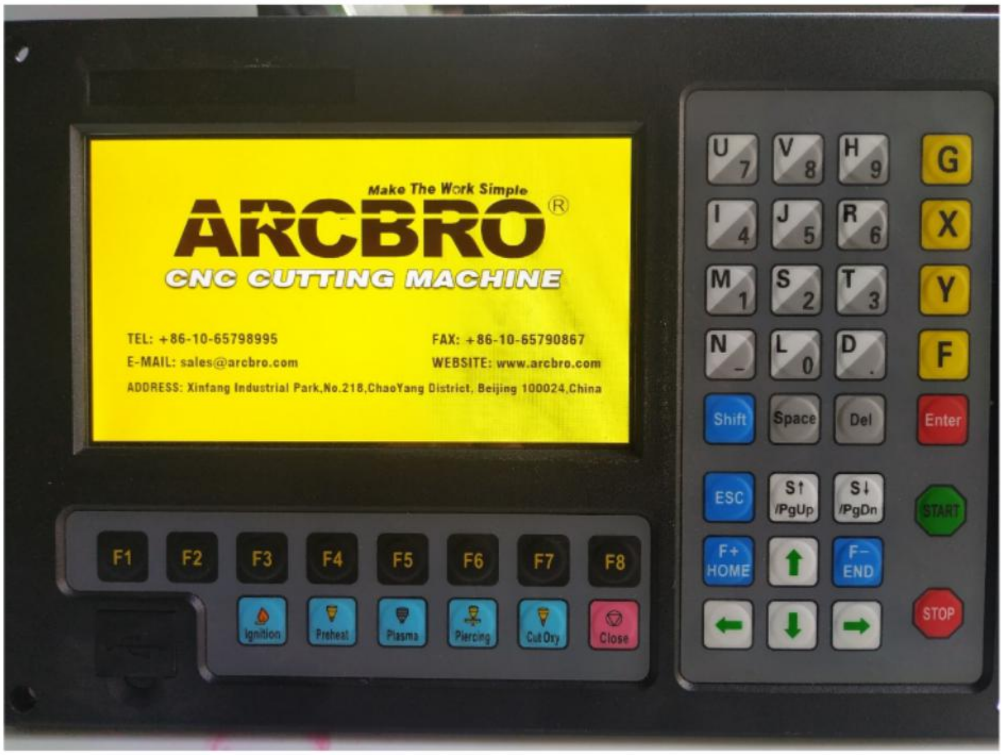
ARCBRO®

Spark SERIES

CNC Plate Cutting Machine User's Manual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U 7
V 8
H 9
G
I 4
J 5
R 6
X
M 1
S 2
T 3
Y
N _
L 0
D .
F
Shift
Space
Del
Enter
ESC
S↑ /PgUp
S↓ /PgDn
START
F+ HOME
F− END
STOP
F1
F2
F3
F4
F5
F6
F7
F8
Ignition
Preheat
Plasma
Piercing
Cut Dry
Close

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1. System Functions

- CNC System for Cutting is designed to work with torch/plasma, high-pressure water jet and laser cutting machines and extensively used in metal working, advertisement fabrication and stone machining businesses.
- High reliability as well as good resistance to plasma disturbance lightning and surge.
- Applied torch/plasma cutting technology, able to perform corner speed control and height control automatically;
- Kerf compensation, reasonability check and report for user's option;
- Breakpoint restoration, automatic power-back recovery and automatic breakpoint memory,
- Random section and piercing point selection,
- Extended piercing for thick plate and bridging feature for thin plate,
- Optional piercing position feature in mode of RETURN, SECTION(section selection) and RESBREK(breakpoint restoration), very convenient for user control,
- Ready for transitional cutting operation at any moment,
- Special short line machining feature based on smooth travel, extensively applicable to metal blanking as well as advertisement and ironwork fabrication, etc.
- Parts library of 24-type patterns, extensible and customizable, including the common machining parts,
- Operation menu both in Chinese and English, dynamic graphic display, 8-times zoom, free point automatic tracking, USB disk program and timely software upgrade.

1.1. Technical specifications

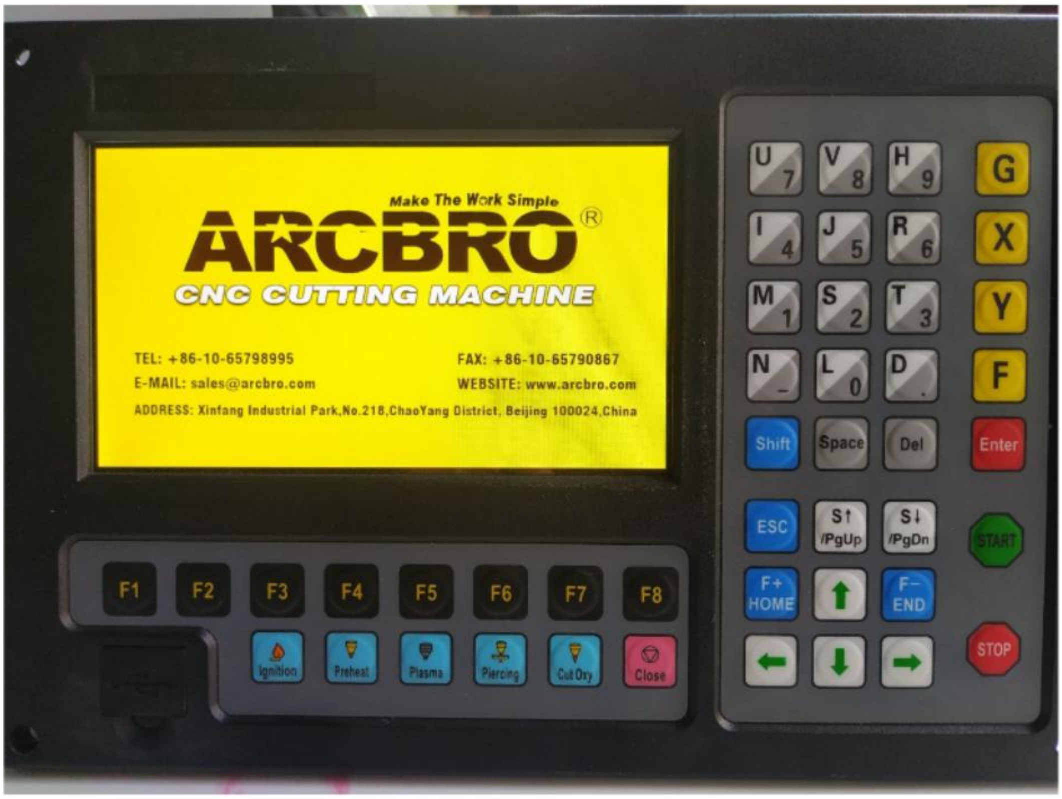
- Processor: Industrial ARM9 CPU
- Display: 7" Color LCD
- Input/output: 13 channels of optical isolation input and 8 channels of optical isolation output
- Interlocked axles: 2 axles, extensible to 4 interlocked axles
- Maximum speed: <24m/min

- Pulse equivalency: variable, electronic gear numerator and optional denominator in the range from 1 to 65535
- Memory space: 32M-64M oversized memory capacity for user program and no restriction to machining program
- Machine case size: 298×202×95.2(mm)
- Operation temperature: 0 to ＋40℃; storage temperature: -40 to ＋60℃

2. Main Menu

2.1. Menu Features

The design of hierarchy-based functional windows is adopted for system operating display. If a function is invoked in the main menu window, the corresponding sub window menu will pop up. Press [F1] to [F7] to select the corresponding function according to window prompt. Press ESC to abandon the selection and return to the upper level of menu.



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U 7
V 8
H 9
G
I 4
J 5
R 6
X
M 1
S 2
T 3
Y
N _
L 0
D .
F
Shift
Space
Del
Enter
ESC
S↑ /PgUp
S↓ /PgDn
START
F+ HOME
F− END
STOP
F1
F2
F3
F4
F5
F6
F7
F8
Ignition
Preheat
Plasma
Piercing
Cut Oxy
Close

Fig.1.1 Main menu display of system after booting

2.2. Description of Main Menu

【F1】-【F8】 Function key in different interface .

【S↑/PgUp】 page-up key of edit interface or Torch up in other interface.

【S↓/PgDn】 page-down key of edit interface or Torch down in other interface.

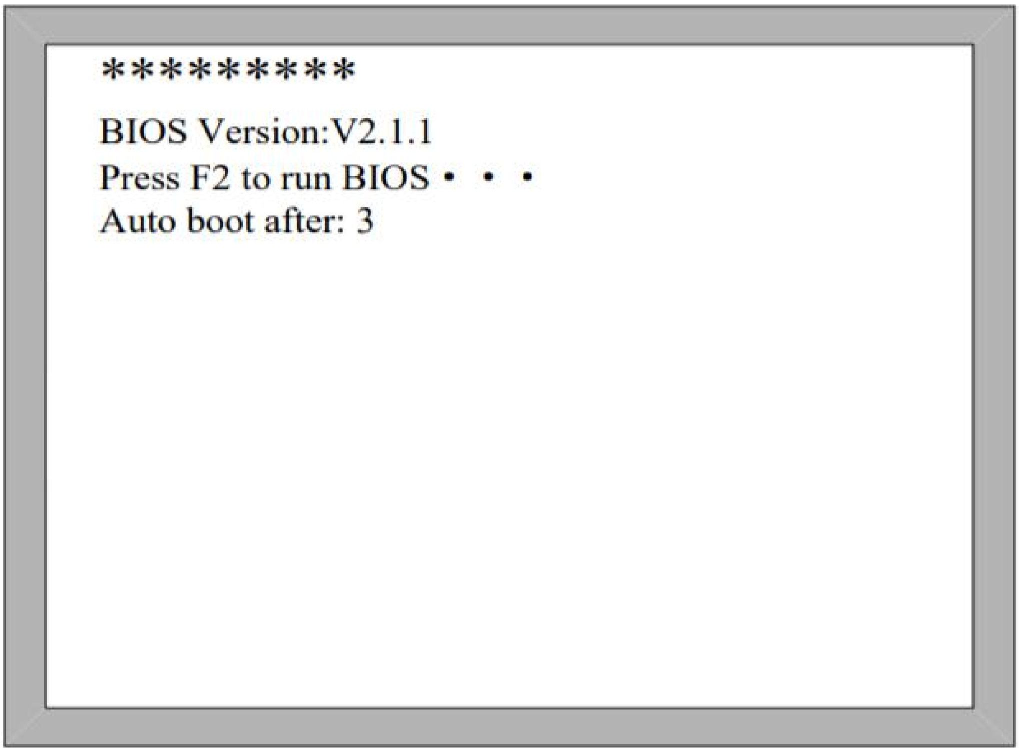
【F+/HOME】 Accelerate or skip to the head of code line.

【F-/END】 Decelerate or skip to the tail of code line.

【1】-【9】 During the cutting process, change the cutting speed to ratio of the speed limit you have set, for example press【1】, change the cutting speed to 10% of the speed limit you have set, press【2】, change the cutting speed to 20% of the speed limit you have set.

3. Automatic Function(AUTO)

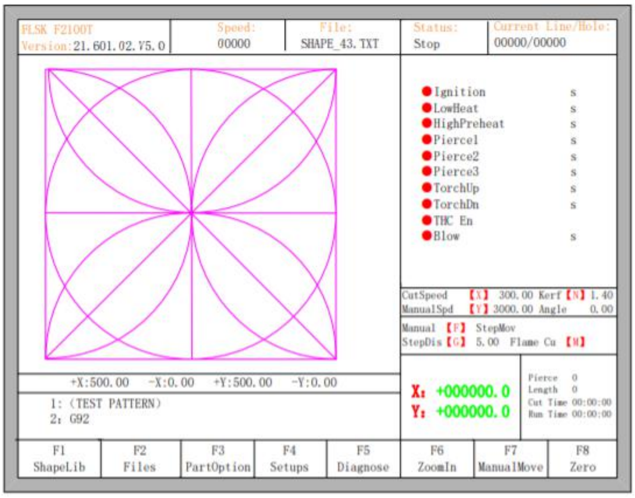
When just power on, the controller will first go into BIOS starting up interface:



```
*********
BIOS Version:V2.1.1
Press F2 to run BIOS • • •
Auto boot after: 3
```

Fig. 3.1 Controller self-check interface

In the starting process, there is 3 seconds to countdown, before the countdown is over, if pressing 【F2】, it will enter the BIOS (please take the reference of the chapter 12 to run bios). If pressing any other key, it will jump over the countdown and directly enter the welcome interface. If pressing no key, it will countdown to 0 and then enter the welcome interface shown as Fig 3.2. In the welcome interface, press any key to enter the main interface automatically shown as Fig3.3.



FLSK F2100T
Version:21.601.02.V5.0
Speed: 00000
File: SHAPE_43.TXT
Status: Stop
Current Line/Hole: 00000/00000

CutSpeed 【X】 300.00 Kerf【N】 1.40
ManualSpd 【Y】 3000.00 Angle 0.00
Manual 【F】 StepMov
StepDis【G】 5.00 Flame Cu 【M】

+X:500.00 -X:0.00 +Y:500.00 -Y:0.00

1: (TEST PATTERN)
2: G92

X: +000000.0
Y: +000000.0

Pierce 0
Length 0
Cut Time 00:00:00
Run Time 00:00:00

●Ignition s
●LowHeat s
●HighPreheat s
●Pierce1 s
●Pierce2 s
●Pierce3 s
●TorchUp s
●TorchDn s
●THC En
●Blow s
F1 ShapeLib
F2 Files
F3 PartOption
F4 Setups
F5 Diagnose
F6 ZoomIn
F7 ManualMove
F8 Zero

Fig.3.3

In the main interface, press 【F1】-【F8】for the following functions:

【F1】ShapeLib: Pressing F1 to enter the Shape Library including 48 common shape, and most of them have plate size and hole size.

【F2】Files: You can load local files, U disk files or edit, import, export and delete codes.

【F3】PartOption: Make actions of mirroring, rotation, plate adjusting, plate arraying, selecting row and hole or code edition etc.

【F4】Setups: Setting all parameters.

【F5】Diagnose: Including input ports diagnosis, output ports diagnosis, keyboard diagnosis, controller self check, date setting and ports definition.

【F6】ZoomIn: Zoom in the shape in full screen.

【F7】ManualMove: Manually move the machine.

【F8】Zero: Clear the coordinate of X and Y before starting cut or after cutting over.

【X】CutSpeed: Setting the cutting speed.

【Y】ManualSpeed: Setting the manual moving speed.

【F】Manual: Setting the mode of manual movement including keepMov(keep movement), StepMov(step movement), ContiMov(continue movement).

【G】StepDis: Setting the distance of the StepMov .

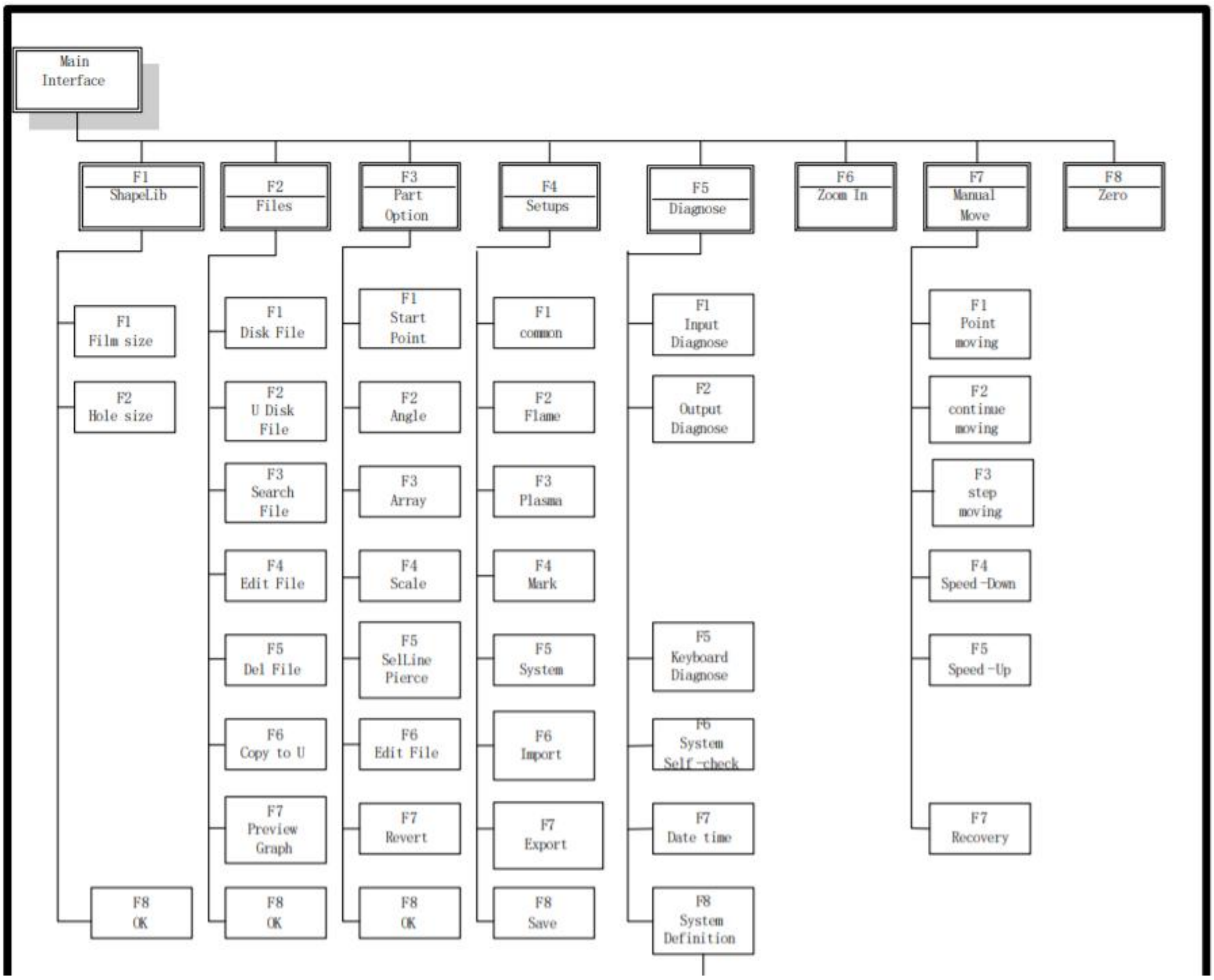
【N/Z】Before the cut running starts, set kerf compensation value.

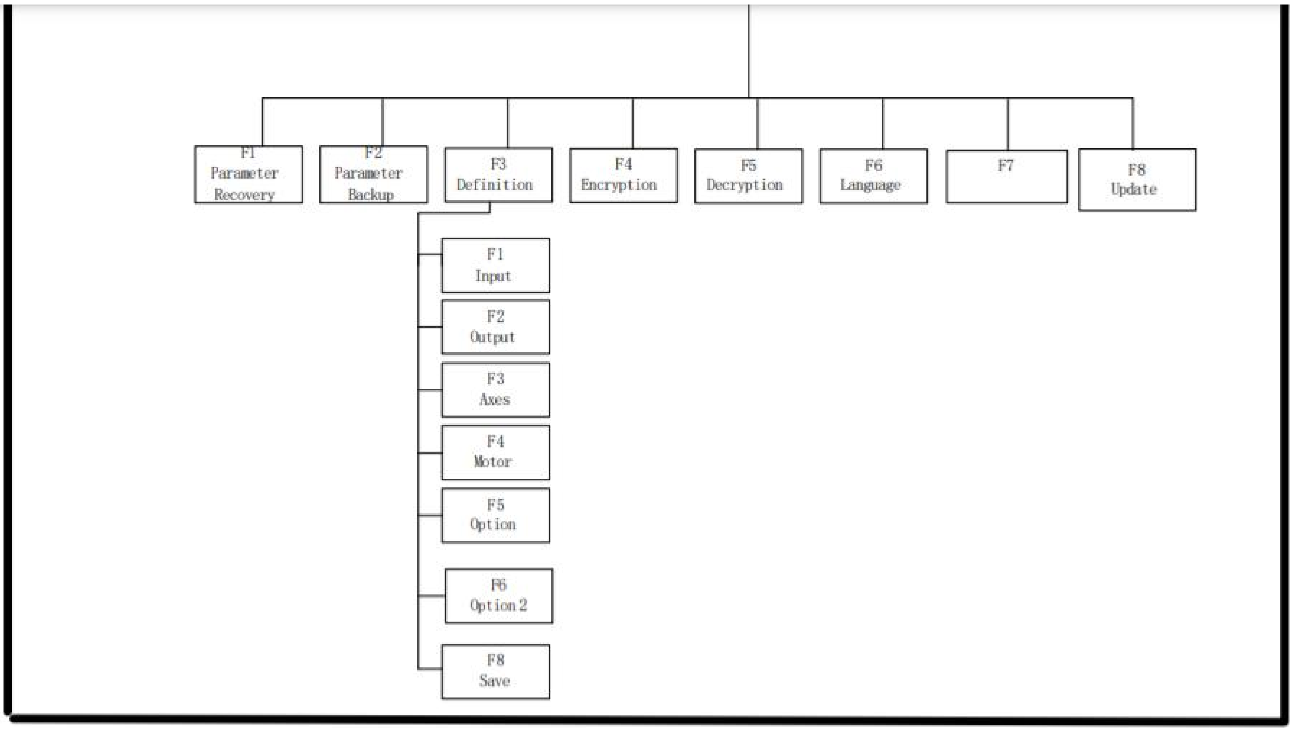
【M】Selecting the cutting mode including Flame Cut(flame cutting), Plasma Cu(plasma cutting), Demo run.

【START】Begin to cut.

【SPACE】 Enter cutting interface.

3.1Function Index

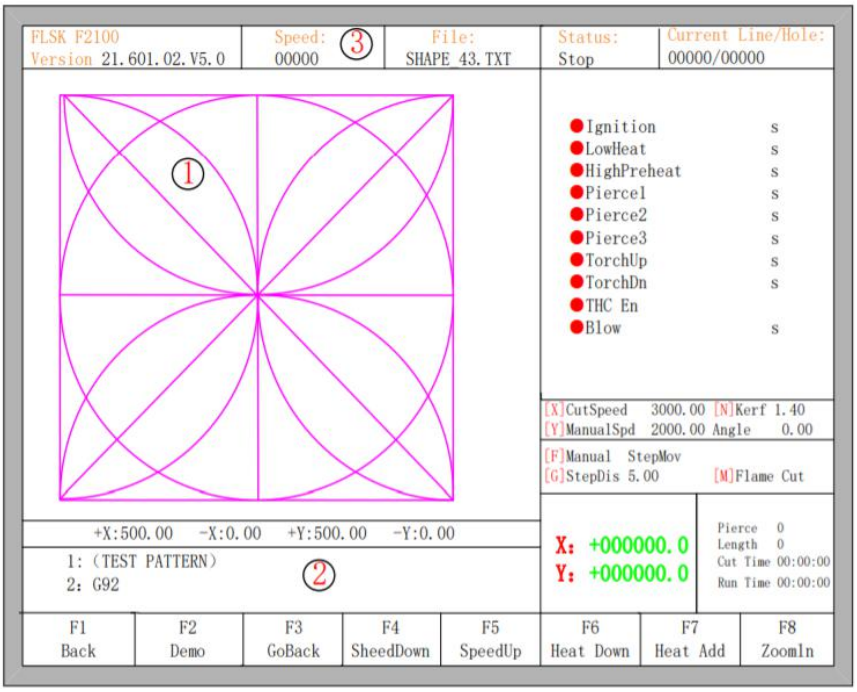

Main Interface
F1 ShapeLib
F2 Files
F3 Part Option
F4 Setups
F5 Diagnose
F6 Zoom In
F7 Manual Move
F8 Zero
F1 Film size
F2 Hole size
F8 OK
F1 Disk File
F2 U Disk File
F3 Search File
F4 Edit File
F5 Del File
F6 Copy to U
F7 Preview Graph
F8 OK
F1 Start Point
F2 Angle
F3 Array
F4 Scale
F5 SelLine Pierce
F6 Edit File
F7 Revert
F8 OK
F1 common
F2 Flame
F3 Plasma
F4 Mark
F5 System
F6 Import
F7 Export
F8 Save
F1 Input Diagnose
F2 Output Diagnose
F5 Keyboard Diagnose
F6 System Self-check
F7 Date time
F8 System Definition
F1 Point moving
F2 continue moving
F3 step moving
F4 Speed-Down
F5 Speed-Up
F7 Recovery


F1
Parameter Recovery
F2
Parameter Backup
F3
Definition
F4
Encryption
F5
Decryption
F6
Language
F7
F8
Update
F1
Input
F2
Output
F3
Axes
F4
Motor
F5
Option
F6
Option 2
F8
Save

3.4 Function index of main interface

4. Cutting Function

In the main interface, press the 【SPACE】to enter the cutting interface, shown as follows:


FLSK F2100
Version 21.601.02.V5.0
Speed: 00000
File: SHAPE_43.TXT
Status: Stop
Current Line/Hole: 00000/00000

+X:500.00 -X:0.00 +Y:500.00 -Y:0.00

1: (TEST PATTERN)
2: G92

[X]CutSpeed 3000.00 [N]Kerf 1.40
[Y]ManualSpd 2000.00 Angle 0.00
[F]Manual StepMov
[G]StepDis 5.00 [M]Flame Cut

X: +000000.0
Y: +000000.0

Pierce 0
Length 0
Cut Time 00:00:00
Run Time 00:00:00

③
①
②
●Ignition s
●LowHeat s
●HighPreheat s
●Pierce1 s
●Pierce2 s
●Pierce3 s
●TorchUp s
●TorchDn s
●THC En
●Blow s
F1 Back
F2 Demo
F3 GoBack
F4 SheedDown
F5 SpeedUp
F6 Heat Down
F7 Heat Add
F8 ZoomIn

Fig 4.1cutting interface

①Shows the current workpiece's cutting path.

②Shows the G-file being processed, shows the current and next line.

③Shows the current cutting speed. during cutting or paused, you can press the keyboard's number keys 【1】 - 【9】 to achieve quick speed regulation. For example, press the number【3】, the speed is automatically adjusted to 30%; press the number 【8】 the speed is automatically adjusted to 80%. Only Key 【1】,【4】,【7】 can achieve rapid speed control with T controller.

X shows the absolute coordinate of the torch in X direction.

Y shows the absolute coordinate of the torch in Y direction.

In the cutting interface:

Press 【X】: Modify the cutting speed.

Press 【Y】: Modify the manual move speed.

Press 【F】: Change the current manual move mode.

Press 【G】: Modify the distance of step move in manual move

【START】(or【F9】): Start cutting.

【STOP】(or 【F10】): Pause, the controller can suspend all ongoing actions.

【F1】:Move back along the cutting path(I / O closed)

【F2】: Move forward along the path (I / O closed).

【F3】: Return to the starting point, i.e. the starting point of the current work piece.

【F4】: It is same to key End. Decrease the cutting speed, each decrease of 3% click rate. Decrease the rate of manual moving machine in manual mode.

【F5】: It is same to key Home. Increase the cutting speed, each 3% increase in click rate. Increase the rate of manual moving machine in manual mode.

【F6】: Reduce the preheat time, skip the remaining preheat time, and the controller automatically records preheat time and the time is used until the workpiece is over.

【F7】: Increase the preheat time once 15 seconds.

【F8】: When the controller move is suspended, for selecting piercing point; when in moving, the trace display is zoom in over the full screen. Four direction keys (Up, down, left and right): manually move.

