Automatic Soldering Machine User Manual

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Catalog

Chapter 1 Summary

There are 3-5 controlling axis in the Automatic Soldering Machine control system, which can support all kinds for automatic soldering control such as gantry structure with three axes, three axes plus rotation axis, three axes plus double Y axes, three axes plus double Y axis plus rotation axis. The teach box of the machine adopt the 5 inch true-color LCD screen to make the operation menu and boot screen more abundant. To make the transmission speed faster and signal Anti-Interference, it adopts the Industrial field bus for connecting between main board and teach box. The teach box can not only storage soldering processing file, system configure file, but also copying file each other when using multiple machines (or using the U Disk to copy). Using ARM + DSP + FPGA control program, with a strong computing power, short refresh time, excellent acceleration and deceleration performance in motion control, They can support high-speed high-precision 3D-line, three-dimensional circular motion. The motion control board has 256M of storage space, can store 1000 soldering processing files, each file can store 4000 soldering programmed point, They can support work without teach box connection.

1.1 Hardware

1. Motor axis number: 3-5 axis output, respectively XYZ three-dimensional coordinate axis, a rotating axis of the rotating shaft, double Y axis function of Y2 expansion axis, it also can realize the rotation axis of the double Y axis soldering machine control.

2. Acceleration and deceleration performance : S-curve acceleration and deceleration mode, acceleration and deceleration acceleration set independently; 10K speed refresh rate, make the mechanical response better performance, less noise.

3. Pulse output frequency:4MHz linear interpolation, 2MHz circular interpolation (including 3 axis space circular interpolation), Using a motor which has 20000 pulses each turn as an example, sufficient to meet the existing high-speed servo motor 5000 rpm/min requirements.

4. Home, Limit Input： Each motor has its own home-input, positive and negative limit-input, no need to take up the general input of programmable hardware resources.

5. Programmable input/output: it has 12 ways independent and dedicated programmable input and output, all used optical isolation and each output current up to 500mA.

6. Supporting 3 bits digital number tube interface, can change and switch 1000 soldering files range 0-999 quickly.

7. Using the small key to adjust the iron head, in the absence of a teach box can also facilitate the realization of the error due to changing the iron head correction.

8. Function key: including ‘Run’, ‘Stop’, ‘Back to Origin’, ‘Step test’, also can control the output by the corresponding indicator led and have a input button called ‘Emergency’.

9. Owning CAN bus, RS-232, Ethernet, can be customized to the special needs of special programs.

10. Read/Write in U Disk: FAT32 file system, no longer than 2G capacity U disk cannot be formatted to limit the FAT format.

11. Storage space : main board 256MV, can store 1000 soldering processing files, each with 4000 program points; teach box 16MB, can store the boot screen, soldering file, copy the soldering file to each other in multiple machines is especially useful.

12. Screen of teach box : Use 480 X 272 pixels, 16 million true color 5-inch LCD screen, allowing the operator menu interface and boot screen is much more abundant.

13. Work Voltage: DC 24V.

14. Work environment: degree 0℃--45℃, humidity 40%--80%.

15. Storage environment: degree -40℃--60℃, humidity 0%--95%.

1.2 Software

1. Three-dimensional linear interpolation, circular interpolation space (real hardware three-dimensional instead of line fitting).

2. Function of double Y axis, without back to the origin when changing the Y axis.

3. Owning the rotation A axis, which can follow with the tangent of route of XY axis.

4. The corner processing can set the priority of the speed and the path for the goodness of fit, and realize the smooth transition of the turn.

5. DXF file conversion function, it can convert the DXF file exported by the finished soldering route \file Created by CAD software to the soldering file.

6. Programming point of the editor can be 30 times the "undo" "redo", to prevent misuse effectively.

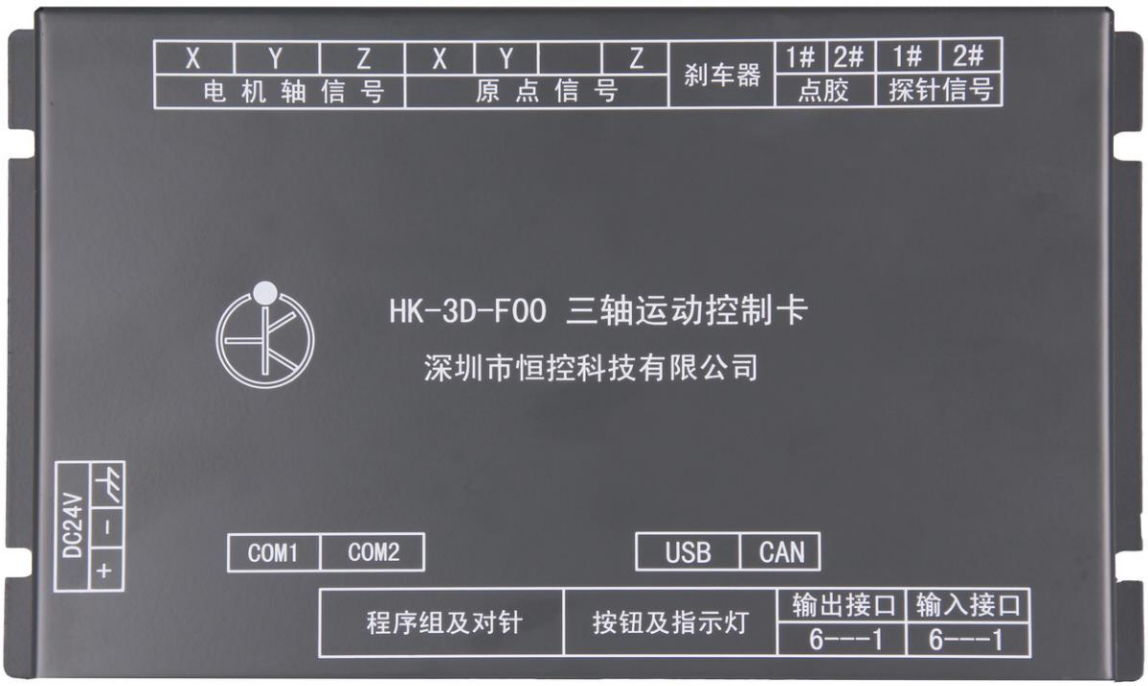
7. Soldering parameters setting is set up in the programming point, which can be realized in the same soldering process when different areas have different soldering parameters.

8. In the return to the origin of the action when the axis back to the origin of the XYZ three axis at the same time the origin of the capture action.

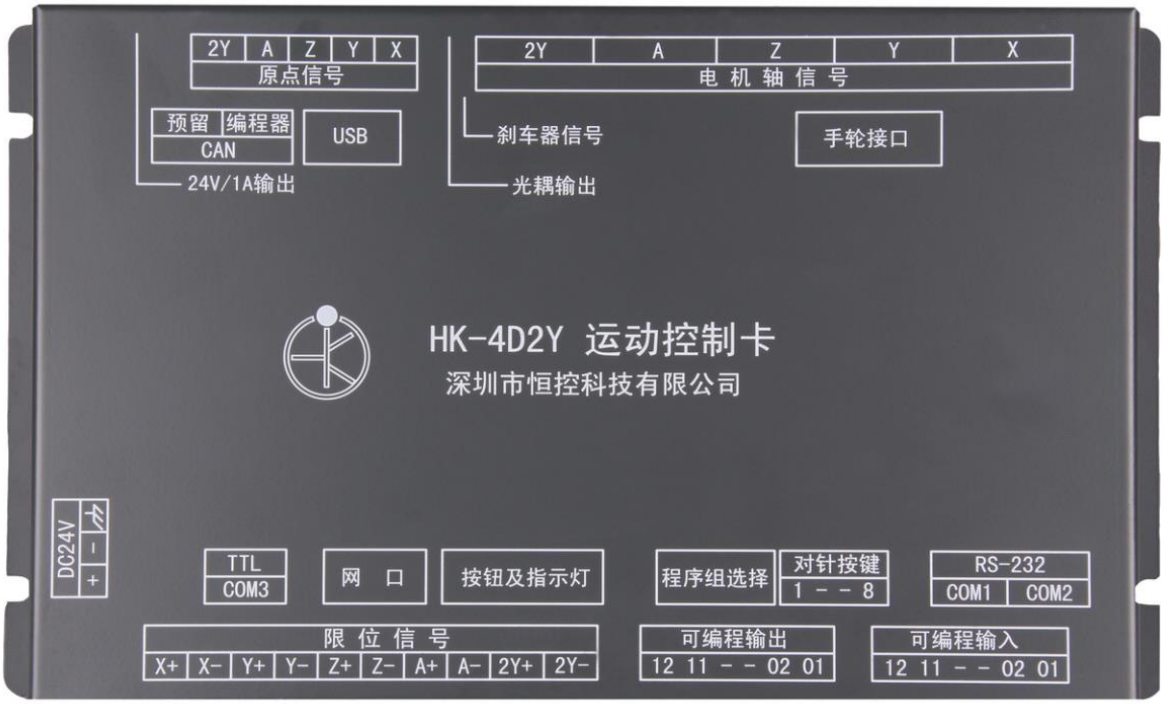
9. With Quanpin IME to input Chinese.

1.3 Accessory

1. Main board



HK-3D-F00 Main board (194mm * 110mm * 42mm)



HK- 4D2Y Main board (224mm * 130mm * 42mm)

2. Teach box (242mm * 142mm * 26mm)

3. Program group selection and iron head calibration panel (107mm * 40mm), Circuit board (70mm * 40mm)

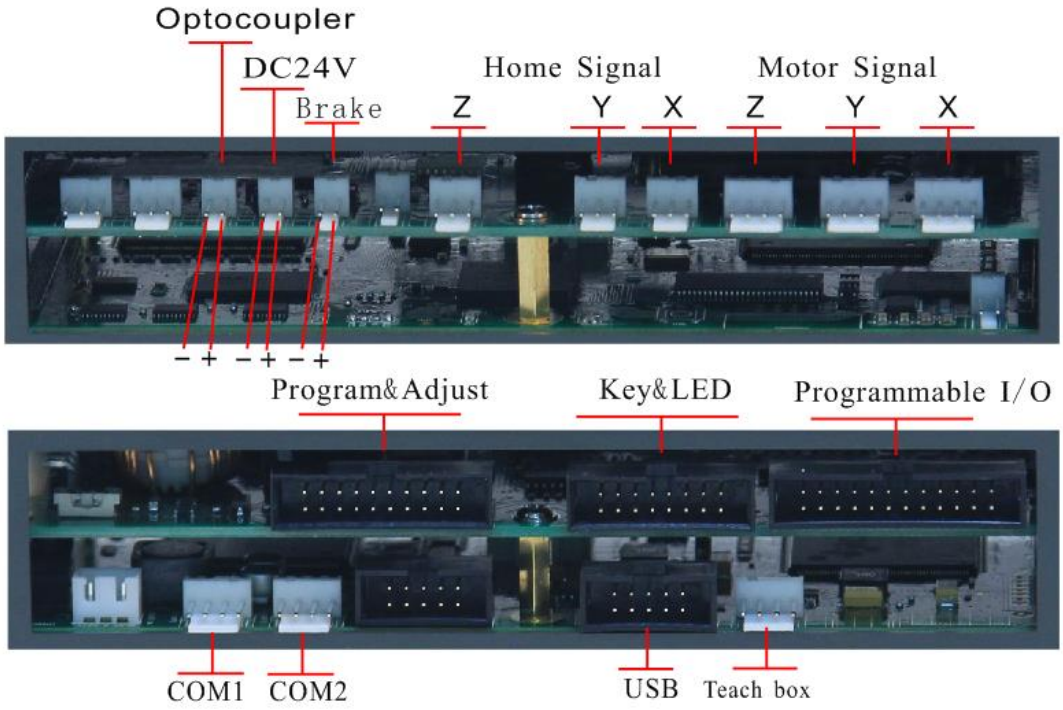
4. Connecting line (Length can be customized)

