

# Manual of Laser Cutting Machine

## **I. Safety warning:**

1. Improper use of the laser cutting machine can cause serious health risks and risk of damage to the machine.
2. If you are using the laser cutting machine, you are responsible for the safety of all people and equipment affected by using the machine.
3. Only persons with proper training and up-to-date knowledge of the safe operation procedures should use the laser cutting machine.
4. If you are in doubt about the safe and proper operation, you **MUST** ask for assistance before operating the machine.
5. Failure to operate the laser cutting machine in a safe and responsible way might result in serious consequences such as being held liable for damages and being banned from using the machine in the future.

## **II. Experimental Safety Precautions:**

1. To avoid damaging machine, must follow the turn on and off procedure below:
  - Turn on procedure :
    - Power on the machine first!
    - Wait for machine positioning, and then power on the laser head.
  - Turn off procedure :
    - Power off the laser head first!
    - Wait for the digital number on the panel light off, and then power off the machine.
2. To avoid damaging the laser power source, check the power is not over 85%.
3. In winter, to avoid humid air damaging the high voltage package of laser power source. The machine needs to warm up about 10 minutes before working.
4. Check the working temperature of the chiller is below 35°C. The best working temperature is between 25 to 27 °C.
5. Operator has to stay with the machine during machining.
6. Don't connect the computer to internet to avoid virus.

## **III. Purpose of the experiment:**

Use laser cutting machine properly.

## **IV. Experiment principle:**

Machine controlled laser cutting process.

## V. Experimental equipments:

1. Monitor:(x 1)



2. Computer: (x1)



3. Laser cutting machine: (x1)



4. Chiller: (x1)



## 5. Air pump: (x1)

**VI. Experimental setup:**

1. Check the wires and tubes are connected well.
2. Check the material is in the range for laser cutting.

**VII. Hole drilling procedure:**

1. Sign the user record book.
2. Turn on computer.
3. Open application software.

Figure 1 appears. File → open a machine file ( file name: \*.out ). ( Figure 1 )

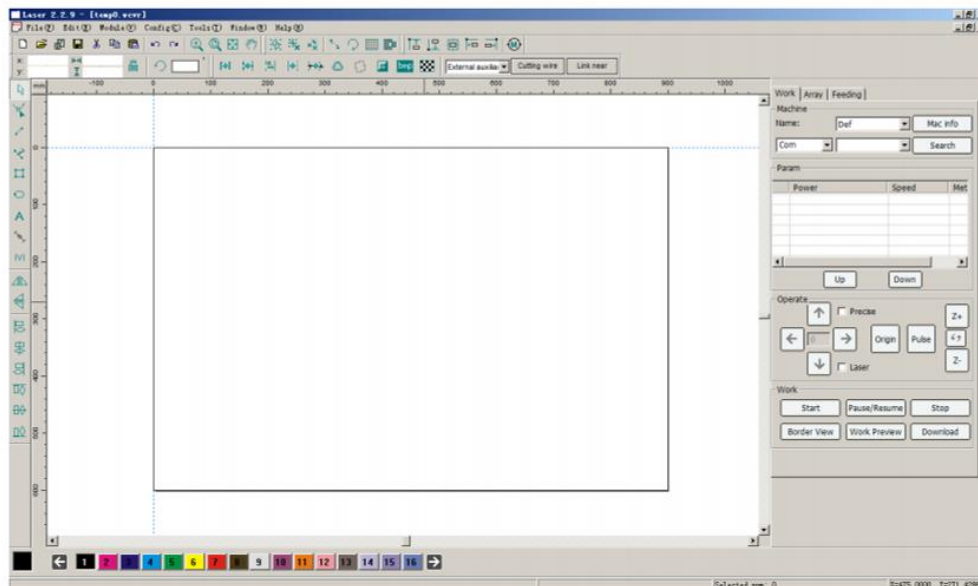


Figure 1 software interface

- 4. Double click the layer name below the “Param” frame to go to the “Work param “ window. ( Figure2 )

