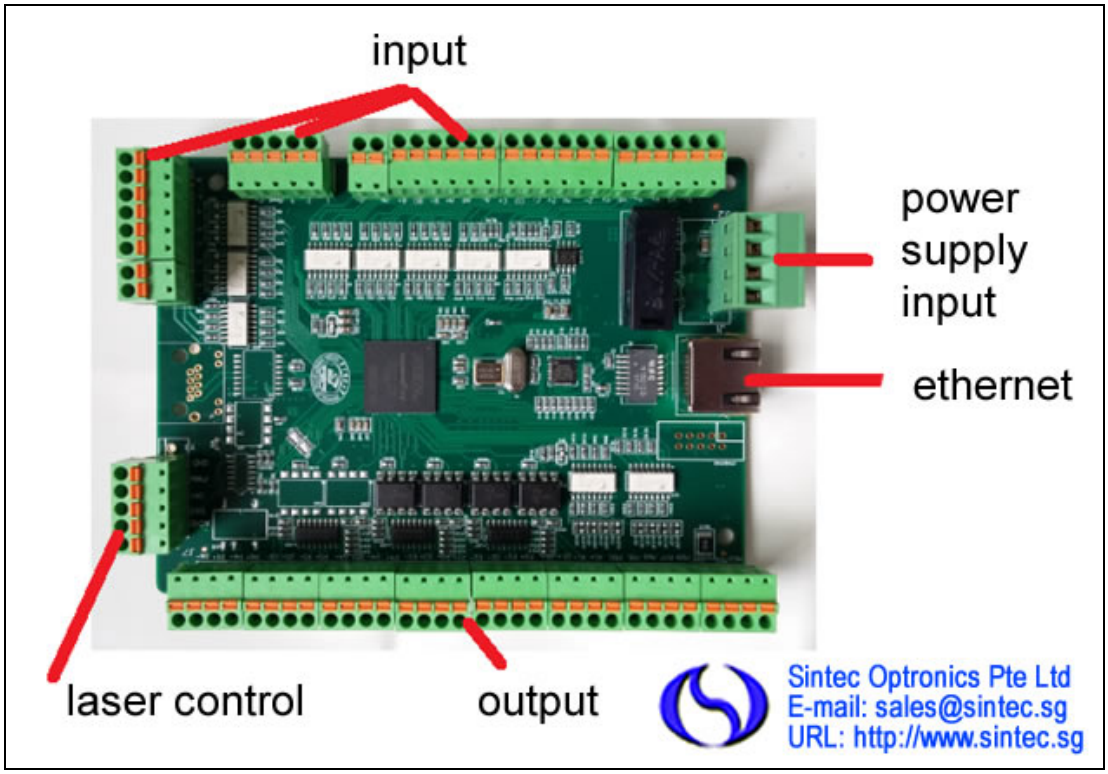
CNC Control Card and Software

Our CNC2000 control card and software can maximally support 6-axis control at the same time. It operates under Windows such as Win10, Win7, Win2000, WinXP, Windows98, WindowsSME or Windows95. It can be used in the numerical control system of 3-axis linear motion + 3-axis rotational motion (X,Y,Z,C,A,B) or 6-axis rotational motion (6-joint mechanical arm). Also it can control all the lasers in the market such as YAG lasers, CO2 lasers, fiber lasers and ultrafast lasers.