4.1Cutting Index

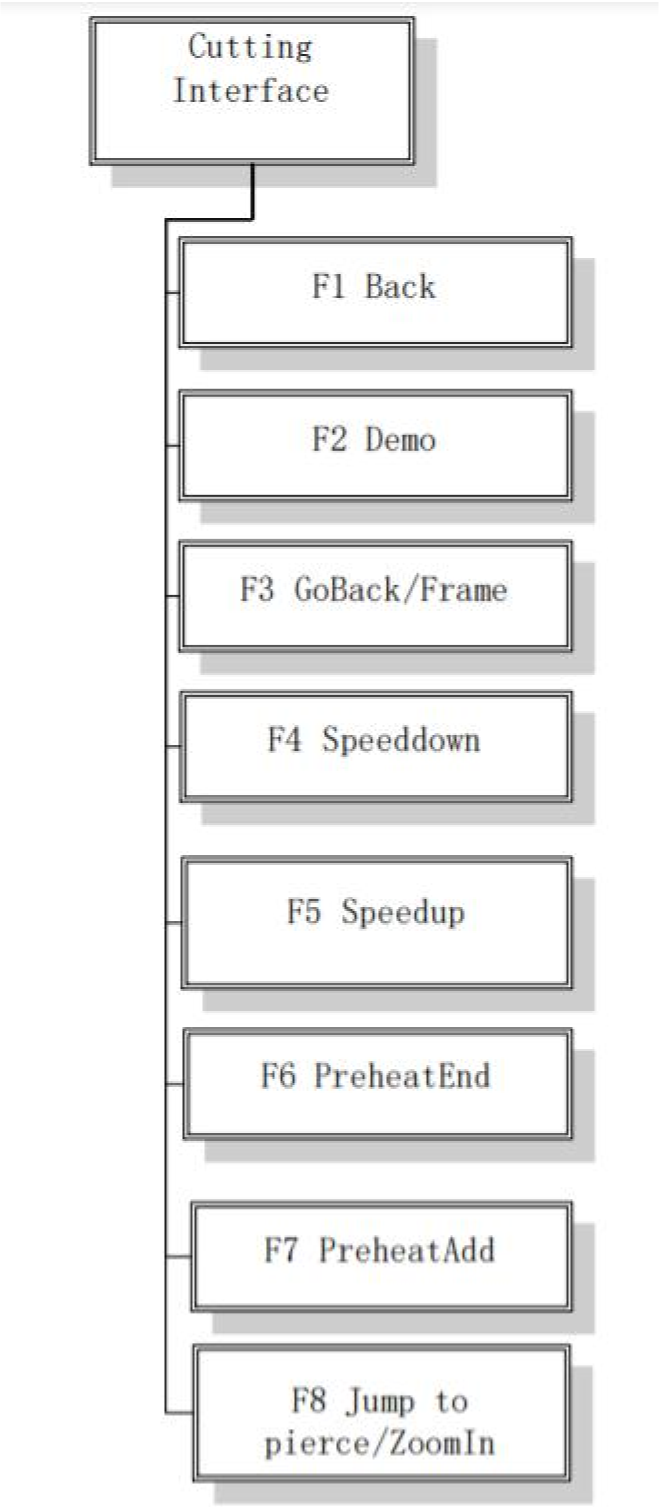

Cutting Interface
F1 Back
F2 Demo
F3 GoBack/Frame
F4 Speeddown
F5 Speedup
F6 PreheatEnd
F7 PreheatAdd
F8 Jump to pierce/ZoomIn

Fig 4.2Cutting operation index

4.2 Forward

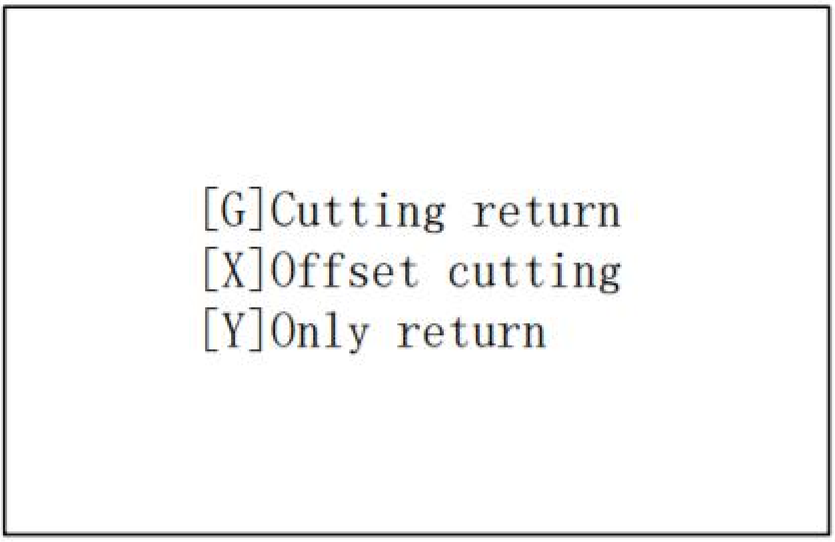
In the automatic function interface, press key【F2】,the machine start to move without cutting. The process does not execute any ignition, piercing and any other I/O working. The machine just moves along with the shape trace. Press 【F2】again, stop running.

The function can be used to check the trace or code before you start the cutting process, or can also be used when the process needs shift piercing. Press the red “STOP” key to stop the forward process as you want.

Forward speed and cutting speed are provided separately. Forward speed is defined by the "Demo/Back speed” in the common parameters.

4.3Edge Cutting / Offset Cutting / Return

When the torch is not on the trace of the current work piece, it will prompt as follows



[G]Cutting return
[X]Offset cutting
[Y]Only return

Fig. 4.3 edge perforation

There are two reasons led to this situation:

1) When the common parameter "Edge Cutting Enable" is checked and if G-file of the next processing line is M07, the system will be automatically suspended. At this time, the torch can be manually moved to any edge of the plate, press the "start" button, the system will prompt as above

2) When the processing is paused, due to some reasons, it needs to move the torch out of the actual path of the work piece, the above prompt will appear.

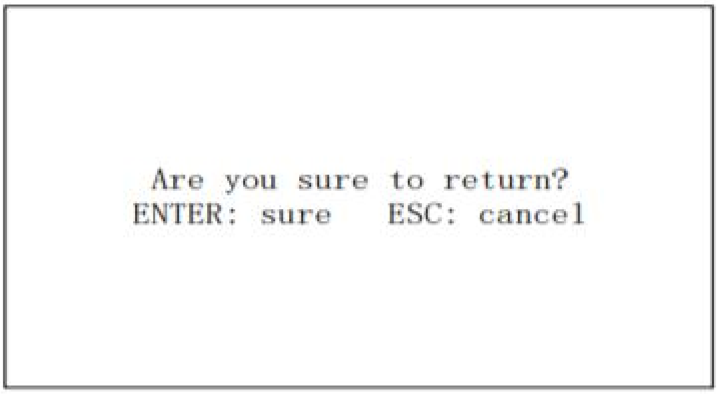
If press【G】, the system cutting returns back to the paused point, continue to cut. This feature is particularly useful for thick steel plate, it can reduce the preheat time and increase cutting efficiency.

If press 【X】, the controller offset current point to paused point, it will continue cutting. That is, the controller offsets the cutting point. When the cutting machine paused or a power outage or any other reason, if the torch is not on the right trace of shape, the function can be used to offset the torch to the shape trace.

If press【Y】, The controller moves to the paused point quickly, and then pause. During the cutting process, if discovering cutting torch malfunction or other issues, system needs to move the cutting tip out of cutting region to overhaul. When return to breakpoint after the maintenance, this key can be pressed. Then return to the paused point, press the【start】 button, the system automatically continues to cutting.

4.4Back to Reference Function

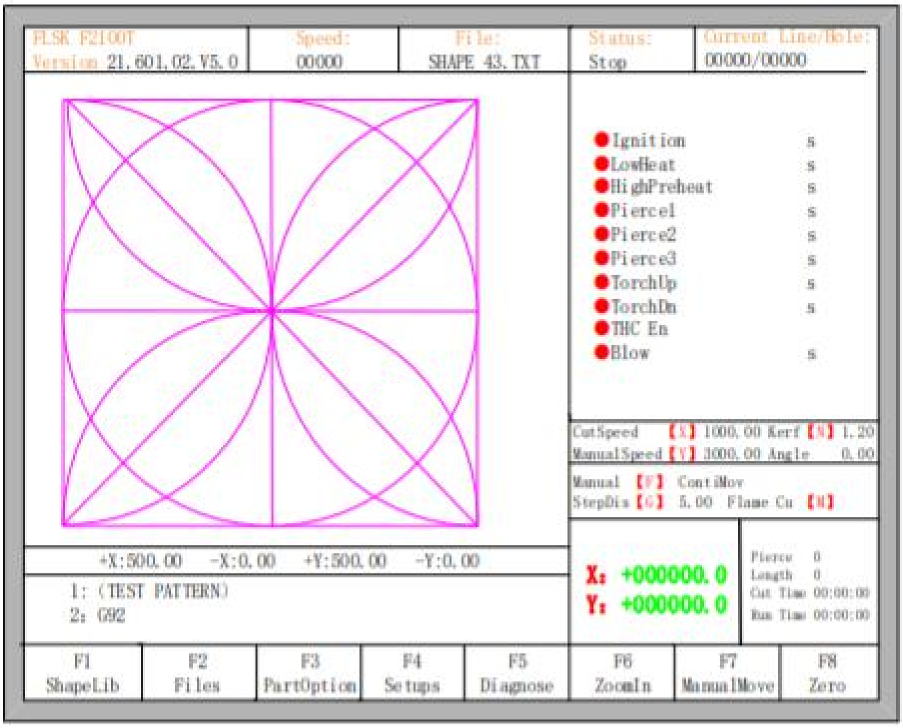
Pause in the processing, if press the 【F3】, then the system will prompt:



Are you sure to return?
ENTER: sure ESC: cancel

Fig. 4.4 Return reference prompt

Press the Enter key, the system will automatically return to the starting point of the work piece, and then the system automatically switches to processing the main interface, and waits for further user action



FLSK F2100T
Version 21.601.02.V5.0
Speed: 00000
File: SHAPE 43.TXT
Status: Stop
Current Line/Hole: 00000/00000

CutSpeed 【X】 1000.00 Kerf 【N】 1.20
ManualSpeed 【Y】 3000.00 Angle 0.00
Manual 【F】 ContiMov
StepDis 【G】 5.00 Flame Cu 【M】

+X:500.00 -X:0.00 +Y:500.00 -Y:0.00

1: (TEST PATTERN)
2: G92

X: +000000.0
Y: +000000.0

Pierce 0
Length 0
Cut Time 00:00:00
Run Time 00:00:00

●Ignition s
●LowHeat s
●HighPreheat s
●Pierce1 s
●Pierce2 s
●Pierce3 s
●TorchUp s
●TorchDn s
●THC En
●Blow s
F1 ShapeLib
F2 Files
F3 PartOption
F4 Setups
F5 Diagnose
F6 ZoomIn
F7 ManualMove
F8 Zero

Fig. 4.5 main process interface

During the return process, the user can press the "Stop" button to stop the operation, and can continue to return operation after pressing of 【F3】. Number of back to reference and stop has no limit.

4.5Preheat Time Regulation

In the preheat process, press the START (F9) key to skip the process of preheat or piercing delay.

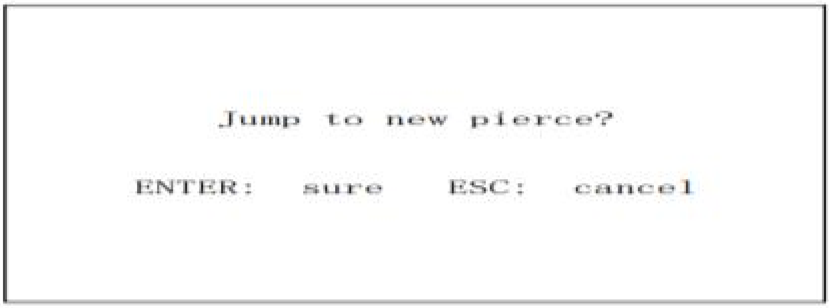
In the preheat process, press the STOP (F10) key to prolong preheat until START(F9) key is pressed again.

In the preheat process, press the 【F6】 key then the preheat time will be reduced to the current preheat time spent, and skip the process of preheat. The total preheat time is remembered until M02 or M30. For example: the preset preheat time is 60 seconds. In preheat process, the preheat time will count down, under normal circumstances, till 0, the system begins the next step of cutting, but if the system has the remaining 10 seconds of countdown time, press 【F6】, then the system immediately stops preheat to begin the next step of cutting, and records the preheat time of 50 seconds, the system automatically thinks that users need preheat time of 50 seconds, the next preheat after the null cutting when the preheat time becomes 50 seconds.

In the preheat process, each press the F7 key, preheat time increases by 15 seconds and the preheat time maintains the increased value till incision ending of this time. For example: The original system sets the preheat time of 60 seconds after the null cutting, during the system countdown, each press【F7】, on the interface the countdown increases by 15 seconds, and the next time you need to preheat, the initial preheat time be 75 seconds.

4.6Jump to pierce

Before you start cutting or cutting is paused, the function key prompt F8 is "Jump to Pierce", now press F8, the system will prompt:

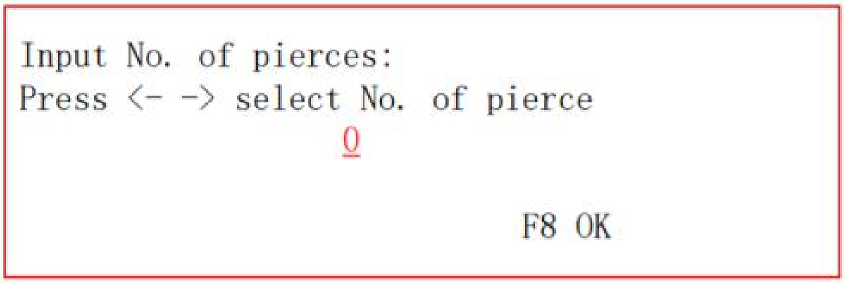


```
Jump to new pierce?

ENTER:  sure    ESC:  cancel
```

Fig. 4.6select new pierce

Pressing ESC, the controller will return back to the cutting interface. Pressing ENTER, the controller will prompt again:



```
Input No. of pierces:
Press <- -> select No. of pierce
                  0

                          F8 OK
```

Fig. 4.7 pierce prompt

Pierce point can be input manually here. You can also press ESC to exit without manual input pierce point, and then press the left and right arrow keys to select the pierce point.

4.7 Dynamic Amplification

After the start of cutting, the F8 in the cutting interface will become "ZoomIn", then press the F8 key, full-screen amplify the processing graphic , and dynamically tracking.

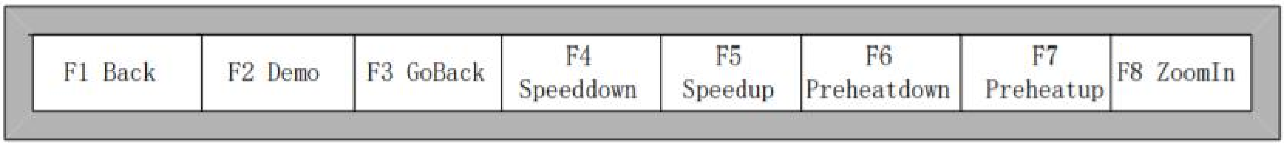


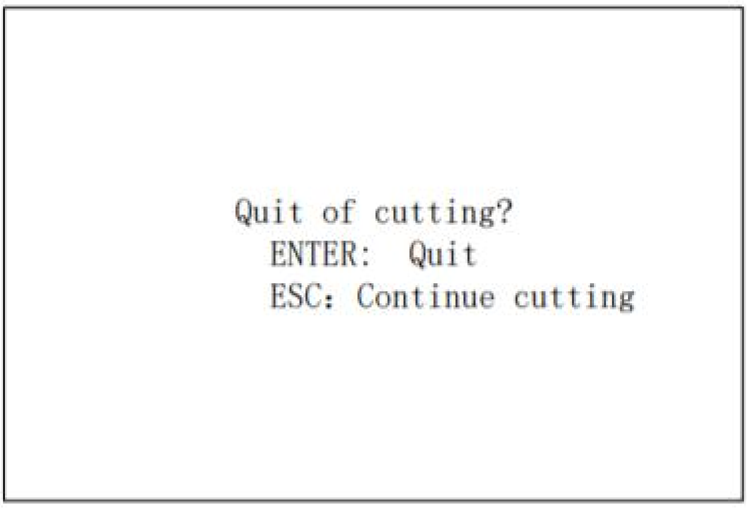
Fig 4.8 Function key of cutting interface

Press the F8 key continuously, the system will progressively amplify graphic.

Press ESC to exit the amplified display, back to the cutting interface.

4.8 Cutting Exit

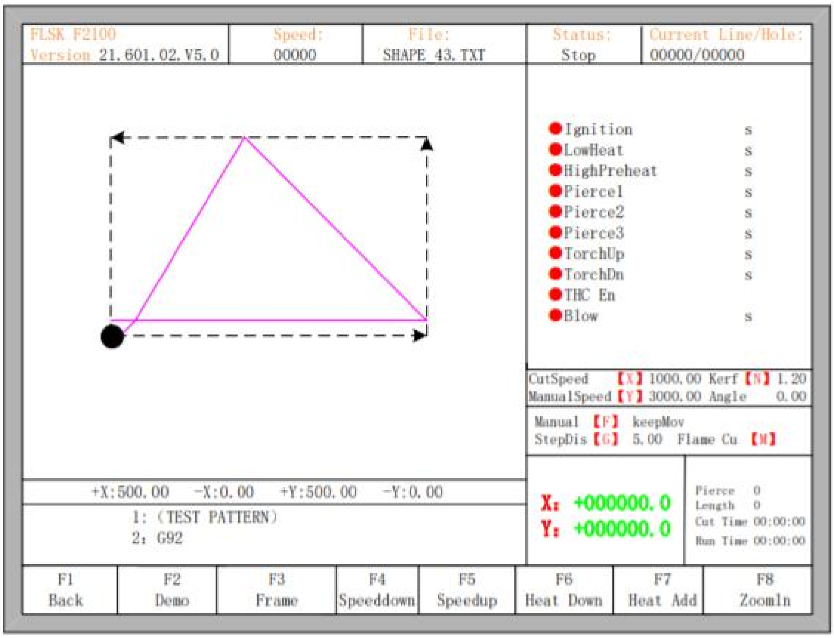
When the cutting process does not get finished, and the cutting machine also being in the pause condition, if press 【Esc】, the controller will query whether quit the cutting process. If pressing 【Enter】, the process will be canceled, and if pressing 【Esc】the process will be saved, and the controller will start cutting from the paused point.



Quit of cutting?
ENTER: Quit
ESC: Continue cutting

Fig.4.9 Quit of cutting

4.9 Frame



FLSK F2100
Version 21.601.02.V5.0
Speed: 00000
File: SHAPE 43.TXT
Status: Stop
Current Line/Hole: 00000/00000

CutSpeed 【X】 1000.00 Kerf 【N】 1.20
ManualSpeed 【Y】 3000.00 Angle 0.00
Manual 【F】 keepMov
StepDis 【G】 5.00 Flame Cu 【M】

+X:500.00 -X:0.00 +Y:500.00 -Y:0.00
1: (TEST PATTERN)
2: G92

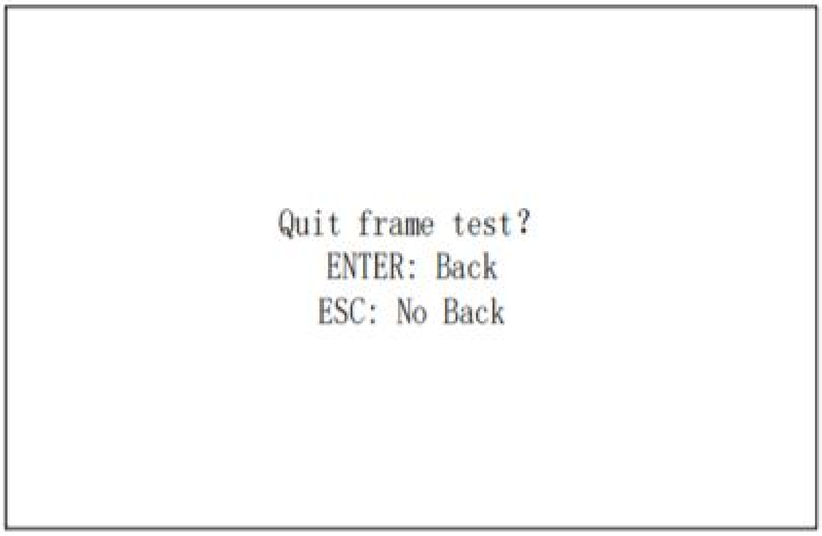
X: +000000.0
Y: +000000.0

Pierce 0
Length 0
Cut Time 00:00:00
Run Time 00:00:00

●Ignition s
●LowHeat s
●HighPreheat s
●Pierce1 s
●Pierce2 s
●Pierce3 s
●TorchUp s
●TorchDn s
●THC En
●Blow s
F1 Back
F2 Demo
F3 Frame
F4 Speeddown
F5 Speedup
F6 Heat Down
F7 Heat Add
F8 ZoomIn

Fig. 4.10 Walk along frame

Before the beginning of the process, Pressing will enter into the interface of auto processing, 【F3】is the function of walking along frame as figure 3.10 shows at CCW direction, the beginning point is the lower left corner. In the end of the walking, the controller will prompt:

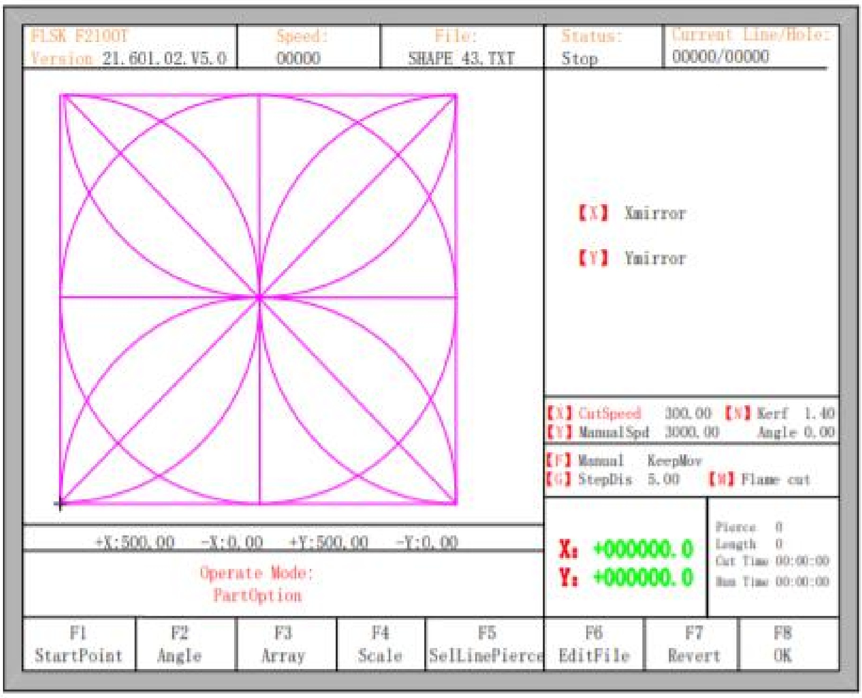


Quit frame test?
ENTER: Back
ESC: No Back

At this time, press【Enter】, the controller will automatically go back to start point of parts. If press 【ESC】, the controller will stop at current point. In the process of walking along frame, pressing STOP suspends operation, and press START, the controller resumes running. Press 【F3】again, the controller returns to the starting point.

5. Part Option

Before starting cutting, you can use “F3 Part Option” in the main interface.



FLSK F2100T
Version 21.601.02.V5.0
Speed: 00000
File: SHAPE 43.TXT
Status: Stop
Current Line/Hole: 00000/00000

【X】CutSpeed 300.00 【N】Kerf 1.40
【Y】ManualSpd 3000.00 Angle 0.00
【F】Manual KeepMov
【G】StepDis 5.00 【M】Flame cut

+X:500.00 -X:0.00 +Y:500.00 -Y:0.00

Operate Mode: PartOption

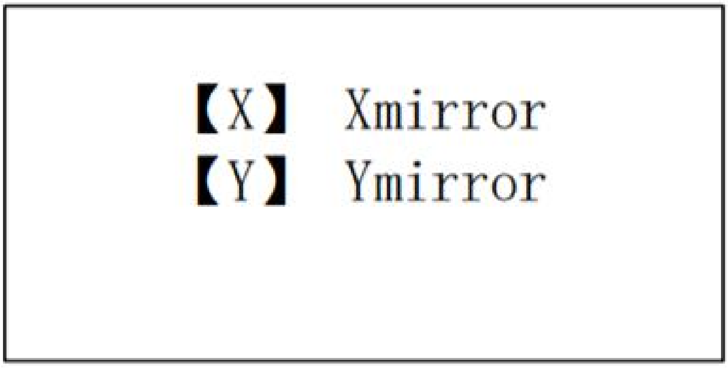
X: +000000.0
Y: +000000.0

Pierce 0
Length 0
Cut Time 00:00:00
Run Time 00:00:00

【X】 Xmirror
【Y】 Ymirror
F1 StartPoint
F2 Angle
F3 Array
F4 Scale
F5 SelLinePierce
F6 EditFile
F7 Revert
F8 OK

Fig 5.1 Part options

5.1 Mirror Function



【X】 Xmirror
【Y】 Ymirror

Press X to mirror the image of the part along the horizontal axis(X axis) Press Y to mirror the image of the part along the vertical axis(Y axis)

5.2 Start Point Selection

After press 【F1】, System will prompt to select start point:

F1 Center
F2 L&B
F3 L&T
F4 R&B
F5 R&T

At this time, press 【F1】-【F5】, the starting point of cutting part automatically jump to relevant location. For example, press 【F4】, the start point will automatically jump to lower right corner. As the following figures 5.2 and 5.3 show:

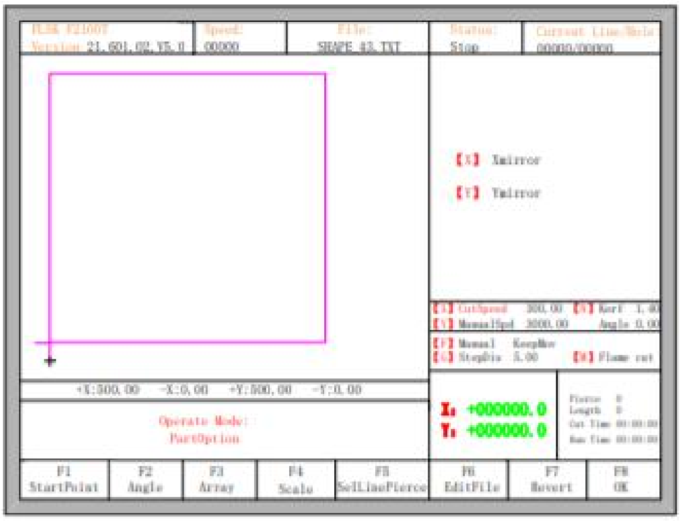

Speed:
00000
File:
SHAPE 43.TXT
Status:
Stop
Current Line/Hole:
00000/00000
【X】 Xmirror
【Y】 Ymirror
CutSpeed 300.00
Kerf 1.40
ManualSpd 3000.00
Angle 0.00
Manual KeepMov
StepDis 5.00
Flame cut
+X:500.00 -X:0.00 +Y:500.00 -Y:0.00
Operate Mode:
PartOption
X: +000000.0
Y: +000000.0
Pierce 0
Length 0
Cut Time 00:00:00
Run Time 00:00:00
F1 StartPoint
F2 Angle
F3 Array
F4 Scale
F5 SelLinePierce
F6 EditFile
F7 Revert
F8 OK

Fig 5.2 before press F4, start point is at original point

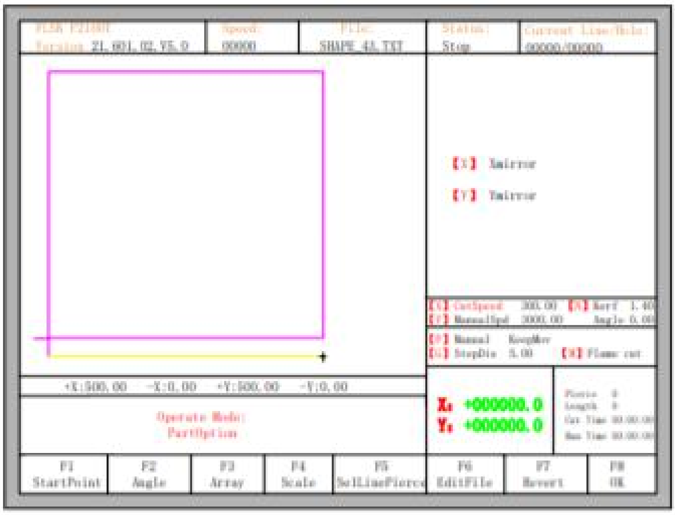
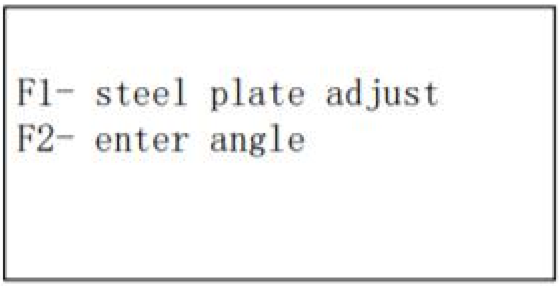

Speed:
00000
File:
SHAPE 43.TXT
Status:
Stop
Current Line/Hole:
00000/00000
【X】 Xmirror
【Y】 Ymirror
CutSpeed 300.00
Kerf 1.40
ManualSpd 3000.00
Angle 0.00
Manual KeepMov
StepDis 5.00
Flame cut
+X:500.00 -X:0.00 +Y:500.00 -Y:0.00
Operate Mode:
PartOption
X: +000000.0
Y: +000000.0
F1 StartPoint
F2 Angle
F3 Array
F4 Scale
F5 SelLinePierce
F6 EditFile
F7 Revert
F8 OK

Fig 5.3 after press F4, start point is at lower right corner

5.3Angle Adjustment

Press F2, the system will prompt:



```
F1- steel plate adjust
F2- enter angle
```

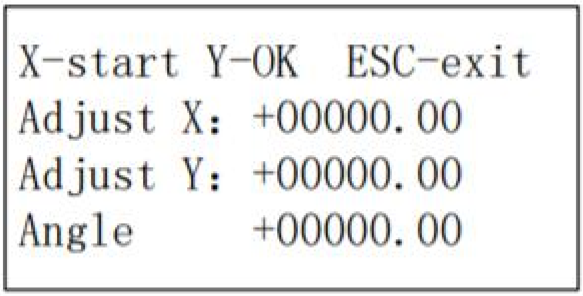
Press F1 to align the part according to steel plate

Press F2 to input align angle directly

Press ESC to exit angle adjusting

5.3.1 Steel Plate Adjustment

After entering steel plate adjustment menu, the system will prompt:



```
X-start Y-OK  ESC-exit
Adjust X: +00000.00
Adjust Y: +00000.00
Angle     +00000.00
```

Here, you can manually move the cutting torch to any edge of the steel plate or a corner of the plate. Pressing 【X】 to set the current point as the starting point of correction. And then manually move the torch far enough away from the starting point along to the second point at the same edge of the steel plate, Pressing 【Y】 to finish the angle adjust. The controller will automatically calculate the current align angle of plate, and then automatically rotate part image.