1.4 Base board of main board mounting dimensions(Height : 42mm)

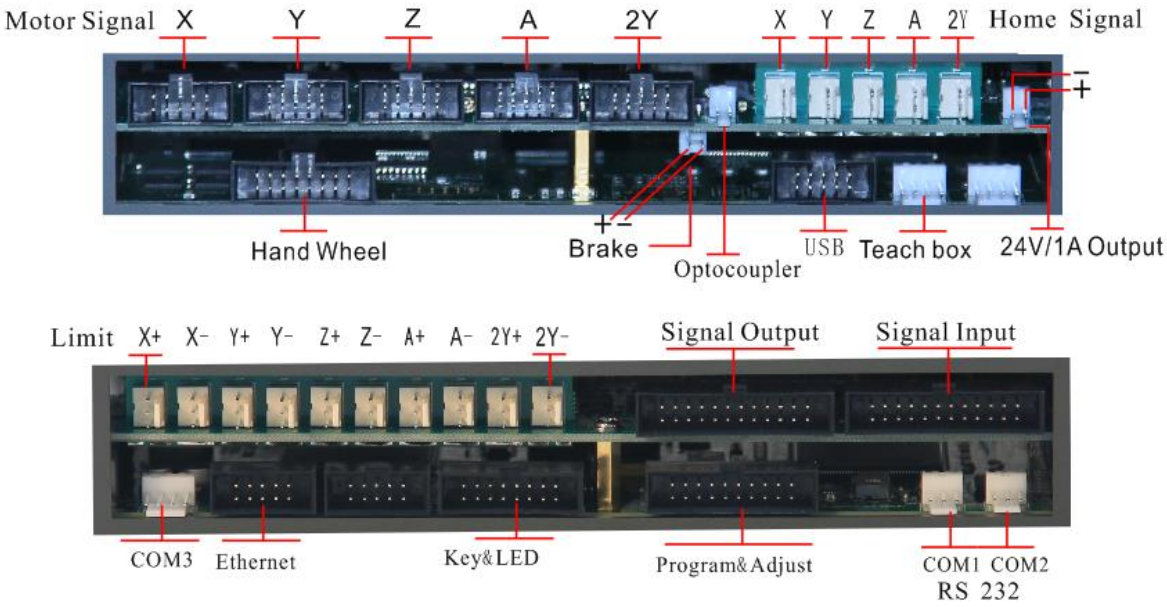
HK-3D-F00 Main board

4D2Y Main board

1.5 Interface Schematic



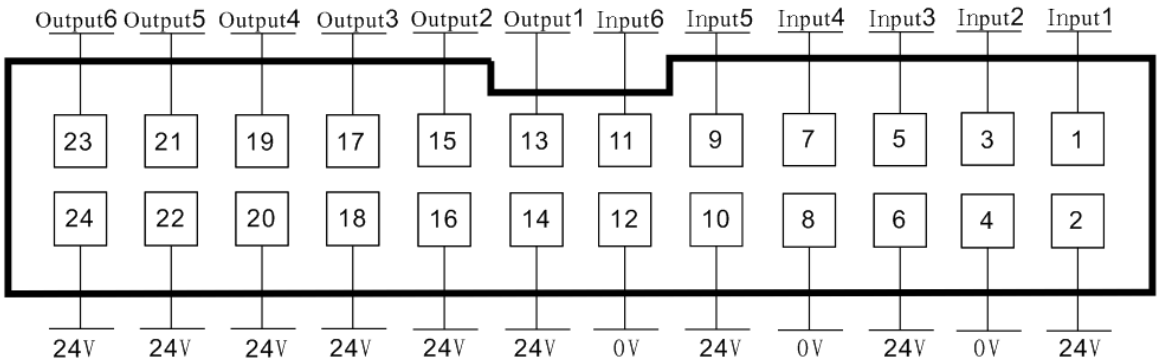
HK-3D-F00 Interface Schematic



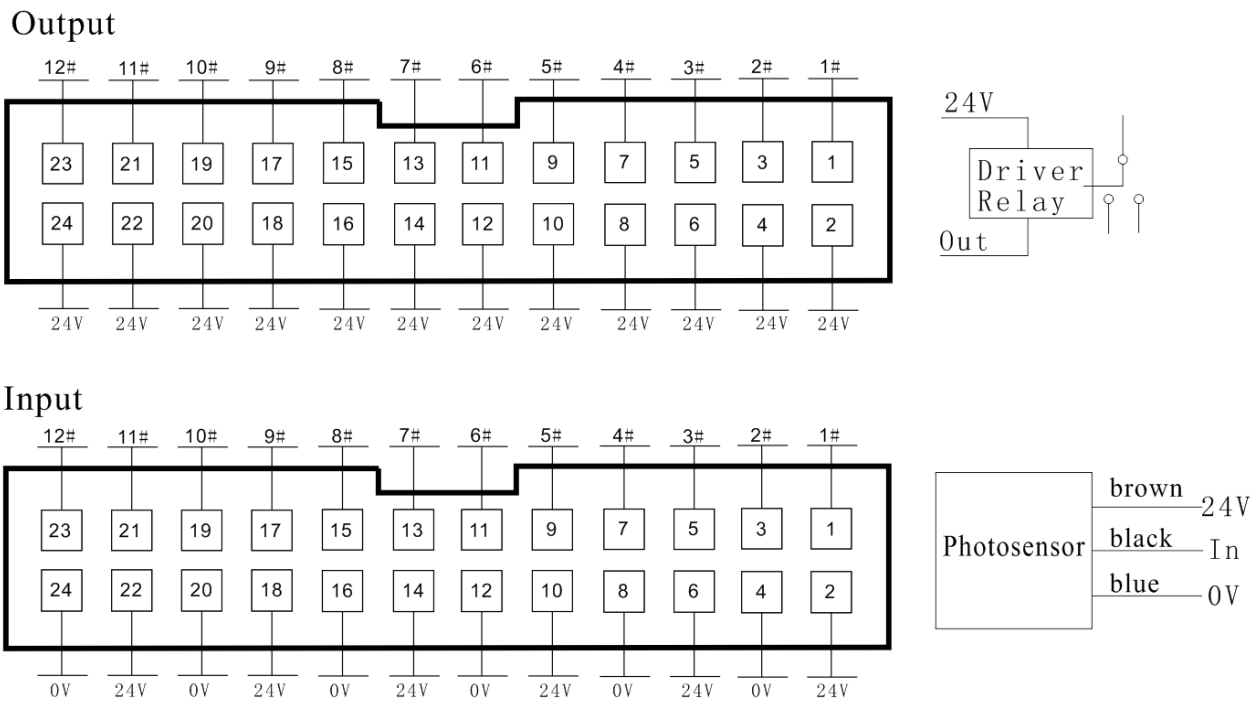
4D2Y Interface Schematic

Note: As default, Axis A is rotation axis, Axis B is motor axis to send tin. When use the function of double Y, then Axis B changed to the second Y axis, and the module of sending tin insert to COM3.

1.6 Programmable input and output interface description

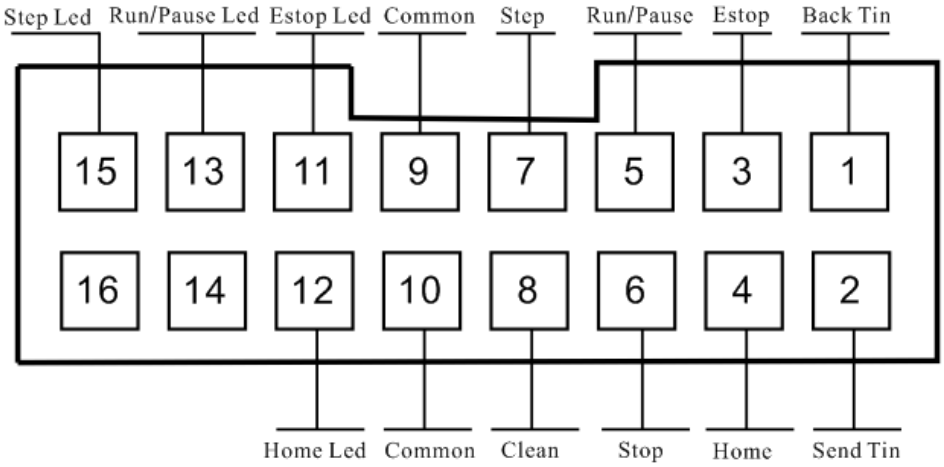


HK-3D-F00 programmable input and output interface



4D2Y programmable input and output interface

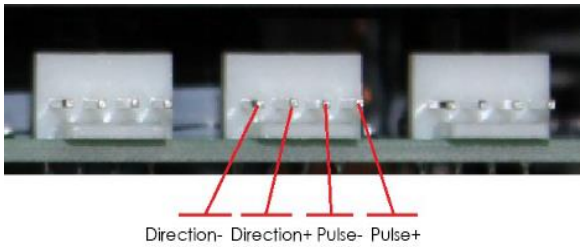
1.7 Button and LED interface description



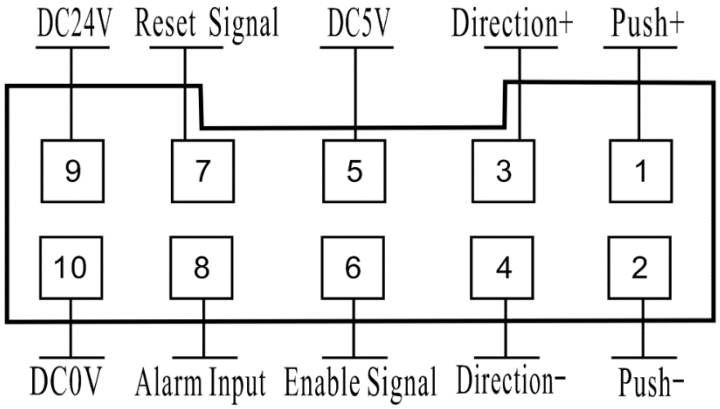
Note : 1. Enable drive indicator LED, connected to the positive terminal (+ 5V), common negative pole

2. For Buttons，Connect one pin to the button signal, and the other to the common(0V).

1.8 Motor axis signal interface description



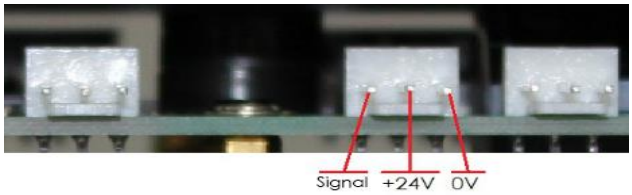
HK-3D-F00 Motor axis signal



4D2Y Motor axis signal

Note: The stepper driver can only be connected to 1, 2, 3, 4 pin; servo drive please refer to the servo instructions access feedback signal.