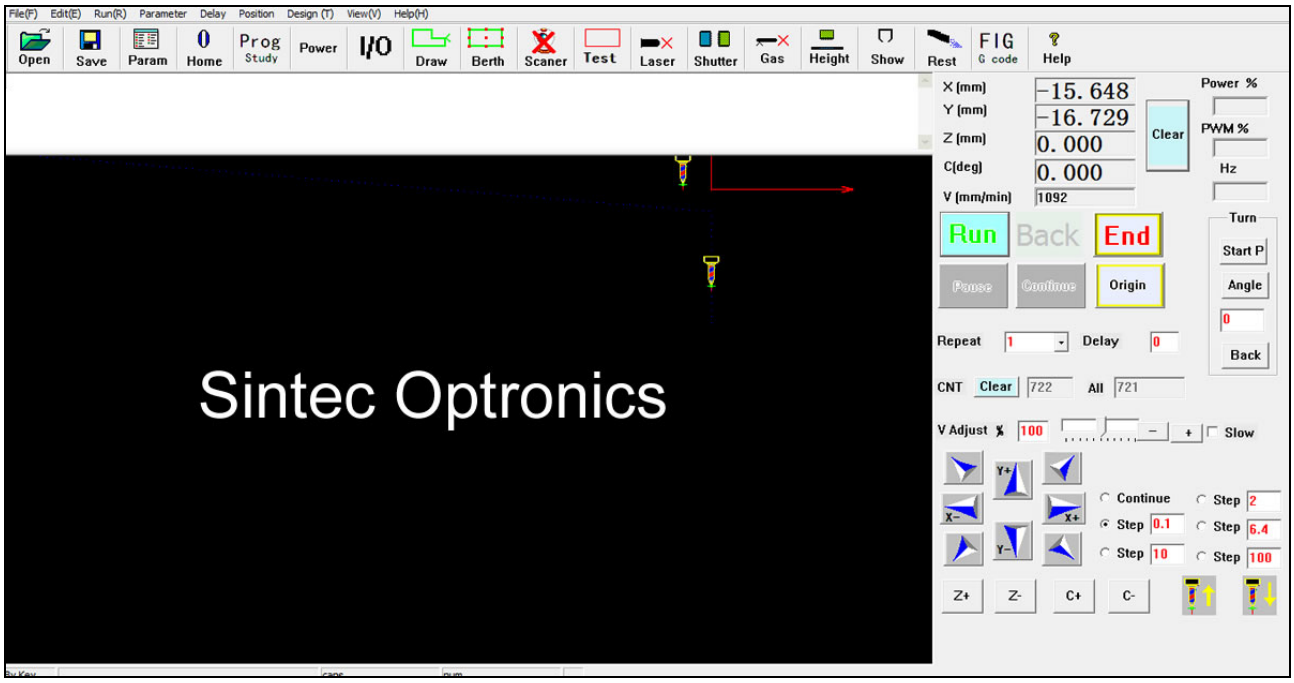
The CNC control card is an Ethernet card which is more convenient for connections. The advantages and features of the CNC control card are

- Better stability, anti-interference and precision than traditional PCI card
- More convenient for connections
- No need to have a PCI slot to insert the control card
- Operate in all versions of Windows systems
- Operate in laptop or desktop computers
- Can output 0-10V analogue voltage to achieve the real-time control of the fiber laser power
- Can output 24V PWM signals to control the frequency and pulse width of the fiber lasers or CO2 lasers
- One control card can support 6-axis system and combined 2 cards can support 10-12-axis system
- The number of the input ports has been increased to 32 to achieve multi-station control and various kinds of logic control according to different input signals

