Teaching Pendant

OPERATION MANUAL

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1. Product Instruction

The teaching pendant provides a method to fast edit at the work locale. User can edit and download the teaching file to process automatically by editing some pivotal points of the soldering component.

1.1 keys Instruction

The following table lists the functions of teaching pendant's keypad.

Tble 1-1: Buttons of teaching pendant

	Button	Name	Function
	**F1、F2、F3、F4**	Function Button	**F1** Create a new file, Inset a drawing, Start or pause a process etc. **F2** Edit a file, or stop a process, or group offset etc. **F3** Data check, or file copy etc. **F4** Array, parameters setting, change a file name etc.
	X、Y、Z、R	Navigation Button	Control jogging move of X, Y, Z or R.
	0~9	Number Button	Be used to input numbers or letters to create a file name or set a parameter etc.
	.	Decimal Point Button	Used to input the decimal point.
	SHF	Switch Button	Change the jog speed level, low-high-middle. Or change the parameters.
	+/-	Front Inserting Button	Used to insert a new point or figure at the front of selected point.
	#	Gloup Button	Used to into the group edit and parameters setting.
	GO	Go Button	When displaying"GO", pressing this key to move the terminal output tip to the point.
	ORG	Reseting Buton	Returen back to zero (0,0,0,0)
	CLR	Delete Button	Delete a file or some points of a file
	ESC	Cancel Button	Cancel an operation, and/or exit from current interface.

	Button	Name	Function
	ENT	Enter Button	Download or process the current file, or save an edited file etc.

1.2 Classification of Point

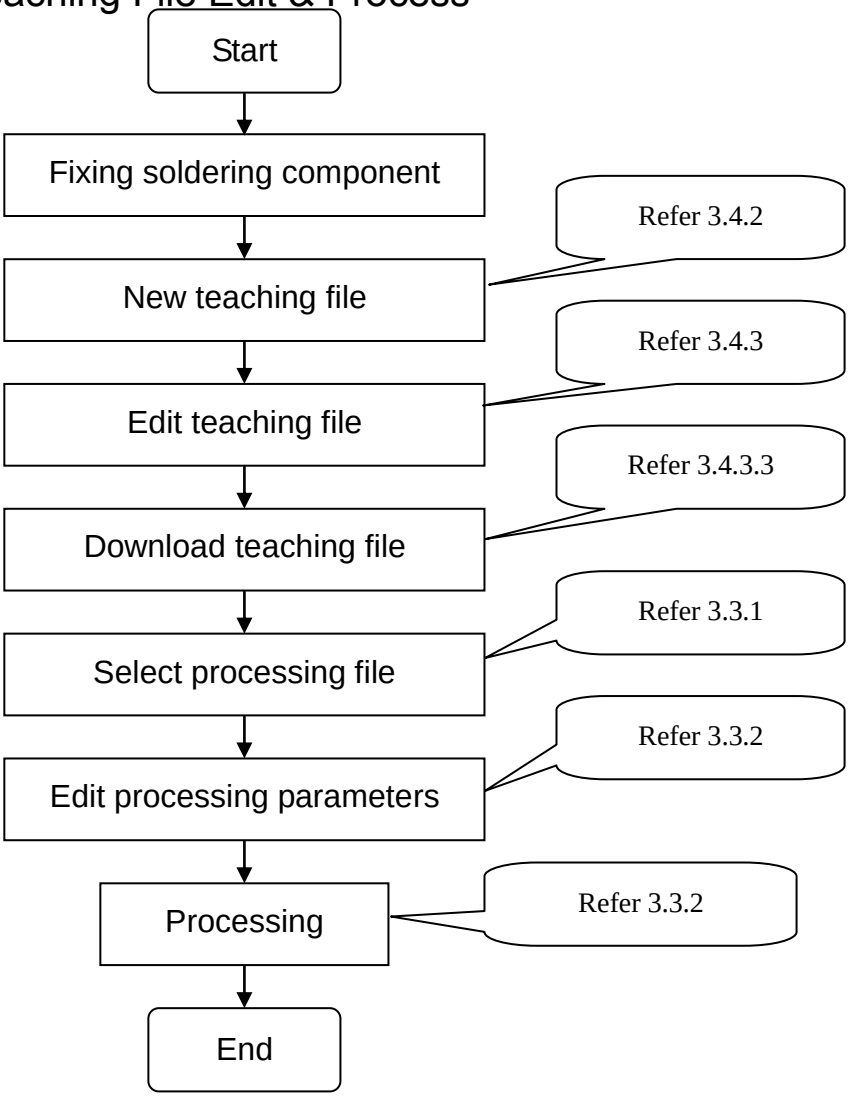
Table 1-2: Point type instruction

NO.	Point	Type	Instruction
1	(Single) Point	graphic	The speed among the points is “jog move speed”. It can set lift height, delay time etc.
2	Line	graphic	Including line-start, line-end, and line-middle point.
3	(Time) Delay Point	non-graphic	The delay point is used to set a delay time, the range is 0~65535ms.
4	MARK Point	graphic	Mark is a moving-assistant point and only be used to move to other position, not do other operation. It is helpful to avoid barrier which is not to soldering. It is valid during step simulated.
5	Pause Point	non-graphic	When run at this pause point, it will pause automatically until send a starting signal.
6	Clean Point	non-graphic	Set the clean point coordinate and parameters etc.
7	Lock left/	non-graphic	Subroutine is a teaching file, lock left insert left coordinate,lock right insert right coordinate

2. Rapid Instruction of Teaching Program

2.1 Edit & Process Instruction

2.1.1 Flow of Teaching File Edit & Process



2.1.2 Instruction of Teaching Edit

1. The new file has not points and needs to insert points.
2. **Method of coordinate point adjusting by Navigation Button:**
   a) ***Adjusting of new inserting point:*** press "F1" or "+/-"insert a new graphic point, and then press Navigation Button "X← / X→ / Y↑ / Y↓ / Z↑ / Z↓ / ®/®" in point edit interface, to set point's coordinate.
   b) ***Adjusting of point:*** parameters have been set: in point edit interface, if showing "GO", it needs press

GO button and then press Navigation Button " X← / X→ / Y↑ / Y↓ / Z↑ / Z↓ / R / R " to set point's coordinate.

Note: When "GO" is displaying at the LCD, it cannot do the opaeration of Navigation Button. Here, press "GO" button and the soldering tip will move to the point. After that, the Navigation Button can be operated.

c) The soldering tip will move to the point's coordinate during adjusting, after finishing set, press ENT button to the next point's adjustment or return to "Teaching-edit Interface".

3. **Method of coordinate point adjusting by Digit Button**: press digit button (0~9) to input the point's coordinate after finishing set, press ENT button to the next point's adjustment or return to "Teaching-edit Interface".
4. **SHF**: It can switch the moving speed of terminal tip by pressing **SHF** button and the moving speed level is Low → Hi → Mid .
5. **ESC**: Usually, ESC button is to exit from the current interface and not save or not change the parameter.
6. Complex graph can be made up by inserting line-middle between line-start and line-end.
7. **F1 "Insert +"**: Insert graphic or point at the back of the selected point.
8. **F2 Edit**: Edit the selected point's parameters.
9. **+/- "+ Insert"**: Insert graphic or point at the front of the selected point.

3. Operation of Teaching Pendant

All the operation instruction can be inputted by the teaching pendant and will display at LCD window or robot's keypad. The operation instruction will be described as the different menus of main interface.

⚠***Caution: For protecting the teaching pendant from damage, please not plug or pull it when the power supply is not cutted off.***

3.1 System Initialization

1. After connecting the teaching pendant with the robot, turn on the power switch, and then.the system comes into the initializing process.
2. Here, displaying information of the LCD window are as follows:

   First row: System name
   Second row: System version.
   Third row: System updates date.
   Fourth row: Company name.
   Fifth row: System initializing rate of process.
3. After initializing, it comes into the main interface.

3.2 Teaching Main Interface

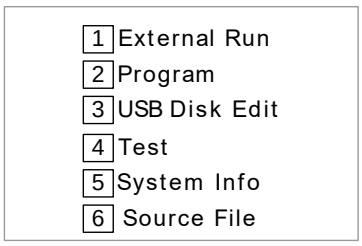


Fig. 3-1: Main Interface

There are six menu options in the Main Menu Interface (Fig. 3-1).

Select "1 External Run"--------Select the work mission, do home adjust and file processing etc.
Select "2 Program" ----------Select teaching file, edit the parameters, copy, delete download etc.
Select "3 USB Disk Edit" -----Download the teaching file, uploading the teaching file, do process update etc.
Select "4 Test" ----------Do some basic test of machine, such as axis-jogging, I/O ports etc.
Select "5 System Info" --------Look system information, edit acquiescent system parameters and so on.
Select "6 Source File" -------Load the teaching file in the robot to the teaching pendant, or delete the teaching file in the robot.

3.3 File Teaching Operation

3.3.1 Operation of Processing File List

In main interface, come into the "Work Mission" interface by pressing "1 External Run" button.

In the "Work Mission" interface, it can select, delete or process the teaching file which has downloaded. The "Work Mission" interface is as following Fig.3-2.

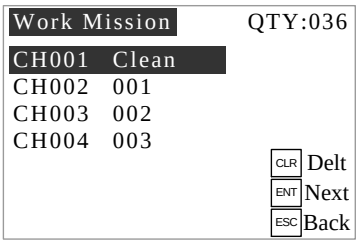


Fig. 3-2: Processing file list interface

1. Select Processing File

In the processing file list interface, file number and file name are displaying at the left side. Press "Y↑"or "Y↓"key to select the processing file.

2. Delete Processing File

1） Press "Y↑"or "Y↓"button to select the processing file which needs to be deleted. And then press CLR button to delete.

