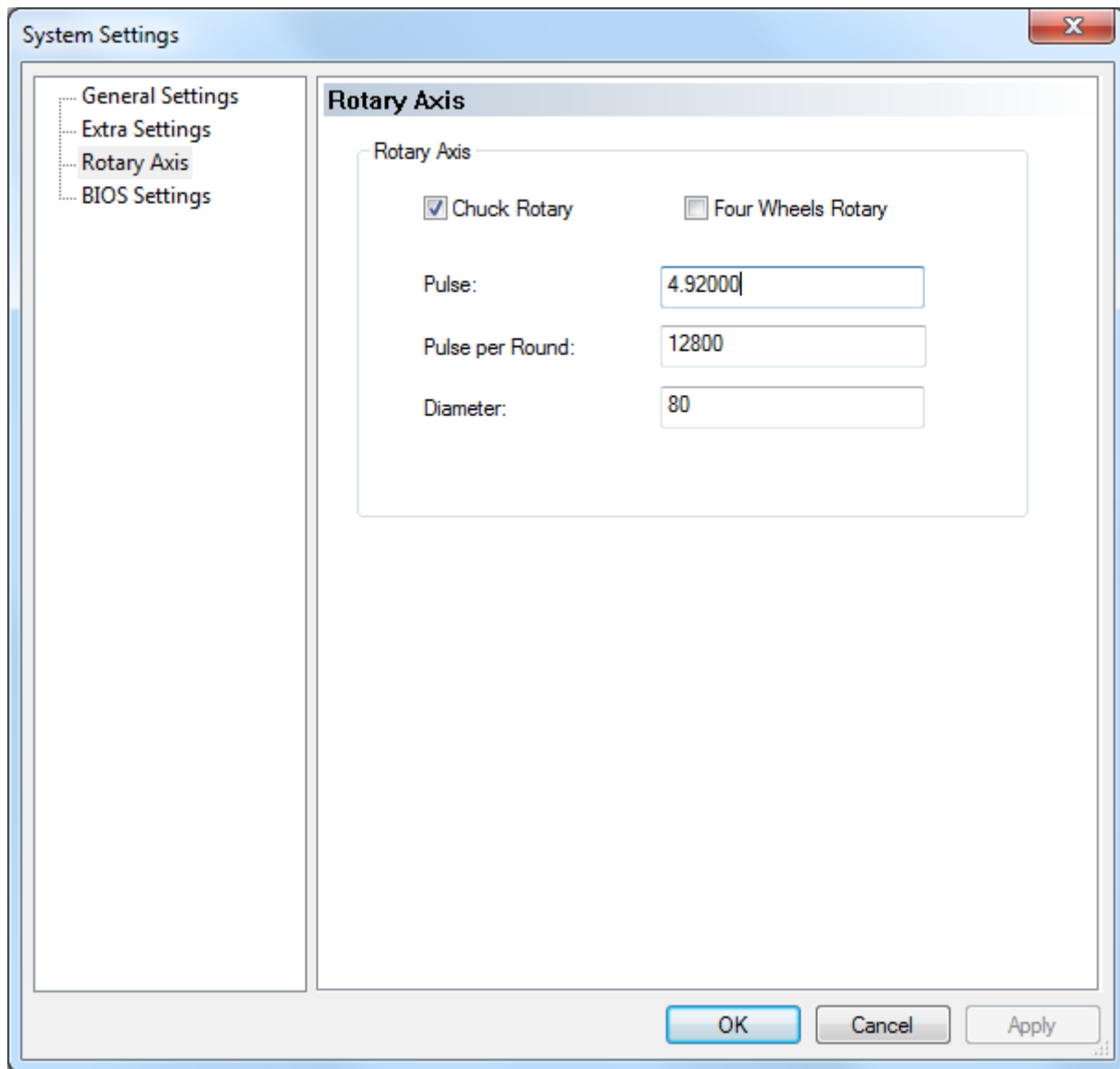
When the speed is 300mm/s, reverse offset is 0.50mm; when the speed is between 200~300mm/s, the speed is proportional to reverse; thus when the speed is 250mm/s, the reverse offset should be  $0.30 + (300 - 250) / (300 - 200) \times (0.5 - 0.3) = 0.40\text{mm}$ ;

When the speed is faster than 300mm/s, the reverse offset is the same as 300mm/s (0.50mm).



## Rotary Axis

There're two types of rotary, tick to activate when you need to use one of them. *When you do not use the rotary axis, please do not tick either of them, or the cutting/engraving will be in a mess.*



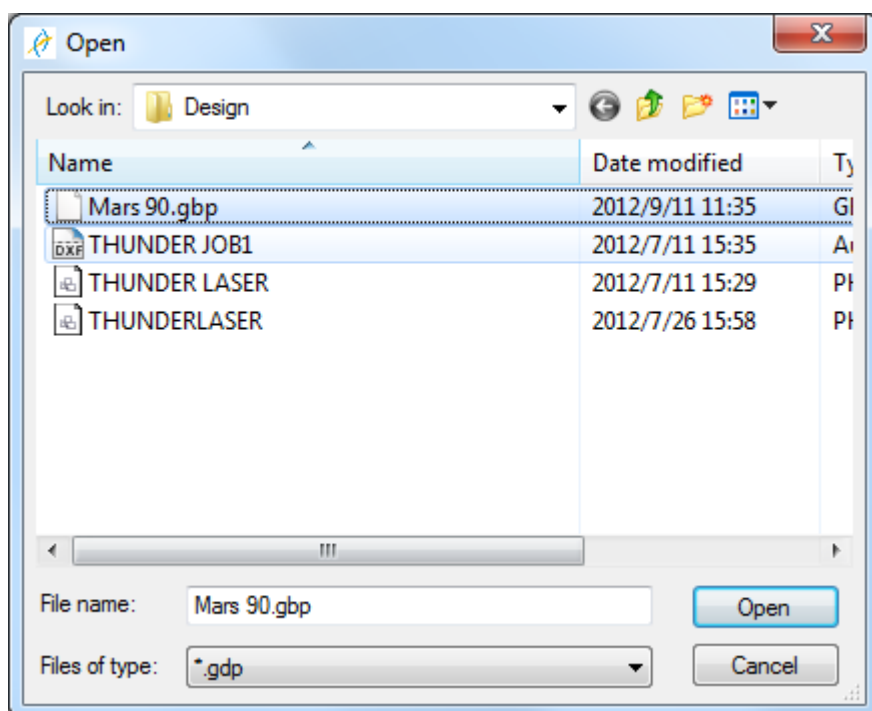
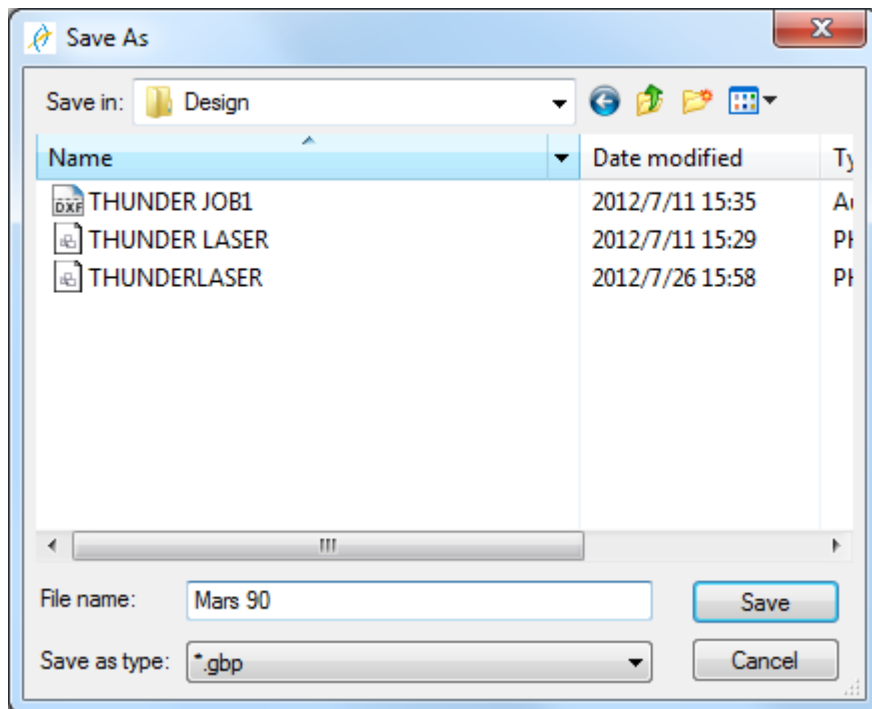
**Pulse:** this setting should be totally the same as the Y axis Pulse.

**Pulse per Round:** this setting = subdivision of your motor driver\*gear ratio of your rotary axis. for example, in our standard machine, this setting=6400\*2=12800

**Diameter:** diameter of the round item that you want to engrave.

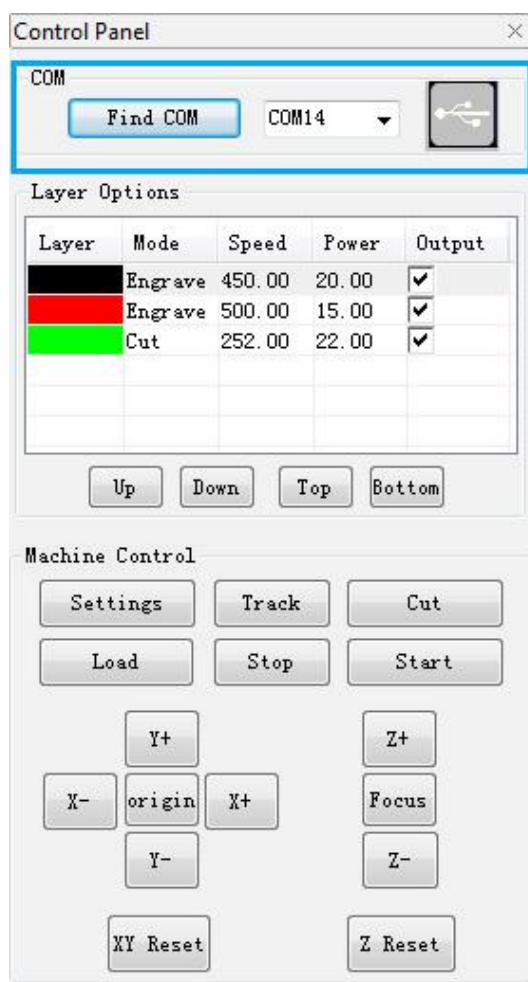
## Save/Load System Settings

Click Options/Save(Load) System Settings then you can save/load the all the System Settings.

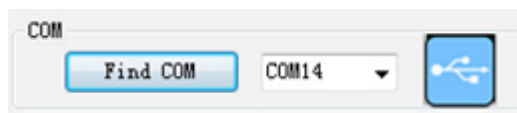


## Control Panel

The laser machine is connected to Computer by using a USB cable, if the COM setting is incorrect, the computer will fail to control the laser machine.