Illustration: if use the laser gun to make adjustment, the laser point can be aligned to the edge of the plate correction, the specific use of the method can refer to section 5.5 laser offset function.

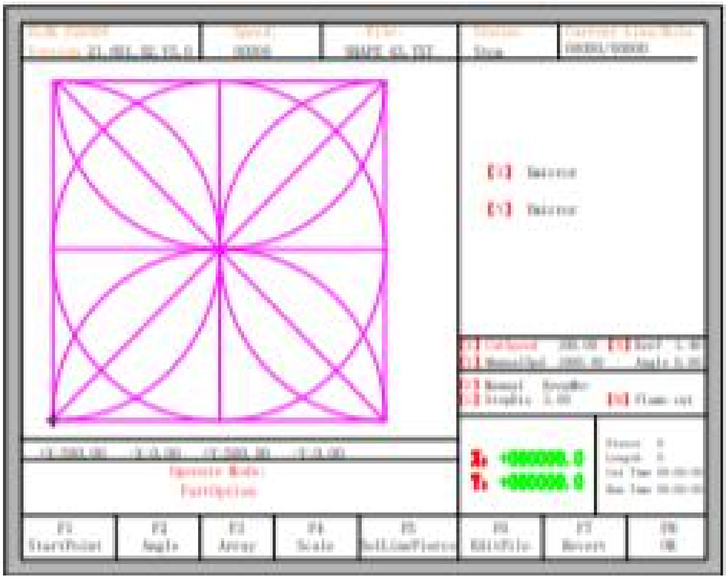

F1 StartPoint
F2 Angle
F3 Array
F4 Scale
F5 RollLinePierce
F6 EditFile
F7 Revert
F8 OK

Fig 5.4 before adjusting

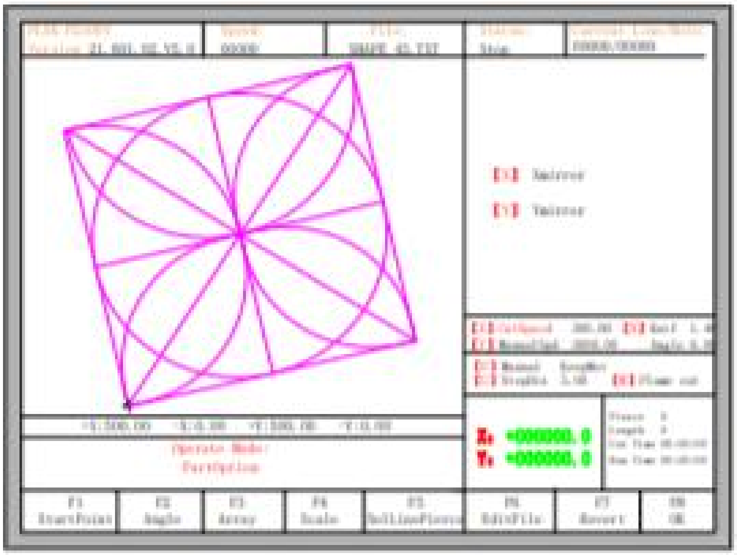
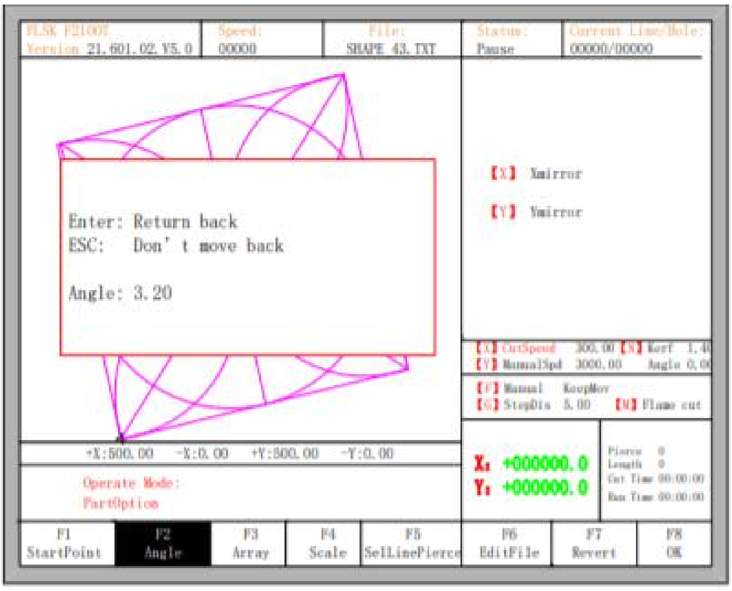

F1 StartPoint
F2 Angle
F3 Array
F4 Scale
F5 RollLinePierce
F6 EditFile
F7 Revert
F8 OK

Fig 5.5 after adjusting

After adjusting, the controller will ask whether to return to the start point, if press 【ENTER】, the controller will run back to the start point of the operation, if press 【ESC】, the controller will do nothing but go back to the auto interface.



FLSK F2100T
Version 21.601.02.V5.0
Speed: 00000
File: SHAPE 43.TXT
Status: Pause
Current Line/Hole: 00000/00000

Enter: Return back
ESC: Don’t move back

Angle: 3.20

【X】 Xmirror
【Y】 Ymirror
CutSpeed 300.00
Kerf 1.40
ManualSpd 3000.00
Angle 0.00
Manual KeepMov
StepDis 5.00
Flame cut
+X:500.00 -X:0.00 +Y:500.00 -Y:0.00
Operate Mode:
PartOption
X: +000000.0
Y: +000000.0
Pierce 0
Length 0
Cut Time 00:00:00
Run Time 00:00:00
F1 StartPoint
F2 Angle
F3 Array
F4 Scale
F5 SelLinePierce
F6 EditFile
F7 Revert
F8 OK

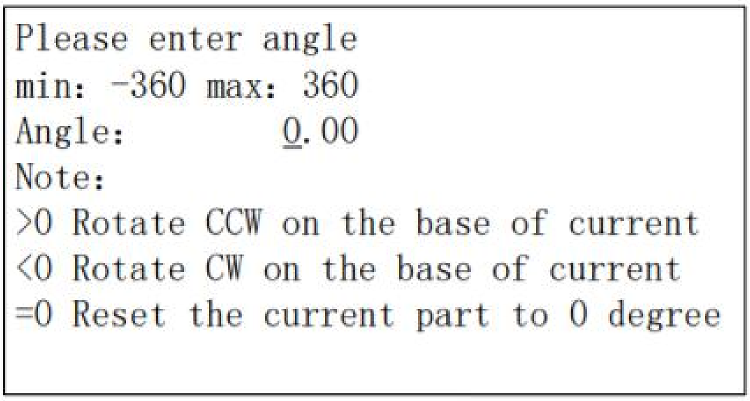
Fig 5.6 Return to the start point after adjusting

5.3.2 Steel Plate Adjust Angle Memory Function

About steel plate adjust angle memory, please refer to the section of 8.7.6.6.

5.3.3 Enter Angle

When the angle of the current work piece is known, you can input the angle:



Please enter angle
min: -360 max: 360
Angle: 0.00
Note:
>0 Rotate CCW on the base of current
<0 Rotate CW on the base of current
=0 Reset the current part to 0 degree

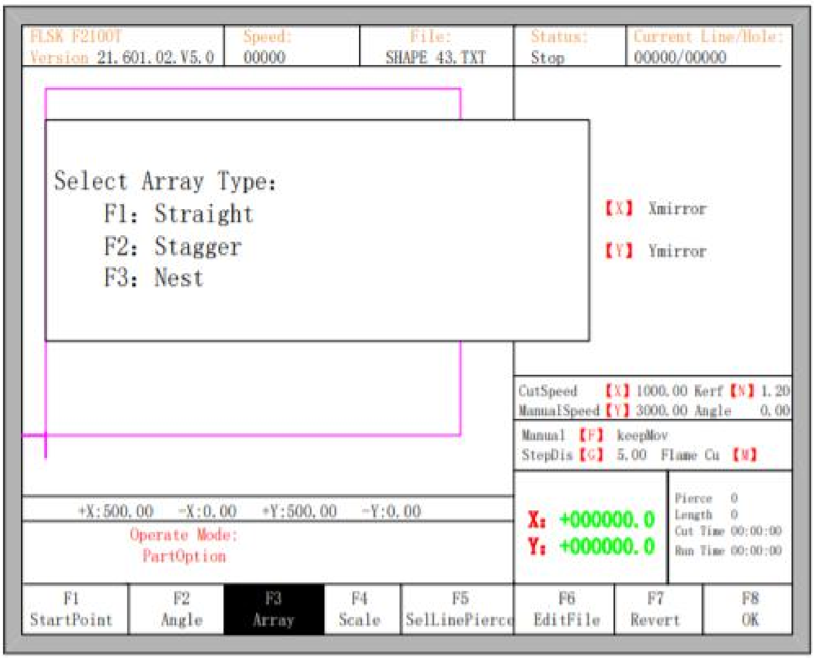
After manually input the angle, press 【ENTER】 to make sure, the part image will be rotate with the corresponding angle. Positive angle means rotate incounterclockwise, while negative means clockwise. Press 【ESC】 to exit angle adjusting.

Illustration: when enter angle 0, the part image will restore to the angel of 0°, at this time, the controller will clear the angle of steel plate adjustment and manual input angle. Generally, the angle entered is not as the angle of steel plate adjusting.

If the angle entered here needs to be as the angle of steel plate adjusting, please refer to section 8.7.6.8.

5.4 Array

In the part options menu, press 【F3】, the system will prompt as Fig 4.7. There are three build-in array types: arrange in straight, arrange in stagger, arrange in nest.

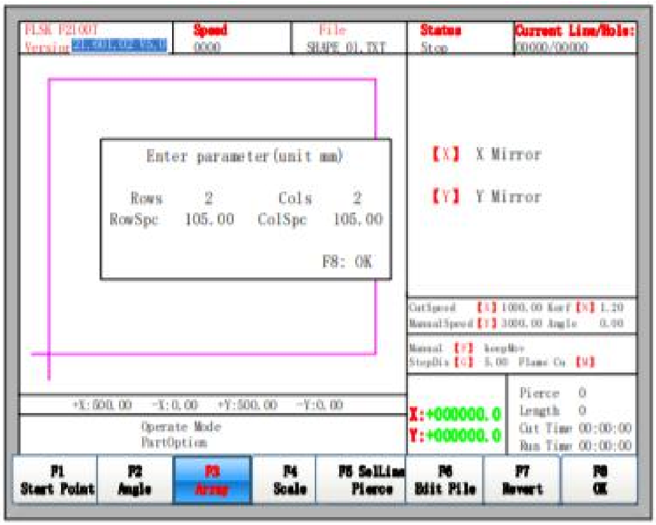


Select Array Type:
F1: Straight
F2: Stagger
F3: Nest

FLSK F2100T
Version 21.601.02.V5.0
Speed:
00000
File:
SHAPE 43.TXT
Status:
Stop
Current Line/Hole:
00000/00000
【X】 Xmirror
【Y】 Ymirror
CutSpeed 【X】 1000.00 Kerf 【N】 1.20
ManualSpeed 【Y】 3000.00 Angle 0.00
Manual 【F】 keepMov
StepDis 【G】 5.00 Flame Cu 【M】
+X:500.00 -X:0.00 +Y:500.00 -Y:0.00
Operate Mode:
PartOption
X: +000000.0
Y: +000000.0
Pierce 0
Length 0
Cut Time 00:00:00
Run Time 00:00:00
F1 StartPoint
F2 Angle
F3 Array
F4 Scale
F5 SelLinePierce
F6 EditFile
F7 Revert
F8 OK

Fig 5.7 Select arrange type

Press【F1】 to arrange in matrix.



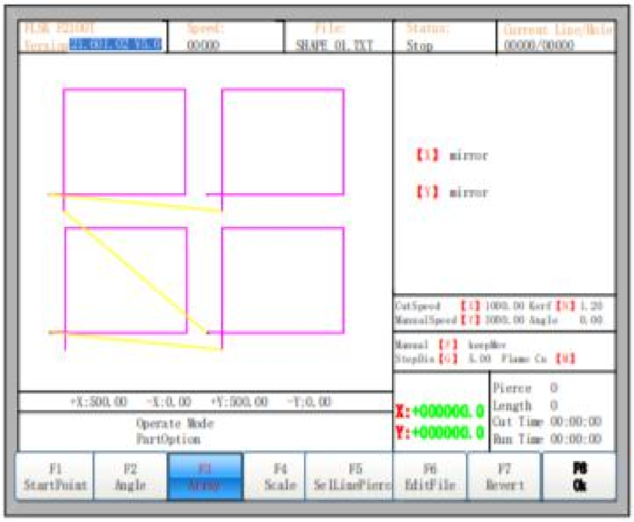
Enter parameter (unit mm)

Rows 2 Cols 2
RowSpc 105.00 ColSpc 105.00

F8: OK

FLSK F2100T
Version 21.601.02.V5.0
Speed
0000
File
SHAPE 01.TXT
Status
Stop
Current Line/Hole:
00000/00000
【X】 X Mirror
【Y】 Y Mirror
+X:500.00 -X:0.00 +Y:500.00 -Y:0.00
Operate Mode
PartOption
X:+000000.0
Y:+000000.0
F1 Start Point
F2 Angle
F3 Array
F4 Scale
F5 SelLine Pierce
F6 Edit File
F7 Revert
F8 OK

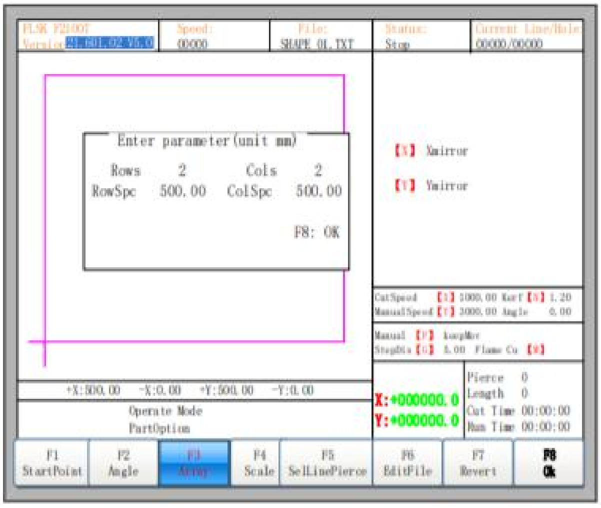
Fig 5.8 Arrange in straight



FLSK F2100T
Version 21.601.02.V5.0
Speed:
00000
File:
SHAPE 01.TXT
Status:
Stop
Current Line/Hole
00000/00000
【X】 mirror
【Y】 mirror
+X:500.00 -X:0.00 +Y:500.00 -Y:0.00
Operate Mode
PartOption
X:+000000.0
Y:+000000.0
F1 StartPoint
F2 Angle
F3 Array
F4 Scale
F5 SelLinePierce
F6 EditFile
F7 Revert
F8 Ok

Fig 5.9 Result of arranging in matrix

Press [F2] to enter staggered arrangement.



FLSK F2100T Version 21.601.02 V6.0 | Speed: 00000 | File: SHAPE 01.TXT | Status: Stop | Current Line/Hole 00000/00000

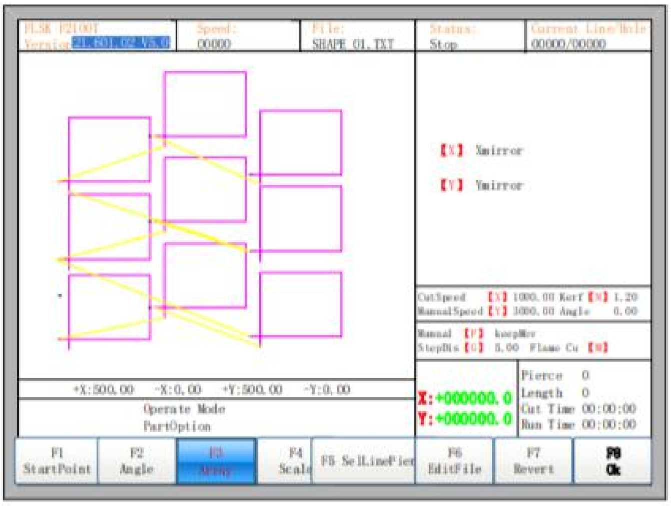
Enter parameter(unit mm)

Rows 2 Cols 2
RowSpc 500.00 ColSpc 500.00

F8: OK

+X:500.00 -X:0.00 +Y:500.00 -Y:0.00

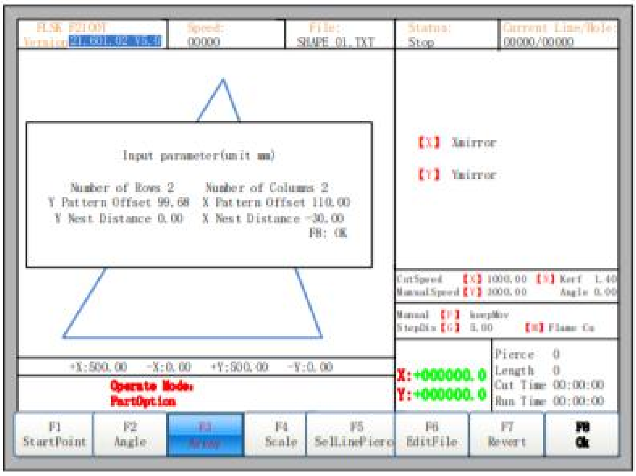
【X】 Xmirror
【Y】 Ymirror
Operate Mode
PartOption
F1 StartPoint
F2 Angle
F3 Array
F4 Scale
F5 SelLinePierce
F6 EditFile
F7 Revert
F8 Ok



【X】 Xmirror
【Y】 Ymirror
Operate Mode
PartOption
F1 StartPoint
F2 Angle
F3 Array
F4 Scale
F5 SelLinePier
F6 EditFile
F7 Revert
F8 Ok

Fig5.10 Staggered arrange Fig 4.11 Result of staggered arrangement

Press [F3] to enter arrangement in stack.

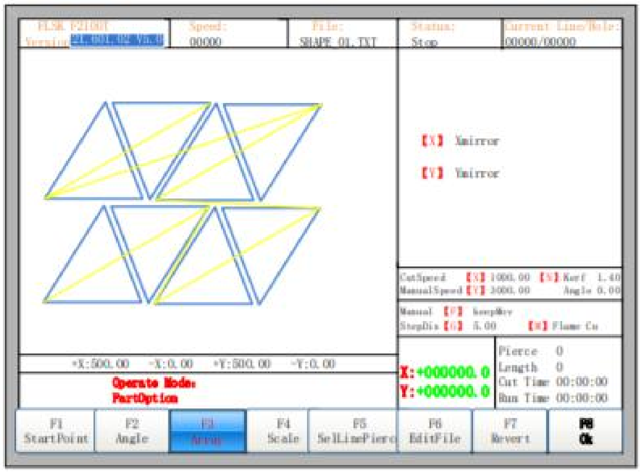


Input parameter(unit mm)

Number of Rows 2 Number of Columns 2
Y Pattern Offset 99.68 X Pattern Offset 110.00
Y Nest Distance 0.00 X Nest Distance -30.00
F8: OK

+X:500.00 -X:0.00 +Y:500.00 -Y:0.00

【X】 Xmirror
【Y】 Ymirror
Operate Mode:
PartOption
F1 StartPoint
F2 Angle
F3 Array
F4 Scale
F5 SelLinePierce
F6 EditFile
F7 Revert
F8 Ok



【X】 Xmirror
【Y】 Ymirror
Operate Mode:
PartOption
F1 StartPoint
F2 Angle
F3 Array
F4 Scale
F5 SelLinePierce
F6 EditFile
F7 Revert
F8 Ok

Note:

The Arrange in Nest is mainly applied to graphics that are suitable for insertion, such as triangles, trapezoids and so on. First, the current graphic is rotated 180 degrees in the center. The original graphics and the rotated graphics are inserted into a new pattern. Then the combination of the new graphics start Staggered arrange.

The description of parameters:

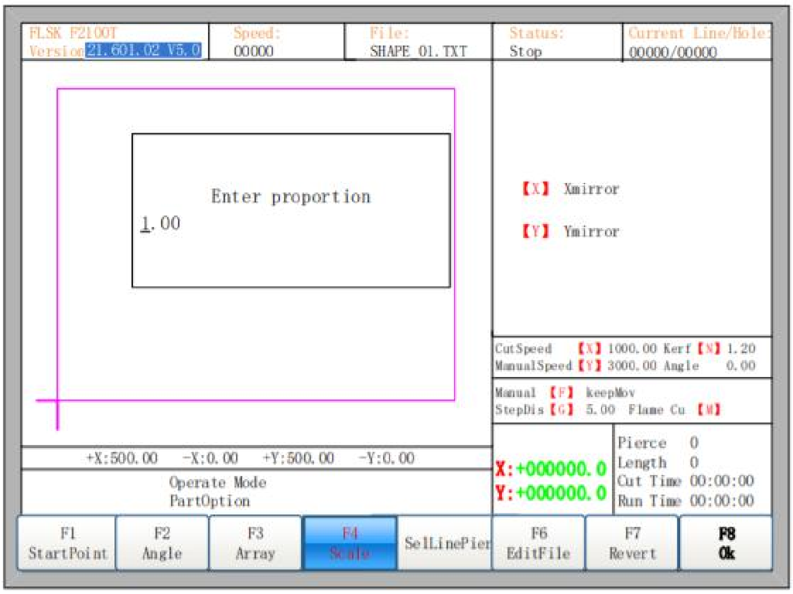
Y Nest Distance: When two graphs are inserted in centrosymmetric way, the distance between the two graphics center in the Y direction. This parameter can be negative.

X Nest Distance: When two graphs are inserted in centrosymmetric way, the distance between the two graphics center in the X direction. This parameter can be negative.

Number of Rows: Two graphics in centrosymmetric way combined into a graphic, and the number of rows that the combination of graphics arrange. Number of Columns: Two graphics in centrosymmetric way combined into a graphic, and the number of columns that the combination of graphics arrange. Y Pattern Offset: Two graphics in centrosymmetric way combined into a graphic, and the Y pattern offset that the combination of graphics arrange. X Pattern Offset: Two graphics in centrosymmetric way combined into a graphic, and the X pattern offset that the combination of graphics arrange.

5.5Proportion

In the part options menu, press [F4] (scale), the controller prompt as figure:



FLSK F2100T Version 21.601.02 V5.0
Speed: 00000
File: SHAPE_01.TXT
Status: Stop
Current Line/Hole: 00000/00000

Enter proportion
1.00

【X】 Xmirror
【Y】 Ymirror

CutSpeed 【X】 1000.00 Kerf 【N】 1.20
ManualSpeed 【Y】 3000.00 Angle 0.00
Manual 【F】 keepMov
StepDis 【G】 5.00 Flame Cu 【M】

+X:500.00 -X:0.00 +Y:500.00 -Y:0.00

Operate Mode
PartOption

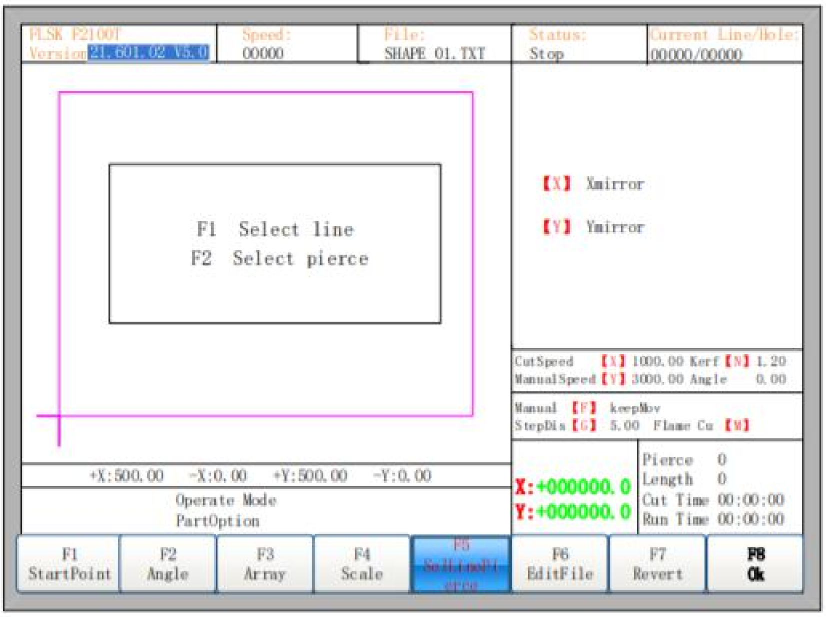
X:+000000.0
Y:+000000.0

Pierce 0
Length 0
Cut Time 00:00:00
Run Time 00:00:00

After entering the scale, press 【Enter】, then the shape will automatically be scaled if the parameter is legal. Note: Proportion is also applied to lead in and lead out.

5.6 Select Line/Pierce

In part options menu, press【F5】to enter selecting line/pierce, the controller will prompt:



FLSK F2100T Version 21.601.02 V5.0
Speed: 00000
File: SHAPE 01.TXT
Status: Stop
Current Line/Hole: 00000/00000

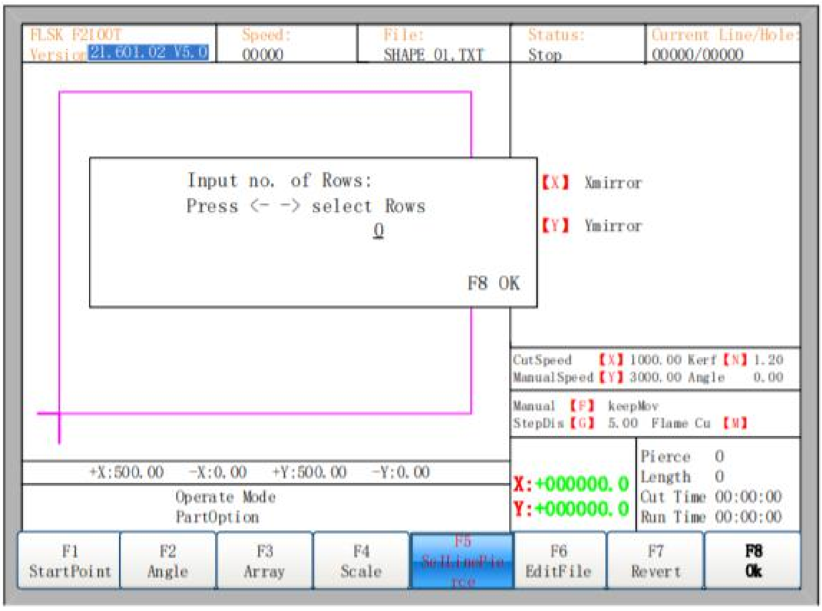
F1 Select line
F2 Select pierce

CutSpeed【X】1000.00 Kerf【N】1.20
ManualSpeed【Y】3000.00 Angle 0.00
Manual【F】keepMov
StepDis【G】5.00 Flame Cu【M】
+X:500.00 -X:0.00 +Y:500.00 -Y:0.00
Operate Mode PartOption
X:+000000.0
Y:+000000.0
Pierce 0
Length 0
Cut Time 00:00:00
Run Time 00:00:00

【X】 Xmirror
【Y】 Ymirror
F1 StartPoint
F2 Angle
F3 Array
F4 Scale
F5 SelLinePierce
F6 EditFile
F7 Revert
F8 Ok

5.6.1 Select Line

Press【F1】to select the number of G code line to start cutting, the controller prompts:



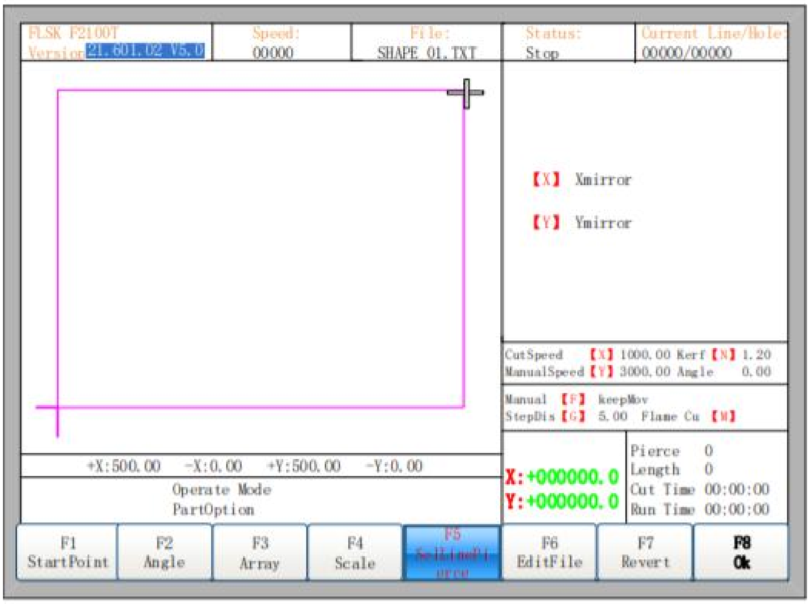
FLSK F2100T Version 21.601.02 V5.0
Speed: 00000
File: SHAPE 01.TXT
Status: Stop
Current Line/Hole: 00000/00000

Input no. of Rows:
Press <- -> select Rows
0
F8 OK

CutSpeed【X】1000.00 Kerf【N】1.20
ManualSpeed【Y】3000.00 Angle 0.00
Manual【F】keepMov
StepDis【G】5.00 Flame Cu【M】
+X:500.00 -X:0.00 +Y:500.00 -Y:0.00
Operate Mode PartOption
X:+000000.0
Y:+000000.0
Pierce 0
Length 0
Cut Time 00:00:00
Run Time 00:00:00

【X】 Xmirror
【Y】 Ymirror
F1 StartPoint
F2 Angle
F3 Array
F4 Scale
F5 SelLinePierce
F6 EditFile
F7 Revert
F8 Ok

Here, you can directly enter the row number or press 【ENTER】 to press 【←】 or【→】 to select row



FLSK F2100T
Version 21.601.02 V5.0
Speed: 00000
File: SHAPE 01.TXT
Status: Stop
Current Line/Hole: 00000/00000

CutSpeed 【X】 1000.00 Kerf 【N】 1.20
ManualSpeed 【Y】 3000.00 Angle 0.00
Manual 【F】 keepMov
StepDis 【G】 5.00 Flame Cu 【M】

+X:500.00 -X:0.00 +Y:500.00 -Y:0.00
Operate Mode
PartOption

X:+000000.0
Y:+000000.0
Pierce 0
Length 0
Cut Time 00:00:00
Run Time 00:00:00

【X】 Xmirror
【Y】 Ymirror
F1 StartPoint
F2 Angle
F3 Array
F4 Scale
F5
F6 EditFile
F7 Revert
F8 Ok

After selecting row, press【F8】 to confirm.