2） Before deleting, the system will confirm delete or not as following fig. 3-3. In processing file deleteing interface, press "ENT" button to delete, press "ESC" button to cancle and returen back to processing file list interface.

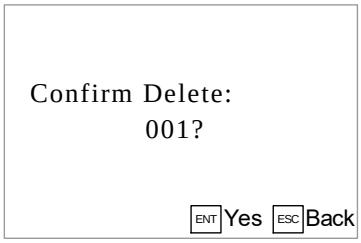


Fig. 3-3: Processing File Eeleting Interface

⚠***Caution: once delete, the deleted file cannot be recovered.***

3. Into File Processing

1） Press "Y↑"or "Y↓"button to select the processing file which needs to process. And then press ENT button into processing file manage interface (Fig. 3-4).

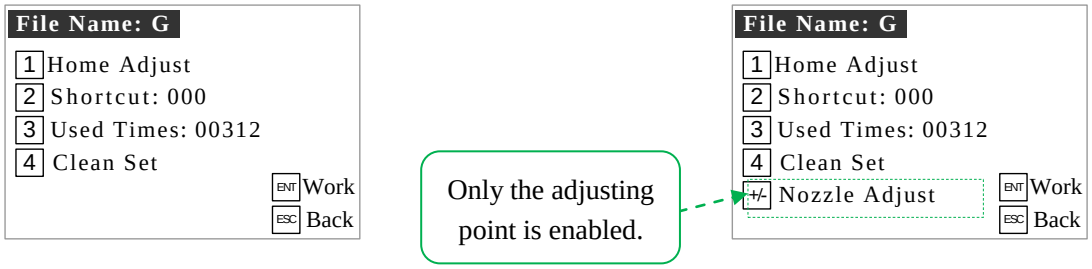


Fig. 3-4: Processing File Manage Interface

2） After into the processing file manage interface, it can select processing directly, or processing after doing home adjusting or back to origin.

Press **1** button: into the home adjusting interface (it can refer 3.3.1 "4. Home Adjust Setting").

Press **2** button: into the **shortcut setting interface**, it can set **shortcut number** and which can be triggered by the outer signal.

Press **3** button: into the **use period setting interface**, it can limit the "used times" of nozzle or clean the used times as 0 after change a new nozzle. If "Usable Times" is set as 0, it means the using times of nozzle are without limited (Absolute).

Press **4** button: into the **clean setting interface**, it can limit the "maximal clean times" or set the clean times as 0.

4. Home Adjust

1） If work piece or soldering trace has group departure, it can adjust by doing "Home Adjust".

2） After selected the teaching file in Processing-File-List-Interface, press **ENT** button into the Processing-File-Manage-Interface, and then press **1** button into the "Home-Adjusting Interface" (Fig. 3-4).

3） Here, the window displays "Home Adj"and the home point's coordinate. Press **Go** button to make the terminal output tip fix position to the corresponding home point. And by that, it can judge the home point whether is corresponding with the real processing position or not. Also, it can set the home point and do fix position again.

4） In home-adjust-interface, by pressing **SHF** button, it can switch the jogging speed Low⟶ Hi ⟶ Mid .

5） After inputting home point, if pressing "**ESC** Cancel" button, it can cancle the home point changing and not save the change. If pressing "**ENT** Save" button, it can save the change of home point and then return "Processing File Manage Interface".

6） Home point coordinate change can refer "2.1.2 instruction of teaching edit".

Press GO button moving to the corresponding real home point.

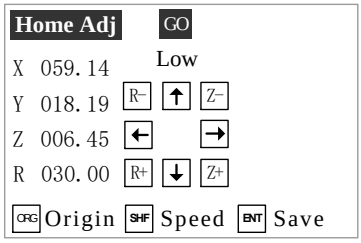


Fig. 3-5: Home Adjust Interface

⚠***Caution:***

- ***It can do home adjusting in processing file interface and teaching file interface. If doing home adusting in teaching file interface, it needs download and then it can effect in processing file.***
- ***The non-graphic point (such as delay point) will not offset when doing home adjusting.***
- ***When doing home adjusting, if the point of any one axis is 0, in that way, this home adjusting operation is invalid.***

3.3.2 File Processing Interface

In file processing interface (Fig. 3-6-1 & 3-6-2), it can do start work, stop work, clean, set, clear, return to origin point and set parameters etc.

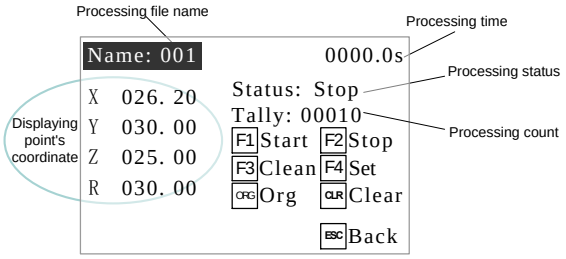


Fig. 3-6-1: File Processing Interface

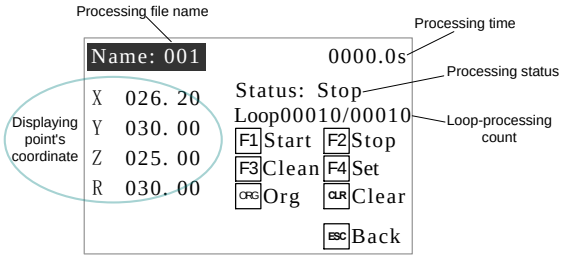


Fig. 3-6-2: File Loop-processing Interface

Note: In teaching file manage interface, it also can come into the file processing interface after pressing ENT button to download the teaching file.

Table 3-1

Displaying	Description	
Status	Processing status	It will display the processing status, work, pause,and stop etc.
Tally	Processing count	It counts the processing times. If processing once, it will add 1.
Loop	Loop-processing count	It counts the loop-processing times. If processing once, it will add 1 until to the total loop-times.
F1 Start	Start processing	Start or pause to work by pressing **F1**. If it has paused or stopped, namely, the status is “Pause” or “Stop”, press **F1** to start the work again.
F2 Stop	Stop processing	Stop to work by pressing **F2**. After stop, it must press **ORG** to reset.

F4 Set	Set loop-processing parameters	Set the loop-processing parameters by press **F4**. Refer “3.3.3”.
ORG Org	Origin	Do resetting and returen to zero point [000.00,000.00,000.00,000.00] by pressing **ORG**.

3.3.3 Loop Parameter Setting

It can do process automatically by setting “loop-parameter”.

1. Setting method: Press digit button (0~9) to change the digit and then press X↑ / X↓or Y↑ / Y↓ to set the next.
2. Loop Times: The setting range is 0~99999. When the processing count is up to the setting times, the system will stop work.

   Note: when set the as 0000 or 0001, it will be defaulted as not loop and process 1 times.
3. Loop Interval: Waiting interval time and the setting range is 0~999.9s. The default time is 000.0s, namely, not waits.
4. Org Interval: Reset to zero point after processing setting times. The “Org Interval” times setting is available to clean up the accumulated error and get precise processing.

⚠***Caution: Loop-parameter setting is only valid to the current file. Even if download a teaching file which name is same to the former, it also gets the loop processing by setting the loop-parameter.***

3.4 Program of Teaching File

3.4.1 Teaching File List Interface

1. In Teaching File List Interface, it displays quantity, number and name of teaching files. Also, it can do the operation of new, edit, copy, name and delete etc to the selected teaching file.
2. **Into the “Teaching File List Interface”**: in main interface, press “2 **program”** come into it.

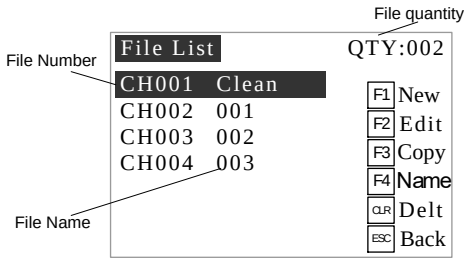


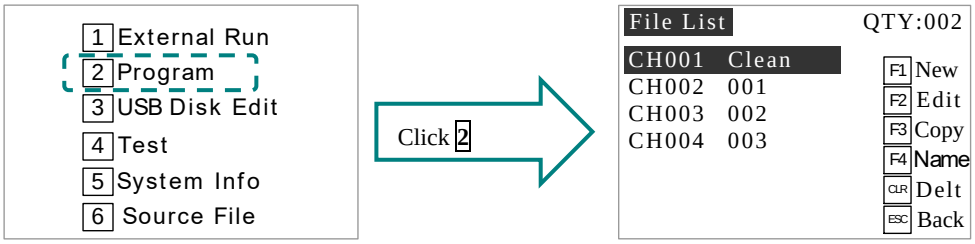
Fig. 3-8: Teaching File List Interface

3. Select the teaching file by pressing Y↑ / Y↓.

3.4.2 Insert a New Teaching File

Press **F1** to insert a new teaching file in the teaching file list interface. The inserting flow is as following steps. Also, it can refer “2. Rapid Instruction of Teaching Program”.

1. In the teaching file list interface, if without any teaching files, it hasn't any teaching files under the File List.It needs to insert a new teaching file firstly and then it can do edit.



Main Interface　　Teaching File List Interface

2. Insert a new file: press "F1 New"

Insert a new teaching file by pressing F1. And then it comes into the file name inputting interface (Fig.3-9). It needs to input a file name, which is not repeated with the other files in the file list.

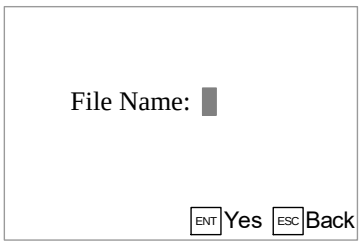


Fig. 3-9:　File-name Inputting Interface

3. Return after inputting file name.

After inputting the name, press **ENT** to save it. If inputting successfully, it will returen to "Teaching File-List Interface" and add a teaching file under the File List.