1.9 Limit signal and home signal interface description

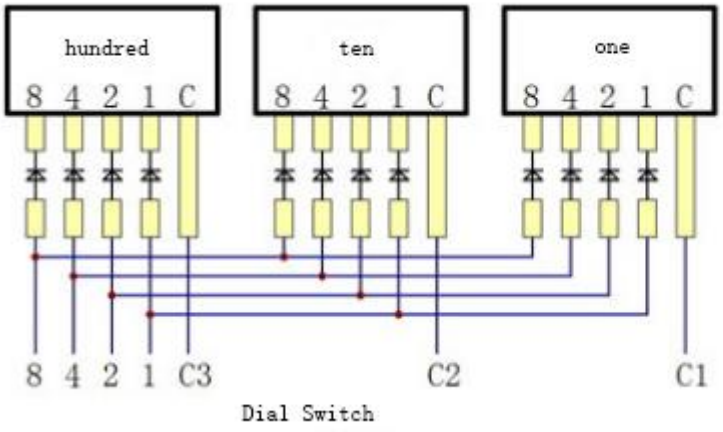


HK-3D-F00 Home signal

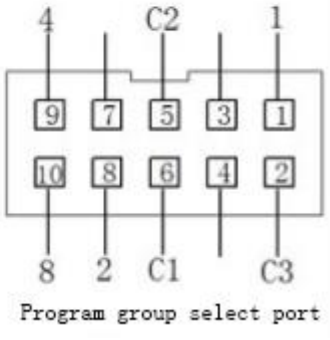
4D2Y Limit signal and home signal

1.10 Use dial switch to choose the program group interface description

We can use digital tube to choose program group with the supported 10pin line. But use the dial switch, then must select the dial switch mode in page 2, menu 4. The wire method between the program select interface and dial switch of dial switch mode is in follow, if only need 1bit or 2bit, then just remove the high bits.



Dial Switch

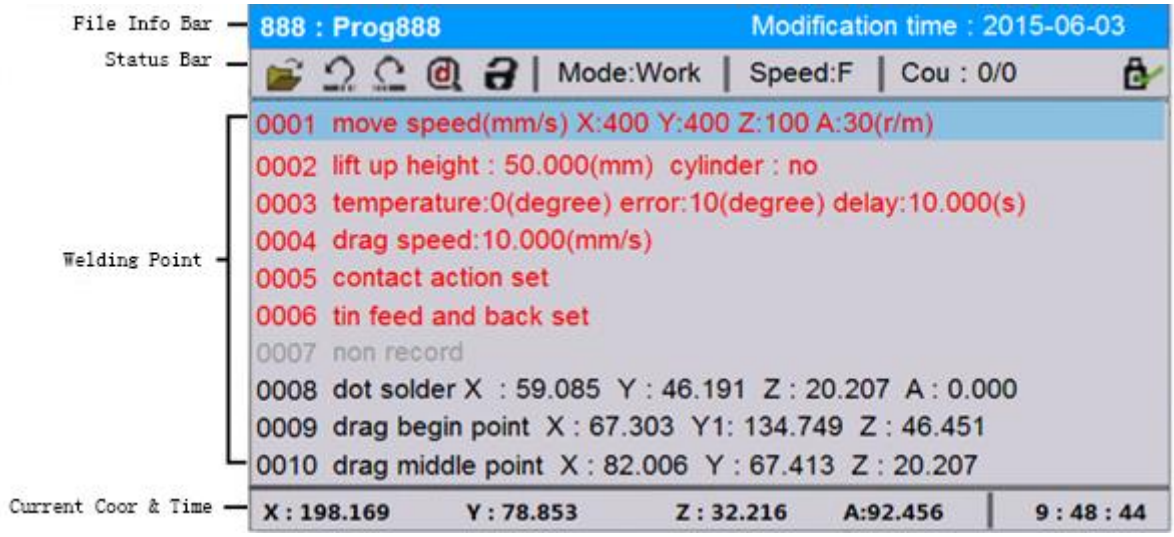


Program group select port

Chapter 2 Main interface and press key description

2.1 Main interface and description

1. Main interface description of content distribution.



2. 005 : Prog005 Soldering file No. And File name, “005” is No., “Prog005” is file name.

3. Modification time : 2015-06-03 Latest modified time of the soldering file.

4.  Icon of open soldering file, can use “Table” key move the cursor to this icon.

5.  “undo”“redo”state indication icon, up to 30 times to “undo”, “redo”, but can’t use when icon is gray.

6.  Means the soldering file is edited, need “debug” operation, when already debugged, the icon becomes gray.

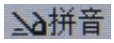
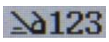
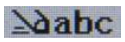
7.  File is not locked,  file is locked,  machine is locked.

8. Mode:Work Run mode, including 3 mode like ’work’, ’test’, ’uniform speed’; ‘work’ mode is normal soldering processing mode , ‘test’ mode is the same movement speed and path as ‘work’ mode ,but no tin out, ‘uniform speed’ mode is the same movement path as ‘work’ mode ,but in uniform speed, and no tin ,mainly used for movement path testing.

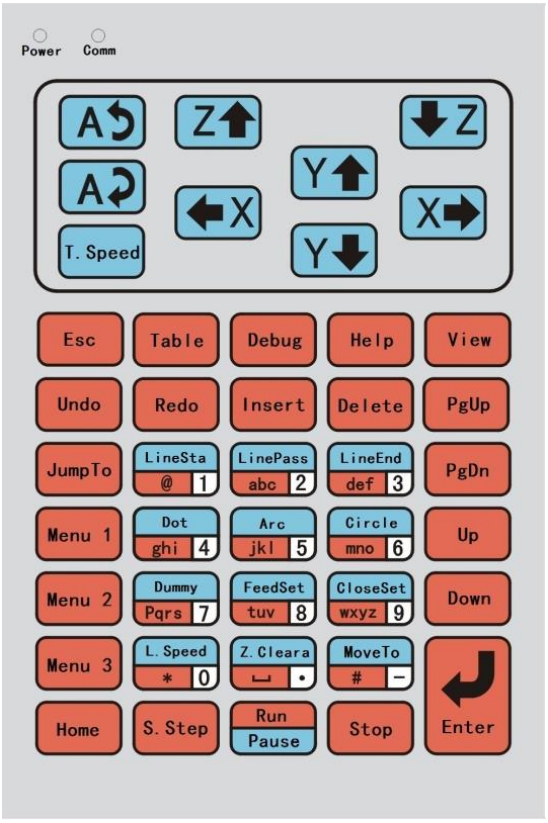
9. Speed:F Move speed by manual, part of “fast, middle, slow”, press the "speed" key to switch.

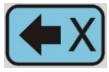
10. Cou : 0/0 Workpiece counter, in front of the value is the count value of the workpiece, behind the value set the number of workpieces to be processed. If the work count reach the number of set to be processed, it will prompt that the workpiece counter is full, and if there is no work piece number limit, set the limit number as ‘0’.

11.  Insert U Disk,  No U Disk.

12.  Pinyin input,  number input,  lower-case letter input,  capital letter input, Press “#” can change the IME when in the character input state.

2.2 Teach box key description



1.  The fourth axis named A axis counter clockwise rotation by manual.
2.  The fourth axis named A axis clockwise rotation by manual.
3.  Z axis up by manual.
4.  Z axis down by manual
5.  Y axis front by manual
6.  Y axis back by manual
7.  X axis left by manual
8.  X axis right by manual

9. T. Speed Switch manual speed “slow, middle, fast”
10. Esc Operation of exiting the menu or canceling the input dialog
11. Table Cursor switch between “soldering programming point” area and “short menu bar” area, or transform plane when previewing.
12. Debug Analysis of the current soldering file whether its programmed point accord with the soldering programming rules, if yes, then the icon  will become gray.
13. Help Press this key can pop up some help information of the current page, press any key to exit
14. View Preview the tin out path graphic in current soldering program file in XY, XZ, YZ plane position, press Table to change plane, press other any key to exit
15. Undo Redo Undo and redo to the edition of programming points, up to 30 times, for preventing misuse effectively.
16. Insert In front of the cursor point of the selected insert a blank soldering program point.
17. Delete Delete the programming point of selected in main page, or in the menu state use for “delete” key.
18. JumpTo Jump to the special programming point address by manual input.
19. Menu 1 Into Menu 1, for the soldering point of action, displaying as black.
20. Menu 2 Into Menu 2, for soldering point of parameters setting, displaying as red.
21. Menu 3 Into Menu3, for device of parameters setting and some application operation
22. Home Perform to home.
23. S. Step Perform step soldering test.
24. Run / Pause Soldering working run or pause.
25. Stop Soldering working stop.
26. PgUp Cursor up a page in main page state, or up a page in menu state.

27. 

Cursor down a page in main page state, or down a page in menu state.

28. 

Cursor up a line in main page state, or up a line in menu state, or up a line in input dialog.

29. 

Cursor down a line in main page state, or down a line in menu state, or down a line in input dialog.

30. 

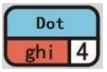
Start point of drag soldering program in main page, or input ‘1’, characters in input dialog.

31. 

Middle point of drag soldering program in main page, or input ‘2’, ‘abc’ in input dialog.

32. 

Finish point of drag soldering program in main page, or input ‘3’, ‘def’ in input dialog.

33. 

Dot welding program in main page, or input ‘4’, ‘ghi’ in input dialog.

34. 

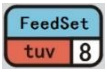
Drag the arc welding program in main page, or input ‘5’, ‘jkl’ in input dialog.

35. 

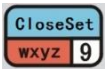
Drag soldering program in main page, or input ‘6’, ‘mno’ in input dialog.

36. 

Soldering dump point(dump point is just like the dot welding, only move to the point coordinate, but no more action, mainly used to other expect soldering, such as clear iron head, etc) program in main page, or input ‘7’, ‘pqrs’ in input dialog.

37. 

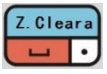
Input ‘8’or ’tuv’ in input dialog.

38. 

Input ‘9’or ’wxyz’ in input dialog.

39. 

Set parameters of drag soldering speed program in main page, or input ‘0 ’ in input dialog.

40. 

Set Z height parameters in main page, or input space character or decimal point in input dialog.

41. 

Move the iron head to the programming point of cursor selected in main page when there is coordinate occurred, or switch IME or input negative value symbol in input dialog.

42. 

+ 

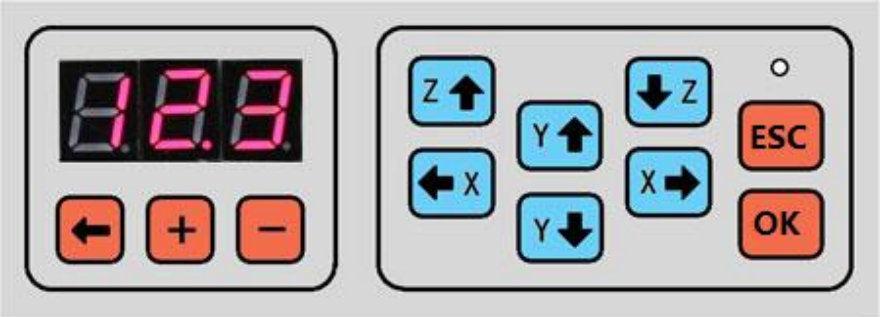
Change Y axis between Y1 and Y2 then display when in double Y mode.

43. 

+ 

Into menu 4, for bottom layer parameters of the device, suggested not open to users.

2.3 Program selection and adjustment for iron head of key description



1.  The current file selected is soldering file 123.
2.  Move the decimal point bit of the current soldering file No., there is '+','-' operation follow with the decimal point bit.
3.  Plus 1 on the bit of decimal point in the soldering File No.
4.  Minus 1 on the bit of decimal point in the soldering File No.
5.  Z axis move up by manual when adjusting base point.
6.  Y axis move down by manual when adjusting base point.
7.  Y axis move front by manual when adjusting base point.
8.  Z axis move back by manual when adjusting base point.
9.  Z axis move left by manual when adjusting base point.
10.  Z axis move right by manual when adjusting base point.
11.  Enter or confirm the adjustment operation for base point, when enter the adjustment to the base point position, LED on the back of the film began flashing, press manual key then press confirm key to finish the operation.
12.  Cancel the adjustment operation.

Chapter 3 Basic method for programming description

3.1 Unit symbol interpretation

1. Length unit (mm) = (millimeter)
2. Time unit (s) = (second)
3. Speed unit (mm/s) = (millimeter per second)
4. Acceleration unit (mm/(s*s)) = (speed of increment of millimeter per second for one second)

3.2 Appointment for soldering program finish

To improve the readability of the soldering program, programming points can be kept a ‘Non program’ line between the lines, if there are two consecutive lines of ‘Non program’, then means here is the end of the program or subroutine return, its useful is the same as ‘Program end or return’.