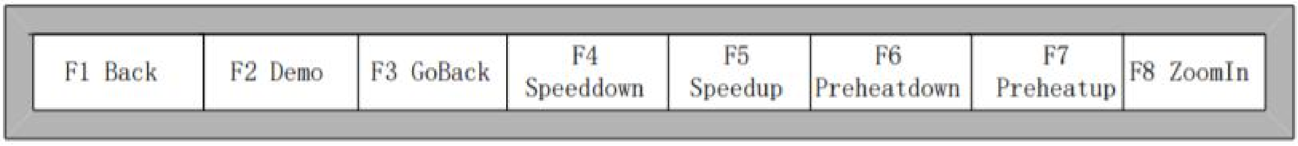
5.6.2 Select Pierce

The operation is similar to 4.6.1.

5.6.3 Operation after Select Line/Pierce

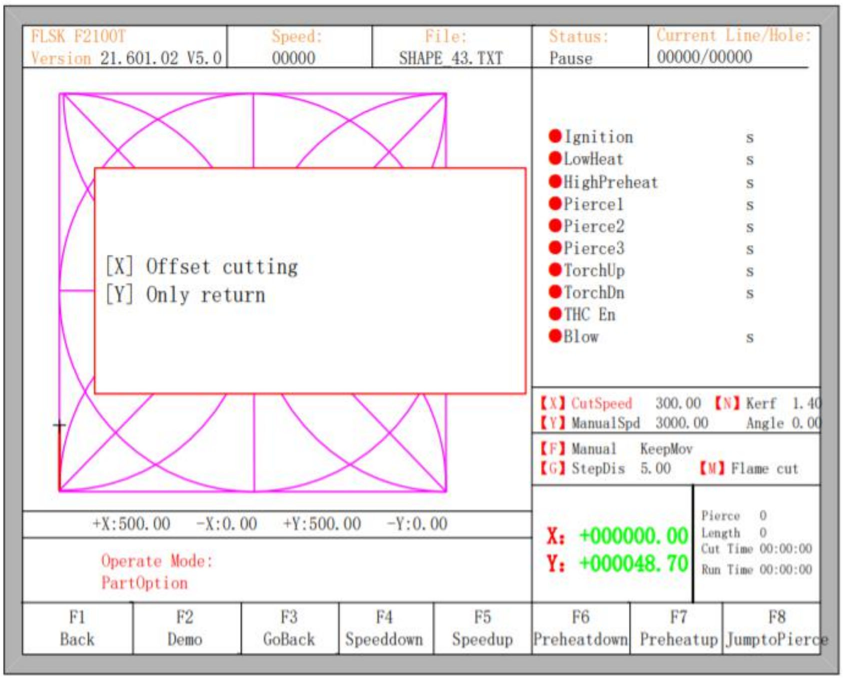
After selecting row or pierce, press 【F8】 to exit to the main interface. Press SPACE to enter the auto interface, there are two kind of operation: 1. Move from current position to the selected position and then cutting

Press 【F1】in the auto interface, the controller will directly run to the position of the selected line or pierce without cutting, then pause and wait for the next operation.



F1 Back
F2 Demo
F3 GoBack
F4 Speeddown
F5 Speedup
F6 Preheatdown
F7 Preheatup
F8 ZoomIn

Press 【START】 in the cutting interface, the controller will prompt:



FLSK F2100T
Version 21.601.02 V5.0
Speed: 00000
File: SHAPE_43.TXT
Status: Pause
Current Line/Hole: 00000/00000

[X] Offset cutting
[Y] Only return

●Ignition s
●LowHeat s
●HighPreheat s
●Pierce1 s
●Pierce2 s
●Pierce3 s
●TorchUp s
●TorchDn s
●THC En
●Blow s

【X】CutSpeed 300.00 【N】Kerf 1.4
【Y】ManualSpd 3000.00 Angle 0.0
【F】Manual KeepMov
【G】StepDis 5.00 【M】Flame cut

+X:500.00 -X:0.00 +Y:500.00 -Y:0.00

X: +000000.00
Y: +000048.70

Pierce 0
Length 0
Cut Time 00:00:00
Run Time 00:00:00

Operate Mode:
PartOption

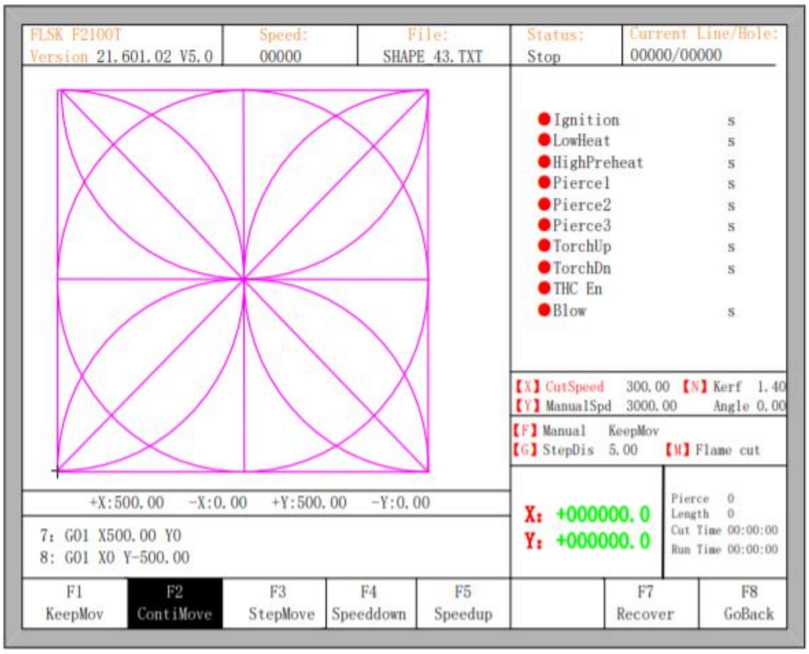
Press 【Y】, the controller will also directly move to the selected line or pierce, then pause and wait for the next operation. 2. Cutting from the current position After the prompt of Fig 4.19, press 【X】, then the controller will start cutting from current position.

5.7 Restore

If you want to cancel all of operations with part option including mirror, angel adjust, scale or/and array, press 【F7】 in the part options menu, the controller automatically revert to original state of the part.

6. Manual Function

In the automatic interface, press 【F7】(Manual) to enter manual function interface, shown



FLSK F2100T Version 21.601.02 V5.0

Speed: 00000

File: SHAPE 43.TXT

Status: Stop

Current Line/Hole: 00000/00000

●Ignition s
●LowHeat s
●HighPreheat s
●Pierce1 s
●Pierce2 s
●Pierce3 s
●TorchUp s
●TorchDn s
●THC En
●Blow s

【X】CutSpeed 300.00 【N】Kerf 1.40
【Y】ManualSpd 3000.00 Angle 0.00
【F】Manual KeepMov
【G】StepDis 5.00 【M】Flame cut

+X:500.00 -X:0.00 +Y:500.00 -Y:0.00

```
7: G01 X500.00 Y0
8: G01 X0 Y-500.00
```

X: +000000.0
Y: +000000.0

Pierce 0
Length 0
Cut Time 00:00:00
Run Time 00:00:00

ManualSpd 3000.00 Angle 0.00 【F】Manual KeepMov 【G】StepDis 5.00 【M】Flame cut Pierce 0 Length 0 Cut Time 00:00:00 Run Time 00:00:00 F8 GoBack Fig 5.1 Manual function interface Manual move speed can be increased by pressing 【HOME】 or be decreased by pressing【END】 Also, press numeric key, the manual move speed changes to ratio which is 10 times of the corresponding figure of the speed limit you have set, for example press 【3】, change the cutting speed to 30% of the speed limit you have set, press 【8】, change the cutting speed to 80% of the speed limit you have set.

6.1 Keep Moving Function

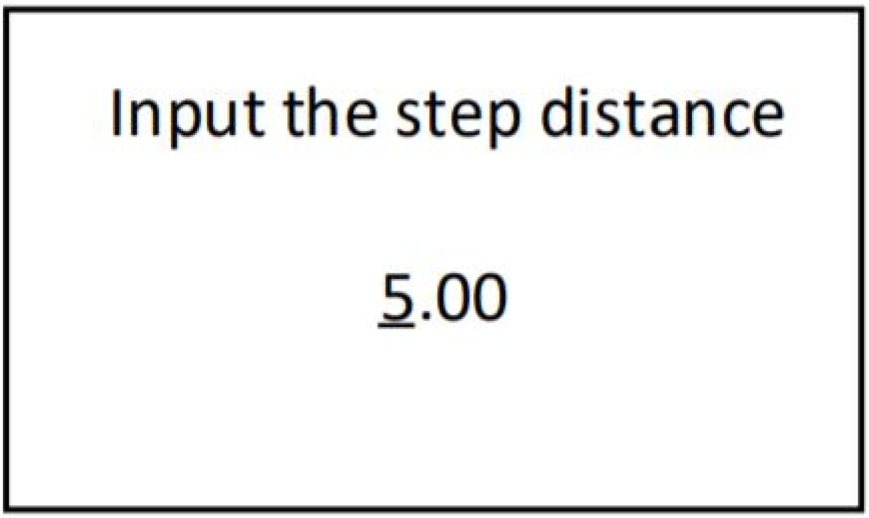
When you enter into the manual interface, the default option is continuous moving function. Press key 【F1】 to go for the keep moving function. At this moment, the controller will move toward the specified direction if any directory key is pressed, and when the directory key is released, the system will stop.

6.2 Continuous Moving Function

When in the manual interface, press 【F2】to enter the continuous-moving function interface. At this moment, the controller will move toward the specified direction if any directory key is pressed and then released, and when any directory key or stop key is pressed the controller will stop moving.

6.3 Step Moving Function

In the manual interface, press 【F3】to enter the interface of step moving,. The controller prompts to input the step distance:



Input the step distance

5.00

After inputting the step distance. Press any direction key and then release, the system will move the step distance toward the direction, in the process of moving, when any direction key or stop key is pressed, the controller will stop moving.

6.4 Breakpoint Recovery

To guarantee that the breakpoint could work correctly, you need to meet with the following conditions:

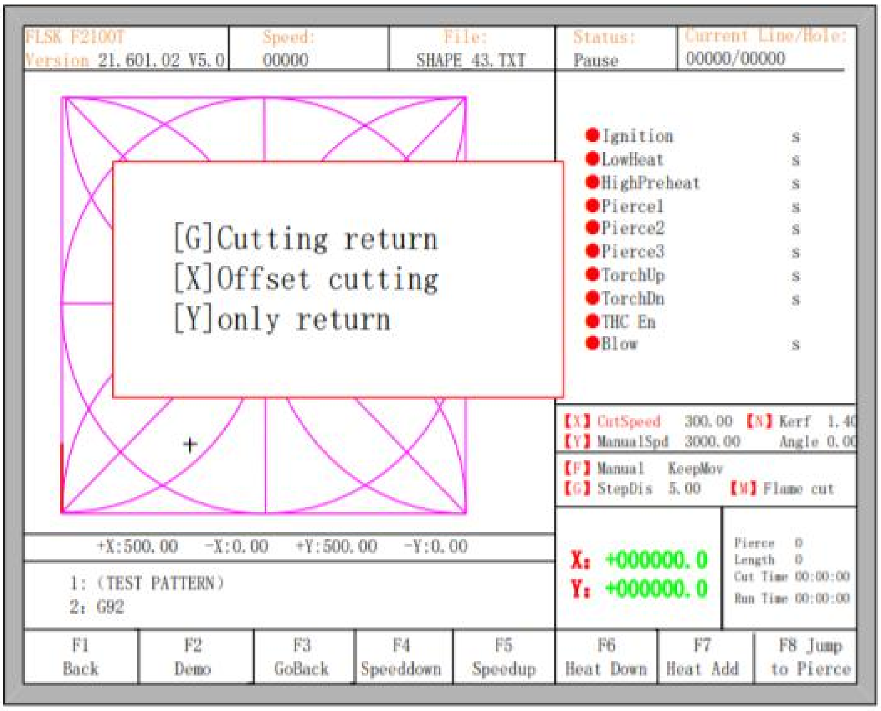
1) When the controller is paused. The controller will automatically remember the paused point as the breakpoint.

2) In the process of cutting, when power is off, the controller will remember the current position as the breakpoint and remember it.

When you need to recover from the breakpoint from the breakpoint. After the controller powers on, don’t move the torch, press 【F7】 in the main interface to enter the manual interface, then press【F7】 to recover from the breakpoint. After recovering, if the torch hadn’t been moved and is on the position when the power is off, press 【START】, the controller will go on from the breakpoint.

After the breakpoint is recovered, if the position is not on the exact position, you need move the torch to the exact point manually, check the exact point by Forward or Backward and Offset cutting operation.

Also you can move the torch to the start point of the part, then select Line or Pierce (refer to chapter 4.6 Select Line/Pierce), Press 【START】 and select only return function.



FLSK F2100T
Version 21.601.02 V5.0
Speed: 00000
File: SHAPE 43.TXT
Status: Pause
Current Line/Hole: 00000/00000

[G]Cutting return
[X]Offset cutting
[Y]only return

【X】CutSpeed 300.00 【N】Kerf 1.40
【Y】ManualSpd 3000.00 Angle 0.00
【F】Manual KeepMov
【G】StepDis 5.00 【M】Flame cut

+X:500.00 -X:0.00 +Y:500.00 -Y:0.00

1: (TEST PATTERN)
2: G92

X: +000000.0
Y: +000000.0

Pierce 0
Length 0
Cut Time 00:00:00
Run Time 00:00:00

Ignition s
LowHeat s
HighPreheat s
Pierce1 s
Pierce2 s
Pierce3 s
TorchUp s
TorchDn s
THC En
Blow s
F1 Back
F2 Demo
F3 GoBack
F4 Speeddown
F5 Speedup
F6 Heat Down
F7 Heat Add
F8 Jump to Pierce

Press 【G】, the controller will start cutting from current point to the start point of the select Line or Pierce.

Press 【X】, the controller will offset current point to the start point of the select Line or Pierce.

Press 【Y】, only move from the current point to the start point of the select Line or Pierce.

6.5 Laser Offset Function

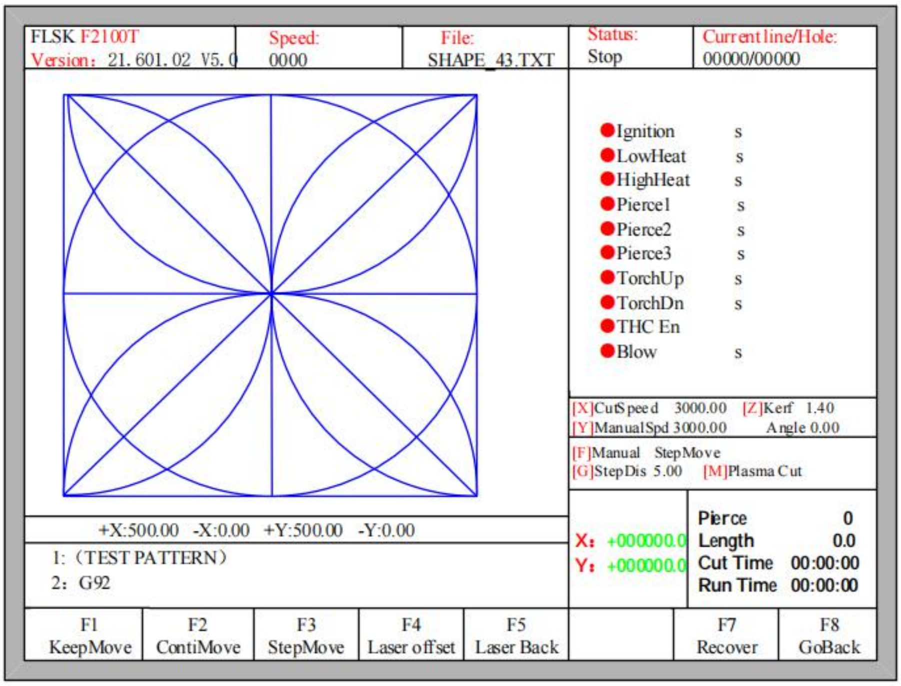
Laser offset function refers to the user's installation of a laser cross location next to cutting torch. Distance between the cross and the cutting torch is fixed. After setting this offset distance(refers to section 7.4 powder parameters), user can use in 【F7】Manual Move interface:

【F4】Laser offset: can make the cross cursor move to the original position of the torch

【F5】Laser bias: can make the torch move to the position of the cross cursor

Using this function, the user can conveniently use positioning characteristics of the cross laser cursor. After the completion of the positioning, make the torch move back to the position point of the cross cursor. This function can be mainly used in steel plate correction, steel plate start point search, etc.

If user has customized the laser offset function, the previous acceleration and deceleration buttons in manual move interface will be replaced by buttons [F4] laser offset and [F5] laser bias, shown



FLSK F2100T
Version: 21.601.02 V5.0
Speed: 0000
File: SHAPE_43.TXT
Status: Stop
Current line/Hole: 00000/00000
[X]CutSpeed 3000.00 [Z]Kerf 1.40
[Y]ManualSpd 3000.00 Angle 0.00
[F]Manual StepMove
[G]StepDis 5.00 [M]Plasma Cut
+X:500.00 -X:0.00 +Y:500.00 -Y:0.00
1: (TEST PATTERN)
2: G92
X: +000000.0
Y: +000000.0
Pierce 0
Length 0.0
Cut Time 00:00:00
Run Time 00:00:00

●Ignition s
●LowHeat s
●HighHeat s
●Pierce1 s
●Pierce2 s
●Pierce3 s
●TorchUp s
●TorchDn s
●THC En
●Blow s
F1 KeepMove
F2 ContiMove
F3 StepMove
F4 Laser offset
F5 Laser Back
F7 Recover
F8 GoBack

7.File Operation

The controller supports cutting file which has txt,cnc,nc,B3,MPG postfixes. The maximum file size is 4M and the largest lines is 150000. You can edit, compile, delete, export or import.

Note:

The total files in the controller is less than 5000. And only less than 1000 files in a folder.

The total length of the file path in the USB disk can not exceed 133 bytes. A Chinese Character is counted by two bytes, and the letters and characters are counted by one byte.

The hard disk folder name is 13 bytes.

The file name is less than 64 bytes.

In the main interface, press key【F2】(edit) to enter file management interface, shown as follows:

7.1 Disk Files

In the file management interface, press F1 to enter the Disk File management, as shown in Fig 7.1 .

All supported files are listed.

Press F4, if the file is G file, you could edit them. Please refer to chapter 6.4 on how to edit files.

Press F5, you could choose to delete the current file or the current folder, as well as all the files.

Press F6, if the file to USB.

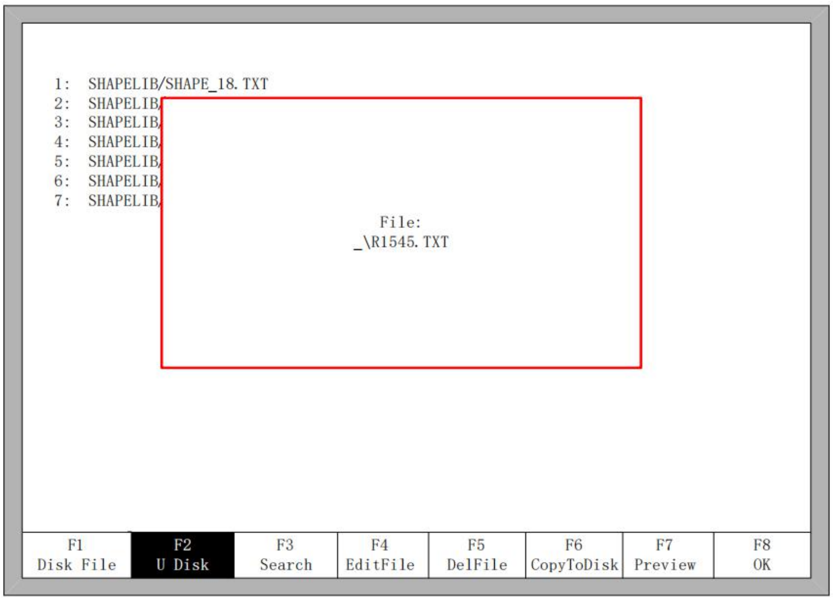
Press F7, preview the part image if the file is G file.

Press F8, load the G file to the controller.

7.2 U Disk Files

In the file management interface, press key【F2】to go for U Disk interface.

In the U Disk interface, choose the corresponding G file stored in USB, press 【F6】 the controller will save the file into the disk.



```
1:  SHAPELIB/SHAPE_18.TXT
2:  SHAPELIB/
3:  SHAPELIB/
4:  SHAPELIB/
5:  SHAPELIB/
6:  SHAPELIB/
7:  SHAPELIB/
```

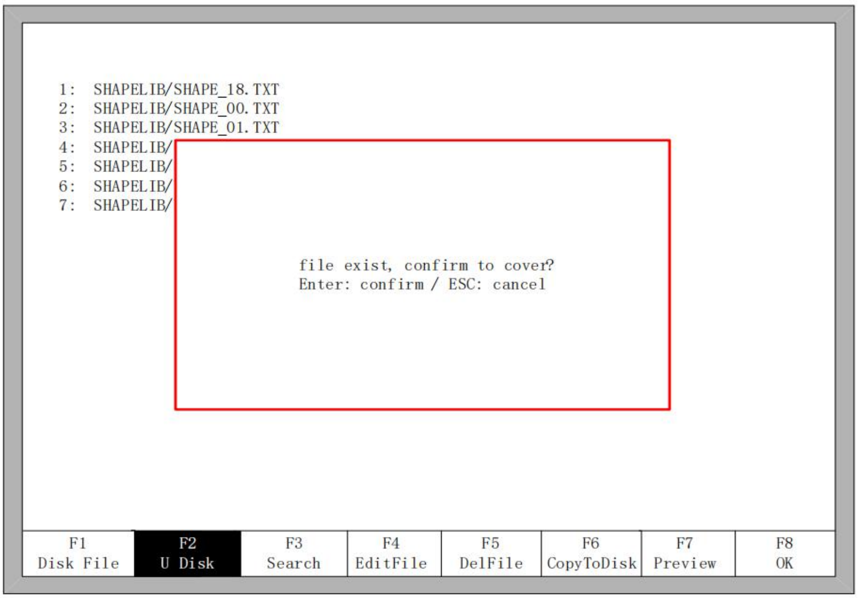
File:
_\R1545.TXT

Note: The file in U disk can be loaded into the controller directly without be copied into the disk.

At this time, the file will be saved automatically by name ufile.txt. Shown

When input file name, if you do not want to change the file name, you can be directly press

【Enter】to preserved; or modify the file name and then press【Enter】 to save. If the same named file has already exited, the system prompts:

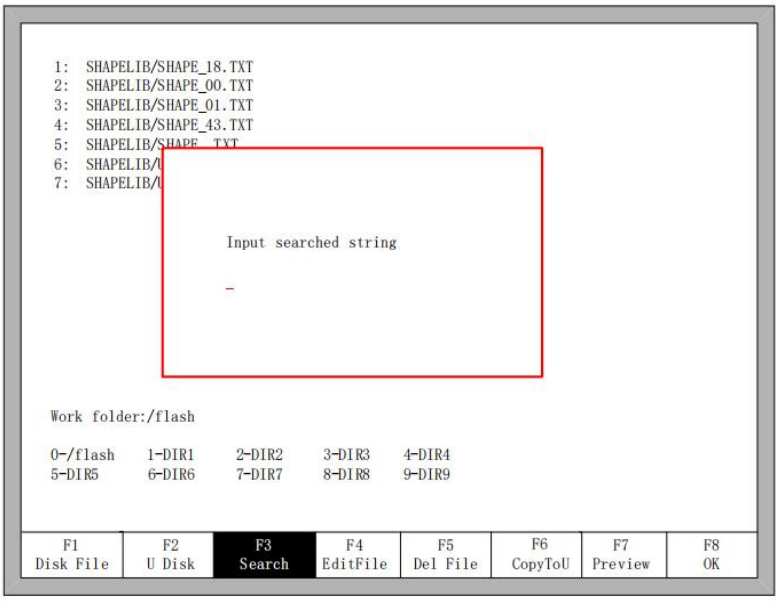


1: SHAPELIB/SHAPE_18.TXT
2: SHAPELIB/SHAPE_00.TXT
3: SHAPELIB/SHAPE_01.TXT
4: SHAPELIB/
5: SHAPELIB/
6: SHAPELIB/
7: SHAPELIB/

file exist, confirm to cover?
Enter: confirm / ESC: cancel

7.3 Search File

In the file manage interface, press key【F3】to search a file. You can input all or part of the file name, then press 【Enter】, and the controller will list all the files which name include the input word.



1: SHAPELIB/SHAPE_18.TXT
2: SHAPELIB/SHAPE_00.TXT
3: SHAPELIB/SHAPE_01.TXT
4: SHAPELIB/SHAPE_43.TXT
5: SHAPELIB/SHAPE_ TXT
6: SHAPELIB/U
7: SHAPELIB/U

Input searched string

_

Work folder:/flash

7.4Edit File

In the disk file interface, move the cursor to the file that you want to edit, then press 【 F4 】 to enter the edit interface.

When enter the characters, some keys are multiplexing button. Press these keys directly, enter the characters under the button. If first press 【Shift】 key, release the 【Shift】 key and then press the multiplexing button, then enter characters upper the button. Or press both【Shift】and reuse keys, then enter characters upper the button.

When editing the file, press 【F2】can insert a new line after the current line, and press 【F3】to delete the current line. Press 【F+/Home】 key, the cursor automatically moves to the first character of the current line, press【F-/End】, the cursor automatically moves to last character of the current line.

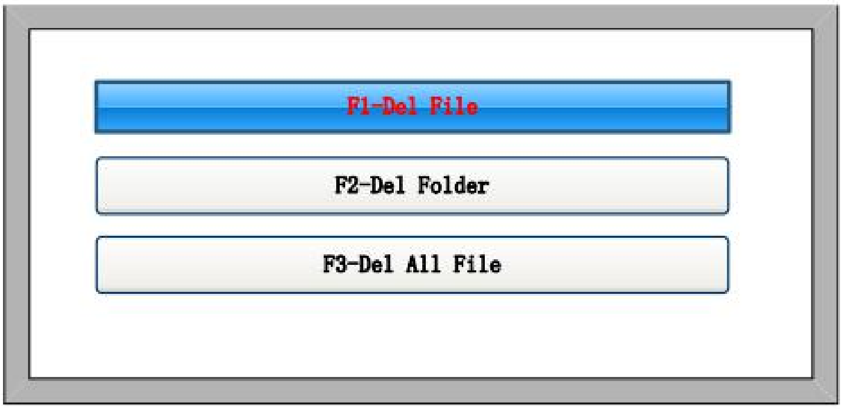
Each edit line supports 128 characters maximum.

When you open a file on U disk or new a G file, you must save it before using it. Otherwise, you cannot make use of the breakpoint recovery function.

Press 【F8】to save the file.

7.5Delete File

In the file management interface, press 【 F5 】 to delete the file, it will pop up the dialog box as shown , select the cursor to delete the file or the current selected folder all the files, or empty all the files.



【F1】Delete file: The G file where the current cursor is located is deleted.

【F2】Delete folder: all G files in the current folder will be deleted.

【F3】Empty all files: all G files in the machine will be deleted.

7.6New File

In the editing file interface (refer to 6.4 edit code), you can press key【F4】to create an new file.

7.7Compile Code

After create a new G file or edit G file, if you want to check if file is legal or not , in the edit interface, press 【F1】, you can compile the file to check it.