If the inputting file name is repeated, it will hint "The file name is repeat, please input again". Only the inputting name is not repeated, it can insert a new file successfully.

4. Edit the new teaching file.

After inserting the new teaching file, it needs to edit it (refer 3.4.3 teaching file edit).

In the "Teaching File-List Interface", press **F2** into the Teaching File Manage Interface (Fig. 3-10), and then press **F2** again, it comes into the File Edit Interface.

In the File Edit Interface, it can do the operations such as edit, point insert, group, clean, simulation, delete and step etc. If it is a new teaching file, there are not any points under the Points List and it cannot do edit. So, it needs to insert points firstly.

3.4.3 Edit of Teaching File

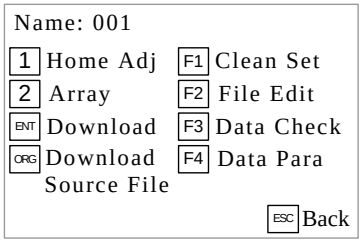


Fig. 3-10: Teaching-file Manage Interface

3.4.3.1 Home-Point Adjusting

1. In the teaching-file manage interface, press "**1 Home Adj**" button to do home point adjusting.
2. After finishing home adjusting, the other points in this teaching file will be offset together as the corresponding home offset. The interface and operation can refer to "home adjusting" of 3.3.1 processing file interface.

3.4.3.2 Virtual Array Setting

In the teaching-file manage interface, press "**2 Array**" into the virtual group array setting interface.

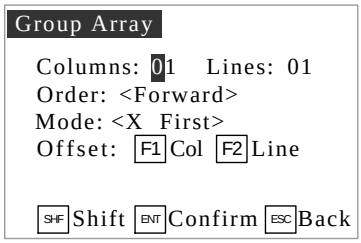


Fig. 3-11: Virtual Group Array Setting Interface

1. Array columns/ lines

If column and line both are 01, it cannot set the offset of column or line. Namely, it isn't an array.

2. Array Order

Array Order is <Forward> and cannot be shifted by pressing **SHF** in the virtual group array setting interface.

3. Array Mode

After moving to array mode by pressing **Y↑** / **Y↓**, press **SHF** to change amonge "<X First>/<Y First>/<By Teach>". Different array mode, the moving track is different.

4. Offset (<X First> / <Y First>)

1） Input the columns and lines, such as <columns: 03 Lines: 03>. The digits of column and line need big than 01, or else, it cannot do offset.

2） Set the array mode as <X First> or <Y First>.

3） Press **F1** and/or **F2** to set the offset in the array offset setting interface (Fig. 3-12).

4） In the array setting offset interface (Fig. 3-12), input the col-offset and line-offset. After that, press

ENT to save and then return to "Virtual Group Array Setting Interface".

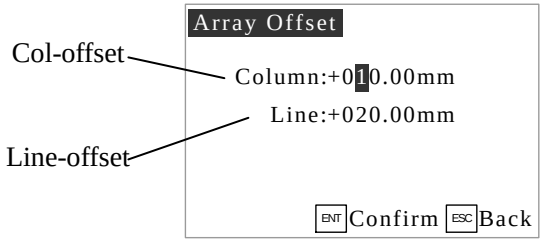
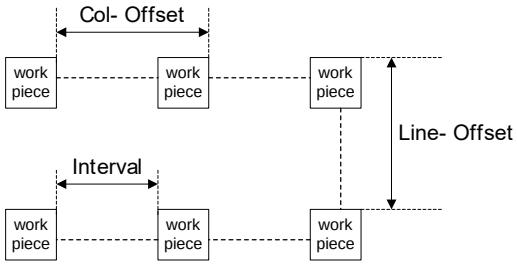


Fig. 3-12: Array Offset Setting Interface



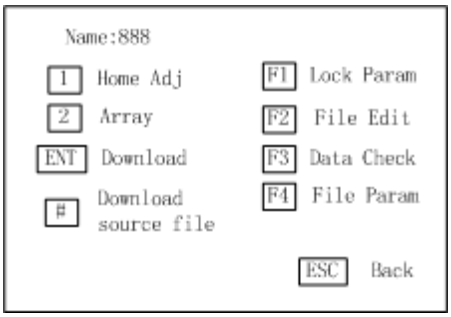
⚠***Caution: offset distance is different with the workpiece interval. Don't confuse it.***

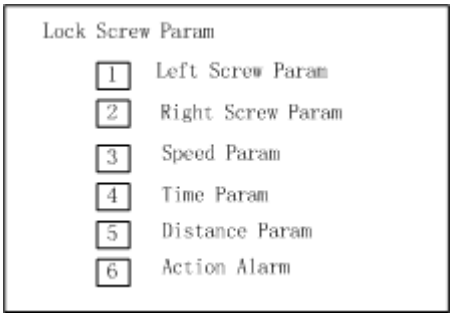
3.4.3.3 Teaching File Download

1. In teaching file manage interface, press **ENT** to download the teaching file.
2. During download, it displays "downloading". When download finished, it comes into the file processing interface (Fig. 3-6-1). It can do process.
3. **Only download teaching file to the moving controller, it can do real external run of the processing file**.

3.4.3.4 locking screw parameter---key F1

1. In teaching file manage interface, press "**F1** locking screw parameter" to set the clean point.





2. Press digital key can set fetch screw parameter, include location , speed parameter, time parameter, distance parameter, movement and alarm.

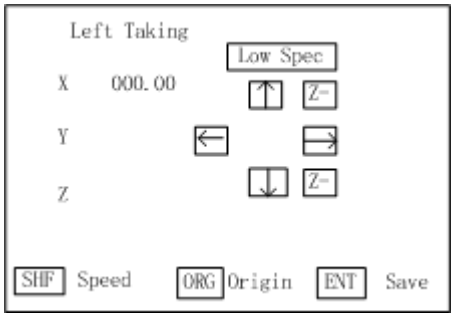
Prepare signal : open prepare for testing .

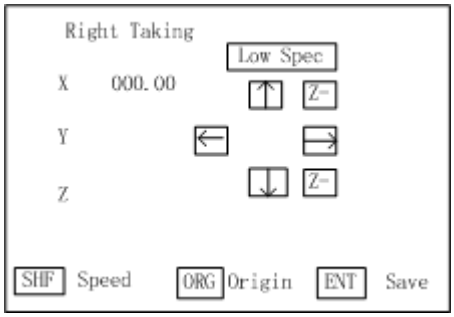
Detection signal of vacuum: open vacuum manometer detection.

Detection OKsignal: open twisting force detection.

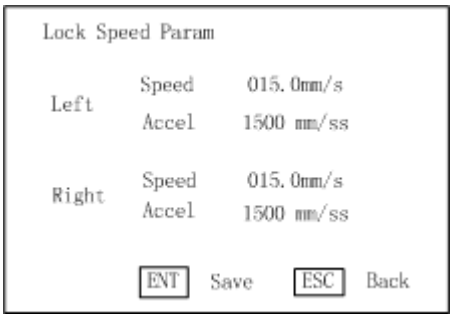
3. Press 1 "the left location of screw": setting the left coordinate.

4. Press2 "the left location of screw": setting the left coordinate.

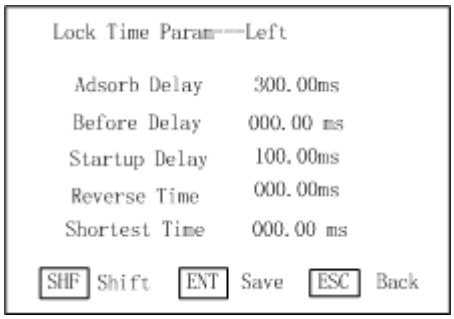




5. Press 3: enter into speed and accelerated speed setting interface.



6. press4: enter into locking screw time parameter setting interface.



（1）1000ms is 1s。

（2）adsorption time: adsorb time.

Before delayed: before suction nozzle delay time.

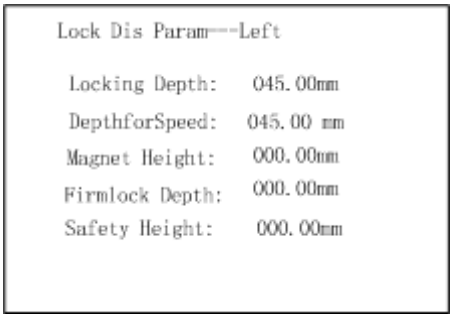
Start-up delay: after adsorb screw, remain time.

Reversal time: after OK signal, inverted time.

The shortest locking time: the time from starting locking to appearing OK signal. "0"express not start use,not "0"express real time less than setting time, abnormity warning.

（3）left and right locking time parameter separate set,press SHF key select setting parameteris left or right.

7. press5: enter into distance parameter setting interface.



depth of sctew:the length of threaded.

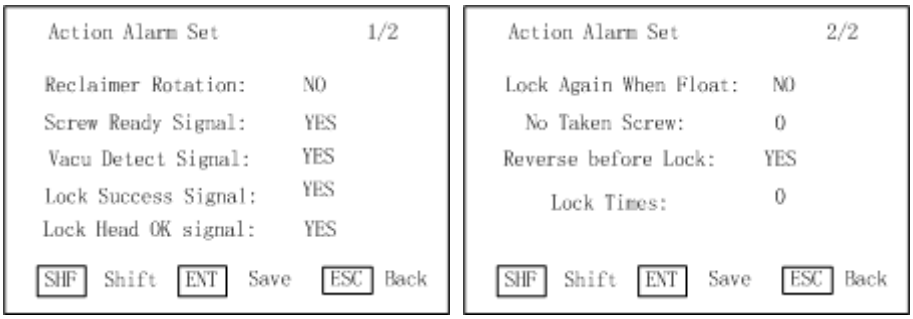
Depth of throw-over: the rotate speed from low to high, “0”express speed is high, not transition.