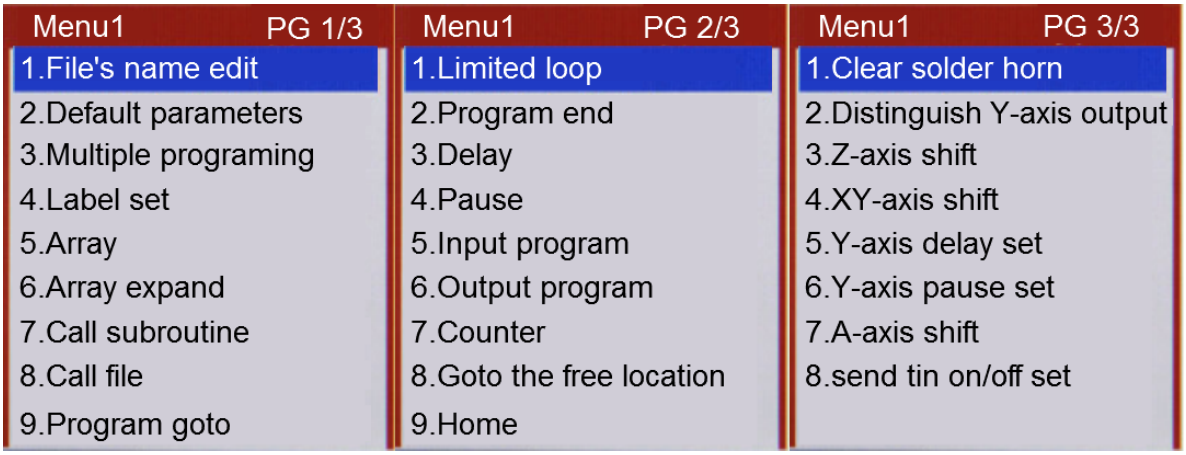
3.3 Run mode of soldering program

The running of soldering program is according to the sequence from address 0001 begin, and down to execute action or parameter setting of each program point until the program end or press ‘stop’ , ‘emergency’ key. Among those program points expect the point of dot welding, drag welding, also have the order such call, array, jump, delay, pause, etc.

As using program point method in processing parameters setting, so as long as insert the parameters setting program point to the welding processing, we can achieve use different soldering parameters in different soldering area in one processing file.

Chapter 4 Menu 1

Menu 1 is soldering programming action and frequently-used soldering file operation, Menu 1 generated by the soldering programming point is usually the type of soldering operation, with a black display. Menu 1 contains:



4.1 Page 1 1. File's name edit

Supports Quanpin, sensitive English, digital input, press 

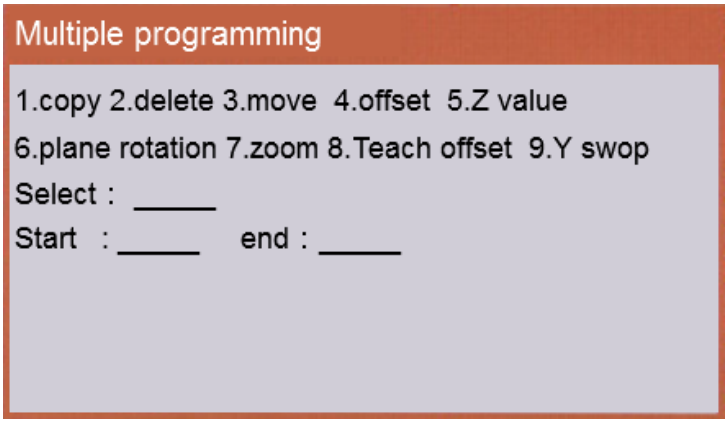
to switch IME

4.2 Page 1 2. Default parameters

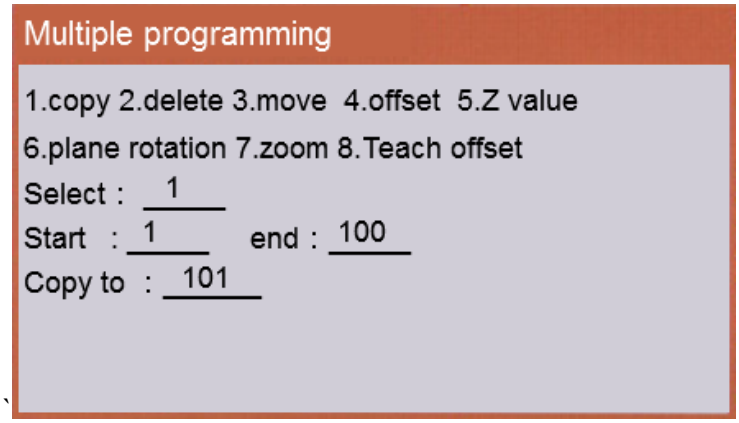
This menu can generate all the normal welding processing parameters quickly, each parameter can also generate in menu 2, after generate and selected in main face, we can modify it one by one. The function descriptions of each parameter are located in menu 2.

4.3 Page 1 3. Multiple programming

As follow picture, there are following operations when edit multiple programming points. If the machine is single Y axis mode, then have no "9. Y swop".

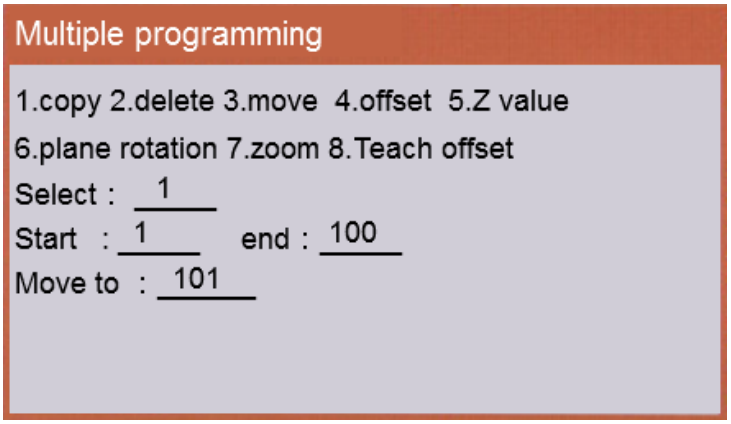


1. **Copy**, as following picture, copy 0001-0100 programming points to address 0101, then it will set the processing start point copied as a new coordinate for the machine with a little offset, if there are various products have to processed in one clamp, then just program one product, then we can copy these coordinates to other products as long as adjust the base point.



2. **Delete**, we can delete the programming point in the edit range together.

3. **Move**, as following picture, move programming point at 0001-0100 to address 0101, then former 0101 will change to 0001, this function mainly to adjust the processing order.



4. **Offset**, this function can offset the coordinate of tin points in inputted range as set value, the offset value can be positive and negative value.

5. **Z value**, change programming point of Z axis in edit area to the set value, this function mainly to let various programming points solder at the same face.

6. **Plane rotation,** rotating the programming point of welding graphic in the edit range, mainly used for correcting when the clamp tool is rotated without programming again.

7. **Zoom**, zoom the welding graphic of programming point in or out in the edit range, mainly used for correcting when DXF file generating soldering file due to the accuracy of the machine caused the deviation by the processing size and the actual size.

8. **Teaching offset**, this function can offset the welding point in input range as the relative displacement coordinate point coordinates with the iron head move to value.

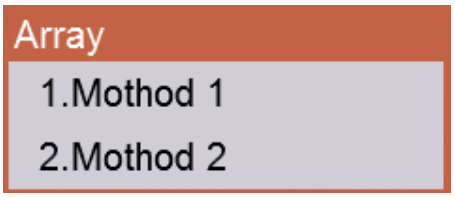
9. **Y swop,** if the machine is double Y axis mode, this parameter can be used to switch the Y axis.

4.4 Page 1 4. Label set

Labels can not only used to called with array, loop, sub, jump, general input programming, etc. but also be used to program comments to improve the readability of the program.

4.5 Page 1 5. Array

If soldering processing fixture plate placed multiple horizontal and vertical arrangement of the work piece, and horizontal and vertical respectively spacing is consistent then can use array soldering, as long as the series good soldering machining of one work piece, and then use the array soldering can achieve full disk work piece machining, so that programming efficiency is greatly improved. Array soldering has two different ways:



If the fixture plane with the XY plane is consistent with the plane, and horizontal and vertical with the X, Y axis parallel to the direction then can use the first array, also the second ways. If the fixture plane is not consistent with the XY plane, or horizontal, vertical and X, Y axis direction is not parallel to the direction, then can only use the second array methods.

4.6 Page 1 6. Array expand

Selected the array soldering programming point of the cursor in the main page, performing array deployment can generate programming points with the same effect as the array soldering, and delete the array soldering programming point, It can modify each screw hole when the tool disc is not regular.

4.7 Page 1 7. Call subroutine

If soldering processing fixture plate placed multiple direction, but there is no rule of the work piece. It is only necessary to programming and machining of one work piece then call the subroutine in each part of the start position. It can call the address or the label of the subroutine.

4.8 Page 1 8. Call file

The way to call file is the same to call subroutine, as long as change the called subroutine to a soldering file No., and change the soldering processing programming point from the subroutine to the file.

4.9 Page 1 9. Program go to

Program go to special address or label to run when run to the current programming point, usually used to loop. If add a programming order jumped to 0001, then the program will loop work all the time.

4.10 Page 2 1. Limited loop

It is similar to the “program jump”, just the “program jump” is no limit counts when loop, limit counts loop is limited jump, and the second can only jump to before itself, program jump can jump to anywhere.

4.11 Page 2 2. Program end

When in a subroutine execution to the programming, the subroutine returns, when not in a subroutine execution to the soldering programming is processing the end of the program, if there are more than two lines of "no programming point" means the end of the program.

4.12 Page 2 3. Delay

If the program execution to the delay programming point is processed to stop the time delay a certain period of time and then continue to execute the soldering processing point.

4.13 Page 2 4. Pause

If the program execution to the pause programming point, waiting for the run key then continue to execute the processing point.

4.14 Page 2 5. Input program

Programming input signal is when the program execution to the programming of the point, if the values of the input state accord with the specified input signals then program jump to the specified address or label, if not then program continue to execute. For example, when program run to 0002, it will check the state of “GPIO-I 01”， if it is 0, then jump to 0001 and run this check again, until this signal become as 1, then run the below. Use this function can be achieved with other devices with the work or as a pause key input, etc. (Signal definition: if has the input signal then the signal is defined as the amount of 1, no input signal is defined as the amount of the signal 0).

4.15 Page 2 6. Output program

When the program is executed to the output signal programming point, then the output signal will output specified value, 1 as DC24V output, 0 as DC0V output.

4.16 Page 2 7. Counter

When the program is executed, the work piece counter increases the corresponding set value and then compares the value of the counting value to overflow limit, if overflow then stopped. This function usually used to count loop work pieces.

4.17 Page 2 8. Goto the free location

When execute this command, the iron head will go back to the free stop position.

4.18 Page 2 9. Home

This current programming point makes the machine back to the origin.

4.19 Page 3 1. Clear solder horn

When execute this command, the iron head will go to the cleaning position to clean.

4.20 Page 3 2. Distinguish Y-axis output

This option allows you to specify one of output of the Y1 axis or Y2 axis. Y-axis options are: 1 or 2, the output option is 1-12, and the output port option is 0 or 1.

4.21 Page 3 3. Z-axis shift

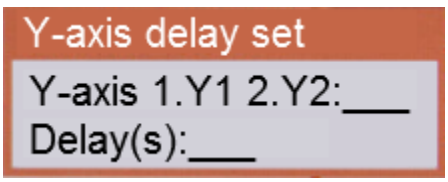
The value that should be input when Z-axis moved to the specified place.