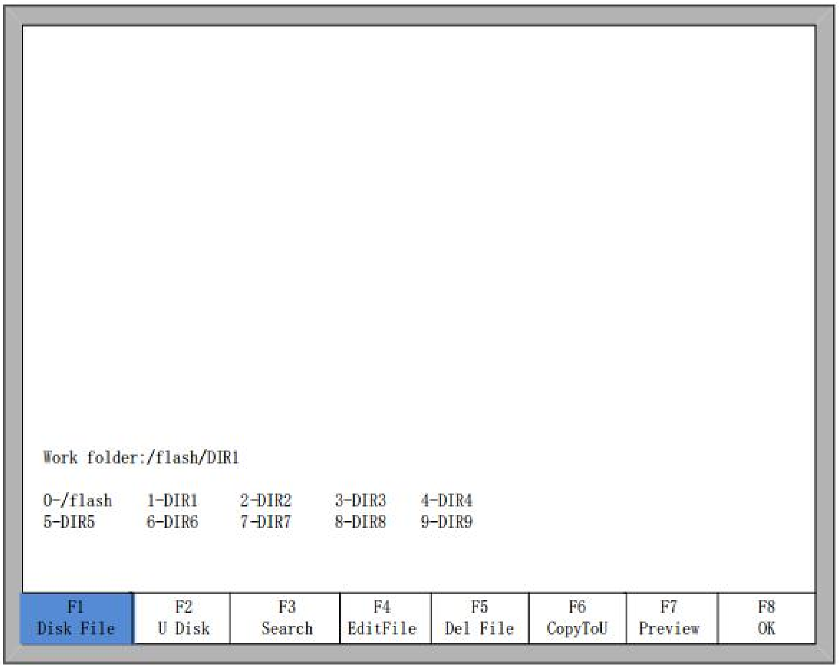
7.8Folder Management

7.8.1Select Work Folder

The controller supports 10 folders, as the figure 6.1 shows.

Work folder: current work folder path.

0-/flash 1-DIR1 2-DIR2 3-DIR3 4-DIR4 5-DIR5 6-DIR6 7-DIR7 8-DIR8 9-DIR9 。These 10 symbols interpret 10 folder path. The number before ‘-‘ is the short key, press the corresponding number, switch current work folder into corresponding folder. For example, press【1】, it will show as the figure.



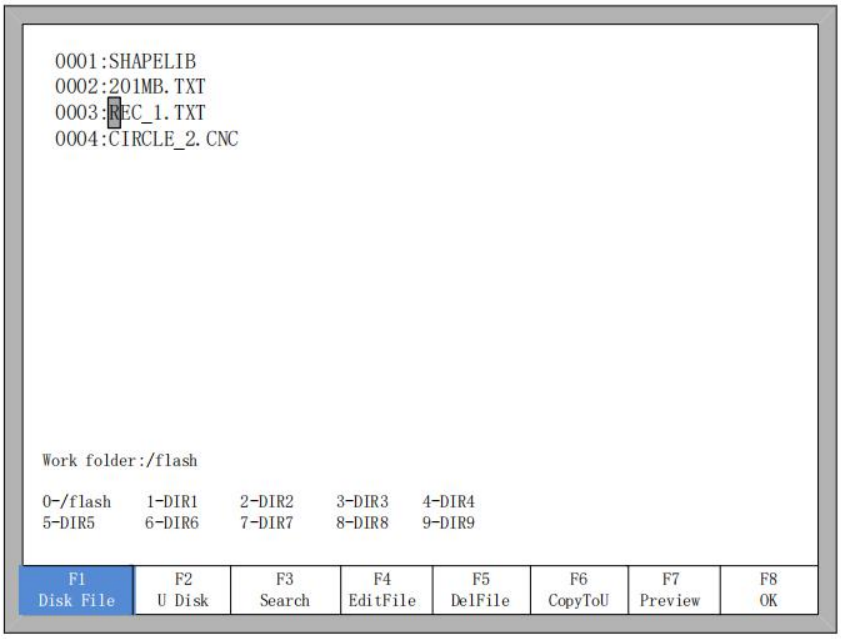
Work folder:/flash/DIR1

0-/flash 1-DIR1 2-DIR2 3-DIR3 4-DIR4
5-DIR5 6-DIR6 7-DIR7 8-DIR8 9-DIR9

F1 Disk File
F2 U Disk
F3 Search
F4 EditFile
F5 Del File
F6 CopyToU
F7 Preview
F8 OK

7.8.2Create New Folder

As 6.4 edit file. First go to the edit file interface and edit a G file. As the figure shows.



0001:SHAPELIB
0002:201MB.TXT
0003:REC_1.TXT
0004:CIRCLE_2.CNC

Work folder:/flash

0-/flash 1-DIR1 2-DIR2 3-DIR3 4-DIR4
5-DIR5 6-DIR6 7-DIR7 8-DIR8 9-DIR9

F1 Disk File
F2 U Disk
F3 Search
F4 EditFile
F5 DelFile
F6 CopyToU
F7 Preview
F8 OK

Then press【F4】-- edit file, the function keys under the edit file show as figure .

F1 Compile	F2 AddRow	F3 Del Row	F4 New File	F5 NewFolder			F8 Save

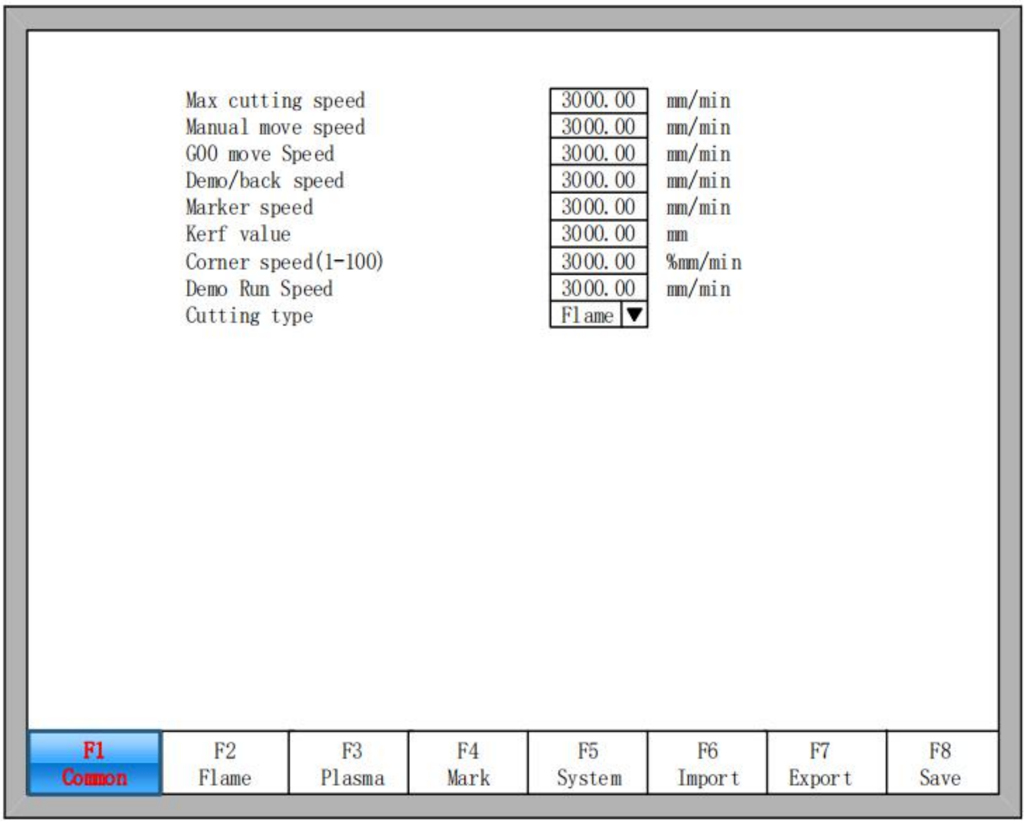
At this time, press【F5】, input the folder’ s name in the prompting dialog window and then press

【Enter】.

Illustration: the controller supports only 10 folders. If there already are 10 folder , then the new added folder will replace the second folder, successively the third folder, the forth file and so on. The first folder /flash is reserve folder, this folder can neither be replaced nor be modified.

8. Parameter Setting

In the main interface, you can get the parameter interface by pressing key【F4】(Setups). Showed as Fig.



Max cutting speed	3000.00	mm/min
Manual move speed	3000.00	mm/min
G00 move Speed	3000.00	mm/min
Demo/back speed	3000.00	mm/min
Marker speed	3000.00	mm/min
Kerf value	3000.00	mm
Corner speed(1-100)	3000.00	%mm/min
Demo Run Speed	3000.00	mm/min
Cutting type	Flame ▼	

You can set five kinds of parameter in the parameter interface:

1) Common parameters: cutting speed, manual move speed, G00 move speed, the size of kerf compensation, corner speed, cutting type.

2) Flame parameters: all the parameters used in oxygen gas cutting, edge cut enable.

3) Plasma parameters: all the parameters used in plasma cutting

3) Marker parameters: ignition, perforation cycle parameters, marker gun offset

4) System parameters: you can set system pulses, maximum speed limit, motor parameters and soft limit parameters.

8.1 Common Parameters

Cutting Speed: the current cutting speed.

Manual Move Speed: manual move speed.

G00 Move Speed: the move speed at G00. That is the rapid move in cutting.

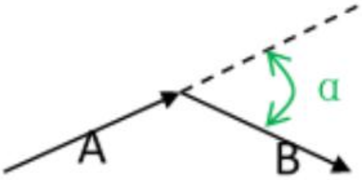
Demo/ back speed: the speed of forward or backward along the part path.

Dust speed: the speed when executing powder.

Kerf: Specifies the amount of kerf that is applied to the current part program.

Corner speed: Corner speed is speed limited at corner. When the is between 10-35 degree, the speed is limited automatically by controller. If the corner is less than 10 degree, the speed is not limited, if it is more than 35, the speed is limited to start speed.

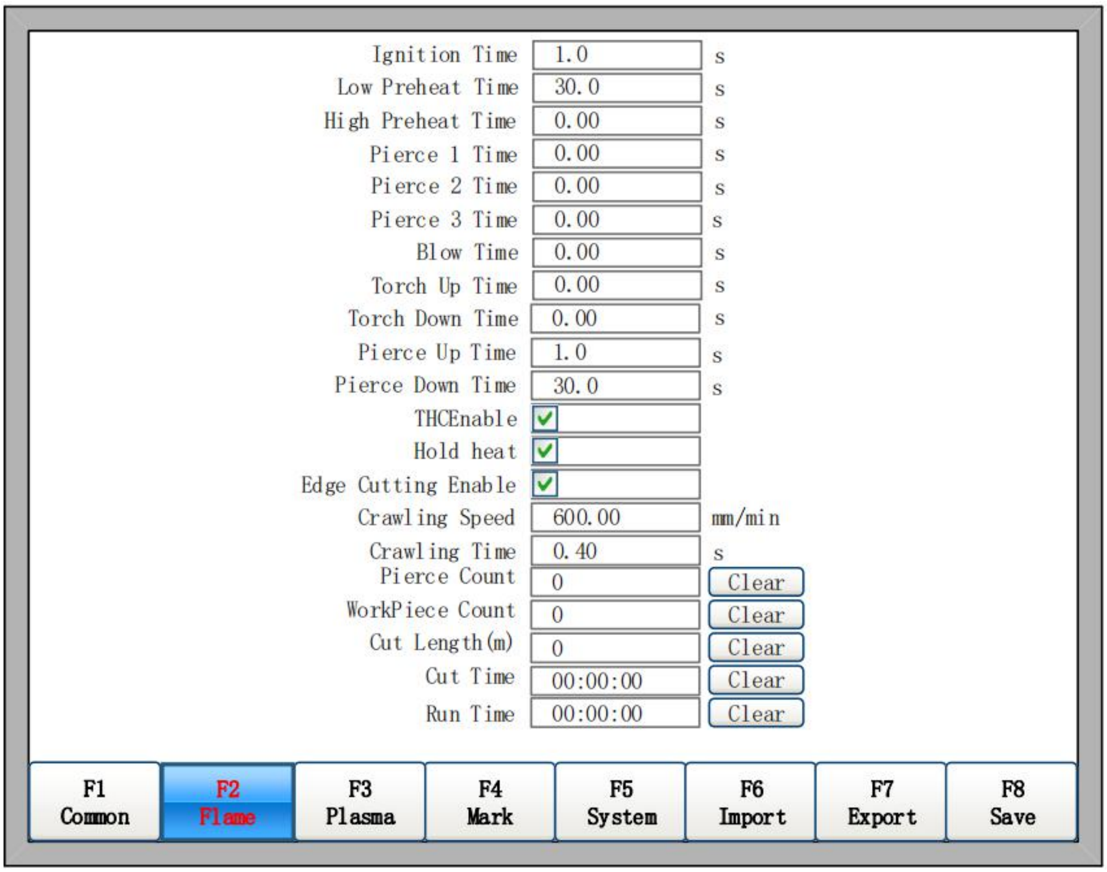
$$V_x = \begin{cases} V & \alpha < 10 \\ \left(1-\frac{\alpha}{25\pi}*h\right)*V, & 10 \le \alpha \le 35 \\ \text{start speed} & \alpha > 35 \end{cases}$$



Demo run speed: the speed under demonstration.

Cutting Type: There are three cutting types: flame (Oxygen gas), Plasma and demonstration type.

8.2 Flame Parameters



Ignition Time	1.0	s
Low Preheat Time	30.0	s
High Preheat Time	0.00	s
Pierce 1 Time	0.00	s
Pierce 2 Time	0.00	s
Pierce 3 Time	0.00	s
Blow Time	0.00	s
Torch Up Time	0.00	s
Torch Down Time	0.00	s
Pierce Up Time	1.0	s
Pierce Down Time	30.0	s
THCEnable	☑	
Hold heat	☑	
Edge Cutting Enable	☑	
Crawling Speed	600.00	mm/min
Crawling Time	0.40	s
Pierce Count	0	Clear
WorkPiece Count	0	Clear
Cut Length(m)	0	Clear
Cut Time	00:00:00	Clear
Run Time	00:00:00	Clear

Ignition Time: the time delay after opening ignition output.

Low Preheat Time: The preheating time before piercing the steel plate. During the low pressure preheating process, you can prolong the preheating time by pressing “stop” key or 【F7】 key. If Key【stop】 is pressed, the preheating time will delay until

【Start】 is pressed . If【F7】 is pressed, the preheating time will automatically be increased 15 seconds, and this time will be preserved by controller.

High Preheat Time: Like Low Preheat Time. But open different IO, high preheat time is before low preheat time.

Pierce 1 Time: Piercing time with low pressure oxygen open.

Pierce 2 Time: Piercing time with middle pressure oxygen open.

Pierce 3 Time: Piercing time with high pressure oxygen open. Chapter 7 Parameter Setting 44

Blow Time: The open time of output blow after oxygen output is closed.

Torch Up Time: Specifies the amount of time used for torch lift after completing each cut. This is normally used to provide torch head clearance and return the torch to its predefined rest position.

Torch Down Time: Specifies the amount of time used to lower the torch at the beginning of each new cut. This is usually longer than the Pierce Torch down Time as it involves lowering the torch from its predefined rest position.

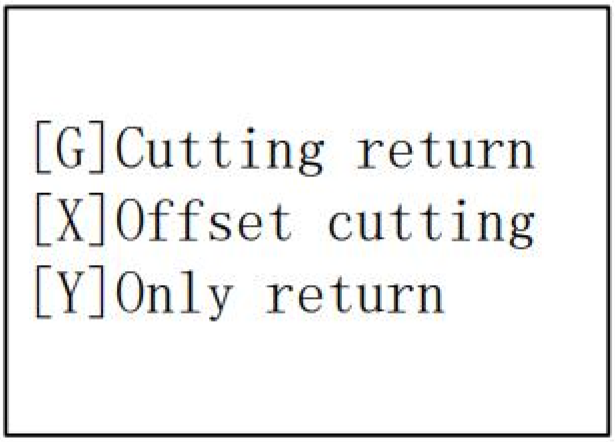
Pierce up Time: Specifies the amount of time used for torch lift during piercing. This parameter is used to provide distance between the torch tip and metal surface for cutting.

Pierce down Time: Specifies the amount of time used for torch lowering during piercing.

THC Enable: Torch Height Control is enable or disable. The output of THC enable is active or inactive in flame cutting.

Hold Preheat: If it is checked, Low Heat IO port is on the open status even after completing each cut. It will be closed when all cuts are finished, that is the file is finished. Also, it can be kept open status even all cuts are finished if Hold Preheat after cutting end is YES, refer 8.7.6 option.

Edge Cutting Enable: When it is checked, the controller will automatically stop whenever each pierce point has occurred. When it stops, user can move the torch to the edge of steel panel, then press start button, the controller will prompt:



[G]Cutting return
[X]Offset cutting
[Y]Only return

When press 【G】, after the controller will pierce at the current position and cutting to the part path. The current position should be at edge of metal.

This function will be especially useful when cut the thick metal plate. Thick steel plate is hard to be punched holes and the punched hole will be also larger. If directly punch hole in the cutting path, it will maybe affect the final production quality. Using edge cutting can may accelerate the efficiency of punch holes, save cutting time and improve production quality.

Of course, don’ t use edge cutting, punch hole with lead-in is also a more effective method.

Crawling speed: creep speed when opening the crawling function. See8.7.6.9 for crawling function.

Crawling time: Specifies the amount of time after piercing the part that the torch Chapter 7 Parameter Setting 45 travels at crawling speed. After the Crawling Time is completed, the control accelerates to full cut speed. This parameter is helpful in allowing the operator to bring the cutting surface up to temperature and completely pierce the metal before cutting at full speed.

Note: Depending on the performance of the plasma system, a crawling time may be required to allow for ramp up of the cut voltage after a pierce.

Pierce count: record the number of pierce during flame cutting.

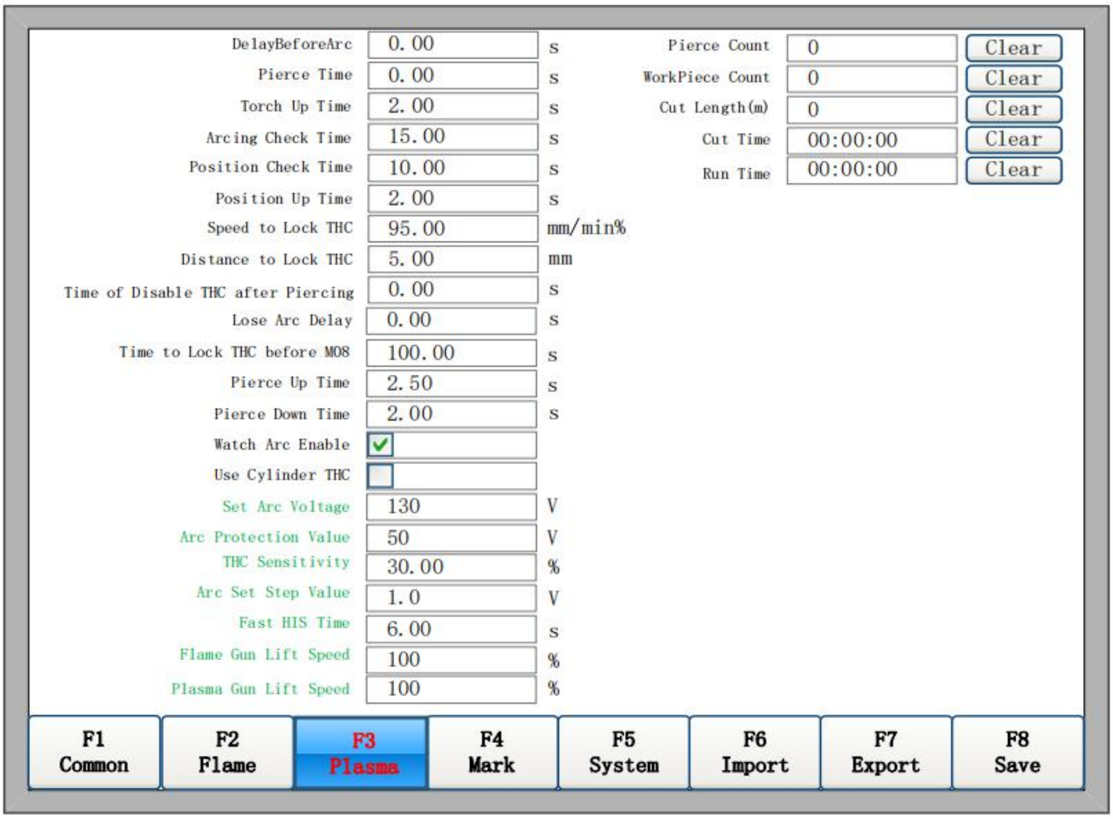
Workpiece count: record the number of workpieces completed by flame cutting.

Cut length: record the total flame cutting distance. Unit: metric-meters, Inch-feet

Cut time: record the time of flame cutting process.

Run time: record the flame cutting time + G00 move time + the time of piercing time.

8.3 Plasma Parameter



DelayBeforeArc 0.00 s

Pierce Time 0.00 s

Torch Up Time 2.00 s

Arcing Check Time 15.00 s

Position Check Time 10.00 s

Position Up Time 2.00 s

Speed to Lock THC 95.00 mm/min%

Distance to Lock THC 5.00 mm

Time of Disable THC after Piercing 0.00 s

Lose Arc Delay 0.00 s

Time to Lock THC before M08 100.00 s

Pierce Up Time 2.50 s

Pierce Down Time 2.00 s

Watch Arc Enable ☑

Use Cylinder THC ☐

Set Arc Voltage 130 V

Arc Protection Value 50 V

THC Sensitivity 30.00 %

Arc Set Step Value 1.0 V

Fast HIS Time 6.00 s

Flame Gun Lift Speed 100 %

Plasma Gun Lift Speed 100 %

Pierce Count 0

WorkPiece Count 0

Cut Length(m) 0

Cut Time 00:00:00

Run Time 00:00:00

DelayBeforeArc: Specifies the delay time before starting piercing. That is a wait time before controller starts to cut. All outputs are off.

Pierce time: Specifies the time delay from when the torch completes lowering until motion is initiated at Creep Speed. Used to allow the plasma torch to completely pierce the material before moving.

Torch Up Time: Specifies the length of time to raise the torch at the beginning and end of each cut to provide clearance over the cut pieces. If you are using an automatic height control system, set Torch Up Time to zero.

Arcing Check Time: The time between the control system start arc on and Arc On Feedback is on. The controller will go on to move and cut if arc on feedback is on with this time. Or it will prompt a warning message and stop running if arc on feedback is off after this time.

Position check Time: The max time of controller start to lower the lifter and Position Detection is on.

Position up Time: In Position Check Time, if the Position Detection is on, then the torch is raised for this time. It is the ignition height of plasma arc.

Speed to Lock THC: The percentage speed of full cut speed. If the speed is less than this, the output of LockTHC is on.

Distance to Lock THC: Within the distance of each cut segment, the output of LockTHC is on.

Time of Disable THC after Piercing: The delay time to enable torch height control after arc on feedback is on.

Lose arc delay: The filter time of lose arc detection.

Time to Lock THC before M08: Plasma is off before the end of part cut.

Pierce up time: When the crawling function is opened, the dynamic pierce parameters are described in detail. 8.7.6.9 Reptile function description.

Pierce Down time: When the crawling function is opened, the dynamic pierce parameters are described in detail. 8.7.6.9 Reptile function description.

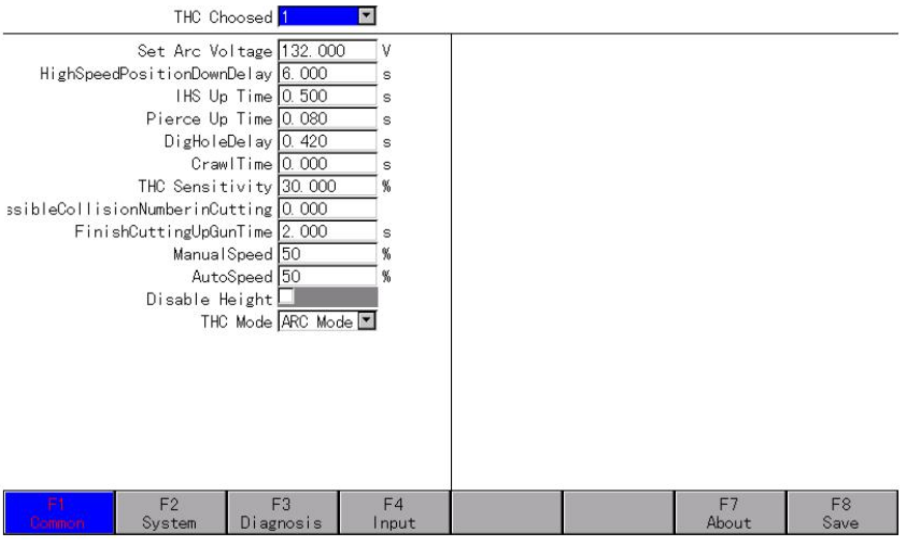
Watch arc enable: whether real-time detection of arc on signal in cutting process or not. If setting "yes", in the cutting process, the system detects the real-time arc on feedback signal. If arc on is lost, the controller will stop the cutting and prompt alarm message.

If setting "No", then in the cutting process does not detect arc on feedback signal

Use Cylinder THC: When this parameter is selected, it keeps Torch Down output in cutting.

8.3.1 THC Parameters Setting

8.3.1.1 THC common parameter



THC Choosed 1

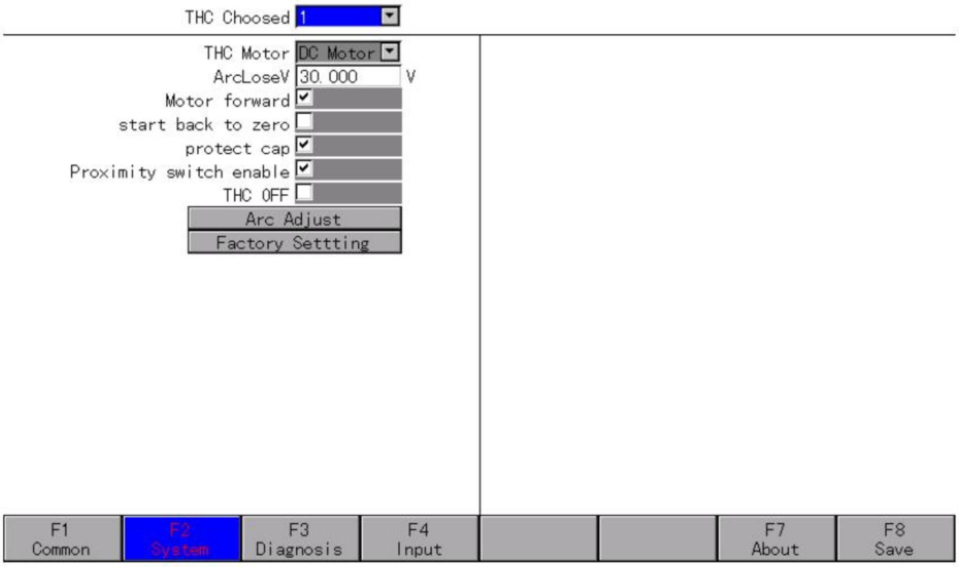
Set Arc Voltage 132.000 V
HighSpeedPositionDownDelay 6.000 s
IHS Up Time 0.500 s
Pierce Up Time 0.080 s
DigHoleDelay 0.420 s
CrawlTime 0.000 s
THC Sensitivity 30.000 %
ssibleCollisionNumberinCutting 0.000
FinishCuttingUpGunTime 2.000 s
ManualSpeed 50 %
AutoSpeed 50 %
Disable Height ☐
THC Mode ARC Mode

THC Choosed: Allow user to choose the THC which configure the preset station. User can switch the THC which configure with the enabled station.

Parameter Save: Press “F8 Save” to save the parameters to local THC, when the value of the THC choosed is ALL, will jump out a window “Updated to all THC?”, press Enter, the parameters will transfer to all THC. Press ESC, the system will only save the parameters.

THC parameters: Please check the F162X manual for specific details.

8.3.1.2 System



THC Choosed 1

THC Motor DC Motor

ArcLoseV 30.000 V

Motor forward ☑

start back to zero ☐

protect cap ☑

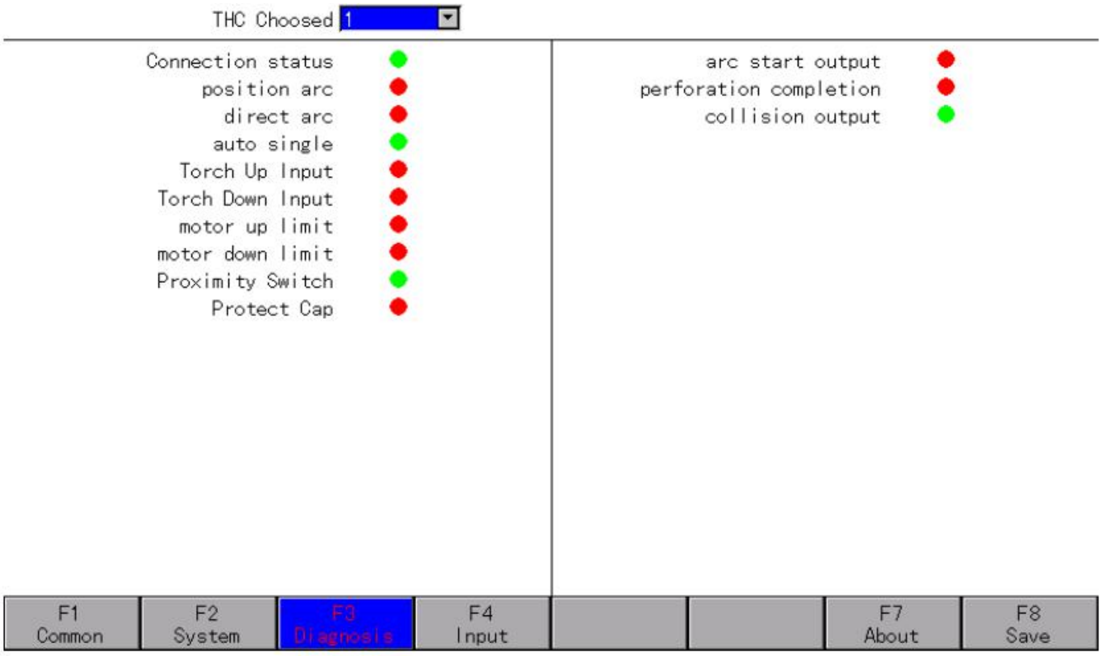
Proximity switch enable ☑

THC OFF ☐

THC Choosed: Allow user to choose the THC which configure the preset station. User can switch the THC which configure with the enabled station.

