THUNDER LASER SYSTEMS SOFTWARE V4.43

USER'S MANUAL

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

Any differences are subject to the software

1.INTRODUCTION

1.1 INTRODUCTION OF LASER ENGRAVING AND CUTTING SYSTEM

This system control the laser machine by using computer.User will learn how to use the software to control the machine in this manual.

1.2 DIFFERENT VERSIONS OF SOFTWARE

There are three versions of software: independent version, CorelDraw based version, AutoCAD based version.

1.3 SUPPORTED FORMATS

Vector format: dxf, ai, plt, dst, dsb etc.
Bitmap format: bmp,jpg,gif,png,mng etc.

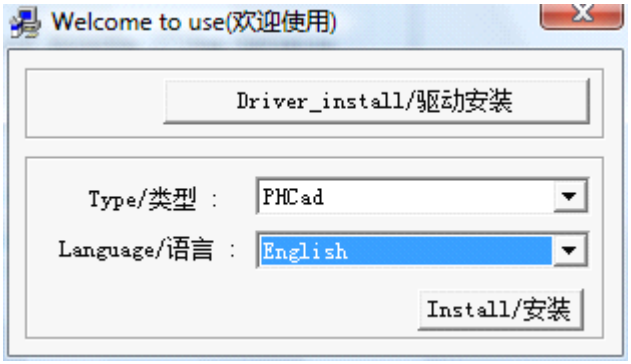
1.4 ENVIRONMENTAL REQUIREMENTS

1. Above PIII or PV recommended
2. Memory, above 1G recommended
3. Windows2000/XP/VISTA/WIN7
4. Support the software of CoreDraw11 and CorelDraw12，CorelDrawX3，CorelDrawX4 and AutoCad

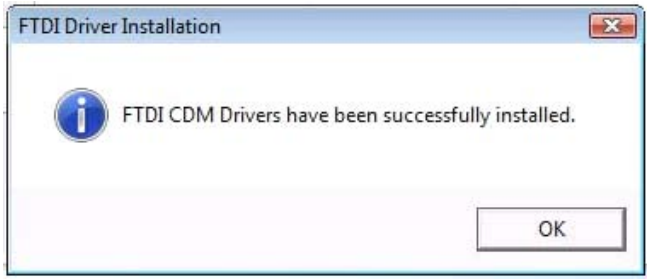
2. INSTALLATION OF SOFTWARE

2.1 INSTALLING PROCEDURE

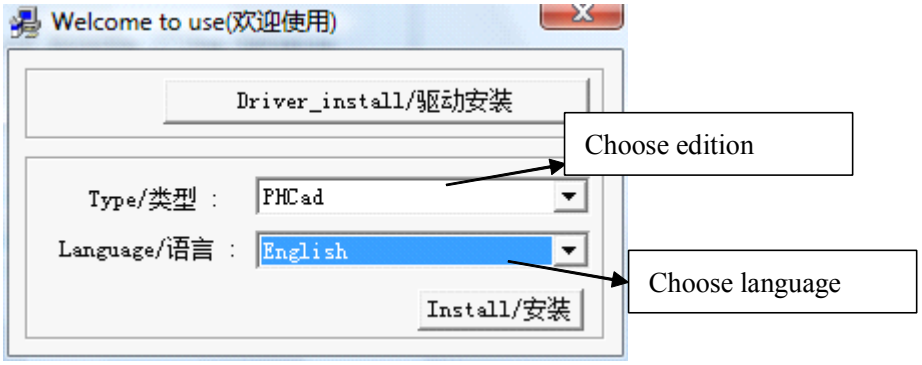
(1) Double click “Setup.exe” in the installation directory, the following dialog will pop up.



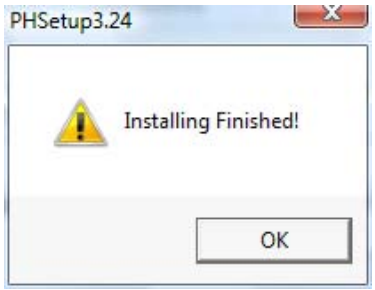
(2) Click “Driver_install”to install USB driver. The following dialog will pop up when USB driver is successfully installed.



(3) Choose version of software and the language you need. please refer to the following picture:



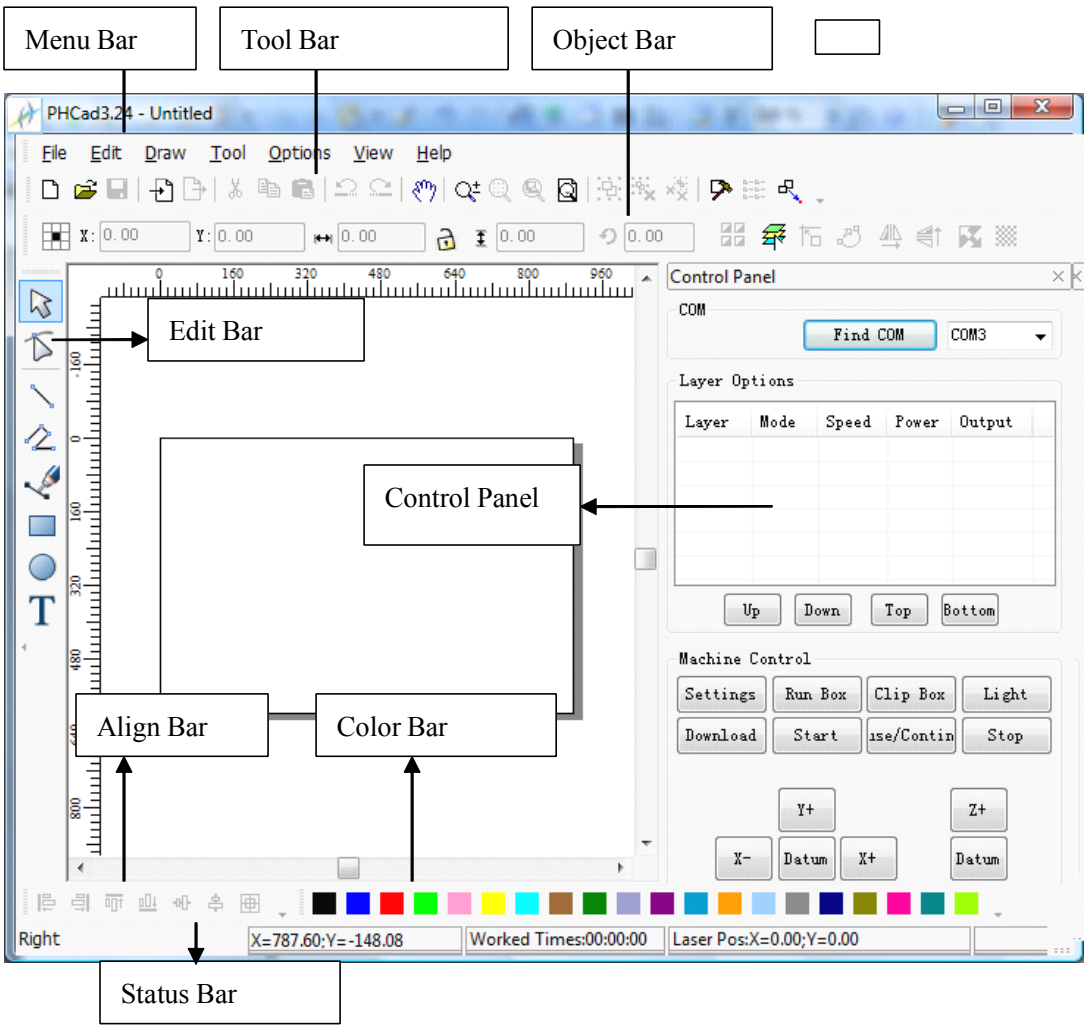
(4) Click “Install”to install laser software. The following dialog will pop up when software is successfully installed.



3. BASIC SETTINGS OF INDEPENDENT SOFTWARE

3.1 MAIN INTERFACE

The main interface will be as following after starting the software. Learn the basic settings of the software is an requirement of starting your work.



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: these most useful tools are selected from the menu bar.

Object bar: change the settings of the selected object.

Edit bar: on the left side of the work area. some of the most useful editing tools are put here to make operating easier.

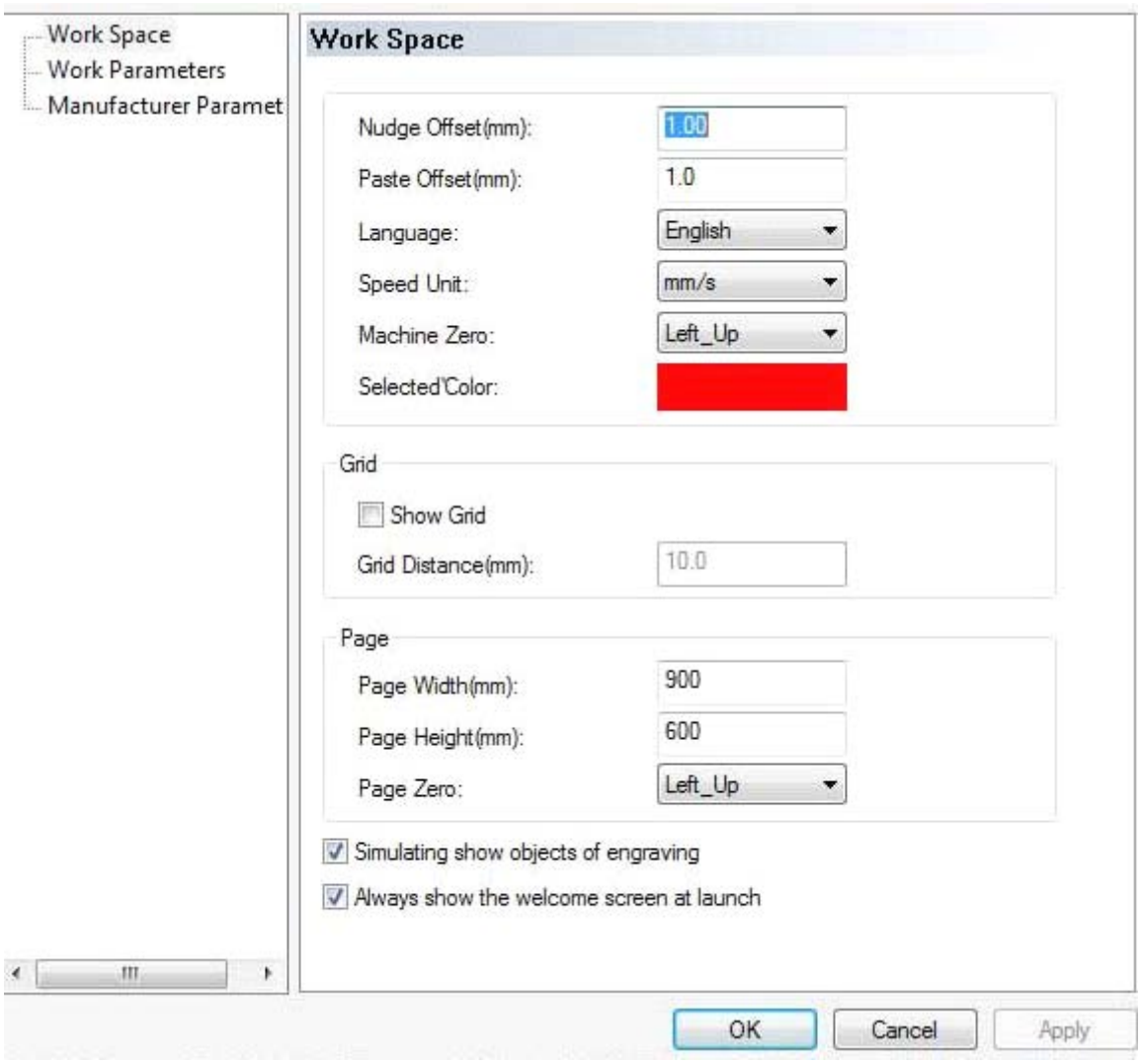
Align bar: to align multiple objects to make typeset easier.

Color bar: change the color of the selected objects.

Control panel: by using control panel, you can finish lots of complicated tasks, including settings communication port, settings of layer parameters, loading of graphs etc.

3.2 SETTING OF THE WORK AREA

Click option/system system option 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.

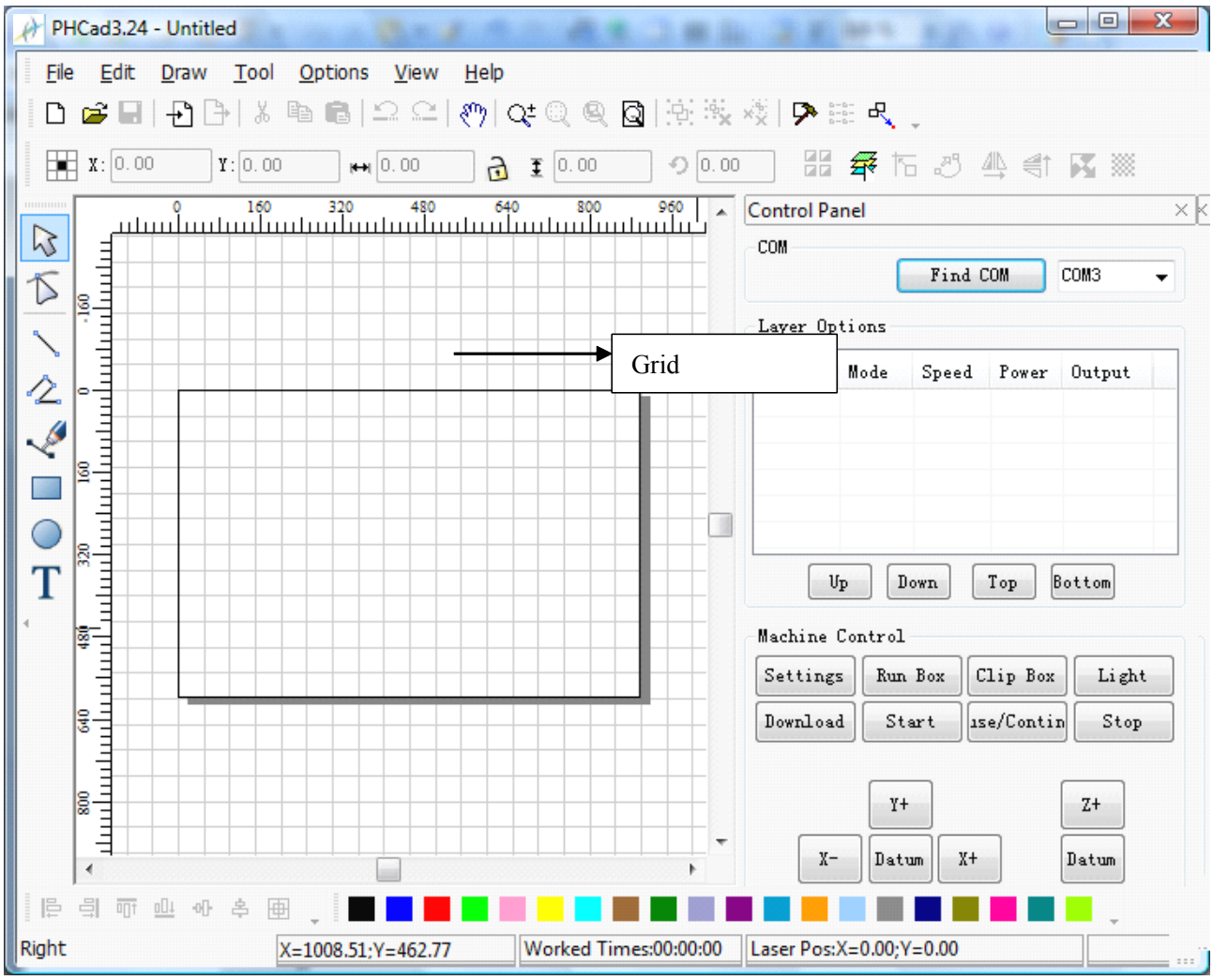
Language: choose the language you prefer.

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

Machine Zero: the zero point of the machine(limit point) must be correct, or the finished picture might be converse(pay attention)

Selected color:boder color of the selected object.

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



Grid distance: set the size of the grid you need.

Page width: set the width of the page,the default size is the same as the machine's X-axis

Page height: set the height of the page,the default size is the same as the machine's Y-axis

Page Zero:set the zero point of the page,the default setting is the same as the machine's zero point.

Simulating show objects of engraving:tick to use the function.

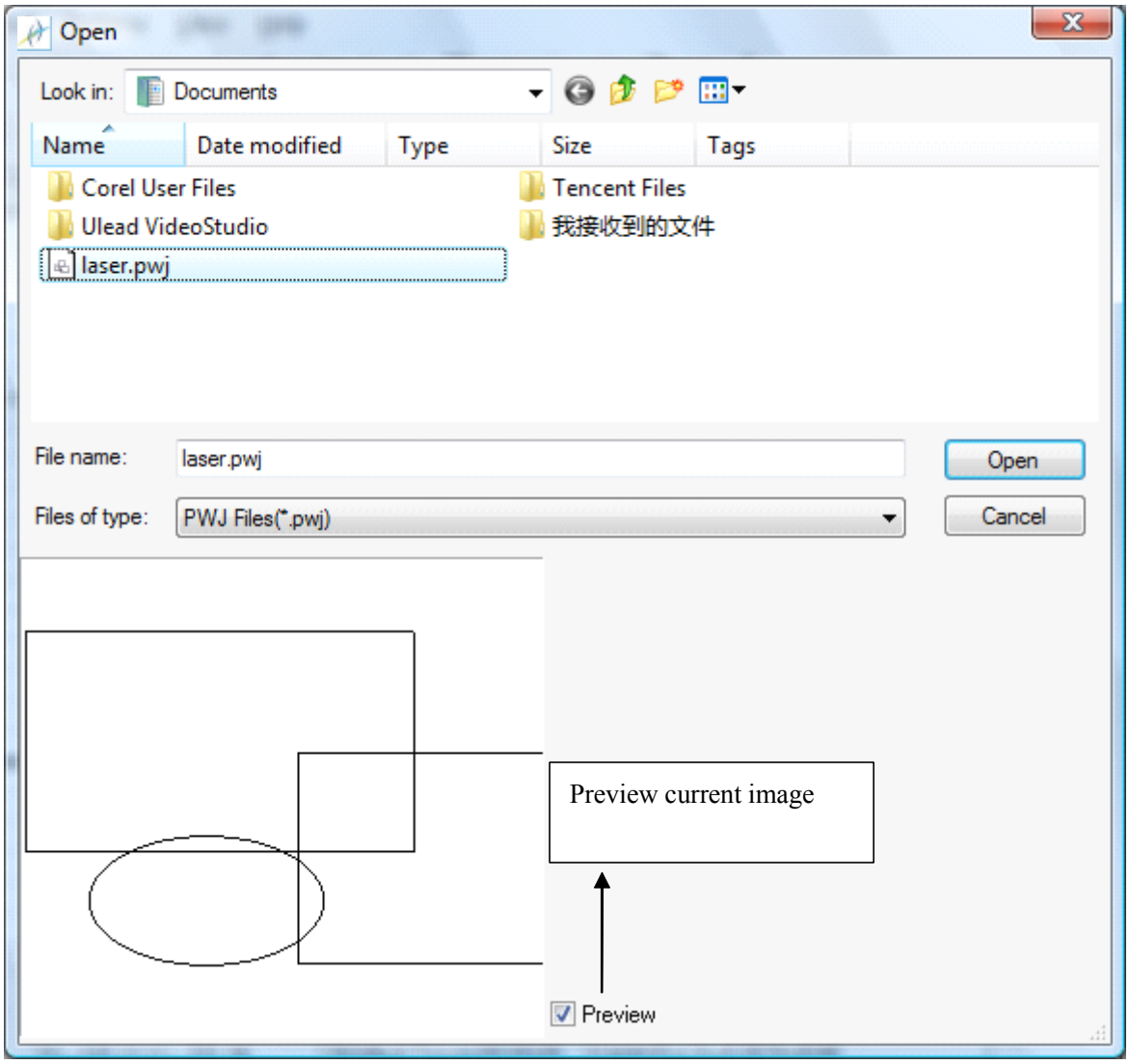
Always show the welcome screen at launch:tick to let it show.

3.3 OPEN AND SAVE THE FILE

The files will be saved in pwj format.the whole project will be saved safely in pwj format,this means all the information,including parameters of the layers and orders.save the imported files as pwj format will make your future work a piece of cake.

3.3.1 open the file

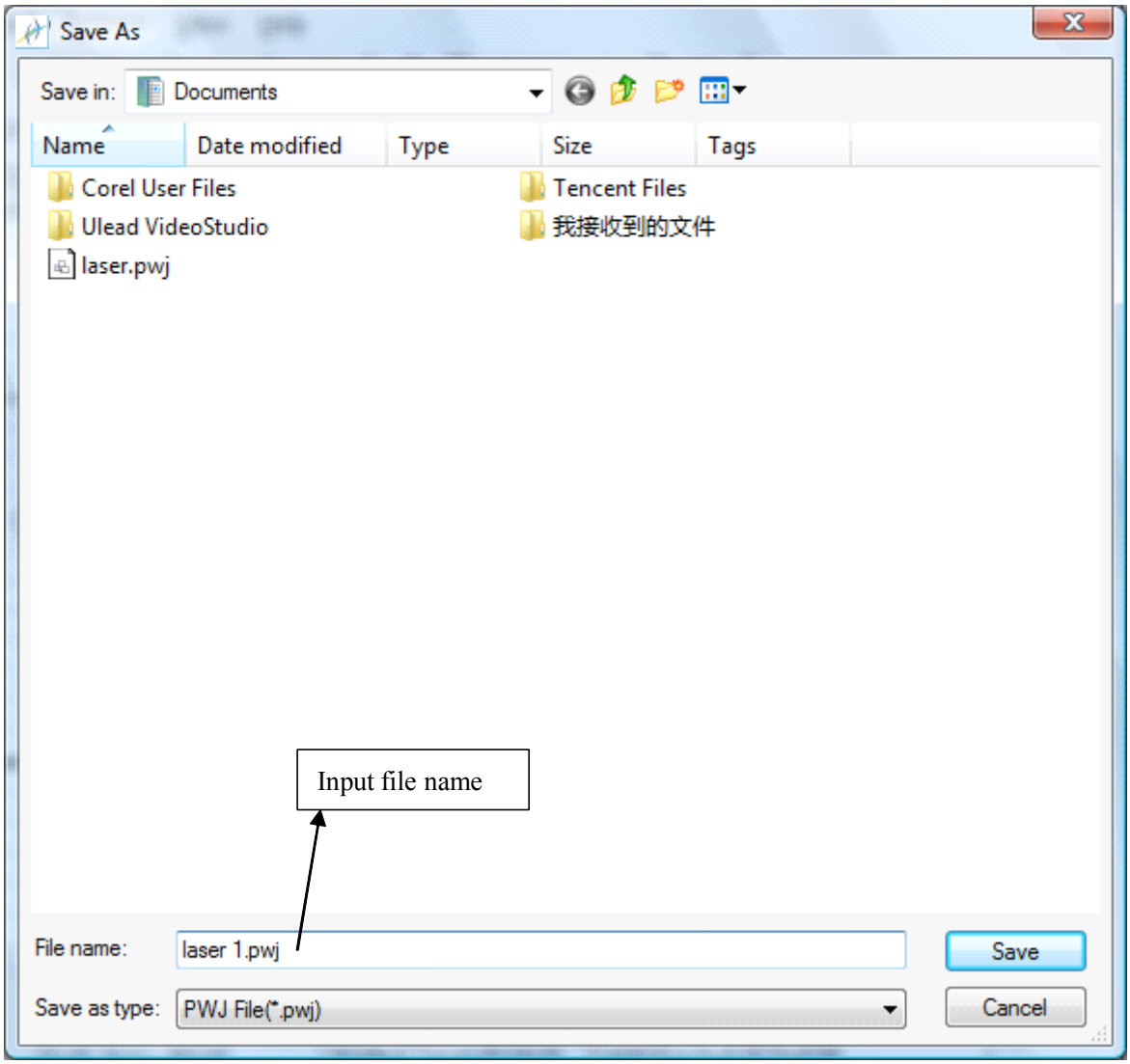
(1)click File/Open or click, the following dialog will pop up:



(2)select the file you want to open(ex:111.pwj)and click open.

3.3.2 save the file

(1)click , the following dialog will pop up:



(2)input the file name in the edit box and then click save.