4.22 Page 3 4. XY-axis shift

The value that should be input when XY-axis moved to the specified place.

4.23 Page 3 5. Y-axis delay set

When Y1 is not required to synchronize with the Y2 axis, it is necessary to set the time delay for Y1 or Y2 axis.



4.24 Page 3 6. Y-axis pause set

Y1 or Y2 is pause by the following options.

4.25 Page 3 7. A-axis shift

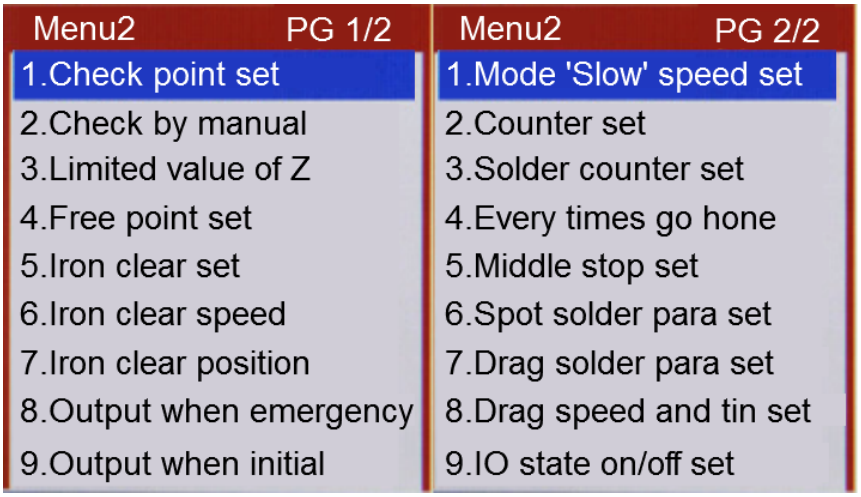
The value that should be input when Z-axis moved to the specified place.

4.26 Page 3 8. Send tin on/off set

During the operation, the switch of the tin signal is controlled by this parameter.

Chapter 5 Menu 2

Menu 2 is mainly for the parameter settings of the programming point, Menu 2 generated by the programming point is usually display black. Menu 2 contains:



5.1 Page 1 1. Check point set

Adjustment base point, when there is some processing offset cased by the offset of changing iron head, we can use the adjustment base point to correct it. There are two ways to set the adjustment point, one is take the first soldering point coordinate as the adjustment base point, the other is set the coordinate by manual, if choose the second one, move the iron head to the specified position, then press confirm.

5.2 Page 1 2. Check by manual

When into the calibration menu , the iron head move to the up 3mm than adjustment point automatically(Prevent collision), then move the iron head to the specified coordinate to calibrate by manual, pressing confirm to finish this calibration operation. Then all the soldering processing point will compensate the deviation from the offset of iron head to ensure machining accuracy unchanged.

This function can also use the special calibration on the keyboard to operate while no teaching box available, as long as the machine in an idle state, we can press “confirm” key into the calibration operation, at the same time the keyboard mask on the LED will flash, then move the iron head to the specified coordinate by manual, press “confirm” again to complete the calibration of the operation, then the LED will extinguish and exit.

5.3 Page 1 3. Limit Value of Z

Set this value to limit Z axis down to prevent the number of collision for work piece or the tool by manual, this setting is independent of each processing program file

5.4 Page 1 4. Free point set

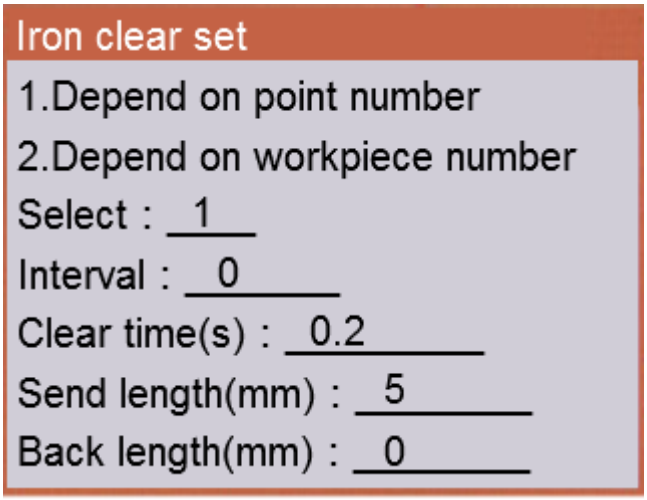
Free stop point means the position of stop when soldering processing is finished, can set as below:

1. Make the set coordinate as free stop point;
2. Make the above of starting point as free stop point;
3. Make the above of finish point as free stop point;

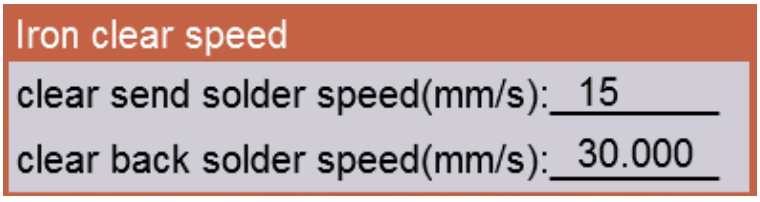
The soldering processing general can choose 2 or 3 work efficiency will be higher, but it need to choose 1 when iron head have to move away to change the product.

5.5 Page 1 5. Iron clear set

As following picture, the interval period of automatic cleaning tip can be the number of soldering dots, or the number of products, we advise to choose the number of product if there is not too much soldering dots. The length of send tin is the amount of tin after clean out, the length of back tin is the back length after send tin, we also use these parameters when soldering, for it will automatically compensate for the length of the send tin, setting the length of the tin is no need to add the back length.



5.6 Page 1 6. Iron clear speed



Clear send solder speed：The setting of send solder speed when cleaning the head of a soldering iron.

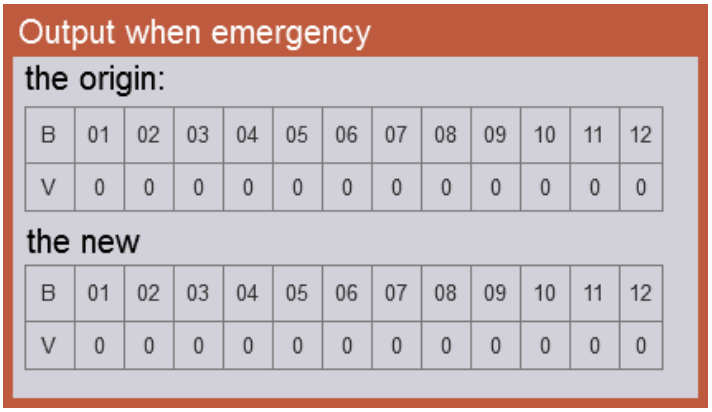
Clear back solder speed：The setting of back solder speed when cleaning the head of a soldering iron.

5.7 Page 1 7. Iron clear position

Move the iron head to the position of clear then into menu and press “enter”.

5.8 Page 1 8. Output when emergency

General output signal when emergency, ‘1’ means 24V, ‘0’ means 0V.



5.9 Page 1 9. Output when initial

Set the general output signal when turn on the machine, ‘1’ means 24V, ‘0’ means 0V.

5.10 Page 2 1. Mode ‘slow’ speed set

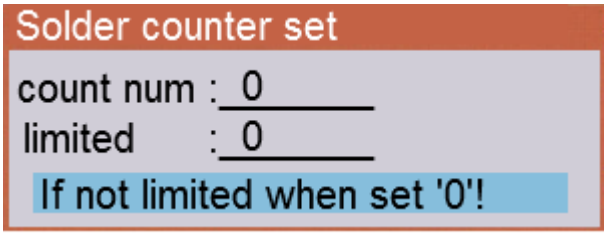
This speed is used for ‘slow’ run mode.

5.11 Page 2 2. Counter set

We can set the count value and limit count value in the work piece counter, as running, the count value will add the set number when execute to the programming point, if the count value larger than the count limit value, prompt that count overflow, and stop processing, until set the count again. If not use the work piece count limit, please set the count limit value as 0.

5.12 Page 2 3. Solder counter set

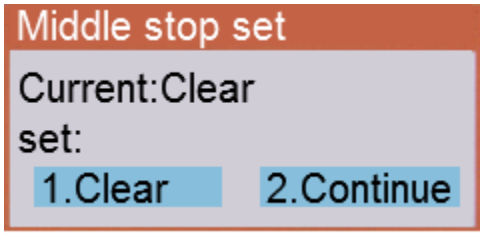
We can set the count value and life count value in the set welding frequency counter, as running, the count value will add the set number when execute to the programming point, if the count value larger than the count life value, prompt that the life of this iron head is over, and stop processing, until change the head. If not use the welding frequency counter, please set the count life value as 0.



5.13 Page 2 4. Every times go home

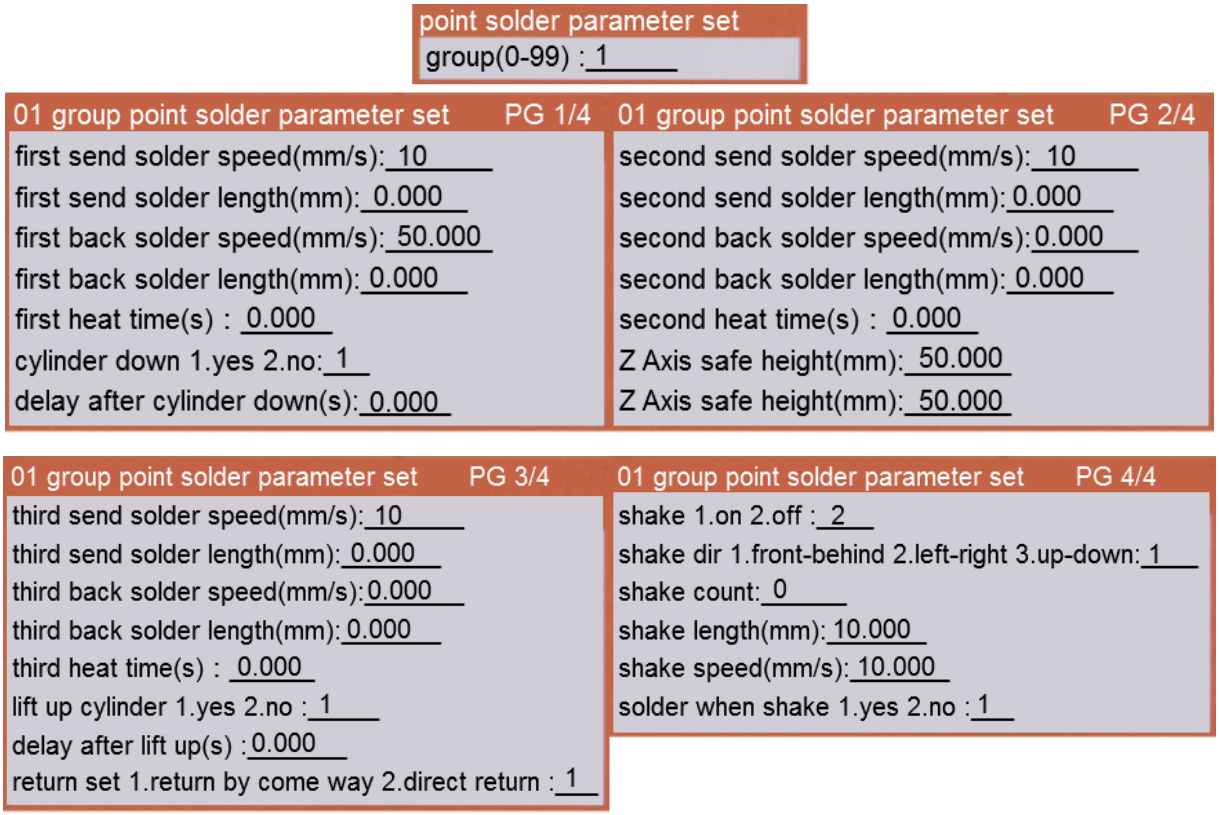
In the welding product process, if the number of processing reach to the number ever been set, go back to the origin, then continue. If in the loop mode, then continue.