THC parameters: Please check the F162X manual for specific details.

8.3.1.3 Diagnosis



THC Choosed: 1

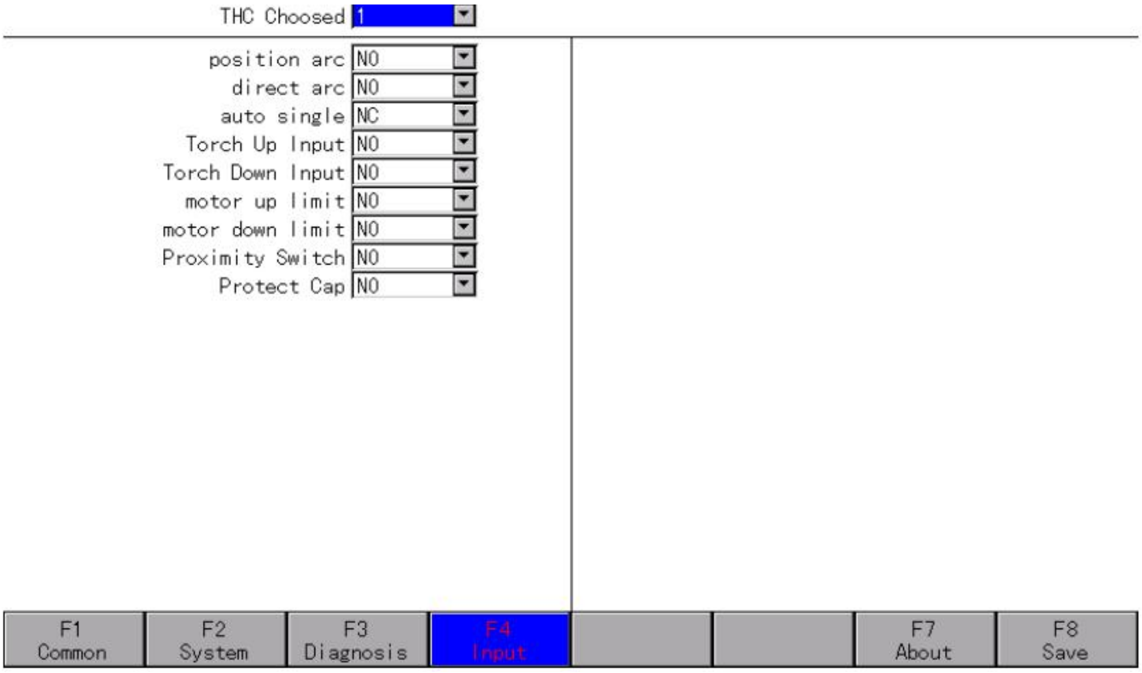
Input		Output	
Connection status	🟢	arc start output	🔴
position arc	🔴	perforation completion	🔴
direct arc	🔴	collision output	🟢
auto single	🟢		
Torch Up Input	🔴		
Torch Down Input	🔴		
motor up limit	🔴		
motor down limit	🔴		
Proximity Switch	🟢		
Protect Cap	🔴		

F1
Common
F2
System
F3
Diagnosis
F4
Input
F7
About
F8
Save

THC Choosed: Allow user to choose the THC which configure the preset station. User can switch the THC which configure with the enabled station.

Indicator Light: The indicator light on the left stands for the input status of the THC, and the right side stands for output status of the THC.

8.3.1.4 Input(Define)



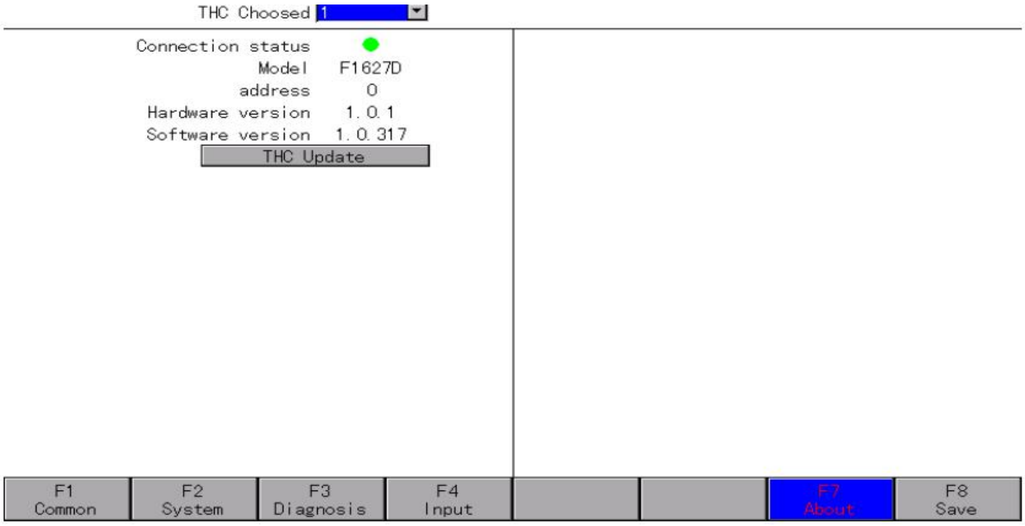
THC Choosed: 1

position arc	NO
direct arc	NO
auto single	NC
Torch Up Input	NO
Torch Down Input	NO
motor up limit	NO
motor down limit	NO
Proximity Switch	NO
Protect Cap	NO

F1
Common
F2
System
F3
Diagnosis
F4
Input
F7
About
F8
Save

This page allow user to change the definition of the I/O pin of the THC.

8.3.1.5 About


THC Update
F1 Common
F2 System
F3 Diagnosis
F4 Input
F7 About
F8 Save

THC Choosed 1

Connection status ●
Model F1627D
address 0
Hardware version 1.0.1
Software version 1.0.317

Connection status: Green light stands for THC online, Red light stands for THC offline.

Model: The model of your current THC.

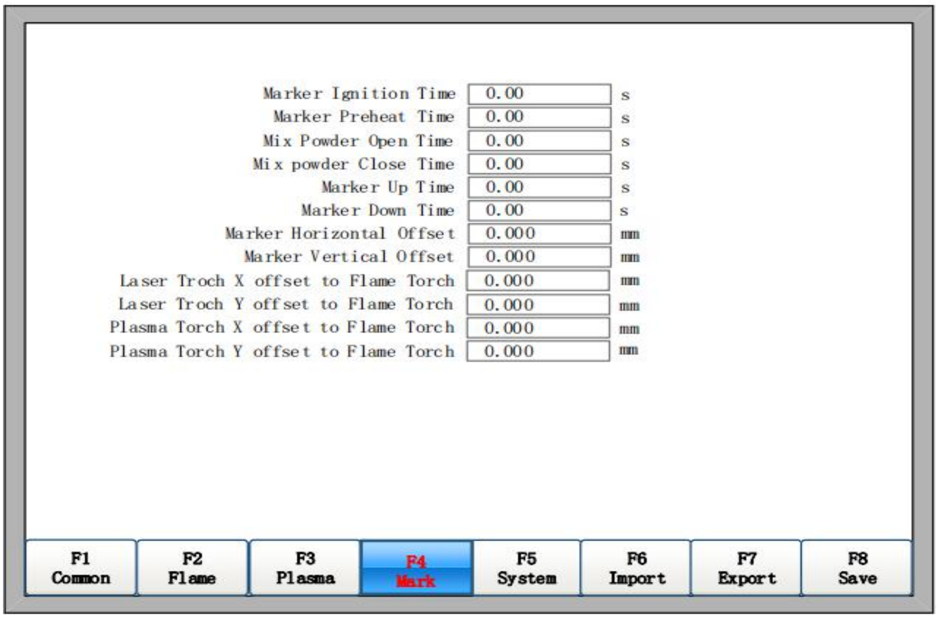
Address: The connecting address of the THC.

Hardware version: The current hardware version of the THC.

Software version: The current software version of the THC

THC update: update the version of your THC by U-Disk.

8.4 Marker Parameters


F1 Common
F2 Flame
F3 Plasma
F4 Mark
F5 System
F6 Import
F7 Export
F8 Save

Marker Ignition Time 0.00 s
Marker Preheat Time 0.00 s
Mix Powder Open Time 0.00 s
Mix powder Close Time 0.00 s
Marker Up Time 0.00 s
Marker Down Time 0.00 s
Marker Horizontal Offset 0.000 mm
Marker Vertical Offset 0.000 mm
Laser Troch X offset to Flame Torch 0.000 mm
Laser Troch Y offset to Flame Torch 0.000 mm
Plasma Torch X offset to Flame Torch 0.000 mm
Plasma Torch Y offset to Flame Torch 0.000 mm

Marker Ignition Time：Ignition time of marker. Note: the output is same to flame ignition output.

Marker Preheat Time：The preheat time of marker from ignition complete to open mix power Open.

Mix powder Open/Close Time：Delay time of scatter powder mouth relative to spurt powder mouth open/close, input ≥0 arbitrary value, unit: s.

Marker Up Time：The time of marker torch going up. Unit: s.

Marker Down Time：The time of marker torch going down. Unit: s.

Marker Horizontal Offset：Horizontal offset of powder torch gun relative to flame cutting torch gun. Unit: mm.

Marker Vertical Offset：Vertical offset of powder gun relative to cutting torch. Unit: mm.

Laser Troch X offset to Flame Torch: the horizontal distance of the laser gun relative to the flame torch gun.

Laser Troch Y offset to Flame Torch: the Vertical distance of the laser gun relative to the flame torch.

Plasma Torch X offset to Flame Torch: the horizontal distance of the plasma torch gun relative to the flame torch gun.

Plasma Torch Y offset to Flame Torch: the Vertical distance of the plasma torch relative to the flame torch.

8.5 System Parameters

The system parameters, as shown in Fig 7.11, are related with the precision of driver shaft of the cutting machine, coordinate axis, increase/decrease of rate and little arc processing limited parameter.

Horizontal Axis Pulse: The number of pulse that controller needs to generate when the machine move1mm towards X axis, maintaining 3 digits at most after decimal point.

Vertical Axis Pulse: The number of pulse that system needs to generate when the machine move 1mm towards Y axis , maintaining 3 digits at most after decimal point.

Max Cutting Speed: the maximum cutting speed.

Max G00 speed: the allowable maximum rapid move speed.

Max Manual Speed: the maximum speed of manual move.

Small Arc Limit: Maximum speed at cutting a small arc. Refer to note 1. Small Arc Radius Limit: If the radius is less than or equal to the value of the circular arc, the running speed should be limited. Refer to note 1.

Flame adjusts time: the accelerate time from start speed to the full speed in flame cutting.

Plasma adjust time: the accelerate time from start speed to the full speed in plasma cutting.

Emergency STOPTime: the deaccelerate time from current speed to stop in emergency.

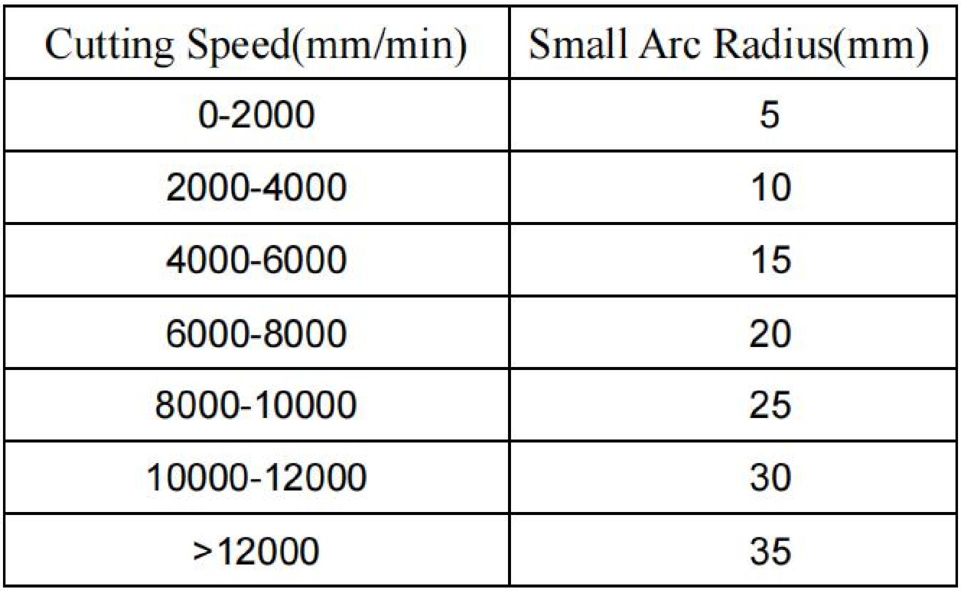
Start Speed: the system’ s speed when it began to start.

Max Coordinate: The maximum positive coordinate which the machine can reach horizontally.

Min Coordinate: The minimum negative coordinate which the machine can reach horizontally.

Note 1:

Table 7.1 Small Arc Definition



Cutting Speed(mm/min)	Small Arc Radius(mm)
0-2000	5
2000-4000	10
4000-6000	15
6000-8000	20
8000-10000	25
10000-12000	30
>12000	35

The relationship between cut speed and arc radius:

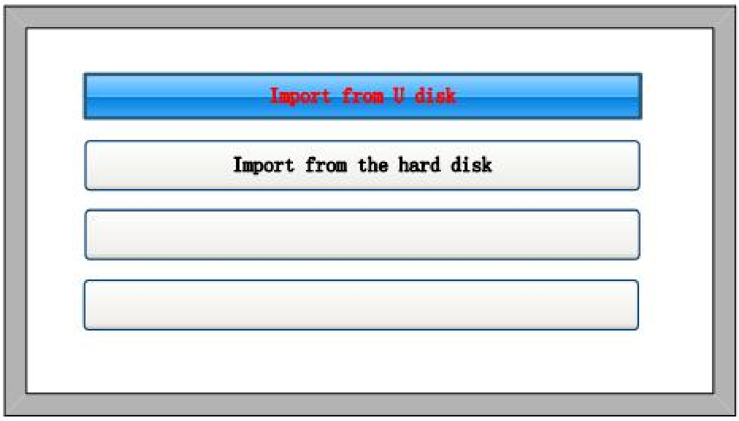
Small Arc Limit	Small Arc Radius	Cutting Speed
=0	=0	No limit
>0	=0	Follow table 7.1, for arc less than small arc radius, the running speed should be limited.
>0	>0	Cutting speed = small arc limit x (arc radius/ radius of small arc limit). When the result is less than the starting speed, the value is starting speed. When starting speed is less than cutting speed, the value is cutting speed.

Note: the modified small arc limit or radius of small arc limit will become effective only after reloading cutting files.

8.6 Parameter Import

In the parameter configuration interface, press F6 to import the parameters from the U disk or the hard disk. As shown in Fig 7.12.The import from the U disk, first of all, insert the U disk into the system USB interface, and the corresponding parameter file in the U disk, which can only be from the same system with the system model derived from the parameters of the file. Then select the parameter file that need to import from the U disk, click Enter.

The import from the hard disk, first of all, determine that the local hard disk has a saved parameter file. Click Enter to select the parameter file saved in the local hard disk, then click enter.

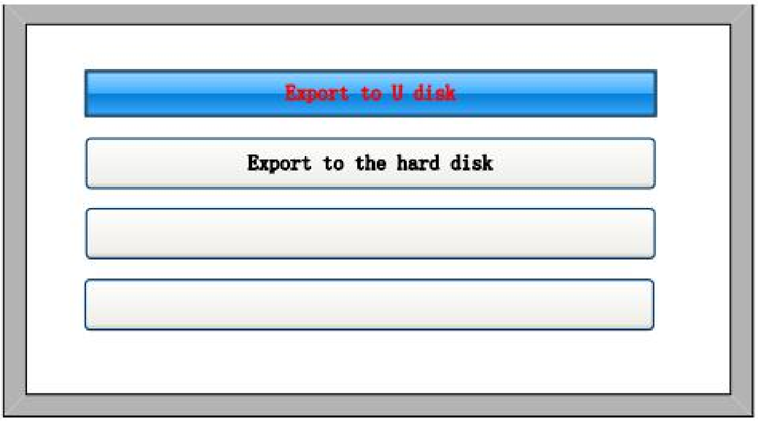


8. 7 Parameter Export

After the parameter configuration is over, press F7 in the parameter configuration interface to export the parameters, you could choose to export to the U disk or hard disk.

The export to the U disk. First of all, insert the U disk into the USB port of the unit, named the name of the parameter file. Click Enter to complete the parameters saved to the U disk.

Export to the hard disk, and the parameters stored in the hard disk. When needed, restore at any time.



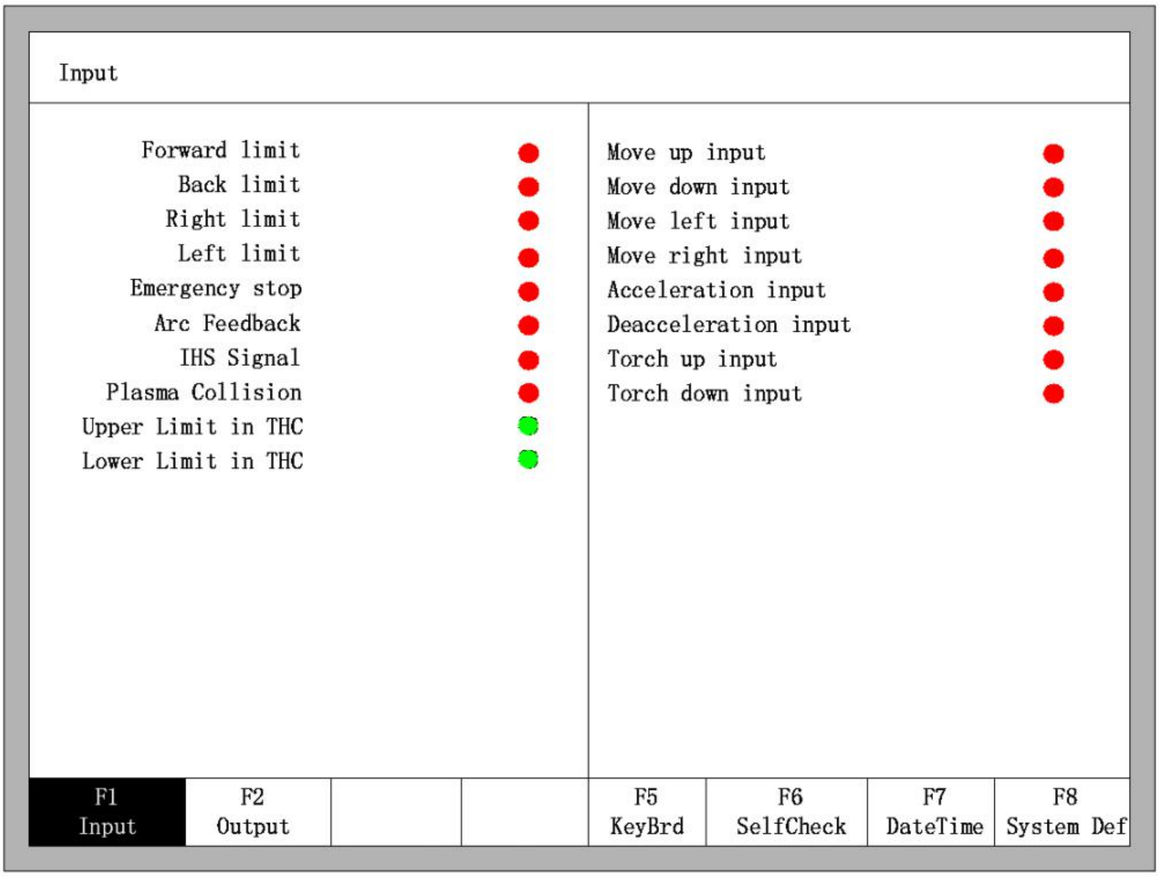
This function combines the input parameter function to enable rapid adjustment of the cutting parameters required for different thickness plates. Use the export parameters function to let the cutting parameters of thickness of the plate required to store in the hard disk or the U disk. When cutting the corresponding thickness of the plate, use the import parameters function from the U disk or hard disk to import the corresponding parameters can be.

8.8 Save Parameters

After parameter modification, press 【F8】 to save.

Note: When any parameter has been modified, you must take preservation operation to keep modification valid, or the system will take the original parameters.

9.Diagnosis Function


Input

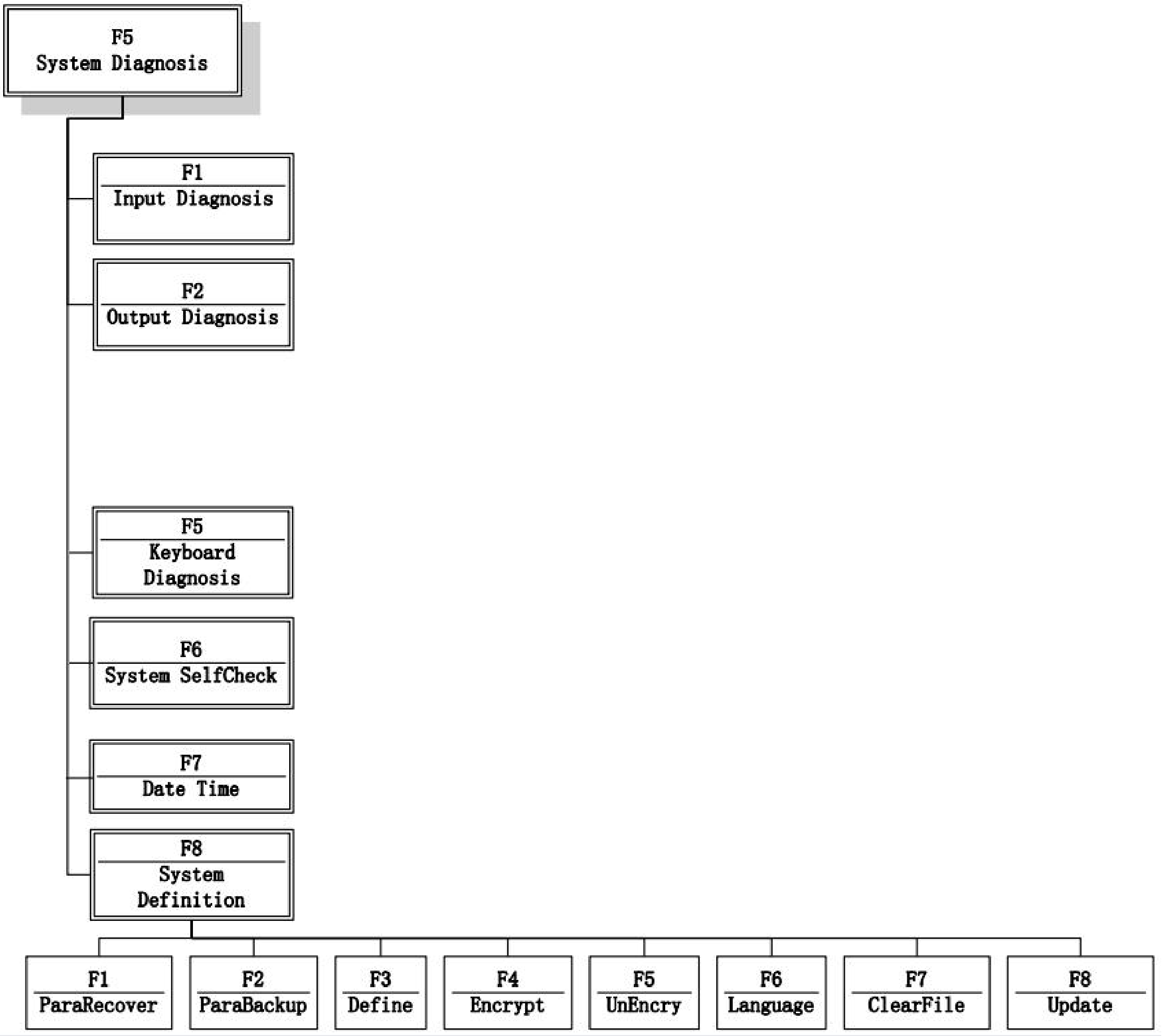
Forward limit	🔴	Move up input	🔴
Back limit	🔴	Move down input	🔴
Right limit	🔴	Move left input	🔴
Left limit	🔴	Move right input	🔴
Emergency stop	🔴	Acceleration input	🔴
Arc Feedback	🔴	Deacceleration input	🔴
IHS Signal	🔴	Torch up input	🔴
Plasma Collision	🔴	Torch down input	🔴
Upper Limit in THC	🟢		
Lower Limit in THC	🟢		

F1 Input
F2 Output
F5 KeyBrd
F6 SelfCheck
F7 DateTime
F8 System Def

In the main interface, you can press 【F5】to enter the system diagnosis interface, as shown in Fig 8.1.

You can be diagnosing the I/O and keyboard in this interface. System self-check can be made by this.

9.1 Diagnosis Interface Index

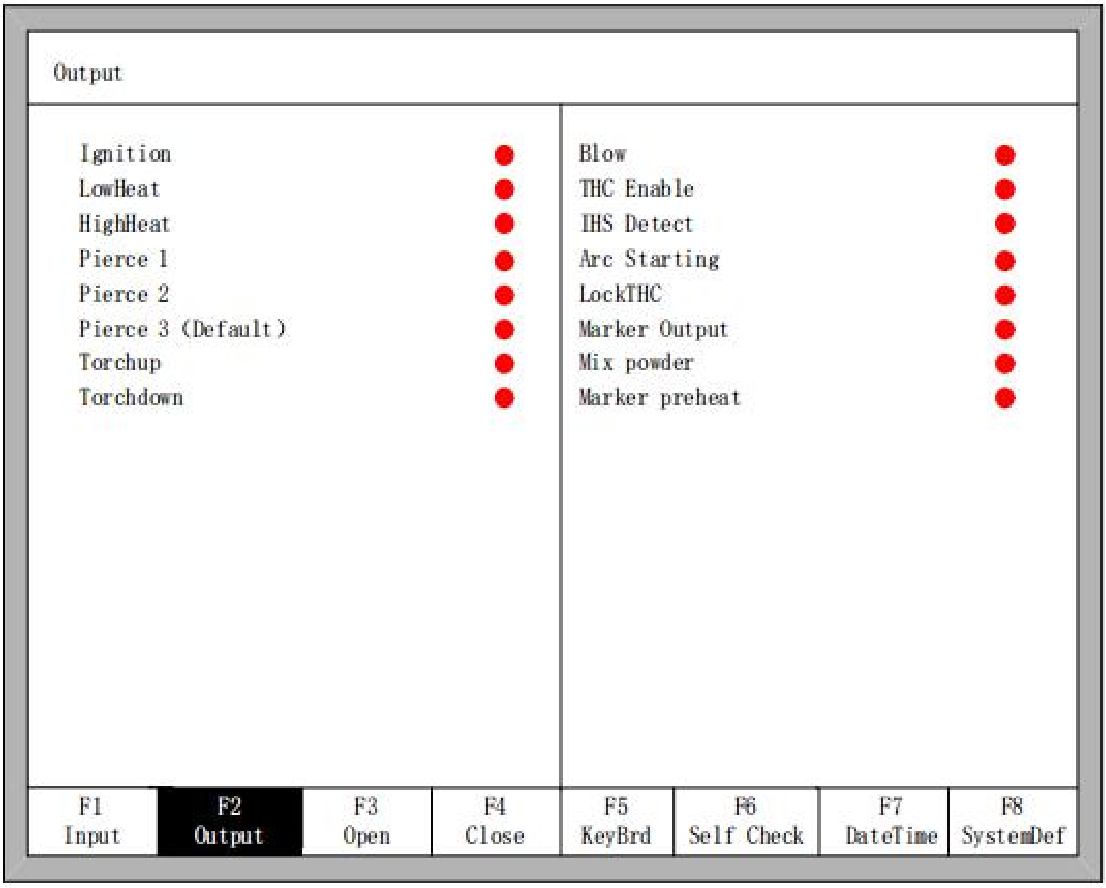

F5
System Diagnosis
F1
Input Diagnosis
F2
Output Diagnosis
F5
Keyboard Diagnosis
F6
System SelfCheck
F7
Date Time
F8
System Definition
F1
ParaRecover
F2
ParaBackup
F3
Define
F4
Encrypt
F5
UnEncry
F6
Language
F7
ClearFile
F8
Update

9.2 Input Diagnosis

The system will read current IO information when press【F1】to refresh the interface, and display all IO’s status. The green NC means the input is effective, and the red NO means the input is ineffective.