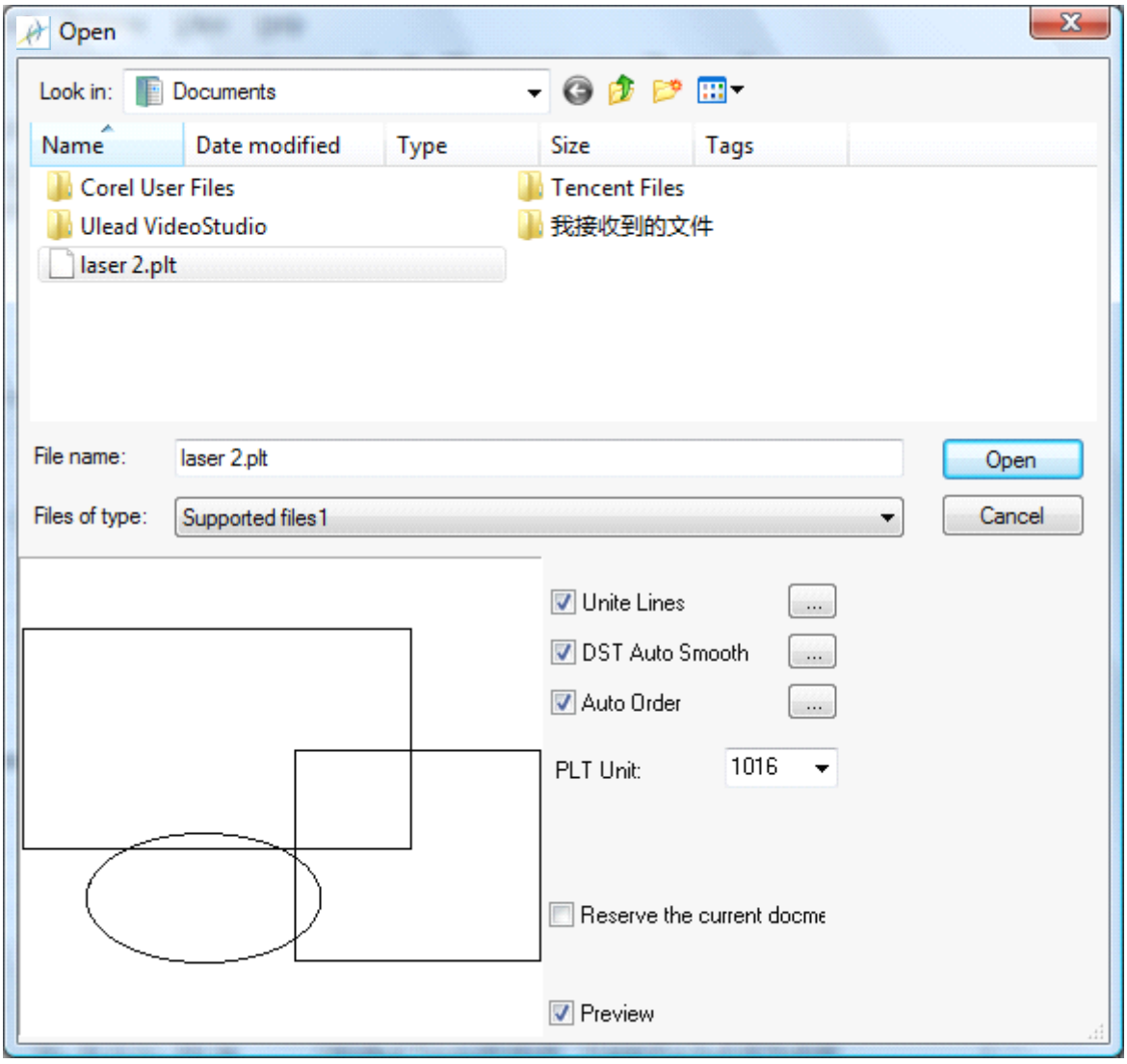
3.4 IMPORT AND EXPORT FILE

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 etc.

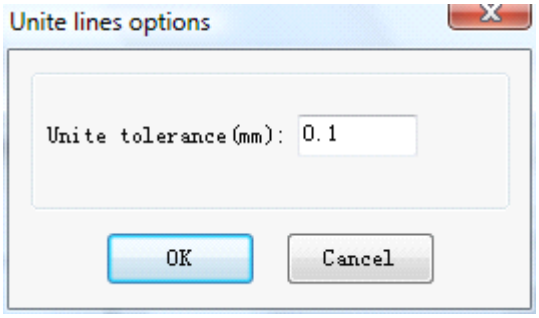
And you can also export files as plt format.

3.4.1 import file

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

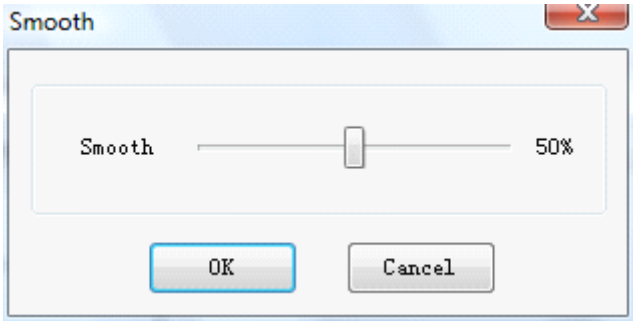


Tick Unite lines,when importing graphs, the software will combine the adjacent lines as one. You can click ... to set Unite tolerance as the following picture:



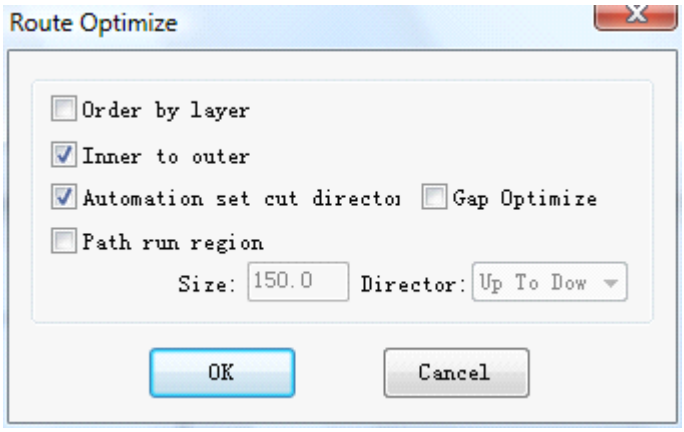
Unite tolerance: when the distance between adjacent lines is less than the combination tolerance,the lines will be combined as one.

Tick 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.

Tick auto order,arrange graphs orderly when importing files(thus the laser will work orderly).click  to set the rules of arrangement as the following picture.



Tick Order by layer,layers of the same color will be lasered in succession(the machine will first laser layer of the same color and then laser another color)

Tick Inner to outer,the machine will cut from Inner to outer.

Tick automation set cut directions,the machine will set the starting points and directions for the target graphs automatically.

Tick path run region,the graphs will be arranged by the set directions.this is function is usually used to arrange

graphics array(circular array, rectangular array).
PLT Unit, length unit, the size of the imported graphs will be differ according to the setting of the PLT unit.
Tick reserve the current document data, when you import another file, the former file will be reserved.
Tick preview, preview the file you select.

3.4.2 Export of the file

Click File/export or click  to save the files in PLT format.

3.5 DRAW SIMPLE GRAPHICS AND EDIT NODE

3.5.1 Draw simple graphics

Draw a line

Clic 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

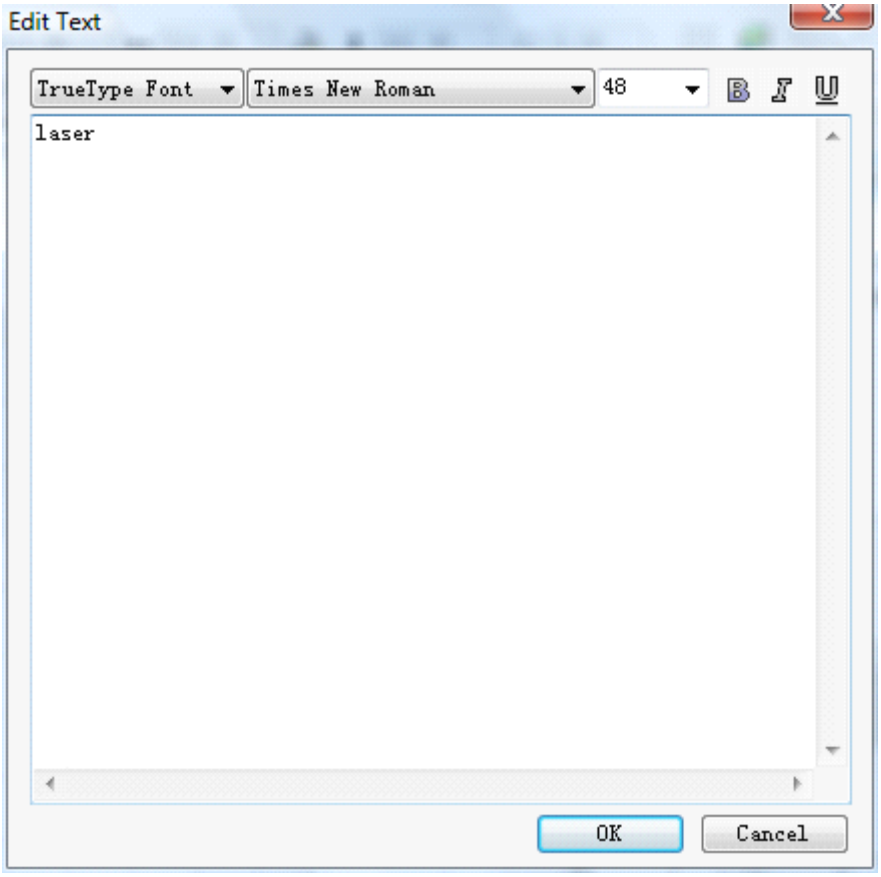
Click Rectangle in draw menu or  in edit tool bar to draw Rectangle.Press “Ctrl”to draw square.

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



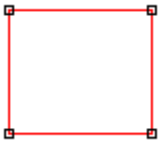
Choose font and choose the size of the character and then input the text the click ok.

3.5.2 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.

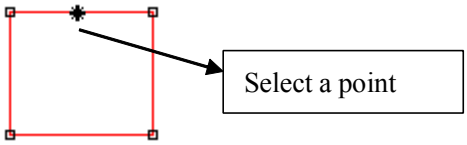
Select object

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

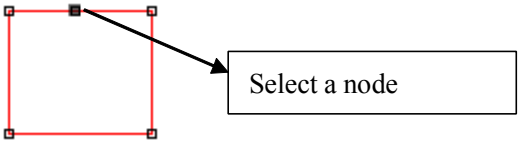


Point in the selected object

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



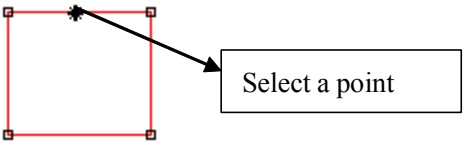
Click the node"■" of the selected object as below



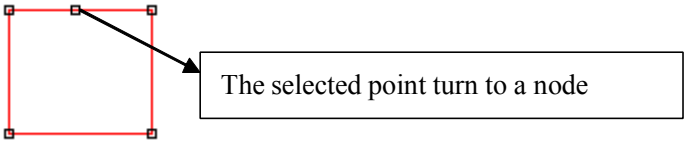
PS:press "shift" to select more than one node.

Add node

Select a point as below:

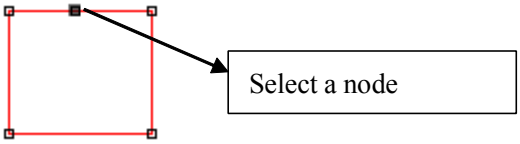


Then click add node in edit menu or click  in edit object bar to add a node as below:

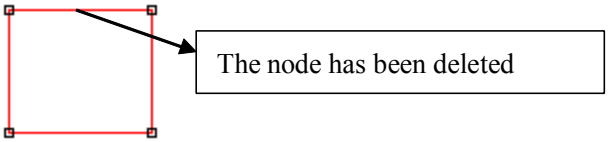


Delete node

Select a node as below:

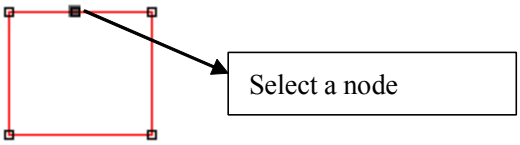


Then click delete node or  in the edit object bar to delete a node as below:

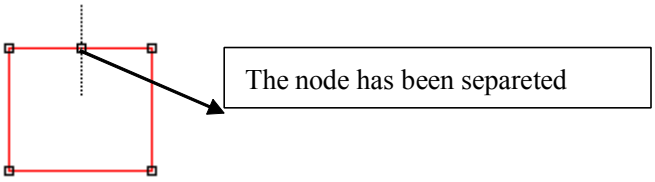


Separate node

Select a node as below:



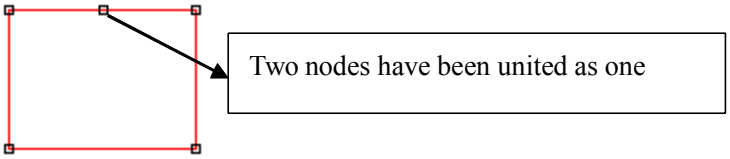
Then click separate node or  in the edit object bar to separate a node as below:



unite node

Select two node as below:

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



3.6 SELECT OBJECT

When the object is selected, there is a "×" 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.

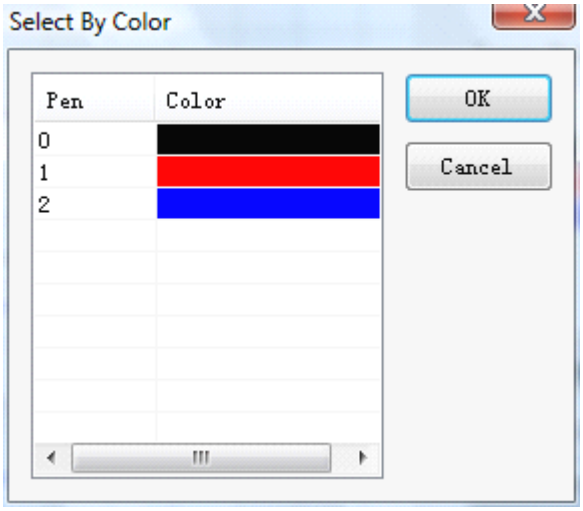
Add selected objects/reduce selected objects

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.

3.7 COLOR OF AN OBJECT

Select an object and then click

to change the color of an object.

3.8 CHANGE AN OBJECT

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

3.8.1 Mirror

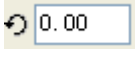
Reverse an object horizonlly or vertically

Click  in edit object bar to reverse an object horizontally

Click  in edit object bar to reverse an object vertically

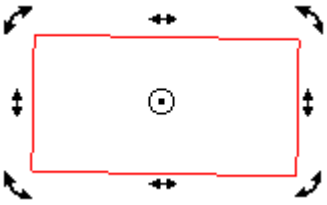
3.8.2 rotate an object

There are two ways to use this function:

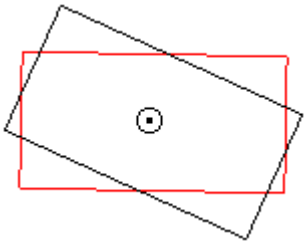
(1)use 

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

(2)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.

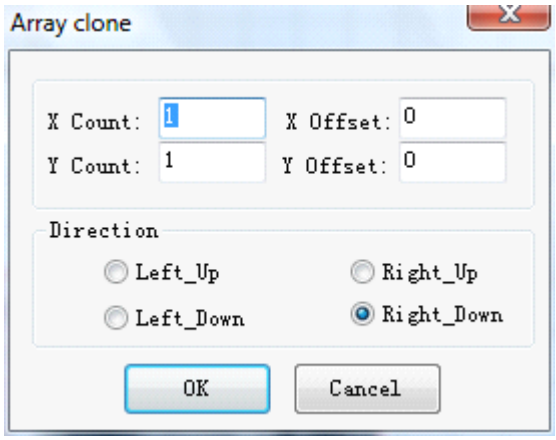
3.8.3 change the size of an object

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.

3.8.4 Copy the objects by array

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



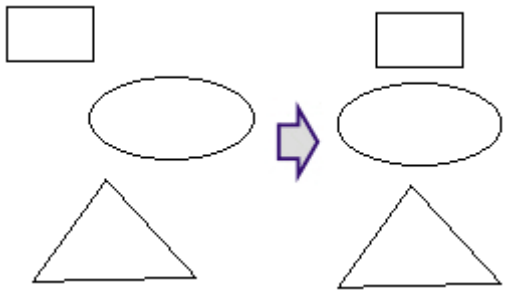
Input the number you need and click ok.

3.8.5 move an object to original position

Select an object and click  in manage object bar to move the object to original position.

3.9 ALIGN OBJECTS

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



3.10 GROUP OBJECTS

User can group multiple objects as one object as below:

(1) select the objects

(2) click  in tool bar to group the objects

(3) now objects of the same group will move together.

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

3.11 ZOOM THE VIEW

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.

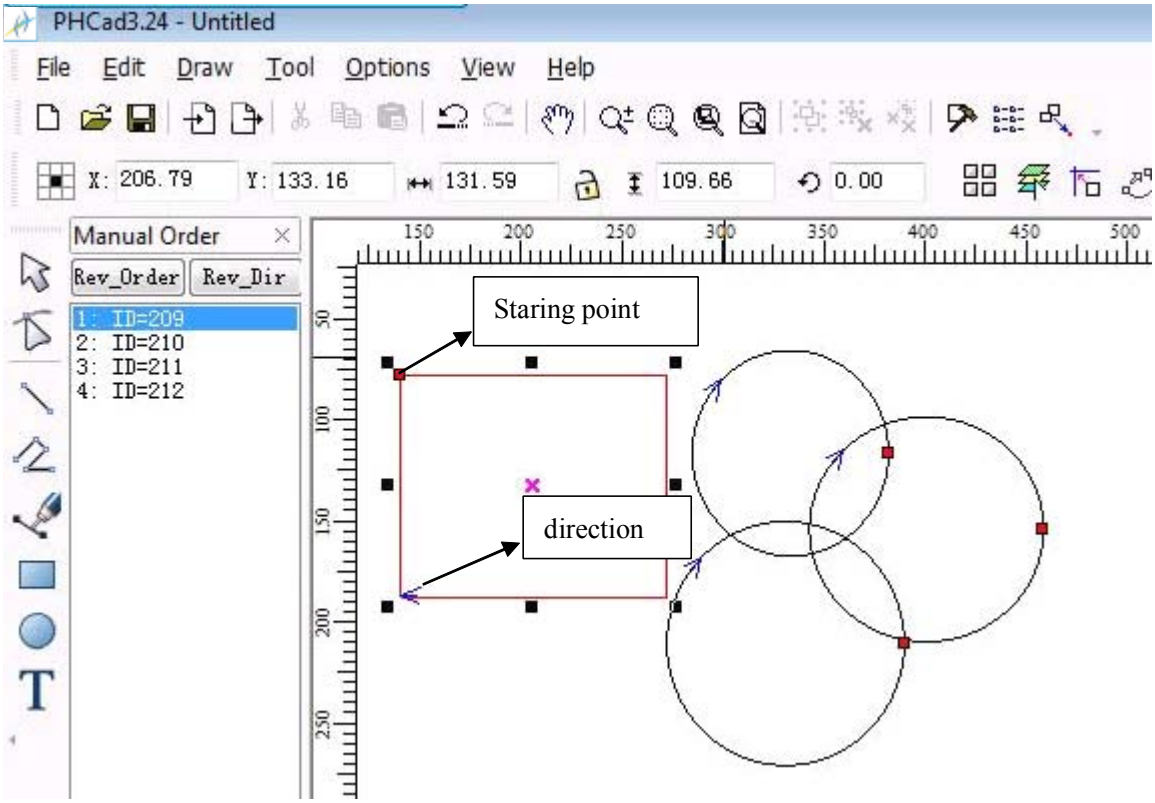
Click  to view the whole page.

3.12 IMPORTANT TOOLS

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

3.12.1 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

(1)Drag the Item in the order list to change the cutting orders.

(2)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 staring point.

Change the cutting direction

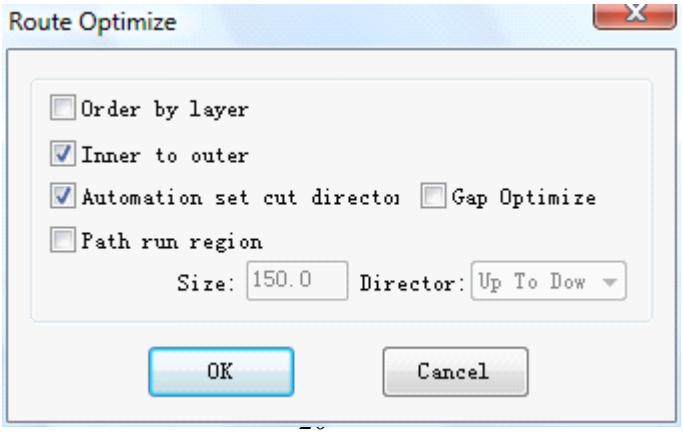
The cutting direction is showed as ⇜.User can click Rev_Dir to change the direction.

3.12.2 Automatic order

Automatic order is used to arrange all objects automatically.By using this function, user can find the best way to finish the work.

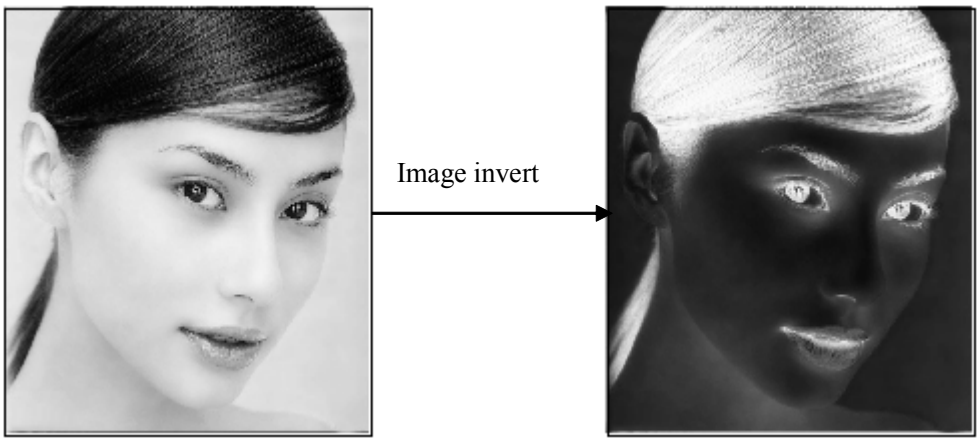
Click automatic order in tool menu and the following dialog will pop up:

You can tick the items to use different functions.



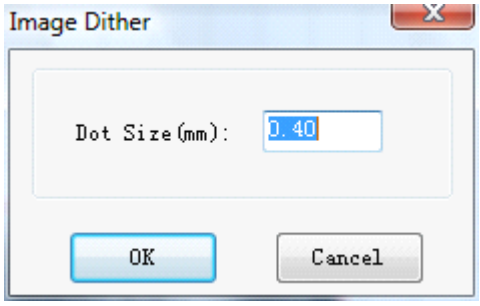
3.12.3 Image invert

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

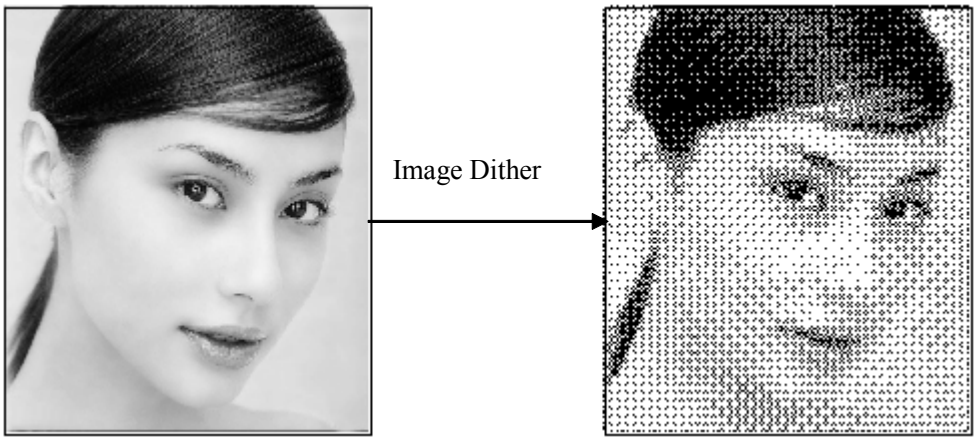


3.12.4 Image Dither

Selet the image and then click  in Tool Bar and a dialog will pop up:



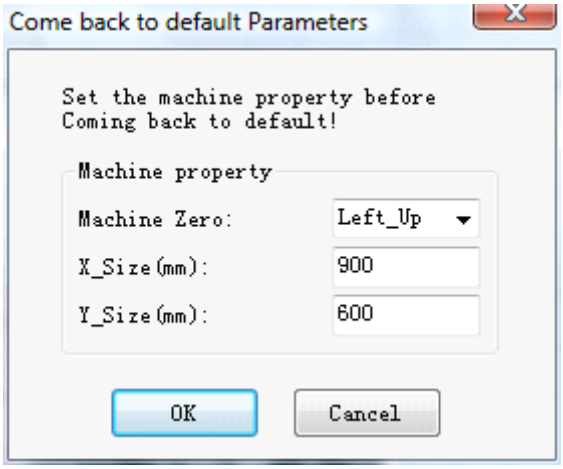
Input the Dot Size you need(the smaller the higher resolution) and then click OK.