Open magnet height: height of opening magnet.

Depth of locking screw:the depth of locking screw down.

Safety height: the height of Z axis from last location to the next location.

8.press6: enter intomovement and alarm setting.



Screw rotate: “no”express not rotate;“yes”express rotate all the time.

Prepare signal: detection pretare state of screw provide.

Vacuum testing signal: detection adsorbent state of screw.

Detection OK signal: judge adsorbent state of screw by OK signal.

Reversal times: allow reverse and forward times.

Reverse before lock: yes express before reverse

3.4.3.5 Edit the Teaching File

1. Select a teaching file in the File List Interface and then press **F2** into the Teaching File Manage Interface.
2. In the Teaching File Manage Interface, press **F2** into the teaching file edit interface (Fig. 3-17 & Fig. 3-18).

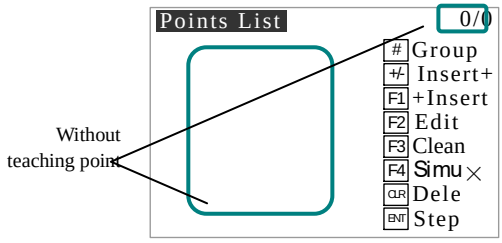


Fig. 3-17: Teaching File Edit Interface1 (null point)

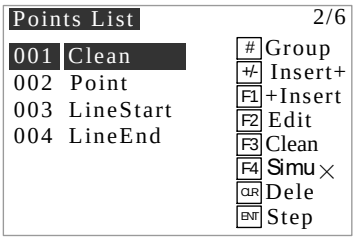


Fig. 3-18: Teaching File Edit Interface2

3. For a new teaching file, it has not any points at the "points list" and needs to insert.
4. In teaching file edit interface, it can do the parameters setting, such as insert, delete, step, simulation etc.

Note: about the clean, it takes effect when has clean point in the file.

3.4.3.5.1 Insert Point

1. It can insert points for the new teaching file or when editing the teaching file. For a new teaching file, it has not any points at the leftside point list.
2. It can do insert point at the front or behind of the selected point.

   [+/-] **"Insert +"**: namely, insert a point at the front of selected point at Points List interface.

   [**F1**] **"+Insert"**: namely, insert a point at the back of the selected point at Points List interface.
3. Firstly, select a point at Points List interface. And then, press [F1] or [+/-] into the "Teaching Insert—Point Selecting Interface" (Fig. 3-19).

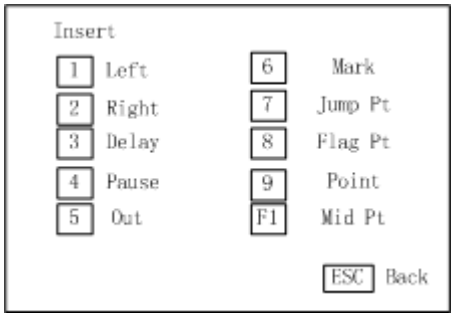


Fig. 3-19: Teaching Insert—Point Selecting Interface

Note: for a new teaching file without any points, it can insert the first point by pressing [+/-] or [F1] at Points List interface.

4. Before saving the edit of point after inserting, it is not finished the inserting. In "Teaching Insert—Point Selecting Interface", it can insert point, line, delay-point, mark-point, pause-point, clean-point, subroutine, output-point etc.
5. About point inserting, it can refer "2.2.1". About line inserting, it can refer "2.2.2".

6. Insert delay point

In the point selecting interface, press button [3] to select "Delay" point, and then it will come into the delay-point setting interface (refer Fig. 3-20). The delay time range is 0~65535ms.

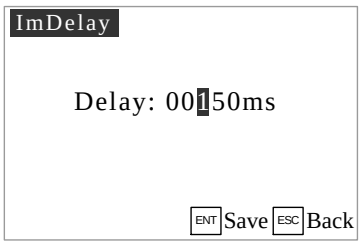


Fig. 3-20: Delay-point Setting Interface

7. Insert mark point

In the point selecting interface, press button 4 to select "Mark" point, and then it will come into the mark-point setting interface (refer Fig. 3-21). Click the button F4 to set the Mark point parameters.

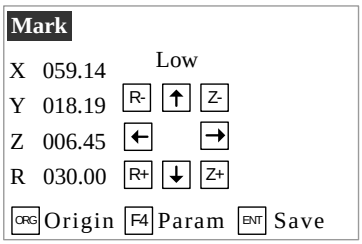


Fig. 3-21: Mark-point Setting Interface

8. Insert pause point

1. In the point selecting interface, press 5 to select inserting "Pause" point, and then it will come into the pause-point setting interface (refer Fig.3-22-1&3-22-2). Now, it can set "**F1 Button To Continue**" or "**F2 Input To Continue**".
2. It will automatic pause during the work after adding a Pause Point in the teaching file.

   < **F1 Button To Continue** >: When the program is paused, it can run the program again by pressing any one button.

   < **F2 Input To Continue >:** When the program is paused, it can run the program again by detecting the corresponding valid input. 0 is low electrical level, 1 is high electrical level.

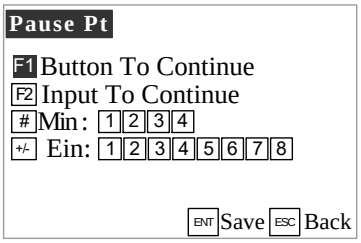


Fig. 3-22-1: Pause-point setting interface1

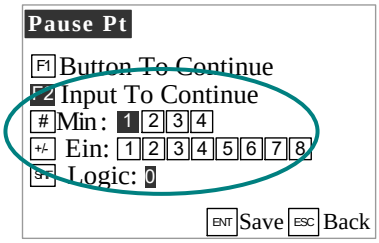


Fig. 3-22-2: Pause-point setting interface2

9. Insert clean point

In the point selecting interface, press button 6 to select "Clean" point, and then it will come into the clean-point setting interface (refer Fig. 3-15).

In clean-point setting interface, it can set coordinate and parameters of clean-point.

10. Insert subroutine

In the point selecting interface, press 7 to select "Subroutine" point, and then it will come into the subroutine-point setting interface.

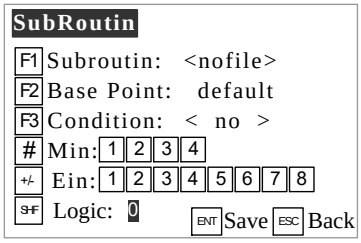


Fig. 3-23: Subroutine-point setting interface

Subroutine inserting must have 2 teaching files at least. It cannot select the teaching file itself as subroutine.

11. Insert output point

In the point selecting interface, press 8 to select "output" point, and then it will come into the out-point setting interface.

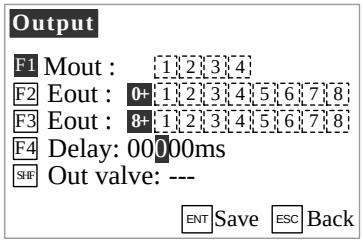


Fig. 3-24: Output-point Setting Interface

a) Output point set can change the output status. Output point can be set to 3 statues, including open (reverse color), close (Solid frame) and constant (Dashed frame).

Reverse color showing the digit: means the output-port is turned on.

Solid line frame showing around the digit: means the output-port is turned off.

Dashed line frame showing around the digit: means the output-port keep the former state.

b) When the delay time is bigger than 0, execute the operation of output-point after delaying the setting time, and then close the operation. If the delay time is 0, change the output-point directly, and then execute the next point.

c) Out valve: it is used to quickly set the out port. Convert the decimal digit to binary system, it set the out port.

For example: Set the out valve as 1(01), the out port is 1.

Set the out valve as 2(10), the out port is 2.

Set the out valve as 6(110), the out ports are 2&3.

Set the out valve as 255(11111111), the out ports of corresponding row all be selected.

12. Insert arc

In the point selecting interface, press 9 to select "Arc" point, and then it will come into the arc-points setting interface. It needs set 3 points to form an arc, including arc-origin-point, arc-middle-point and arc-terminal-point. The setting methods can refer single point.

13. Insert circular

In the point selecting interface, press **10** to select "Circular" point, and then it will come into the Circular-points setting interface. It needs set 3 points to form a circular, including circular-origin-point, circular-middle-point and circular-terminal-point. The setting methods can refer single point.

14. Insert Parameter point

In the point selecting interface, press # to select "param pt", and then it will come into the parameter-point setting interface.

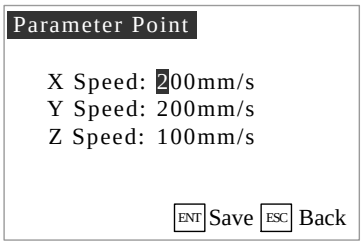


Fig. 3-25: Parameter Setting Setting Interface

15. Insert Polyline

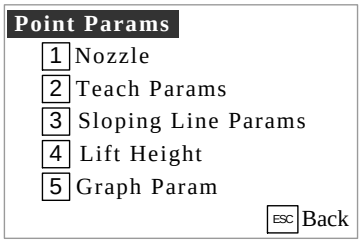
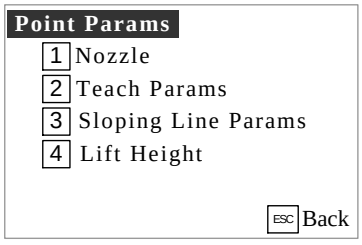
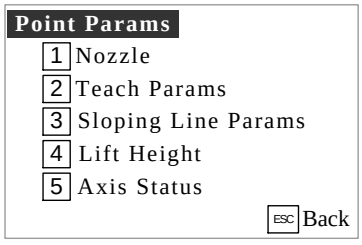
In the point selecting interface, press **F1** to select "Polyline", and then it will come into the polyline setting interface.