9.3 Output Diagnosis

In diagnosis interface ,press 【F2】to enter output diagnosis interface, shown as Fig.



Output

Ignition	🔴	Blow	🔴
LowHeat	🔴	THC Enable	🔴
HighHeat	🔴	IHS Detect	🔴
Pierce 1	🔴	Arc Starting	🔴
Pierce 2	🔴	LockTHC	🔴
Pierce 3 (Default)	🔴	Marker Output	🔴
Torchup	🔴	Mix powder	🔴
Torchdown	🔴	Marker preheat	🔴

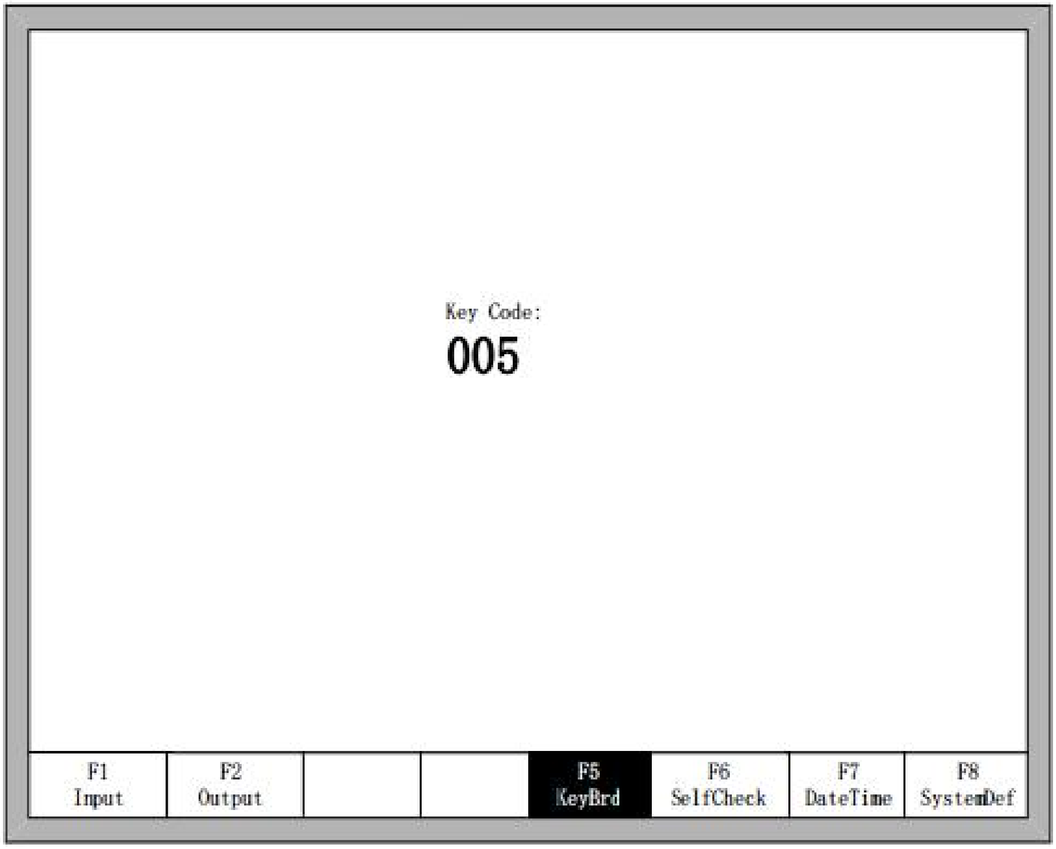
F1
Input
F2
Output
F3
Open
F4
Close
F5
KeyBrd
F6
Self Check
F7
DateTime
F8
SystemDef

Press【↑】,【↓】,【←】,【→】, you can move the cursor to the corresponding output port, press【F3】 to open the corresponding output port, press【F4】to close the corresponding output. 🔴 represents the output is active,

🟢represents the output is inactive.

9.4 Keyboard Diagnosis

In diagnosis interface ,press 【F5】to enter keyboard diagnosis interface, shown as Fig.



Key Code:
005

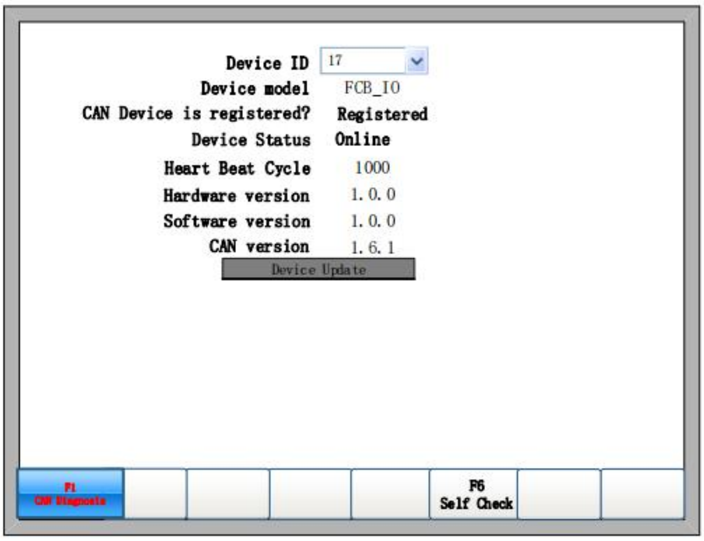
F1
Input
F2
Output
F5
KeyBrd
F6
SelfCheck
F7
DateTime
F8
SystemDef

In this interface, press any key of the keyboard, there will be a corresponding keyboard encoding shown here. If there is no encoding shown, then this key is out of fault.

9.5 More

9.5.1 CAN Diagnosis

Press F1 to enter the CAN Diagnosis interface when you are under “more” section.



Device ID 17
Device model FCB_IO
CAN Device is registered? Registered
Device Status Online
Heart Beat Cycle 1000
Hardware version 1.0.0
Software version 1.0.0
CAN version 1.6.1

Device ID: The ID of the current device.

Device Model: The model of the current device.

CAN device is registered: The current device is registered or not.

Device status: The connection status, online means the device is function, offline Means the device is not working.

Heart beat cycle: the working cycle of the current device.

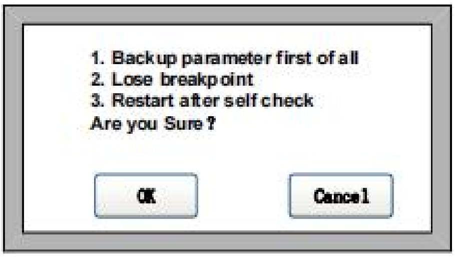
Hardware Version: The version of the hardware.

Software Version: The version of the software.

CAN Version: The version of the CAN system.

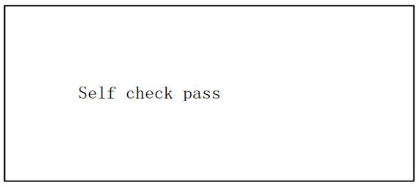
9.5.2 System Self check

Press F7 under the “more” section to enter the System Self check page.



1. Backup parameter first of all
2. Lose breakpoint
3. Restart after self check
Are you Sure ?

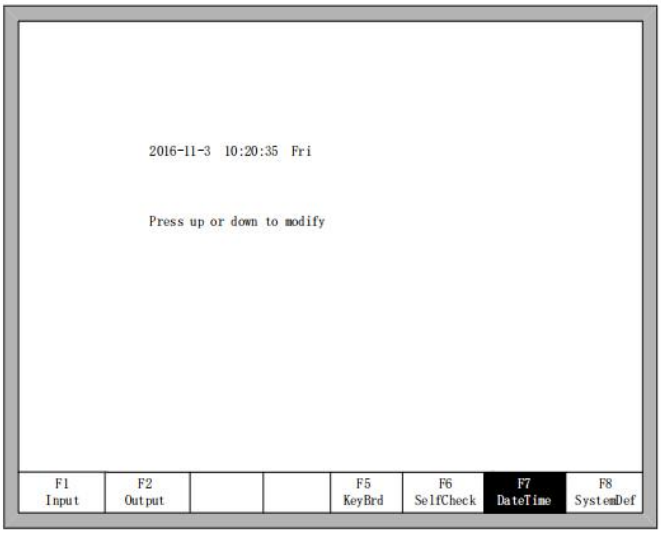
If the self-check pass, the system will show:



Self check pass

9.6 Date and Time

Press F7 in the system diagnosis interface to set the date and time



2016-11-3 10:20:35 Fri

Press up or down to modify

Move the cursor to the corresponding date, time or week, press 【↑】 or【↓】to adjust the time.

9.7 System Definition

In the system diagnosis interface, press F8 to enter the system custom definition interface, in the interface, you could set the input IO, output IO or system coordinate, set back to zero, and also reset or backup the parameters and one key switch between English or Chinese.

9.7.1 Parameter Backup and Restore

Parameter Backup: The process of parameter backup is, in the main interface press 【F5】(System Diagnosis), 【F8】(System Definition), 【F2】(Parameter Backup). The system will need code, after inputting the code "1396", press【Enter】, the system will import the default parameters. In the following process, if the parameters are modified or some of them are broken, reset the parameters.

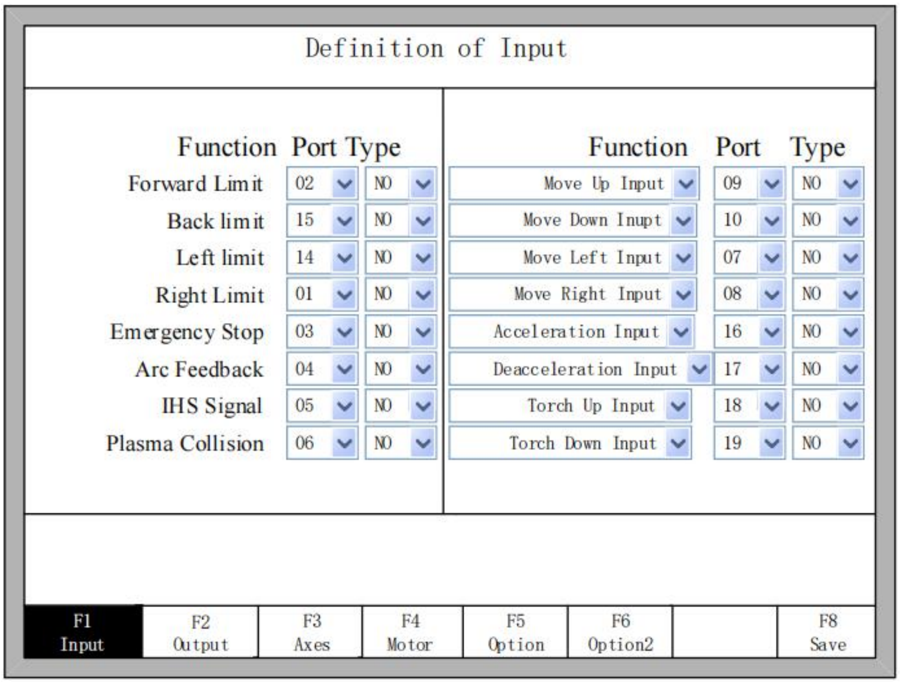
Notice: after installing and debugging the complete equipment, equipment manufacturer please backup the parameters.

Parameter Reset: The process of reset the parameters is, press【F5】(System Diagnosis) in the main interface, 【F8】(System Definition), 【F1】(Parameter Reset).

Notice: After resetting successfully, please restart the system.

9.7.2 Input Definition

The controller could change the IO definition, including changing the order of IO number, the type of IO(normally open or closed) according to the user' s need. In the system custom definition interface, press【F3】to enter the definition interface, press【F1】 to enter the input definition interface. As shown in fig.



Definition of Input

Function	Port	Type	Function	Port	Type
Forward Limit	02	NO	Move Up Input	09	NO
Back limit	15	NO	Move Down Inupt	10	NO
Left limit	14	NO	Move Left Input	07	NO
Right Limit	01	NO	Move Right Input	08	NO
Emergency Stop	03	NO	Acceleration Input	16	NO
Arc Feedback	04	NO	Deacceleration Input	17	NO
IHS Signal	05	NO	Torch Up Input	18	NO
Plasma Collision	06	NO	Torch Down Input	19	NO

In the interface press 【↑】【, ↓】【, ←】【, →】, move the cursor to the position that needs changing, press 【Enter】 to open the tab of the drop - down box at the location of the cursor, move the cursor by 【↑】,【↓】, press 【Enter】 to change the number of the Input, press 【Enter】to set the selected parameters.

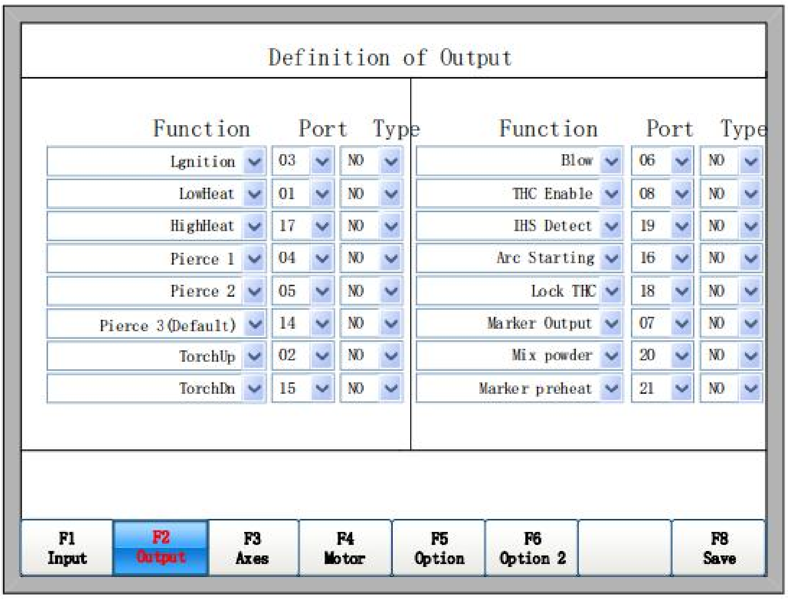
Serial number: 01~10,14~22.

Type: NO (normally open), NC (normally closed)

Function: Move forward, move back, move left and move right, ignition input, oxygen cutting input, start input, stop input, gun rising input, gun down input, acceleration input, deceleration input, z axis upper limit position, z axis lower limit position, open drilling rig, drive no alarm situation, forward and backward.

9.7.3 Output Definition

The controller could change the IO definition, including changing the order of IO number, the type of IO(normally open or closed) according to the user' s need. In the system custom definition interface, press 【F2】 to enter the definition interface,, as shown in fig.



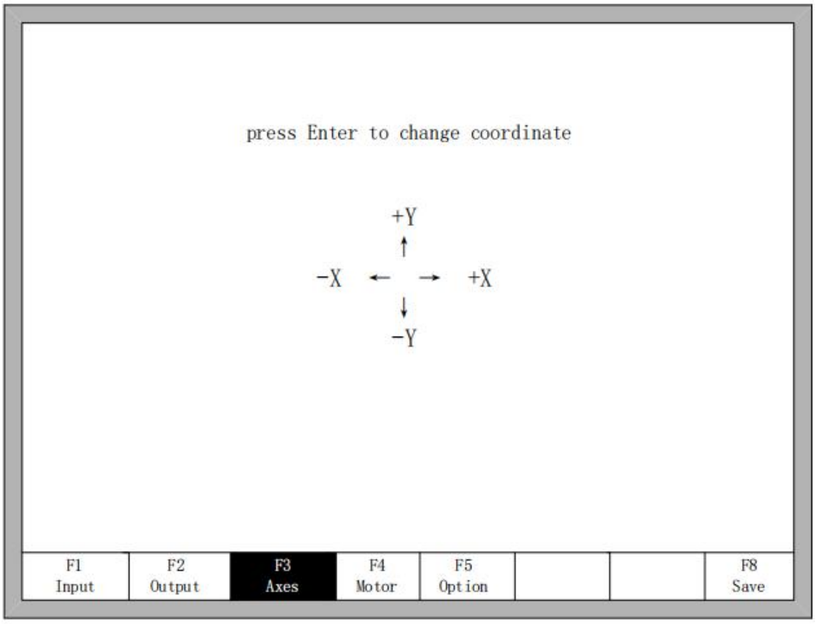
Definition of Output

Function	Port	Type	Function	Port	Type
Lgnition	03	NO	Blow	06	NO
LowHeat	01	NO	THC Enable	08	NO
HighHeat	17	NO	IHS Detect	19	NO
Pierce 1	04	NO	Arc Starting	16	NO
Pierce 2	05	NO	Lock THC	18	NO
Pierce 3(Default)	14	NO	Marker Output	07	NO
TorchUp	02	NO	Mix powder	20	NO
TorchDn	15	NO	Marker preheat	21	NO

In the interface press 【↑】【↓】, 【←】, 【→】,, move the cursor to the position that needs changing, press the【Enter】key to open the tab of the drop-down box where the cursor is located. Press 【↑】, 【↓】to move the cursor and press 【Enter】 again to set the selected parameter. The output type is open drain transistor output type. Type NO means that the output signal is normally open. Type NC means that the output signal is normally closed.

9.7.4 Coordinate Definition

The system could provide IO definition for the user. As shown in Fig.

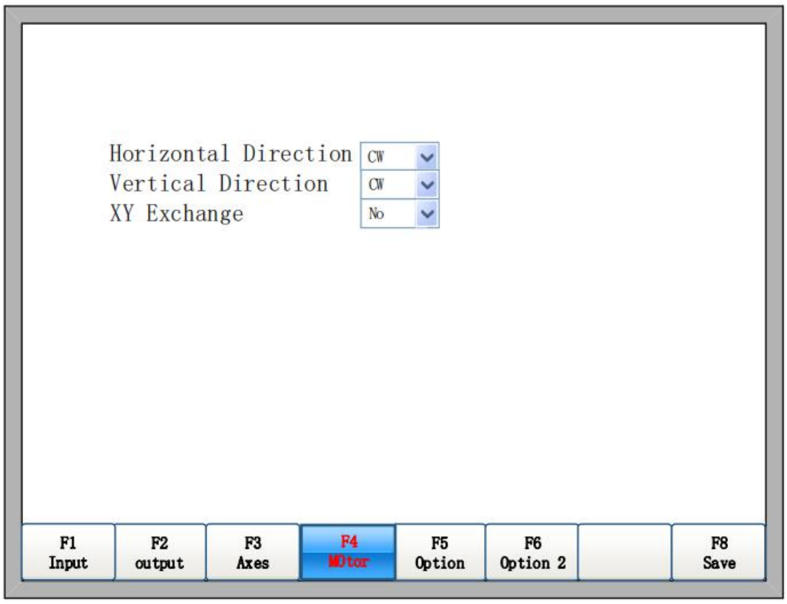


press Enter to change coordinate

+Y
-X
+X
-Y
F1 Input
F2 Output
F3 Axes
F4 Motor
F5 Option
F8 Save

In the interface, press Enter repeatedly to change among 8 type of coordinates. Pres 【F8】 to save.

9.7.5 Motor



Horizontal Direction CW
Vertical Direction CW
XY Exchange No

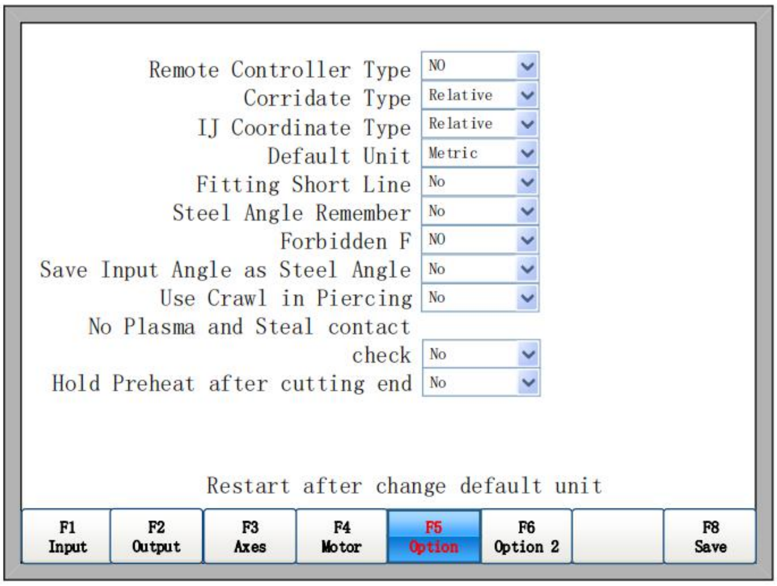
F1 Input
F2 output
F3 Axes
F4 MOtor
F5 Option
F6 Option 2
F8 Save

Fig Motor direction Press up or down key, move the cursor ▌ to the axes of which needs to change motor rotation direction, then press 【Enter】, the motor direction can switch between positive and reversal.

XY exchange: if this function is "YES", output pulse of X axis and Y axis exchange each other, in other words, horizontal axis and vertical axis exchange each other.

9.7.6 Option

9.7.6.1 Remote Controller



Remote Controller Type NO
Corridate Type Relative
IJ Coordinate Type Relative
Default Unit Metric
Fitting Short Line No
Steel Angle Remember No
Forbidden F NO
Save Input Angle as Steel Angle No
Use Crawl in Piercing No
No Plasma and Steal contact check No
Hold Preheat after cutting end No

Restart after change default unit

Press left or right arrow in this interface, remote controller’s type can be set arbitrarily one of the three types which are NO, P2P, 8421.

NO type: no input of remote controller.

P2P type: reference the section 11.1.2 Remote input.

8421 type: reference the section 11.1.2 Remote input.

9.7.6.2 Default Coordinate

As the figure 8.12 shows, the default coordinate can be set default relative coordinate or default absolute coordinate.

9.7.6.3 Default IJ Coordinate

As the figure 8.12 shows, in the G code of G02 or G03, I or J parameter after the code is relative coordinate or absolute coordinate. Under the general circumstance, the arc’s IJ coordinate is relative coordinate, only minority several G code of arc’s IJ coordinate is absolute coordinate.

9.7.6.4 Switch between Metric and Inch

As the figure 8.12 shows, default unit can be switched to either the metric or the inches, after switching, the data’ s units about length are all switched.

9.7.6.5 Short Line Fitting

As the figure 8.12 shows, when short line segments in the G code are too many and continuous shake or shock occurs in the process of machine tool runs, set this parameter ” Yes ” , in the general Chapter 8 Diagnosis Function 62 condition this parameter is set “No” .

9.7.6.6 Steel Plate Angle Memory

In the default condition, the angle after steel plate is adjusted has no memory. After this parameter is set “Yes” , steel plate angle memory will be automatically stored, until the steel plate is adjust again or the angle is cleared.

9.7.6.7 F Instruction Forbidden

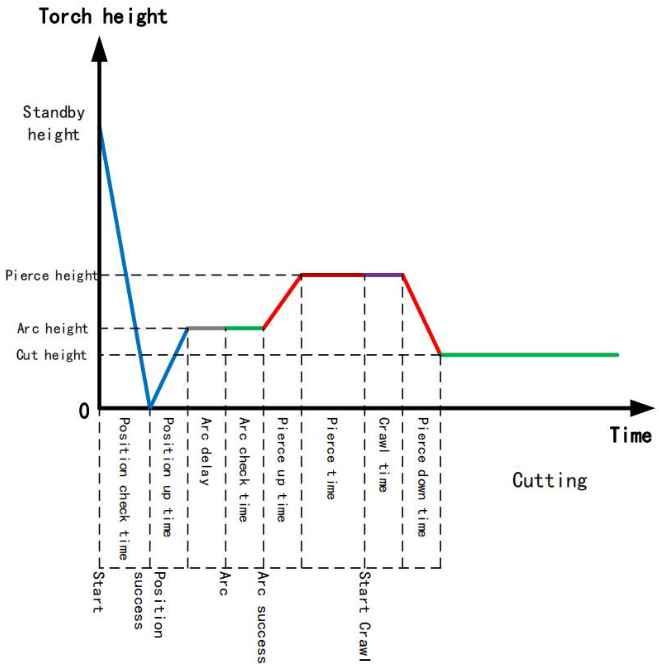
When this parameter is “Yes” , F instruction after G code which is used for limited rate is ignored.

9.7.6.8 Manual Angle Input to Adjust Steel Plate

When this parameter is “Yes” , the manual input angle in the section of 4.3.3 is also steel plate adjusting angle. This angle will be shown in the main interface, if open the function of steel plate angle memory, this angle is also add to the steel plate adjust angle and accordingly saved.

9.7.6.9 Use the crawl function

When this parameter is yes, dynamic pierce and crawl are enable. The timing diagram of the dynamic pierce is shown in Fig.


Torch height
Standby height
Pierce height
Arc height
Cut height
0
Time
Cutting
Position check time
Position up time
Arc delay
Arc check time
Pierce up time
Pierce time
Crawl time
Pierce down time
Start
Position success
Position
Arc
Arc success
Start Crawl

Time parameter description: (For details, see 7.3 Plasma Parameter Settings.)

Position check time: After the cutting is started, the torch descends, and when the system detects the positioning success signal, the positioning detection time ends in advance. If the system has not received the positioning success signal after the positioning detection time has ended, the system will alarm. When this parameter is 0, the system will skip the detection of the positioning success signal and the torch will not fall and go directly to the positioning up phase.

Position up time: After detecting the positioning success signal, the torch is lifted and the ascending time is the positioning rise time. When the parameter is 0, the torch does not lift, the system goes directly into the arc delay phase.

Arc delay: After the positioning up time is over, the system will delay the arc for a period of time, which is defined as the arc delay. When the parameter is 0, the system goes directly to the arc, instead of delaying.

Arc check time: After the Arc delay time is over, the system starts to open the Arcing port and detect the successful starting feedback signal. When detecting the successful signal, the arc detection time ends in advance. If the system has not received the successful starting feedback signal after the arc detection time has ended, the system will prompt the error and terminate the cutting of the current workpiece, and exit the program according to the breakpoint memory. When the parameter is 0, the system will directly detect the starting feedback signal. If the signal is not detected, it will report an error. After detecting the signal, the system will enter the next stage.

Pierce up time: After arc success, the torch at the same time to enhance. This upgrade time is the pierce up time. When the parameter is 0, the torch does not lift and the system goes directly to the next stage.

Piercing time: After the system detects the successful feedback signal from the arc, the system starts to static perforation, which is called piercing time. When this parameter is 0, the system will skip the time and enter the crawl phase.

Crawl time: At the end of the static perforation, if there is more perforation at the perforation point, higher slag build-up, the arc will be unstable when cutting in this area. So it is necessary to move forward for a period of time under the condition of no height adjust, the time is the crawl time. When this parameter is 0, the system will skip the time and enter the perforation fall phase.

Pierce Down time: When the crawl time ends and the torch descends to the normal cutting height, start cutting. And this fall time is the perforation fall time. When the parameter is 0, the torch does not drop, and directly start normal cutting.

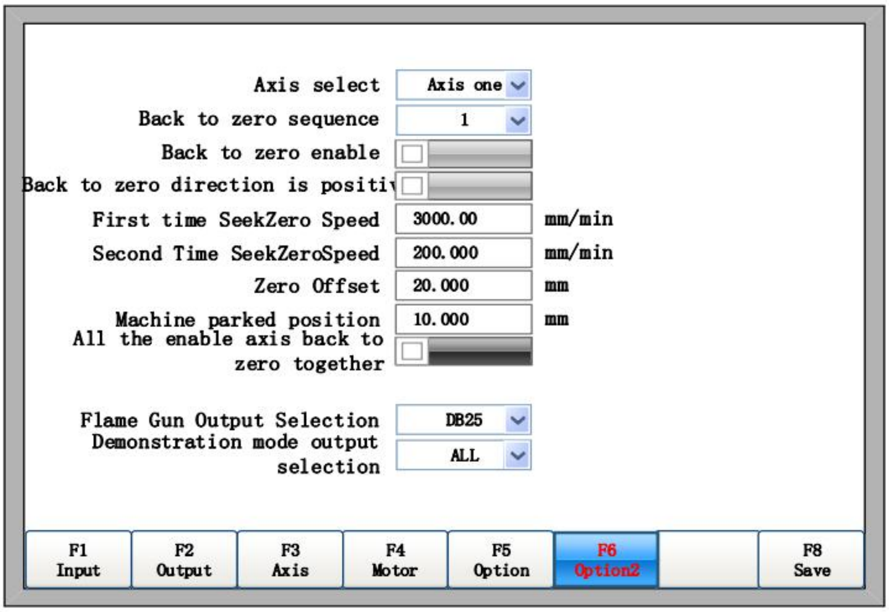
9.7.6.10 No Plasma and Steal contact check

Whether the collision signal is detected during the plasma cutting process. If the election is no, when the collision between the plasma gun and the steel plate is detected during cutting process, cutting will be stopped and the alarm prompt will be given. If it is selected yes, the collision information is not processed during cutting.

9.7.6.11 Hold Preheat after cutting end.

In oxygen gas cutting, when cutting is completed, choose whether to turn off the preheated oxygen automatically..