5.14 Page 2 5. Middle stop set



When the midway stop, this parameter sets up to clear the running state or continue to.

5.15 Page 2 6. Spot solder para Set



All the soldering point in the programming line without group share a set of default soldering parameters, without having to reset.

The parameters of spot solder are set up. There are "0-99" in total 100 groups. 0-99 can be set separately. As shown above: in order to improve the efficiency, the first delivery of tin is completed before moving to the solder joint, so the length of the first tin delivery cannot be too long to prevent the tin from falling down.

The tin feeding process of spot welding is as follows: after heating to the solder joint, it is heated for the first time, then sent to tin second times, second times heating, and then sent to tin third times, third times heating and tin stripping. In addition to the tin speed, each parameter can be 0.

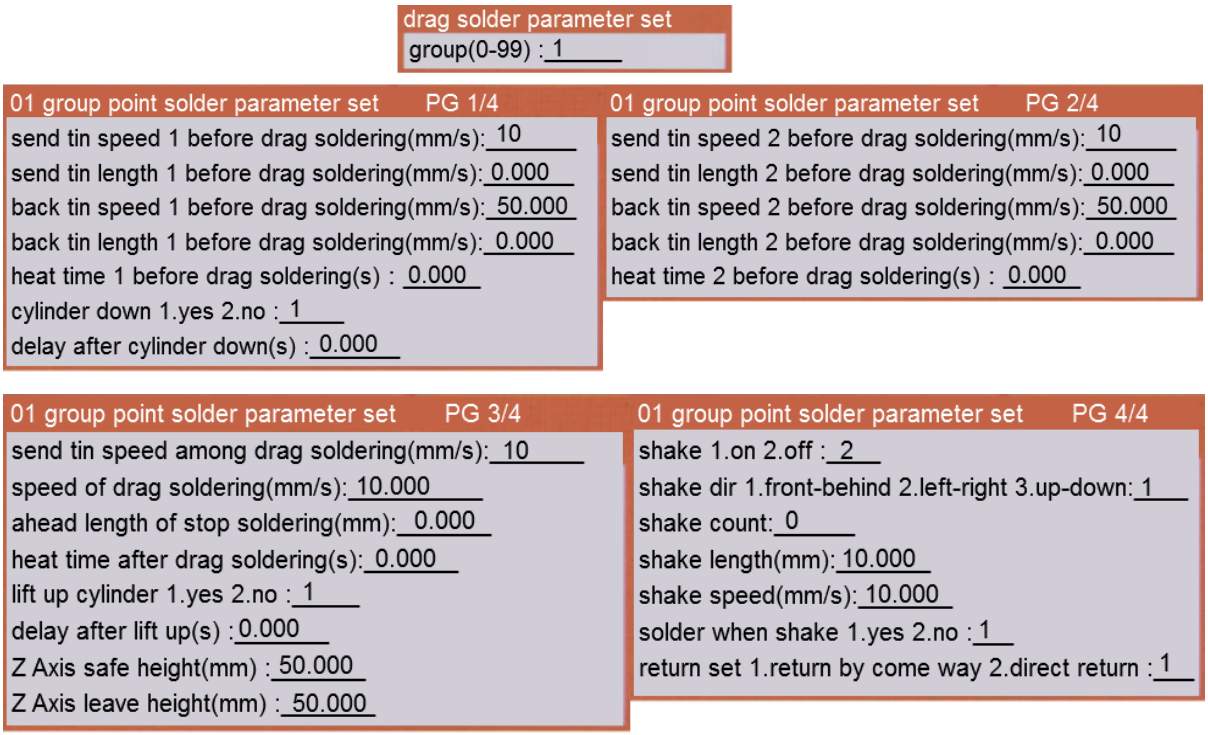
When some larger solder joints are encountered, the shake function may be used.it can be carried out, front and behind, left and right, up and down shake. Shake count, shake length, shake speed and solder when shake are also can be set up.

The parameters of the cylinder can be set up, include whether the cylinder downs and delay in place, whether the cylinder should lift up and delay in place.

Z axis safe height also can be set up to ensure safety. When the spot solder is completed, return by the come way or direct return also can be set up.

Note: if the group function is closed in the menu 4 function settings, the above parameters do not need to be set, all spot welding parameters are shared.

5.16 Page 2 7. Drag solder para Set



All the soldering point in the programming line without group share a set of default soldering parameters, without having to reset.

The parameters of drag solder are set up, and there are "0-99" in total 100 groups. 0-99 can be set separately. In order to improve the efficiency, advance to send tin in moving to the drag start point before the completion of solder, so the solder tin front drag length cannot be too long, to prevent the drop of molten tin.

The delivery process of drag solder is as follows: after the starting point of drag solder, it is heated according to the heating time before solder, and the iron head moves. At the same time, the tin speed is released from tin in the process of dragging, and after the end point of the drag solder, it is heated by the time when the drag solder is not completed and the heating time is added. Do not set the tin speed to 0.

When some larger solder joints are encountered, the shake function may be used.it can be carried out, front and behind, left and right, up and down shake. Shake count, shake length, shake speed and solder when shake are also can be set up.

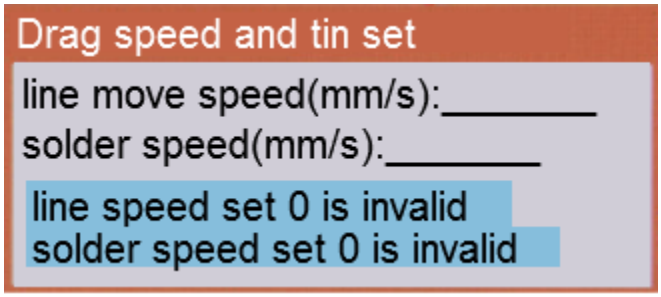
The parameters of the cylinder can be set up, include whether the cylinder downs and delay in place, whether the cylinder should lift up and delay in place.

Z axis safe height also can be set up to ensure safety. When the spot solder is completed, return by the come way or direct return also can be set up.

In these parameters, heat time before and after drag soldering, send tin speed among drag soldering, speed of drag soldering, ahead time after drag soldering are can be set up.

Note: if the group function is closed in the menu 4 function settings, the above parameters do not need to be set, all spot welding parameters are shared.

5.17 Page 2 8. Drag speed and tin set

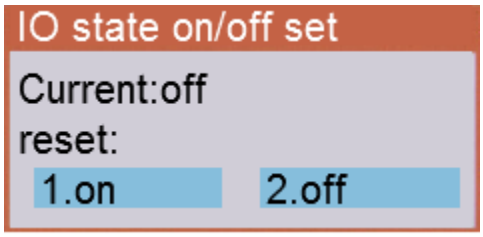


Line move speed: the speed of the soldering iron head during the drag soldering.

Solder speed: tin discharging speed of the tin shaft in the process of drag soldering.

When set to 0, it indicates invalid.

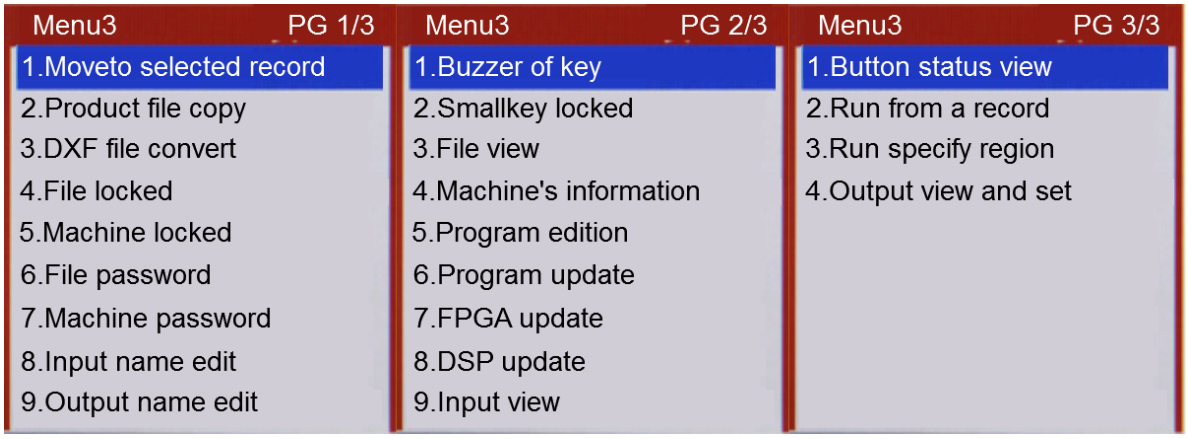
5.18 Page 2 9. IO state on/off set



When this parameter setting is on, you can see the state of the input and output on the main interface.it is convenient for real-time observation.

Chapter 6 Menu 3

Menu 3 is mainly machine setting or menu operation, no programming point generated. Menu 3 contains:

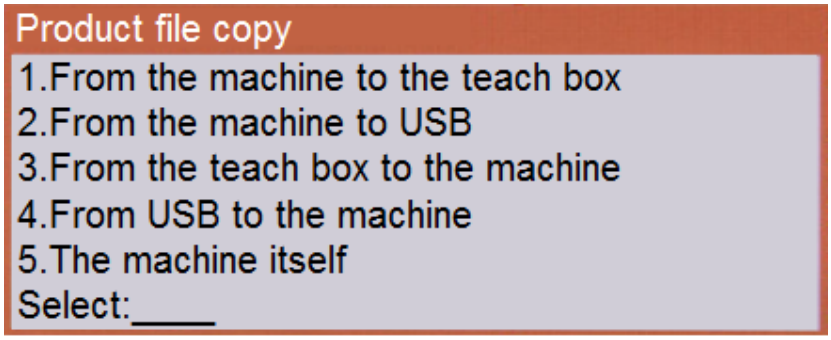


6.1 Page 1 1. Move to selected record

When input the specific coordinate of iron and press “confirm” key after enter the menu, the iron will move to the set position as order of Z axis up, XY axis to set position, Z axis down to set coordinate.

6.2 Page 1 2. Product file copy

This function can storage in U Disk or teach box and copy soldering files between each machine, when there are several machines process the same file, we can just program in one soldering machine and copy it to others. The teach box copying applies to the field using, and the U Disk copying can not only between soldering machines, but also storage in the computer as backup. File copying operation contains:



1. From soldering machine to teach box

This operation copy the current soldering processing file to the teach box.

2. From soldering machine to U Disk

The operation is currently open soldering processing files copied to the root directory of U Disk “焊锡机-焊锡程序” folder, the extension file name is ‘HXF’ . (Note: U disk must be formatted as FAT32 format).

3. From teach box to soldering machine.

This operation copy the storage soldering file in the teach box to replace the current soldering processing file in the soldering machine.

4. From U Disk to soldering machine

Copy the soldering file in the root directory of U Disk called “焊锡机-焊锡程序” to current open soldering processing file. (Note: U disk must be formatted as FAT32 format)

5. Copy between each soldering programs.

This operation copy soldering files with different File No. to replace, mainly used to make a soldering processing files backup. We can use the backup file when can’t undo after an error program operation.

6.3 Page 1 3. DXF file convert

Save the Auto CAD graphics file as Auto CAD 2010 DXF format file to “焊锡\DXF 文件” folder, then operating this menu to convert graphics files into dispense processing files.

6.4 Page 1 4. File locked

When the file unlock, icon display  in the status bar, meanwhile the parameters of current file and machine all can be modified; when the file lock, icon display  in the status bar, meanwhile the current file can’t be modified , but not the parameters of the machine.