Click Find COM, if the machine is turned on and has been connected to computer through a USB cable, the correct COM will be showed and the USB icon will turn to Blue color.



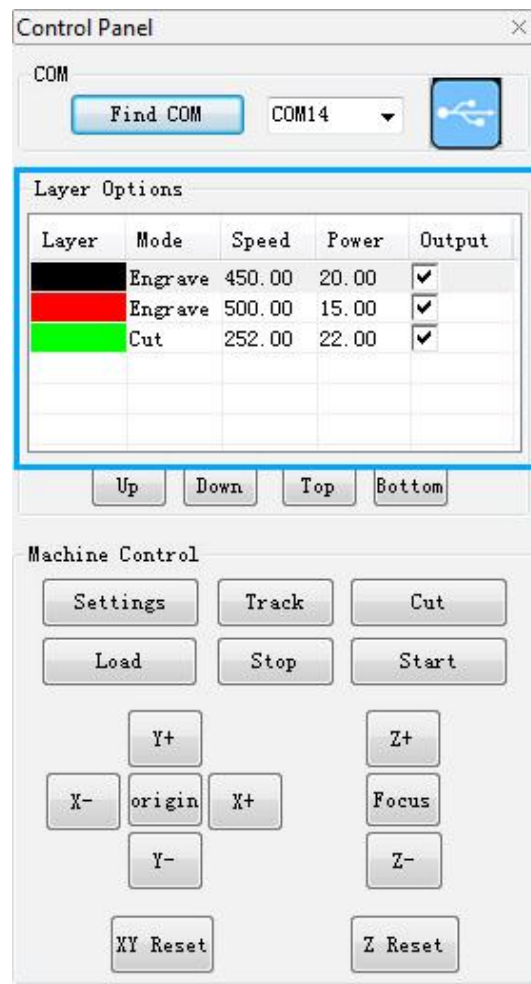
This means the laser machine has been connected to computer



This means the connection is cut off

## Layer Options

You can set different speed, power for each single layer by set the layer to different colors.



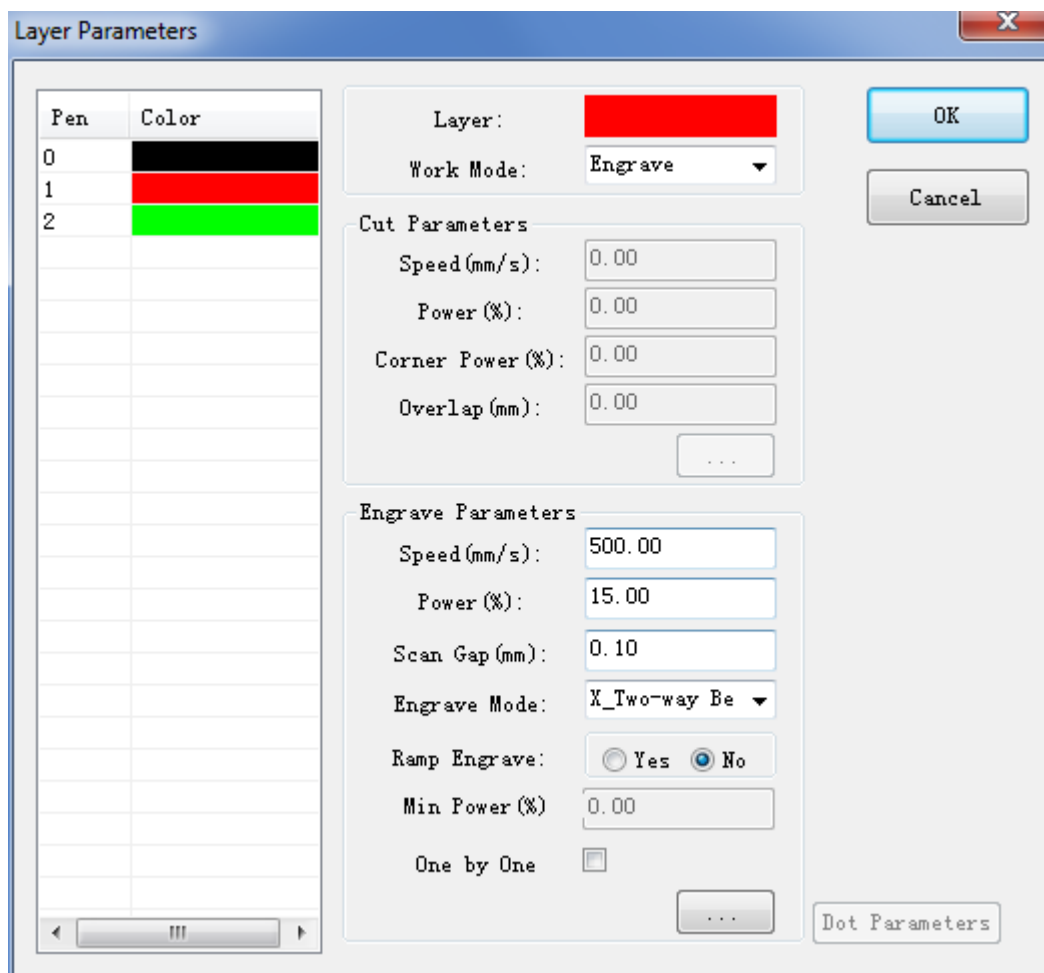
## Layer Parameters

Tick output bar to choose whether to process the layer.




☒ means process the layer

☐ means not to process the layer.

Double click the layer Engrave 500.00 15.00 ☒ and the following dialog will pop up:



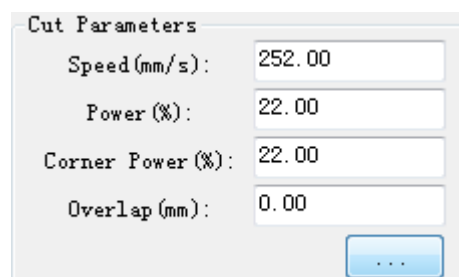
**Layer:**the color shows the current layer you select. Left click the colors to choose the layer you want to edit.

Pen	Color
0	
1	
2	

**Work Mode:** you can choose *Cut*, *Engrave*, *Engrave&Cut* or *Draw Dot*. If the current layer is **BMP layer**, you can choose Engrave Mode only(since BMP file is only for engraving)

#### Cut Parameters

Choose Cut or Engrave&Cut Mode and then set the parameters for the layer




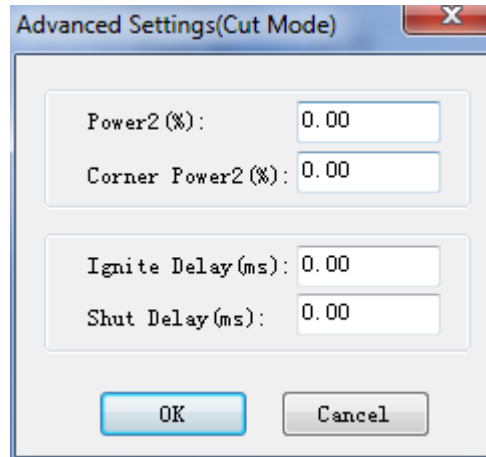
**Speed(mm/s):** max cutting speed of the laser while working

**Power(%):** max power of the laser while working

**Corner power(%):** since the laser head moves slower when making a turn, you need to set this into a smaller power than the normal power to keep the laser dot at the same size while processing.

**Overlap:** if this setting is added, laser will still keep moving a bit even the job is cutting is done. This will revise some of the mechanical problem.(but usually it is not suggested to use this setting,it's better to improve the mechanical structure/parts of the machine)

Click  to set the Advance Settings(Cut Mode):



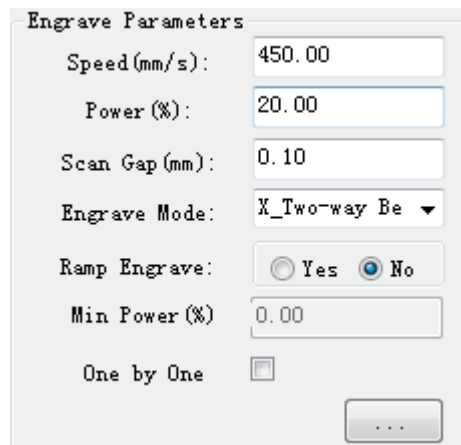
**Power2(%):**if your machine has two laser heads, you can set the power for the second head here.

**Corner Power2(%):**if your machine has two laser heads, you can set the power for the second head here.

**Ignite Delay(ms):** turn on the laser power before start working

**Shut Delay(ms):** delay the turning off the laser power after the work is finished.

#### Engrave Parameters:



**Speed(mm/s):** max engraving speed of the laser while working

**Power(%):** max power of the laser while working

**Scan Gap(mm):** interval of each scanning strip, in other words, resolution of the layer.

**Engrave Mode:** there are four Mode

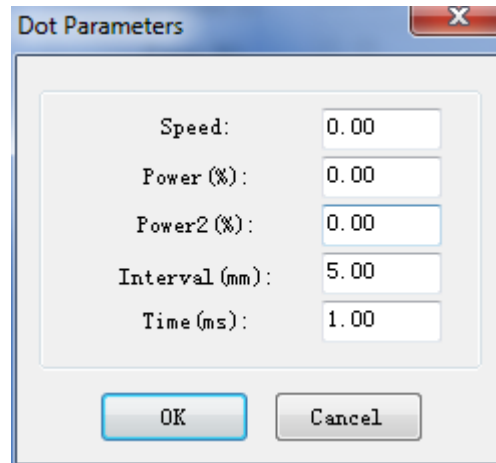
- ✧ **X\_Two-way Beam:** default setting. the laser beam is on when engraving from left side to right side or right side to left side.
- ✧ **X\_One-way Beam:** the laser beam is on when engraving from left side to right side. But when engraving from right side to left side, there's no beam. And this will cause double time to finish the same job.
- ✧ **Y\_Two-way Beam:** the laser beam is on when engraving from upper side to bottom side or bottom side to upper side.
- ✧ **Y\_One-way Beam:** the laser beam is on only when engraving from upper side to bottom side

**Ramp Engrave:** choose yes to engrave ramp. (this function is usually used for stamp engraving)

**Min Power(%):** min power of the laser beam. Usually, this should be set a lot smaller than the **Power**, and the difference between these two power settings will create the ramp. (like when the power is set to 50%, you can set the min power to 15%)

### Dot parameters:

Select Draw Dot in the work mode and then click Dot Parameters:



**Speed:** speed of the laser.





**Power:** power of the laser while drawing holes.

**Power2:** power of the second laser head

**Interval:** interval of each holes

**Time:** the longer the time, the larger the hole will be.

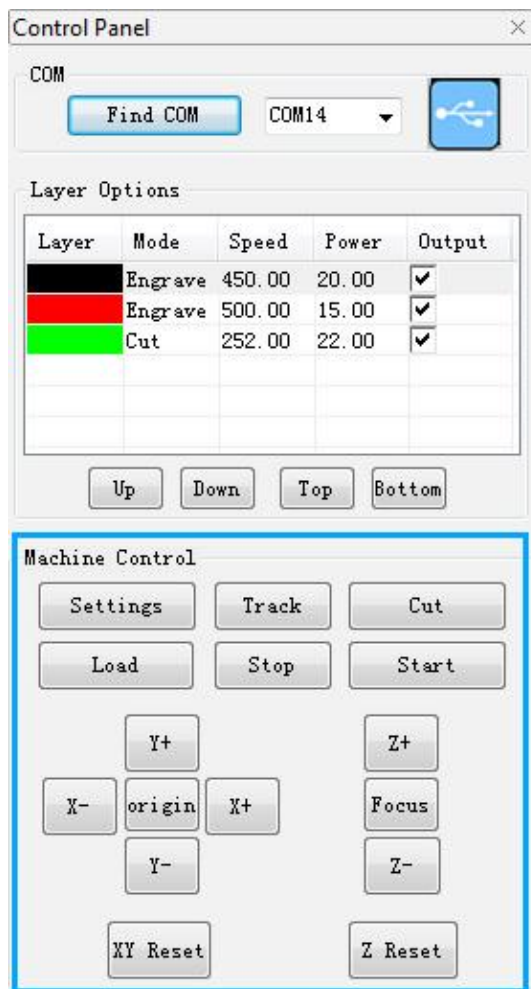
### Adjust the orders of the layers

The default working order is from Top to Bottom. If you want to change the order of each layer, just select the layer and then click     to change its order.