It can set the "Line Mid" or "Arc Mid" by pressing **#.**

It inserts many point and two points at least. The last inserting point will become "Line End point".

3.4.3.5.2 Edit Points Parameters

1. Select the point in "Teaching Points List Interface", and then press **F2** button into the "Point Edit Interface".
2. In the "Point Edit Interface", set the coordinate or the parameters of the selected point, and then press **ENT** button to save the changing. If press **SHF** button, it can switch the jogging speed of axis Low⟶ Hi ⟶ Mid .If press **ESC** button, it will not save the change and then returen to the "Teaching Points List Interface".
3. The interface and operations of point, clean point, line are same with the new inserting a point.
4. In the "Point Edit Interface", press **F4** button to edit the parameters of the corresponding point.

Fig. 3-26: Line-start & Line-mid Parameter Setting Interface	Fig. 3-27: Line-end Parameter Setting Interface	Fig. 3-28: Point Parameter Setting Interface
		
* *Line-mid only can set "1 Nozzzle"& "5 Graph Param"*		

5. Mark-point Parameter Setting Interface

Fig. 3-28-1:
Mark-point Parameter Setting Interface (not enable ☒)

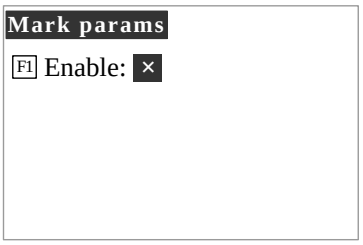


Fig. 3-28-2:
Mark-point Parameter Setting Interface1 (enable √)

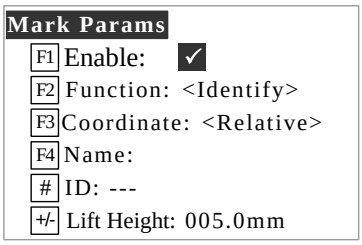
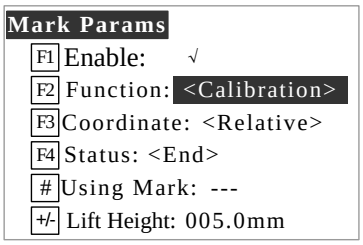


Fig. 3-28-3:
Mark-point Parameter Setting Interface 2 (enable √)



7. Mark parameters setting:

(1) **Mark point**: It needs to select √, or else it cannot be set.

(2) **Identify**: Mark point is an identifying coordinate. In the equipment with visual sensor, collect and save the information of mark-point coordinate and shape. It will not have an affect on the processing.

(3) **Calibration**: Using the Mark-point when processing, compare and figure out the real coordinate of work-point from "Start" to "End". Thereby, it can achieve automatical calibration.

(4) **Absolute**: The coordinate of the mark-point is corresponding with the zero-point and don't change with the calibration or group.

(5) **Relative**: The coordinate of the mark-point is corresponding with the start-point of teaching file and change with the calibration or group.

(6) With Identify function, the mark point parameter setting interface displays "Name, ID". Name is used to looke by the operator, and ID is used to call by the system.

(7) With Mark function, the mark point parameter setting interface displays "Status, Using Mark".

"Using Mark: ---" is the ID of mark point, which is used in calibrating process. System reeds coordinate and shape of the mark point by the ID.

8. Other point parameters setting

(1) Nozzle status: Set the nozzle (the terminal output tip) is opened or closed or keep constant.

Here, for the status, open is "Reverse color", close is "Solid frame" and constant is "Dashed frame".

For example:

Reverse color	Solid frame	Dashed frame
1	1	1

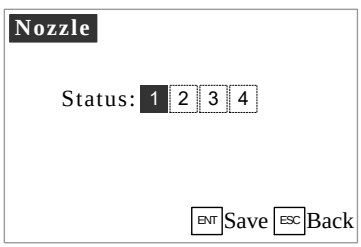


Fig. 3-29: Nozzle Setting Interface

(2) Feed parameters:

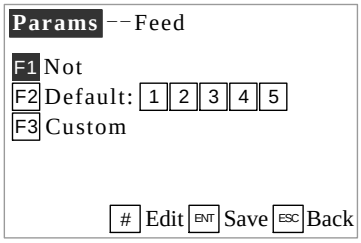


Fig. 3-30: Feed Parameter Setting Interface

Select **F1**: It has not any feeding parameters and cannot be edited.

Select **F2**: It has 5 kinds of default feeding parameters and can be edited by pressing # button. The parameters setting can refer "3.4.3.7.2 Teaching Feeding Parameters Setting".

Select **F3**: It can customize feeding parameters different with default by user and the feeding parameters can be edited by pressing # button. The parameters setting can refer "3.4.3.7.2 Teaching Feeding Parameters Setting".

Example of setting flow:

Press F2 → press one of number button 1~5 → press # → into default parameter setting.

(3) Sloping Line Parameters

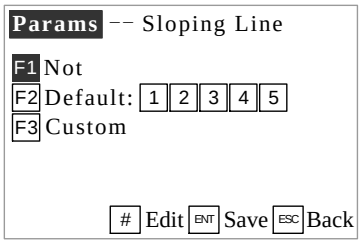


Fig. 3-31: Sloping Parameters Interface

Select **F1**: It has not any sloping line parameters and cannot be edited.

Select **F2**: It has 5 kinds of default sloping line parameters and can be edited by pressing # button.

Select **F3**: It can customize sloping line parameters different with default by user and the parameters can be edited by pressing # button.

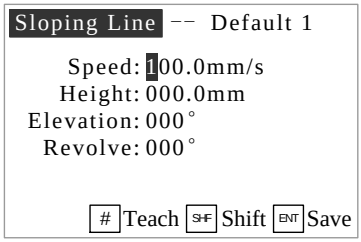


Fig. 3-32: Sloping Parameters Setting Interface

Sloping Line: moving to the specify point with unvertical trace.

Sloping Line Parameters: the parameters that moving to the specify point with unvertical trace.

Sloping Speed: the speed that the terminal output tip obliquly moves to the work point.

Sloping Height: the initial height that the nozzle (namely, the terminial output tip) comes to sloping move.

Sloping Elevation: the angle between the oblique moving trace and work surface.

Sloping Revolve: the angle that the terminial output tip revolving when it comes to oblique move (here, the work surface is treated as rectangular coordinate system).

(4) Lift Height

Z-axis will move downwards before soldering, and Z-axis will move upwards after completed. The distance of Z-axis moving upwards to top is called lift height.

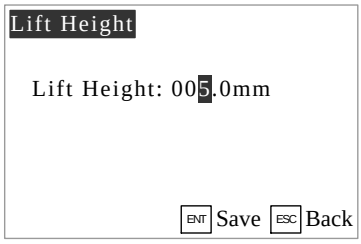


Fig. 3-33: Lift Height Setting Interface

(5) Graph Parameters

It can set graph speed and/or off distance in this interface.

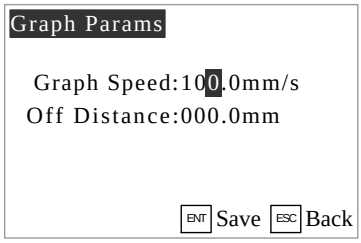


Fig. 3-34: Graph-Parameters Setting Interface

(6) Axis Status

In the axis status setting interface, it can set the axis status of X/Y/Z/R as "*Dynamic*" or "*Static*".

Dynamic: the point coordinate is changed along with the operations of home adjusting, offset or copy etc.

Static: the point coordinate is not changed along with the operations of home adjusting, offset or copy etc.

Press F1 / F2 / F3 / F4 button to change the status of corresponding axis X/Y/Z/R.

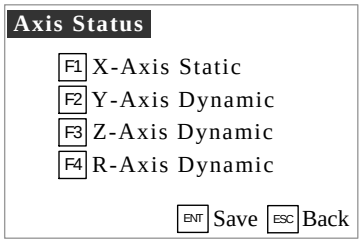


Fig. 3-35: Axis-Status Setting Interface

(7) Clean Time

It can set clean time of clean point in this interface.

3.4.3.5.3 Simulation Setting--- F4 Simu

1. In the "Point Edit Interface", press **F4** button to switch between "Simu ×" and "Simu √".
2. Simu ×: when stepping, only move to the point's coordinate.
   Simu √: when stepping, move to the point's coordinate and simulate the work at the point.

3.4.3.5.4 Step

1. Step can emulate the effect of graphic point moving during teaching and not need to download the teaching file（ignore the non-graphic point）.
2. In the "Point Edit Interface", select the point needing step and then press **ENT** button to do stepping operation. The terminal output tip will move to the corresponding points.

3.4.3.5.5 Delete the selected point

1. If need to delete point in one teaching file, it can select deleted point at the "Points List Interface", and then press "**CLR**" to delete. Before deleting, the system will hint delete or not (Fig. 3-36). Once deleted, it cannot be recovered.

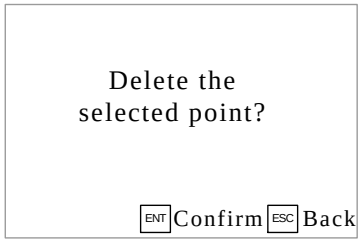


Fig. 3-36: Point Deleting Interface

2. Usually, the delete is for one point. But for line, if delete the line-start or line-end, the whole line will be deleted. If only delete the line-mid, the line will not be deleted.