3.13 Default Parameters

When the parameters are irrational, 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 size of X/Y axis, then click ok.

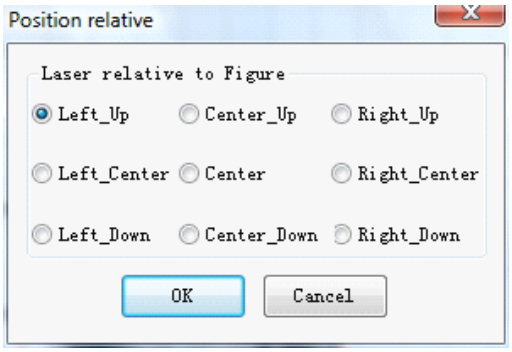
PS: the size of X/Y axis must be the same with the actual size, or the size of the image may be different with the actual work.

4. LASER SETTINGS

4.1 POSITION RELATIVE

Set relative position for work.

Click  to set relative position for work as below:



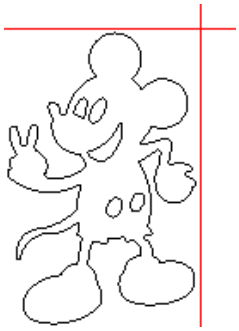
Choose the relative position to fit your work.

The default relative position (Left_Up) is the same as machine zero point.

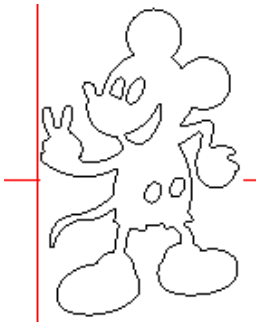
Look at the following examples to set relative position(the crossing point is the laser):

Left_up

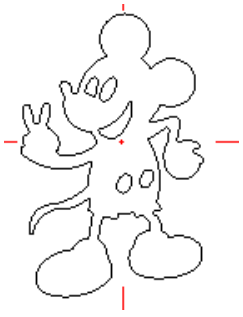
Center_up



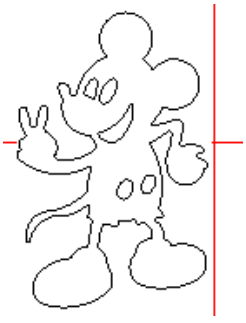
Right_up



Left_center



Center



Rgiht_center

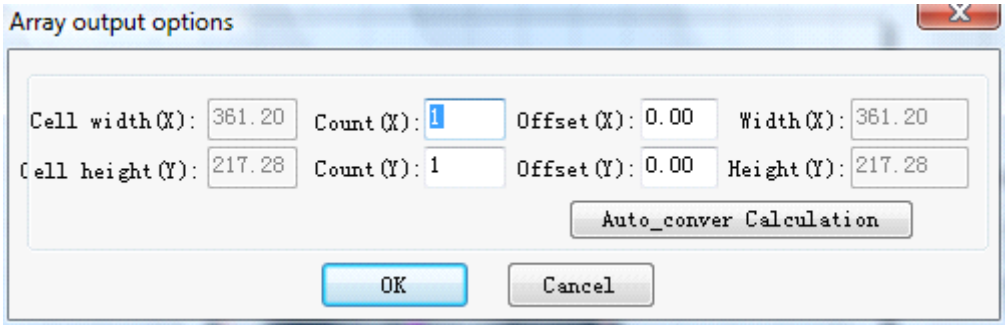
Left_down

Center_down

Right_down

4.2 ARRAY PARAMETERS

Click  to set array parameters as below:



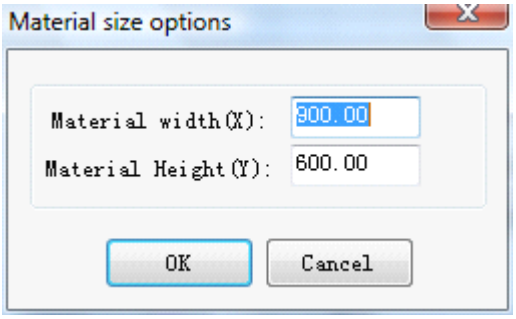
Cell width(X)/Cell height(Y): size of the object.

Count: number of the object you need.

Offset: interval of each object.

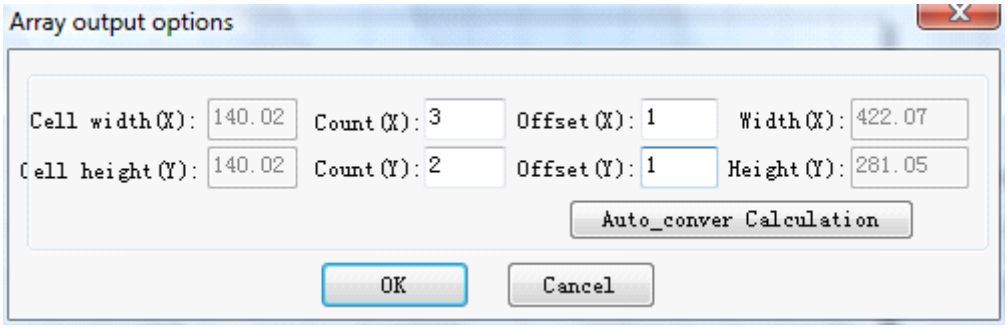
Width/Height: size of the whole work.

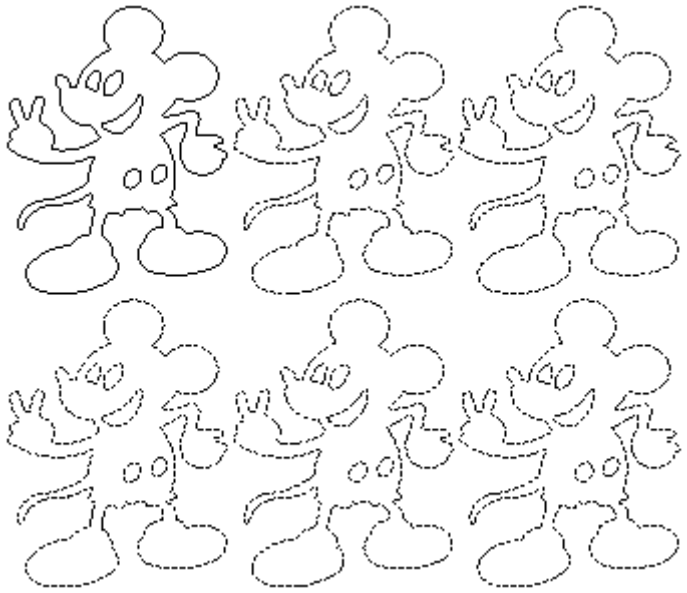
Auto_conver Calculation: machine will set the max objects to fill the work area.



Material width/height: size of the object.

Look at the following example:

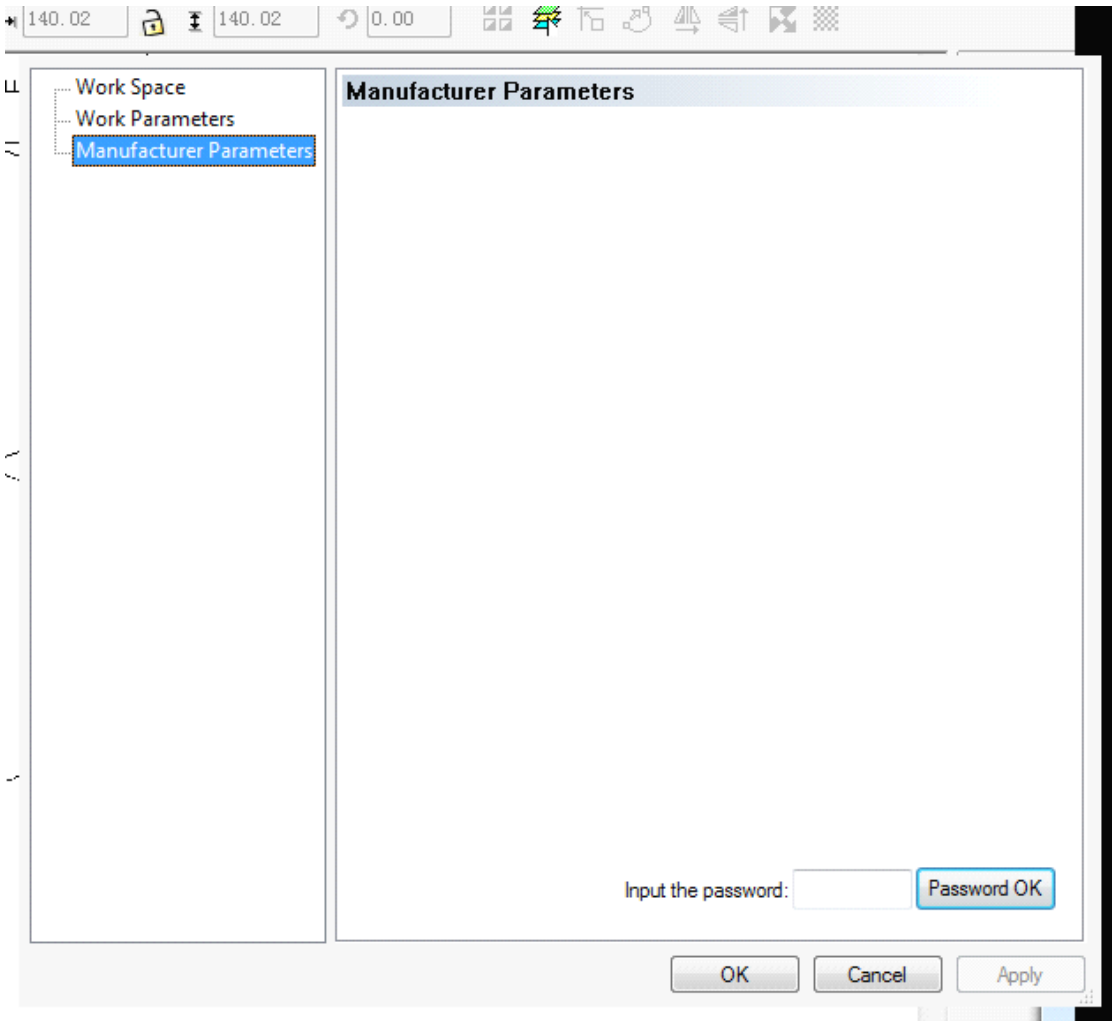




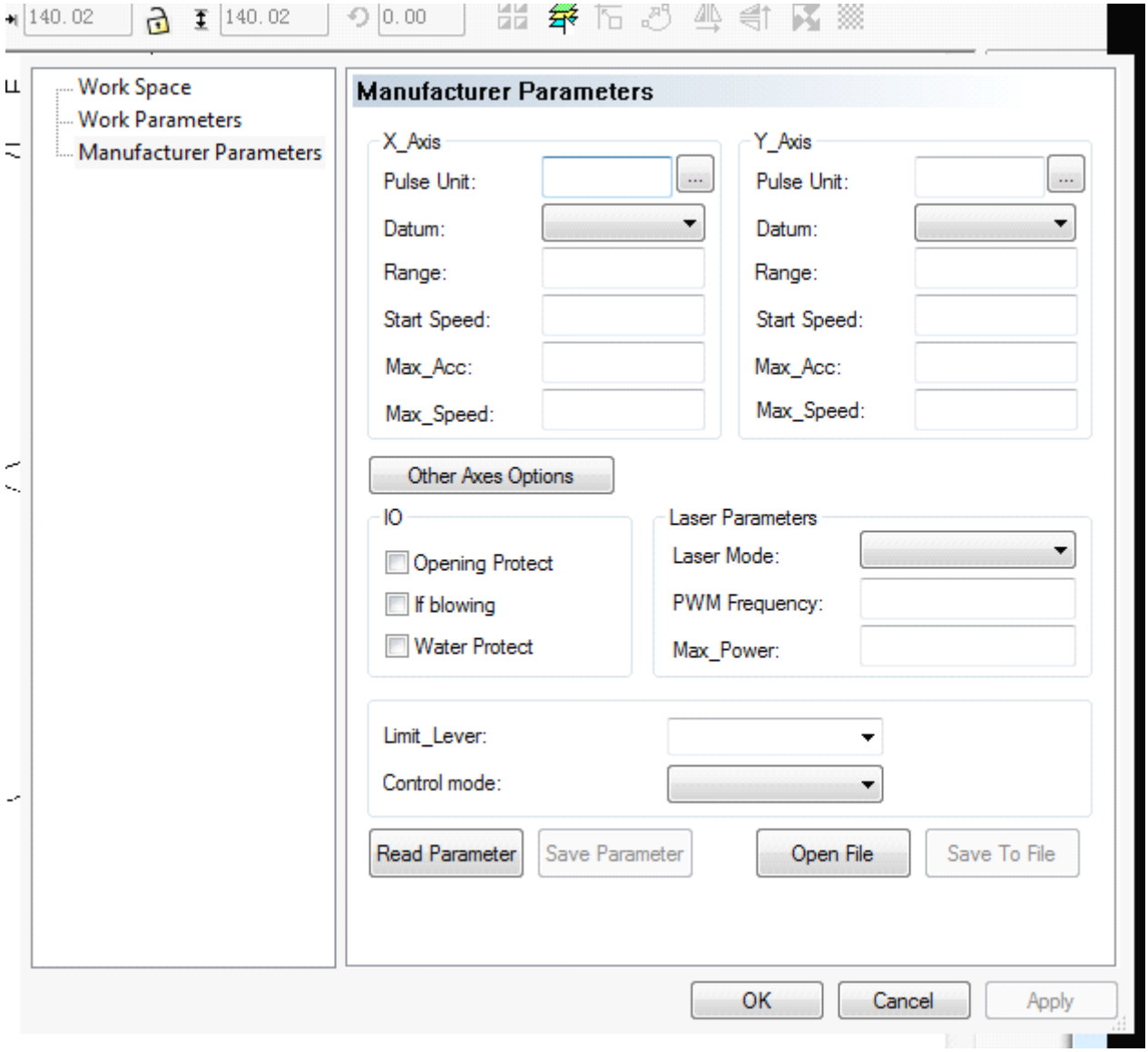
4.3 MANUFACTURER PARAMETERS

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: the password is "ph123"



Input the password to change the setting:

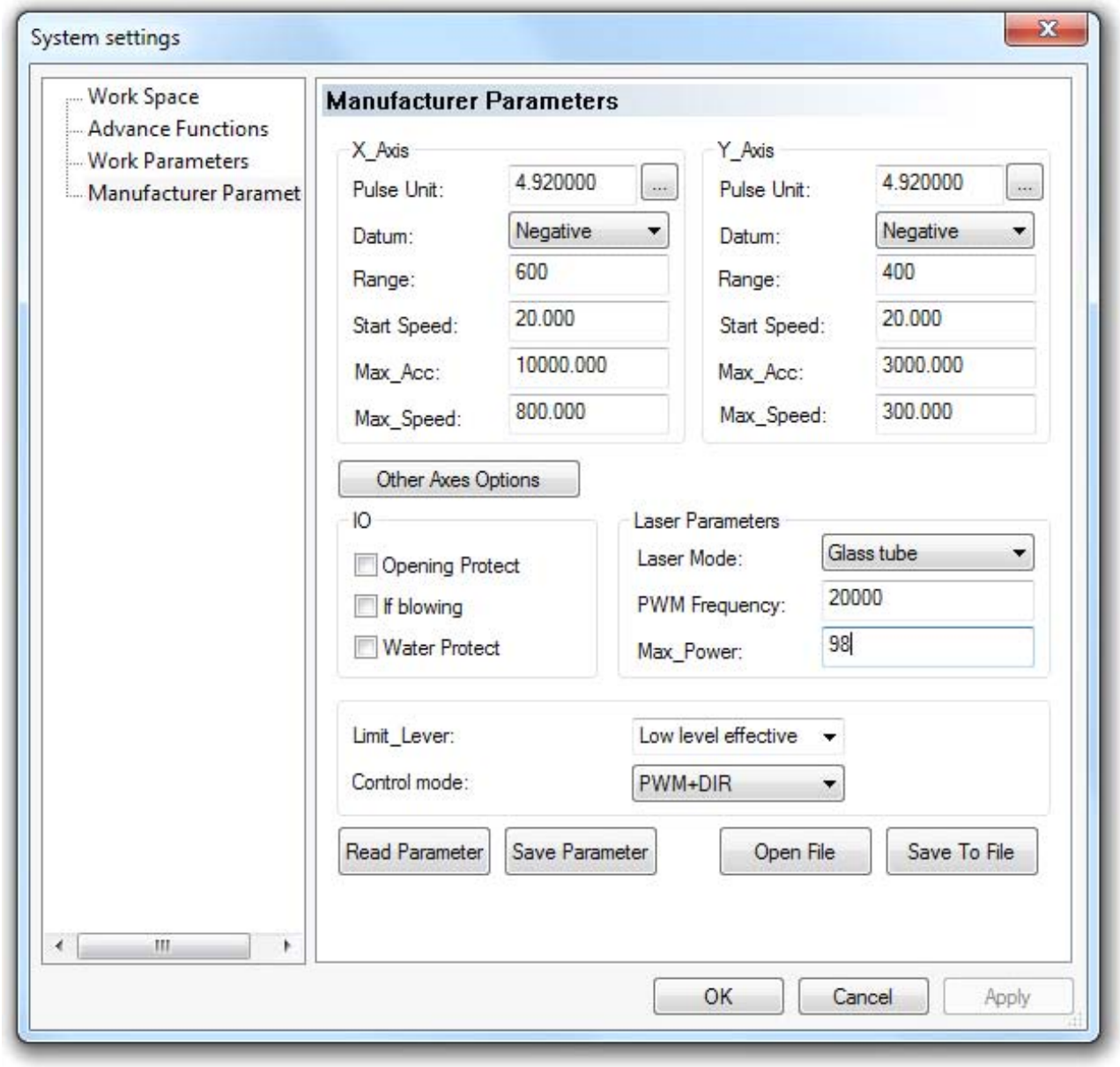


There are two ways to change the parameters:

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

Click Open File to read parameters and then click Save Parameter.

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



Click Read Parameter to show the default parameter.

Pulse Unit: send an pulse to control the machine. If this is not correctly set, the size of the image may differ with the actual work.

Datum: to set the axis direction of the machine.

Range: size of work area

Start speed: start speed of the machine.

Max_Acc: Max accelerate speed of the machine.

Max_Speed: Max speed of the machine.

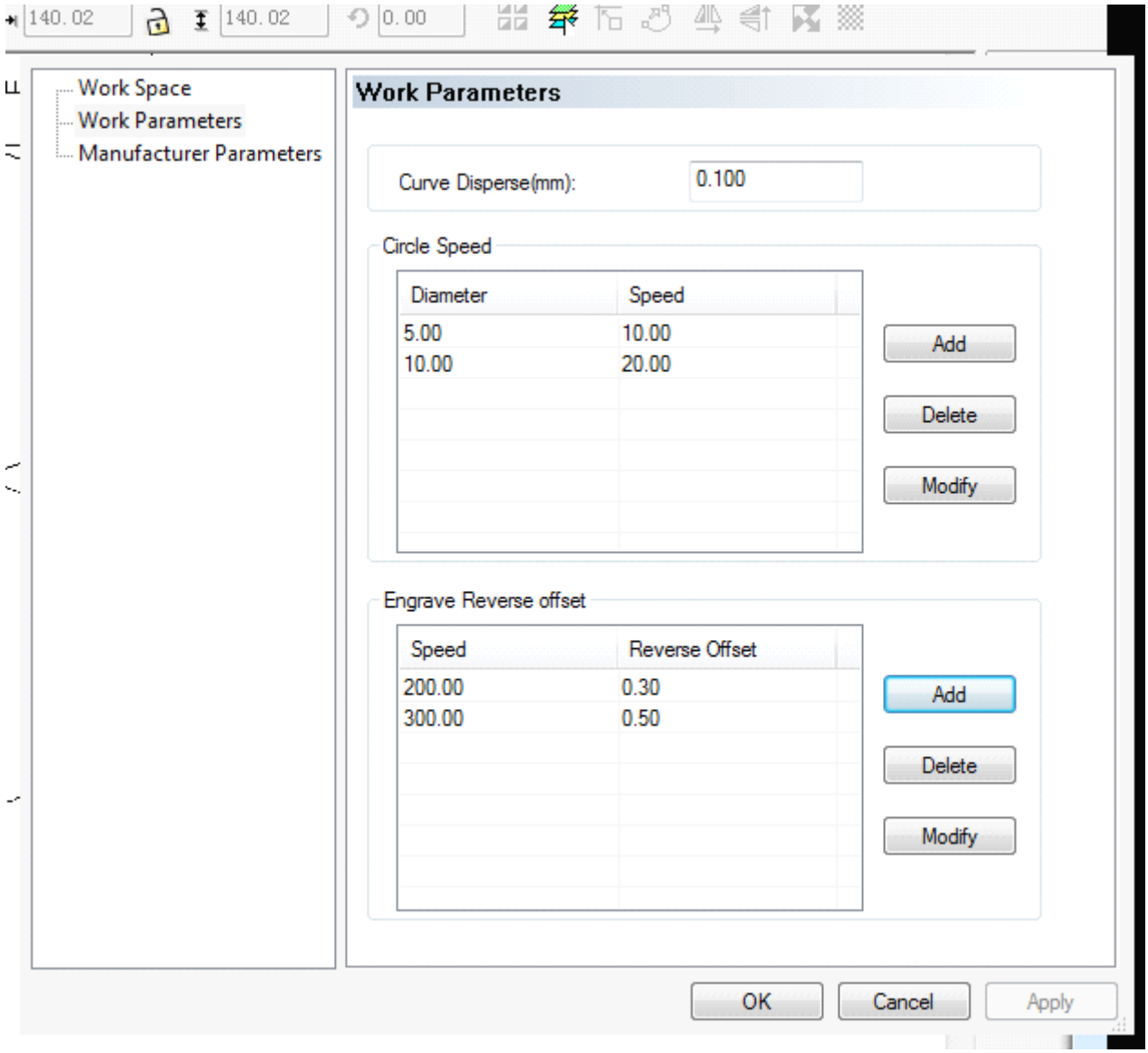
PWM frequency: the normal frequency is between 10000~20000.

Max power: the default is 98%

4.4 WORK PARAMETER

Adjust the parameter to improve your work.

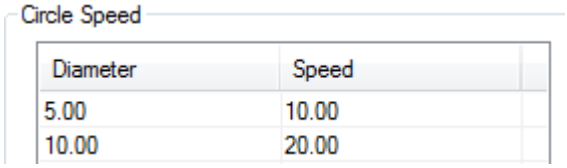
Click  to change the setting:



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.