**Attention:** this function will work only when you tick Order by Layer Color in route optimize.

## Machine Control

Some major settings to control the machine.



### Control Parameters

These parameters are saved in the main board. The data won't miss even if you reinstall the software. Click Settings, the dialog will pop up:



The screenshot shows the 'Control Parameters' dialog box with the following settings:

Work Parameters	
Space Speed:	0.01
Space Acc:	0.01
Initial Speed:	0.01
Min Acc:	0.01
Cut Acc:	0.01
Engrave Acc:	0.01

Parameter List

Control Panel Parameters	
Track Frame Speed:	0.01
Cut Frame Speed:	0.01
Origin:	Machine Zero

Other Cut Parameters

Cut Mode:	Precise Cut
Reset Speed:	1.00
Outage Delay(ms):	0
Focus:	0.00
F Multiple:	1.00

Buttons: Read Parameters, Save Parameters

Click read parameters, the software will read the parameters saved in the main board as below:

The screenshot shows the 'Control Parameters' dialog box with the following settings read from the main board:

Work Parameters	
Space Speed:	300.00
Space Acc:	2400.00
Initial Speed:	10.00
Min Acc:	600.00
Cut Acc:	2400.00
Engrave Acc:	10000.00

Parameter List

Control Panel Parameters	
Track Frame Speed:	150.00
Cut Frame Speed:	80.00
Origin:	Origin

Other Cut Parameters

Cut Mode:	Precise Cut
Reset Speed:	50.00
Outage Delay(ms):	200
Focus:	8.00
F Multiple:	1.00

Buttons: Read Parameters, Save Parameters

Select the parameters and change the settings and then click save parameters to save the data in mainboard.

## Work Parameters

**Space Speed:** the max speed of the machine when there's no laser in the work process.

**Space Acc:** the accelerated speed of the machine when there's no laser in the work process.

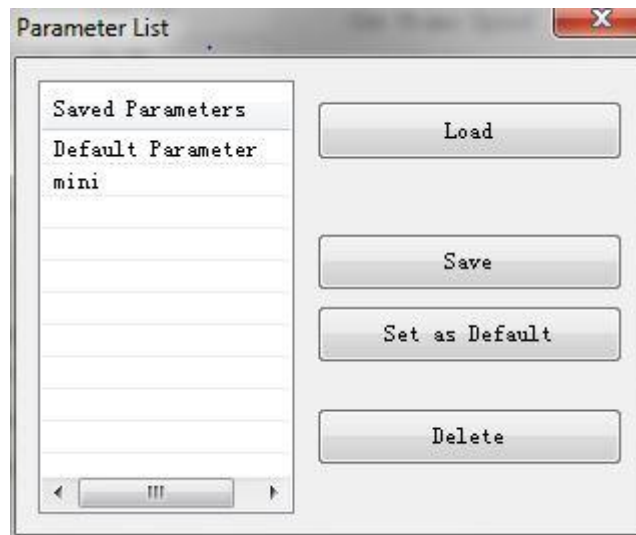
**Initial Speed:** the initial velocity of the machine.

**Min Acc:** the min accelerated speed of the machine in work process

**Cut Acc:** the max accelerated speed of the machine in work process

**Engrave Acc:** the max accelerated speed of the machine while engraving, normally this should be larger than 8000

**Parameter List:** user can save the parameters here. click Parameter List the dialog will pop up:



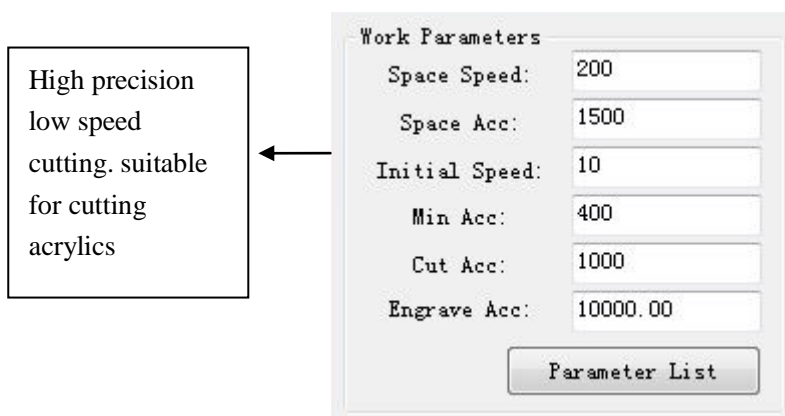
**Load:** load one parameter from the parameter list on the left.

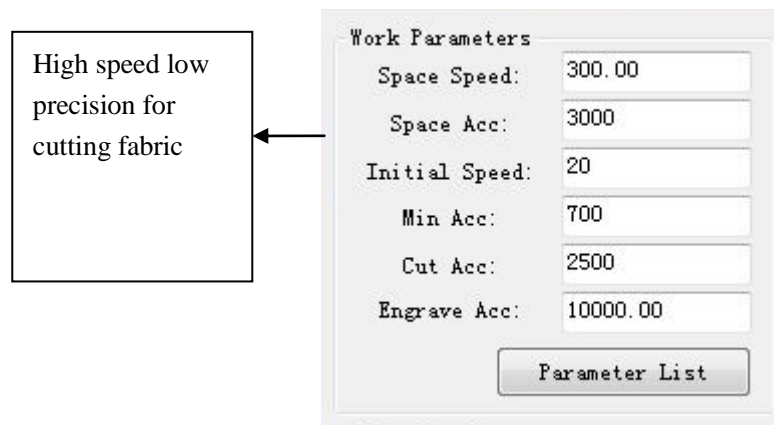
**Save:** add the current parameter to the parameter list.

**Set as Default:** set the current parameter as default parameter(users are not allowed to use this function.this setting is done by the factories only) the default parameter is saved in the main board, the data will not miss even if the software is reinstalled.

**Delete:** delete the parameter in the list(the default parameter can not be deleted)

Below are two suggested parameters:





### Control Panel Parameters

**Track Frame Speed:** speed of tracking the frame.

**Cut Frame Speed:** speed of cutting the frame.

**Origin:** there're two selection here. If set to Machine Zero, the laser head will move to the machine zero after the job is done.

If set to Origin, the laser head will move back to the origin point(start cutting point) where you set after the job is done.

### Other Parameters

**Cut Mode:**there are two modes,Precise Cut is for jobs need higher precision but slow speed and Quick Cut is for jobs need fast speed but low precision.

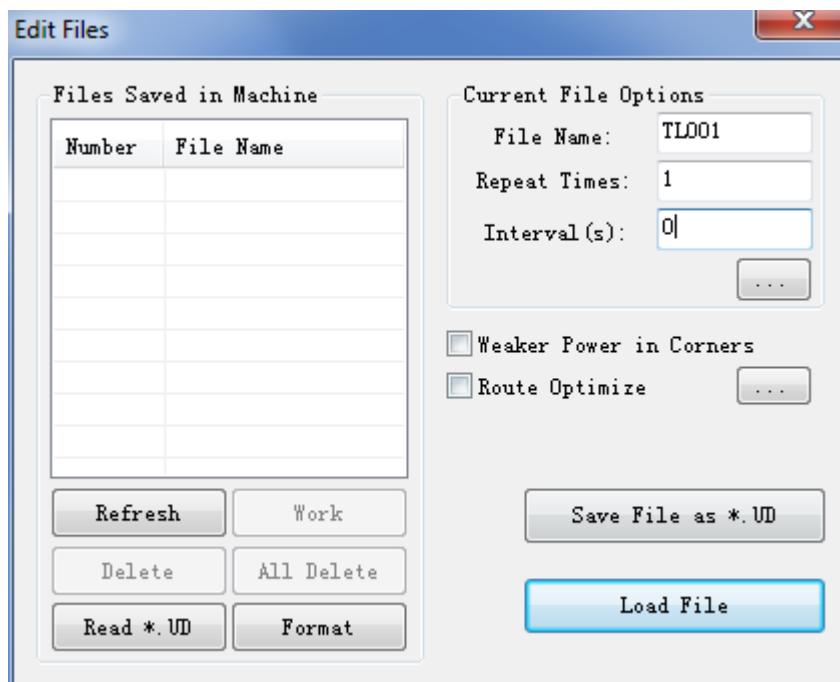
**Reset Speed:** moving speed of the laser head when you press the Reset button.

**Outage Delay:** when the power is suddenly cut off, you can still continue the unfinished work. The default setting is 1000ms.

**Focus:**The table will move down by using your setting when the auto focus sensor is activated. If you set 1mm here, the table will move down 1mm when auto focus function is used.

**Load Job to Machine**

Click , the following dialog will pop up:

**Current File Options**

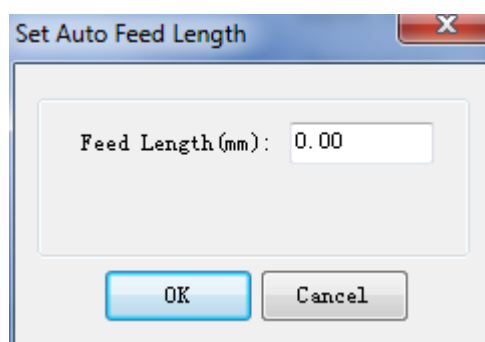
**File Name:** name of the files which will be loaded to the laser machine.

**Repeat Times:** set the repeat times of the same work. If the setting is set to 2, the job will be repeated 2 times. this function is usually used for repeated cutting the same job.