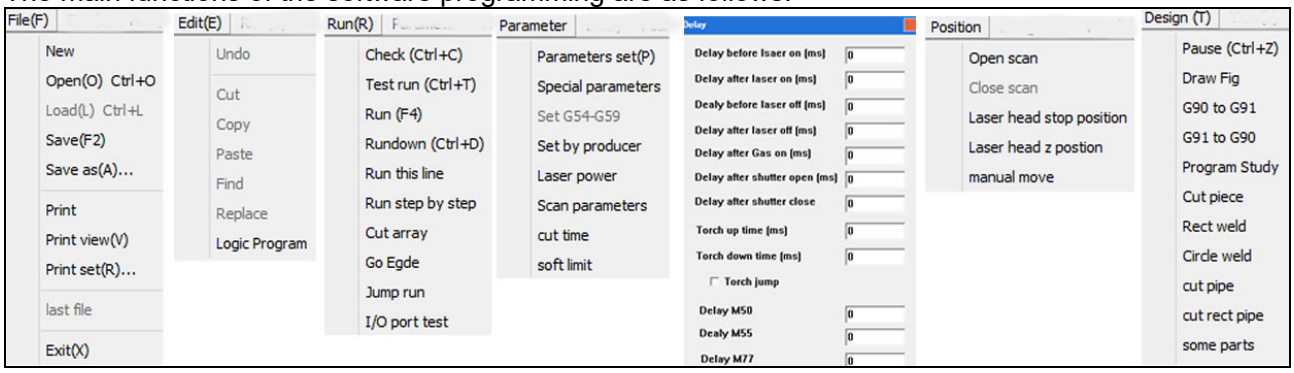


Our control cards are made with multi-layer circuit boards and power source and ground are separated into two layers. Although the card costs more, they improve the performance of anti-interference. Thus our cards can be used in precise control.

Our software's functions are strong and easy to operate. The programming is simple and easy. There are 3 methods to write a programming: automatic conversion of PLT and DXF files, teaching or CNC programming. The software programming panel is as follows:



The main functions of the software programming are as follows:



The main programming points are as follows:

Maximum axis: 6
Program verification function
MDI function
Absolute/increment programming (G90, G91)
Programming using inch, metric, pulse number (G20, G21, G22)
Mirror function (G24, G25)
Zoom (magnification/demagnification) (G50, G51)
Automatic, step, manual, home function
Fast position (G00), linear interpolation (G01)
Arc interpolation (G02, G03)
Pause (G04), screw thread function (G33)
Set/back zero (G29, G30)
Reverse clearance compensation, beam diameter compensation (G40, G41, G42)
Coordinate rotation (G68, G69)
Sub-function
Static/dynamic emulation
Max stepping frequency: 200000Hz
Automatic acceleration/deceleration
Automatic conversion of PLT and DXF files

Ordering Information

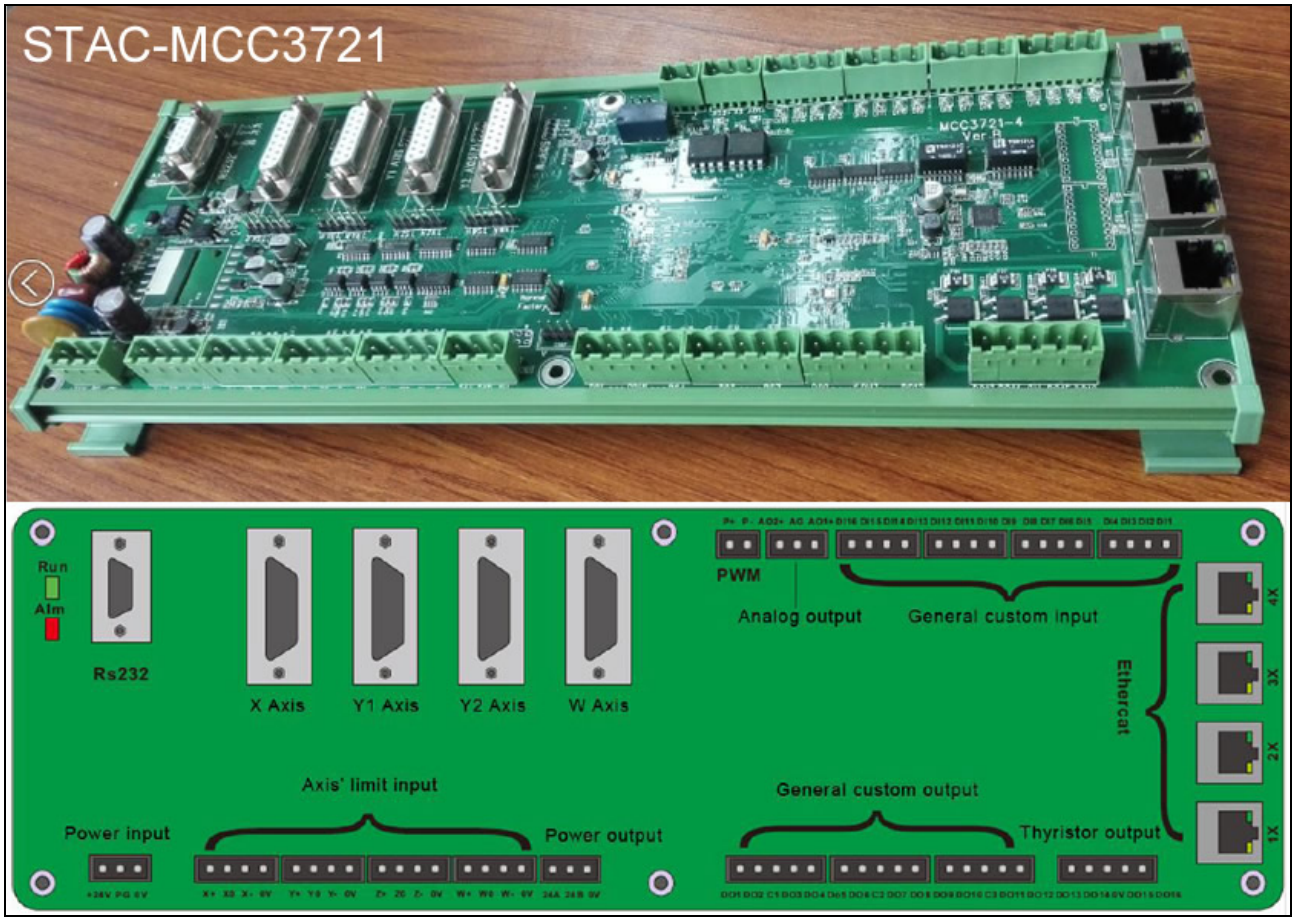
Part number	Description
ST-CNC2000-4S	4-axis control and to switch on/off laser beam such as YAG laser