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

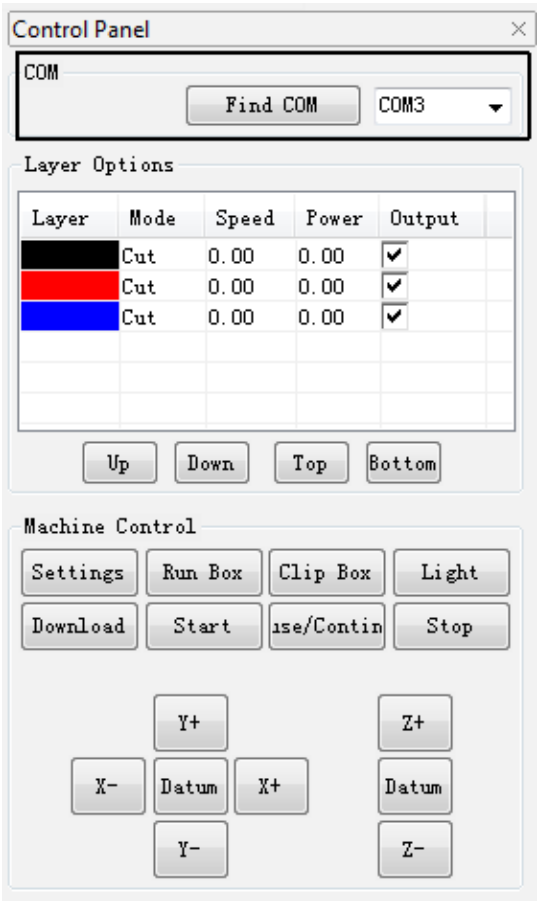
When speed is 200mm/s,the reverse offset should be 0.30mm;when the speed is slower than 200mm/s,the speed is proportional to reverse offset.Thus, when the speed is 100mm/s,the reverse offset should be 0.30*(100/200) =0.15mm

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)×(0.5-0.3)=0.40mm;

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

4.5 COM

The machine is connected to PC with a USB cable, if the COM setting is incorrect, the PC will fail to control the machine.

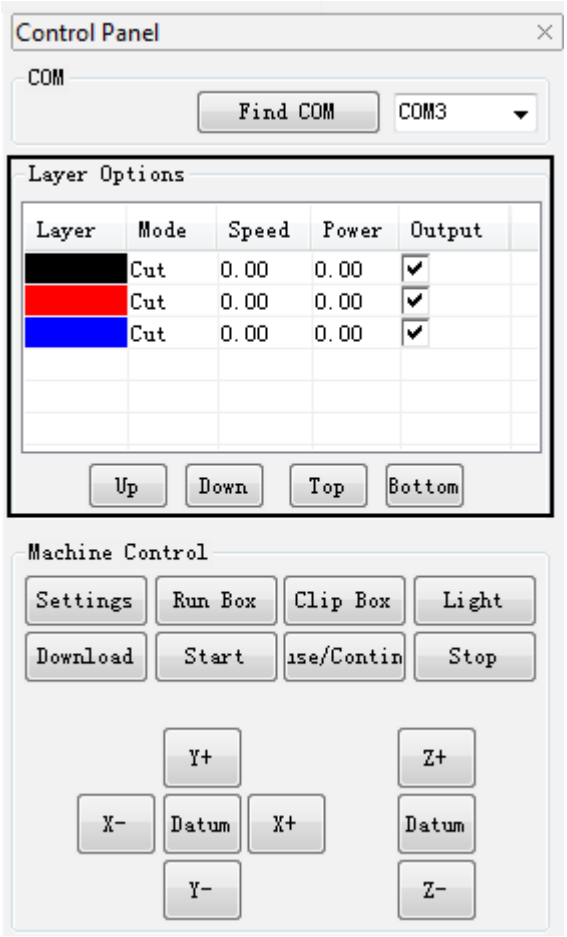


Click Find COM, if the machine is turned on and has been connected to PC with a USB cable, the correct COM will be showed as:

This means the current COM is COM3.

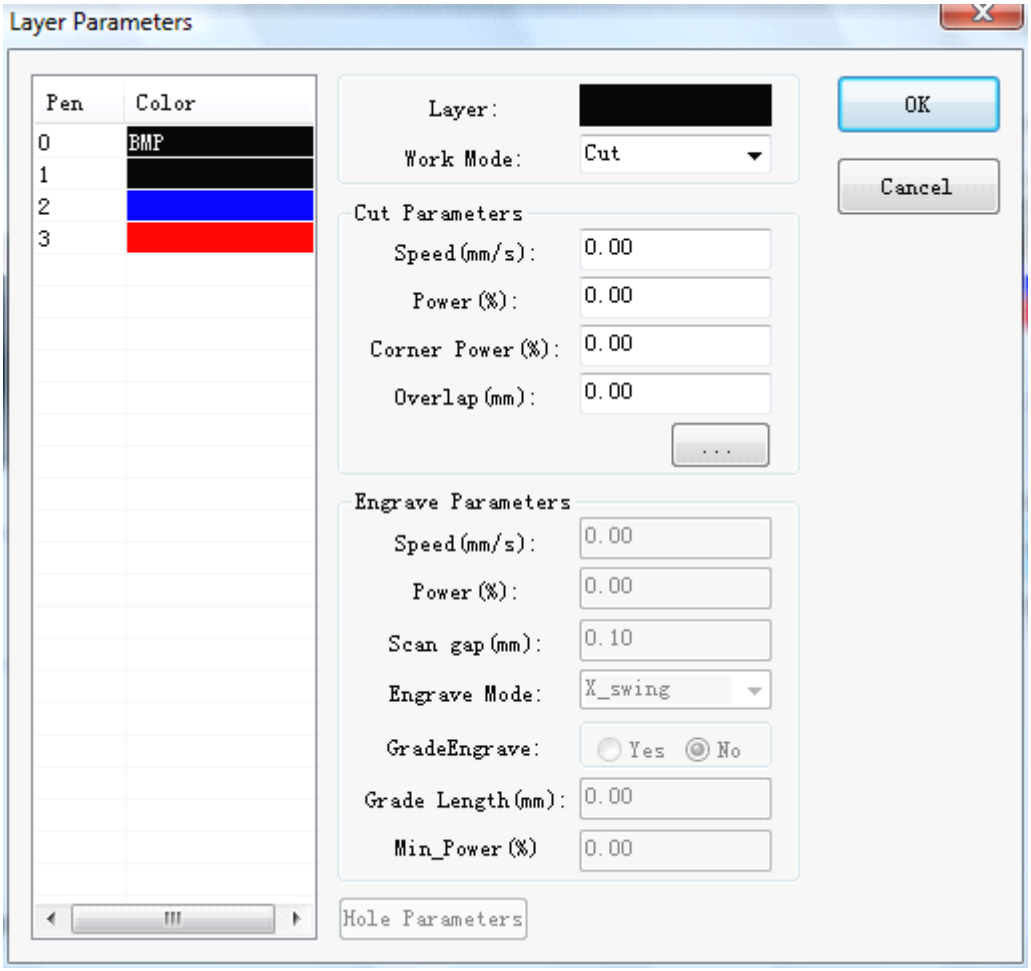
4.6 LAYER OPTIONS

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

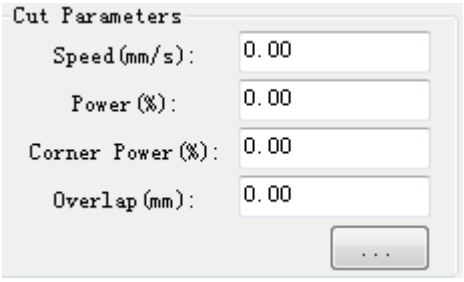


4.6.1 Layer parameters

Tick output bar to choose whether to process the layer. ☑ means process the layer while ☐ means not process the layer. Double click the layer and the following dialog will pop up:

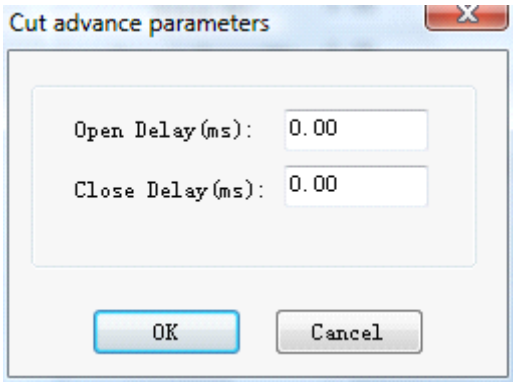


Layer:the color shows you the current layer you select. Left click the colors to choose the layer you want to edit.
Work Mode: you can choose cut, engrave, and cut after engrave or hole. If the current layer is BMP layer, you can choose engrave only.
Cut parameters
Choose cut or engrave after cut and then set the parameters for the layer



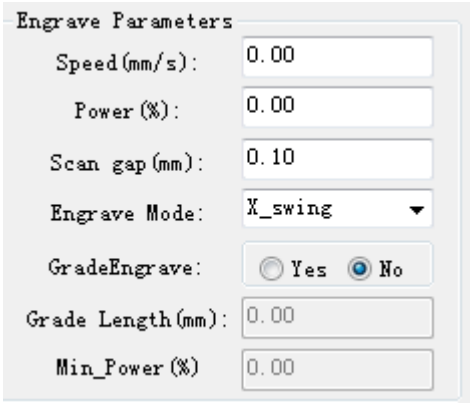
Speed: speed of the laser while work
Power: max power of the laser while work
Corner power: min power of the laser while the laser make a turn.
By adjusting the above powers, you can keep the laser dot at the same size while work.
Overlap: this will revise some of the mechanical deviation.

Click  to set the advance cutting parameters:



Open delay: turn on the laser power before start working
Close delay: delay the turning off the laser power after the work is finished.

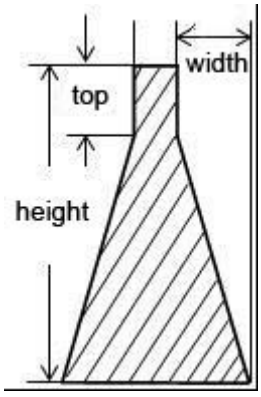
Engrave parameters:
Choose engrave or cut after engrave to set the parameters:



Speed: speed of the laser while engraving.
Power: max laser power of the laser while engraving.
Scan gap: interval of each scanning strip, in other words, resolution of the layer.
Engrave mode: there are four modes: X_swing, X_unilateralism, Y_swing, Y_unilateralism,

X_swing: engrave the graphics in two ways(higher speed)
X_unilateralism: engrave the graphics in way(slower speed)
Y_swing: engrave the graphics in two ways(higher speed)
Y_unilateralism: engrave the graphics in way(slower speed)

Grade engrave:choose yes and then set the parameters:

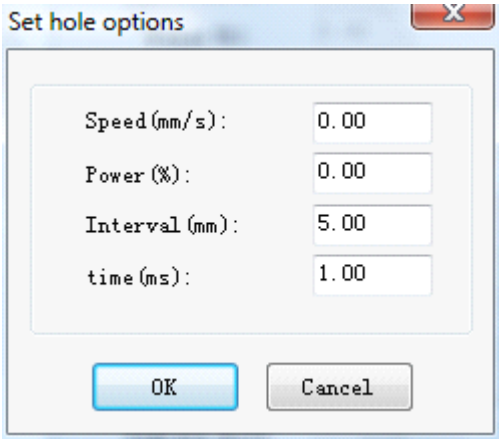


Width: see the picture

Min power: set the min power for the laser. this will decide the height of the top while the laser power will decide the depth of the grade.

Hole parameters:

Select hole in the work mode and then click hole parameters:



Speed: speed of the laser.

Power: power of the laser while drawing holes.

Interval: interval of each holes

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

4.6.2 adjust the orders of the layers

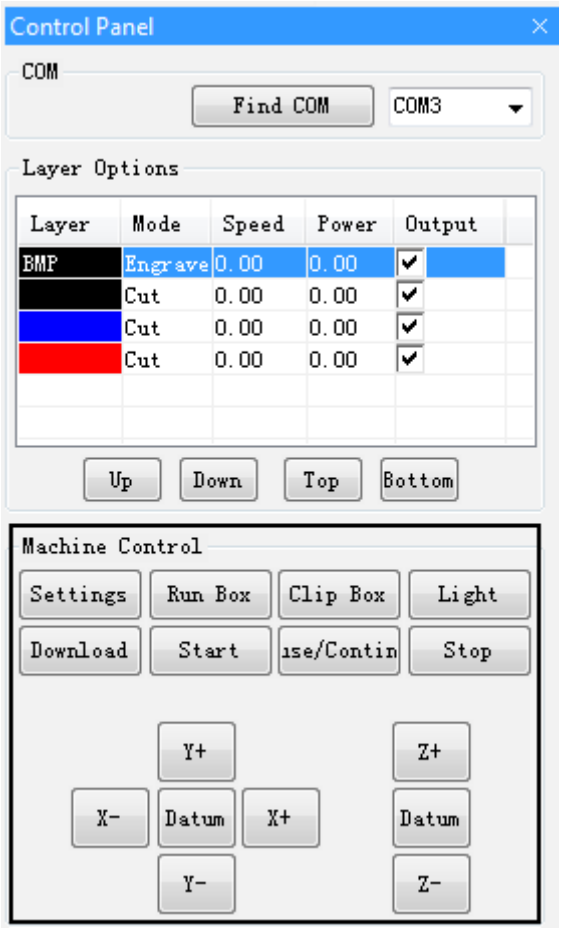
The default work order is up-down. If you want to change the order of each layer, just select the layer and then click 

to change its order.

Attention: this function will work only when you tick order by layer in route optimize.

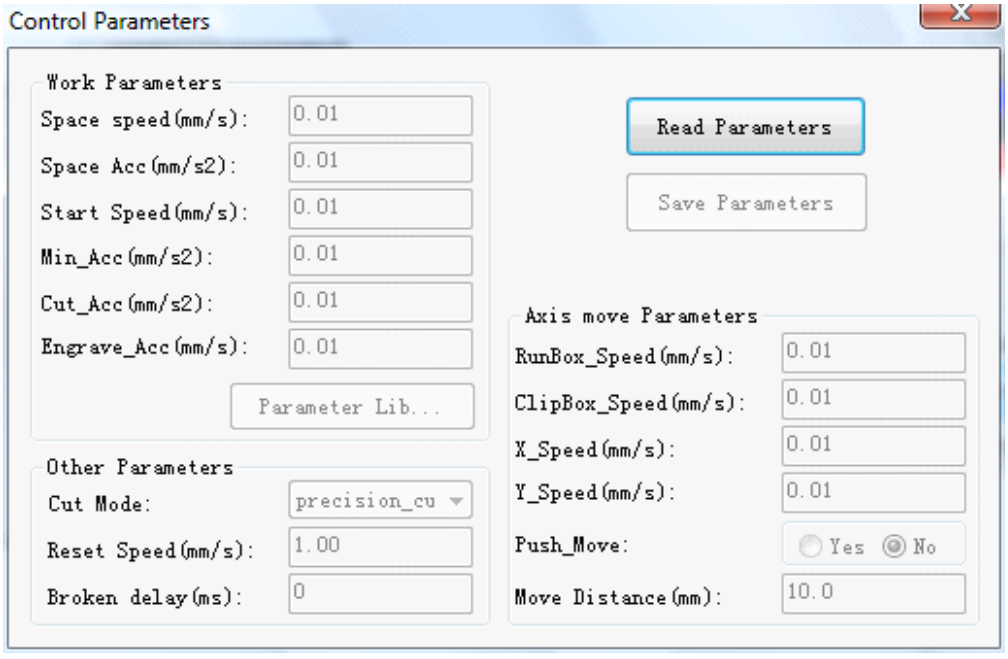
4.7 MACHINE CONTROL

Some major settings to control the machine.

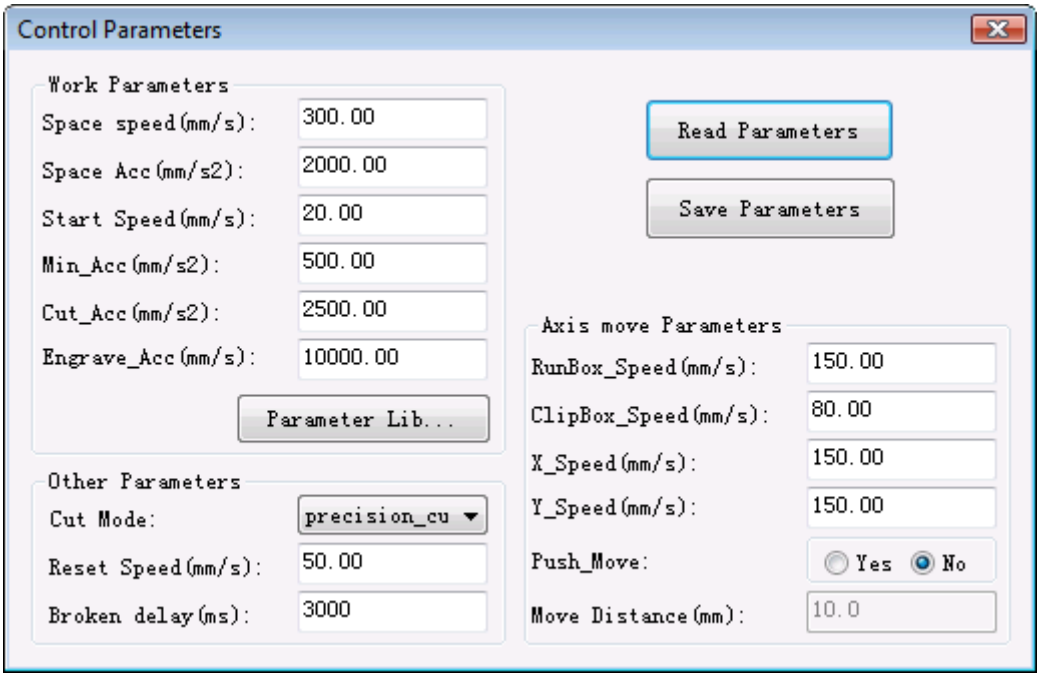


4.7.1 control parameters

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:



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



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

Introduction of the parameters:

- 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.

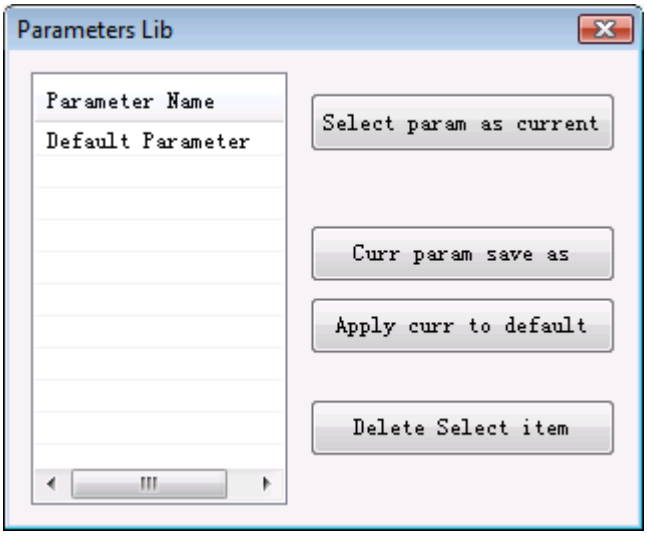
  Start speed: the initial velocity of the machine.

  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 the machine while engraving. normally this should be larger than 8000

Parameter library: user can save the parameters as files here. user can read the parameters directly when laser the same kind of materials.click parameters lib… , the dialog will pop up:



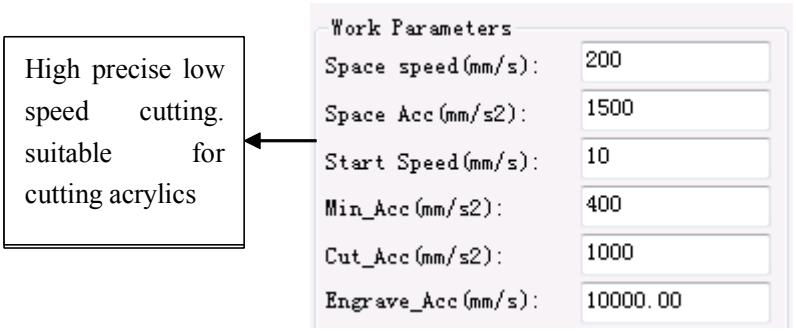
Select param as current:read the parameters in the parameter list on the left.

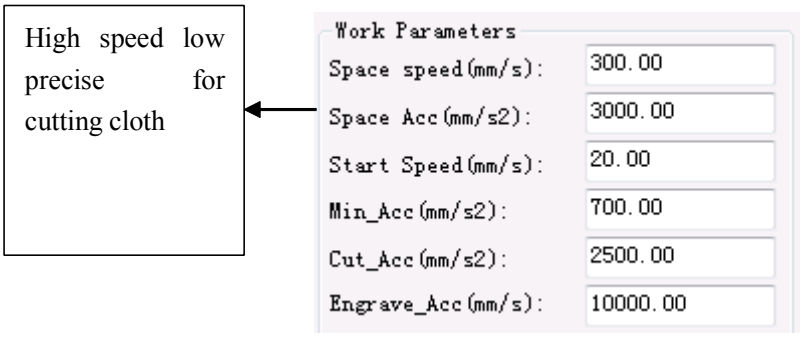
Curr param save as: save the current parameters in the parameter library.

Apply curr to default: save the current parameters in the main board as default parameters(users are not allowed to use this function) the default parameters are saved in the main board, the data will not miss even if the software is reinstalled.

Delete select item: delete the parameters in the list(the default parameters can not be deleted)

Below are two suggested parameters:





Axis move parameters:

Runbox_speed: speed of tracking the frame.

Clipbox__speed

X_speed: speed of X_axis when press the arrows.

Y_speed: speed of Y_axis when press the arrows.

Push_move:choose no, the machine will move only when you press the arrows. Choose yes, the machine will move at a certain each time you press the arrows.

Move distance: the moving distance each time you press the arrows.

Other parameters

Cut mode:there are two cut modes, precise cut(with higher precision) and quick cut(with faster speed).

Reset speed: reset speed of the machine.

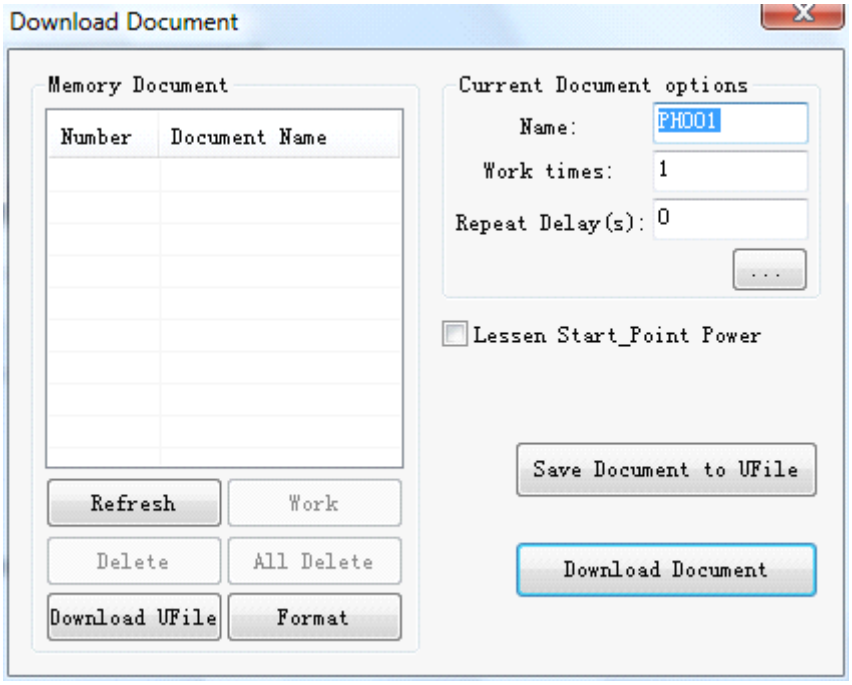
Broken delay: when the power is suddenly cut off, this function will make the machine continue the unfinished work. The default setting is 1000ms.

4.7.2 download data and machine control

Click 

in 

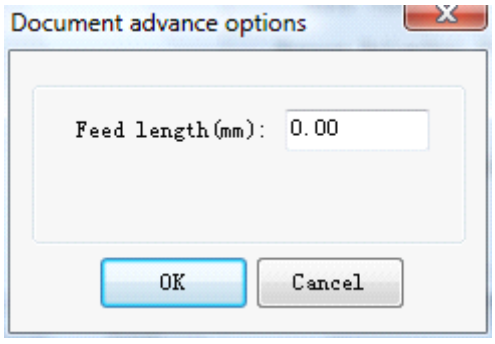
, the following dialog will pop up:



Current document

Name: name of the files which will be downloaded to machine.
Work times:set the repeat times of the same work.
Repeat delay: interval of the same work.