**Interval:** interval between each cutting, this setting is used to change the materials after each cutting is done.



:set the Auto Feed Length.



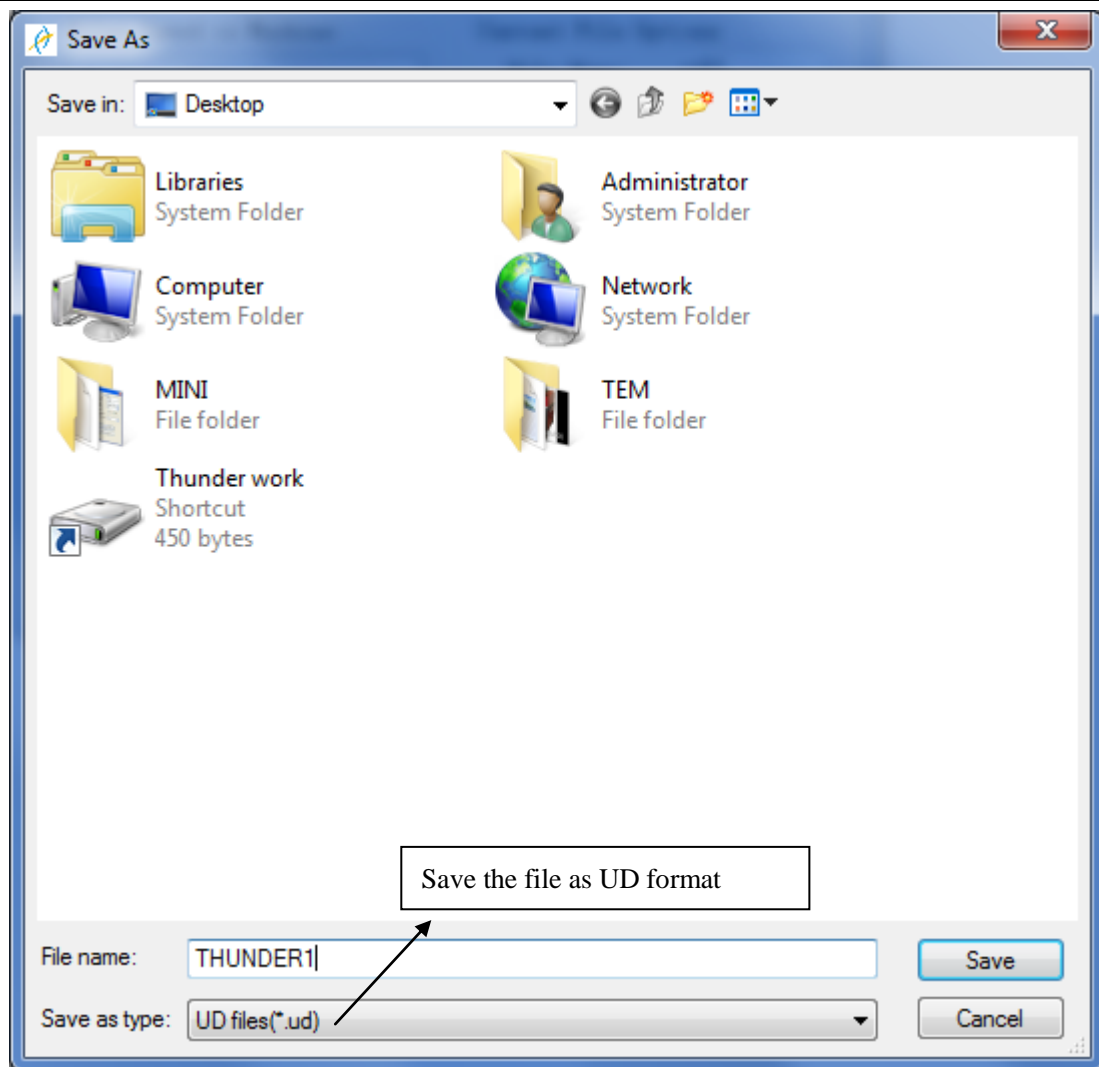
**Feed length:** the moving distance of U(auto feed Axis) axis between each process. This function is used only when the laser machine has a auto feeding conveyor.

**Weaker Power in Corners:** when this is ticked, the laser will use less power when turning the

**Route Optimize:** please refer to page 13.

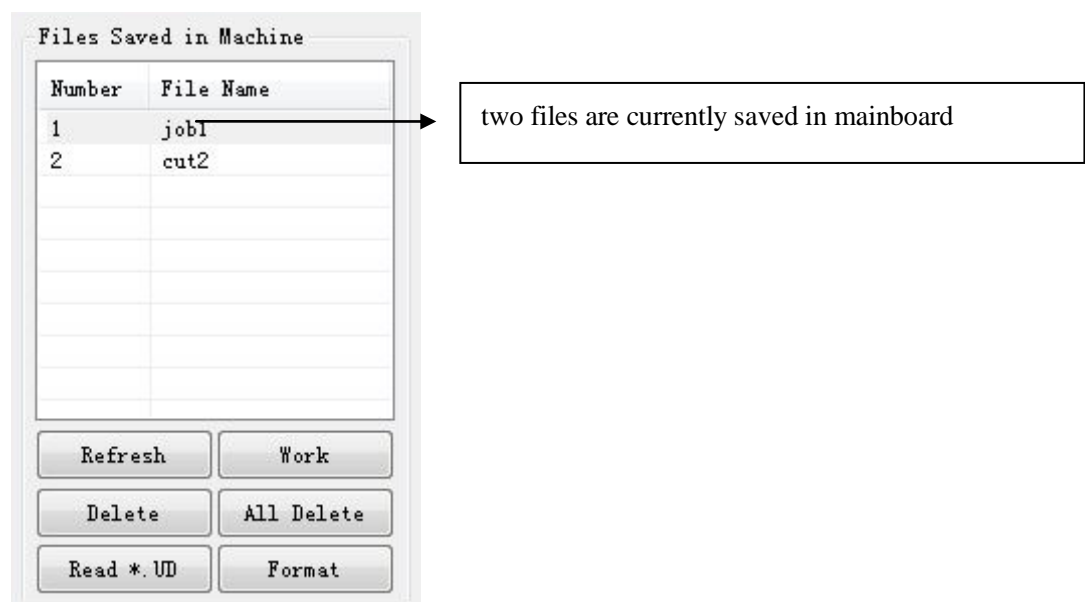
**Load File:** Send the file to the laser machine.

**Save File as \*.UD:** save the current file as UD format. User can use this function to save the file in memory stick and then the machine can read files from the memory stick directly. This means the user can send the files to the machine even without a Computer nearby.



### Files Saved in Machine

**Refresh:** read all the files saved in the mainboard. And this will activate the rest buttons.



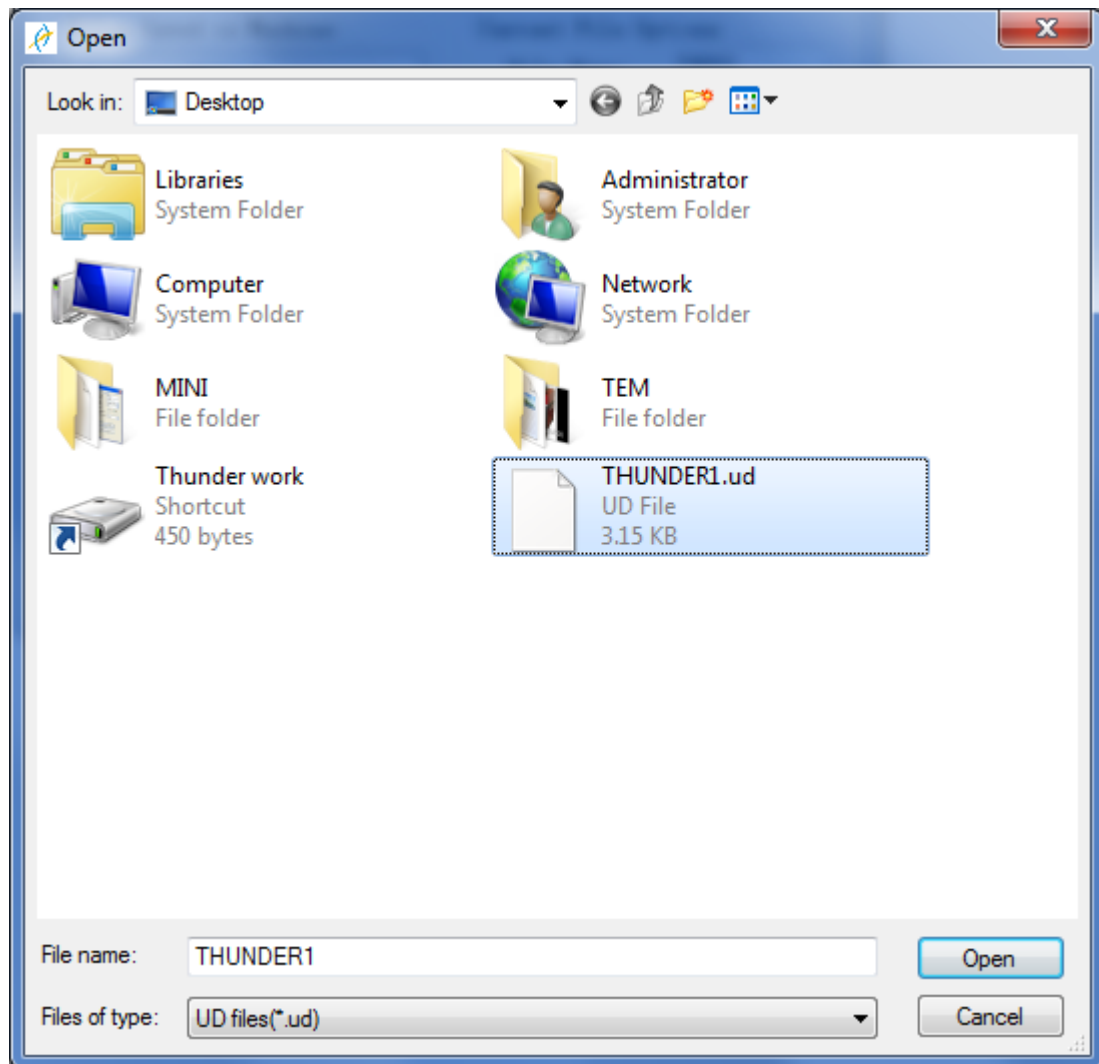
**Work:** select a certain file in the list and click work to start laser the file.