3.4.3.5.6 Group Edit

By the point group edit, it can copy, array, offset or delete the selected a group of points.

1. In points list interface, press # into the group edit interface.
2. Press Y↑ or Y↓ to select points and then press **ENT**. At the time, the digit at the top right corner will not twinkle.

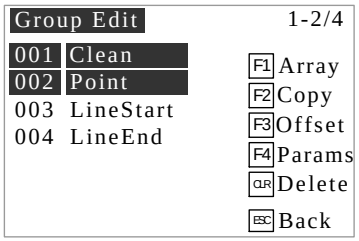


Fig. 3-37: Group Edit Interface

3. Group edit must select an integrated graph or point. If select a unintegrated graph, the window will display "not integrated graph" and cannot do the operation of group array, group copy, group offset etc. Such as for the line, if select the line-start, it must select the line-end, or else, it cannot do the group edit.

4. Array

Group Array: Array arrange to a point or a group of points together. It is also a special copy and can add points or graph in the teaching file.

The array interface and function are same with the "3.4.3.2".

Group Array Order: <Forward>, <Reverse>.

Moving to array order by pressing **Y↑** / **Y↓**, and then press **SHF** to change.

Group Array Mode: <X First>, <Y First> and <By Teach>.

Moving to array mode by pressing **Y↑** / **Y↓**, and then press **SHF** to change. Different array mode, the moving track is different.

5. Group Array Copy

Array Copy: copy a group of selected points together. It can increase the point of the teaching file.

Operation of Array Copy:

① **Select the points**. Select the points by pressing **Y↑** / **Y↓**, and then press **ENT**.

② **Into the group array copying interface**.

Press **F2** into the array copying interface. Here, it displays coordinate of "Copy Base" before setting. It is default, and not need to set.

③ **Set the coordinate of Copy Base.**

Press **GO** moving to the coordinate, and then it displays "Copy Base Setting Interface" and it can set the copy-base.

④ After that, press **ENT** to save and the copied points will be increased into the teaching file.

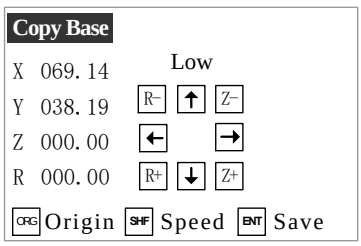


Fig. 3-38: Copy Base Setting Interface

***For example**: coordinate before copying is (036.00, 000.00, 020.00, 065.0), and corresponding coordinate*

before copying is (046.00, 000.00, 020.00, 065.0). So the other points offset (010.00, 000.00, 000.00, 065.0).

⚠***Caution: For the group integrality, array copy only for a whole group. Such as, the line-mid only can be copyed into a line.***

6. Group Array Offset

Array offset: offset a group of selected points together to the other position as the corresponding offset.

It cannot increase the point of the teaching file.

Operation of Array Copy:

① **Select the points**. Select the points by pressing **Y↑** / **Y↓**, and then press **ENT**.

② **Into the group array offset interface**.

Press **F3** into the array offset interface. Here, it displays coordinate of "offset Base" before setting. It is default, and not need to set.

③ **Set the coordinate of Offset Base.**

Press **GO** moving to the coordinate, and then it displays "Offset Base Setting Interface" and it can set the offset-base.

④ After that, press **ENT** to save and the offset points will be increased into the teaching file.

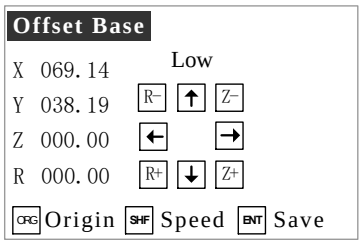


Fig. 3-39: Offset Base Setting Interface

Offset value = the offset base point after going - the offset base point before going

The offset base point after going is new base point and the other points of the group will offset as the D-value between "the offset base point after going" and "the offset base point before going".

☞ Instruction:

Array offset is similar with array copy. They are both move the group of points to the other position. The difference is: the operation of Array offset will not increase points, only move the selected points to the other position. But the operation of Array offset will increase a group of points to the other position and the selected points still are at the former position.

7. Group Parameters

Set the parameters of a group of selected points together.

The parameters include "Nozze", "Teach Params", "Sloping Line Params", "Lift Height", and "Axis Status".

The setting method can refer “3.4.3.5.2”. “Update the selected point parameter?”

8. Group Delete

Group Delete: Delete the parameters of a group of selected points together.

Press “↑ or ↓” to select a group of points, and then press **CLR** to delete. Before deleting, it will hint “delete the selected point?”. If be deleted, it cannot be recovered.

3.4.3.6 Data Check

Data check: it is used to check the route of all the points in the selected teaching file wether in the setting range.

In “teaching file main interface”, press **F3** to check the setting point in the file is correct or not. By data checking, it can protect the axis from colliding because out of the range.

3.4.3.7 File Parameters Setting F4

1. Every teaching file has a series paramerters, including speed, teach, distance, etc. Change these paramerters will affect the effect of soldering.
2. In the parameters setting of System Info, it has set the default parameters. If not do change, the parameter data are default and same with the system information.
3. In teaching file manage interface, press “F4 File Params” button into the teaching parameters manage interface (Fig. 3-40).

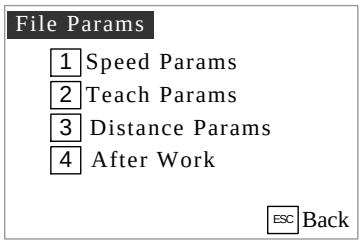


Fig. 3-40: Teaching File Parameters Manage Interface

3.4.3.7.1 Speed Parameters Setting

In speed parameters setting interface (refer to Fig. 3-41), it can the speeds of graph, X-axis, Y-axis, Z-axis, R-axis, accelerated speed and initial speed.

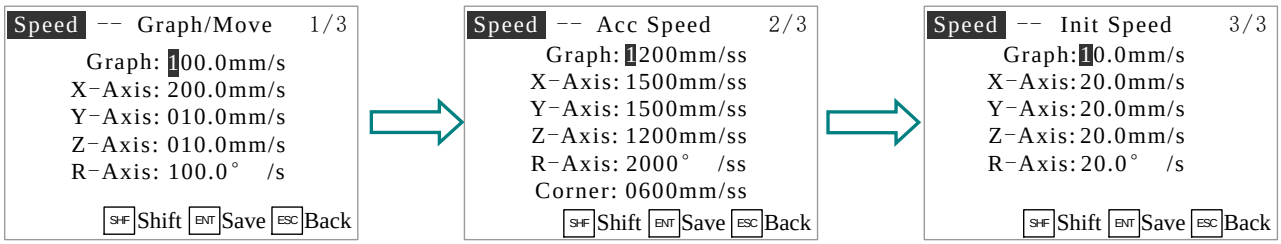


Fig. 3-41: Speed Parameters Setting Interface

Table 3-2: Speed Parameters Description

Parameter	Description
Graph speed:	Speed of graph track. It cannot be set too big.
Axis speed of X/Y/Z/R:	Speed of any one axis moving alone. It cannot be set too big.
Accelerated speed (Acc Speed):	The acceleration of moving from initial speed to high-speed.
Graph accelerated speed:	Accelerated speed of soldering track. It cannot be set too big.
Accelerated speed of X/Y/Z/R:	Accelerated speed of any one axis moving alone. It cannot be set too big.
Corner accelerated speed:	The maximum acceleration when turning. The acceleration effective for a turning movement. Higher turning acceleration will cause a faster turning but a heavier mechanical shock the same time. Lower turning acceleration will lead to a smoother but slower turning. When the turning acceleration is set to be extremely low, glue will be heaped around the turning point. Recommended value is about 600mm/ss.
Initial Speed (Init Speed):	The initial speed of movement. Too big valve maybe cause mechanical shock or unaccurate orientation. It cannot be set too big.

Table 3-3: Button Description

Button	Description
SHF Shift	Shift the parameters' page among the "Graph/Move", "Acc Speed", and "Init Speed".
ENT Save	Save the setting parameters.
ESC Back	Don't save the setting parameters and then return to Teaching File Parameters Manage Interface

3.4.3.7.2 Teaching (feeding) Parameters Setting

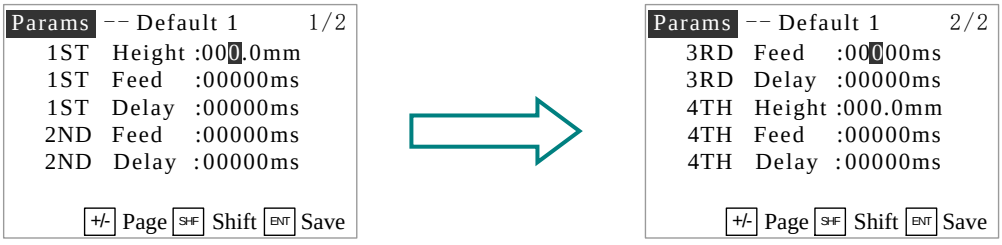


Fig. 3-42: Feeding Parameters Setting Interface

1. In the "Feeding Parameters Setting Interface", it can set feeding height, feeding time, delay time etc. Press "+/-" button to page, and then it can see the other feeding parameters not displaying in page 1.