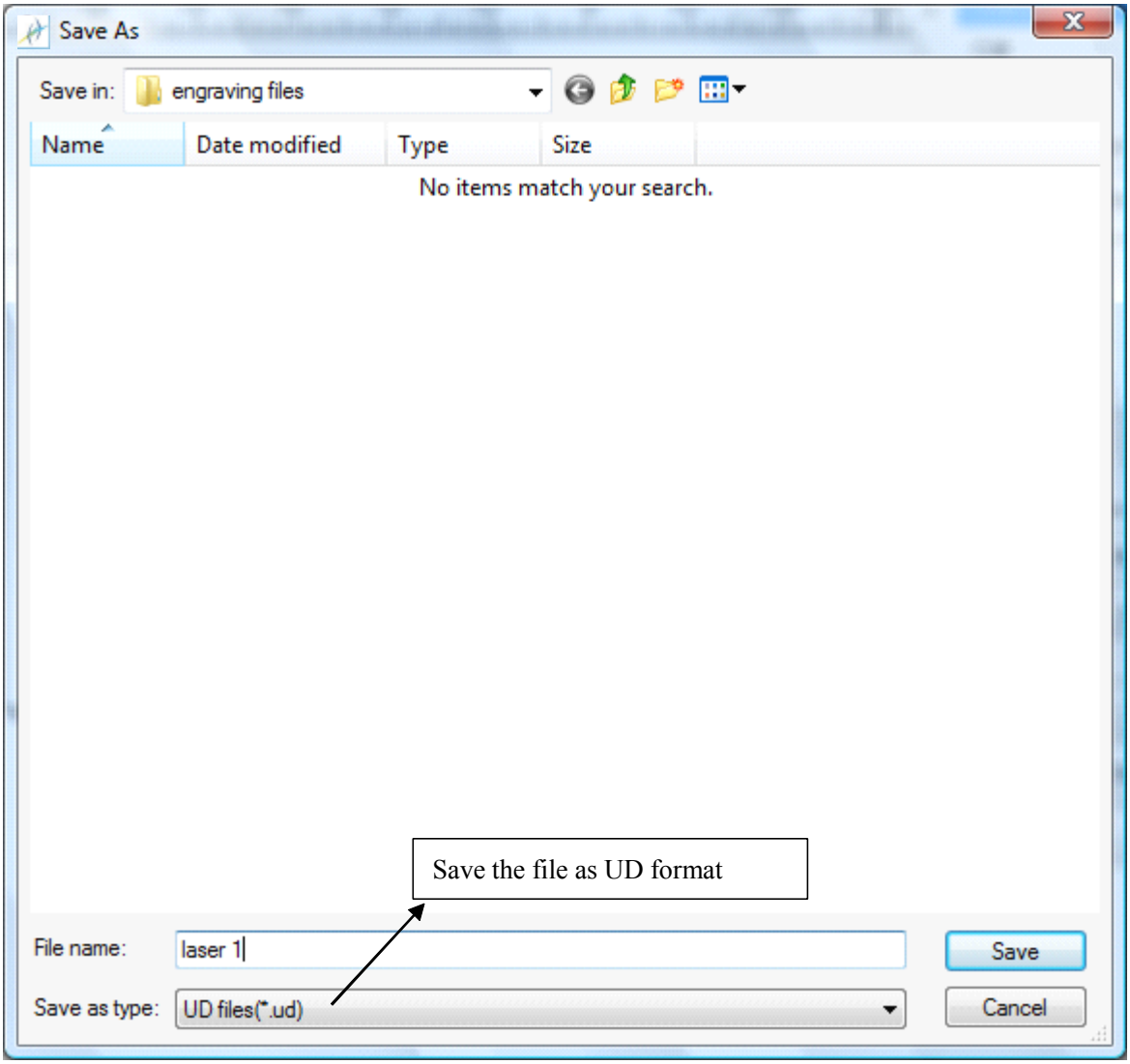
:set the advance attribution of the document. when click the following dialog will pop up:



Feed length: the moving distance of Z axis after each process.
Download document: download the current document to the main board.

Save document to Ufile: save current file in ud format in PC.user can copy this file to memory stick and the machine will read files directly from memory stick without connecting to PC. Click 

, the following dialog will pop up:

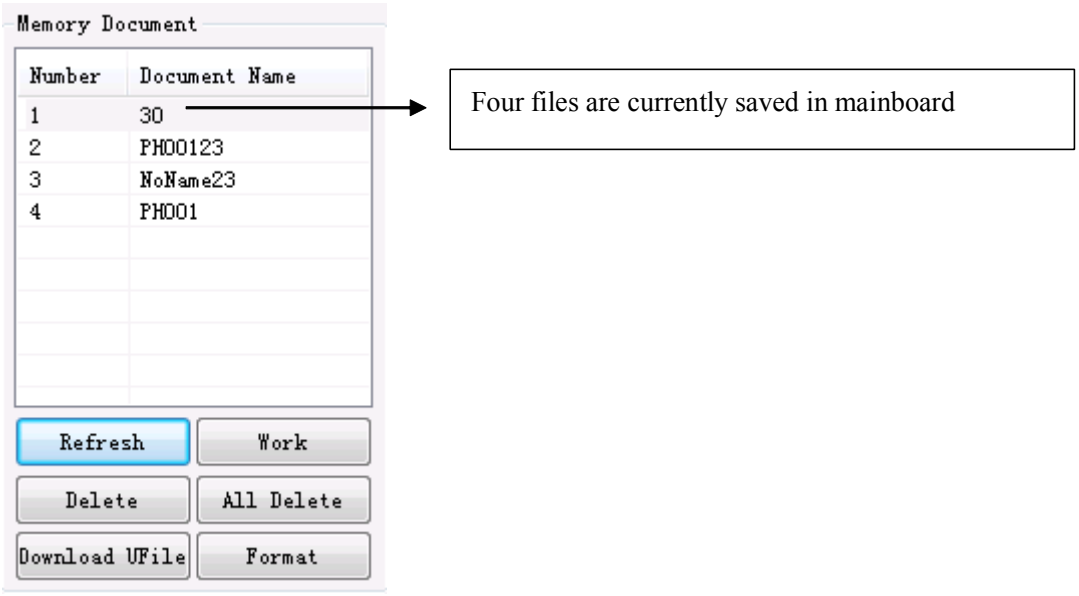


Name the file and then click save

Memory document

Manage the files in the mainboard.

Refresh: read all the files in the mainboard. Click refresh to read all and all files will be showed in the list.



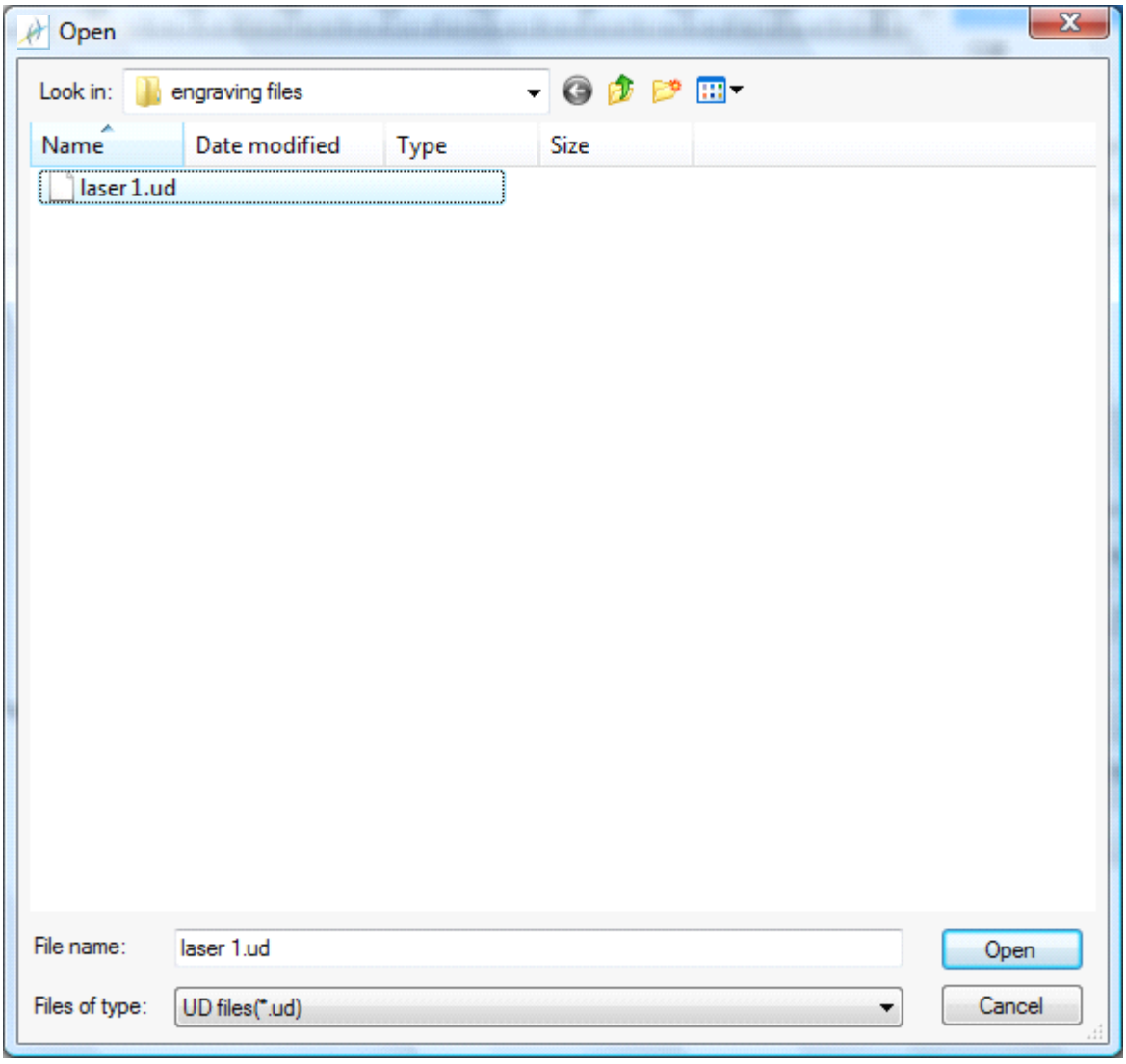
Work: select a certain file in the list and click work to start laser the file.

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.

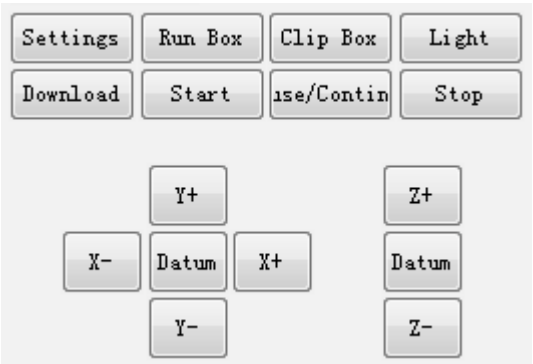
Format: format the mainboard

Download Ufile: download the ud format files to main board from PC.



Select the ud file you need and click open.

4.7.3 start working and controls



Start:start processing the current file in the main board.

Pause/continue: if the machine is working, click 

to pause, if the machine is pause, click 

to continue work.

Stop: machine will stop the current work.

Run box: machine will track the frame of the current work.

Clip box: machine will cut the frame of the current work.

Light: press 

to test the laser dot.

Datum:click the button, machine will move to the zero point and then move the original point.

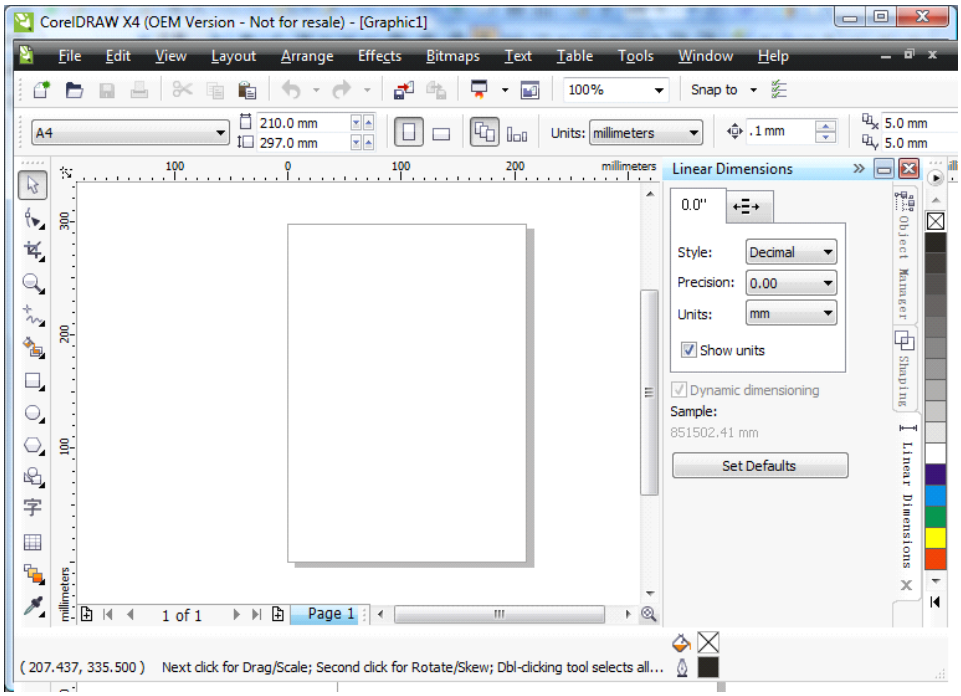
This function will clear the accumulated deviation. It is suggested to use the function before each work.

【X-】【X+】【Y-】【Y+】【Z-】【Z+】: :arrow directions to control the moving of the machine.

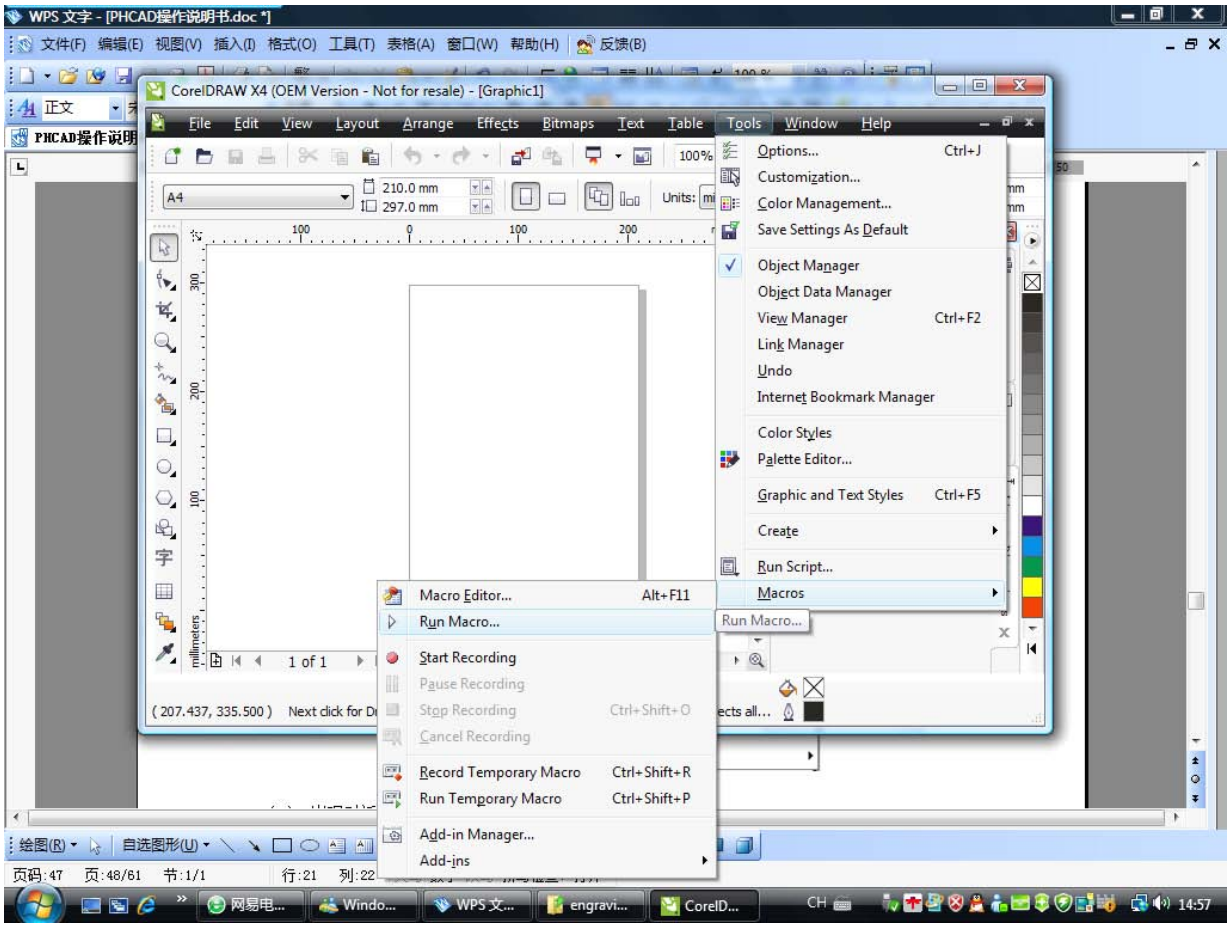
5. CORELDRAW BASED SOFTWARE

5.1 Add PH_lasercut tool bar to coreldraw

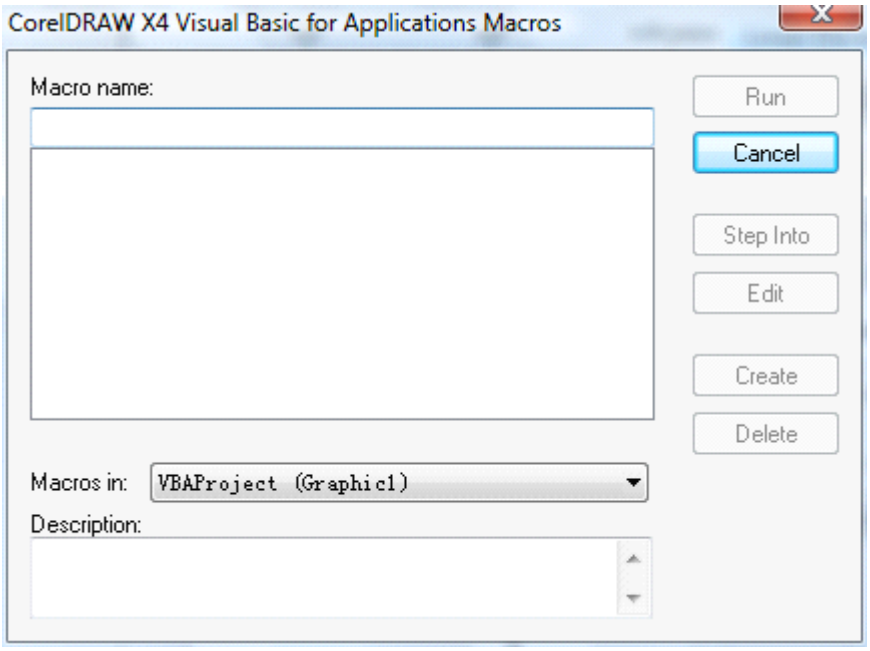
After installing ***Coreldraw_laser***, user should add the tool bar to coreldraw as below:



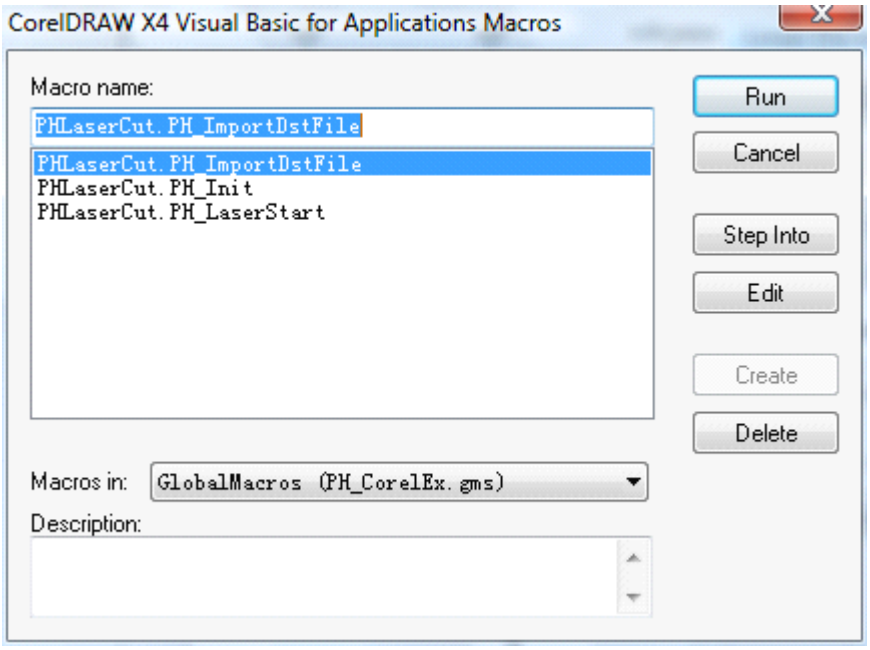
Click ***tool/macro/run macro***



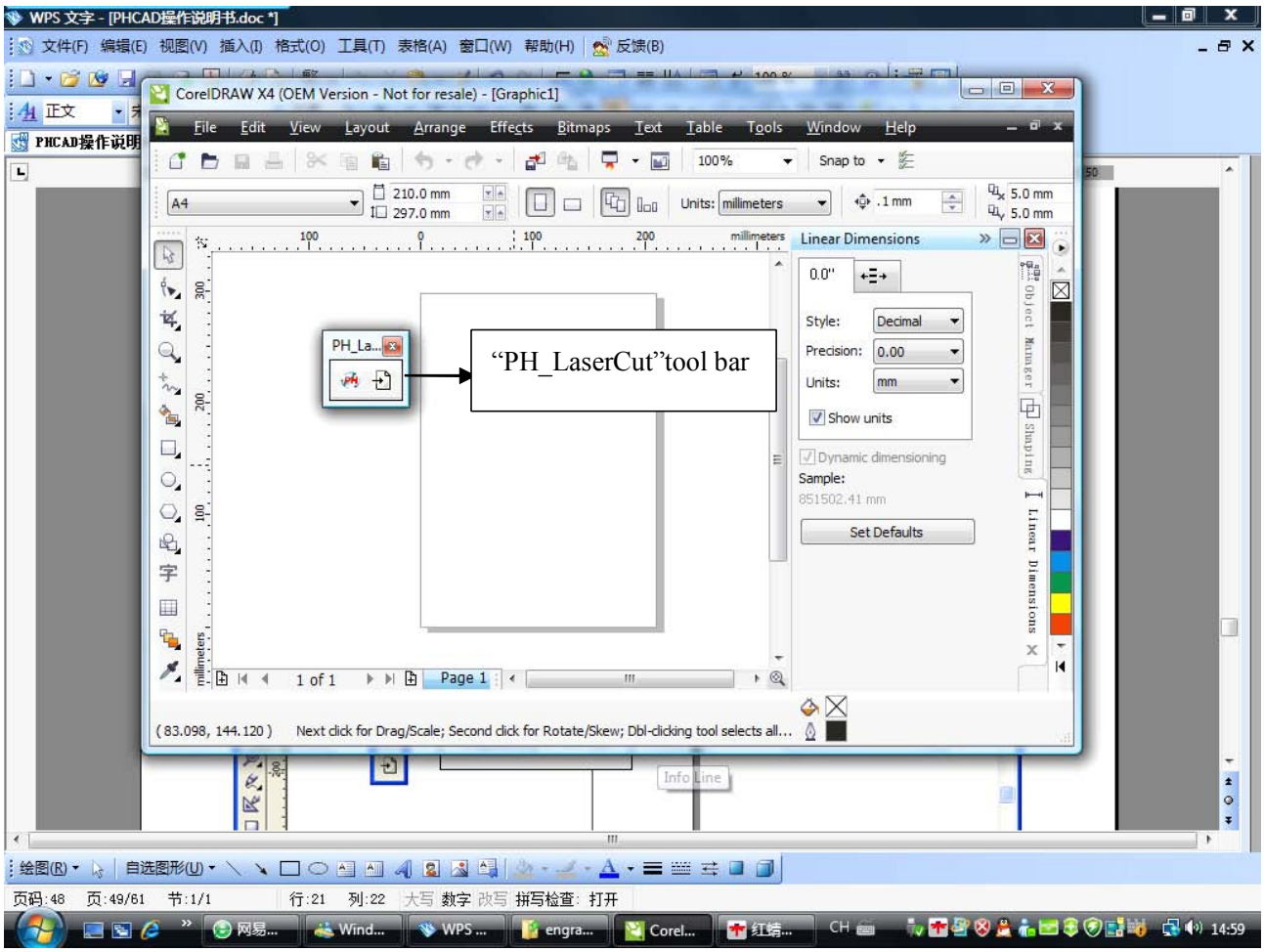
（2） A dialog will pop up：



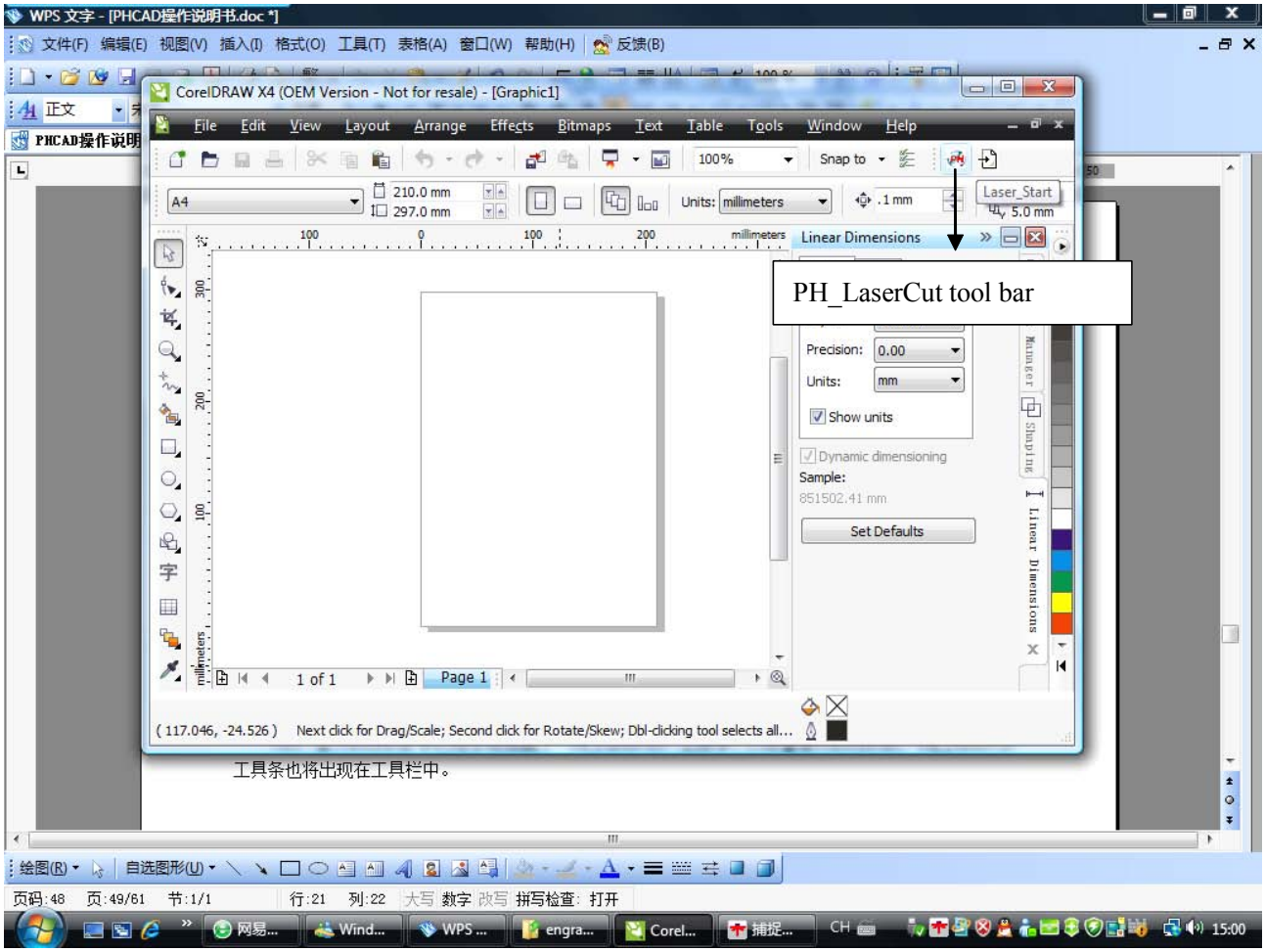
(3) Macro in:select GlobalMacros (PH_CorelEx.Gms or PH_Corel12.Gms) and then select PHLaserCut.PH_Init



（4） Click ***Run*** to add the tool bar as below:

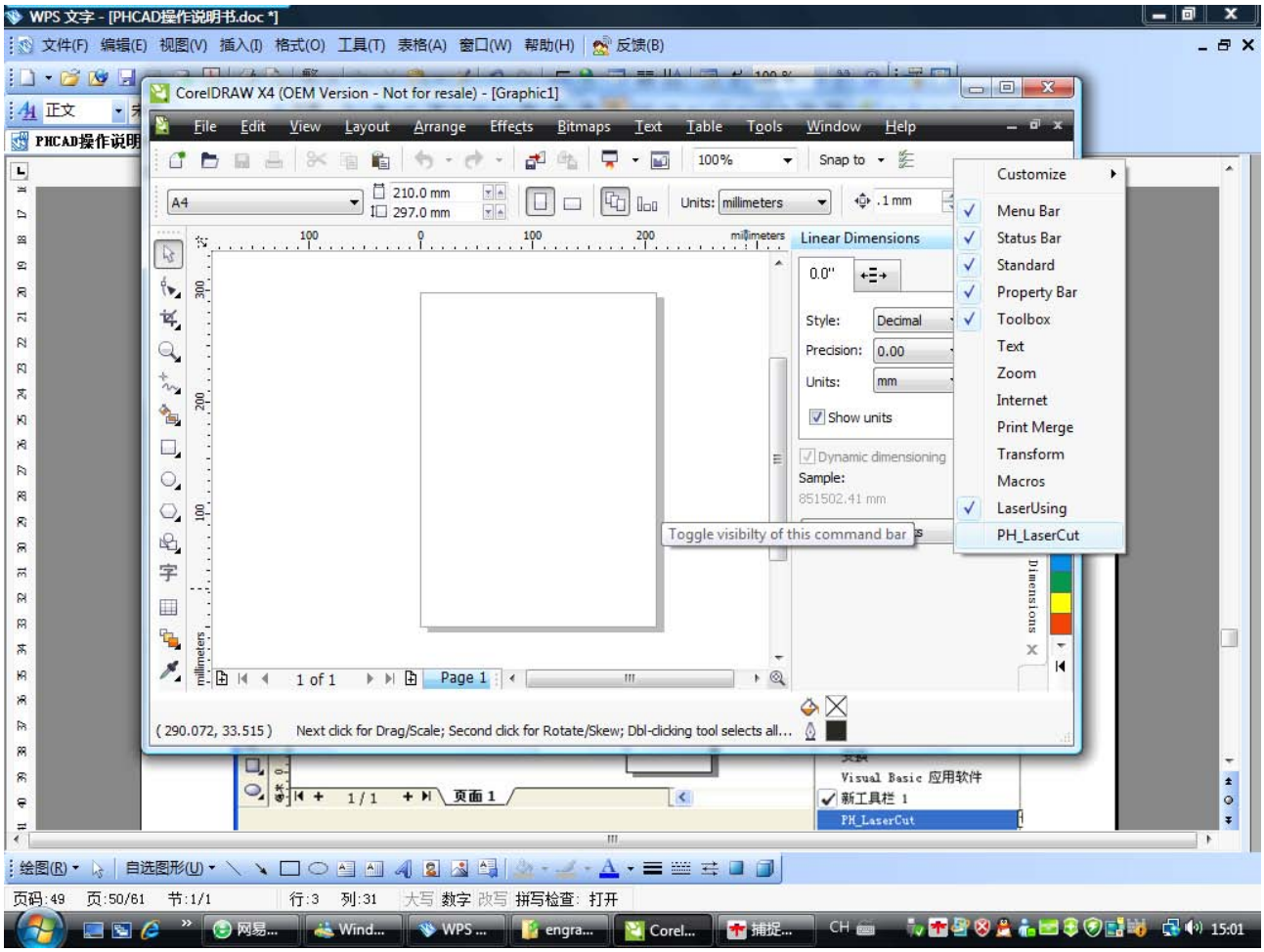


（5）Drag ***PH_LaserCut*** to where you want as below:


PH_LaserCut tool bar
工具条也将出现在工具栏中。

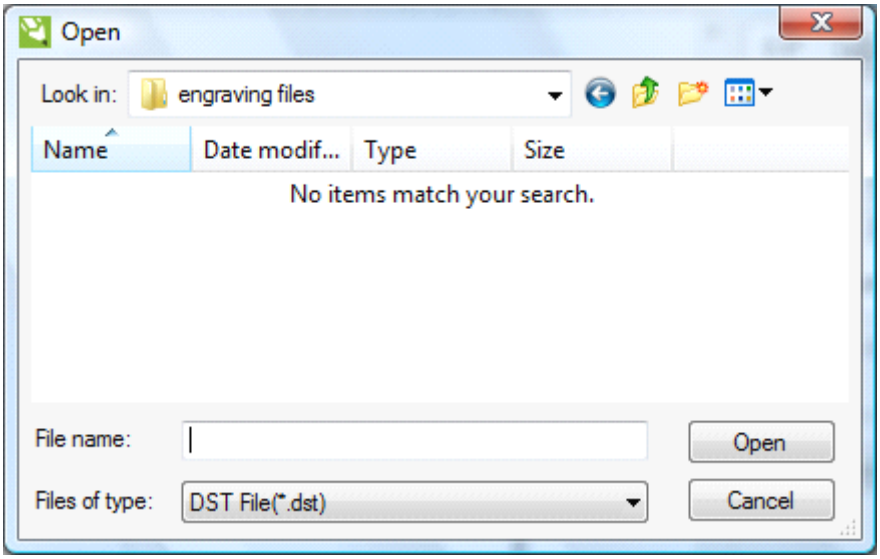
5.2 show the hidden PH_LaserCut toolbar

When the toolbar is hidden, user can use the way below to show it:



5.3 IMPORT DST/DSB FILE

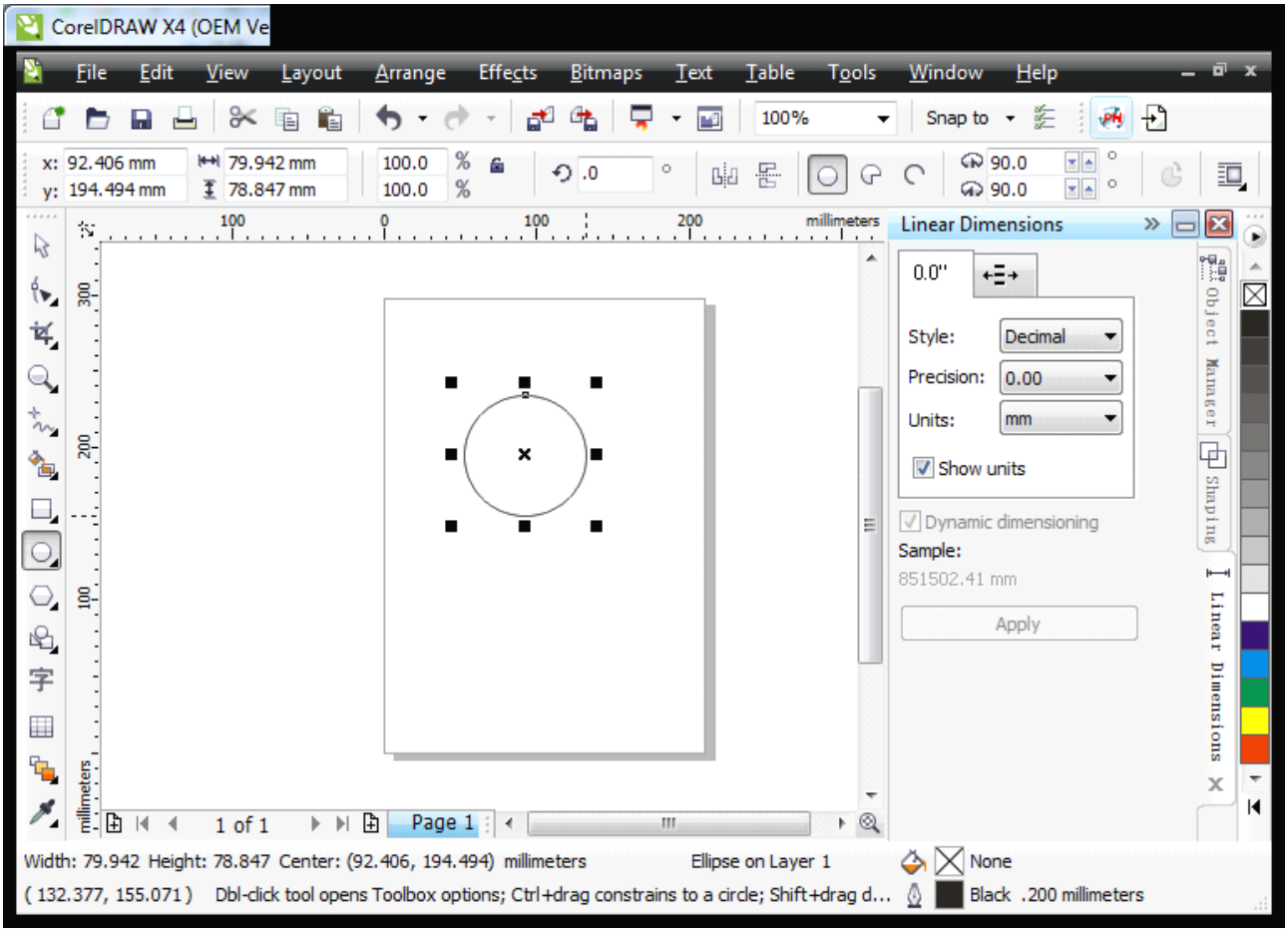
Click  to import file as below:

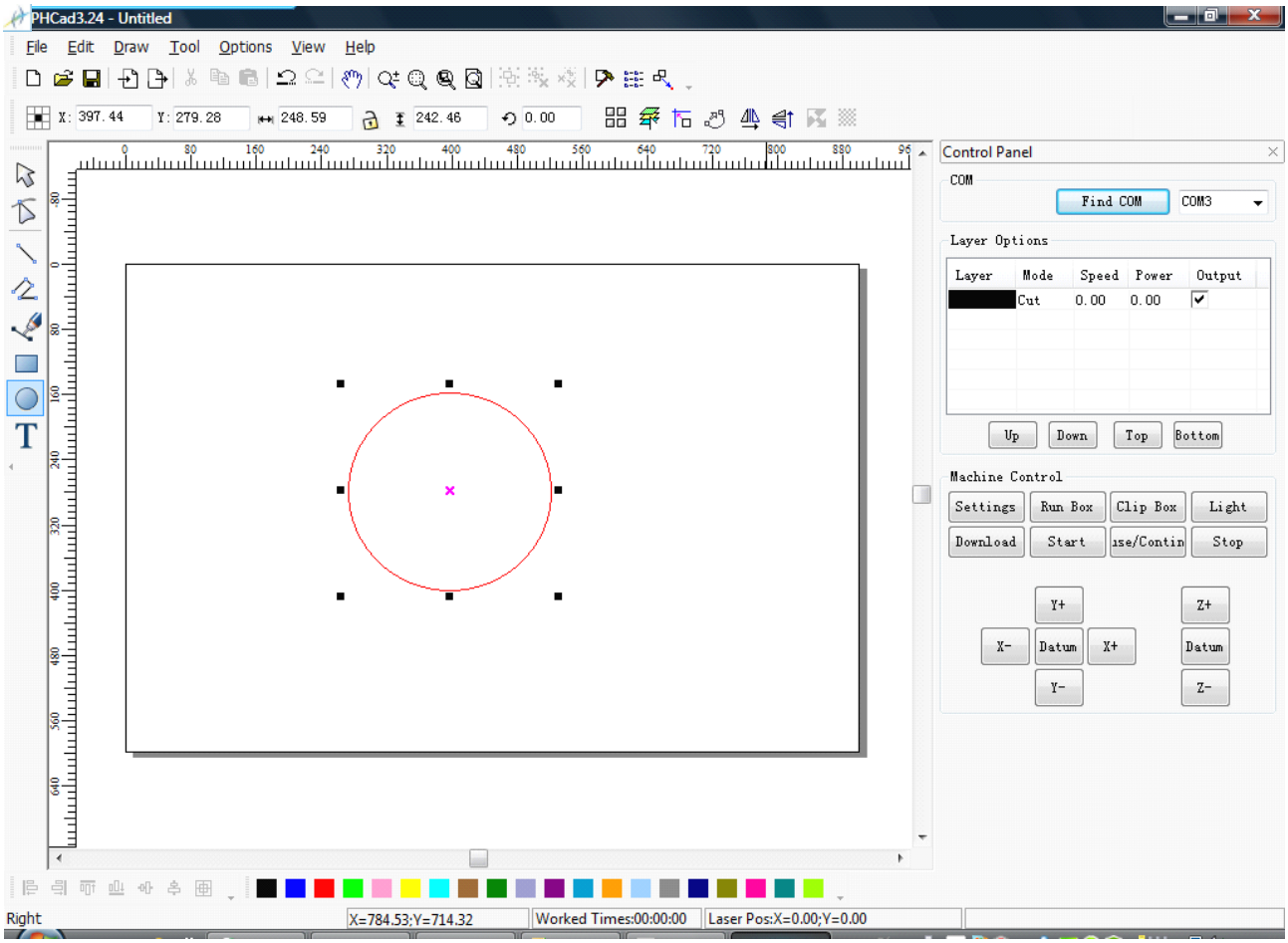


Choose the file you need and then click Open.

5.4 SWITCH TO INDEPENDENT SOFTWARE

Click  to switch to independent software as below:





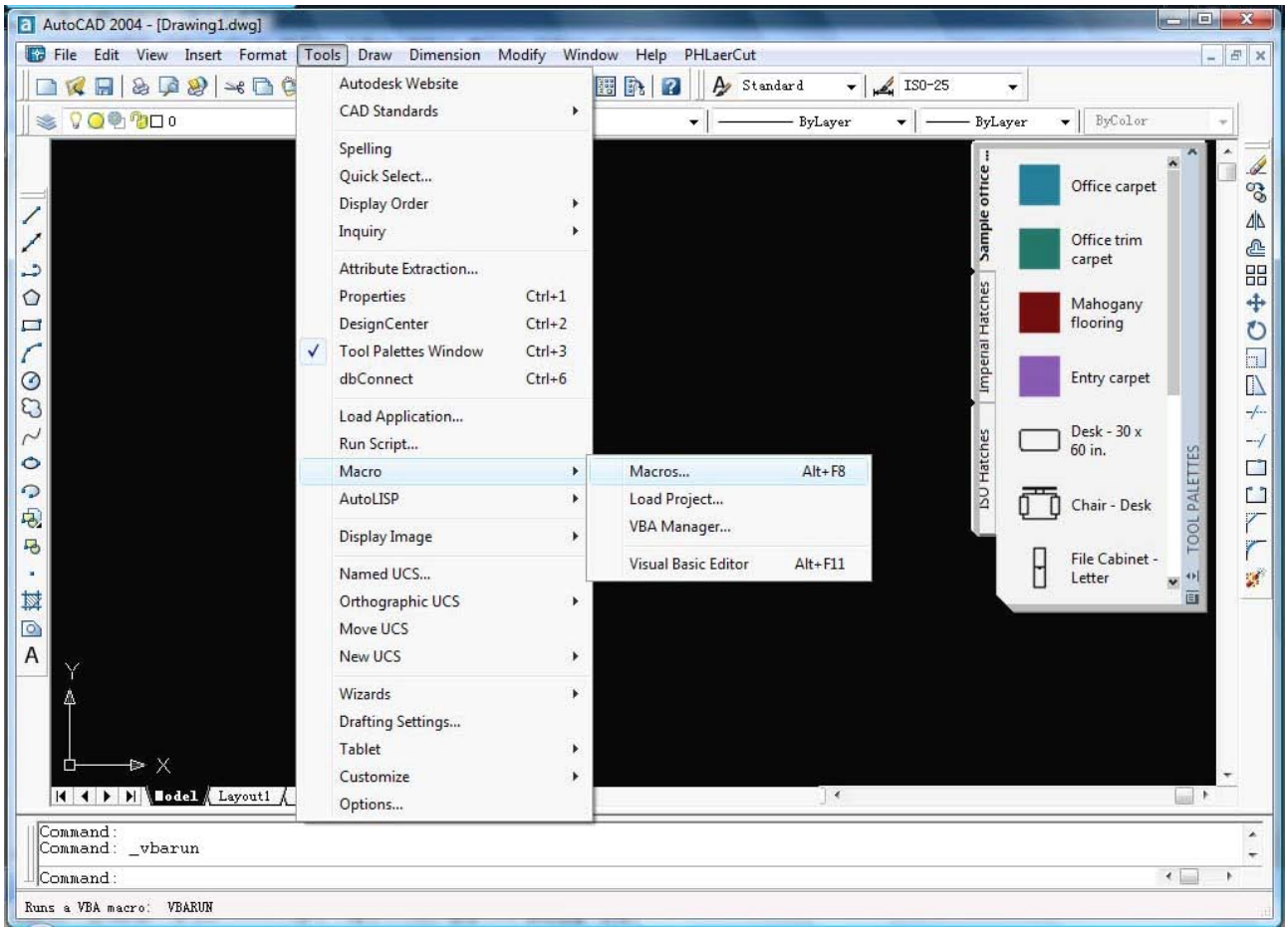
Now you can use independent software to do the settings for your work.