ST-CNC2000-4M	4-axis control and to fully control all types lasers such as YAG, CO2 or fiber lasers
ST-CNC2000-6S	6-axis control and to switch on/off laser beam such as YAG laser
ST-CNC2000-6M	6-axis control and to fully control all types lasers such as YAG, CO2 or fiber lasers

STAC Series CNC Control Boards & Software

1. STAC-MCC3721 Control Boards

The control boards used to control lasers, laser cutting heads, XYZW motion and capacitor height sensor in the cutting heads. STAC-MCC3721H is to control XYZ 3-axis motion and STAC-MCC3721NC is to control XYZW 4-axis motion.



The I/O ports are defined as following table.

Port		Function	Remark
Power input	+24V	DC24V input + end	24V/10A DC. Recommend to use DC 24V/10A power supply
	PG	protective ground	
	0V	DC input - end, power GND	
Axis' limit input	X+	X Axis' positive limit input, special signal, low-level propagation is effective.	X Axis' limit input
	X0	X Axis' origin signal, special signal, low-level propagation is effective.	
	X-	X Axis' negative limit input, special signal, low-level propagation is effective.	
	0V	GND, X Axis' limit signal COM port	
	Y+	Y Axis' positive limit input, special signal , low-level propagation is effective.	Y Axis' limit input
	Y0	Y Axis' origin signal， special signal， low-level propagation is effective. YY Axis' negative limit input， special signal， low-level propagation is effective. 0V GND, Y Axis' limit signal	

