screw machine handle

Operating instructions

Version number:V20210510-1

Updated: 2021.05.10

Shenzhen Jinghe Technology Co., Ltd.

CONTENTS

User's Guide

1.1 Create or open a new project file

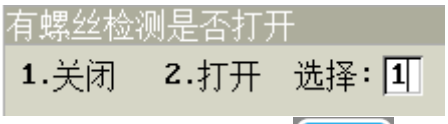
After the initialization of a new machine or system that has not been programmed, the handheld programmer will first enter the "Setting Screw Hole Coordinates and Programming" window after the machine is turned on and powered up. By default, the system opens the project file with file number "000" and workpiece name "Workpiece 000", and you can program the current file directly.

How to create or open a project file? In the window of "Setting Screw Hole Coordinates and Programming", press 切换 to switch the cursor to the icon in the "Shortcut Menu and Status Bar", press 确定 to open it, and then enter "File No." (range 0~999) in the pop-up input box, and then press "OK" to confirm, and then an editable "Workpiece Name" input box will pop up. (range 0~999), and then press "OK" to confirm, then the editable "Workpiece Name" input box will pop up, users can change the "Workpiece Name" according to their own needs. Finally, press the "OK" button. At this time, there are two situations: ① If there is a project file corresponding to the file number, then directly open an existing project file. ② If there is no project file corresponding to the file number, then create a new blank project file, and automatically set the new project file "file number" for the input box to enter the number, "workpiece name" for "workpiece +" (for example: "workpiece + file number"). file number" (e.g., if there is no corresponding project file for the input file number 666, the file number of the new project file will be "666" and the name of the workpiece will be "Workpiece 666").

1.2 Configuration of machine motion-related parameters

After the system is turned on, some basic parameters related to machine movement need to be configured according to the working conditions of the machine. For example: "whether to open with screw detection", "electric batch torque detection and alarm", "motion-related time and delay", "motion-related height and length", "speed and acceleration".

Press 导航界面 shortcut key to enter the "navigation interface", move the cursor to



有螺丝检测是否打开 > option by pressing 向下 and 向上 keys, and press 确定 key to pop up the window of "whether to open the screw detection", such asFigure 0 .1 As shown in Figure 1.1, this window is related to whether "Screw Detection" is turned on or off, if it is turned on, the system will detect whether there is screw supply from the feeder, if there is screw supply from the feeder, the system will detect "Screw Signal" is valid, if there is no screw supply from the feeder, the system will not detect "Screw Signal". If the feeder has a screw supply, the system will detect whether the feeder has a screw supply, if the feeder has a screw supply, the system will detect that the "screw signal" is valid.

Figure 0 .1 "Screw detection open or

When the "Screw Detection" is "on": ① If the machine adopts the "suction" method of picking up materials, the machine must detect whether the "Screw Signal" of the screw supply machine is valid (valid means the screws are ready) or not, if the "Screw Signal" is invalid, then the machine will be in a waiting state until the screws are ready. Supply machine "screw signal" is valid (valid means that the screws are ready), if the "screw signal" is invalid, then the machine will be in a waiting state does not move, until the "screw signal" is valid before the machine will go to take the screws; ② if the machine is used "blowing" feeding method, the machine in the screws before playing the screws must be detected before the screw supply machine "screw signal" is valid (valid then), that that the screws have been blown out), if the "screw signal" is invalid, then the machine will have been in a waiting state does not move until the "screw signal" is valid, the machine will perform the back of the screw action.

When the "Screw Detection" is "off": ① If the machine adopts the "Suction" method of picking up materials, the machine ignores the "Screw Signal" status of the screw feeder every time it picks up screws. The machine ignores the screw feeder's "screw signal" and picks up screws directly. ② If the machine adopts the "blowing"

method of feeding, the machine ignores the "screw signal" state of the screw feeder every time it goes to fetch screws and goes to fetch screws directly before it punches screws.

Press 导航界面 shortcut key to enter the "navigation interface", move the cursor to 电批扭力检测与报警 > option by pressing 向下 and 向上 keys, and press 确定 key to pop up the window of "Warrant Torque Detection and Alarm", such asFigure 0 .2 As shown in Figure 1.2, this window is related to the presence or absence of "Torque Detection" and whether "Alarm" is on or off. If there is "torque detection", the batch will detect the size of the batch torque during the screwing process, and if the torque reaches the set value, the system will detect the "blocking signal", which indicates that screwing is completed; if there is no "torque detection", the batch will detect the torque during the screwing process, and the system will detect the "blocking signal" if the torque reaches the set value. Detection", the electric batch will not detect the size of the electric batch torque in the process of screwdriving.

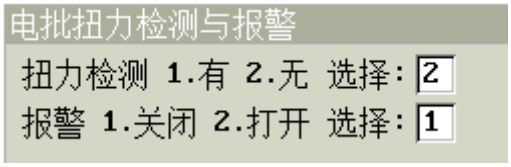


Figure 0 .2 The "Wrench Torque

Move the cursor to the 运动相关时间与延时 > option by pressing 向下 , 向上 , and press 确定 to bring up the "Motion Correlation Time and Delay" window, as shown in Figure 1.3.Figure 0 .3 As shown in Figure 1.3, the first page of this window involves four parameters, namely, "Screwing time", "Delay time after screwing", "Delay time after taking (blowing) screws" and "Float lock time". The four parameters are

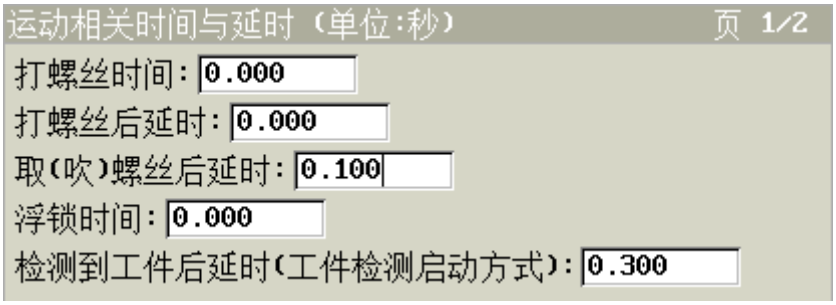


Figure 0 .3 Window "Motion-dependent time and delay" on page 1

Knowing how the above 2 windows open, some of the parameters involved are interrelated and cannot be viewed in isolation, their different configurations will constitute many different kinds of motion logic. We can switch between the different input boxes by pressing 向下 and 向上 and enter the "numeric keys" to edit the parameters.

Here we look at the different configurations that produce different motion logics:

When the machine takes a screw, after waiting for the length of the "delay after taking (blowing) the screw", the head of the electric batch will move to the screw holes, and the machine "presses down" to hit the screws, what is the current screwing " End condition"? In fact, this "end condition" and "screwing time", "torque detection" with or without, "alarm" on or off these three configurations. The "end condition" is related to three configuration parameters: "Screwing time", "Torque detection" or not, and "Alarm" on or off. ①When "Torque Detection" is in the state of "No", the torque of the electric wrench will not be detected during the process of screwing, and the time of turning on the electric wrench will be the time of "Screwing Time", for example, "Screwing Time" will be the time of turning on the electric wrench. For example, "screwing time" time for 0.5 seconds, then, when the head of the electric batch to move to the screw holes, the machine "downward pressure" moment at the same time open the electric batch, at this time, regardless of the electric batch head "downward pressure "to where, regardless of the machine is relying on the Z-axis motor" downward pressure "or by the cylinder" downward pressure "and so on time to reach 0.5 seconds, at this time, the machine that playing screws has been completed, and then immediately shut down the electric batch, and then open the "Screwing delay" this time timing, and so reached the "screwing delay"

time directly after lifting the head of the batch. ②What was analyzed just now is when "Torque Detection" is in the state of "No", and next, when "Torque Detection" is in the state of "Yes", then, analyze the "Torque Detection". " state, at this time, the time to turn on the electric batch is not necessarily equal to the "screwing time" time, such as "screwing time" time for 0.5 seconds, then, when the electric batch head to move to the position of the screw holes, machine "downward pressure" moment at the same time open the electric batch, in the time to reach 0.5 seconds before, if the middle of the time to reach 0.3 seconds when suddenly detected that the electric batch torque is too large, that is, there is a "blocking signal", at this time, regardless of the electric batch head "downward pressure" to where the "screwing time" time. downward pressure" to where, also regardless of the machine is relying on the Z-axis motor "downward pressure" or relying on the cylinder "downward pressure", the machine thinks that the current playing screws have been completed, so immediately turn off the electric batch (the process of the electric batch is only open for 0.3 seconds), and then turn on the electric batch 0.3 seconds), and then open the "screwing delay" this time timing, and so reached the "screwing delay" time directly after lifting the head of the electric batch. **(3)**The previous two analyses were done when the "Alarm" was in the "Off" state, and now the "Alarm" is analyzed to be in the "On" state. Now analyze the state of "Alarm" in "Open". When the "alarm" is in the "open" state, if the "torque detection" is in the "no" state, then the alarm is meaningless and can be analyzed. Then the alarm is meaningless and can be ignored. Now we are going to analyze the situation where "Alarm" is "Open" and "Torque Detection" is "Yes". There are two kinds of alarms, one is the floating lock alarm, a slippery teeth alarm, as long as there is an alarm, the machine will stop immediately, while the handheld programmer programmer's LCD display and the machine on the OLED LCD display shows the alarm prompt information. First analyze the floating lock alarm, when the "blocking signal" time is less than or equal to the "floating lock time", it is considered to be floating lock alarm, for example, "screw time" set to 0.5 seconds, "floating lock time" is set to 0.2 seconds, when the electric batch is opened to play screws, if the "blocking signal" is detected in 0.1 seconds, then the machine immediately stops while displaying the floating lock alarm. Then analyze the slippery teeth alarm, when the time to open the electric screwdriver has reached the "screwing

time" when not yet detected "blocking signal", it is considered slippery teeth alarm, for example, "screwing time For example, "screwing time" is set to 0.5 seconds, when the batch is opened for screwing, if the "blocking signal" is not detected for more than 0.5 seconds, then the machine will immediately stop and display the slippery teeth alarm.

In the window of "Motion related time and delay", you can see that there is a parameter "Delay after detecting workpiece (workpiece detection start mode)", which is used for the machine running in the "Workpiece detection start" mode. For the "workpiece detection startup" mode, after the system detects the workpiece through the "workpiece detection sensor", it will set the length of time that the corresponding Y-axis will be in the stationary state, in order to allow the user to have enough time to fix the workpiece.

Press 向下 , 向上 or 上页 , 下页 to go to page 2 of the "Motion Related Time and Delay" window. The meanings of the time parameters on this page are described in detail:第 3 章 **Description of the** navigation interface Chapter 3 Navigating the Interface **3.8 Motion-related time and delay** .

Press 导航界面 shortcut key to enter the "navigation interface", move the cursor to 运动相关高度与长度 > option by pressing 向下 and 向上 keys, and press 确定 key to pop up the window of "Motion Related Height and Length", as shown in Figure 1.4.Figure 0 .4 This is shown in Figure 1.4. The configuration of the two

Figure 0 .4 "Safe Height and Follow-Up Depth

parameters "Safe Height Above Screwing" and "Safe Height Above Screwing" in this window is related to the safety of the machine in the process of movement, to avoid hitting the workpiece or the feeder in the process of picking up screws and screwing.

The "safe height above the screw" refers to the absolute height from the lowest screw hole on the workpiece to the highest point on the surface of the workpiece; "safe height above the screw" refers to the absolute height from the screw position on

the feeder to the highest point on the surface of the feeder. The setting of these two safety height parameters is to avoid the machine's electric batch head touching the workpiece or the screw feeder's "protruding part", each time before taking screws, after taking screws, before playing screws, after playing screws, must first let the machine's electric batch head in a position higher than the workpiece or feeder's "protruding part", and then let the machine's electric batch head in a position higher than the workpiece or the feeder's "protruding part", and then let it be a safe height. protruding part" of the workpiece or reclaimer before allowing the X-axis and Y-axis to move, otherwise, the machine's electric batch head will hit the workpiece or reclaimer. Once the user has set these two parameters, the machine system will automatically calculate the position of the batch head according to the "feeder position coordinates" before taking screws, and after taking screws; according to the "coordinates of the lowest screw hole on the workpiece" to automatically calculate the position of the batch head before hitting screws, and after hitting screws. (Note: The setting of the safety height is related to the setting of the safety height. (**Note**: The setting of the safety height is related to the "downward pressure screwing method" and the hole setting method when setting the screw hole coordinates, etc. Generally, the highest point of the "protruding part" is taken as the benchmark, and it is safer to adjust the height a little bit).

The schematic diagram of the machine after removing the screws to punch the screws is as followsFigure 0 .5 Figure 1.5: Diagram of picking up the screws after the machine picks up the screws.Figure 0 .6 Figure 1.6

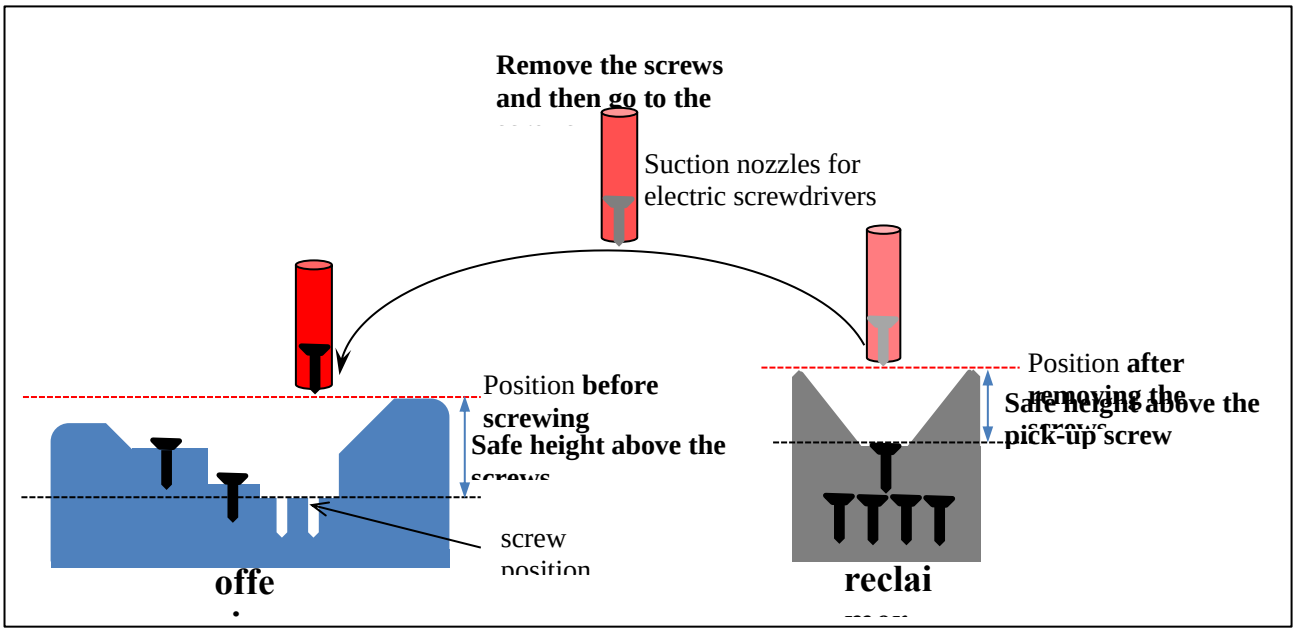
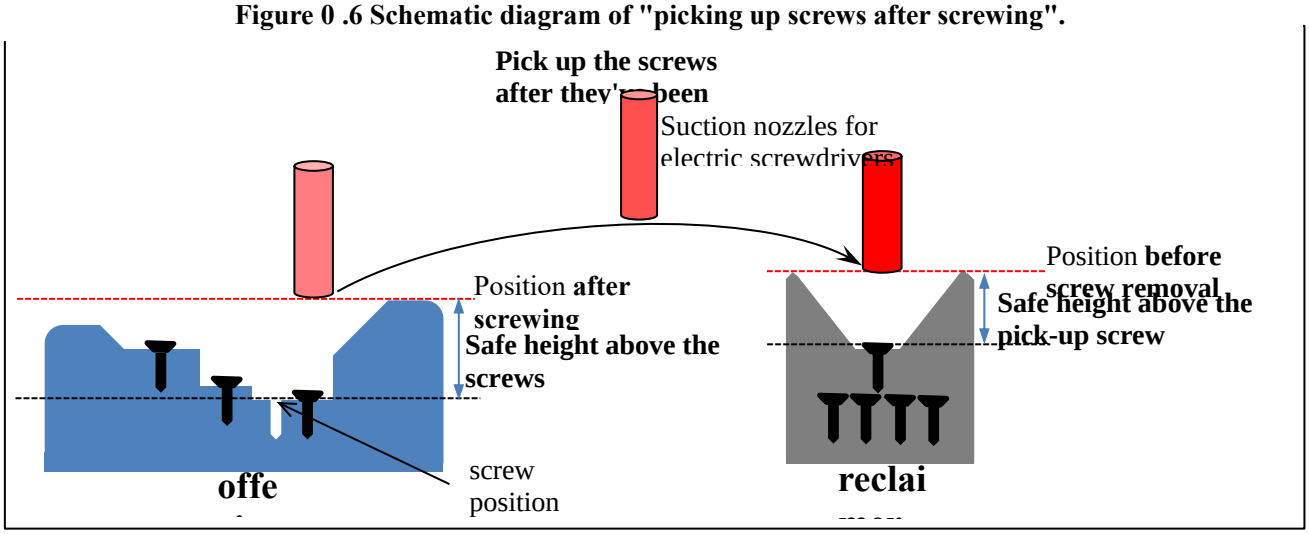


Figure 0 .5 Schematic diagram of "Taking the screws and screwing them".

Figure 0 .6 Schematic diagram of "picking up screws after screwing".



Note: ①The above schematic diagrams of "picking up the screws and then screwing" and "picking up the screws after screwing" are for the "suction" type of feeding machine. ②When using the "blowing" type material supply machine, you only need to configure the "safe height above the screw" parameter, even if you configure the "safe height above the screw" parameter, it will not be effective. Even if "Safe Height Above Screw Taking" is configured, it is not effective.

In the window of "Motion-related height and length", you can see that there is a parameter of "Follow-up length (Z-axis motor down-pressing mode)", which is bound to the parameter of "Follow-up speed (Z-axis motor down-pressing mode)" in the option of "Speed and acceleration" in the "Navigation interface". This parameter is

bound together with the "Follow-up speed (Z-axis motor down-pressing method)" parameter in the "Speed and acceleration" option, and you need to set these two parameters when the down-pressing screwing method is "Z-axis motor down-pressing". You need to set these two parameters when the downward screwing method is "Z-axis motor downward".

So press 导航界面 shortcut to enter the "navigation interface", by pressing 向下 , 向上 key to move the cursor to the 速度与加速度 option, press 确定 key will pop up the "speed and acceleration" window, such asFigure 0 .7 The "Velocity and Acceleration" window will pop up as shown in Figure 1.7.

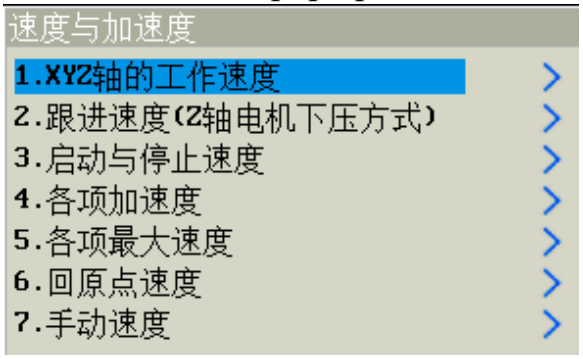


Figure 0 .7 "Velocity and Acceleration

Then press 向下 and 向上 to move the cursor to the "Follow-up speed (Z-axis motor pressing down mode)" option, and press 确定 to pop up the

corresponding setting window, as shown in Figure 1.8.Figure 0 .8 The corresponding setting window will pop up, as shown in Fig. 1.8.