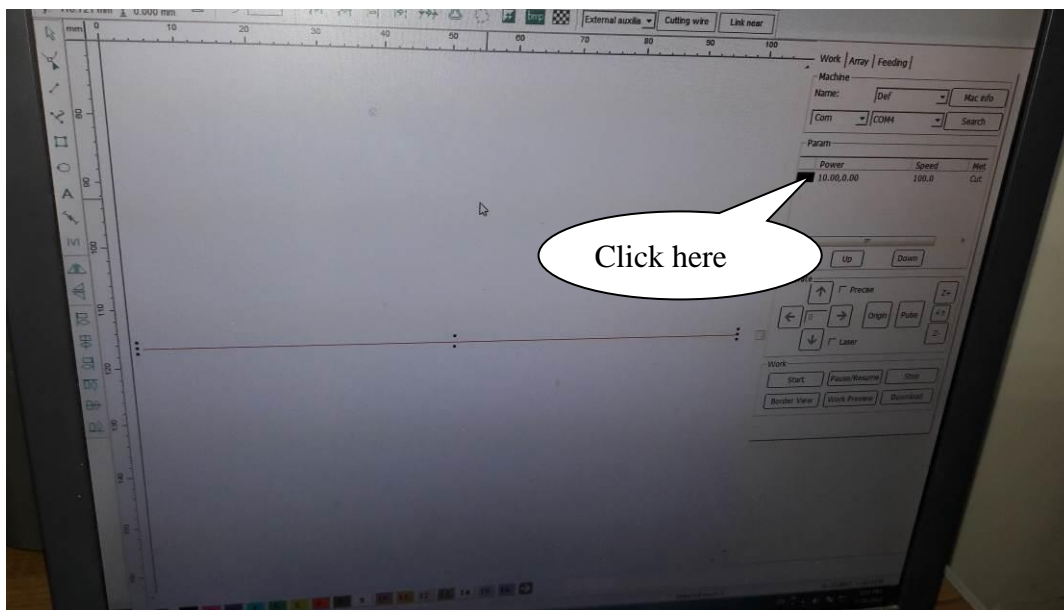


Figure 2

- 5. Check the “cut” option. ( Figure 3 )

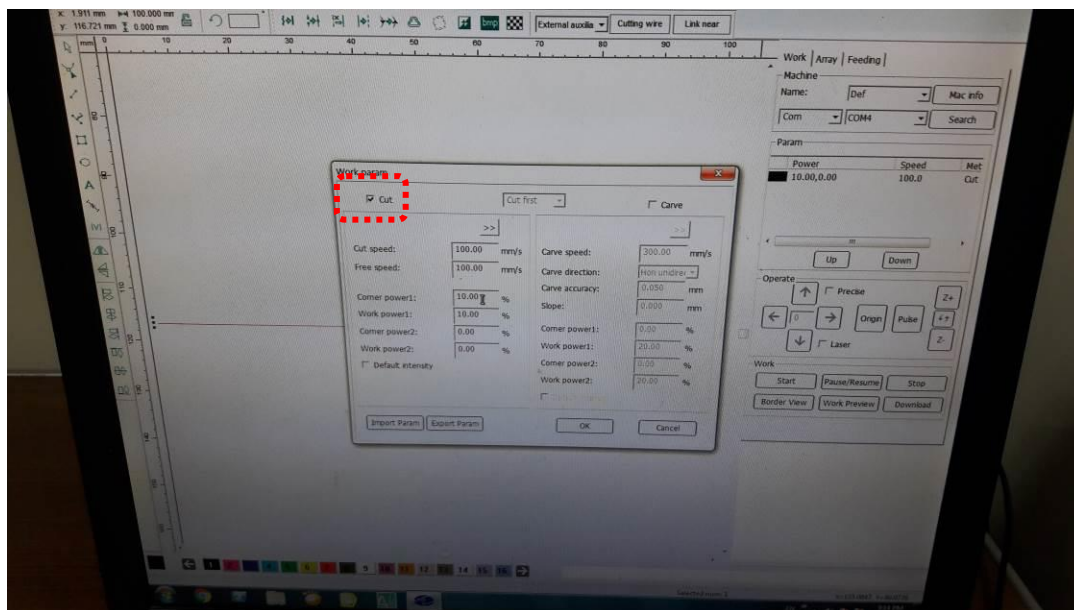


Figure 3 Work param window

- 6. Setup “Cut speed” and “Free speed”. ( Figure 4 )
- 7. Setup “Work power1” and “Corner power1”. ( Figure 4 )