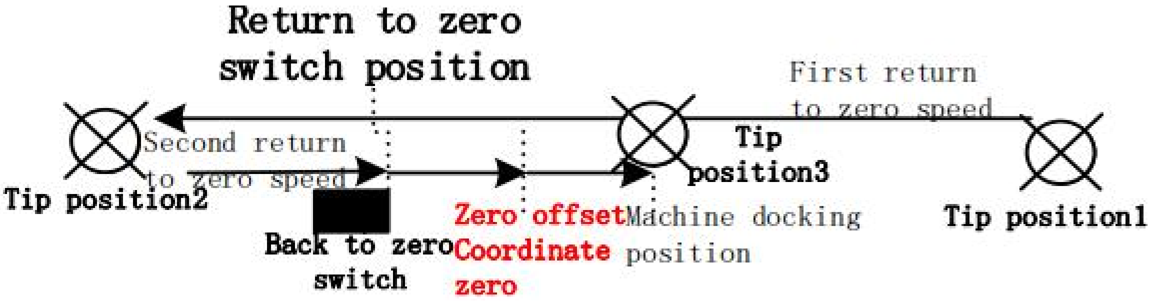
9.7.7 Option2



Axis select: Axis one
Back to zero sequence: 1
Back to zero enable: ☐
Back to zero direction is positi: ☐
First time SeekZero Speed: 3000.00 mm/min
Second Time SeekZeroSpeed: 200.000 mm/min
Zero Offset: 20.000 mm
Machine parked position: 10.000 mm
All the enable axis back to zero together: ☐
Flame Gun Output Selection: DB25
Demonstration mode output selection: ALL

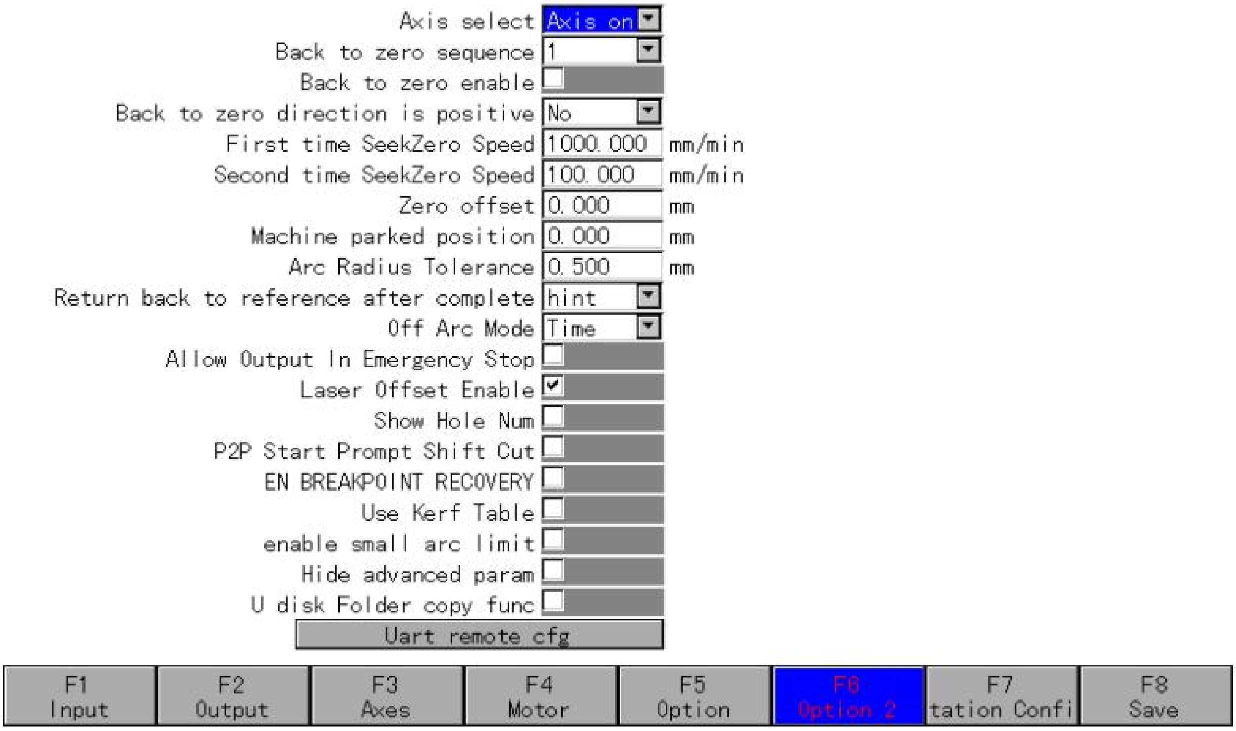
F1 Input
F2 Output
F3 Axis
F4 Motor
F5 Option
F6 Option2
F8 Save

9.7.7.1 The function of backing to zero.


Return to zero switch position
First return to zero speed
Second return to zero speed
Tip position2
Tip position3
Tip position1
Back to zero switch
Zero offset
Coordinate zero
Machine docking position

As shown in Fig, backing to zero process is: Before starting to return to zero, the tip is in the right side of the tip position 1, then press the F8 button on the main interface, the machine starts to return to zero, The tip moves to the left in the direction of the first zero return arrow shown in Figure 8.15 at the first zero return. The location of the first time to find the zero switch is just to find the approximate range of zero switch, so the speed can be relatively fast. When the return switch is detected, the system will immediately pause, then the gun will stop at the left side of the zero switch, as shown in the figure Tip position 2. The machine will then move to the right in the direction of the second return arrow as shown in Figure 8.15 at the second return to zero, and the position of the second time to find the zero switch is found, and the range of the zero switch has been determined. Now speed needs to be smaller in order to improve the accuracy of zero. When the tip moves to the zero switch position in the figure, it runs to the zero point of the current axis according to the zero offset parameter, and finally runs to the machine tool position, that is the tip position 3.

The parameter setting interface is shown as below. The parameters are defined as follows



Axis select: Axis on
Back to zero sequence: 1
Back to zero enable: ☐
Back to zero direction is positive: No
First time SeekZero Speed: 1000.000 mm/min
Second time SeekZero Speed: 100.000 mm/min
Zero offset: 0.000 mm
Machine parked position: 0.000 mm
Arc Radius Tolerance: 0.500 mm
Return back to reference after complete: hint
Off Arc Mode: Time
Allow Output In Emergency Stop: ☐
Laser Offset Enable: ☑
Show Hole Num: ☐
P2P Start Prompt Shift Cut: ☐
EN BREAKPOINT RECOVERY: ☐
Use Kerf Table: ☐
enable small arc limit: ☐
Hide advanced param: ☐
U disk Folder copy func: ☐

Axis select: select the need to set the zero axis X, Y, the following parameters are set on the axis.

Back to zero sequence: 1 ~ 2, the current axis of the return order.

Back to zero enable: If selected, the current axis will be back to zero, otherwise the current axis will not return to zero.

Back to zero direction positive: If selected, the current axis will return to the positive direction, otherwise it will return to the opposite direction.

First time seek zero speed: the first time the current axis to find the speed of zero switch, this time just to find the approximate range of zero switch, so the speed can be relatively large.

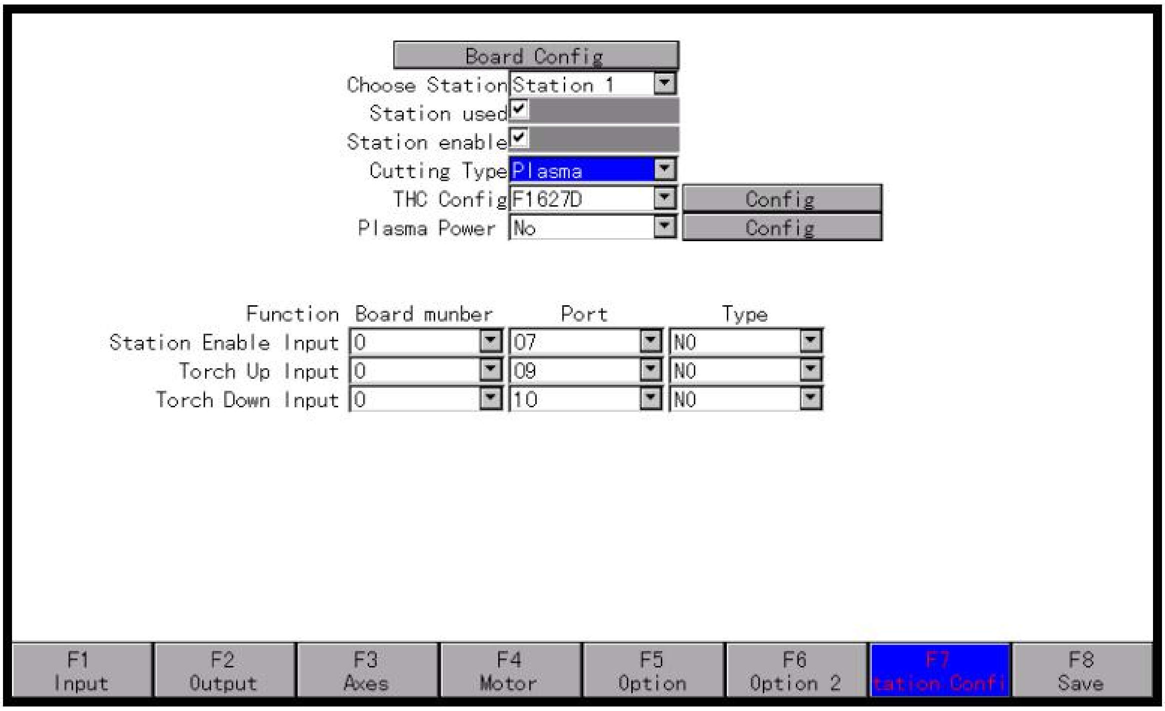
Second time seek zero speed: the current axis of the second time to find the speed of zero switch, then return to zero the scope of the switch has been determined, now speed needs to be smaller in order to improve the accuracy of zero.

Zero Offset: The location of the actual machine zero relative to the zero return switch. If the position of the return switch is not the zero position of the machine, this parameter is required to set as the zero position of the machine.

Machine parked position: After the completion of back to zero, the coordinate position which current axis required to dock.

All the enabled axis back to zero to gather: If this is selected, all enabled axis will back to zero, otherwise they will back to zero in order.

9.7.8 Station Config


Board Config
Config
Config
F1 Input
F2 Output
F3 Axes
F4 Motor
F5 Option
F6 Option 2
F7 tation Confi
F8 Save

Choose Station: Station 1

Station used: ☑

Station enable: ☑

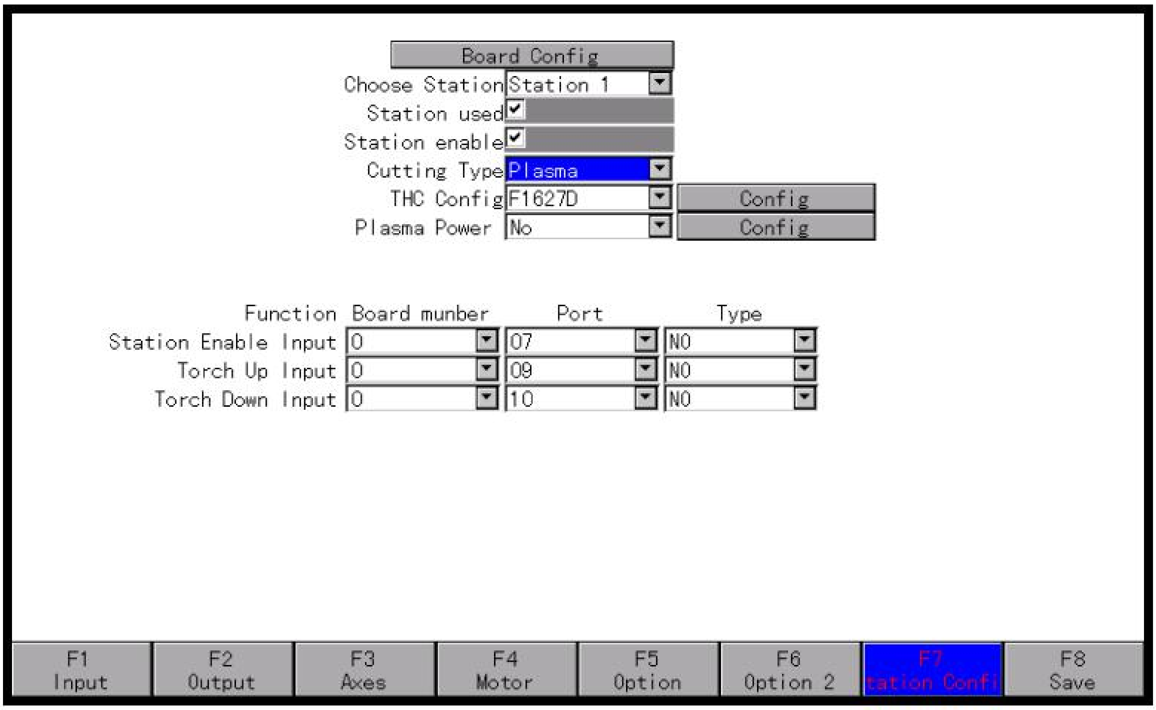
Cutting Type: Plasma

THC Config: F1627D

Plasma Power: No

Function	Board munber	Port	Type
Station Enable Input	0	07	NO
Torch Up Input	0	09	NO
Torch Down Input	0	10	NO

Extension board Configuration:



Board Config

Choose Station: Station 1

Station used: ☑

Station enable: ☑

Cutting Type: Plasma

THC Config: F1627D

Plasma Power: No

Function	Board munber	Port	Type
Station Enable Input	0	07	NO
Torch Up Input	0	09	NO
Torch Down Input	0	10	NO

You can go to this page to set the model of each extension board. It can be connected by CAN with the correct address. You could configure three extension board at most, to match the correct ID. After the configuration, press F8 to save, and press ESC to cancel.

9.7.9 Language Switch

In the main interface, press 【F5 Diagnose】, then press 【F8 System definition】, then press 【F6 Language】, it will select needed language interface.

9.7.10 Add the Language File

From the company get the language pack file and copy it into the USB. Insert the USB into the system USB port. In the main interface, move the cursor to add language file, press 【Enter】. There will be an introduction appearing to show the result.

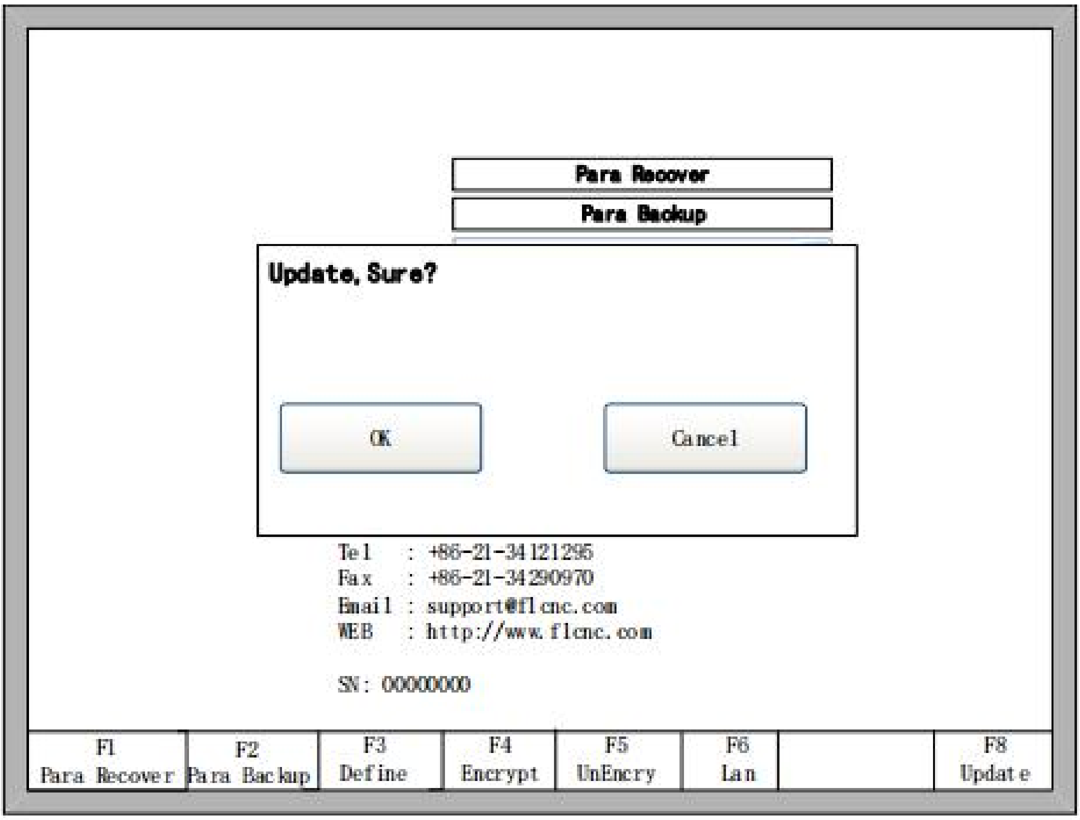
This system can support most of the national language files, can also be customized language file. Please contact the company demand.

8.7.11 Clear Files

In the main interface, press 【F5 Diagnose】, then press 【F8 System definition】, then press 【↓】 to make cursor above 【Clear File】 button and press 【ENTER】, the system will clear all G code files of system.

8.7.12 System Update

In the main interface, press 【F5 Diagnose】, then press 【F8 System definition】, then press 【F8 System update】, please ensure that you have inserted the U disk into system's USB interface, otherwise it will pop up a prompt box "please insert U disk". If U disk is okay, after press 【F8 System update】, it will pop up a dialog box as Fig 8.20. Press 【Enter】 and confirm, it will prompt to update as the figure 8.21 shows.

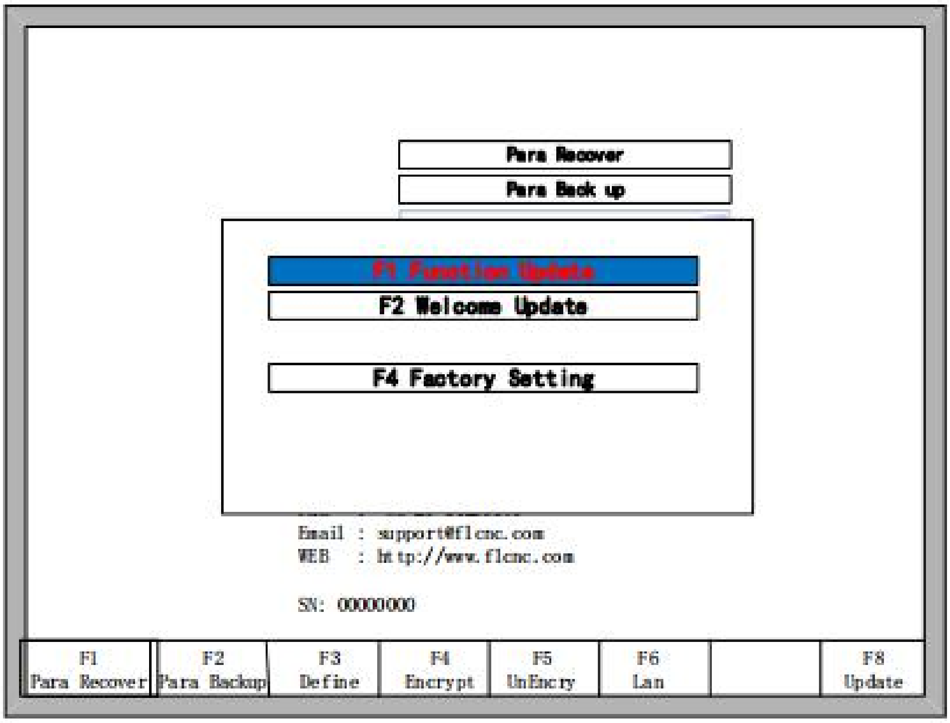

Para Recover
Para Backup
OK
Cancel
F1
Para Recover
F2
Para Backup
F3
Define
F4
Encrypt
F5
UnEncry
F6
Lan
F8
Update

Update, Sure?

Tel : +86-21-34121295
Fax : +86-21-34290970
Email : support@flcnc.com
WEB : http://www.flcnc.com

SN: 00000000

Fig 8.19 the prompt of update confirm


Para Recover
Para Back up
F1 Function Update
F2 Welcome Update
F4 Factory Setting
F1
Para Recover
F2
Para Backup
F3
Define
F4
Encrypt
F5
UnEncry
F6
Lan
F8
Update

Email : support@flcnc.com
WEB : http://www.flcnc.com

SN: 00000000

Fig 8.20 the prompt of system update

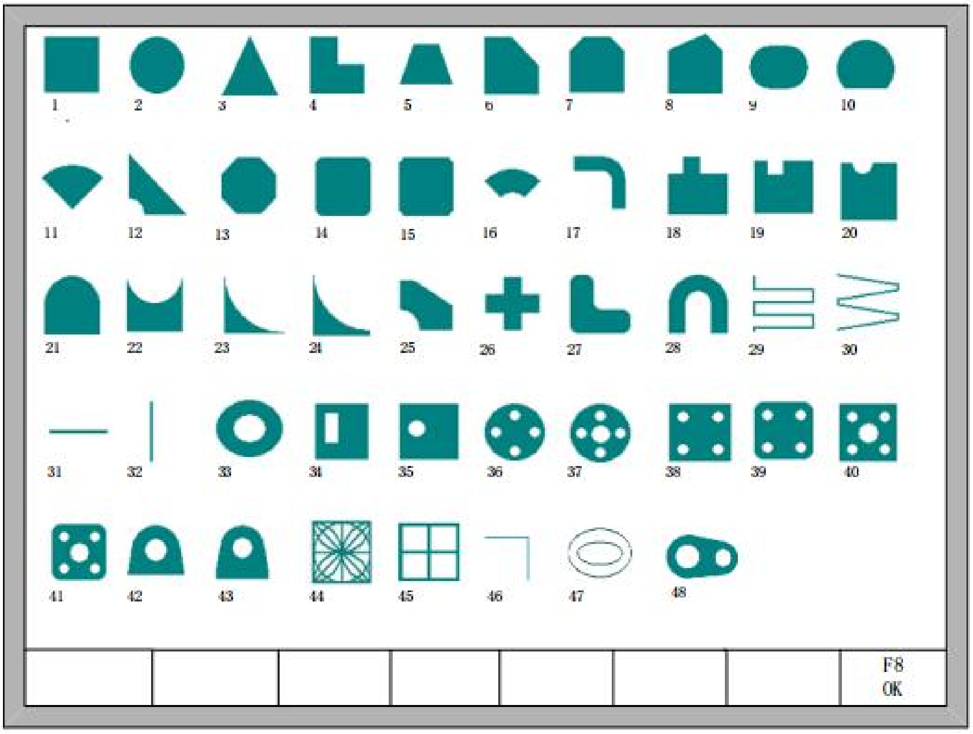
Function Update: after press 【F1】, it will update function. The function update file is F2000.exe or corresponding model upgrade file F2100BV4.exe, F2300V4.exe, F2500V4.exe.

Welcome Update: after press 【F2】, it will update the welcome interface. The interface upgrade file is named WELCOME.bmp, which should be put directly into the U disk but not in any folders. This welcome interface is the first shown interface after power on. If you want to find the method of make new welcome interface, please contact with our after-sale service department.

System recovery: after press 【F4】, it will recover the system. At this time, the system is exhaustively recovered back to the status before leaving factory, in other words, the parameters, IO Chapter 8 Diagnosis Function 69 ports configuration, coordinate direction definition and so on are all recovered back to the status before leaving factory. In the general condition, please don’t use this function to recover system.

10. Graph Management

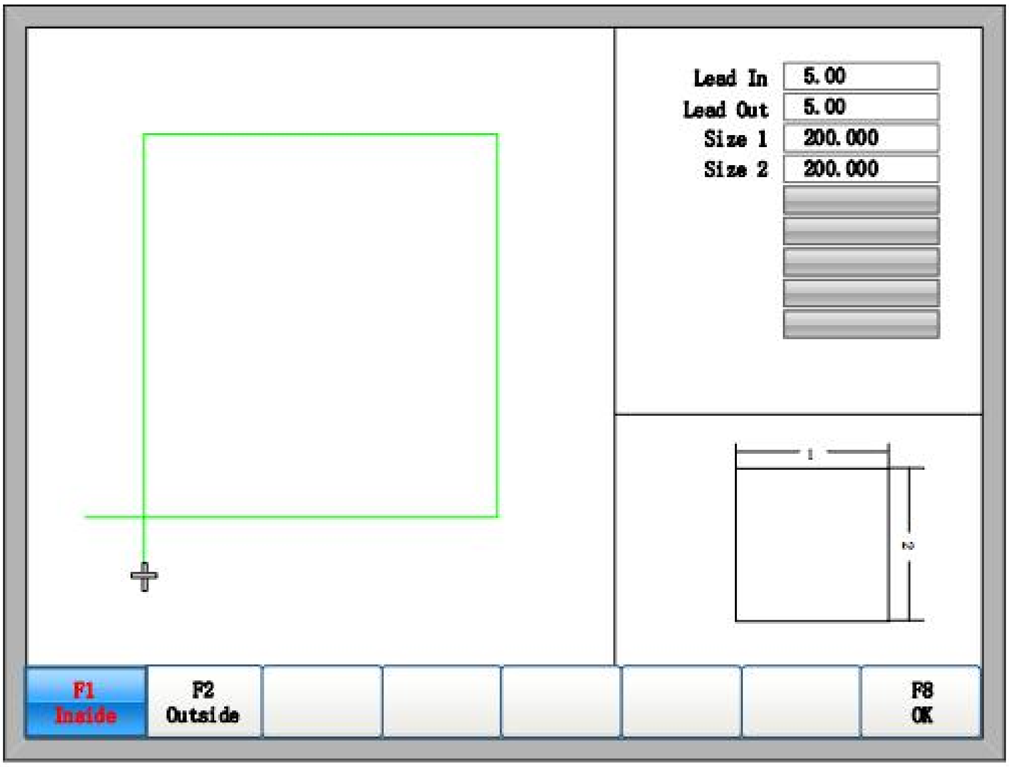
In the main interface, press【F1】(Shape Lib) to enter graph interface, shown as follows:



You can press 【↑】,【↓】,【←】,【→】to choose different graph.

10.1 Choose Graph

In home interface of graph, move the cursor to the required graph, press 【F8】 to confirm, shown as Fig



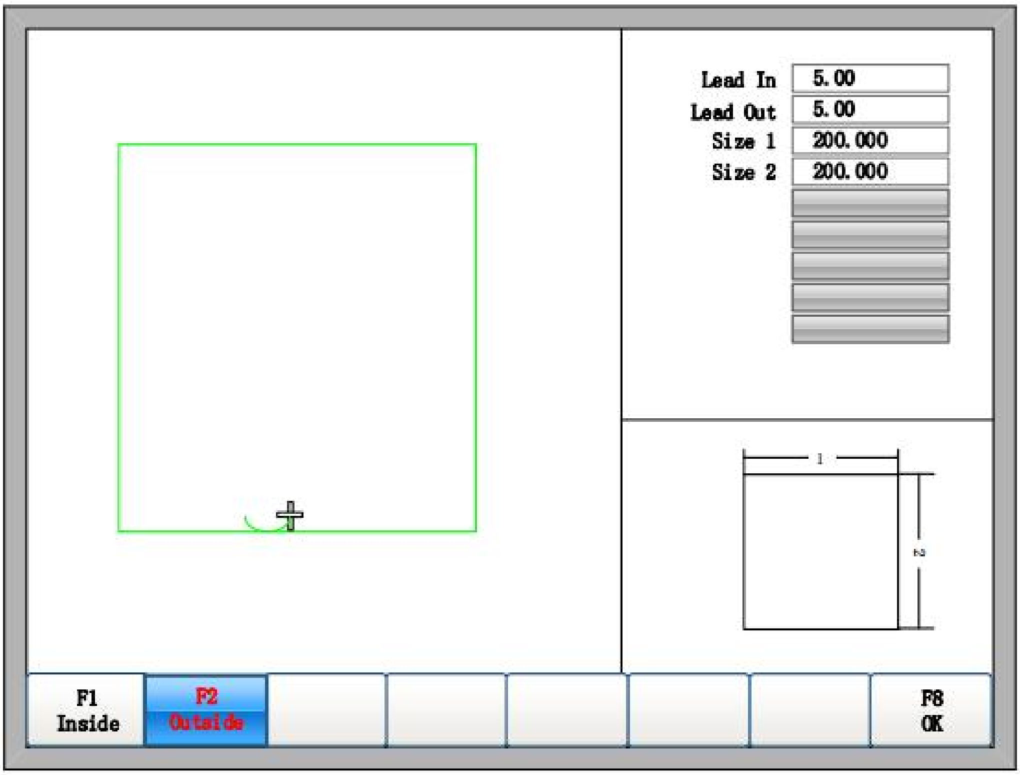
Lead In 5.00
Lead Out 5.00
Size 1 200.000
Size 2 200.000

You can press【 ↑】【, ↓】【, ←】【, →】to modify sizes, after modification , press 【F8】to confirmed.

Press any key to return to graphics processing interface as shown in Fig.

9.2 Chip/Hole Size

In Fig in chip size interface, you can press【F2】to choose hole size, shown as Fig :



Lead In 5.00

Lead Out 5.00

Size 1 200.000

Size 2 200.000

Modify hole sizes is the same as chip sizes.

After modification , press 【F8】to confirmed, then enter into the interface of cutting as shown in Fig.

Note: The graphic after No.29 don’t have hole size.