**Delete:** select a certain file in the list and click delete to delete it from mainboard.

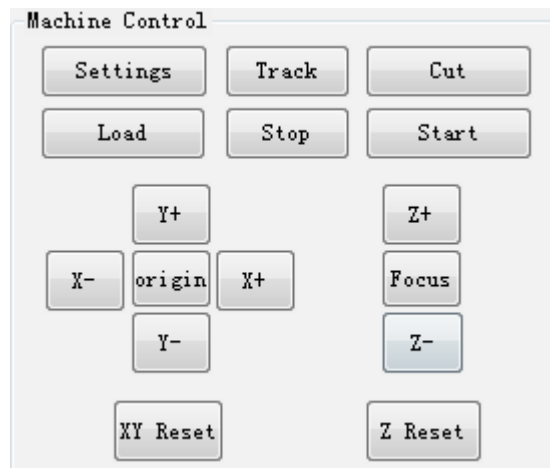
**All Delete:** delete all files in the main board.

**Format:** format all the files saved in the mainboard

**Read \*.UD:** load the UD format files from PC.



## Control Buttons



**Start/Pause:** start processing the job. When press again, job will be paused.

**Stop:** the current work will be canceled.

**Track:** machine will track the frame of the current work. This function is used to test if the material is put at the correct position.

**Cut:** machine will cut the frame of the current work.

**Origin:** Set the starting position(home position)

**Focus:** laser machines with auto focus function can use this function. When use auto focus, user need to set the correct focus distance first.

**X/Y Reset:** Reset the X/Y axis of machine.

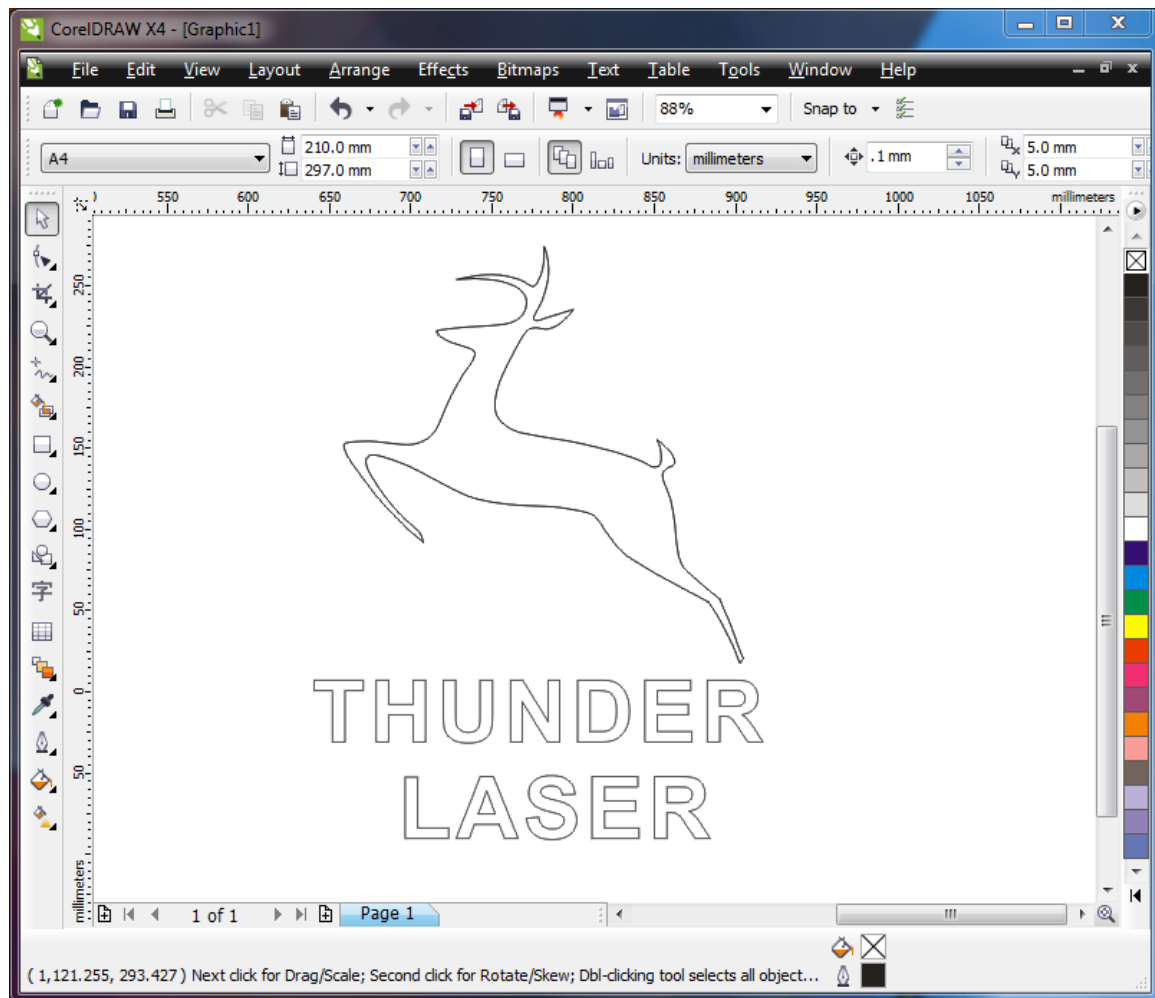
**Z Reset:** reset the Z axis.

**X- / X+ / Y- / Y+ / Z- / Z+ :** arrow directions to control laser head.

## Chapter 5 - CorelDRAW Plug-in

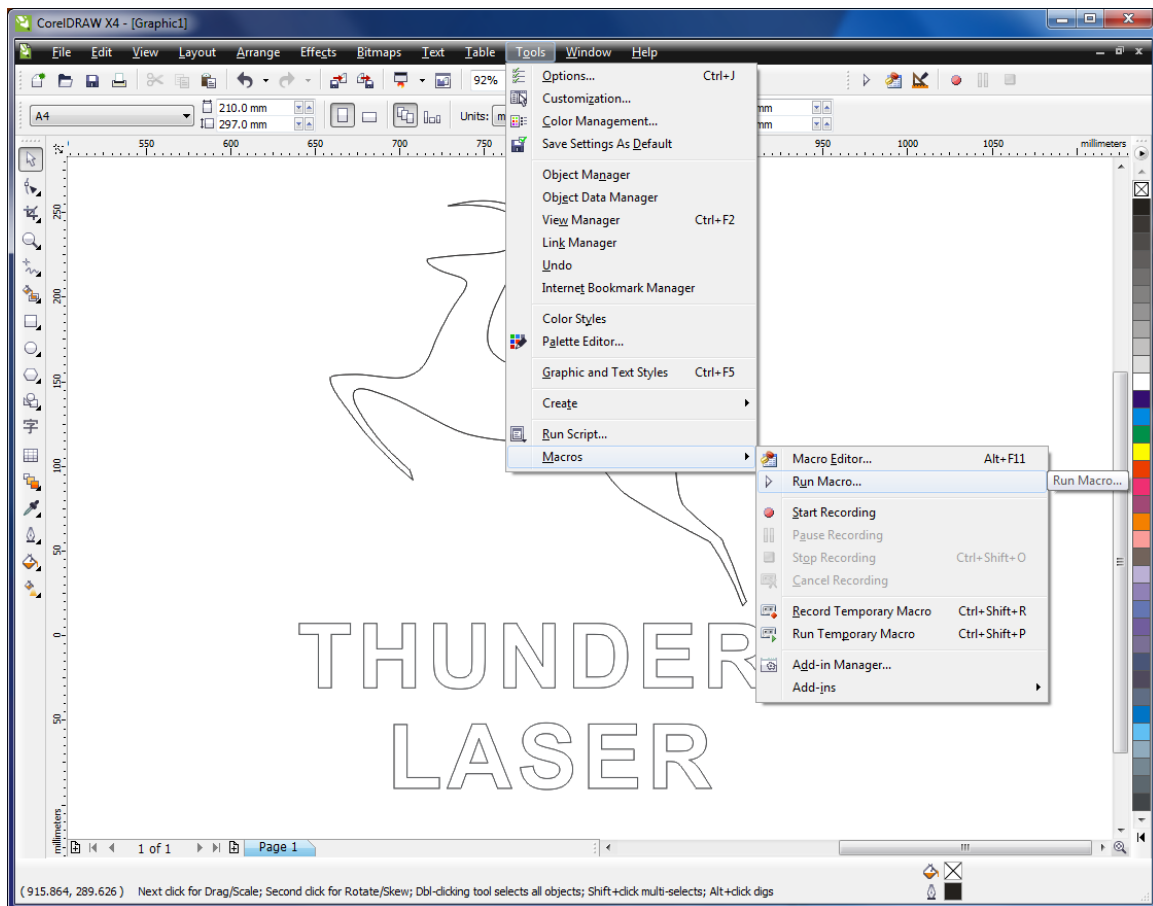
Add Plug-in to CorelDRAW

After installing the Plug-in, please start CorelDRAW to run it.