6.5 Page 1 5. Machine locked

When in unlock states, the parameters of machine can be modified, whether the file is locked is up to the file lock/unlock setting; when in lock states, icon display  in the status bar, meanwhile all the parameters of soldering file and machine are locked.

6.6 Page 1 6. File password

This menu is used to set the password for the “Page 1 4.file locked”.

6.7 Page 1 7. Machine password

This menu is used to set the password for the “Page 1 5.machine locked”.

6.8 Page 1 8. Input name edit

The default name of programmable universal input port is “GPIO-I 01”—“GPIO-I 12”, to improve the readability of the program, each programmable universal input port can be named according to the function of the application, so that the programming is more convenient.

6.9 Page 1 9. Output name edit

The default name of programmable universal output port is “GPIO-O 01”—“GPIO-O 12”, to improve the readability of the program, each programmable universal output port can be named according to the function of the application, so that the programming is more convenient.

6.10 Page 2 1. Buzzer of Key

This menu can set whether the key voice of teach box is on or off.

6.12 Page 2 2. Small key locked

Small keyboard means special keyboard for the check adjustment point, this menu usually used to prevent misuse with locking this keyboard and taking the teach box away.

6.13 Page 2 3. File view

Because the soldering processing file is so many (1000 files), it’s terrible to open and search file one by one, so we can use this function for tabbed browsing, find the number of file we wanted then open it, and press “delete” to delete the selected.

6.14 Page 2 4. Machine’s information

Display the device information, such as machine number, etc.

6.15 Page 2 5. Program edition

Display the program version information.

6.16 Page 2 6. Program update

As long as put the application program file into U Disk of FAT32 format with folder called “焊锡机/升级文件”，enter the menu and update the program after insert the U Disk. If the U Disk can identify correct, icon  will display at the right in status bar.

6.17 Page 2 7. FPGA update

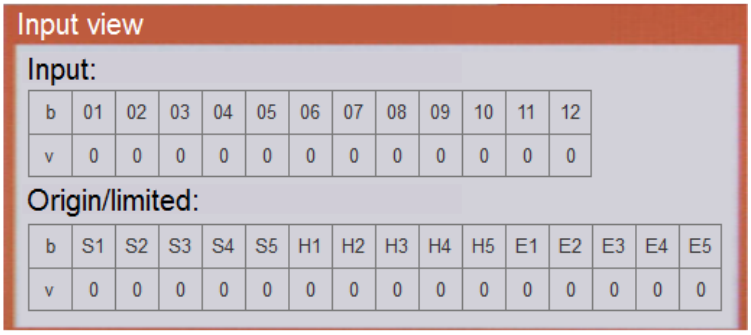
As long as put the driver program file into U Disk of FAT32 format with folder called “焊锡机/升级文件”，enter the menu and update the program after insert the U Disk. If the U Disk can identify correct, icon  will display at the right in status bar.

6.18 Page 2 8. DSP update

As long as put the DSP program file into U Disk of FAT32 format with folder called “焊锡机/升级文件”, enter the menu and update the program after insert the U Disk. If the U Disk can identify correct, icon  will display at the right in status bar.

6.19 Page 2 9. Input view

As shown in the following picture:



0-12 of “general input” is 12 input states for programmable input port, when check input signal for ‘1’, no input signal for ‘0’

“origin limit” is input state of origin signal and limit signal, S1-S5 for 1-5 axis negative direction limit signal, H1-H5 for 1-5 axis origin signal, E1-E5 for positive limit signal, when check input signal for ‘1’, no input signal for ‘0’ .

6.20 Page 3 1. Button status view

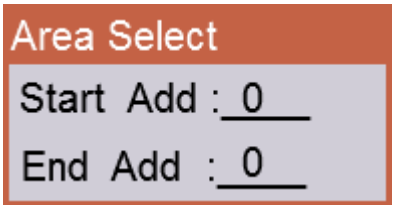
View the input state of function key, when no key means states is 0, when check key down means states is 1.

6.21 Page 3 2. Run from a record

This function usually used to dispense the leftover hole at the specified welding hole when there are some little errors in the process midway.

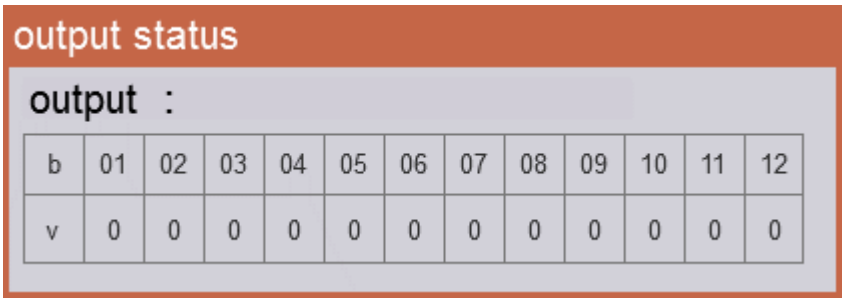
6.22 Page 3 3. Run specify region

This function means we can choose the designated area in the programmed address to work independently. As the following picture:



6.23 Page 3 4. Output view and set

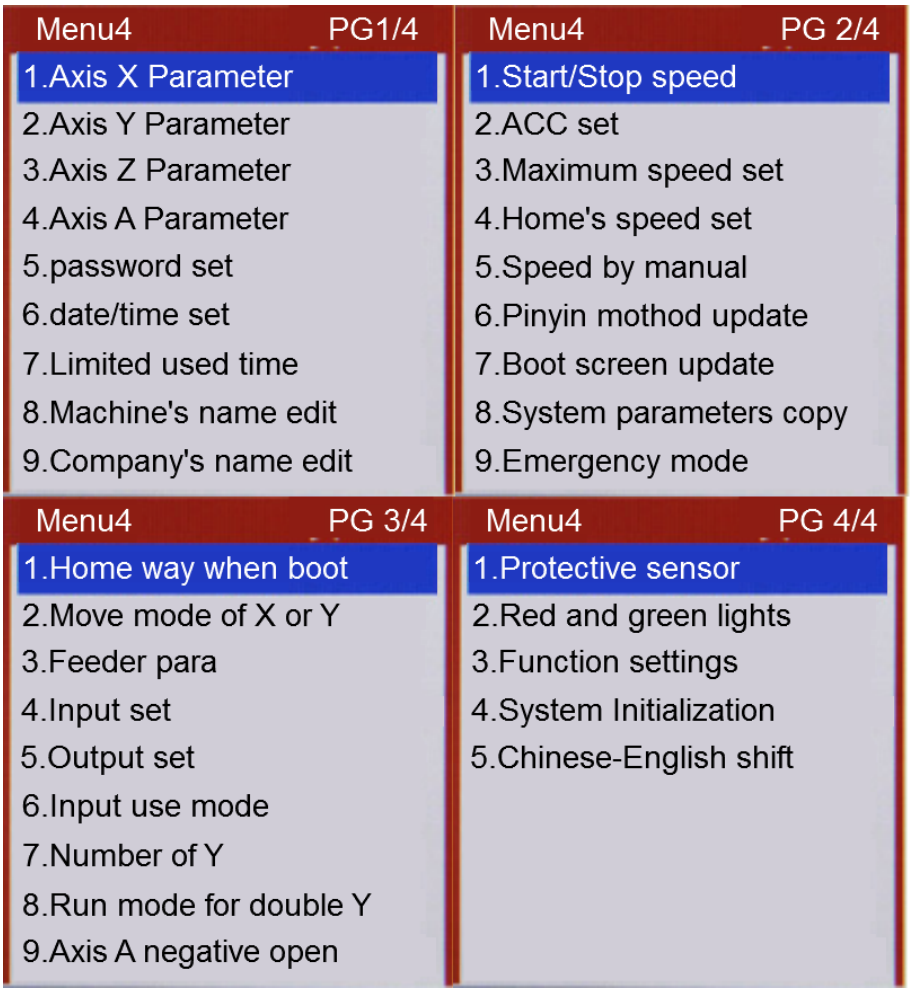
As following picture:



View general output state, also control the output state of general output port. Set 1 means open the corresponding port, set 0 means close the corresponding port.

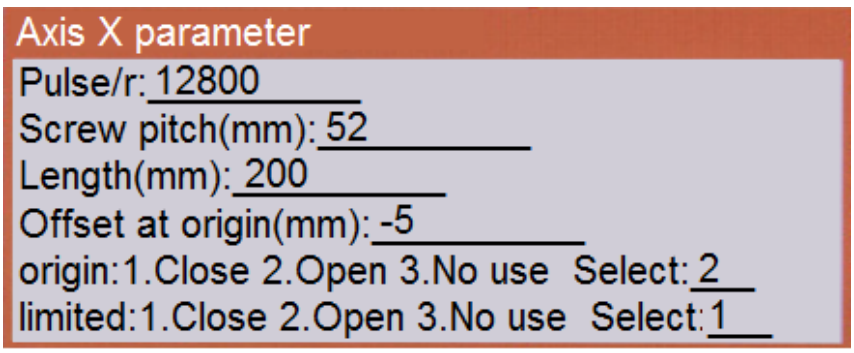
Chapter 7 Menu 4

Press “Stop” + “Menu1” into Menu 4, Menu 4 is the menu for manufacturers to set parameters of machine, not recommend opening for users. Menu 4 contains:



7.1 Page 1 1-4. Set parameters of XYZA axis

The motor shaft parameter setting options are shown below:



Pulse/r: means the number of pulses for the driver motor per revolution, or the fine fraction of driver motor.

Screw pitch: means the run distance for the driver motor per revolution, or the circumference of the belt pulley or the pitch of lead screw.

Length: The longest distance the axis can move.

Offset at origin: Home offset can be 0 or others, as well as offset the error value as coordinate 0 after capture the home position.

Close/Open: Close if capture sensor output low voltage when motor shaft don't trigger the origin, and the opposite is open.

No use: If you select no use, the axis does not use the origin or limited.

7.2 Page 1 5. Password set

Before set the use limit time, set the password first.

7.3 Page 1 6. Data/time set

As the use of time to limit the need have to refer to the clock machine, so if you set the time limit to modify the machine, you must enter a password that uses a time limit.

7.4 Page 1 7. Limited used time

When out of factory we can set to limit the use of time, then when the limit time become, it will pop a dialog to ask for the password to relieve while turn on the machine, or input the password in menu to relieve.

7.5 Page 1 8. Machine's name edit

The name of device edited will display at "menu 3, page 2, 4. Machine's information".

7.6 Page 1 9. Company's name edit

The name of company edited will display at "menu 3, page 2, 4. Machine's information".

7.7 Page 2 1. Start/stop speed

The motor has a process of acceleration and deceleration in motor control applications when running, to improve work efficiency, start/stop speed can set neither 0 nor too large, the greater the load, the smaller the start/stop speed, or it will cause the loss of step or mechanical noise, general recommendations in range of 0-20 mm/s.

7.8 Page 2 2. Acceleration set

Acceleration can generally be set between 1000-10000, and have to corresponding modulation according to the mechanical bearing capacity and different load.

The manual move speed can set a little smaller in actual use, generally between 100-500, manual moving acceleration is set a little smaller to have an obvious start acceleration process in manual operation, it is easy to move a short distance when it is moving at a high speed, satisfied the speed and short distance requirements.

The control card support asymmetric acceleration and deceleration, start acceleration and stop acceleration can be set to different values, the actual application of the general will be set larger to stop the acceleration than the start acceleration. The acceleration of the size of the setting must be according to the motor drive capacity, load size, mechanical properties, etc. taking not lose step, shaking not big as the standard.

7.9 Page 2 3. Maximum speed set

Setting the maximum value allowed by each axis speed in user programming, this will prevent the user from setting a speed that is greater than the speed of the machine design requirements, so that prevent the lose of step.