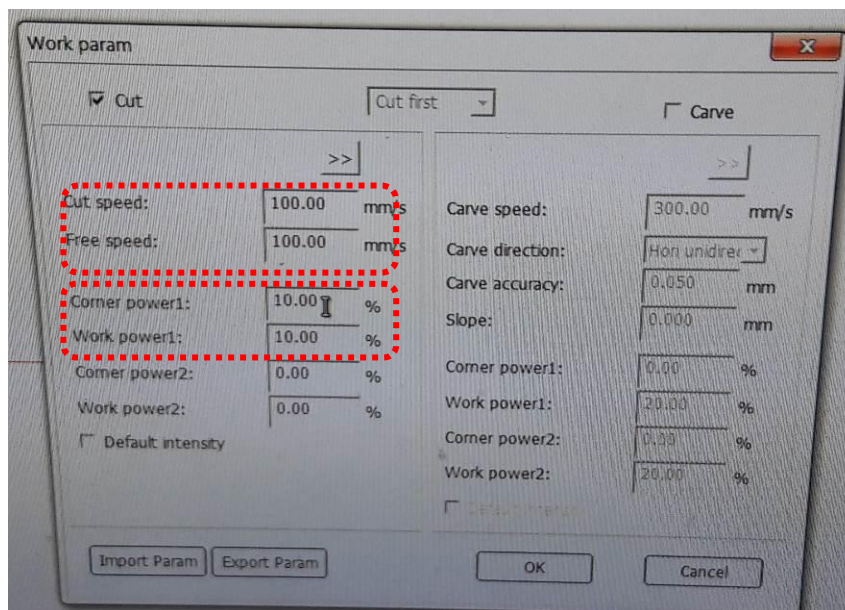


Figure 4 Work param window

- 8. Click the arrow below the “cut” function frame to go to the “cut” window.

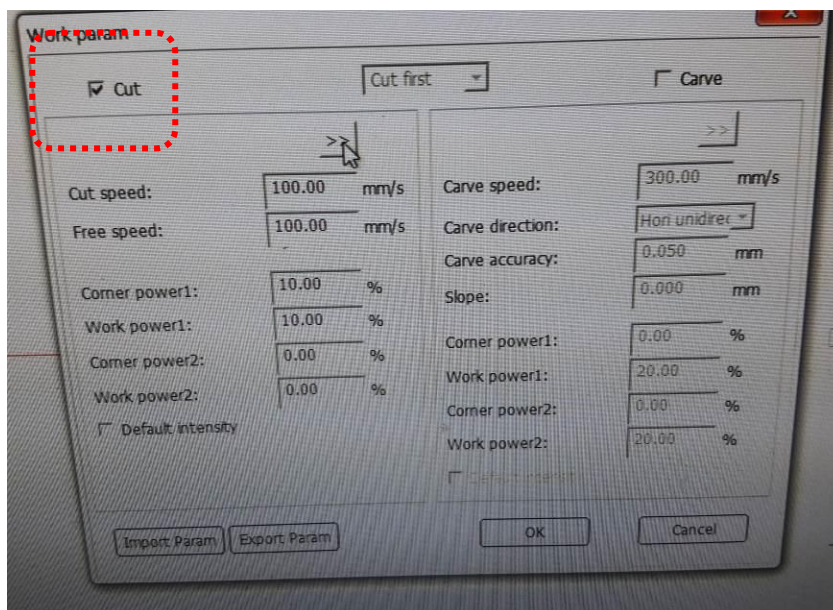


Figure 5 Work param window

- 9. Check the “Point Mode” option in Figure 6.