		COM port	
	Y-	Y Axis' origin signal， special signal， low-level propagation is effective. YY Axis' negative limit input， special signal， low-level propagation is effective. 0V GND, Y Axis' limit signal COM port	
	0V	Y Axis' origin signal， special signal， low-level propagation is effective. YY Axis' negative limit input， special signal， low-level propagation is effective. 0V GND, Y Axis' limit signal COM port	
	Z+	Z Axis' positive limit input， special signal， low-level propagation is effective.	Z Axis (standby) input
	Z0	Z Axis' origin signal，special signal，low-level propagation is effective.	
	Z-	Z Axis' negative limit input， special signal， low-level propagation is effective.	
	0v	GND, Z Axis' limit signal COM port	
	W+	W Axis' positive limit input， special signal， low-level propagation is effective.	W Axis(Rotation Axis / standby) input
	W0	W Axis' origin signal，W	
	W-	W Axis' negative limit input， special signal， low-level propagation is effective.	
	0v	GND, W Axis' limit signal COM port	
Axis' controlling ports	X	X Axis' controlling signal	DB15female
	Y1	Y1 Axis' controlling signal	
	Y2(Z)	Y2（Z）Axis' controlling signal	If Y Axis is set up as dual - drive mode, it is Y2Axis; if Y Axis is set up as single drive mode, it is Z Axis' controlling port(standby).
	W	W Axis' controlling signal	Rotation Axis(standby)
General custom outputs	DO1	DO1 general output port	The function of output port can be set up arbitrarily by software. Passive output port has the same output TTL with COM port.
	DO2	DO2 general output port	
	COM1	general output COM port	
	DO3	DO3 general output port	
	DO4	DO4 general output port	
	DO5	DO5 general output port	
	DO6	DO6 general output port	
	COM2	general output COM port	
	DO7	DO7 general output port	
	DO8	DO8 general output port	
	DO9	DO9 general output port	
	DO10	DO10 general output port	
	COM3	General output COM port	
	DO11	DO11 general output port	
	DO12	DO12 general output port	
Thyristor output	DO13	DO13 thyristor output port	DCV output: 24V, drive current: 1A
	DO14	DO14 thyristor output port	
	COM4	Thyristor output COM port	
	DO15	DO15 thyristor output port	
	DO16	DO16 thyristor output port	
Power output	24A	The first DC24V output +end	Can be used as Axis' limit switch/general output port can supply standard TTL
	24B	The 2nd DC24V output +end	
	0V	The GND for DC24V output	

PWM output	P+	PWM signal output +end	The TTL of PWM output is 24V/5, which can be configured by the jumper nearby.
	P-	PWM signal output -end	
Analog output	AO1+	Analog output port +end	The voltage of analog output is from 0V to 10V, which can be configured by software.
	AG	The GND for analog output	
	AO2+	Analog outpot port +end	
	AI	Analog input	
General input	DI1	general input port, low-level propagation is effective (Default)	
	DI2	general input port, low-level propagation is effective (Default)	
	DI3	general input port, low-level propagation is effective (Default)	
	DI4	general input port, low-level propagation is effective (Default)	
	DI5	general input port, low-level propagation is effective (Default)	
	DI6	general input port, low-level propagation is effective (Default)	
	DI7	general input port, low-level propagation is effective (Default)	
	DI8	general input port, low-level propagation is effective (Default)	
	DI9	general input port, low-level propagation is effective (Default)	
	DI10	general input port, low-level propagation is effective (Default)	
	DI11	general input port, low-level propagation is effective (Default)	
	DI12	general input port, low-level propagation is effective (Default)	
	DI13	general input port, low-level propagation is effective (Default)	
	DI14	general input port, low-level propagation is effective (Default)	
	DI15	general input port, low-level propagation is effective (Default)	
	0V	Signal input public port	
Ethernet	1X	Industrial Ethernet interface	These four ports can be arbitrarily configured
	2X	Industrial Ethernet interface	
	3X	Industrial Ethernet interface	
	4X	Industrial Ethernet interface	
General serial port	RS232	RS232 serial port	It can butt-joint with laser

2. Laser Cutting Software STAC-SC2000

STAC-SC2000 CNC cutting software is designed for flat fiber laser cutting which includes graphic drawing and editing, cutting process dealing, cutting process controlling, system monitoring, components monitoring and debugging, and so on.

Features:

1) Simple Operations, Powerful Functions.

- Developed based on RIBBON framework, the design is unique and the software is easy to be operated.
- UI design is more humanized, which is easier to use even without training.
- With powerful CAM functions based on AUTOCAD design, support graphic import, graphic drawing, graphic editing, and graphic transformation, graphic optimized and so on.
- Intelligent capturing, which makes drawing more convenient and accurate.
- Unique properties option design, which helps user to design the cutting graphic more easily.
- Support various sort methods, auto sort can recognize the film inside or outside the graphic to make sure the path planning optimized.
- Powerful lead line function, support various ways to lead line, auto added suitable lead line based on graphic nested relations. Support check/revise interfered lead line by one click.