Figure 0 .8 Window "Follow-up speed of Z-

However, whether this parameter is set or not depends on whether the "downward screwing m · is "Z-axis motor downward pressure" or "pneumatic downward pressure". When the first "Z-axis motor downward pressure" is used, both "Follow-up speed (Z-axis motor downward pressure method)" and "Follow-up length (Z-axis motor downward pressure method)" need to be set at the same time, and neither can be set to zero. ②When using the second type of cylinder "pneumatic press down", the parameters "Follow-up speed

(Z-axis motor press down)" and "Follow-up length (Z-axis motor press down)" are invalid and do not need to be set. "parameters are invalid and do not need to be set.

In the "Speed and Acceleration" window, you can see the parameter "XYZ axis working speed", which is the speed that the XYZ motor axes usually work at. In dual Y-axis mode, the speed of Y1 and Y2 are both the speed of Y-axis, that is to say, the working speed of Y1 and Y2 are the same in normal times, and the parameters of Y1 and Y2 cannot be set separately. The parameters of "Start and Stop Speed, Acceleration, Maximum Speed, Home Speed, Manual Speed" under this window need to be configured by providing the password of the machine, which is usually set by the manufacturer's professional staff.

1.3 Programming Machine Motion Ideas

The machine is able to perform a variety of flexible logical movements according to the user's specific needs because after running the machine by pressing the 

key, all the machine's movement steps strictly follow the instructions in the "Programming Area" of the "Setting Screw Hole Coordinates and Programming" window, from top to bottom. All the steps of the machine's movement follow the instructions in the "Programming Area" of the "Setting Screw Hole Coordinates and Programming" window, strictly from top to bottom.

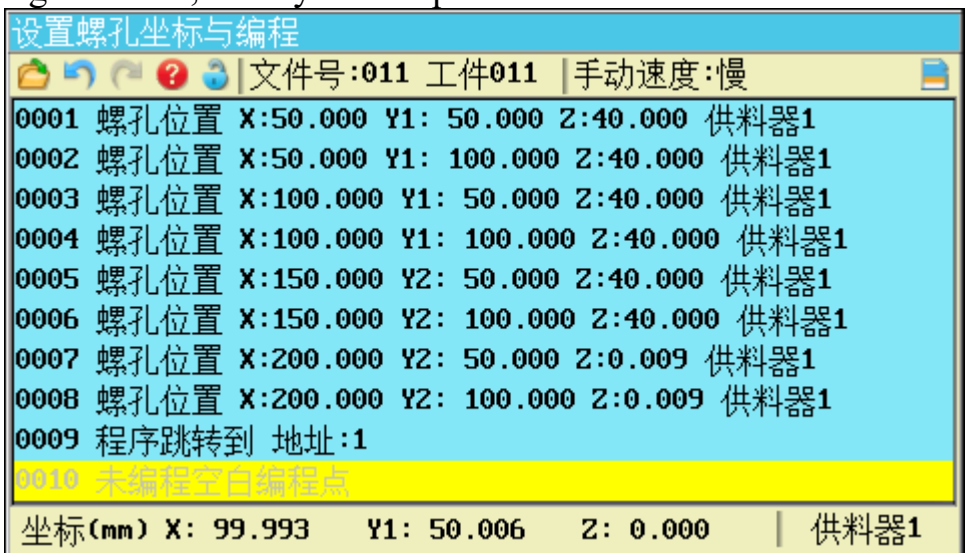


Figure 0 .9 "Setting the screw hole coordinates and programming" window

For example: dual Y-axis machine (four-axis machine) each Y-axis fixture plate were fixed on the two workpieces, each workpiece has two screw holes, to the eight screw holes to play screws, in the "Programming Area" to set the screw hole

coordinates (see.):**0User's Guide** Chapter 1 User's Guide **1.6 Setting the screw hole coordinates**), as shown inFigure 0 .9 Figure 1.9 shows. In the "programming area" from top to bottom there are 9 lines of content (i.e., "programming points"), the machine scans from top to bottom, for example, when scanning to the first line of content "0001 Screw hole position X: 50.000 Y1. 50.000 Z:40.000 feeder 1", the machine will know that this screw hole to play screws, so the electric batch from the "feeder 1" to take the screws, and then in the corresponding position to play screws; when scanning to the contents of the ninth line "0009 program When scanning the contents of line 9 "0009 program jump to address:1", the program will jump to the programming point with address 1, and continue to drive screws in the down cycle. Of course, more instructions can be inserted in the "Programming Area" to accomplish more complicated functions.

From the example above, there are 2 problems:

Question 1: The "Programming Area" shows 8 rows of screw hole coordinates and the corresponding feeder, but does not show the position information of the "feeder", how does the electric batches pick up the screws from the feeder? At this point, the user has to do the corresponding settings according to the way the machine feeds: ① If the machine adopts the "suction" feeding method, the coordinates of the feeder must be set first. Before the machine screws, the electric batch will be moved to the feeder coordinates of the feeder, through the compressed air generated by the adsorption force from the feeder to get the screws, and then hit the screws. In fact, the feeder coordinates are hidden in other windows, to open or set the coordinates of this window, just press 导航界面 shortcut to enter the "navigation interface", move the cursor to the "Set Feeder Coordinates" option by pressing 向下 , 向上 , and then press 确定 to pop up the "Set Feeder Coordinates" option. "Set feeder coordinates" window will pop up, and then select the feeder to be set to set (see details.):**0User's Guide** For more information, please refer to the following section. **1.4.1 Aspirated Feeding** (The machine is designed for "Blow" feeding.) ②If the machine is "air blowing" feeding method, there is no need to set the coordinates of the feeder. Before the machine drives the screws, the feeder will blow the screws to the head of the wrench through the thrust force generated by the compressed air, and the wrench will

move directly to each screw hole to drive the screws directly (see details in Chapter 1.):**0User's Guide in 1.4.2 Blowout Feeding**).

Question 2: Where do all the other instructions inserted come from? During the programming process, according to the needs of the function, the user can just insert the corresponding instruction through the shortcut instruction key on the handheld programmer or the 更多指令 tuv 8 key (for details, see:**0User's Guide** Chapter 1 User Operation Guide **1.7 insertion instruction**).

1.4 Screw machine feeding (screw) method

1.4.1 Aspirated Feeding

Machine working principle: Before the machine hits the screws, the electric batch will move to the coordinates of the feeder, and through the adsorption force generated by the compressed air, the screws will be adsorbed in the electric batch head, and then the screws will be hit.

The feeder coordinates are set as follows:

Initialize the coordinates of the machine's axes by first pressing 回原点 to return to the home position.

Put the screw feeder in a suitable position under the X-axis beam of the machine, through ← X , X → , Z ↑ , Z ↓ four keys, the machine's "electric batch pickup end" to move to the feeding position of the screw feeder (manual movement speed can be switched to "fast, medium, slow" speed by pressing the 手动速度 key), and then press shortcut key to enter the "navigation interface". At this time, press 导航界面 shortcut key to enter the "navigation interface", by pressing 向下 , 向上 key to move the cursor to 设置供料器坐标 > option, press 确定 key will pop up the "set the coordinates of the feeder" selection window, such asFigure 0 .10 The "Set Feeder Coordinates" selection window will pop up by pressing , as shown in Figure 1.10.

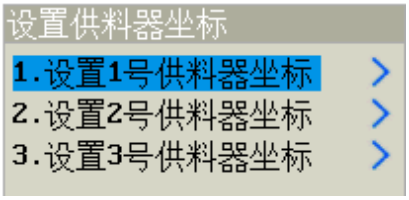


Figure 0 .10 Selection window "Set feeder

For example, if we select "1. Set No. 1 Feeder Coordinates", the "Set No. 1 Feeder Coordinates" window will pop up, as inFigure 0 .11 The "Set Feeder 1 Coordinates" window pops up, as shown in Figure 1.11. The window shows the No. 1 feeder "original set coordinates" (that is, the No. 1 feeder in the previous position, and the Y-axis parameters have nothing to do), if you need to change the No. 1 feeder "original set coordinates" to "current coordinates", just need to change the "original set coordinates" to "current coordinates", just need to change the "original set coordinates" to "current coordinates". If it is necessary to change the "originally set coordinate value" of feeder No. 1 to the "current coordinates", simply press the 确定 key to change it over, and the window will exit automatically. In order to verify that the change has been made, go to the "Set Feeder Coordinates" option again and select "1. Set Feeder 1 Coordinates", and in the window you will find that the X-axis and Z-axis coordinates have been changed to the current real-time coordinates. Setting the coordinates of feeder 2 and 3 is done in the same way as setting the coordinates of feeder 1.

Note: ①**If** the machine adopts the "blowing" type of feeding method, it is not necessary to set the coordinates of the feeder (even if it is set, it is invalid). The system can support 3 feeders. In the "suction" feeding mode, if the machine is fed by only one feeder, you only need to set the coordinates of feeder No. 1; if the machine is fed by two feeders, you only need to set the coordinates of feeders No. 1 and No. 2; if the machine is fed by three feeders, you need to set the coordinates of feeders No. 1, No. 2 and No. 3. If the machine uses 3 feeders, you need to set the coordinates of feeders 1, 2 and 3.

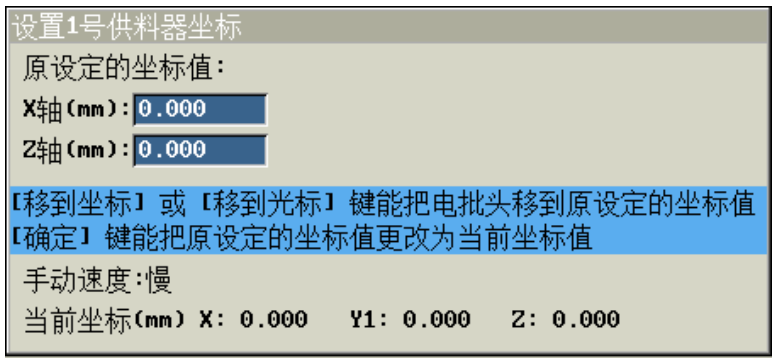


Figure 0 .11 "Setting the coordinates of feeder No. 1" window

1.4.2 Blowout Feeding

Machine working principle: before the machine screws, the feeder through the compressed air generated by the thrust, the screws will be blown to the head of the electric batch, and then the electric batch will be moved directly to each screw hole position to directly hit the screws.

The related parameters are set as follows:

Press 导航界面 shortcut key to enter the "navigation interface", move the cursor to 运动相关时间与延时 > by pressing 向下 , 向上 key or pressing 上页 , 下页 key to quickly flip the page, press 确定 key to pop up the "Motion related time and delay (unit: second)" window.

Turn to page 1 by pressing 上页 , 下页 , as shown inFigure 0 .12 Figure 1.12

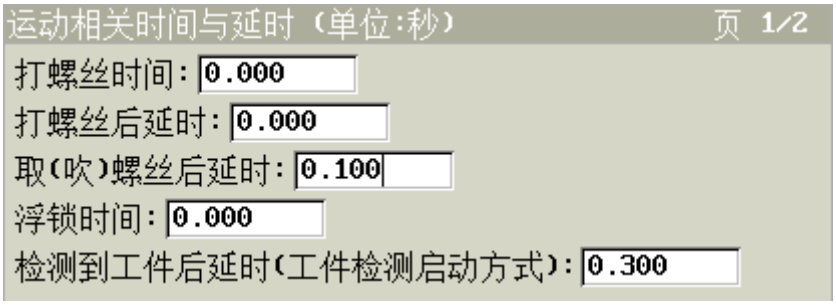


Figure 0 .12 "Motion-dependent time and delay" window, page 1

The relevant parameters to be set in page 1 are:

Delay time after taking (blowing) screws: This parameter is generally required to be set when blowing the air supply, the machine will send a request screw signal before hitting the screws, and the screws will be blown by the compressed gas from the feeder, and transmitted in the pipe with a certain transmission distance, and it will

take a certain amount of time for the screws to be sent to the head of the electric batch to be locked and paid.

Then press 下页 and 向下 to move the cursor to page 2, as shown in Figure 1.13.Figure 0 .13 Figure 1.13

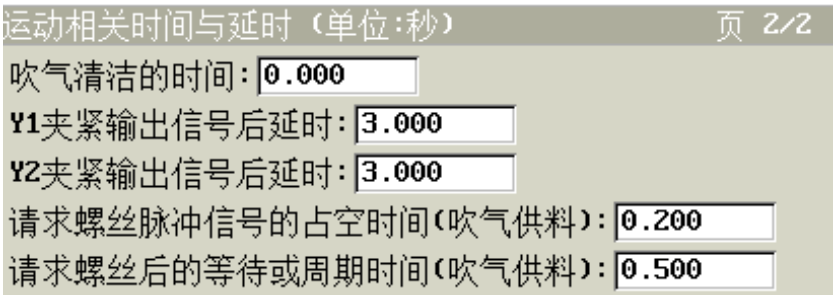


Figure 0 .13" Motion Correlation Time and Delay window, page 2

The relevant parameters to be set in page 2 are:

Duty cycle time of the request screw pulse signal (air supply): ①This time is valid when "Screw Detection" is turned on ("Screw Detection" is turned on or off in the "Navigation" option), indicating the duty cycle time (valid level time) of the request screw signal sent by the system to the feeder. (The "Screw Detection" on and off is set in the "Navigation Screen" in the "Screw Detection On or Off" option.) It indicates the duty time (effective level time) for the system to send the request screw signal to the feeder. Before machine screwing, the system will send a request screw signal to the feeder, and at the same time, constantly detect whether there is a "screw signal", if the feeder feeds within the "duty cycle of the request screw pulse signal", that is, the system detects the "screw signal". If the feeder is fed within the duty cycle of the "request screw pulse signal", i.e. the system has detected the "screw signal", the request for screws is successful, and the system immediately stops sending the request screw signal to the feeder, and the fetching is successful; if the feeder is not fed within the duty cycle of the "request screw pulse signal", i.e. the system does not detect the "screw signal", the system stops sending the request screw signal to the feeder. If the feeder is not fed within the "duty cycle time of the request screw pulse signal", i.e. the system does not detect the "screw signal", the system stops sending the request screw signal to the feeder, but it will continue to detect the "screw signal", because there is a delay time for the feeder to be fed, and if it is detected within the "waiting or cycle time after requesting a screw", the feeder will be fed successfully.

In the "wait or cycle time after requesting screws", if the "screw signal" is detected, then the request for screws is successful and the feeding is successful, if the "screw signal" is not detected, then the request for screws fails, and the request will be sent up to 5 times, and the alarm will be raised if the request exceeds 5 times. If the "screw signal" is not detected, the request for screws fails, and a maximum of 5 requests will be sent. ②This time is invalid when "Screw Detection" is turned off.

Waiting or cycle time after requesting screws (blowing and feeding): ①This time is valid when "Screw Detection" is turned on, and it indicates the waiting time for detecting "Screw Signal" every time the system sends a signal requesting screws. Before the machine screws, the system will send a request screw signal to the feeder, and at the same time constantly detect whether there is a "screw signal", if there has been no "screw signal" detected within the time period, it will send a request screw signal to the feeder again. If the time period has not been detected "screw signal", it will send a request for screw signal to the feeder again, and then continue to detect whether there is a "screw signal", up to 5 times to send a request, more than 5 times will be alarmed; if the request is not more than 5 times, the system detects the "screw signal", then the machine no longer sends a request for screws this time to send a request for signals, the Pick up materials successfully. ②This time is invalid when "Screw Detection" is off.

Example of Blow-Through Feeding Configuration Parameters:

If the user sets "Wait or cycle time after requesting screws" to 1 second, "Duty time of requesting screw pulse signal" to 0.2 seconds, and "Delay time after picking up (blowing) screws" to 2 seconds. When "Screw Detection" is turned on, the system sends out a request screw signal to the feeder before the machine drives the screws, and at the same time, it constantly detects whether there is a "Screw Signal" or not, and if the system detects a "Screw Signal" within 0.2 seconds, the system will send out a "Screw Signal" to the feeder. If within 0.2 seconds, the system detects a "screw signal", then the request for screws is successful, the system immediately stops sending the request for screws to the feeder signal, the fetch is successful, after waiting for 2 seconds "to take (blowing) screws after the delay", the machine begins to perform the screw; if within 0.2 seconds of time If in 0.2 seconds, the system does not detect the "screw signal", then stop sending the request screw signal to the feeder,

but will continue to detect whether there is a "screw signal", in the remaining 0.8 seconds (i.e., 1-0.2 seconds), if it detects a "screw signal", then the machine will start playing screws. In the remaining 0.8 seconds (i.e. 1-0.2 seconds), if a "screw signal" is detected, then the request for screws is successful, indicating that the fetch is still successful, after waiting for 2 seconds of "fetch (blowing) screws after the delay", the machine starts to perform screwing, if no "screw signal" is detected, then the request for screws is successful. If the "screw signal" is not detected, the request for screws fails. The system sends out the request screw signal to the feeder again, and sends out 5 requests at most, and the alarm will be raised if the request exceeds 5 times. ② In the "screw detection" off, the machine in the screw before sending a request for screw signal, will not detect whether there is a "screw signal", and directly after waiting for 2 seconds "take (blow) screws after the delay After waiting for 2 seconds for the "delay time after taking (blowing) screws", the machine starts to execute screwing.

1.5 Counterbore method

Before setting the screw hole coordinates, you should align the screw hole position. There are 2 ways to align the holes:

1. If the machine is "Z-axis motor downward pressure" screwing mode, in the hole operation of a product, the product will be pre-punched screw holes, and then move the bare electric batch without adsorbed screws to the surface of the screw holes above, so that the alignment point of the electric batch head to the screw cap of the screw holes can be entered into the coordinates of the screw holes. Before each screw, the system will automatically calculate the position of the electric batch to stay (i.e., the value of the Z coordinate of the screw hole minus the value of the "follow up length"), after the electric batch adsorption of screws, each time before hitting the screws, the screw tip is located in the vicinity of the surface of the mouth of the screw hole. When the screw is driven, the Z-axis moves downward at the "follow-through speed", carrying the electric screwdriver to drive the screw, and the depth of the drive in is the "follow-through length".

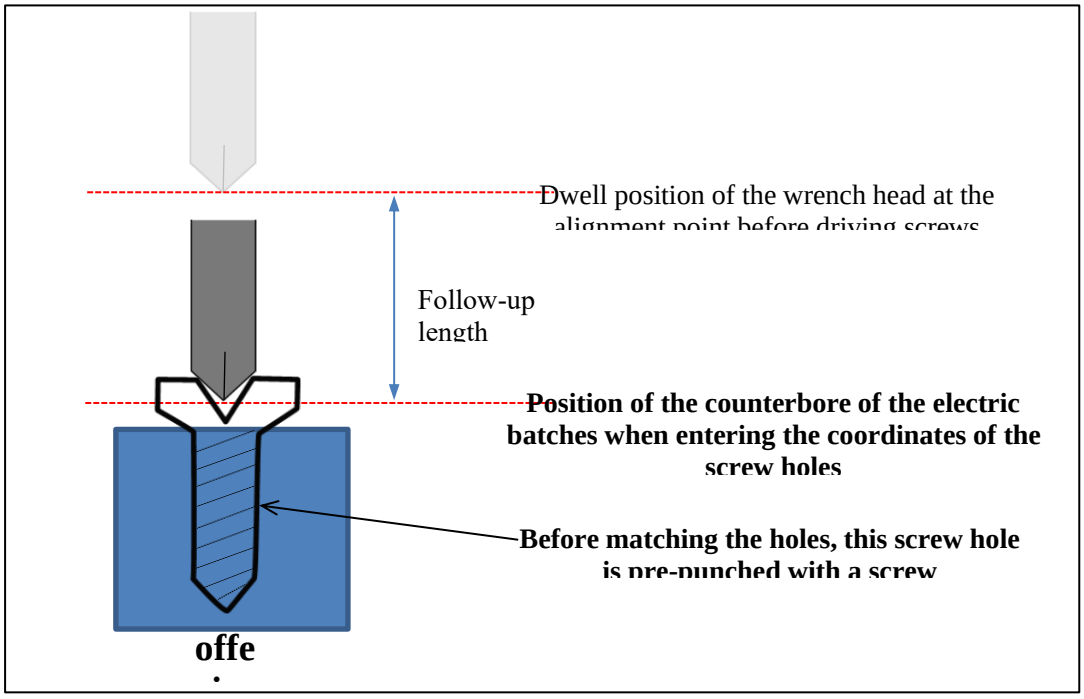


Figure 0 .14 Schematic diagram of the screwing method "Z-axis motor pressing down".