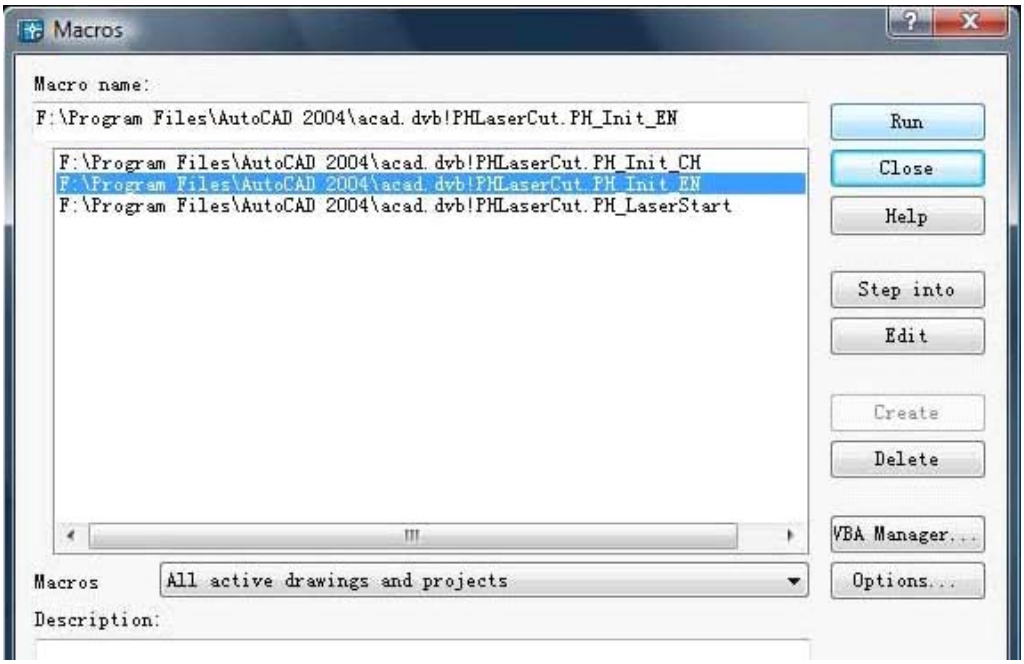
6. AUTOCAD BASED SOFTWARE

6.1 ADD PHcad toolbar.

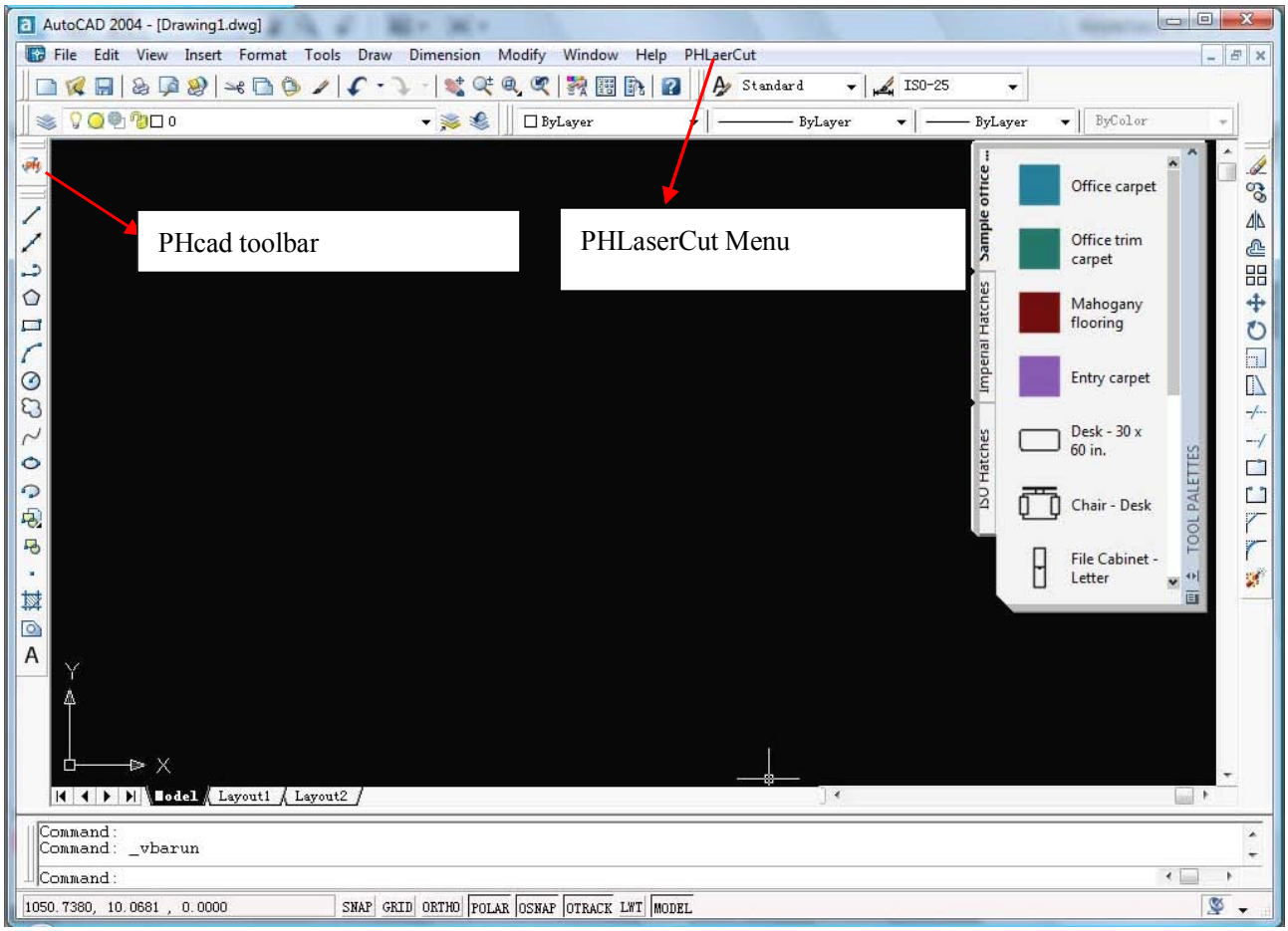
After installing Autocad_PHLasercut,there should be PHcad toolbar on the left,if not, user can add by themselves as below:

(1)Click Tools/Macro/Macros...



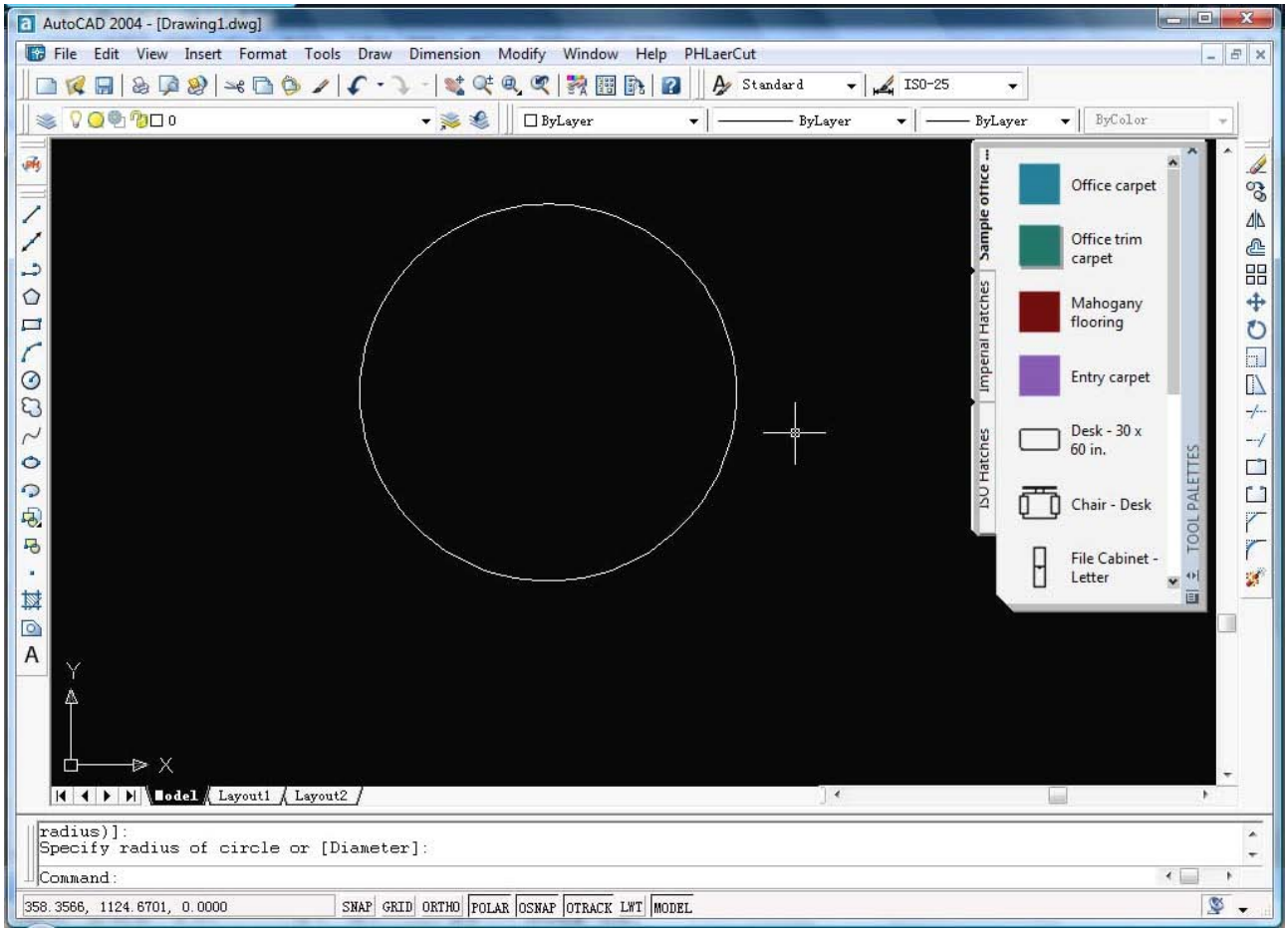


(2) Choose "…PHLaserCut.PH_Init_EN" and click Run and then the toolbar will pop up as below:

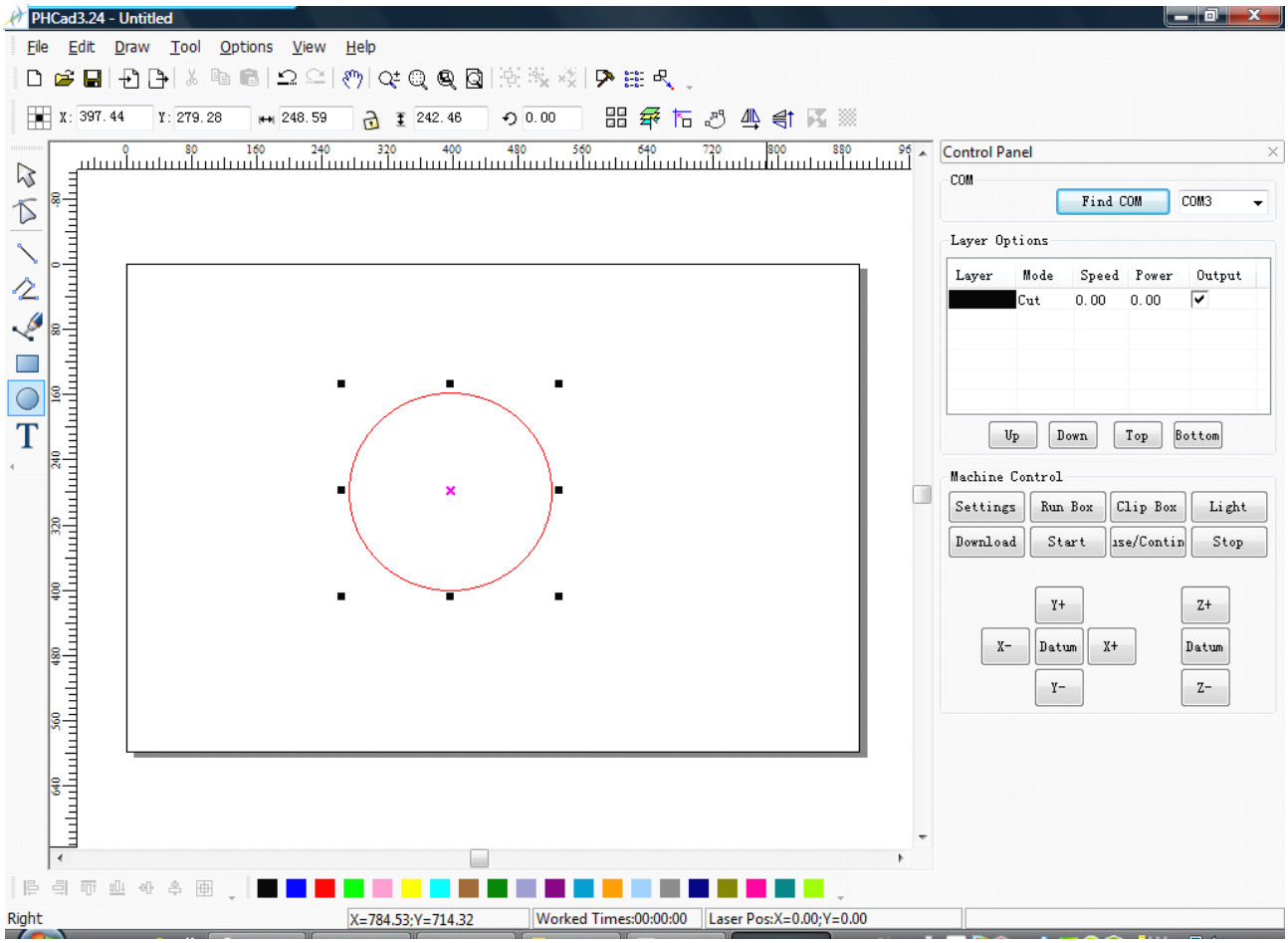


6.2 Switch AutoCAD to PHcad:

Draw graphics in Autocad as below:



Then click  to switch to Autocad as below:



Now user can start working in PHcad.

7. CONTROL PANEL

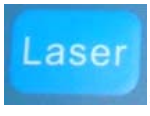
：Press this button to restart the machine.The laser head will first move back to zero point and then to original point.

：stop current work.

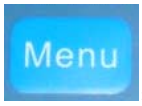
：Pause current work

：confirm your operation.

：Cancel your operation or back to previous menu.

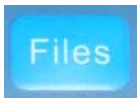


：Use laser to draw a dot, this function is usually used for location.



：Set different functions of control panel.

：Track frame of the current work, used for location.



：edit the file saved in the mainboard.

：set the original(starting) point of the laser head.

：arrows to control the laser head.

Main menu

File：	AAA
Power：	100/100%
Speed：	100mm/s
Waiting：。	。 。 000

File:Current file saved in the mainboard.

Power:the first one is used to cut most of the work, the second one is used in the corner.

Speed:speed of current work.

Waiting:time used in current work and repeat times of current work.

Press Enter button and then you can move the cursor to change the settings.

File：	AAA
Power：	100/100%
Speed：	100mm/s
Waiting：。	。 。 000

Press start button and then screen will show as below:

File：	AAA
Power：	100/100%
Speed：	100mm/s
Work：	00：00：15. 001

File：Name of the current file

Power：power used in current work

Speed:speed of current work

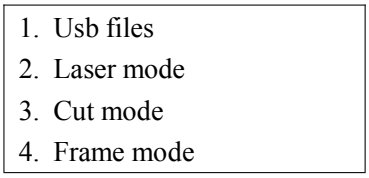
Work:Time used in current work and repeat times of current work.

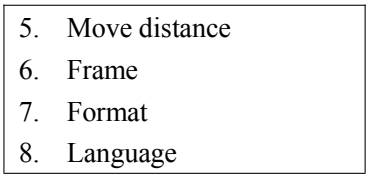
At this status you can press Pause button and then Confirm button to show the cursor and change the speed and power of current work..

- Press Arrows to change the power and speed.
- Press Start button to continue current work.
- Press Stop to cancel current work.

Function menu

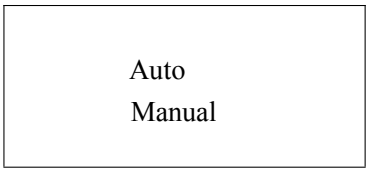
Press Function button to show the menu:





1. Usb files：Read files from U-flash disk

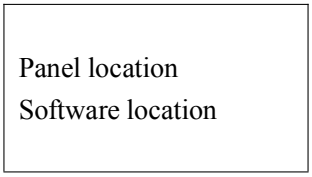
2. Laser mode: There two mode



Auto:use the speed and power set by the software.

Manual:use the speed and power set by the panel

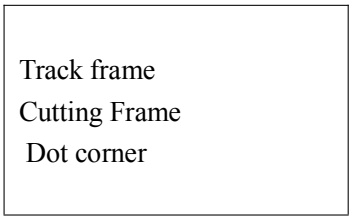
3. Cut mode:there two mode



Panel location: set the original point in panel.

Software location:set the original point in software

4.Frame Mode:

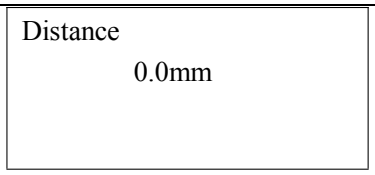


Track frame:track the frame of current work

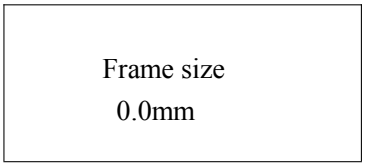
Cut frame:cut the frame of current work

Dot corner:draw four dots in the corner of current work.

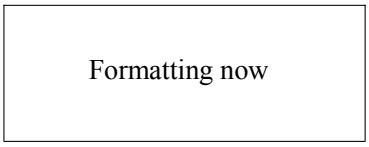
5.Move distance:moving distance of the laser head when press the arrows.



6.Frame:set the frame size of current work.



7.Format:format the files saved in mainboard



8.Language: Set the language of the control panel

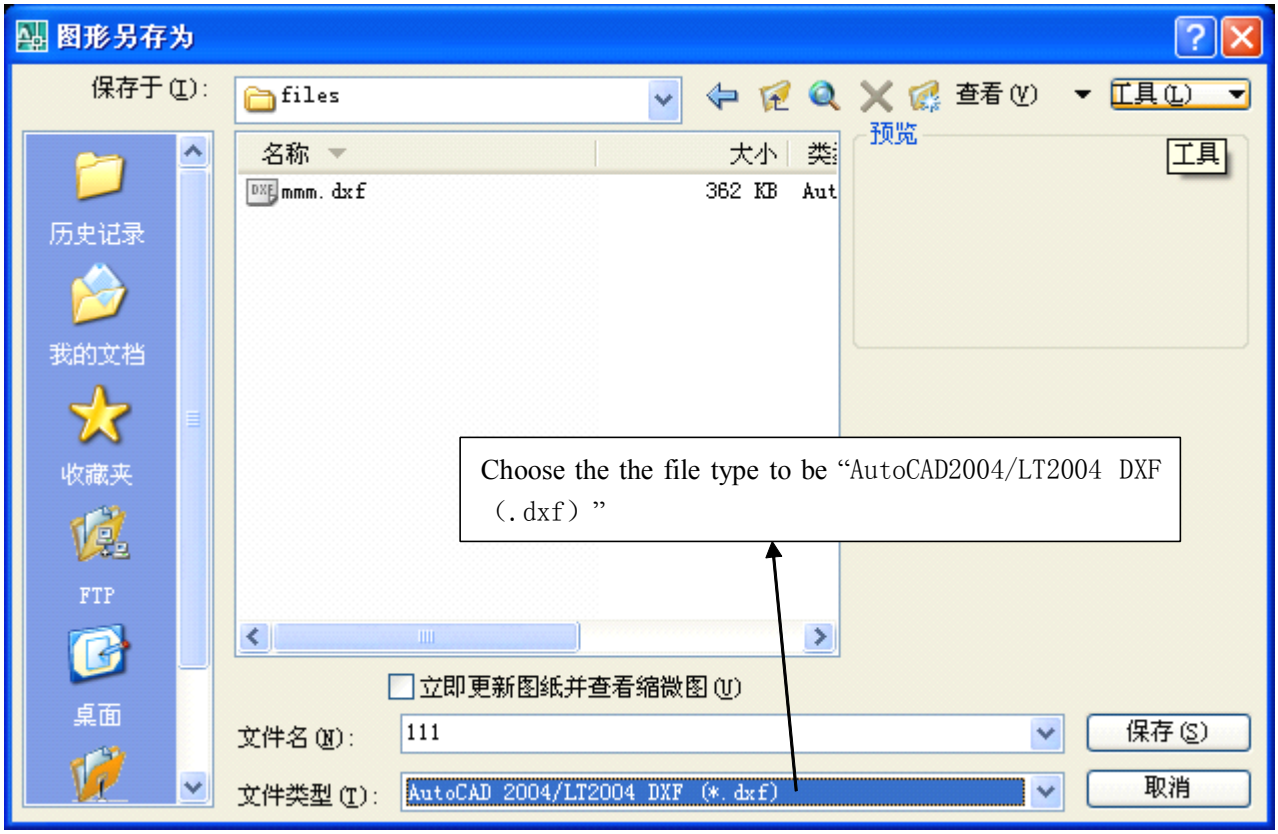
8. FREQUENT QUESTIONS

8.1 the machine is not working or moving around or part of the graphs is not processed

Make sure the graph is inside the window, the part outside it will not be cut.
Make sure the "graphic relative laser head position" (see: 4.1 Graphics relative laser head position) is set correctly.

8.2 the software will shut down when importing the dxf file

use the Version of AutoCAD or above version to open the dxf file, and then use the "breakdown" function to decomposition the graph. At last ,choose the "AutoCAD2004/LT2004 DXF (. Dxf)" format to save the file. As follows:



Then try the Universal version to import the saved file.

8.3 Panel tips (buffer distance not enough)

Make sure the parameters of the engraving acceleration is not too low, the engraving acceleration is not less than 8,000

Make sure the graphics are not close to the machine frame format of the border

8.4 tips when downloading files (The current file is empty)

Make sure the Graphics you want to Engraved is closed

Make sure all the layers are on 'no" output (see 4.6.1 set layer Parameters)

8.5 the real figure Imagines the Graphics processed

Check the machine null Position is set in a right way

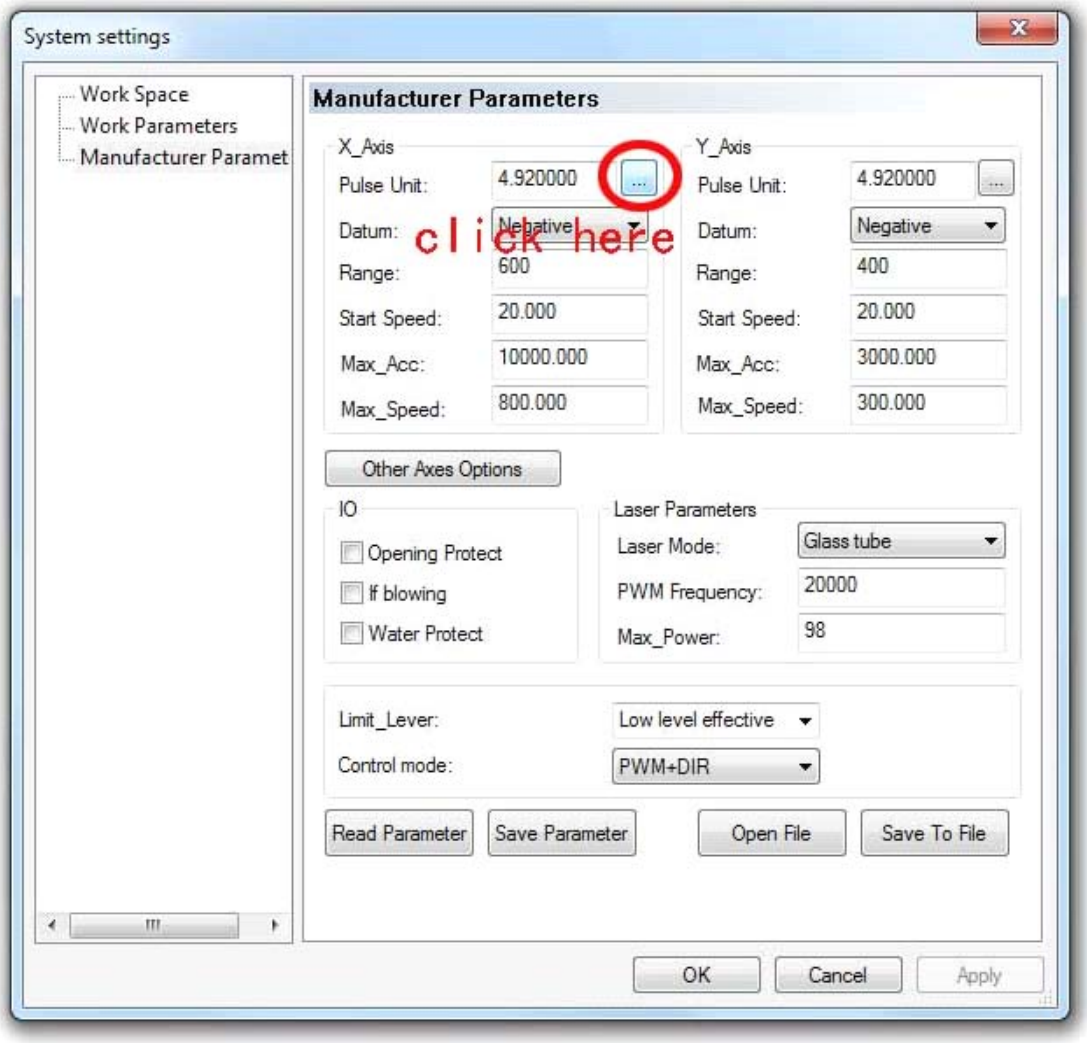
8.6 the cutting/engraving size is not correct.(pulse is not correct)

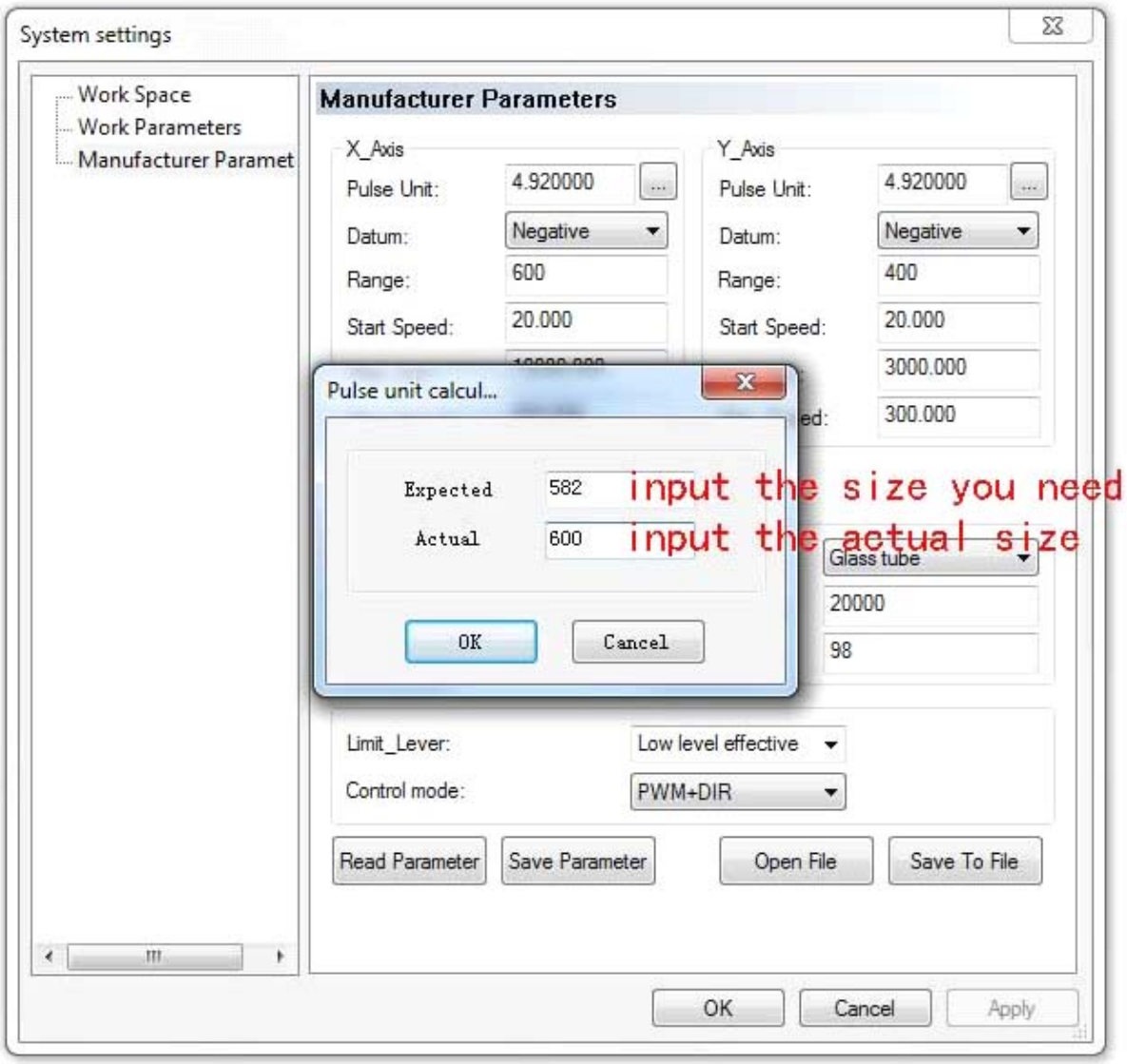
If the item you cut is not in the correct size. Ex. You want to cut a 10*10cm, but the machine only cut 8*8cm. Then the pulse setting is not correct. You can fix it as the following way:

Open manufacturer parameters and then input password"ph123" then click ok.