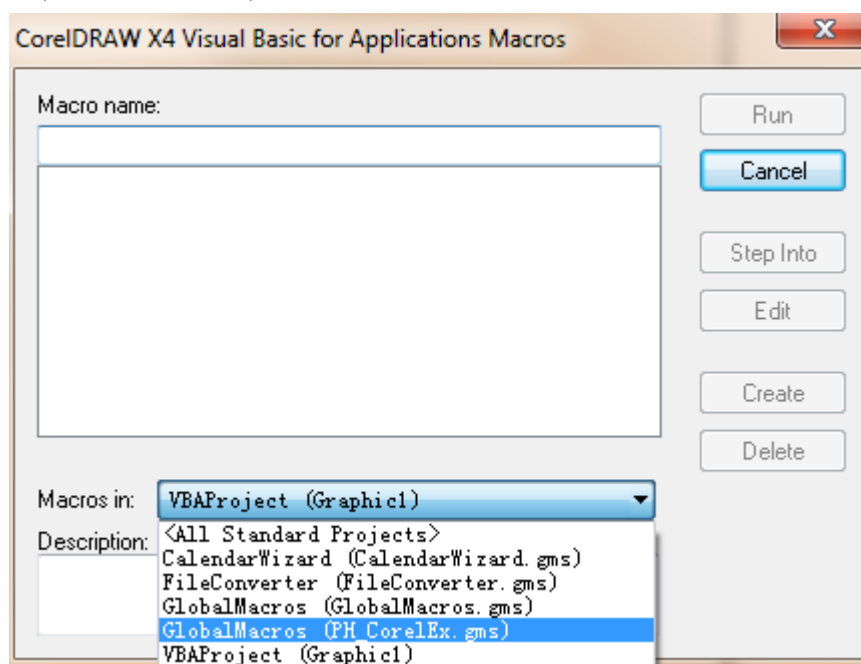




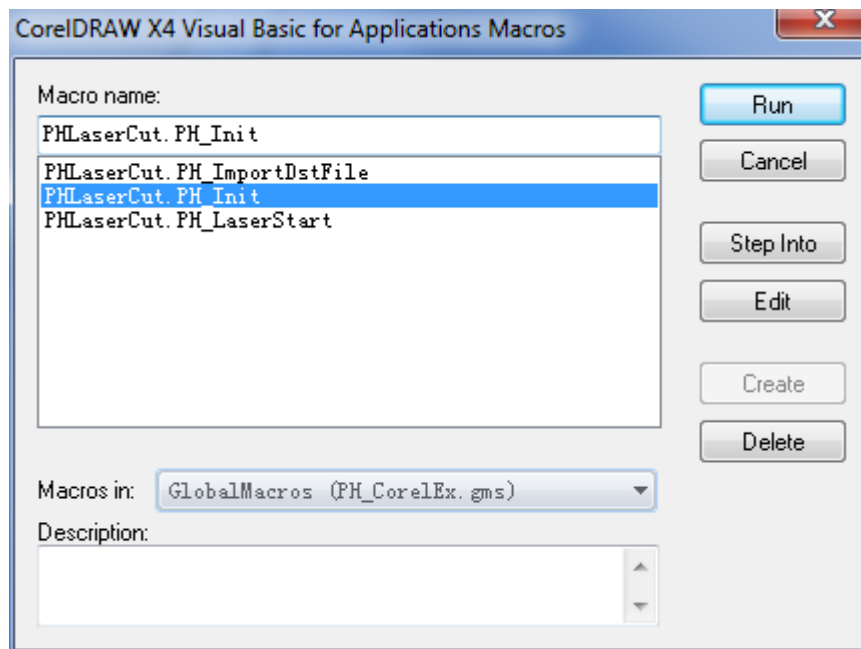
Click **Tools/Macros/Run Macro...**



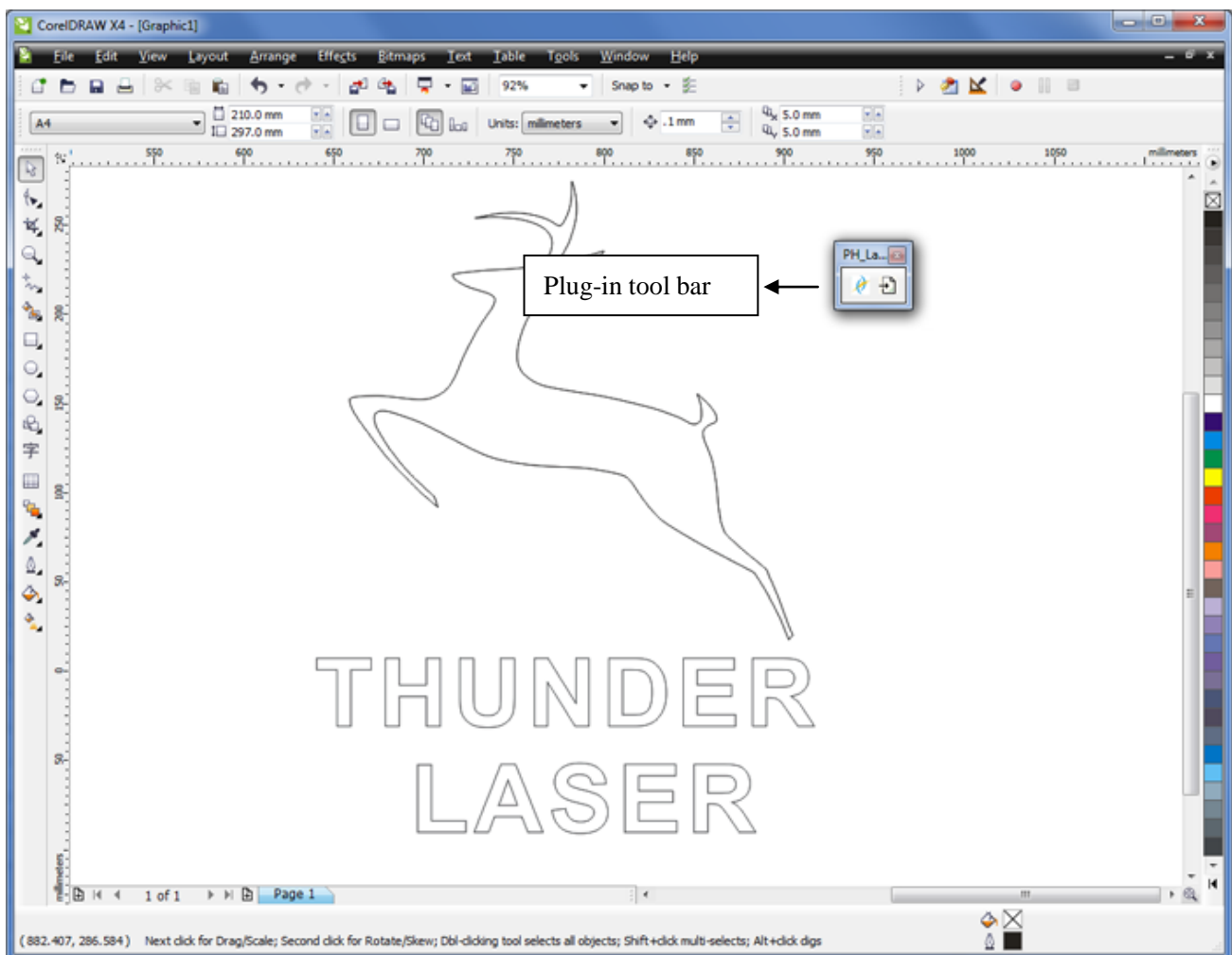
select GlobalMacros (PH\_CorelEx.Gms)



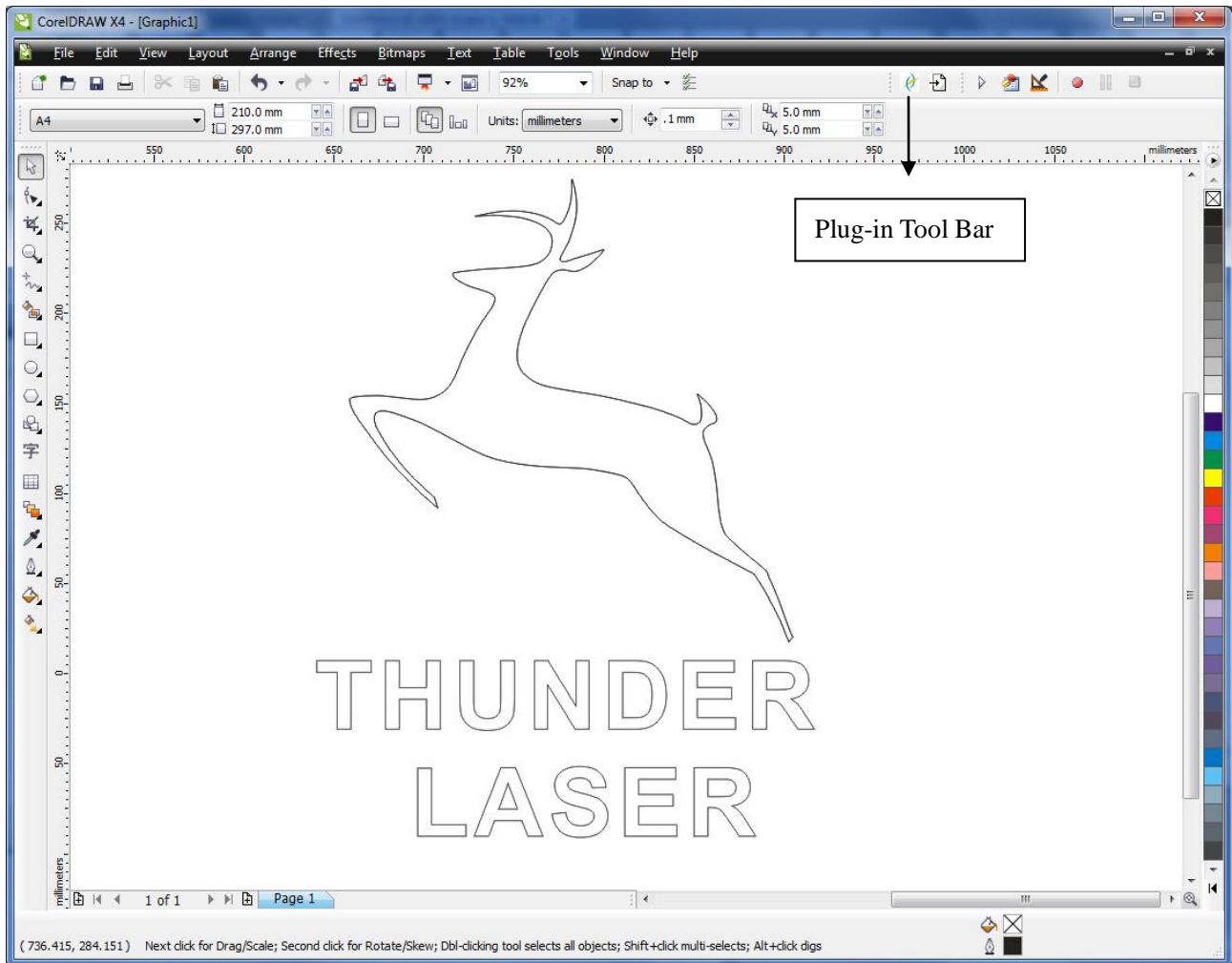
then select PHLaserCut.PH\_Init



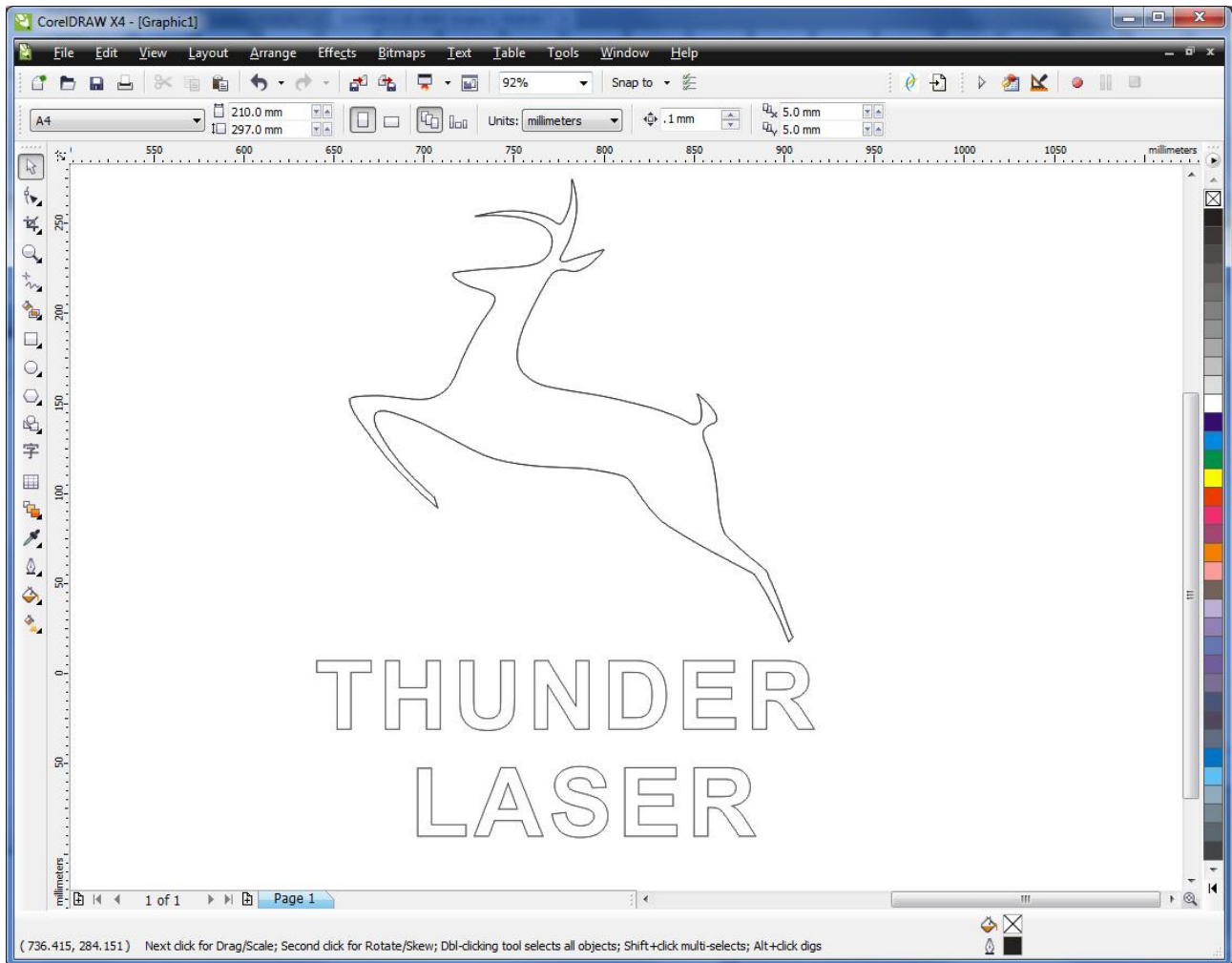
Now click **Run** to add the tool bar as below:




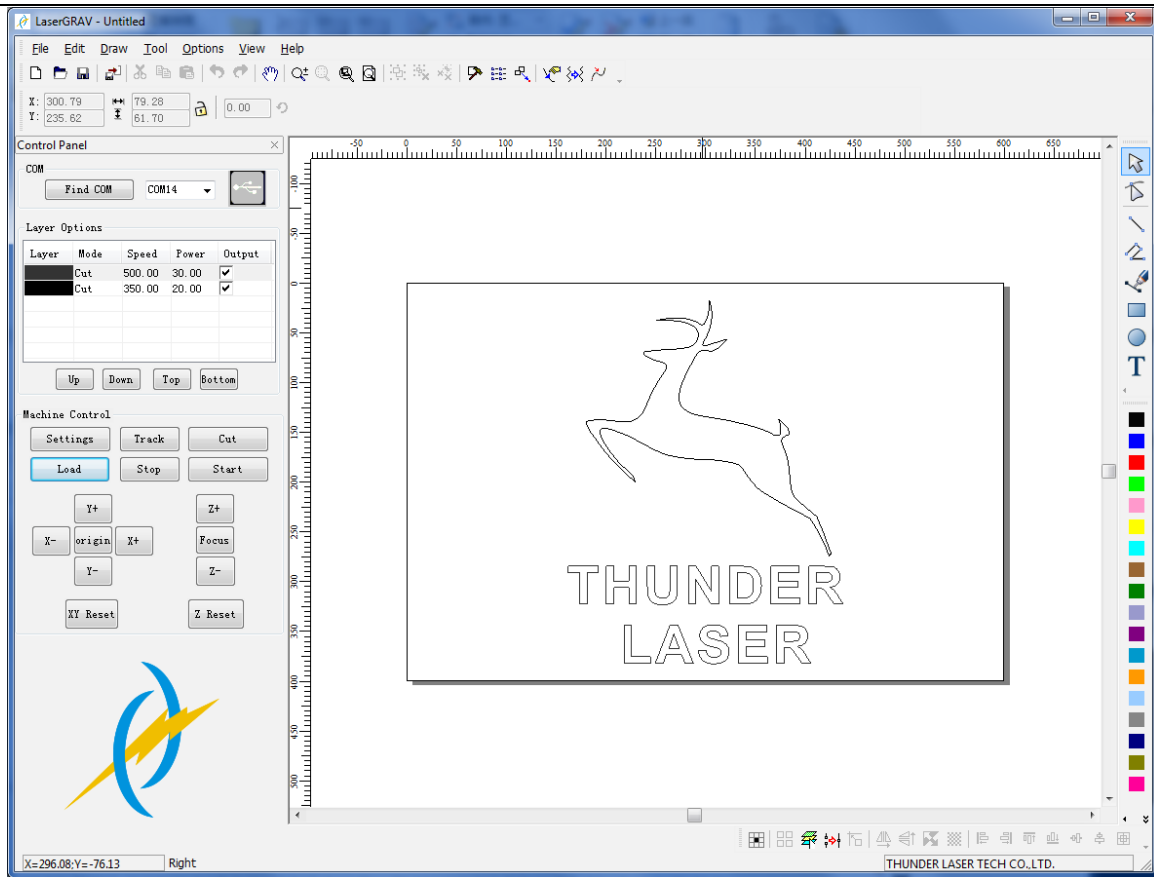
Drag **Plug-in Tool Bar** to where you want as below:



## Create jobs in CorelDRAW



Then click  to switch to LaserGRAV as below:



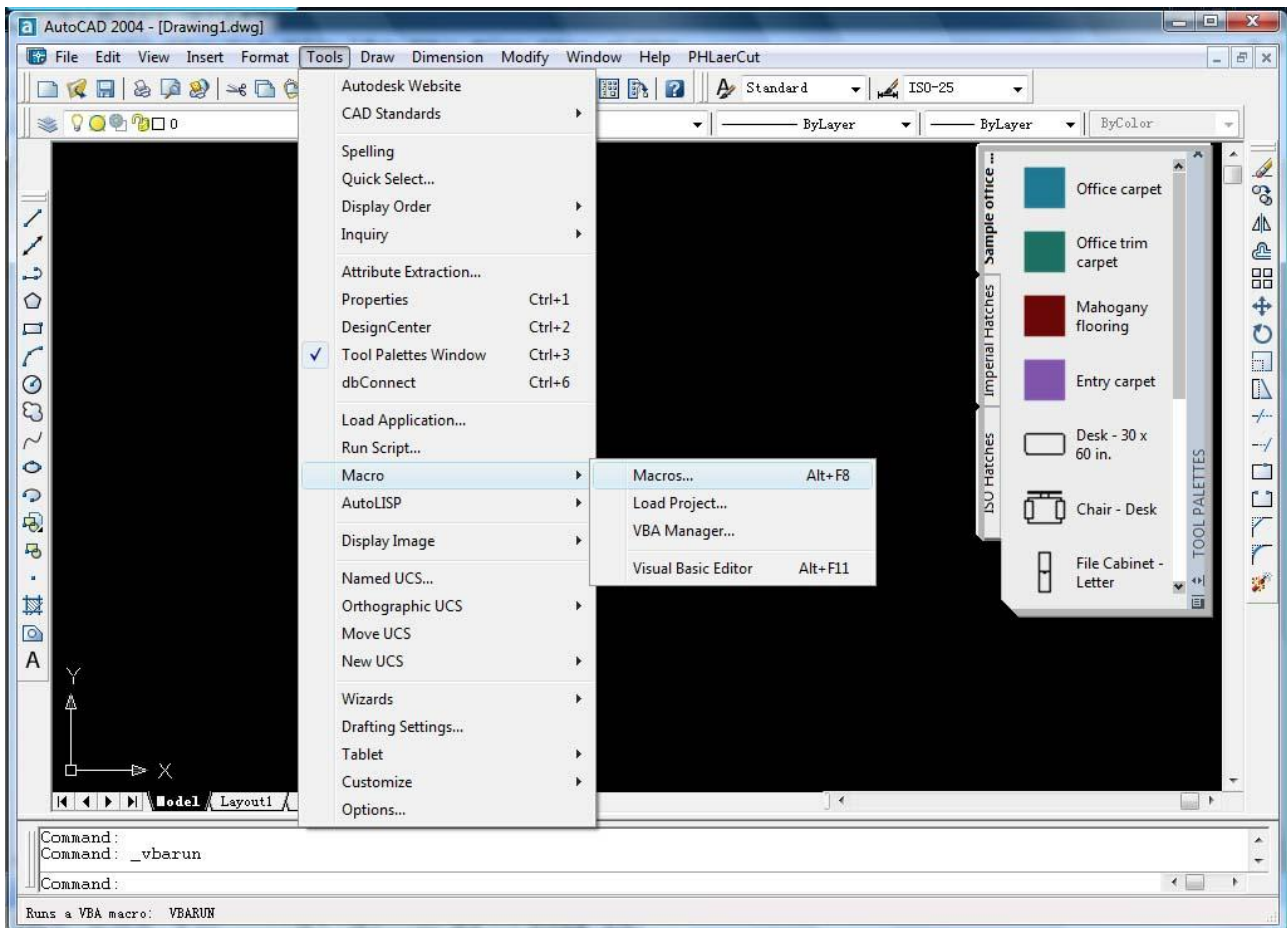
Now you can use LaserGRAV to do the settings for your work.