2. If the machine for the "pneumatic downward pressure" screwing method, this time only need to move the electric batch suction nozzle to a certain position above the surface of the screw hole mouth, to ensure that the electric batch adsorption of screws, before each time to hit the screw, the screw tip is in the surface of the screw hole mouth above the vicinity of the screw can be. When playing screws, the cylinder pneumatic downward pressure, carrying the electric screwdriver to play screws, according to the flexibility of the gas pressure to play screws.

1.6 Setting the screw hole coordinates

Initialize the coordinates of the machine's axes by first pressing 回原点 to return to the home position.

Enter the coordinates. Fix the workpiece in a position under the machine platform, assuming that there are 3 screw holes on the workpiece to be screwed. Through the 6 keys of X , X , Y , Y , Z , Z , move the alignment point of the machine's "batch head" to the position near the first screw hole to perform the hole setting operation, in which the manual movement speed can be switched to "fast, medium, slow" by pressing the 手动速度 key. After the hole alignment

is completed, then press 螺丝孔位 @ 1 to enter the current coordinates into the "programming area" where the cursor is located, at this time, the cursor will automatically change the line, and then, according to the above steps, to continue to enter the coordinates of the second and third screw hole position.

Switching Y-axis. On a 4-axis machine (dual Y-axis), the machine has two Y-axes, Y1 and Y2, and the Y-axis is switched by pressing the 换Y key. The "Coordinates" information column at the bottom of the "Set Screw Hole Coordinates and Programming" window shows whether the Y1 or Y2 axis coordinates are currently being set. When entering the coordinates, you need to pay attention to the Y-axis switching.

Switching feeders. The system can support 3 feeders at the same time, and the screw holes are tied to the feeders (when a certain screw hole is punched, it will be fed by the corresponding numbered feeder). In the case of 2 or 3 feeders, press 换供料器 to switch feeders. When entering coordinates, it is necessary to pay attention to the feeder switching.

Batch set Z-axis. When the coordinates of the screw holes of the workpiece are entered, if you want to change the Z-axis coordinates of these screw holes to the same, then you can press 批量Z轴 mno 6 to pop up the "Batch Setting Z-axis Coordinates" window, according to the window prompts, press the "numeric" key to enter the address interval (start and end address) and "Z-axis coordinates" of the screw holes that need to be changed. According to the window prompt, press the "numeric" key to input the programming point address interval (the beginning address and the end address) and the "Z-axis coordinates", and then press 确定 to change all the Z-axis coordinates of the screw holes in the interval in a batch.

Batch setting of Y-axis. Under the four-axis machine (dual Y-axis), the machine has two Y-axis, Y1 and Y2. After the coordinates of the screw holes of the workpiece are recorded, if you want to change the Y-axis of the screw holes with consecutive addresses to another Y-axis, you can press 批量换Y jkl 5 to pop up the "Batch Y" window, and according to the prompts in the window, press the "Numeric" key. According to the prompts in the window, press the "numeric" key to input the programming point

address interval (start address and end address) of the screw holes that need to be changed, as well as to choose which axis to be replaced, and finally press the 确定 key to change the Y-axis of all the screw holes in the interval to another Y-axis.

To modify the coordinates of a screw hole, press or to move the yellow background line cursor. In the "Programming Area" window, press 向上 or 向下 to move the "yellow background line cursor", select the line that needs to be edited, then press 确定 to pop up the "Modify Coordinate Value" window, press 向上 or 向下 to move the Press 确定 or to move the cursor to switch the input box, then press "Delete, Numeric Keys, Decimal Point Keys" to change the values of coordinate value, Y-axis number and feeder number, and finally press to finish the modification.

Delete, Undo, Redo. If you want to delete a line of programming points, under "Programming Area", press 向上 , 向下 to move the "yellow background line cursor", select the line to be deleted, and then press 删除 to delete the programming points of the current line. If it is found that the programmed point has been deleted by mistake, just press the 撤销 key to restore the programmed point that has been deleted by mistake. If you press 重做 at this time, the previous deletion operation will be resumed (the programmed point that was just restored will be deleted again). When editing a programmed point, "Undo" and "Redo" can be used up to 30 times to effectively prevent misuse.

1.7 insertion instruction

1.7.1 How to insert instructions

Machine movements are scanned from top to bottom, strictly following the contents of the handheld programmer's "Programming Area", executing whatever commands are encountered. Therefore, the editing of programming points is centered around the Programming Area interface. The cursor of the "Programming Area" is a yellow background line, press 向上 or 向下 to move the "yellow background line cursor" to select a certain line of programming points, and then you can modify,

delete, move, insert and other operations on this line of programming points.

The keys that are often used in conjunction with editing programming points are 插入空行 , 撤销 , 重做 , 删除 , 上页 , 下页 , 向上 , 向下 , 确定 , 取消 .

The keys for shortcut insertion of instructions are 螺丝孔位 @ 1 , 程序跳转 abc 2 , 完成移到 ghi 4 .

(**Note**: If you want to insert an instruction between two consecutive lines of instructions in the "Programming Area", you have to press the "Insert Blank Line" key first to insert a blank line between the two lines of instructions to make a space, and then insert the corresponding instruction, or else the currently inserted instruction will overwrite the previous one. (Otherwise, the currently inserted instruction will overwrite the previous instruction.)

The shortcut batch editing keys are 批量换Y jkl 5 , 批量Z轴 mno 6 , 工件复制 pqrs 7 .

To perform batch operation in "Programming Area", such as workpiece copy, batch delete, batch move, batch coordinate offset, batch set Z-axis value, plane rotation, batch scale, batch teach offset, batch change Y-axis, batch change feeder, these operation functions can be accessed by pressing the 更多指令 tuv 8 key, the window of "More Instruction" will be popped up. These operation functions can be accessed by pressing 确定 to pop up the "More Commands" window, pressing 向上 or 向下 to select "3. Batch Edit of Edit Points", and then pressing to enter the "Batch Edit of Edit Points" window, and then carry out the corresponding batch operation according to the prompts.

The Chinese programming instructions for the motion logic of "Programming Area" are also concentrated in "More Instructions", press 更多指令 tuv 8 to pop up the "More Instructions" window. Press 上页 , 下页 , 向上 , 向下 to see many Chinese programming instructions that can be used, for example, "Array", "Set Marker", "Jump to Program", "Call to Program", "Call to Program", "Call to Program", "Call to Program", "Call to Program", "Call to Program", "Call to Program", "Call to Program", and so on. ", "call subroutine", "call file", "finite number of loops", "program end or return to ", "Delay", "Pause", "Input Signal Programming", "Output Signal Programming ", "Workpiece counter",

"Workpiece move to after screwdriving is completed" and so on.

For example, in "Dual Y-axis mode", there are two kinds of screw hole coordinates, Y1 and Y2, in the "Programming Area". When the machine is drilling for Y1 screw holes, it will automatically move the Y2 axis to the outermost 0.000mm coordinates by default, so that the user can change the workpiece for the Y2 axis. And vice versa, when the machine is screwing Y2 holes, it will automatically default to move the Y1 axis to the outermost 0.000mm coordinate position, so that the user can change the workpiece for the Y1 axis. If you want to move the Y1 or Y2 axis to a "non-0.000mm" position when replacing a workpiece, what should you do? At this time, you can simply insert the Chinese command "Move the workpiece to" after screwing is completed. How to call the Chinese instruction "Move the workpiece to the position after finishing screwing"? Firstly, move a Y-axis to "specified place" by Y↑ and Y↓ keys, then press 完成移到 ghi 4 shortcut command key, or press 更多指令 tuv 8 key to enter "more commands" window, and then move the cursor to the first item of page 3 "1. After screwing is completed, the workpiece is moved to" by 向上 and 向下 keys. The workpiece is moved to", press 确定 key to insert the Chinese instruction of "workpiece is moved to" in the "Programming Area", when this instruction is scanned by the machine, the corresponding Y-axis will be moved to the coordinate specified by this instruction. This coordinate value can also be changed directly by selecting the programmed point of this instruction in the "Programming Area", pressing 确定 , and then inputting the value in the input box.

1.7.2 **More commands**

In the "Setting Screw Hole Coordinates and Programming" window, press 更多指令 tuv 8 to bring up the "More Instructions" window, press 向上 or 向下 or 上页 , 下页 to move the cursor to select the corresponding instruction, and finally press 确定 to insert the selected instruction in the line where the cursor is located in the "Programming Area". Finally, press to insert the selected instruction in the line where the cursor is located in the "Programming Area".

1.7.2.1 **screw position**

To enter the new screw hole coordinates and the corresponding feeder number when drilling this screw position, you can use the 换Y and 换供料器 keys when entering the new screw hole coordinates.

1.7.2.2 **Customization of commonly used motion parameters**

This function is used to modify the motion parameters of the current project file, which is only valid for the current project file. The motion parameters involved are "feeder coordinates, follow up speed, follow up length, screwing time, delay after picking up (blowing) screws, delay after screwing, floating lock time, torque detection, alarm, screw detection, working speed, safety height". After inserting this instruction in the "Programming Area", the corresponding value of the parameter will be the value set in the relevant option in the "Navigation Interface", but it is possible to select a certain line of motion parameter in the "Programming Area" and press the "OK" key. Press "OK" to make local modification. (**Note**: The inserted motion parameters are only valid for the current project file and only when the machine is in the "motion" state of automatic screwing, the system scans a certain motion parameter, and then it is valid for the screwing action of the screw holes behind. Among them, the "working speed" in the implementation of "single-step" screwing is invalid, is the "navigation interface" in the "speed and acceleration" option in the "speed" and "acceleration". (The "working speed of XYZ axis" in the "speed and acceleration" option in the "navigation interface" is used to run).

1.7.2.3 **Batch editing of programming points**

This function is to set the programming points in the "Programming Area" in batch, which is convenient for quick programming, such as copying, deleting, moving, coordinate offset, setting Z-axis value, rotating, scaling, teaching offset, changing Y-axis, and changing the feeder of the workpiece. AsFigure 0 .15 shown, the specific functions are as follows:

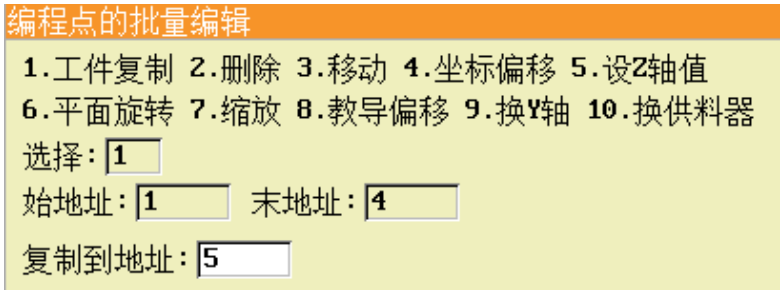


Figure 0 .15 "Batch Edit of Programming Points" Function

(1) **Copy**: The function is the same as the "Workpiece Copy" shortcut key on the handheld programmer. In "Programming area", there are n programming points to be copied from "Start address" to "End address", after executing the function of workpiece copying, the coordinate value of the programming point corresponding to the address of "copying to After the workpiece copying function is executed, the coordinate value of the programming point corresponding to the address of "Copy to" is set to the real-time coordinate value of the current location of the "batch head", and the X, Y (Y1 or Y2) and Z coordinate values corresponding to the rest of the second to nth programmed points to be copied are each shifted by one offset ("Beginning address" to "End address"). The absolute value of the difference between the X, Y, and Z coordinate values of the first screw hole programming point in the interval from "Address" to "Last Address" and the X, Y, and Z coordinate values corresponding to the current location of the "Electric Batch Head" respectively is the offset. After copying, the programmed point address is copied to the next line of the programmed point address corresponding to the "Copy to Address" in sequence. After copying, the relative position of each screw hole remains unchanged. [**"Copy" case**: The screw holes at addresses 0001~0004 in the "Programming Area" (i.e., the address range of the "Programming Point to be copied") are copied to address 0006 (i.e., the "Copy to Address" address). Program screenshot after "Copy to Address", as shown inFigure 0 .16 The real "top view of the motion preview trajectory" is shown inFigure 0 .17 Its real "top view of motion preview trajectory" is shown in Fig. 1.17, and the corresponding "copy principle" is shown inFigure 0 .18 (The red points are the selected screw holes to be copied in the interval from "Beginning Address" to "End Address", and the blue points are

the screw holes after copying is completed).

Figure 0 .16 Screenshot of the program corresponding to the case

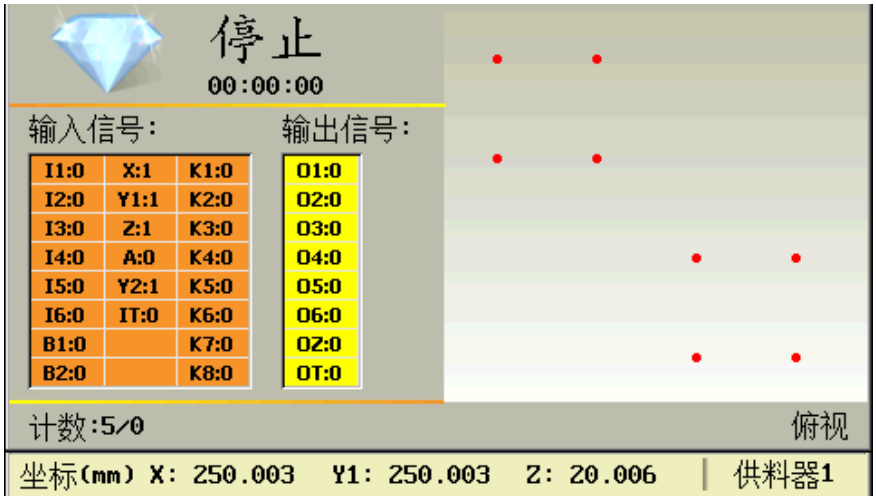


Figure 0 .17 Top view of the real motion preview trajectory corresponding to the case

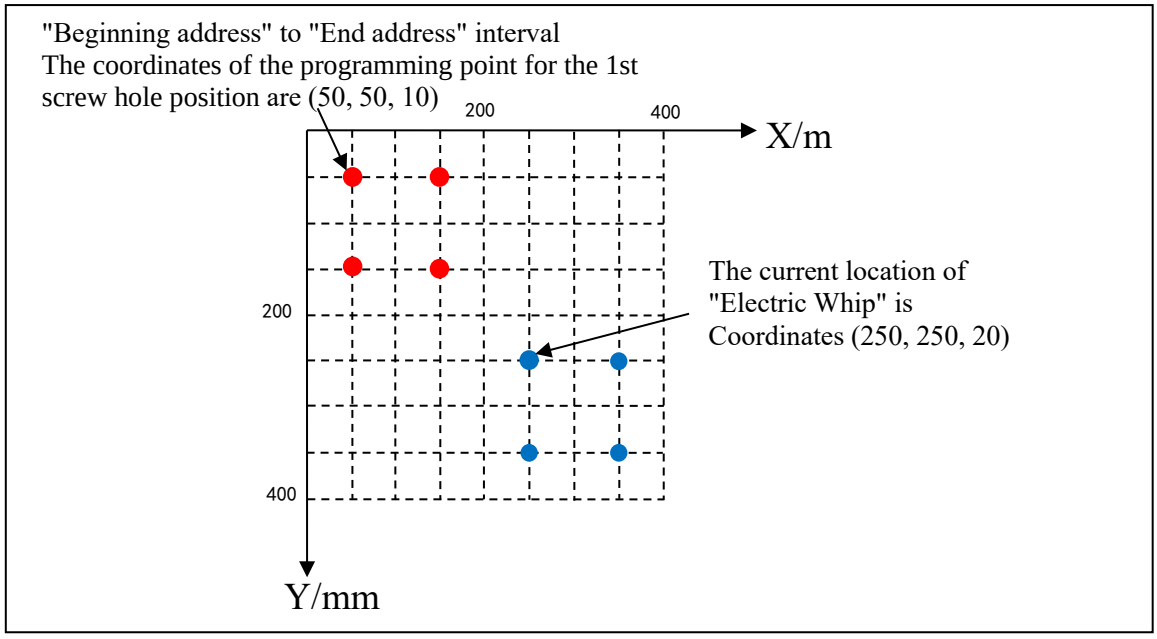


Figure 0 .18 Schematic diagram of the "replication" principle corresponding to the case.

(2) **Delete**: Deletes all programmed points in the range of "Beginning Address" and "End Address".

(3) **Move**: Move all the programmed points within the range of "Beginning Address" and "End Address" to the front of the programmed point corresponding to "Move to Address" in batch, and the rest of the programmed points will be moved forward automatically, this function is mainly used for adjusting the machining sequence of each screw hole position. This function is mainly used to adjust the machining sequence of each screw hole position.

(4) **Coordinate offset**: The X, Y, Z coordinates of all the programming points of the screw holes in the range of "Beginning Address" and "End Address" will be offset in batch according to the manually inputted offset amount, which is similar to the principle of the function of "Copy" in (1) above. This function is similar to the "Copy" function in (1) above. This function is commonly used occasions: when the product has countersunk holes, set the screw hole coordinates electric batch head alignment point is not good for holes, you can be in the countersunk holes on the surface of the hole can be aligned, and then according to the countersunk holes in the depth of the Z coordinate value of the batch offset.

(5) **Set Z-axis value**: Set the Z-axis coordinates of all programmed points for

screw holes in the range of "Beginning address" and "End address" to the same value in batch.

(6) **Plane rotation**: All screw holes in the range of "start address" and "end address" will be rotated with the coordinate point halfway between the "travel" of X and Y axes as the rotation center, and the corresponding X and Y coordinates will be changed in batch according to the "rotation angle" rotation. The corresponding X and Y coordinates can be changed in a batch by rotating them according to the "rotation angle". [The **"plane rotation" case**: If the machine X-axis travel for 400mm, Y-axis travel for 400mm, a screw hole position of the coordinates of the point (100mm, 100mm, 40mm), after 45 ° clockwise rotation of the coordinates of (200, 58.579mm, 40mm), such asFigure 0 .19 shown]

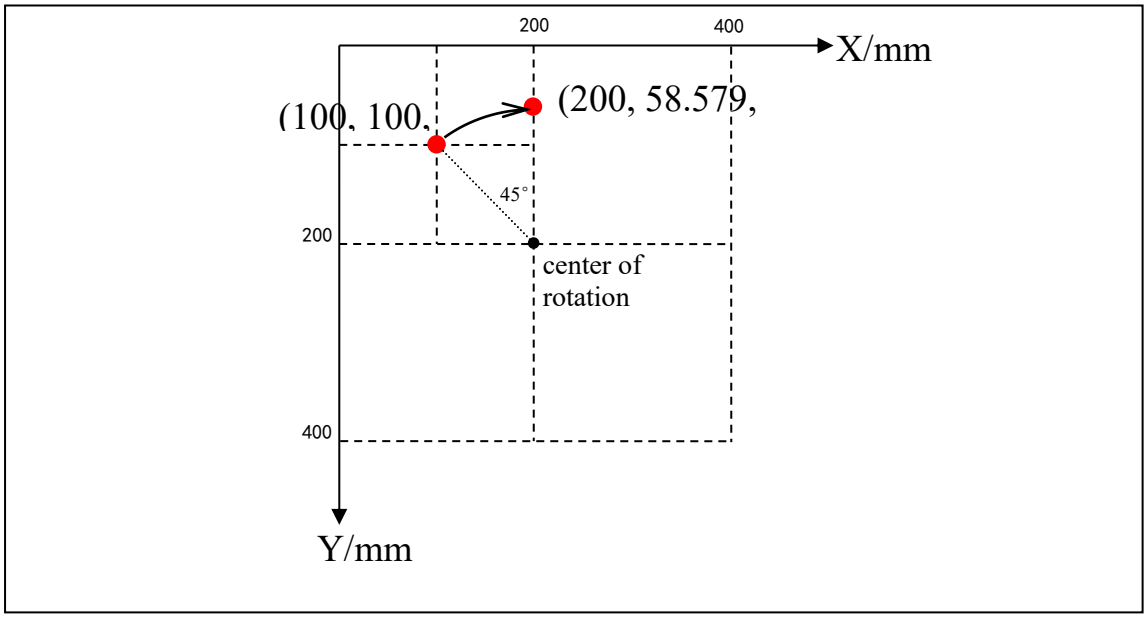


Figure 0 .19 "Schematic diagram of "Plane Rotation

(7) **Zoom**: The layout of all the programming points of the screw holes in the range of "Beginning Address" and "End Address" will be scaled up or down by taking the coordinate point at the half of the "travel" of X-axis and Y-axis as the scaled-up reference point, and changing the corresponding X and Y coordinates in a batch. This function can be used to change the corresponding X and Y coordinates in a batch by zooming in or out proportionally, mainly for correcting the deviation of the machining dimensions from the actual dimensions caused by the accuracy of the machine after the DXF file is

converted into a machining file. [**"Zoom" case**: If the machine X-axis travel is 400mm, Y-axis travel is 400mm, a workpiece of all the screw holes in the programming point of the graphic reduced to 50% of the original (the red point indicates that the reduction of the former, the blue indicates that the reduction of the latter), as followsFigure 0 .20 shown].