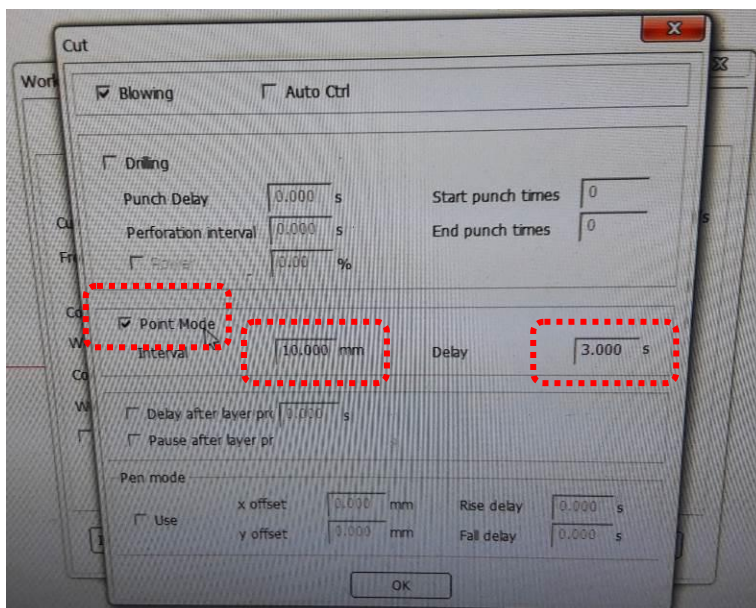


Figure 6 Cut window

- 10. Setup the value of “Interval” which means the distance between each hole. ( Figure 6 )
- 11. Setup “Delay” time which means the delay time for each hole drilling. ( Figure 6 )
- 12. Setup Speed Factor = 0.1 ~1 to cut smoothly; otherwise, setup Speed Fator >1. ( Figure 7 )

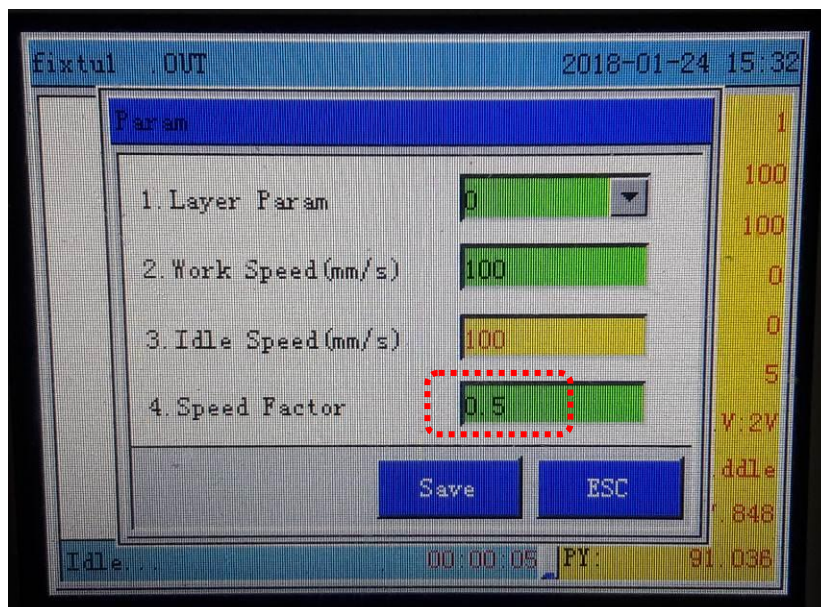


Figure 7 Operating panel on the machine

## Parameters for PEEK1000

<b>Material : Peek1000</b>				
<b>Work Speed : 100 mm/s ,</b>				
<b>Idle Speed : 100 mm/s</b>				
<b>Interval : 10 mm</b>				
<b>Power = Work Power = Corner Power</b>				
Length (mm)	Power (%)	Delay Time (s)	Total Time (s)	Real Diameter (mm)
100	5	1.0	14	0.26
100	5	1.5	20	0.25
100	5	2.0	25	0.29
100	5	2.5	30	0.30
100	5	3.0	36	0.31
100	3	1.0	14	0.01
100	3	1.5	19	0.02
100	3	2.0	25	0.05
100	3	2.5	30	0.09
100	3	3.0	36	0.10