Table 3-4: Button Description

Parameter	Description
1ST Height	Height of 1st tin on the soldering tip
1ST Feed	Soler-wire length of 1st tin on the soldering tip
1ST Delay	Heating time of 1st prepare to soldering
2ND Feed	Soler-wire length of 2nd tin on the soldering tip
2ND Delay	Heating time of 2nd prepare to soldering
3RD Feed	Soler-wire length of 3rd tin on the soldering tip
3RD Delay	Soler-wire length of 3rd tin on the soldering tip
4TH Height	Lift up height of 4th soldering for avoiding sharp soldering point
4TH Feed	Soler-wire length of 4th tin on the soldering tip
4TH Delay	Heating time of 4th prepare to soldering

2. For line, parameters of "1st height, 1st feed, 1st delay"& "2nd feed, 2nd delay" & "3rd feed, 3rd delay" are the line-start's parameters, and parameters of "4th height, 4th feed, and 4th delay" are the line-end's parameters.
3. There are 5 kinds of feeding parameters and it can switch by pressing **SHF** button. Before switching, it will prompt switch or not?

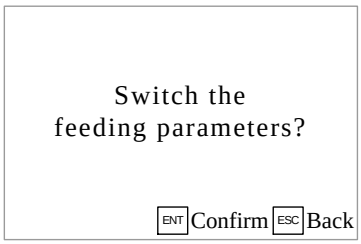


Fig. 3-43: Parameters Switch Prompting Interface

Table 3-5: Button Description

Button	Description
+/- Page	"Page" can read the other parameters not displaying at first page.There are two pages in a group.
SHF Shift	Shift the default parameter group. There are 5 kinds of default parameters.
ENT Save	Save the setting parameters.
ESC Back	Don't save the setting parameters and then return to Teaching File Parameters Manage Interface

3.4.3.7.3 Distance Parameters

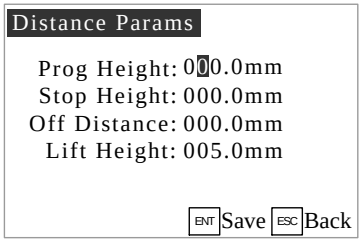


Fig. 3-44: File Distance Parameters Setting Interface

1）Program Height: Lift height during program, usually, set as 0.

For example: press **F2** into the point list interface, edit the points, the height from one point moving to the other point is "Program height".

Setting Range: the moving range of Z-axis. If Z-axis moving range is 0~50mm or 0~100mm, it needs to set among 0~49mm or 0~99mm.

2) Stop Height: When finishing the work, the terminal will lift up to a safety height. Before processing, Z-axis also will move down to the safety height. The height height is stop height.

Setting Range: the moving range of Z-axis. If Z-axis moving range is 0~50mm or 0~100mm, it needs to set among 0~49mm or 0~99mm.

3) Off Distance: During soldering, it close the teminal output before reach the end-point and finish the soldering with the redundant solder. The distance between close terminal output and finish work is "off distance".

4) Lift Height: the height of the teminal lifting up after finishing soldering.

It cannot be set too big or too small. Too big will decrease work efficiency. Too small will cause collide with workpiece.

Setting Range: the moving range of Z-axis. If Z-axis moving range is 0~50mm or 0~100mm, it needs to set among 0~49mm or 0~99mm.

Note: Lift height is only in processing or stepping.

3.4.3.7.4 After Work Setting

Function: set the action and positon of soldering tip finishing process, including "back to start point", "stop at the end point", "back to origin" and "back to the specify point".

In the teaching file parameter manage interface, by pressing "4" button, come into the "After-work-setting Interface".

In the "After-work-setting Interface", it can select one parameter (such as "4 specify point") and set the specify point's coordinate after finishing work, the terminal output tip will return to this point.

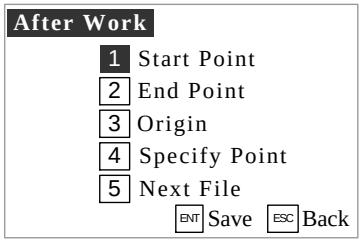


Fig. 3-45: After-work-setting Interface

3.4.3.8 Download Source File

1. In the Teaching-file Manage Interface, press # button, it can download this teaching file into the robot controller. After download completed, it still returens "Teaching-file Manage Interface".
2. After download completed, in "Source File List Interface", it can look the source files in the robot.
3. In the robot, the files are teaching file, other than processing file. At the time, the teaching files in the robot can be laoded by anyone teaching pendant. After that, it can do edit or change parameters again in the teaching pendant.

3.4.4 Copy Teaching File

1. In the Teaching Program List Interface, select a file, and then press F3 button into the File-copying Interface. It can get a new file with different file name. When copying, it needs to input a file name without repeating with the other file's name.

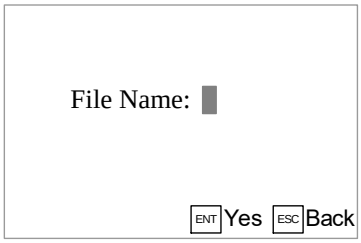


Fig. 3-46: File-copying Interface

2. If the file name is repeated with the other, it will display "input again".

3.4.5 Change File Name

1. In the Teaching Program List Interface, select a file, and then press **F4** into the File-name-change Interface. It can change the teaching file's name. The name is made of digit or character. The changed digit or character shows as reverse color.
2. When inputting the file name, press the same button to input the digit or character, and then press the "→"moving to the next position.
3. After changing, press "**ENT**" to save the file name.

3.4.6 File Delete

In the Teaching Program List Interface, select a file, and then press CLR button into the File-deleting Interface. Before deleting, it will check delete or not? In the File-deleting Interface, press ENT to delete the teaching file.

NOTE: the deleted files cannot be recovered once deleted.

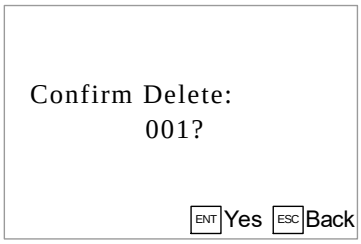


Fig.3-47: File-deleting Interface

3.5 USB Disk Edit

1. **USB Disk Edit:** The system can detect the teaching file in the USB disk, and then download or upload the teaching file in the teaching pendant to the USB disk. By the USB disk edit, it can achieve using one teaching file amonge many teaching pendant and not to be edit to same soldering work.

   ⚠***Caution:***

   - ***During download or upload, USB disk needs to be connected with the teaching pendant, or else, the teaching file download or upload will not be successful.***
   - ***Please not cut off the power supply during update the program for protecting the unit or teaching pendant from damage.***

2. In the Main Menu Interface, press the button 3 to enter the **USB Disk Interface**. And connecting USB disk, the system will detect the USB and displaying as following (Fig. 3-48 & 3-49).

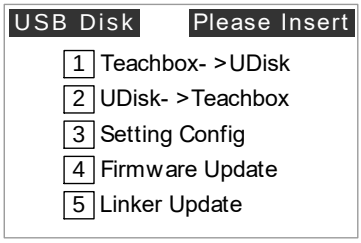


Fig.3-48: USB-Disk-edit Interface1

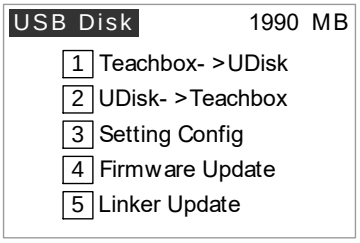


Fig.3-49: USB-Disk-edit Interface 2

3. Teaching File Upload to USB Disk

In USB-Disk-edit Interface 2, Press "**1 Teachbox -> UDisk**" button, and then into the "Uploading to UDisk" interface. Press ↑ or ↓ button to select the teaching file and then press ENT button to upload to the USB disk.

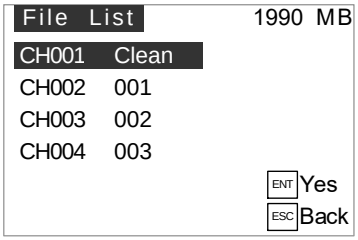


Fig.3-50: Uploading to UDisk Interface

4. Teaching File Download from USB Disk

(1) In USB-Disk-edit Interface 2, Press "2 **UDisk -> Teachbox"** button, and then into the "Downloading from UDisk" interface. Press ↑ or ↓ button to select the teaching file and then press ENT button to download from the USB disk to the teaching pendant.

(2) If has same file's name in the teaching pendant, it needs to change the file name. Only with a different file name, it can download successfully.

5. "3~5 Setting Config, Firmware Update and Linker Update" are used to update the system program.

3.6 Function Test

1. In the Main Menu Interface, press the button 4 to enter the **Test Interface**.

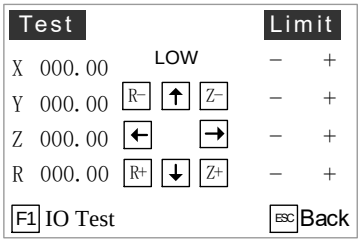


Fig. 3-51: Test Interface

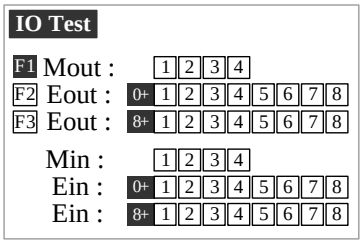


Fig. 3-52: IO Test Interface

2. In the testing interface, it can test the axis' (X/Y/Z/R) moving status whether in normal or not. Press "SHF" button to switch the jogging speed of axis, LOW-HI-MID. Pressing "Navigation-Button" will move to the corresponding point. Press "Digit-Button" to input the coordinate of testing point and then press GO button moving to the corresponding point.
3. In the testing interface, it can test the IO ports' status whether in normal or not. Press F1 button to the "IO Test Interface". Each IO port has two statuses, reverse color showing means open and solid line showing means close.

Example: press F1 and then press corresponding digit-button (such as 1) can change this IO port's status.

4. Press "ORG" key to test whether the terminal output tip return back to the zero point (0, 0, 0, 0) or not.

3.7 System Information

1. In main interface, press 5 into the system information interface.
2. In the system information interface, it can look the sytem information (such as device, teach version, firmware, X/Y/Z/R-axis range, pulse, max speed etc.) by pressing +/- button.
3. The information may be have some different because of different version.