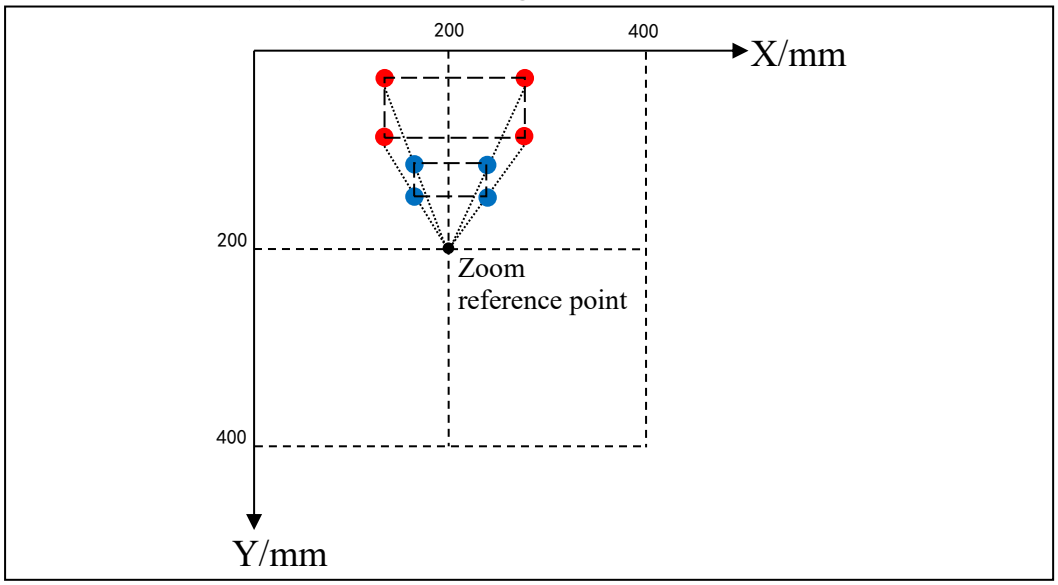


Figure 0 .20Schematic of "scaling" (a product reduced to 50% of its original size)

(8) **Teach Offset**: Generally used in CAD guide, a point on the CAD and the corresponding point on the workbench will be taught offset, the programming point of the screw holes in the editing range will be offset accordingly to the coordinate value, similar to the "workpiece copy function".

(9) **Change Y-axis**: Change the Y-axis of all the programming points for screw holes in the range of "Beginning address" and "End address" to another Y-axis.

(10)**Feeder change**: Change the feeder corresponding to all screw hole programming points in the range of "Beginning address" to "End address".

1.7.2.4 **Setting the label**

Marker refers to a marker set in the "programming area", which can be used for calling arrays, loops, calling subroutines, program jumps, and general-purpose input signal programming, etc., and can also be used as a comment to improve the readability of the program.

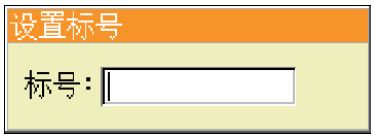


Figure 0 .21 The "Set Label" window.

1.7.2.5 **array**

If multiple identical workpieces are arranged horizontally and vertically on the fixture tray, and the spacing between the horizontal and vertical rows is the same, then the array can be used. Users only need to program a workpiece screw hole position points, and then use the array programming, you can realize the entire fixture tray multiple workpiece programming point entry, improve programming efficiency. AsFigure 0 .22 shown in Figure 1.22, array programming has the following two ways:

Figure 0 .22 Two ways of arraying

1. **Input the array of fixed spacing**. Scenario: The plane of the fixture plate for fixing the workpiece is parallel to the plane of X and Y axes of the machine, and the workpiece on the fixture plate is placed horizontally and vertically parallel to the direction of X and Y axes of the machine, then you can use the first type of "Array of Inputting Constant Pitch", and its setting window is as followsFigure 0 .23 But it is also possible to use the second type of "Array with automatic calculation of the distance", as inFigure 0 .27 as shown in Figure 1.27.

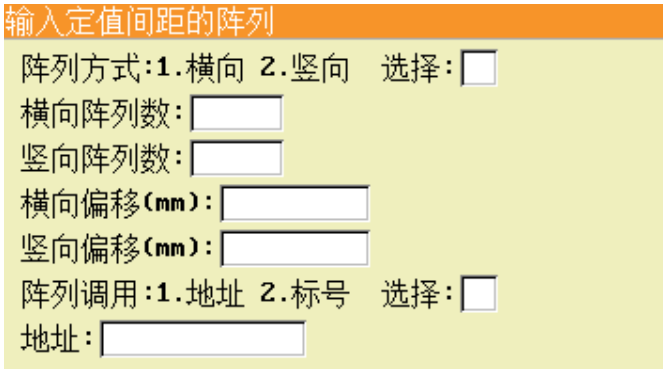


Figure 0 .23 Setting window "Array of input fixed spacing".

(1) **Array mode: 1. Horizontal 2. Vertical**: In the "programming area" to select the need to expand the array of programming points, through the "array to expand" operation, the array of each screw-hole coordinates according to the law (horizontal/vertical array, horizontal/vertical offset) in the replacement of

the corresponding screw-hole coordinates. When programming points with screw-hole coordinates, the direction of unfolding (horizontal or vertical), i.e., the order of arrangement in the "Programming Area" (i.e., the order of playing the screws), can be understood with the following cases.

(2) **Number of horizontal arrays**: the number of columns in the vertical direction (parallel to the Y-axis of the machine) of the entire array after programming through the array, which can be understood in conjunction with the following examples.

(3) **Vertical array number**: the number of rows in the horizontal direction (parallel to the X-axis of the machine) of the entire array after programming through the array, which can be understood in conjunction with the following examples.

(4) **Lateral offset (mm)**: the spacing between columns in the lateral direction of the array in millimeters, which can be understood in conjunction with the following examples.

(5) **Vertical offset (mm)**: the spacing between rows in the vertical direction of the array in millimeters, which can be understood in conjunction with the following examples.

(6) **Array Recall: 1. Address 2. Mark**: Choose to use the programming point corresponding to "Address" or "Mark" as the starting point of the array screw hole interval.

(7) **Address (or mark)**: "Address" (or "mark") corresponding to the programming point to the current "array programming point" interval of all the screw holes as a whole as the array of the first array point (The first array point (i.e., the "reference workpiece").

"Input the array of fixed-value spacing" case: a workpiece has 3 screw holes need to be processed, when the simultaneous processing of a number of such workpieces, these workpieces are fixed to the fixture plate (fixture plate plane with the machine XY-axis plane parallel to the same, and the fixture plate on the placement of workpieces in the horizontal and vertical with the machine X, Y-axis parallel to the direction of the position of the placement of Formed an array of 3 rows and 2 columns, a total of 18 screw hole locations, how to quickly set up each screw hole location? At this point, the user only needs to program the array of "reference

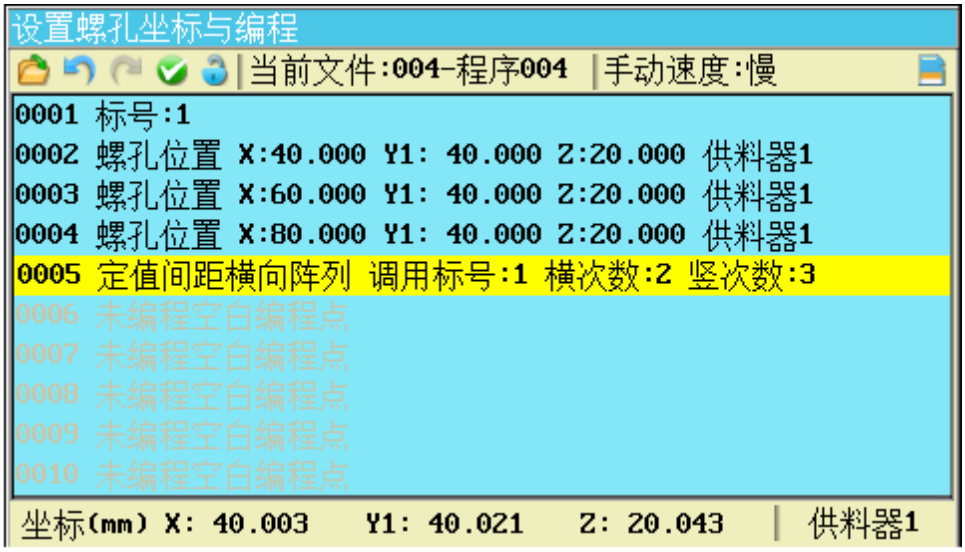


Figure 0 .24 Screenshot of the program for the case "Array of input constant

workpiece" on the coordinates of the three screw hole locations, the use of tools to measure the horizontal and vertical direction with other neighboring workpiece offset of 300mm and vertical offset of 100mm, and then in the third screw hole programming point in the line behind the use of array instructions, select the "Input fixed value spacing". "Enter an array with a fixed pitch". Which configuration parameters "horizontal array number" for 2, "vertical array number" for 3, "array call" if you choose "address ", then the value of the parameter "address" enter the workpiece's first screw hole programming point corresponding to the "address"; if the choice of "labeling", the Prior to enter the workpiece should be the first screw hole programming point in front of a line to set the "mark", at this time you can enter the mark, and then "OK" key to confirm the completion of the array, the program screenshot as followsFigure 0 .24 The program screenshot is shown in Figure 1.24. Motion preview top view asFigure 0 .25 shown in Figure 1.25. The top view of the

screw holes is shown in Figure 1.26.Figure 0 .26 The top view is shown in Fig. 1.26. (The direction of the green arrow means that after the "array expansion operation" is performed, the array in the "programming area" screw hole programming points in the order of expansion, but also the order of screws)

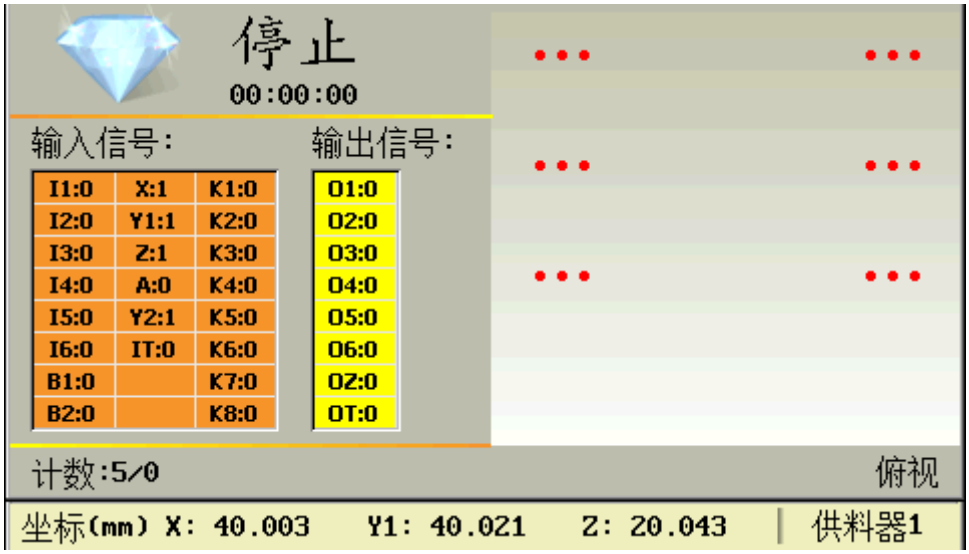


Figure 0 .25 Top view of the motion preview trajectory for the case "Array with

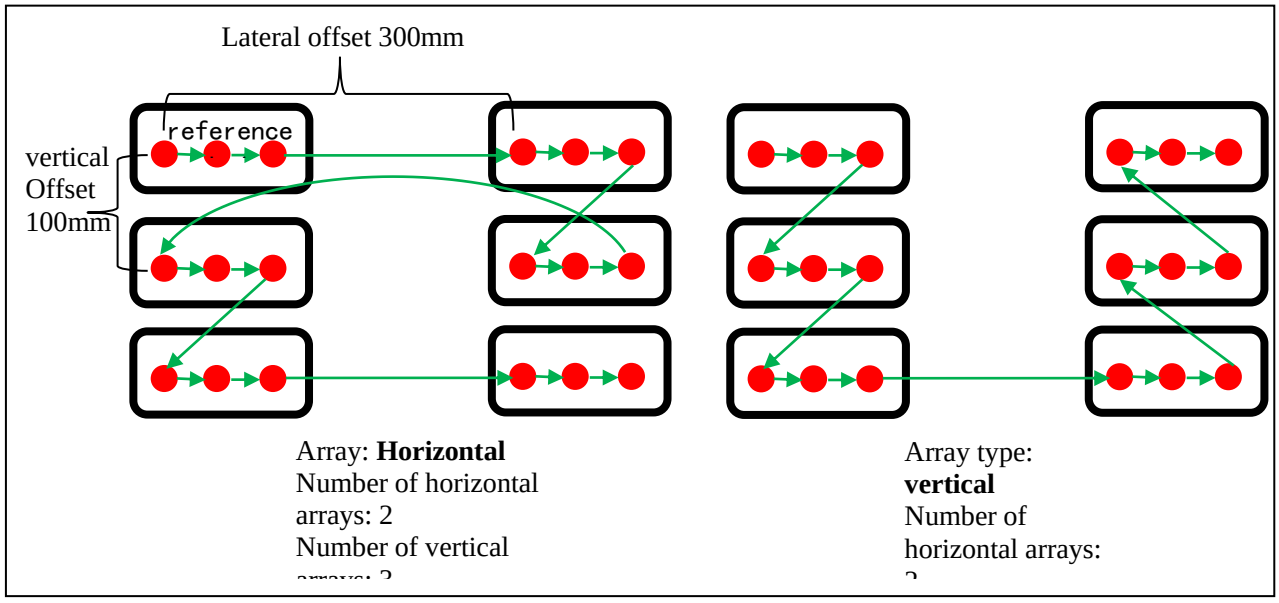


Figure 0 .26 Top view of a workpiece with 3 screw holes arranged by the "Array with constant pitch input".

2. **Automatically calculates the pitch of the array**. Usage Scenario: ① the plane of the fixture disk of the fixed workpiece is parallel to the plane of the XY axis of the machine, and the workpiece on the fixture disk is placed parallel to the direction of the X and Y axes of the machine in the transverse and vertical directions, i.e., it is compatible with the "array of inputting the

fixed value of the pitch"; ② the plane of the fixture disk of the fixed workpiece is not in line with the plane of the XY axis of the machine (at a certain angle of inclination) or the plane of the fixture disk is in line with the XY plane of the machine but the workpiece on the fixture disk is not parallel to the direction of the X and Y axes of the machine in the transverse and vertical directions. (b) The plane of the fixture disk for fixing workpieces is not consistent with the XY plane of the machine (at a certain inclination angle), or the plane of the fixture disk is consistent with the XY plane of the machine, but the workpieces on the fixture disk are not placed parallel to the X and Y axes of the machine in the horizontal and vertical directions. The setting window is as followsFigure 0 .27 The setting window is shown in Figure 1.27.

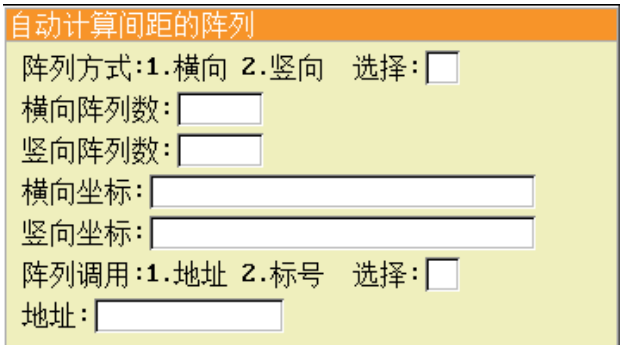


Figure 0 .27 "Array with Automatic Pitch Calculation Settings Window

(1) **Array mode: 1. Horizontal 2. Vertical**: In the "programming area" to select the need to expand the array of programming points, through the "array to expand" operation, the array of each screw-hole coordinates according to the law (horizontal/vertical array number, horizontal/vertical coordinates) in the replacement of the corresponding screw-hole coordinates. When programming points with screw-hole coordinates, the direction of unfolding (horizontal or vertical), i.e., the order of arrangement in the "Programming Area" (i.e., the order of playing screws), can be understood in conjunction with the following case.

(2) **Horizontal array number**: the number of columns in the vertical direction of the entire array after programming through the array, which can be understood in conjunction with the following examples.

(3) **Vertical array number**: the number of rows in the horizontal direction of the

entire array after programming through the array, which can be understood in conjunction with the following examples.

(4) **Horizontal coordinates**: the coordinates of the "first screw hole position" of the workpiece in the upper right corner of the horizontal direction of the "array reference point" of the current array, with the current real-time coordinates of the machine's "electric batch head" as the setting value. Coordinates for the set value, can be combined with the following case to understand.

(5) **Vertical coordinates**: the coordinates of the "first screw hole position" of the workpiece at the bottom left corner of the vertical row of the current array's "array reference point", with the current real-time coordinates of the machine's "electric batch head" as the setting value. Coordinates for the set value, can be combined with the following case to understand.

(6) **Array Recall: 1. Address 2. Mark**: Choose to use the programming point corresponding to "Address" or "Mark" as the starting point of the array screw hole interval.

(7) **Address (or mark)**: "Address" (or "mark") corresponding to the programming point to the current "array programming point" interval of all the screw holes as a whole as the first array of the array point (When there are more than one screw hole position in the interval, the "first screw hole position programming point" is the "array reference point").