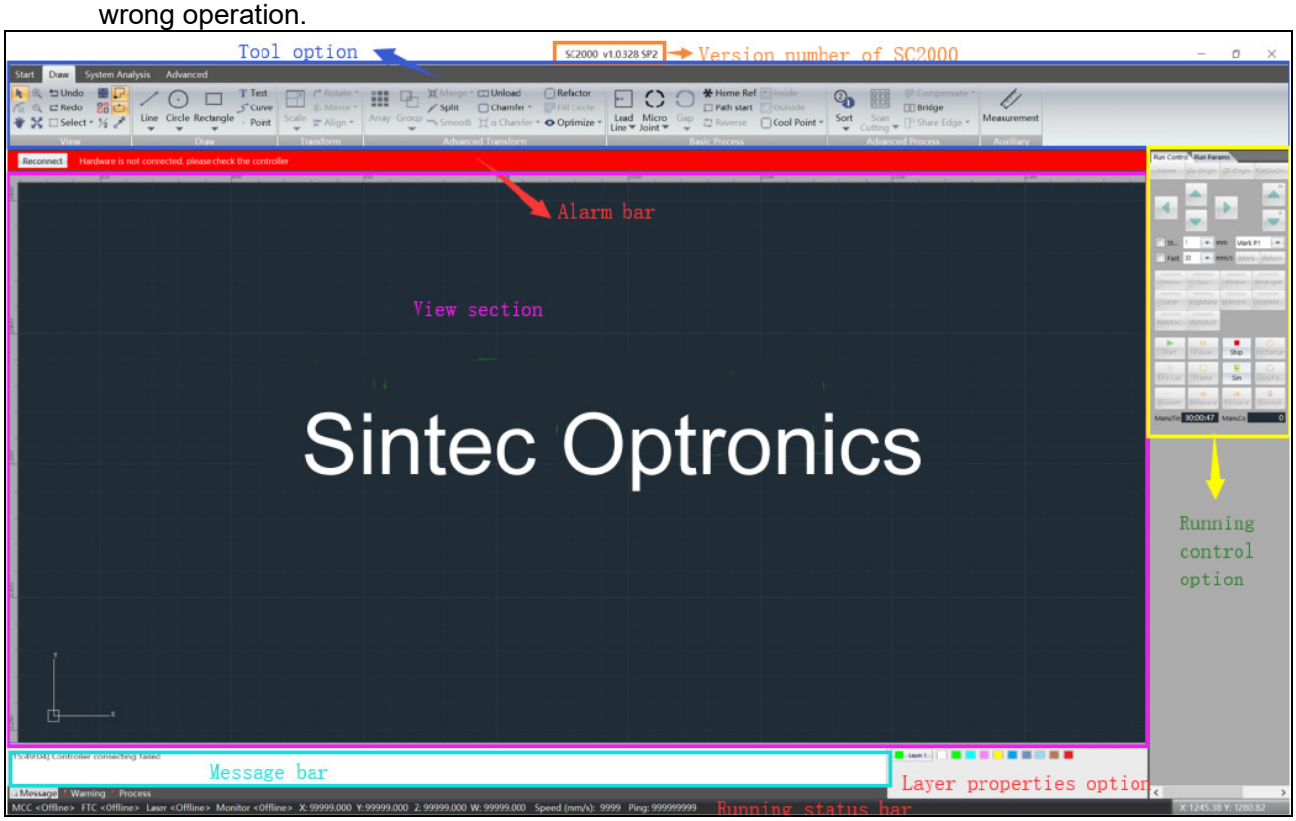
2) Complete cutting process, debugging easily.