Here the XY axis max speed is set for the plane moving speed of the soldering application allowed with the maximum. Z axis max speed is soldering application programming on the moving speed of the hollow shift the maximum allowable value, soldering max speed is soldering application programming in line allows maximum soldering velocity.

7.10 Page 2 4. Home's speed set

Origin capture is record the position of motor shaft when it trigger the origin signal, in order to be in the same position every time, it must be triggered in the same direction every time, so we must move to the correct direction first then perform origin capture when the position of motor shaft is not at the direction of origin capture direction.

"move speed" is the speed that the motor shaft move from error direction to the direction of origin capture, this speed can be upper, generally set range as 50-150mm/s, "capture speed" is the speed that motor shaft move to trigger the origin signal, to improve the accuracy, this speed should not be too high, generally set range as 20-60mm/s.

7.11 Page 2 5. Speed by manual

Manual movement speed is high, medium and low speed of three, press "speed" can cycle switch. Generally set high speed as 80mm/s, middle speed as 40mm/s, low speed as 1mm/s.

7.12 Page 2 6. Pinyin method update

Pinyin IME use the GB2312 library, almost 7000 commonly used Chinese characters, usually the factor has been updated the Pinyin IME, so it's no need to perform this action.

7.13 Page 2 7. Boot screen update

Make the required boot logo to a 480X272 pixels,24 bit color bitmap file with PhotoShop, then save it to the folder called “焊锡机/LOGO” of the U Disk, insert the U Disk and perform the update operation. (Note: The U Disk must be formatted as FAT32)

7.14 Page 2 8. System parameters copy

The function of this menu is copying the system parameters from one machine to teach box or U Disk and then copy it from teach box or U Disk to other same size machines, no need to set them one by one.

If save to the U Disk, must create the folder called “焊锡机-配置文件” first, and the suffix of this file must be “CFG”. (Note: U Disk must be formatted as FAT32)

The contents of the copy include the machine parameters and the default values of the factory settings.

7.15 Page 2 9. Emergency mode

When prompt “emergency” press “cancel” to enter the menu of set emergency mode, so we can modify it quickly if the emergency stop switch damaged or need to modify the emergency mode.

7.16 Page 3 1. Home way when boot

1. Prompt back to the origin when power on: prompt to go back to the origin when the machine power on, press “home” to perform this action.
2. Back to the origin with no prompt: go directly to the origin when the machine power on.
3. No prompt, no back: must press “home” to perform this action after the machine power on.

Recommended use the mode 1.

7.17 Page 3 2. Move mode of X or Y

If not set, then it will be no other effects expect when move Y axis by manual, the direction of move key will be the opposite.

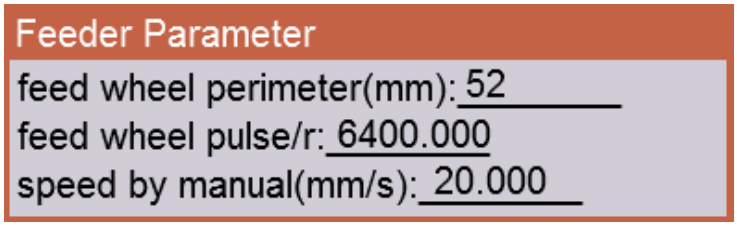
7.18 Page 3 3. Feeder Para

If the parameters of this function is error, then it will cause the difference between length of send tin and the set value directly.

Feeder wheel perimeter: the length of the axis of sending tin moves forward when the axis rotates a circle.

Feeder wheel pulse/r: the subdivision of sub-drive.

Speed by manual: the speed of sending tin with manual control.



7.19 Page 3 4. Input set

Note that there is no port number collision when configuring.

7.20 Page 3 5. Output set

Note that there is no port number collision when configuring.

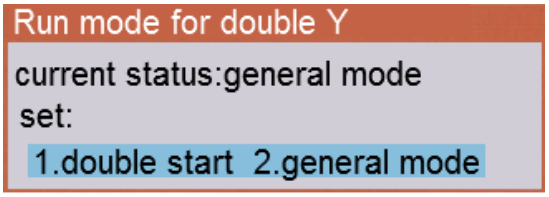
7.21 Page 3 6. Input use mode

If there is no use of the input port checking then select shield.

7.22 Page 3 7. Number of Y

We can set as single Y or double Y work mode, out factory default is single Y mode. If set as double Y work mode, then use Stop + Esc to change Y axis, and coordinate value in the display area will display as Y1 or Y2.

7.23 Page 3 8. Run mode for double Y



Double start: Press the general operation key, put the product, press Y1 to start, Y1 clamping cylinder work, after the clamping completion, waiting for the iron head in idle processing. Press Y2 to start, Y2 clamping cylinder work, after the clamping completion, waiting for the iron head in idle processing.

General mode: After pressing the run key, it runs in order according to the actual programming point.

7.24 Page 3 9. Axis A negative open

This function means in the welding process, set whether A axis allow the negative angle.

7.25 Page 4 1. Protection sensor

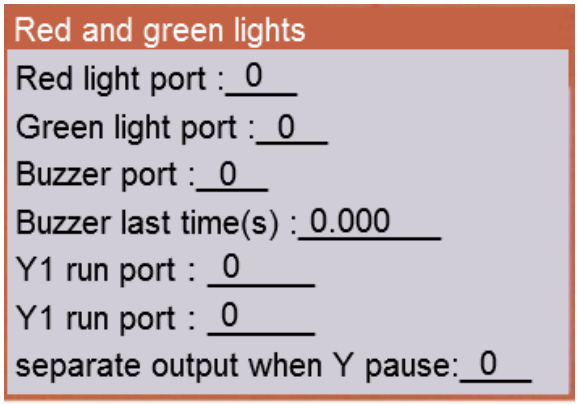
This function protects objects and people in the welding process. If the grating protect has induction, then it will stop running and alarming in the running or back to the origin state. In standby mode, there are grating protection, will prompt the grating sensor, but will not generate the alarm, at this time, the machine can not be returned to the origin and operation until the grating sensor disappears.

7.26 Page 4 2. Red and green lights

Set port of machine indicator led, when the machine works, the green light is bright, when the machine is screwing with alarm, the red light flashes, the green light goes out, and when the operation is run again, the green light is bright, and the red light is turned off. When stop, the lights all go out.

Y1/Y2 run port: In the process of running Y1 or Y2, use that light to show that Y1 or Y2 is in operation.

Separate output when Y pause: When Y1 or Y2 pauses, use that light to show that Y1 or Y2 is in a pause state.



7.27 Page 4 3. Function settings

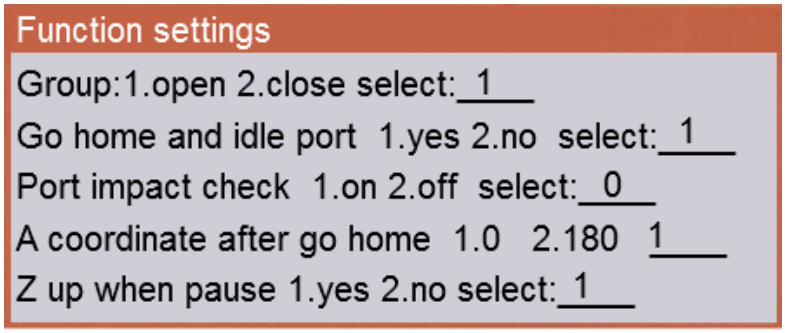
Group: the soldering parameters between different groups can be different. Almost every row of each group has different parameters of each group. Each group of programming instructions can share different sets of default solder parameters.

Go home and idle port: the next run can start directly from the idle port, it can improve the efficiency.

Port impact check: if you choose yes, when the input and output port is set to repeat, it will indicate that the port has been occupied and prevent the port from being repeated.

A coordinate after go home: to set the coordinates of the A axis after go home of 0 or 180 degrees.

Z up when pause: Whether the Z axis can be lifted when the field process is pause.



7.28 Page 4 4. System Initialization

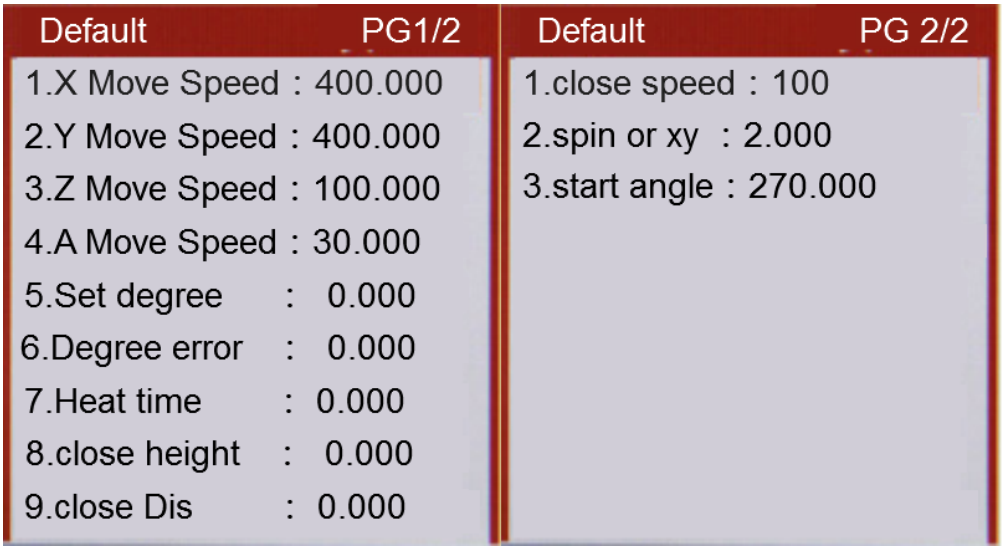
Initialize the parameters of system, all the parameters will revert to initialization settings after initialized. Before this operation, please remember all port settings, parameters of screwdriver, some import parameters, etc. After initialization, set them one by one.

7.29 Page 4 5. Chinese –English shift

This function mainly to change the display language between Chinese and English.

Chapter 8 Default menu

Press “Stop” + “Menu2” into default menu, this is not recommend opening for users. Default menu contains following contents:



The default menu the main processing parameters in the application of welding parameters, if not set above parameters in welding program file, then the soldering machine will use the default menu.

Appendix 1

Method for setting the use time limit

Use the time limit setting method is no longer a password, but the way to use the authorization. We can achieve any change in the use of the period, the use of the time limit is the way to use the date, not the number of days.

To set or modify the restriction of the use of date, as long as input the 16 bit number, which in front of the 8-bit said year, month, day (YYYYMMDD). Low 8 bit is to verify the legitimacy of eight former date character verification code, encryption using XOR mode. The following is the use of the method:

1. Set or modify the password in Menu 4-1-5.

This 8-bit password used for achieving the XOR algorithm or modifying system time after setting the use limit. (Because the use of the time limit is based on the system time to judge, so set the use of restrictions on the clock can't be arbitrarily modified, once you have set the use of restrictions, the machine will be locked if customer destroy the clock power or chip.)

2. Set use time limit in Menu 4-1-7.

Enter the 16bit setting characters, the former 8 are the use of the period of years, months, days. Latter 8 are used for verification code.

The generation of verification code is as follows:

Such as the password of the machine is 12345678, to authorize the machine to use in August 11, 2013, then the verification code of manufacture if 20130811 XOR 1234578 equals 26167989, then get the legal authorization code 2013081126167989, This license code allows the machine to be used to the machine clock in August 11, 2013. We can continue to authorize delay when expired. If you want to unlock the permanent use of a time, then use a legal authorization code with "3" at the first character of time to unlock.

Note:

Use method of XOR:

1. Use computer to open the calculator.
2. Select view/science mode.
3. 20130811 

12345678 then got the result 26167989.