"Automatic calculation of the spacing of the array" case: If in the "input fixed value spacing of the array" case of the fixture plate tilted when (fixture plate plane with the machine XY plane consistent with the fixture plate, but the fixture plate on the placement of workpieces in the horizontal, vertical and machine X, Y axis direction) Not parallel), that is, the placement of the position of the formation of 3 rows and 2 columns of the tilted array, how to quickly set up the various screw hole locations? At this point, the user only needs to program the "array offset reference workpiece" on the coordinates of the three screw holes, and then in the third screw holes in the line behind the programming point using the array command, select "automatically calculate the spacing of the array". The configuration parameter "number of horizontal array" is 2, "number of vertical array" is 3. Move the cursor to

the "horizontal coordinates" input box, and then move the machine by using the arrow keys. "Electric batch head" to reach the current array of "array reference point" in the direction of the horizontal row of the upper right corner of the workpiece of the "first screw hole position", and then "OK" key to confirm the entry of the current real-time coordinate values. And then move the cursor to the "vertical coordinates" input box, at this time through the arrow keys to move the machine "electric batch head" to reach the current array of "array reference point" in the direction of the vertical row of the bottom left corner of the workpiece's "first screw hole". The workpiece of the "first screw hole position", and then "OK" key to confirm the entry of the current real-time coordinate values. If "Address" is selected for "Array Recall", the value of parameter "Address" is entered as the value of "Array Reference Point". If "Address" is selected for "Array Recall", the value of parameter "Address" is entered into the "Address" corresponding to the programming point of the first screw hole position of "Array Reference Point"; if "Mark" is selected for "Array Recall", the value of parameter "Mark" should be set in the line in front of the programming point of the first screw hole position of "Array Reference Point" in advance. "mark", then you can enter the mark. After completing the array, the program screenshot as followsFigure 0 .28 The program screenshot is shown in Figure 1.28. The top view of the motion preview is shown inFigure 0 .29 The top view of the motion preview is shown in Figure 1.29. The top view of the screw holes is shown in Figure 1.30.Figure 0 .30 The top view is shown in Fig. 1.30. (The direction of the green arrow means that after the "array expansion operation" is performed, the array in the "programming area" screw hole programming points in the order of expansion, but also the order of screws)

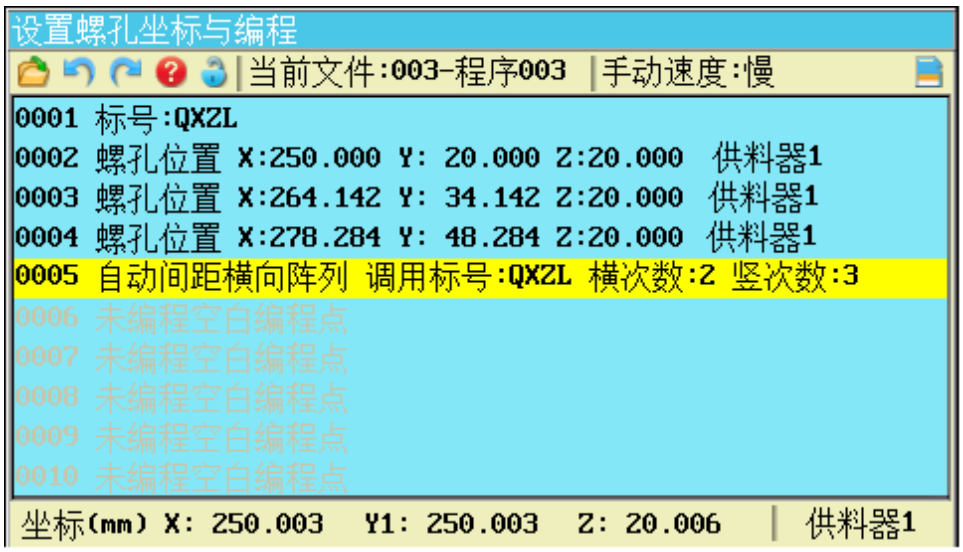


Figure 0 .28 Screenshot of the program for the case "Array with automatic

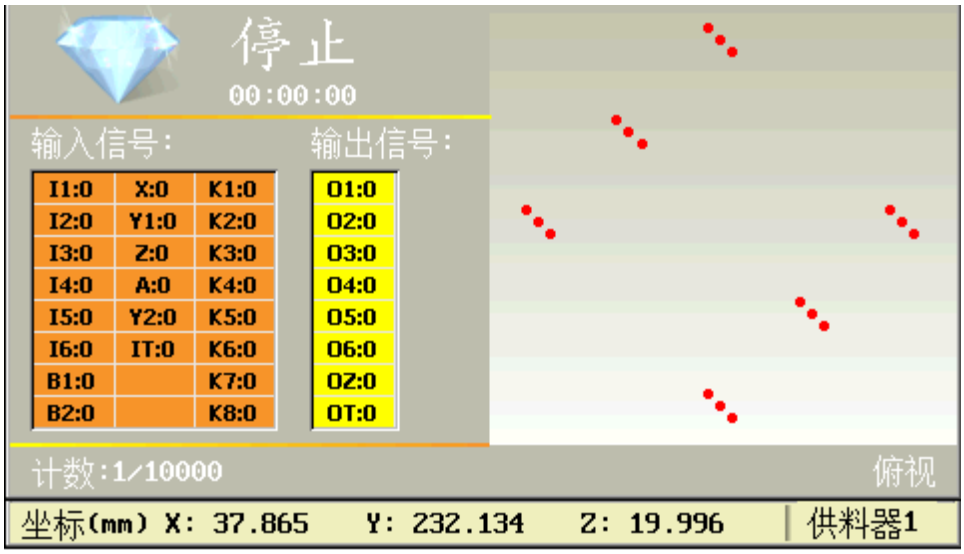


Figure 0 .29 Top view of the motion preview trajectory for the case "Array with

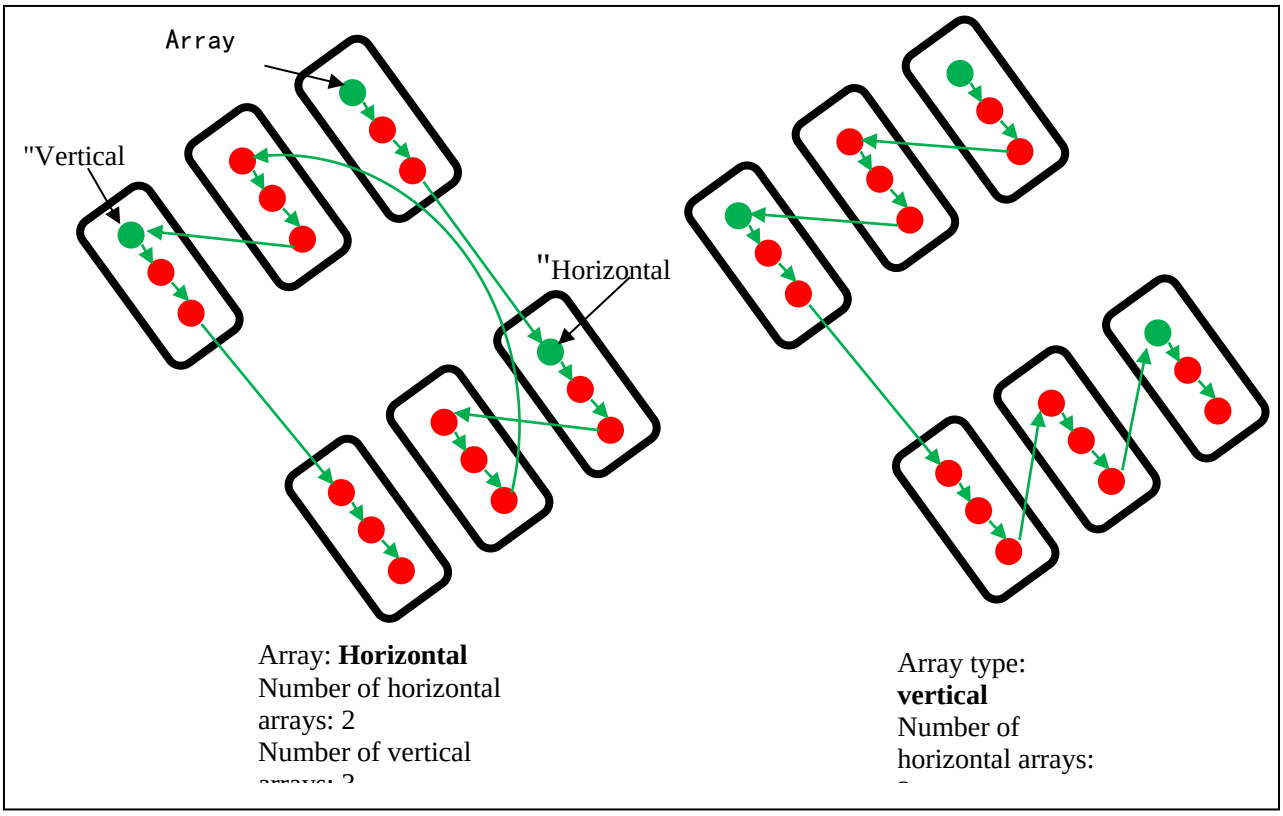


Figure 0 .30 Top view of a workpiece with 3 screw holes arranged in the "Array with automatic spacing

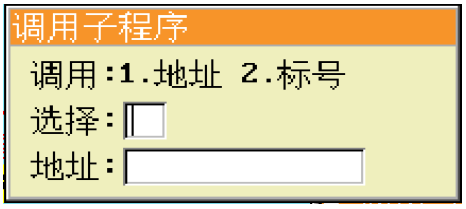
1.7.2.6 **Array Expansion Operation**

By moving the cursor in the Programming Area to the "Array Programming Point" to be expanded, and then executing the "Array Expand Operation", the program statement of the line "Array Programming Point" can be replaced and expanded into a program statement of the "Programming Point" with the same effect. Array Programming Point", the program statement of that line can be expanded and decomposed into the program statement of the "Programming Point" with the same effect.

1.7.2.7 **invoke a subroutine**

The concept of subroutine: A program fragment responsible for accomplishing a specific task that needs to be called by other programs is a subroutine.

If there are several workpieces to be machined on the fixture tray, they are placed in the same direction (the placement height can be different), but the



placement position is not regular. In this case, the user only needs to enter all the screw holes of one of the workpieces in the "programming area" as a subroutine. Then enter the other workpiece screw holes programming points, only need to first move the machine "electric batch head" to their first screw holes, enter the instruction item, select the subroutine to be called "address" (the first address of the subroutine) or "Mark", press "OK" key to insert, as inFigure 0 .31 Figure 1.31 shows.

Figure 0 .31 "Call Subroutine" Settings Window

1. **The specific usage is as follows**:

(1) The first grammatical rule to be observed is that in the "Programming Area", the "Main Program" must be written above the "Subroutines". When there are "subroutines" in a program, the "main program" and the "subroutine" must have an "end-of-program" or "return" instruction or two consecutive lines or more at the end of their respective programming points. Return" instruction or two or more consecutive lines of "unprogrammed blank programming points" must be added at the end of each programming point of the "Main Program" or "Subprogram" to mark the end of the "Main Program" or "Subprogram".

(2) "Call Subroutine" allows you to select the first address of the calling subroutine (the program between the first address and the "end mark" of the program, i.e., the "subroutine"), or the number of the calling subroutine (the program between the beginning of the mark and the "end mark" of the program, i.e., the "subroutine"). The first address of the subroutine can be selected (the program between the first address and the "end mark" of the program is the "subroutine"), and the number of the subroutine can be selected (the program between the beginning of the number and the "end mark" of the program is the "subroutine").

(3) After pressing "OK" to confirm the call, the subroutine call is completed.

2. **The principle of "call subroutine" is analyzed as follows**:

If there are n screw hole programming points in the "subroutine", after the "subroutine" is called by the "main program", the effect of program operation is equivalent to the following: When the system is running to the After the "subroutine programming point", when the machine is playing screws, the coordinates of the first

screw hole position are the coordinates of the position of the "electric batch head" when confirming the "call subroutine", and the coordinates of the second to the nth screw hole position are the coordinates of the "electric batch head" relative to the "main program". The corresponding X, Y (Y1 or Y2) and Z coordinate values of the 2nd to the nth screw hole position points in the "subroutine" are each shifted by one offset (the X, Y and Z coordinate values of the 1st screw hole programming point in the "subroutine" are offset from the X, Y and Z coordinate values of the 1st screw hole programming point in the "subroutine" respectively). The absolute value of the difference between the X, Y, and Z coordinate values of the programming point of the first screw hole position of the "subroutine" and the X, Y, and Z coordinate values corresponding to the position of the "wrench head" at the time of confirming the "subroutine call"), but the relative position of the screw holes remains unchanged. This function is similar to the principle of "Workpiece Copy".

"Call subroutine" case: a kind of workpiece has 3 screw holes to be processed, 5 workpieces are fixed on the fixture plate, they are placed in the same direction (placed at different heights), but the placement is irregular, a total of 15 screw holes, how to quickly set up the various screw holes? At this time, the user only needs to enter the coordinates of all the screw holes of one of the workpieces in the "Programming Area" as a subroutine. And then in the "main program" to enter the screw hole programming points of each workpiece, you only need to move the machine "electric batch head" to the first screw hole position (corresponding to the first screw hole position in the subroutine), then enter the instruction item and select the "address" of the subroutine that you want to call. After entering the instruction, select the "address" or "mark" of the subroutine to be called (in this case, "mark" is used), and the setting can be completed quickly. The screenshot of the corresponding program in this case is as followsFigure 0 .32 The screenshot of the program for the case is shown in Figure 1.32. The top view of the run preview is shown inFigure 0 .33 The corresponding schematic diagram is shown in Figure 1.33. The corresponding schematic is shown inFigure 0 .34 The corresponding schematic is shown in Figure 1.34.

```
0001 标号:主程序
0002 调用子程序 80.006 60.000 30.000 调用标号:子程序
0003 调用子程序 320.006 120.000 19.996 调用标号:子程序
0004 调用子程序 260.015 220.003 30.000 调用标号:子程序
0005 调用子程序 100.003 260.006 39.993 调用标号:子程序
0006 调用子程序 300.000 340.012 49.996 调用标号:子程序
0007 程序结束或子程序返回
0008 未编程空白编程点
0009 标号:子程序
0010 螺孔位置 X:80.000 Y1: 60.000 Z:30.000 供料器1
0011 螺孔位置 X:120.000 Y1: 60.000 Z:40.000 供料器1
0012 螺孔位置 X:100.000 Y1: 100.000 Z:50.000 供料器1
0013 程序结束或子程序返回
```

Figure 0 .32 Screenshot of the program corresponding to the case

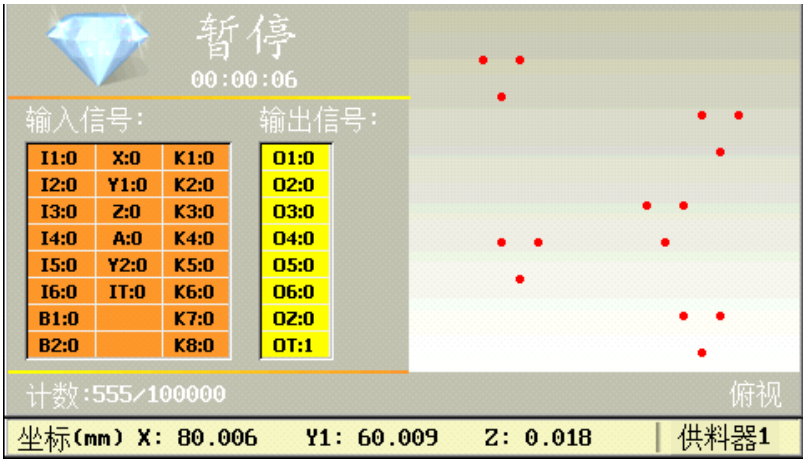


Figure 0 .33 Top view of the motion preview corresponding to the

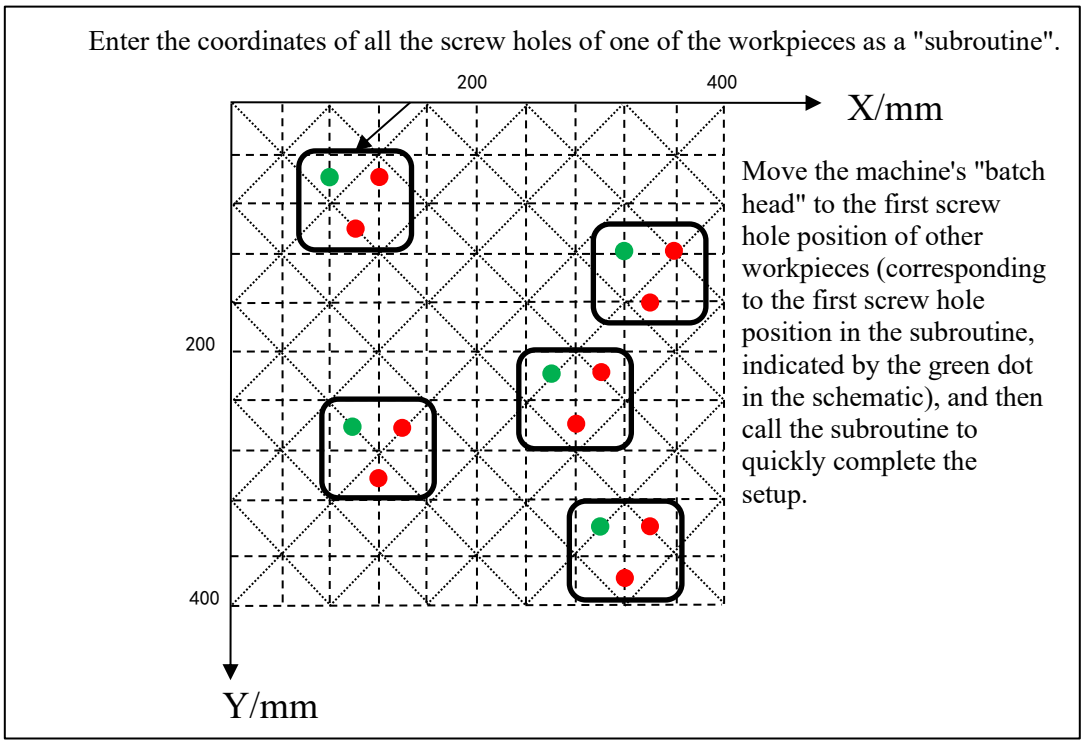


Figure 0 .34 Schematic diagram of the "calling subroutine" principle corresponding to the case.

1.7.2.8 **call file**

Calling a file is similar to calling a subroutine, except that the subroutine is written separately as a project file, and then the user can call it through the file number, and the setting window is as followsFigure 0 .35 The setting window is shown in Figure 1.35.

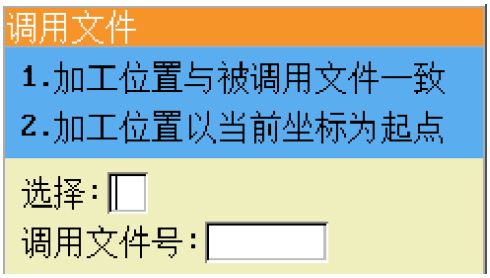


Figure 0 .35 "Recall File Settings Window

Figure 0 .36 Screenshot of the "called file" program

After calling the file, it is used in 2 ways as follows:

1. **The machining position is the same as that of the called file**. The data in the file corresponding to the "calling file number" (i.e., the "called file") is

"borrowed" to be used in the current project file, and the programming point data does not change (the current processing file). (When the current machining file is running, the coordinates of the threaded hole in the "called file" are as many as the coordinates of the threaded hole to be machined.)

Case of "calling file": The program screenshot of "called file" is as followsFigure 0 .36 The program screenshot of the "called file" is shown in Fig. 1.36. The top view of the program motion preview trajectory of the "called file" is as followsFigure 0 .37 The top view of the program motion

preview trajectory of the "called file" is shown in Figure 1.37. Screenshot of the program that calls the "called file" in the current machining file.Figure 0 .38 The program is shown in Fig. 1.38. The top view of the previewed trajectory of the program that calls the "called file" in the current machining file is shown inFigure 0 .39 Figure 1.39].