- Support all kinds of cutting process: Section drill, gradual drill, multi stages drill, cutting with film, fix height cutting, and predrill and so on.
- Support laser's power/frequency adjusted with speed, to decrease or avoid the problem of firing corners when cutting carbon steel.
- Support multilayer cutting or marking, and other sorts of processing ways.
- Support micro-joint, gap, over-cutting, bridge, kerf-compensation and so on.
- Powerful material database, which can save all sorts of material cutting process.
- Support complex functions: Edge seeking, fly-cutting and so on.

- Support breakdown position tracking/forward/backward and so on.

3) Rea-time alarm, stable and reliable.

- Support running error measurement, it can check the error between running orbit and graphic error.
- Real-time alarming the status of capacitive height controller, laser source, auxiliary gas of electric laser cutting head and other equipment, make sure the security during cutting.
- More than 50 different kinds of alarms, to secure the equipment in whole aspect, avoid user's wrong operation.

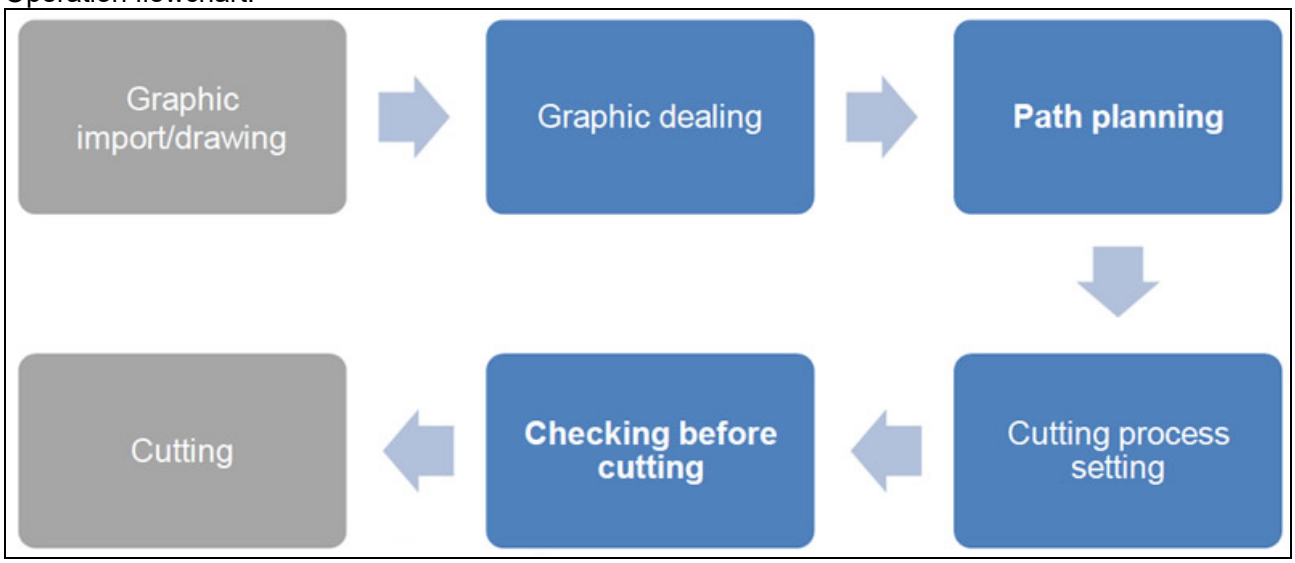


UI design is very clear, from up to down: title option, tool option, alarm option, view option, running control option, message bar, graphic parameters option, and status bar. The functions of each section shows as below:

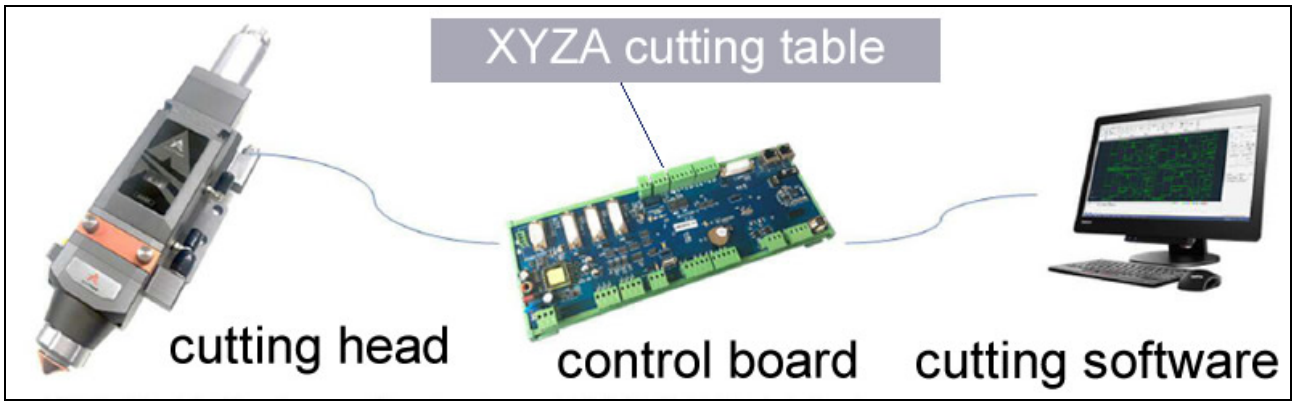
Section	Function	Remark
Tittle bar	Display software's name and version number.	
Tool option	Mainly collects the tools needed for software operation, it has five submenu: Start/Draw/System Analysis/Advanced/Nest. User can do graphic drawing, graphic editing, graphic transformation, adding lead line, monitoring running status, configuration machine tool.	
Alarm bar	Display the current system alarm.	Alarm will be displayed in pop-up window, and once the alarm is cleared, the pop-up window will be gone.
View section	Graphic drawing/displaying section, displaying section of the machine's cutting area.	
Running control option	Run all kinds of cutting actions by software.	
Message bar	Display the current running status in scrolling to attract user's attention.	
Layer properties option	Set up layer properties such as layer process, graphic transformation and so on.	
Running status	Display the running status, running location,	

	cutting speed and so on.	

Operation flowchart:



A full package consists of a laser cutting head, a control board and cutting software.



The functions of each part is summarized as following:

Part name	Part number/combination	Remarks
Cutting head	STAC-A200MS	<2kW, manual focusing
Cutting head	STAC-A200MS-3D	<2kW, manual focusing, smaller 3D nozzle size for tube cutting
Cutting head	STAC-A260E	<2kW, electrical focusing
Cutting head	STAC-A290E	<2kW, electrical focusing, smaller 3D nozzle size for tube cutting
Cutting head	STAC-A280E	<4kW, electrical focusing
Cutting head	STAC-A295E	<4kW, electrical focusing, smaller 3D nozzle size for tube cutting
Control system	STAC-MCC3721H + STAC-SC2000	3-axis (X, Y1, Y2, Z) flat-plate cutting. Y1 & Y2 have same signals.
Control system	STAC-MCC3721NC + STAC-SC2000	4-axis (X, Y1, Y2, Z, A) flat-plate cutting. A is used to exchange tables.
Control system	STAC-MCC3723+STAC-FTC10+SCTube	Tubing cutting such as round, square, L, H and rotation
Control system	STAC-MCC3723+STAC-FTC10+STAC-EX15*2+SCTube	Tubing & flat plate cutting
Total solution	STAC-A200MS+STAC-MCC3721H+STAC-SC2000	Internal height floating, for thin flat plate cutting
Total solution	STAC-A260E+STAC-MCC3721NC+STAC-SC2000	Internal height floating and auto-focusing, for thick flat plate cutting

Total solution	STAC-A200MS-3D+STAC-MCC3723+STAC-FTC10+STAC-SCTube	Professional tubing cutting such as round, square, L, H and rotation
Height floating	STAC-FTC10 (not including sensor nozzle)	Individual height adjusting, for tubing, flat-plate, 3D cutting
Height floating	STAC-FTC61 (not including sensor nozzle)	Individual height adjusting, supporting pulse step or servo motors