Then click "read parameters" and then click"[...]" beside pulse unit.

Then follow the photos below:

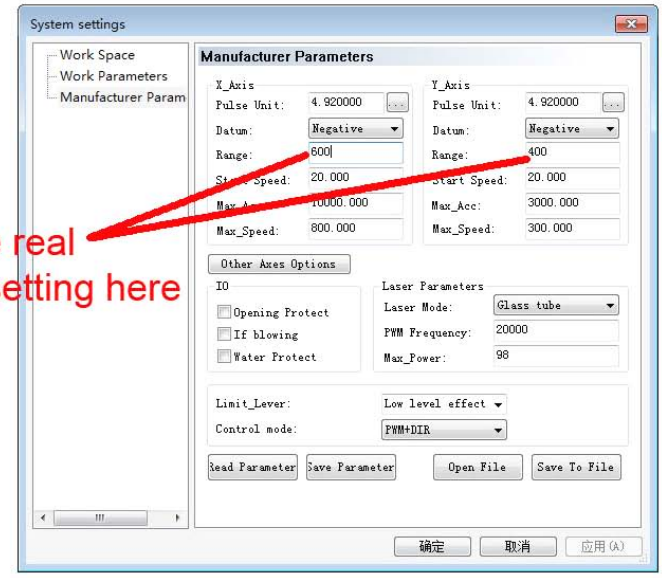




After that,click save parameters and then click "ok".

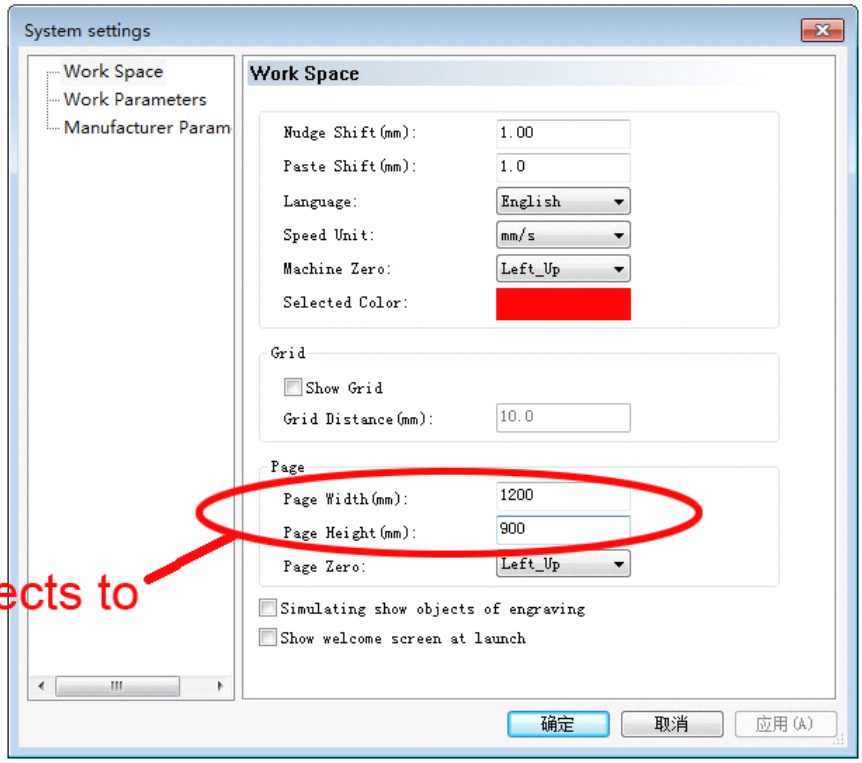
8.7 how to change the size of work area

if you want to change the size of the real work table, you should change the setting here



8.8 how to change the size of simulation work area in software

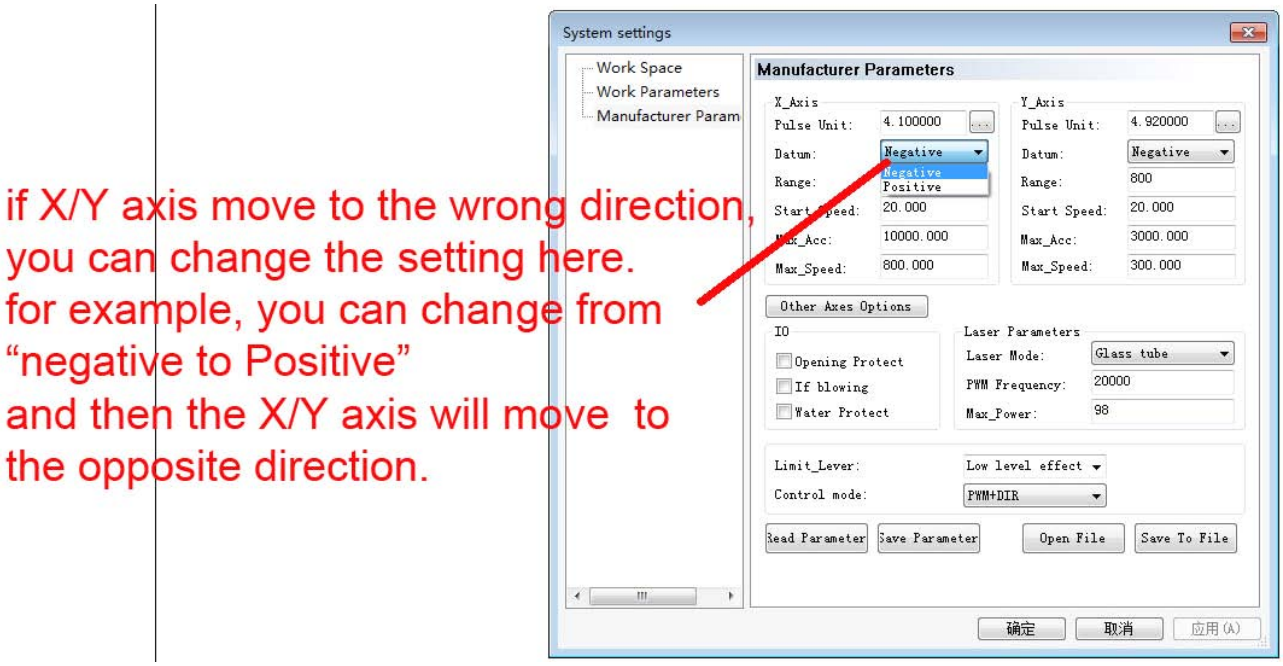
change the size here will only effects to the software



8.9 laser head move to the wrong direction

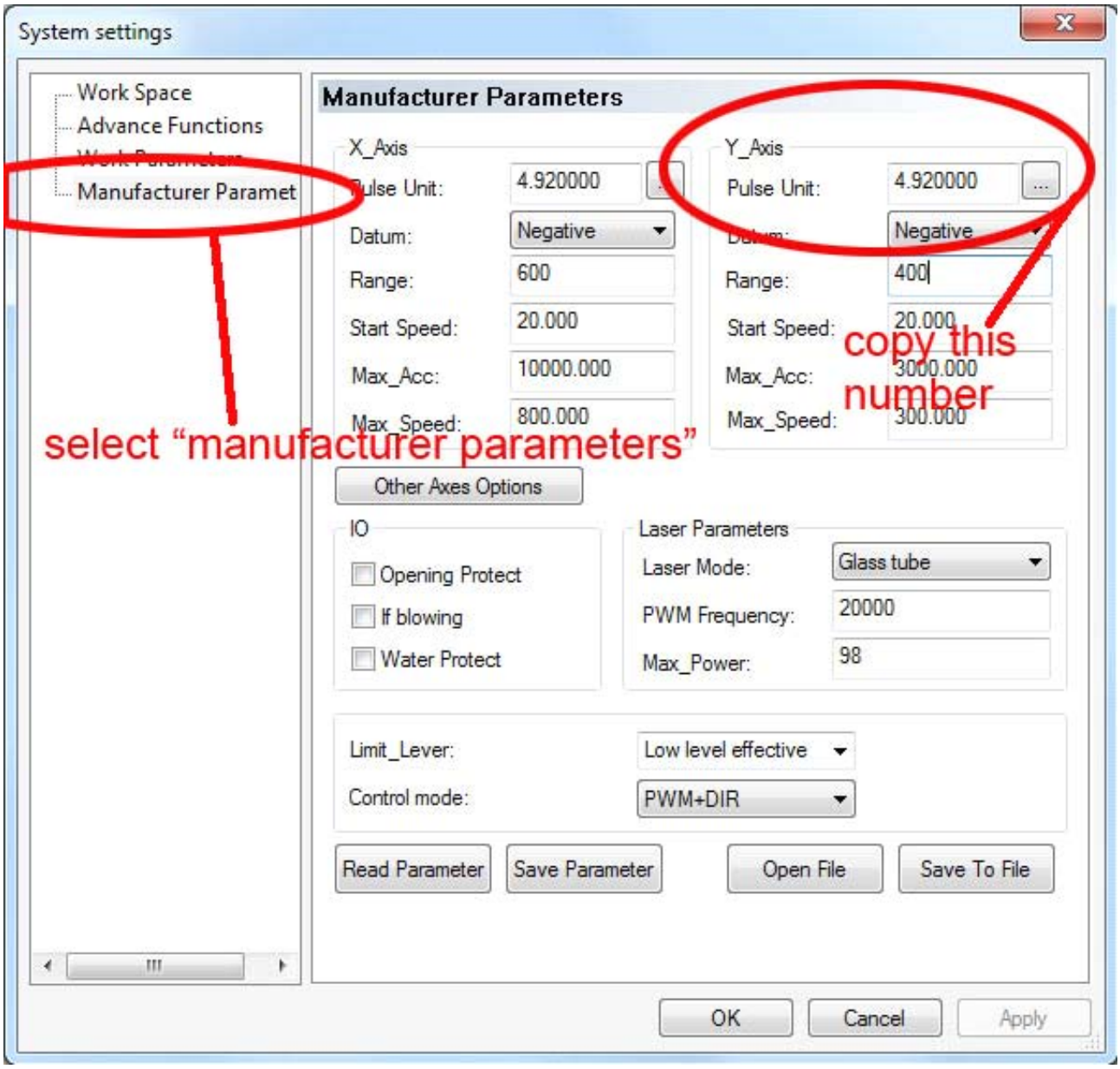
First, please press"stop" button on the display to stop the laser head if it moves to the wrong Direction.

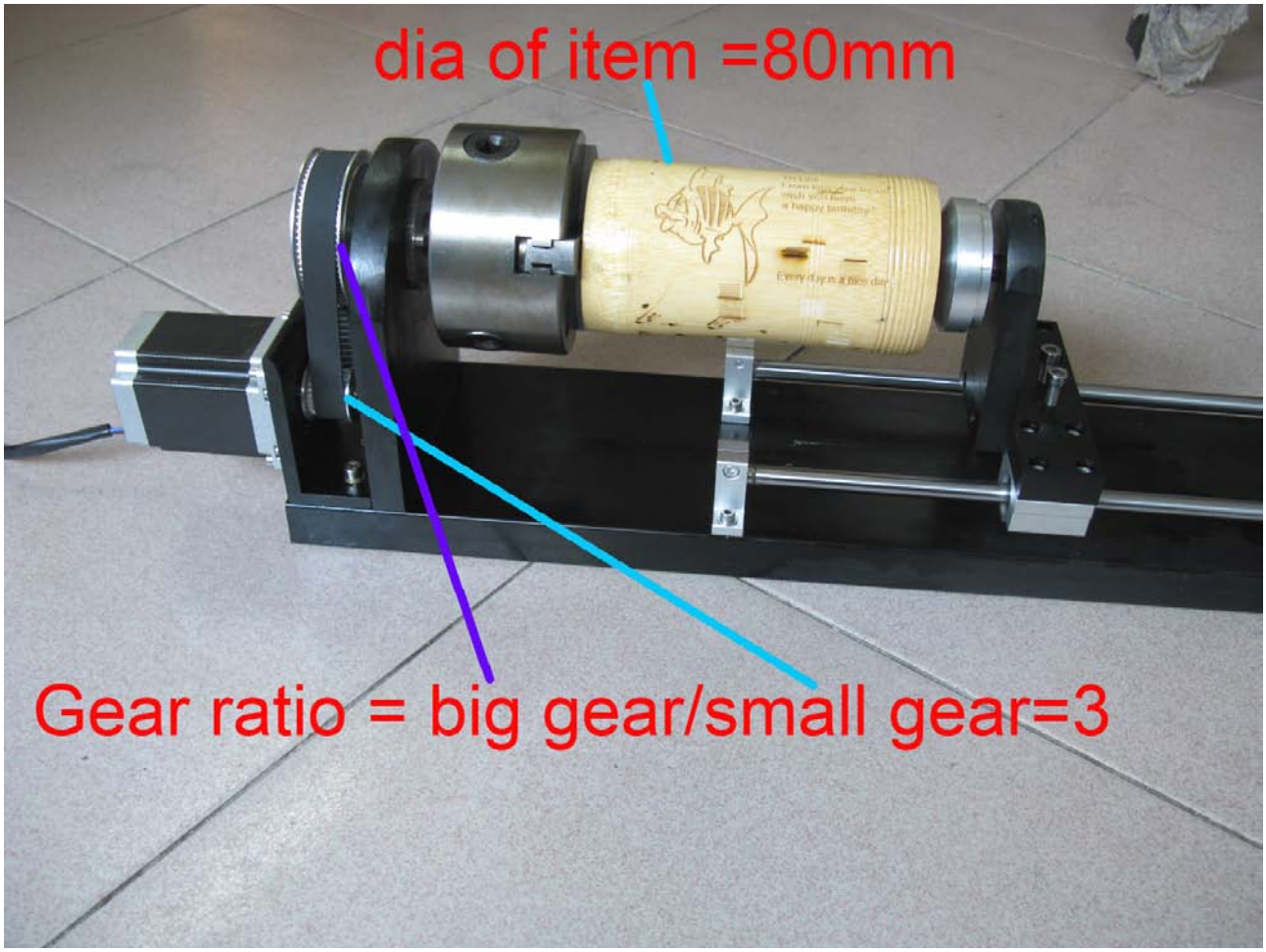
Then change the parameters as below:

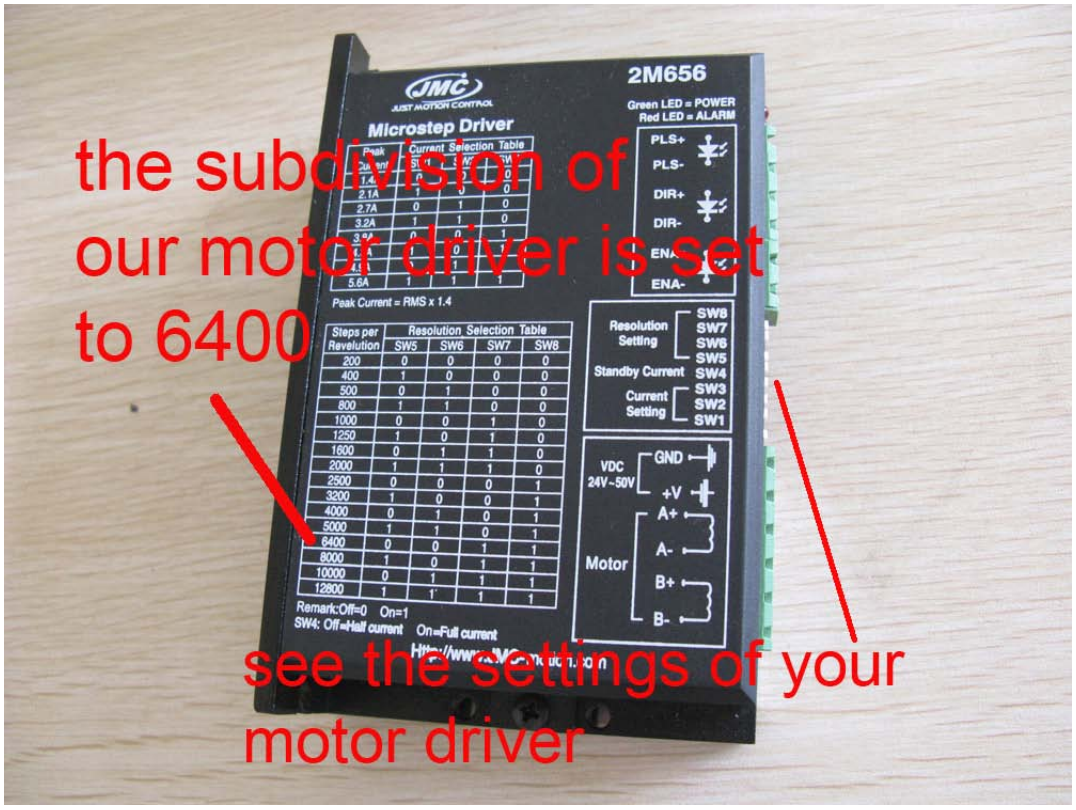


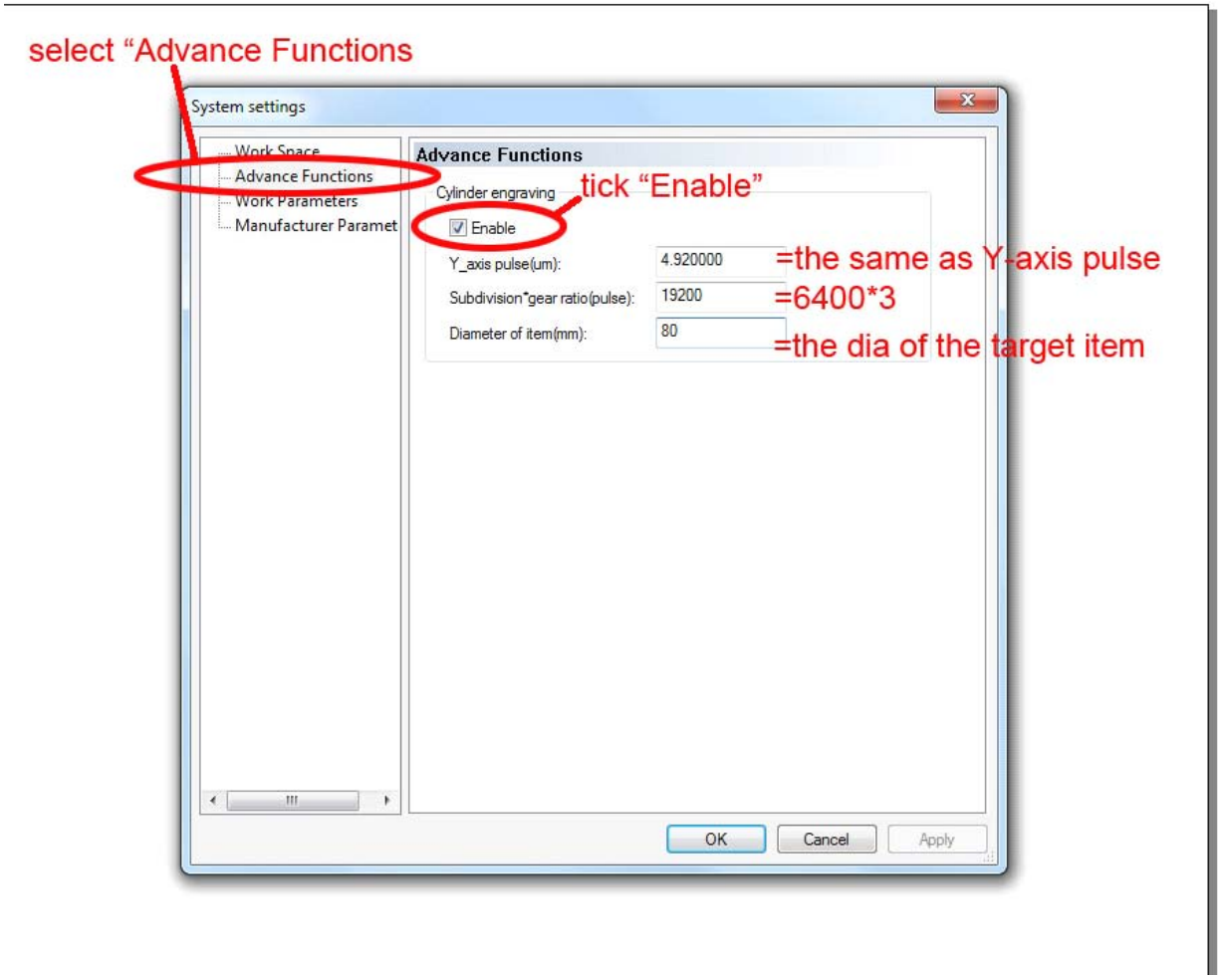
8.10 how to use rotary function

Please follow the pictures below to use rotary:




dia of item =80mm
Gear ratio = big gear/small gear=3


the subdivision of our motor driver is set to 6400
see the settings of your motor driver
JMC
JUST MOTION CONTROL
Microstep Driver
2M656
Green LED = POWER
Red LED = ALARM
PLS+
PLS-
DIR+
DIR-
ENA+
ENA-
Peak Current = RMS x 1.4
Resolution Setting
Standby Current
Current Setting
SW8
SW7
SW6
SW5
SW4
SW3
SW2
SW1
VDC 24V~50V
GND
+V
Motor
A+
A-
B+
B-
Remark:Off=0 On=1
SW4: Off=Half current On=Full current


select “Advance Functions
System settings
Work Space
Advance Functions
Work Parameters
Manufacturer Paramet
Advance Functions
Cylinder engraving
tick “Enable”
Enable
Y_axis pulse(um):
4.920000
=the same as Y-axis pulse
Subdivision*gear ratio(pulse):
19200
=6400*3
Diameter of item(mm):
80
=the dia of the target item
OK
Cancel
Apply

8.11 Reverse engraving

please change the "machine zero"(see the picture)
first click the system settings,
then change the "machine zero", if the default is "left-up",
please change it into "right up",
if the default is "right up",please change it into "left up"
after that,please click "ok" and then reset the machine.