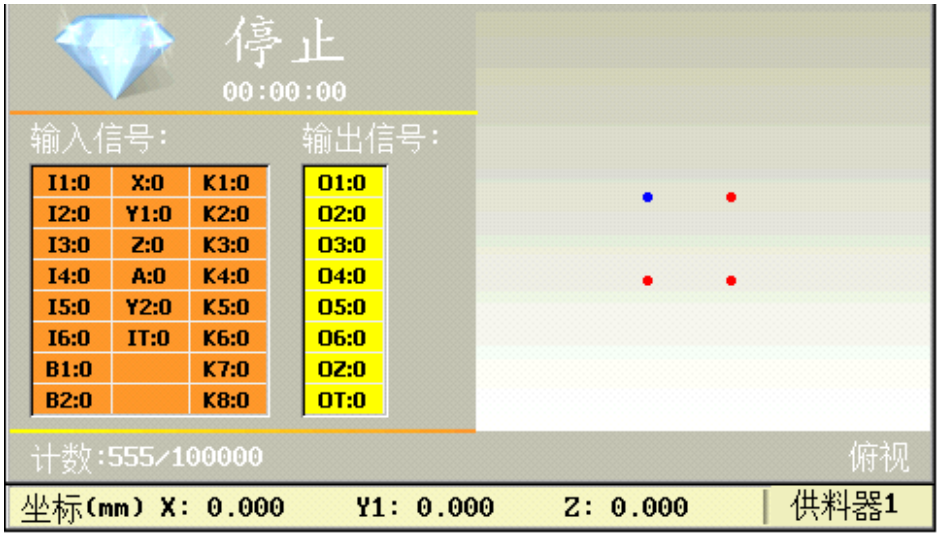


Figure 0 .37 Top view of the previewed trajectory of the program

Figure 0 .38 Screenshot of the program that calls the "called file"

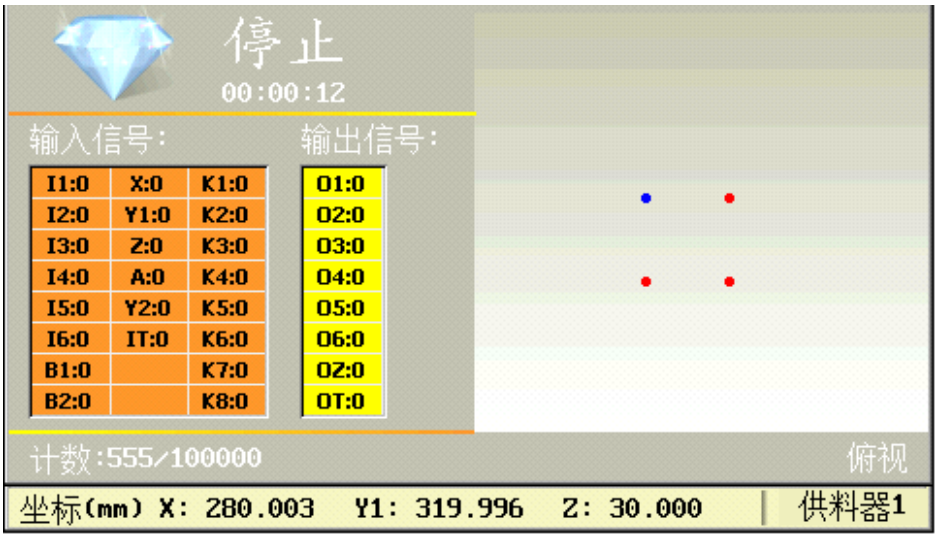


Figure 0 .39 Top view of the previewed trajectory of the program motion of the

2. **The machining position takes the current coordinates as the starting point**. The data in the file corresponding to the "calling file number" (i.e., the "called file", assuming that there are n screw hole programming points) is "borrowed" to the current project file for use. System running to the current processing file in the "call file programming points", the machine to play screws, the first screw hole point coordinates of the value of the "debugging file" window to select "2. Processing position to the current coordinates as a starting point The coordinates of the position of the "electric batch head" in the "Debug File" window are the coordinates of the position of the "electric batch head" when "2. Machining position starts from the current coordinates" is selected, and the coordinates of the 2nd to the nth screw hole positions are shifted by one offset (Y1 or Y2) and one offset (Y1 or Y2) from the corresponding X, Y, and Z coordinates of the 2nd to the nth screw hole positions in the "called file". Each of them is shifted by one offset (the X, Y and Z coordinate values of the first screw hole programming point in the "called file" are the same as those of the user who selects "2. Machining position starts from the current coordinates" in the "Debug File" window). The absolute value of the difference between the X, Y and Z coordinate values of the position of the "electric batch head" when the user selects "2. Machining position starts from the current coordinate" in the "Debug File" window, but the relative position of the screw holes remains unchanged. This

function is based on the same principle as the "Call Subroutine" function.

Case of "Calling File": The program screenshot of "Called File" is as followsFigure 0 .36 The program screenshot of "Called File" is shown in Figure 1.36. The top view of the program motion preview track of the "called file" is shown inFigure 0 .37 The top view of the program motion preview trajectory of the Called File is shown in Figure 1.37. When you select "2. Machining position starts at current coordinates" in the "Recall File" window, the screenshot of the program that calls the "Recalled File" in the current machining file is shown in Figure 1.40.Figure 0 .40 The program screen shot is shown in Fig. 1.40. The top view of the program motion preview trajectory of the "called file" in the current machining file is shown in Figure 1.41.Figure 0 .41 Figure 1.41].

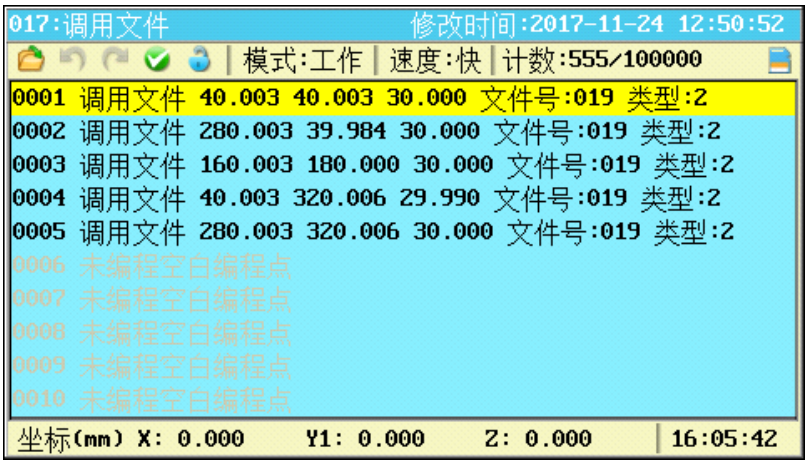


Figure 0 .40 Screenshot of the program that calls the "called file"

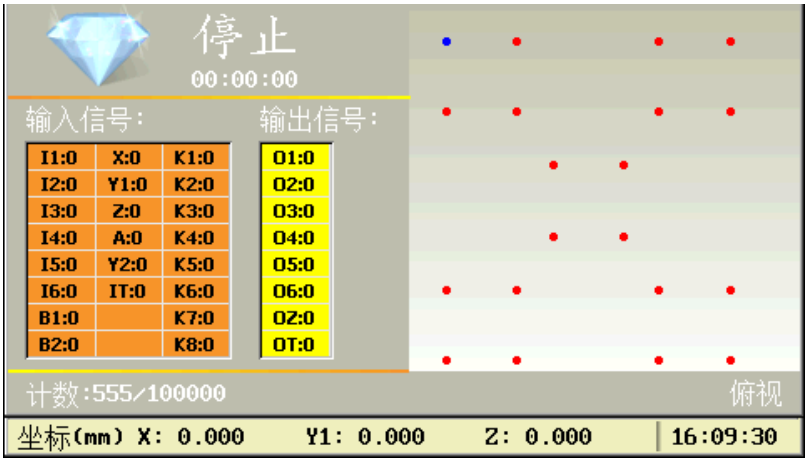


Figure 0 .41 Top view of the previewed trajectory of the program motion of the

1.7.2.9 The program jumps from to

In the "Programming Area", when the program point is executed, the program

jumps to the specified programming point "address" or "mark" and executes from the top to the bottom in an infinite loop. This statement is generally used for loops, etc. The setup window is shown in Figure 1.42.Figure 0 .42 The setting window is shown in Fig. 1.42.

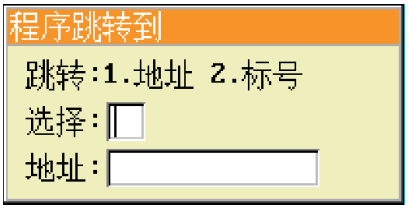


Figure 0 .42 "Program Jump Setting Window

The case of "program jump to": as inFigure 0 .43 The program shown in Figure 1.43, when the program is executed from "0001: Cycle Entry" to the programming point at the address interval of "0008 Program Jump to Mark: Cycle Entry", the program will jump back to the programming point at the address of "001: Cycle Entry", and continue to execute the screwdriving action at the address interval of "0002~0007" from top to bottom. The program will jump back to the programming point at the address of "001 Marker: Cycle Entry" and continue to execute the screwdriving action in the address interval of "0002~0007" from the top to the bottom.

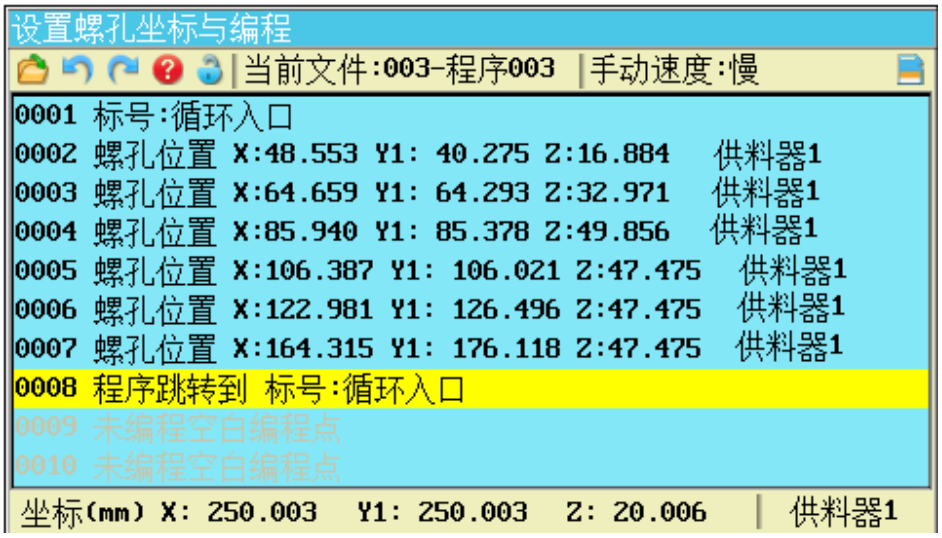


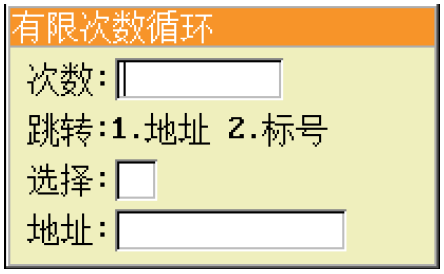
Figure 0 .43 Screenshot of the program in the case of "Program Jump".

1.7.2.10 **finite number of cycles**

A "finite number of loops" is similar to a "program jump", with the difference that a "finite number of loops" is equivalent to a "finite number of program jumps". The difference is that a "finite number of loops" is equivalent to a "finite number of

program jumps".

In the "Programming Area", when the program is executed to this programming point, the program jumps to the specified programming point "Address" or "Marker"



and then executes from the top to the bottom, and the number of jumps is the number of times set in the "Times" window. "The number of jumps is the set number of times, and the setting window is as followsFigure 0 .44 The setting window is shown in Fig. 1.44.

Figure 0 .44 "Finite Loop Settings Window

1.7.2.11 **End of program or return**

When this programming point is reached in subroutine execution, the subroutine returns.

When this programming point is executed in the main program, the program ends.

If there are 2 or more consecutive lines of "unprogrammed blank programmed points", it has the same effect as the "program end or return" statement, i.e., if there are 2 or more consecutive lines of "unprogrammed blank programmed points", the program is considered to have ended or returned. The program is considered to have ended or returned if there are two or more consecutive "unprogrammed blank programmed points".

1.7.2.12 **latency**

When the program is executed to the "Delay Programming Point", the program will delay for a set length of time before continuing to execute the next machining programming point, as shown inFigure 0 .45 The window for setting the delay time is shown in Figure 1.45.

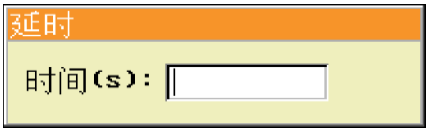


Figure 0 .45 "Delay Time Setting Window

1.7.2.13 **pause (media player)**

When the program reaches the "Pause Programming Point", the machine is in the "Pause" state. Press the 

key and the machine will continue to execute the machining program point.

1.7.2.14 **Input Signal Programming**

As shown inFigure 0 .46 As shown in Fig. 1.46, the "Input Signal" in this window is the "No. value of 1~18 general-purpose input ports", and the value of its input status is 1 or 0 (1 means signal input, 0 means no signal input). The function of input signal programming is that when the program is executed to the programming point, if the program reads that the input status value of the input signal port is equal to the value set in the program, then the program jumps to the specified "address" or "mark", if the input status value of the input signal port is not equal to the value set in the program, then the program jumps to the specified "address" or "mark", if the input status value of the input signal port is not equal to the value set in the program. If the input status value of the input signal port is not equal to the value set in the program, the program continues to execute.

This function enables external devices to access this system, such as machine buttons, sensors, etc., to work together in a coordinated manner.

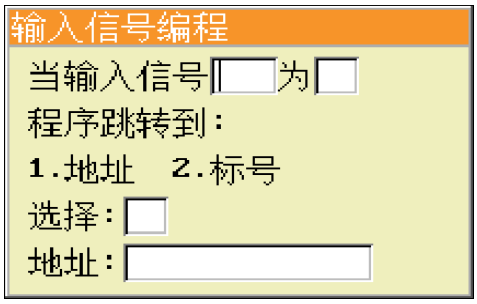


Figure 0 .46 "Input Signal Programming" Setting Window

1.7.2.15 **Output Signal Programming**

As shown inFigure 0 .47 As shown in Fig. 1.47, the "Output Signal" of this window is "No. value of 1~14 universal output ports", and its input status value is 1 or 0 (1 means the output signal is "open", 0 means the output signal is "closed"). The input status value is 1 or 0 (1 means the output signal is "on", 0 means the output signal is "off"). When the program is executed to this programming point, the output signal port specified in this programming point will output the corresponding set value.

This function is used to drive external devices, external output high and low levels for control, such as electric batch start, control solenoid valve suction, clamping cylinders, control signal lamps and so on.

Figure 0 .47 "Output Signal Programming" Setting Window

1.7.2.16 **Workpiece Counter**

As shown inFigure 0 .48 As shown in Fig. 1.48, after setting "Increase Number", when the program is executed to this programming point, the value of "Current Counted" of the workpiece counter will be added with the value of "Increase Number", which is used to record the number of completed workpieces at present. When the count value is greater than the alarm limit value, a prompt window will pop up and the machine will stop. You can also not insert this instruction in the program, directly in the "navigation interface" in the "set counter" option will be "counter is open" set to "On" state, and then set the value of "each time the cumulative amount", so that each time the machine finishes punching the product on the Y-axis, the value of "current count" will be automatically added to the value of "each time the cumulative amount". "This function is mainly used for cycle processing. This function is mainly used for piece counting during cycle processing.

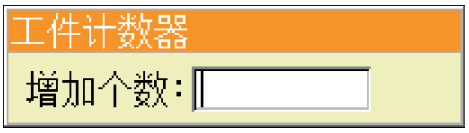


Figure 0 .48 Setting window "Workpiece counter".

1.7.2.17 **Back to '0' coordinate position**

When the program is executed to this programming point, the X, Y, and Z axes of the machine move to the corresponding positions of the (0.000, 0.000, 0.000) coordinates, and the axes come back at the "null speed".

1.7.2.18 **Run N times and return to the home position**

After setting the value of the number of times (N), when the program is executed to the programmed point N times, the machine performs the action of returning to the origin, and the difference with returning to the '0' coordinate position is that the system will capture the output signal of the sensor (i.e., the origin signal detection) when executing the "return to the origin".

1.7.2.19 **After screwing the workpiece is moved to the**

Figure 0 .49 Instruction "After screwing the workpiece is moved to".

The value of "The workpiece moves to" is the current real-time coordinate value of Y-axis when the user adds this instruction in "Programming Area". This value can also be changed directly by selecting the programming point of this instruction in the "Programming Area", pressing the "OK" key, and then inputting the value in the corresponding input box.

There are 2 important meanings and functions of "moving the workpiece after screwing":

1. If the program reaches this line, the part has been machined. When the machine is in "Double Y Manual Start" or "Workpiece Inspection Start", the addition of this instruction to the program can be used as an important indication that the workpiece has been machined (another situation with the same effect is that the Y1-axis (Y2-axis) programming point in the program is switched to the Y2-axis (Y1-axis) programming point). (Another case with the same effect is that when the Y1-axis (Y2-axis) programming point is switched to the Y2-axis (Y1-axis) programming point in the program, it also indicates that machining of the workpiece on the Y1-axis (Y2-axis) is completed. Under "Double Y Manual Start", when the system runs this instruction, it will judge whether the "Y1 Start Key" or "Y2 Start Key" on the machine has been triggered or not, and if the "Y1 Start Key" or "Y2 Start Key" has been triggered, the system will check whether the "Y1 Start Key" or "Y2 Start Key" on the machine has been triggered or not. If "Y1 start key" or "Y2 start key" is triggered, it indicates that the workpiece has been replaced, and the machine will start to hit the screws of the workpiece on the

corresponding axis, otherwise, wait for "Y1 start key" or "Y2 start key" to be triggered, and the machine will start to hit the screws of the workpiece on the corresponding axis. Otherwise, wait for "Y1 start key" or "Y2 start key" to be triggered. Note: If the machine is in the mode of double Y-axis, if you are hitting the screws of the workpiece on Y1 axis at this time, it is invalid to press "Y1 start key", but it is valid to press "Y2 start key", after pressing "Y2 start key", it indicates that the Y2 axis has been replaced. After pressing "Y2 start key", it indicates that the workpiece on Y2 axis has been loaded and ready to hit the screws, at this time, Y2 axis will wait for the completion of the workpiece on Y1 axis, after the completion of the workpiece on Y1 axis, the machine will start to hit the screws on the workpiece on Y2 axis, at this time, press "Y2 start key is invalid", but press "Y1 start key" is valid, press "Y1 start key" is invalid, but press "Y2 start key" is valid. At this time, press "Y2 start key is invalid", but press "Y1 start key" is effective, when pressed "Y1 start key", indicating that the workpiece on the Y1 axis has been loaded and ready to hit the screws, at this time, the Y1 axis will be waiting for the completion of the workpiece on the Y2 axis, to be completed after the completion of the workpiece on the Y2 axis, the machine will start to hit the screws of the workpiece on the Y1 axis, so that the machine will start to hit the screws of the Y1 axis. workpiece on the Y2 axis is completed, the machine will begin to hit the Y1 axis workpiece screws, and so on and so forth; ② in the machine in the "workpiece detection start" mode, the system runs to the instruction, it will detect the sensor signals, to determine whether the screws hit the completion of the workpiece is replaced, to be hit by the workpiece to replace the workpiece is replaced. If the replacement of workpiece is completed, after the system detects that the workpiece has been put on the fixture tray and reaches the user-set "delay after detecting workpiece" (set in the "Motion-related time and delay" option in the "Navigation page"), the system will detect the sensor signal to determine whether the workpiece has been replaced after screwing and whether the workpiece to be screwed has been replaced. After the user set "Delay time after detecting workpiece" (set in "Motion related time and delay time" of

"Navigation page"), the machine will start to drive the screws of the workpiece on the corresponding axis, otherwise, wait for the workpiece to be replaced. Note: If the machine is in the mode of double Y-axis, if the machine is hitting the screws of the workpiece on Y1 axis, you can replace the workpiece on Y2 axis at this time, and wait for the completion of the workpiece on Y1 axis after the completion of the replacement, after the completion of the workpiece on Y1 axis, the machine will start hitting the screws of the workpiece on Y2 axis, at this time, you can replace the workpiece on Y1 axis, after the completion of the replacement, you can wait for the completion of the workpiece on Y2 axis, and wait for the completion of the workpiece on Y2 axis, then the machine will start hitting the screws of the workpiece on Y2 axis. When the workpiece on Y2 axis is finished, the machine will start to hit the screws of the workpiece on Y1 axis, and so on.