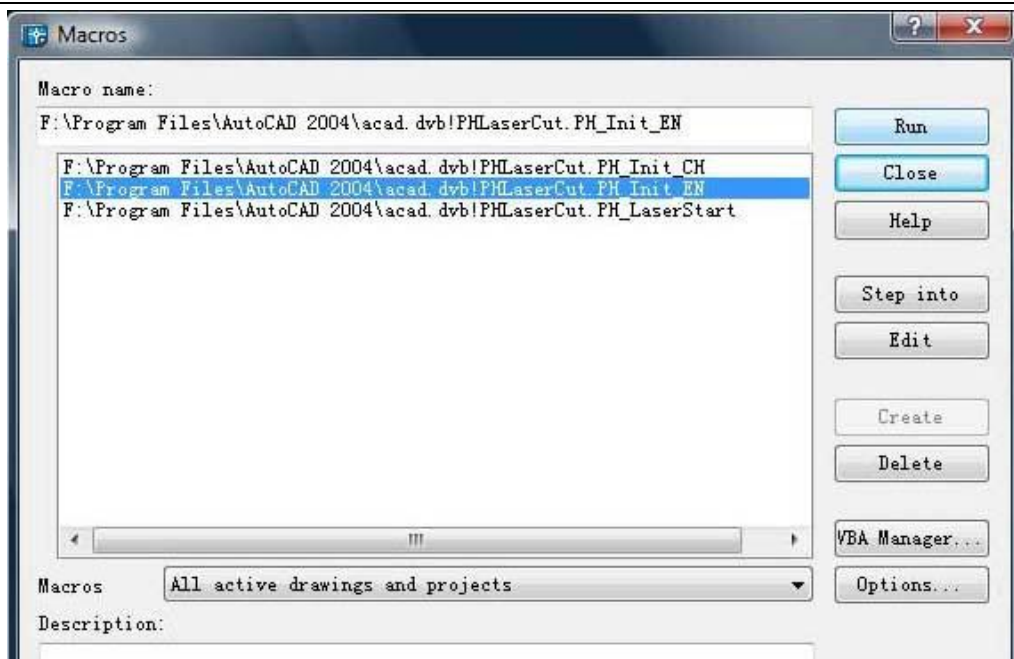
## Chapter 6 - AutoCAD Plug-in

### Add Plug-in to AutCAD

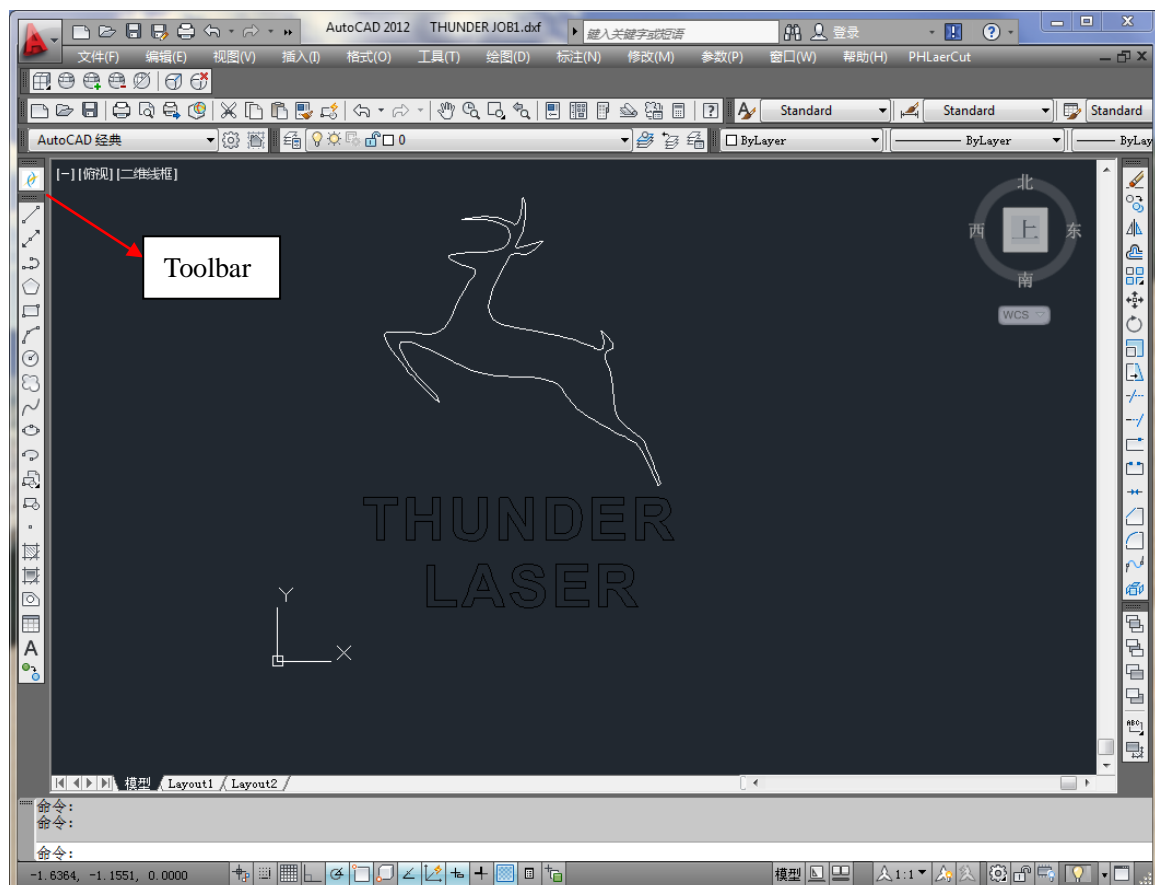
After installing Autocad Plug-in, there should be a Toolbar  on the left. If not, user can add by themselves as below:

Click Tools/Macro/Macros...

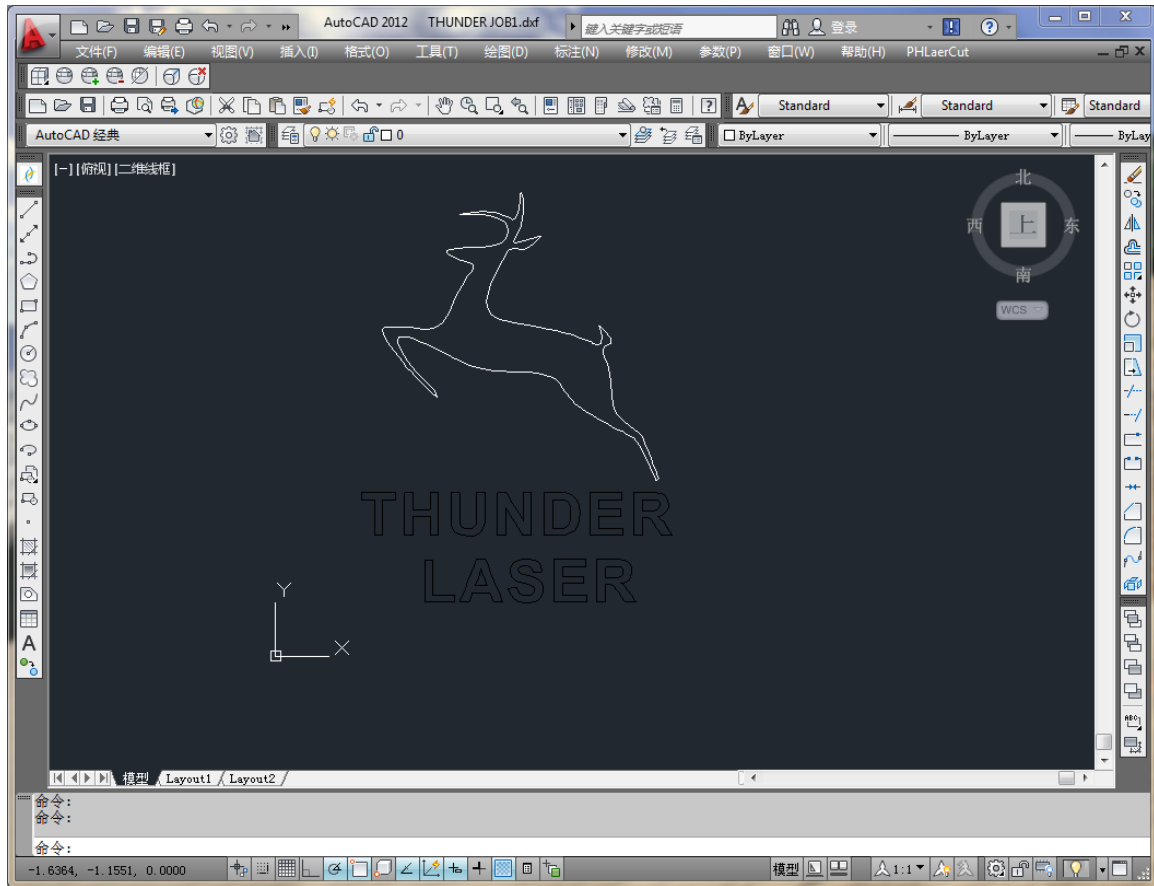





Choose "...PHLaserCut.PH\_Init\_EN" and click Run and then the toolbar will pop up as below:

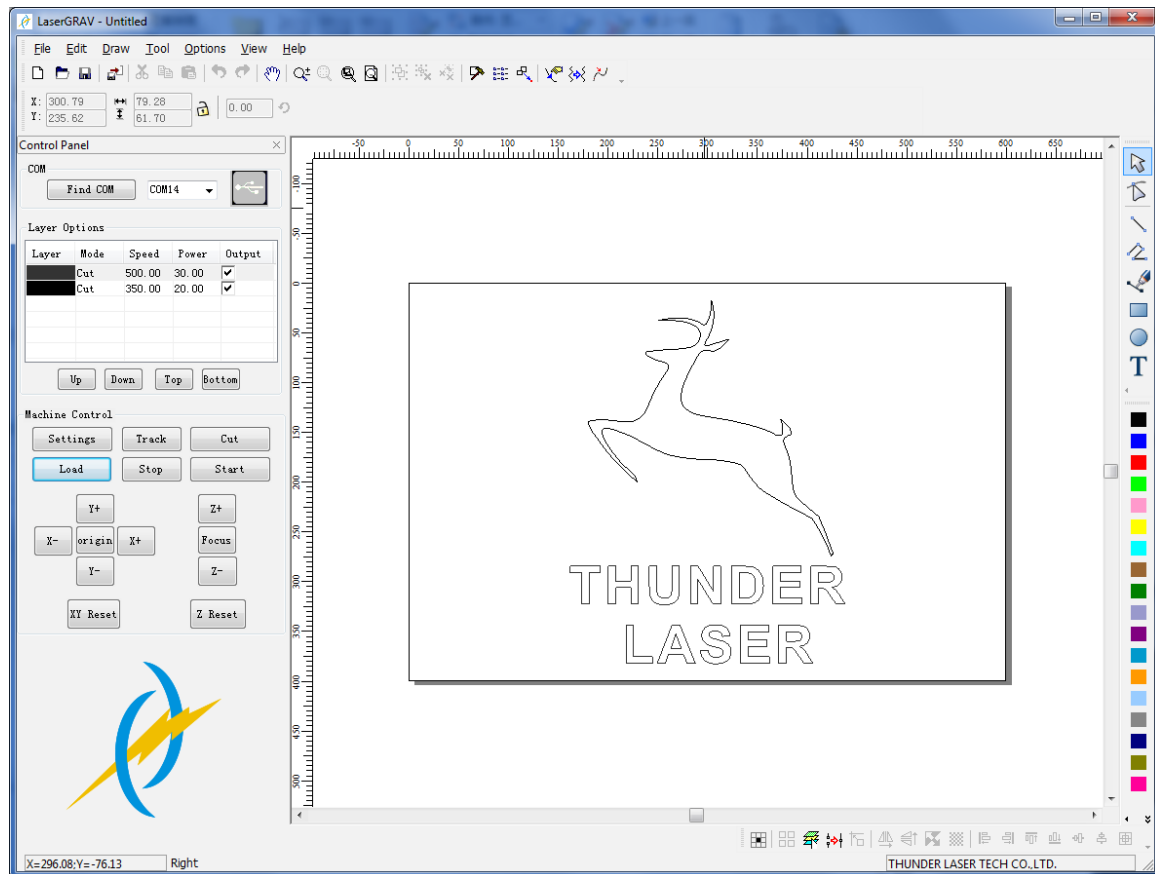


Now create your job in AutoCAD





Then click  to switch to LaserGRAV as below:



Now you can use LaserGRAV to do the settings for your work.