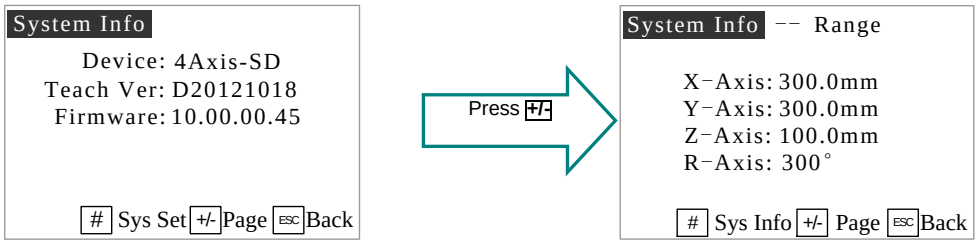


Fig. 3-53: System Information Interface

Note: the axis range and max speed is decided by the mechanical performance. The value cannot bigger than the system value when editingt these parameters.

4. Press # into the system parameters setting interface. It needs to input the right password "888888"after pressing #. The system parameters are global parameters. The change will cause the change of teaching file parameters.

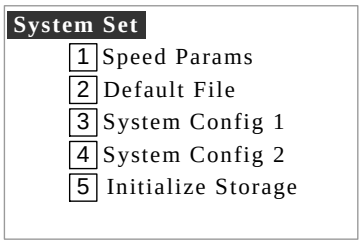
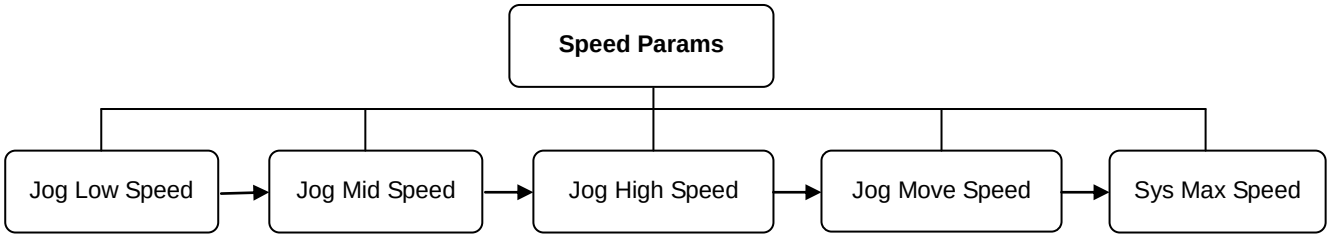


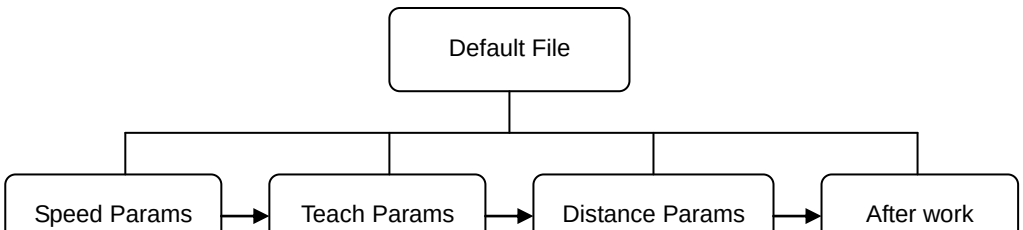
Fig. 3-54: System Parameters Stting Interface

(1) Speed parameters



In the speed parameters setting interface, there are 5pages parameters, including "Jog low speed", "Jog Mid Speed", "Jog High Speed", "Jog Move Speed" and "Sys Max Speed". Press **SHF** to switch between parameter-pages. It can set speed & accelerated speed of axis at parameter-pages.

(2) Default File



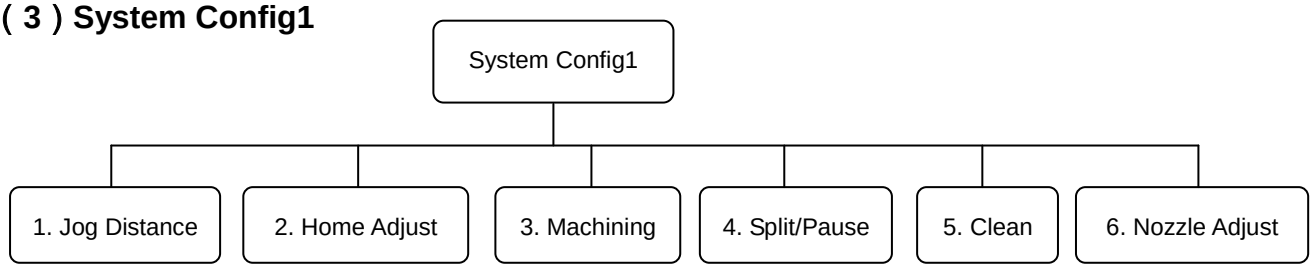
The setting method can refer “3.4.3.7”.

The difference is that, the setting parameters in system information are for all teaching file new inserting, not for the single teaching file. And the system parameters can be changed when edit the single teaching file.

“Teach Params”: parameters setting can refer “3.4.3.7.2”.

“Return Distance” of “Distance Params”: only under “feeding controlled by the pulse”, and parameters setting can refer “3.4.3.7.3”.

（3）System Config1



Set Jog Distance:

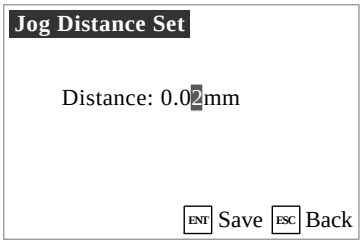


Fig. 3-55 Jog Distance Setting

In this interface, it can set jog distance, which is the moving distance of axis when click the axis button X/Y/Z/R at low speed.

Set “Home Adjust”:

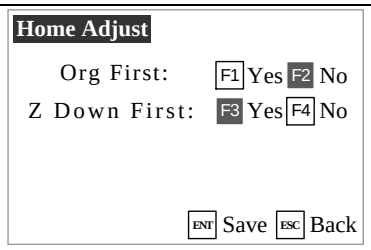


Fig. 3-56 Home Adjust Setting

Set "Machining":

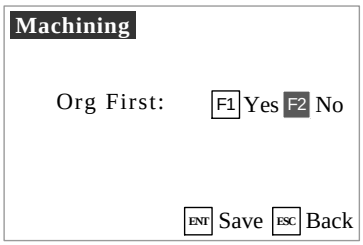


Fig. 3-57 Machining Setting

Set "Split/pause":

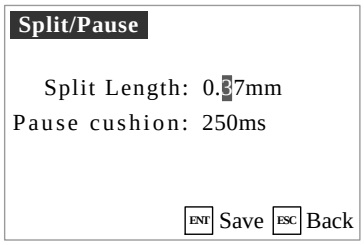


Fig. 3-58 Split/Pause Setting

Split length: the parameter can be used at soldering track along a graph. The length is less, the moving is more stable.

Pause cushion: when the load is overweight, it can set bigger pause cushion time to avoiding slam the brake on.

"Clean Set":

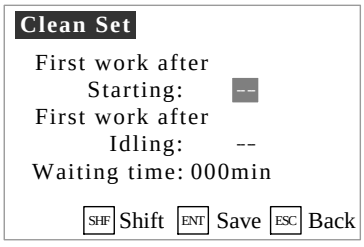


Fig. 3-59 Nozzle Clean Setting

① There are 2 options under the menu interface "Clean Set": ①"First work after starting", ②"First work after idling" .

② Press SHF button, it can set "--" or "Clean". "--" means don't clean the tip or nozzle.

③ "First work after idling" can set the "waiting time". Only the interval "waiting time" between two works is bigger than the "setting waiting time", it can carry out the clean.

"Nozzle Adjust":

It is used to adjust the nozzle's position and it can be set as "Enable" or "Disabled".

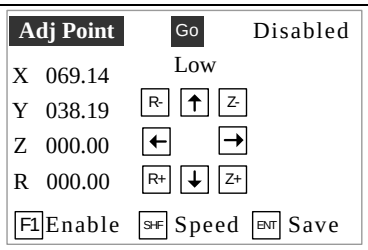


Fig. 3-60 Adjusting Point Setting

Only when the status is “Enable”, it can run the “Nozzle Adjust” at “Processing File Manage Interface”.

（4）Initialize Storage

If select “initialize storage” by pressing **5** in system setting information, it will formate the system and displays “will lost all files, Initialize or not?”

Please do the operation prudently.

Before initializing, the window will display whether initialize. Here, press **ENT** button to do “initialize storage” or press **ESC** to cancle the operation.

3.8 Source File List

1. The files in the source file list are “teaching files” storing in the robot controller. The source files are not processing files, and cannot do processing.
2. Source files in the source file list can download from Teaching-file Manage Interface as “3.4.3.8 download source file”.
3. Source files in the source file list can load to the teaching pendant, and then do edit the parameters in the teaching pendant.

4. Trouble Shooting

1. Displaying “please reset”

1）The emergency switch has been pressed down.

- Please check the emergency stop.

2）The communication cord doesn’t connect well.

- Please check the communication cord connecting.

3）The button of teaching pendant is in malfunction.

- Please check the button or contact with our company.

2. Displaying unusual after power on

1）the version of hardware is not fitting.

Please check the version of teaching pendant and the PCB.

2）it may be pull or connect the teaching pendant after power on

If the teaching pendant cannot communitcate normal and the LCD display is little dark. Please cut off the power supply and then connect the teaching pendant again.

Suggest not connect or pull out the teaching pendant after cutting off the power supply.