2. After the workpiece is machined, the corresponding Y-axis of the machine moves to the specified coordinate position, making it easy for the user to change the workpiece.

1.7.2.20 **Z-axis follow-through speed and follow-through length**

After setting the parameter values in the pop-up parameter setting window, press "OK" to insert the motion parameter instruction in the cursor line of the "Programming Area". You can also modify the motion parameter instruction in the "Programming Area". (**Note**: The inserted motion parameters are only valid for the current project file and only valid when the machine is in the "motion" state of automatic screwing, the system scans the current motion parameters, and only valid for the screwing action of the screw holes in the back)

1.7.2.21 **Motion-related time and delay**

After setting the parameter values in the pop-up parameter setting window, press "OK" to insert the motion parameter instruction in the cursor line of the "Programming Area". You can also modify the motion parameter instruction in the "Programming Area". (**Note**: The inserted motion parameters are only valid for the current project file and only when the machine is in the "motion" state of automatic screwing, the system scans the current motion parameters, and then the screwing action of the following screw holes will be effective.)

1.7.2.22 **Torque detection and alarm for electric batches**

After setting the parameter values in the pop-up parameter setting window, press "OK" to insert the motion parameter instruction in the cursor line of the "Programming Area". You can also modify the motion parameter instruction in the "Programming Area". (**Note**: The inserted motion parameters are only valid for the current project file and only when the machine is in the "motion" state of automatic screwing, the system scans the current motion parameters, and then the screwing action of the following screw holes will be effective.)

1.7.2.23 **There are screws to detect whether it is open or not**

After setting the parameter values in the pop-up parameter setting window, press "OK" to insert the motion parameter instruction in the cursor line of the "Programming Area". You can also modify the motion parameter instruction in the "Programming Area". (**Note**: The inserted motion parameters are only valid for the current project file and only when the machine is in the "motion" state of automatic screwing, the system scans the current motion parameters, and then the screwing action of the following screw holes will be effective.)

1.7.2.24 **Working speed setting**

After setting the parameter values in the pop-up parameter setting window, press "OK" to insert the motion parameter instruction in the cursor line of the "Programming Area". You can also modify the motion parameter instruction in the "Programming Area". (**Note**: The inserted motion parameters are only valid for the current project file and only when the machine is in the "motion" state of automatic screwing, the system scans the current motion parameters, and then it is valid for the screwing action of the screw holes behind. Which is invalid in the implementation of the "single-step" screwing, is the "navigation interface" in the "speed and acceleration" options in the "XYZ axis work (The "Speed" option in the "Navigation interface" is used to run the screwdriver.)

1.7.2.25 **Safety height setting**

After setting the parameter values in the pop-up parameter setting window, press "OK" to insert the motion parameter instruction in the cursor line of the "Programming Area". You can also modify the motion parameter instruction in the "Programming Area". (**Note**: The inserted motion parameters are only valid for the

current project file and only when the machine is in the "motion" state of automatic screwing, the system scans the current motion parameters, and then the screwing action of the following screw holes will be effective.)

1.7.2.26 **Coordinates of feeder 1/2/3**

After selecting the command, press OK to insert the motion parameter command in the cursor line of the Programming Area. You can also modify the motion parameter instruction in the "Programming Area". (**Note**: The inserted motion parameters are only valid for the current project file and only when the machine is in the "motion" state of automatic screwing, the system scans the current motion parameters, and then the screwing action of the following screw holes will be effective).

1.7.2.27 **Sorting of screw holes**

When importing the coordinates of a large number of screw holes in the DXF file of CAD, the order of the programmed points of the imported screw hole coordinates is the same as the order of CAD drawing, and the order of the screw holes may be very messy, which affects the efficiency of the screw holes. At this time, the user can use this function to sort the screw holes, regardless of the order of the CAD drawing of the screw hole graphics, after sorting, it is the top left corner of the top view of the "motion preview trajectory" as a starting point, re-order the "programming area" of the screw hole coordinates. Programming points, you can scan the order of screws, to avoid excessive machine movement stroke in the process of screwing, shorten the screwing path, improve screwing efficiency. Setting window asFigure 0 .50 shown in Figure 1.50.

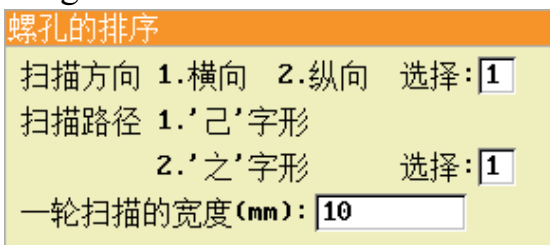


Figure 0 .50 "Screw Hole Sorting Window

The meaning of each of these parameters is as follows:

Scanning direction: the scanning direction when sorting, the schematic is as followsFigure 0 .51 (the direction of the shaded arrow is the scanning direction).

Scan Path: the scan path when sorting, the schematic is as followsFigure 0 .51

is shown in Figure 1.51.

Scanning width: the scanning width of each scanning round during sorting, as shown in the following diagramFigure 0 .51 is shown in Figure 1.51.

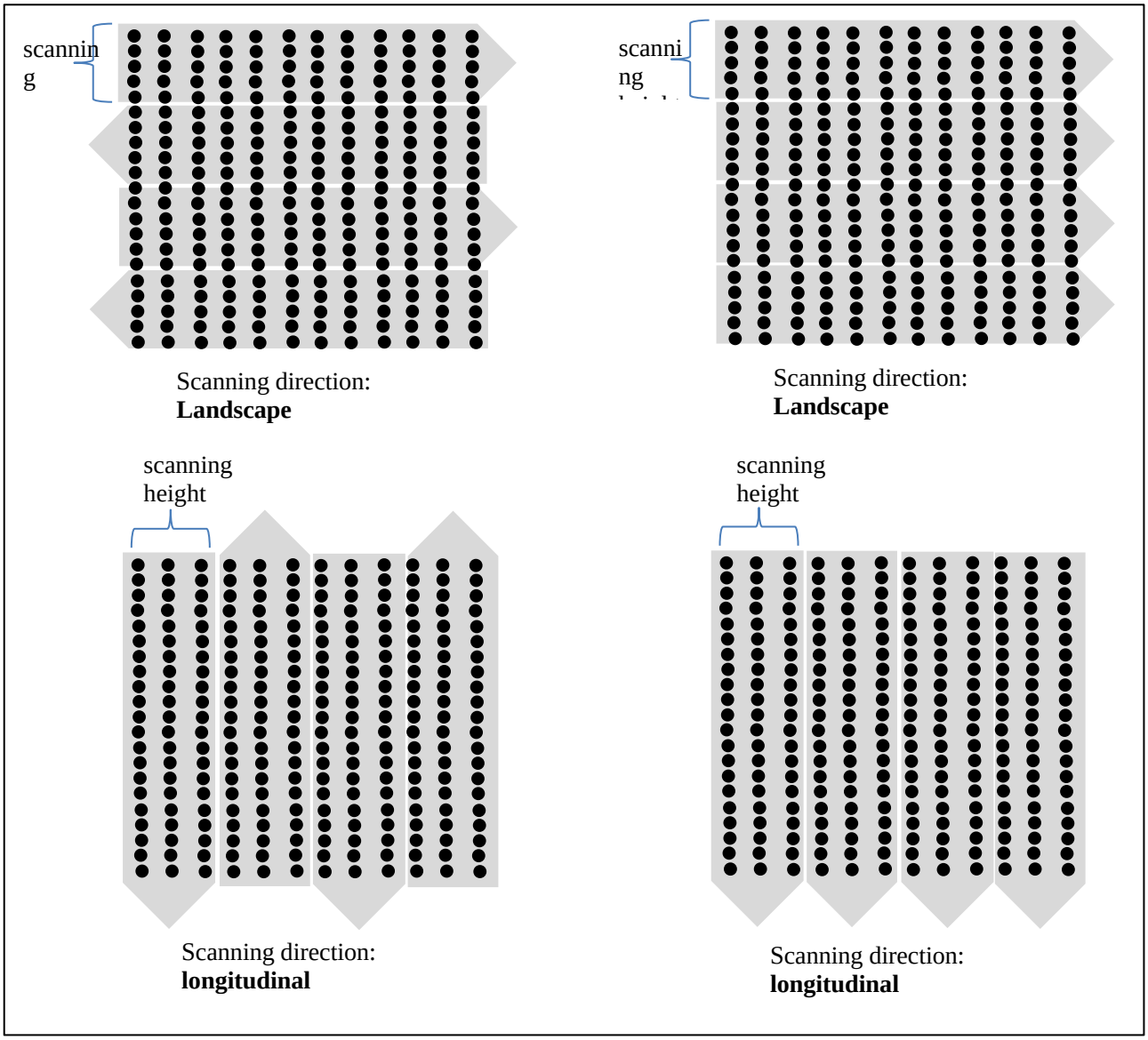


Figure 0 .51 Schematic diagram "Sorting of screw holes".

1.7.2.28 Processing of Y1 before moving in (...)

This directive is mainly used on non-standard machines. If you need to use it, you can contact the manufacturer for technical support.

1.7.2.29 Handling of Y1 after removal (...)

This directive is mainly used on non-standard machines. If you need to use it, you can contact the manufacturer for technical support.

1.7.2.30 **Y2 Processing before moving in (...)**

This directive is mainly used on non-standard machines. If you need to use it, you can contact the manufacturer for technical support.

1.7.2.31 **Handling of Y2 after removal (...)**

This directive is mainly used on non-standard machines. If you need to use it, you can contact the manufacturer for technical support.

1.7.2.32 **post-backtracking (...)**

This directive is mainly used on non-standard machines. If you need to use it, you can contact the manufacturer for technical support.

1.7.2.33 **Post-alarm handling (...)**

This directive is mainly used on non-standard machines. If you need to use it, you can contact the manufacturer for technical support.

1.7.2.34 **empty space**

Record the coordinates of the empty point. When the program runs to this programming point, the machine moves to this coordinate point, but does not do the screwing action and can be used to do other things besides screwing.

1.7.2.35 **Only Y1 moves to**

The Y1 axis of the machine only moves to the specified coordinate position without any other meaning, so pay attention to the difference with the instruction "Move the workpiece to after screwing".

1.7.2.36 **Only Y2 moves to**

The Y2 axis of the machine only moves to the specified coordinate position without any other meaning, so pay attention to the difference with the instruction "move the workpiece to after screwing".

1.8 calibrations

1.8.1 What is "calibration"?

What is the purpose of calibration? When a workpiece is moved "horizontally or vertically" on a machine, it is only necessary to perform a calibration of the coordinates in order to continue to use the originally set screw hole coordinates. The essence of the calibration is an overall offset of all the screw hole coordinates in the "programming area". For example, if there are three screw holes in a certain

workpiece, even though the position of the workpiece has changed, the relative distances of the three screw holes within the workpiece must remain the same, so it is only necessary to carry out a calibration once, thus eliminating the need to repeat the tedious task of entering the screw hole coordinates.

What is the principle of calibration? When a new workpiece is entered into the screw hole coordinates, at this time on the workpiece to find an arbitrary point (this point should have a clear identification mark, such as a screw hole), this arbitrary point as a "calibration point", the "calibration point" coordinates are also entered into the system and stored. The coordinates of the "calibration point" will be recorded and stored in the system. After entering the "calibration mode", when the position of the workpiece placed in the machine does not change, the machine electric batch head running to the original stored "calibration point" coordinates position, the electric batch must be aligned with the "calibration point" position is consistent with the "calibration point". The position of "calibration point" is consistent. On the contrary, when the position of the workpiece placed in the machine changes, the alignment point of the electric batch moves to the pre-set "calibration point" coordinate position, the alignment point of the electric batch is bound to coincide with the position of the "calibration point", at this time, it is necessary to move the electric batch head through 

, 

, 

, 

and 

, 

Direction keys to move the machine batch head, so that the alignment point of the electric batch and the original "calibration point" position match again, and finally press the 

key, the machine will automatically put the "current real-time" coordinate data and the "original storage of calibration point The machine will automatically compare the "current real-time" coordinate data with the "original stored calibration point" coordinates for comparison and arithmetic, resulting in a coordinate offset, and then use this offset to calibrate and update the coordinates of all the screw holes in the "programming area", so that the calibrated coordinates of the screw holes in the "programming area" are in one-to-one agreement with the actual screw hole position. This way, the coordinates of the calibrated screw holes in the "Programming Area" and the actual screw holes in the current situation correspond one by one.

Calibration consists of two parts, namely, "set the coordinates of the calibration point" and "calibrate the calibration point". To calibrate the operation, you must develop this habit, when a new workpiece to enter the screw hole coordinates, you must carry out a "set the coordinates of the calibration point" of the operation, this operation is for the workpiece later calibration of the "ambush" buried.

1.8.2 Setting the coordinates of the calibration point

Initialize the coordinates of the machine's axes by first pressing 回原点 to return to the home position.

Press 导航界面 shortcut key to enter the "navigation interface", move the cursor to 设置螺孔坐标与编程 option by pressing 向下 , 向上 key or pressing 上页 , 下页 key to quickly flip the cursor to option, press 确定 key to pop up the "set calibration point coordinates" window, "3-axis (single Y)" machine can be directly set in this window, but "4-axis (double Y)" machine needs to choose whether to set Y1 calibration point or Y2 calibration point coordinates. For "3-axis (single Y)" machine, you can set the calibration point coordinates directly in this window, but for "4-axis (double Y)" machine, you need to choose whether to set the Y1 calibration point or Y2 calibration point coordinates, and the selection window is shown in Figure 1.52.Figure 0 .52 The selection window is shown in Figure 1.52.

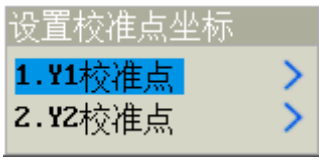
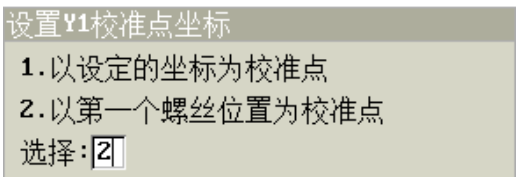


Figure 0 .52 Selection window "Setting

Take the "4-axis (Double Y)" machine as an example, we move the cursor to select the "1.Y1 Calibration Point" option by pressing 向下 and 向上 , and press



确定 to enter the "Set Y1 Calibration Point Coordinate" selection window. Press to enter the "Set Y1 Calibration Point Coordinates" selection window.

As shown inFigure 0 .53 shown, under this window, there are two ways to set the calibration point coordinates:

Calibration point coordinate setting mode 1: Press "Number 1" 

key to select "1. Set coordinate as calibration point", and the pop-up will appear as inFigure 0 .54 The window shown in Figure 1.54 will pop up.

Figure 0 .53 Selection window "Set Y1

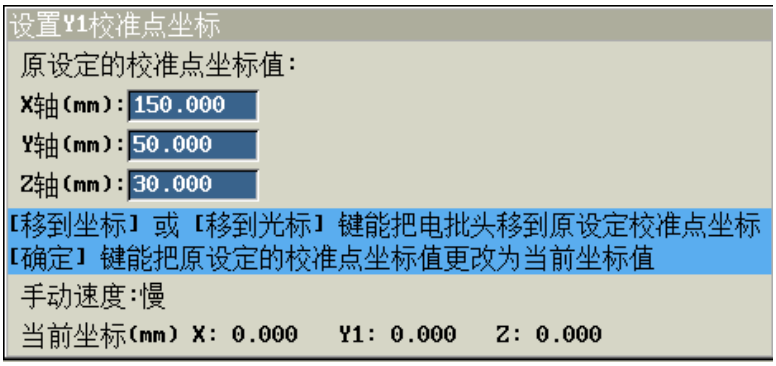


Figure 0 .54 "Setting the Y1 calibration point coordinates" window

This window shows the "original set calibration point coordinates", at this time through the 

, 

, 

, 

, 

, 

six directional keys, manually move the machine's batch alignment point to the pre-set "calibration point" position (manual movement speed can be pressed 

key for "fast, medium, slow" speed switch), and finally press the key will set the current real-time coordinates into the system as the new "original set calibration point coordinates", set the current real-time coordinates into the system as the new "set calibration point coordinates". (the manual moving speed can be switched by pressing 

key for "fast, medium, slow" speed), and finally press key to set the current real-time coordinates into the system as the new "original set calibration point coordinates", and set the new "original set calibration point coordinates". After setting the new "original calibration point coordinates", in order to check whether the setting is successful or not, you can re-enter this window to check whether the stored data is consistent with the current real-time coordinates.

Calibration point coordinate setting mode 2: Press "number 2" 

key to select "2. Take the first screw position as calibration point", you can automatically set

the coordinates of the first screw hole in the "programming area" as the "calibration point". "Calibration point".

Note: Setting the Y2 calibration point coordinates is the same as setting the Y1 calibration point coordinates.

1.8.3 Calibration Operation

After setting the "Calibration point coordinates" using the "Setting calibration coordinates" method described above, there are two ways to "Calibrate calibration points":

The first "Calibrate Calibration Points" method is operated on the handheld programmer. First, press 回原点 to return to the home position and initialize the machine coordinates. Then, press the 校准启动 key on the handheld programmer to enter the "Calibration Start" window, take the "4-axis (Double Y)" machine as an example, as followsFigure 0 .55 The machine is shown in Figure 1.55.

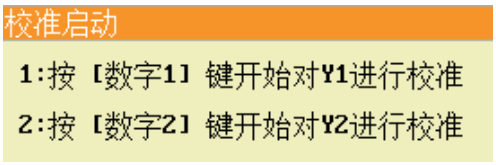


Figure 0 .55 "Calibration Startup

For example, if you want to calibrate the Y1 axis, press the "number 1" 螺丝孔位 @ 1 key to select "1. Press the [number 1] key to start calibrating the Y1". At the same time, the XY axis of the machine will automatically move to the XY coordinate position of the pre-set calibration point, in which the Z axis is at the "0.000" coordinate position, and then according to the prompt box to choose the way to move the Z axis down to the calibration point, there are two kinds of: ① manually manually move the Z axis down to the calibration point. This function is applicable when the XY axis of the machine moves to the position above the calibration point, the Z coordinate of the workpiece surface under the head of the electric batch is smaller than the Z coordinate of the pre-set calibration point (in this case, if the Z axis moves down to the pre-set calibration point, it will collide with the workpiece), in order to avoid the collision of the Z axis and the workpiece, it is necessary to manually move down the Z axis to the calibration point; ② the machine

automatically moves down the Z axis to the calibration point. axis to the calibration point automatically. When this function is selected by pressing the "number 2" key, the Z-axis will automatically run to the pre-set calibration point. When the user has finished moving the Z-axis to the calibration point in one of the above two ways, if the position of the workpiece has not changed, the alignment point of the electric batches must be consistent with the pre-set position of the "calibration point". On the contrary, when the position of the workpiece in the machine changes, the alignment point of the electric batch must not match with the position of the "calibration point", at this time, it is only necessary to move the alignment point of the electric batch through the 

arrow keys to make the alignment point of the electric batch match with the position where the "calibration point" should have been aligned. Finally, press the 

key, the machine will automatically compare the current "real-time coordinates" data with the pre-set coordinates of the calibration point position, and then derive a coordinate offset, and then use this offset to adjust all the "programming area" in the "programming area". Finally, this offset is used to calibrate and update the screw hole coordinates of all the "programming points" in the "programming area", so that the calibrated screw hole coordinates of the "programming area" and the current actual screw hole position correspond to each other.

The second method of "calibrating the calibration point" is operated on the machine's OLED LCD. First, press the [Home] button of the machine (the name of the button may be [Reset] for different machines) to return to the home position and initialize the coordinates of the machine. Then, press 

to enter the "Calibration Start", for example, if the user calibrates the Y1 axis, then press "1#" to start calibrating Y1", at the same time, the XY axis of the machine will automatically move to the XY coordinate position of the pre-set calibration point. At the same time, the machine XY axis will automatically move to the pre-set XY coordinate position of the calibration point, in which the Z-axis moves to the "0.000" coordinate position, and then according to the prompt box to select the Z-axis down to the calibration point of the way, there are two kinds of: ① manual adjustment. This function is applicable when the XY axis of the machine moves to the position above the

calibration point, the Z coordinate of the workpiece surface under the head of the electric batch is smaller than the Z coordinate of the pre-set calibration point (in this case, if the Z axis moves down to the pre-set calibration point, it will collide with the workpiece), in order to avoid collision of the Z axis with the workpiece, this time, it is necessary to manually move down the Z axis to the calibration point; ② machine automatically. When this function is selected by pressing the "2#" key, the Z-axis will automatically run to the pre-set calibration point. When the user has finished moving the Z-axis to the calibration point according to one of the above two ways, if the position of the workpiece has not changed, the alignment point of the electric batches must be consistent with the position of the pre-set "calibration point". On the contrary, when the position of the workpiece placed in the machine changes, the alignment point of the electric batch must be inconsistent with the position of the "calibration point", at this time, it is only necessary to move the alignment point of the electric batch through the 

arrow keys on the OLED LCD to make the alignment point of the electric batch coincide with the position where the "calibration point" should have been. Finally, press the 

key, the machine will automatically compare the current "real-time coordinates" data with the pre-set coordinates of the calibration point position, and then arrive at a coordinate offset, and then use this offset to program all the "programming area". Finally, this offset is used to calibrate and update the screw hole coordinates of all the "programming points" in the "programming area", so that the calibrated screw hole coordinates of the "programming area" and the current actual screw hole position correspond to each other.

1.9 Programming Cases

The machine needs to be programmed according to the running mode of the machine before running to drive screws. This system supports 3 operation modes: **single Y manual start, double Y manual start, and workpiece detection start.**

1.9.1 Single Y manual start

The machine is a single Y-axis (3-axis) machine and can be operated in "Single Y Manual Start" mode. In this mode, the user only needs to press the 

key on

the handheld programmer or the "Run/Pause key" on the machine, and the machine will start to drive screws.

After the machine is turned on, the user puts the workpiece on the fixture plate, presses the 

key on the handheld programmer or the "run/pause key" on the machine, the handheld programmer will enter the "motion preview interface", the machine is in the "run" state and starts screwing directly until the end of the program. The machine will be in "running" state and start screwing directly until the end of the program, when the machine is in "stop" state, replace the workpiece, and then press the 

key on the handheld programmer or the "run/pause key" on the machine to start screwing, and so on. The cycle is repeated.

["Single Y manual start" case]: A single Y-axis (3-axis) machine with 3 workpieces fixed on the fixture plate, 3 screw holes on each workpiece, a total of 9 screw holes, using feeder 1 to feed the material. After a round of screwing, the workpiece count value is increased by 3, the machine stops, and the Y-axis moves to the "0.000 coordinate" for the user to change the workpiece. **Relevant settings:** In the "Setting Counter" option in the "Navigation Interface", set "whether the counter is on" to "on". In the "Set Counter" option in the "Navigation Interface", set "Counter On" to "On", and then set the value of "Accumulate Amount Each Time" to 3. In this way, every time when the machine finishes punching the products on the Y-axis, the value of "Counted Currently" will be added to the value of "Accumulate Amount Each Time". **Screenshot of the program:** as inFigure 0 .56 The program screenshot: as shown in Figure 1.56.

```
0001 螺孔位置 X:50.000 Y: 50.000 Z:40.000 供料器1
0002 螺孔位置 X:50.000 Y: 100.000 Z:40.000 供料器1
0003 螺孔位置 X:50.000 Y: 150.000 Z:40.000 供料器1
0004 螺孔位置 X:100.000 Y: 50.000 Z:40.000 供料器1
0005 螺孔位置 X:100.000 Y: 100.000 Z:40.000 供料器1
0006 螺孔位置 X:100.000 Y: 150.000 Z:40.000 供料器1
0007 螺孔位置 X:150.000 Y: 50.000 Z:40.000 供料器1
0008 螺孔位置 X:150.000 Y: 100.000 Z:40.000 供料器1
0009 螺孔位置 X:150.000 Y: 150.000 Z:40.000 供料器1
0010 打螺丝完成后Y工件移到:0.000
```

Figure 0 .56 Screenshot of the program for the case of "Single Y manual start"

The program is explained below:

1. "9 lines of programmed points at address 0001~0009" indicates the coordinates of the 9 screw holes entered and the feeder used for drilling each screw hole.

2. "0010 Y workpiece move to after screwing: 0.000" is inserted by pressing the "Finish move to" shortcut command key on the hand-held programmer (or pressing the "More commands" key will bring up the "More commands" menu). (or press the "More Instructions" key to bring up the "More Instructions" menu and insert the instruction "1. Workpiece move to after screwdriving" on page 3, item 1). This instruction can not be added, because the machine will automatically return to the "0.000" coordinates of the Y-axis after screwing, but if the machine Y-axis is not moved to the "0.000" coordinates but to other locations, you need to add the instruction and set the value.

1.9.2 Double Y manual start

The machine is a dual Y-axis (4-axis) machine, adopting the "dual Y manual start" operation mode. After the machine is turned on, press the 

key on the handheld programmer or the "run/pause key" on the machine, the handheld programmer will enter the "motion preview interface" and the machine is in the "running" state. However, it will wait for the user to place the workpiece on the Y1-axis (Y2-axis) fixture plate, when the workpiece is placed, then press the corresponding "Y1 start key" ("Y2 start key") on the machine, and then it can start to hit the screws on the workpiece on the Y1-axis (Y2-axis). During the screwing process, the user can assemble the workpiece for the "idle" Y2 axis (Y1 axis), and press the "Y2 start key" ("Y1 start key") after the workpiece is assembled, but press the "Y1 start key" ("Y1 start key") to start the screwing process. "Y1 start key" ("Y2 start key") is invalid, at this time the Y2 axis (Y1 axis) moves to the first screw hole position Y coordinate of the axis ready to wait for the machine to finish playing the Y1 axis (Y2 axis) on the workpiece screws. When the machine finished Y1 axis (Y2 axis) on the workpiece screws, will be followed by Y2 axis (Y1 axis) on the workpiece screws, at this time the user can be uninstalled has been screwed on the Y1 axis (Y2 axis) on the workpiece, and then re-installed a new workpiece, and then press the corresponding "Y1 start key" ("Y2 start key"), but press the "Y2 start key" ("Y1 start key") is invalid, at this time, the Y1 axis (Y2 axis) to move to the axis of the first screw holes in the Y coordinates of the position Ready, waiting for the

machine to finish playing Y2 axis (Y1 axis) on the workpiece screws. When the machine finished playing Y2 axis (Y1 axis) on the workpiece screws, and will then start playing Y1 axis (Y2 axis) on the workpiece screws, so the cycle repeats.

Of course, the machine has 2 Y-axes, so there are two cases: (1) only one of the Y1 or Y2 axes is used to work; (2) both Y1 and Y2 axes work. The case study is as follows:

["Dual Y manual start single Y-axis" case]: Dual Y-axis machine, but only use one of the Y1 or Y2 axis to work. If only Y1 axis is used, put 3 workpieces on the fixture tray of Y1 axis, each workpiece has 3 screw holes, there are 9 screw holes in total, and use feeder 1 to feed the material. After one round of screws, the count value of workpiece will be increased by 3. And every time after one round of workpiece, Y1 axis needs to be moved to "0.000 coordinate" to facilitate the user to replace the workpiece. **Relevant settings:** In the "Set Counter" option in the "Navigation

Interface", set "Counter On" to "On", and then set "Counter On" to "On". In the "Set Counter" option in the "Navigation Interface", set "Counter On" to "On", and then set the value of "Accumulate Amount Each Time" to 3. In this way, every time when the machine finishes punching the product on Y1 axis, the value of "Current Counted" will be automatically added to the value of "Accumulate Amount Each Time". **Screenshot of the program:** as inFigure 0 .57 shown in Figure 1.57.

The program is explained below:

1. "9 lines of programmed points at address 0001~0009" indicates the coordinates of the 9 screw holes entered and the feeder used for drilling each screw hole.

2. "0010 Y1 workpiece move to: 0.000 after screwing is completed" is inserted

Figure 0 .57 Screenshot of the program for the case "Double Y manually

by pressing the "Finish move to" shortcut command key on the hand-held programmer (or pressing the "More commands" key will bring up the "More commands" menu). Pressing the "More Instructions" button brings up the "More Instructions" menu and inserts the instruction "1. Workpiece move to after screwdriving" on page 3, item 1). This instruction has two important functions: ① When the program is executed to the programming point, it means that the screws of the workpiece on the Y1 axis have been finished, and at this time, it will wait for the user to trigger the "Y1 start key" on the machine, if the start key is triggered, it indicates that the workpiece on the Y1 axis has been replaced, and the machine starts to hit the screws on the workpiece on the Y1 axis, or else it will continue to wait for the "Y1 start key" to trigger. Wait for the "Y1 start key" to trigger. After the workpiece is finished, the Y1 axis moves to the specified "0.000" coordinate position, which is convenient for the user to change the workpiece.

["Double Y manual start double Y-axis" case]: Double Y-axis machine, Y1 and Y2 axis both work. In the Y1 and Y2 axis of the fixture tray were placed on two workpieces, each workpiece has 2 screw holes, a total of 8 screw holes, the use of feeder 1 feed. When finish playing the screws of a Y-axis workpiece, the count value of the workpiece will be increased by 2, and every time after playing a Y-axis workpiece, the corresponding Y-axis needs to be moved to the "0.000 coordinate" to facilitate the user to replace the workpiece. **Relevant settings:** In the "Set Counter" option in the "Navigation Interface", set "Counter On" to "On", and then set "Counter On" to "On". Then set the value of "Accumulate amount per time" to 2. In this way, after each time the machine finishes hitting the products on a certain Y-axis, the value of "Current counted" will be automatically added to the value of "Accumulate amount per time". **Screenshot of the program:** as inFigure 0 .58 shown in Figure 1.58.

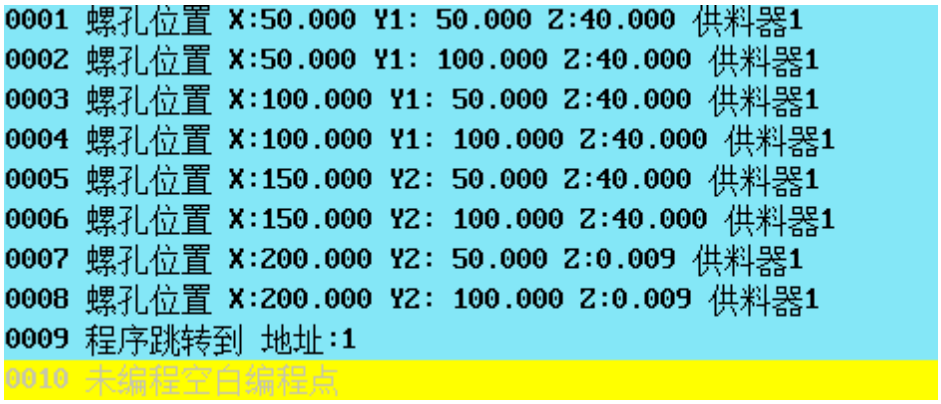


Figure 0 .58 Screenshot of the program for the case "Double Y manual

The program is explained below:

1. "8 lines of programmed points at address 0001~0008" indicates the coordinates of the screw holes in the Y1 and Y2 axes entered and the feeder used for drilling each screw hole.

2. "0009 Program Jump to Address: 1" is inserted by pressing the "Program Jump" shortcut command key on the handheld programmer (or pressing the "More Commands" key will bring up the "More Commands" menu). Press "More Instructions" to bring up the "More Instructions" menu, and insert the instruction "9.) In the "Programming Area", the program jumps to the specified programming point "Address 0001" and cycles from top to bottom when the program is executed at this programming point. When Y1-axis (Y2-axis) is switched to Y2-axis (Y1-axis) in the program, Y1-axis (Y2-axis) will move to the '0.000' coordinate position of Y1-axis (Y2-axis) by default, which means that the screws of the workpiece on Y1-axis (Y2-axis) have been finished, and at the same time, the system will detect whether the "Y At the same time, the system will detect whether the "Y start key" is triggered or not.

1.9.3 **Workpiece inspection startup**

Depending on the machine structure, there are single Y-axis (3-axis) machines and double Y-axis (4-axis) machines, which are operated by the "workpiece detection start" method:

I. "Workpiece **inspection start-up 3-axis machine**". Three-axis machine, i.e., working with one Y-axis, working in "workpiece inspection startup" operation mode. After the machine is turned on, the user presses the 

key on the handheld programmer or the "run/pause key" on the machine, the handheld programmer will

enter the "Motion Preview Interface", and the machine will be in the "Running" state, but will wait for the user to place the workpiece on the machine. The machine is in the "Run" state, but will wait for the user to place the workpiece on the fixture plate, after the system detects that the workpiece has been placed on the fixture plate and reaches the length of the "delay after detecting the workpiece" set by the user, then it will start to drive screws. When the machine finished hitting the workpiece on the Y-axis, the user takes down the workpiece that has been screwed, and then reloads a new workpiece, the system will automatically detect that the workpiece has been replaced, and after the system detects that the workpiece has been placed on the fixture plate and reaches the length of time set by the user for the "delay after detecting the workpiece", then it will start to hit the screws again, so that the cycle repeats. The cycle is repeated.

[**"Workpiece Inspection Starting 3-axis Machine" Case**]: 3-axis machine, 1 Y-axis working, 3 workpieces fixed on the fixture plate, 3 screw holes on each workpiece, a total of 9 screw holes, using the feeder 1 to supply material. After one round of screwing, the count value of workpiece will be added 3, the machine will stop, and the Y-axis will move to "0.000 coordinates" to facilitate the user to change the workpiece. **Relevant settings:** In the "Setting Counter" option in the "Navigation Interface", set "Counter on or off" to "On", and then set "Counter on or off" to "On". In the "Set Counter" option in the "Navigation Interface", set "Counter On" to "On", and then set the value of "Accumulate Amount Each Time" to 3. In this way, every time when the machine finishes punching the products on the Y-axis, the value of "Counted Currently" will be added to the value of "Accumulate Amount Each Time". **Screenshot of the program:** as inFigure 0 .59 The program screenshot: as shown in Figure 1.59.

Figure 0 .59 Screenshot of the program for the case "Workpiece inspection to start the 3-axis machine"

The program is explained below:

1. "9 lines of programmed points at address 0001~0009" indicates the coordinates of the 9 screw holes entered and the feeder used for drilling each screw hole.

2. "0010 Y workpiece move to after screwing: 0.000" is inserted by pressing the "Finish move to" shortcut command key on the handheld programmer (or pressing the "More commands" key will bring up the "More commands" menu). "The "More Instructions" menu will pop up, insert the instruction "1. Workpiece move to after screwdriving" on page 3, item 1). (This instruction must be added, otherwise the machine will be in the "stop" state after screwing, and after replacing the finished parts, you still have to press the "start button" to work. This instruction has two important functions: ① When the program is executed to this programming point, it means that the screws of the workpieces on the Y-axis have been finished, and the system will detect the signals from the sensors to determine whether the workpieces with screws finished are replaced, and whether the workpieces to be punched are replaced. If the workpiece replacement is completed, the machine will start to screw the Y-axis workpiece after the system detects that the workpiece has been put on the fixture tray and reaches the user-set "delay time after detecting the workpiece", otherwise, it will wait for the replacement of the workpiece. After the workpiece is processed, the Y-axis moves to the specified "0.000" coordinate position, which is convenient for the user to replace the workpiece.

II. "Workpiece inspection start-up 4-axis machine". The 4-axis machine, i.e., the machine has 2 Y-axes, and works by "workpiece inspection start" operation. After

the machine is turned on, the user presses the 

key on the handheld programmer or the "run/pause key" on the machine, the handheld programmer will enter the "Motion Preview Interface", and the machine will be in the "Running" state, but will wait for the user to place the workpiece on the machine. The machine is in the "Run" state, but it will wait for the user to place the workpiece on the fixture disk. After the system detects that the workpiece has been placed on the fixture disk of the Y1-axis (Y2-axis) and reaches the length of the "delay after detecting the workpiece" set by the user, it will start to hit the screws of the workpiece on the Y1-axis (Y2-axis). In the process of driving screws, the user can give the "idle" Y2 axis (Y1 axis) assembly workpiece, installed the system will automatically detect the corresponding axis of the workpiece has been installed, at this time, the Y2 axis (Y1 axis) to move to the axis of the first screw hole position Y coordinate ready to wait for the machine to finish driving the screws of the workpiece on the Y1 axis (Y2 axis). When the machine has finished hitting the Y1 axis (Y2 axis) on the workpiece screws. After the machine finishes hitting the workpiece on the Y1 axis (Y2 axis), when the system detects that the workpiece has been placed on the fixture disk of the Y2 axis (Y1 axis) and reaches the length of time set by the user for "delay after detecting the workpiece", the machine will start hitting the screws of the workpiece on the Y2 axis (Y1 axis). In the process of playing screws, the user can give the "idle" Y1 axis (Y2 axis) to replace the workpiece, installed the system will automatically detect the corresponding axis of the workpiece has been replaced, at this time, the Y1 axis (Y2 axis) to move to the axis of the first screw hole position Y coordinate ready to wait for the machine to play the screws of the workpiece on the Y2 axis (Y1 axis). This cycle repeats itself.

Of course, the machine has 2 Y-axes, so there are two cases: (1) only one of the Y1 or Y2 axes is used to work; (2) both Y1 and Y2 axes work. The case study is as follows:

[**"Workpiece Inspection Startup 4-Axis Machine with Single Y-Axis" Case**]: A dual Y-axis machine, but only one of the axes, Y1 or Y2, is used for work. If only Y1 axis is used, 3 workpieces are placed on the fixture tray of Y1 axis, and each workpiece has 3 screw holes, so there are 9 screw holes in total, and feeder 1 is used

to feed the workpieces. After one round of screws, the count value of workpiece will be increased by 3. And every time after one round of workpiece, Y1 axis needs to be moved to "0.000 coordinate" to facilitate the user to replace the workpiece. **Relevant settings:** In the "Set Counter" option in the "Navigation Interface", set "Counter On" to "On", and then set "Counter On" to "On". In the "Set Counter" option in the "Navigation Interface", set "Counter On" to "On", and then set the value of "Accumulate Amount Each Time" to 3. In this way, every time when the machine finishes punching the product on Y1 axis, the value of "Current Counted" will be automatically added to the value of "Accumulate Amount Each Time". **Screenshot of the program:** as inFigure 0 .60 shown in Figure 1.60.

```
0001 螺孔位置 X:50.000 Y1: 50.000 Z:40.000 供料器1
0002 螺孔位置 X:50.000 Y1: 100.000 Z:40.000 供料器1
0003 螺孔位置 X:50.000 Y1: 150.000 Z:40.000 供料器1
0004 螺孔位置 X:100.000 Y1: 50.000 Z:40.000 供料器1
0005 螺孔位置 X:100.000 Y1: 100.000 Z:40.000 供料器1
0006 螺孔位置 X:100.000 Y1: 150.000 Z:40.000 供料器1
0007 螺孔位置 X:150.000 Y1: 50.000 Z:40.000 供料器1
0008 螺孔位置 X:150.000 Y1: 100.000 Z:40.000 供料器1
0009 螺孔位置 X:150.000 Y1: 150.000 Z:40.000 供料器1
0010 打螺丝完成后Y1工件移到:0.000
```

Figure 0 .60 Screenshot of the program for the case "Workpiece inspection to start a 4-axis machine with a single Y-axis"

The program is explained below:

1. "9 lines of programmed points at address 0001~0009" indicates the coordinates of the 9 screw holes entered and the feeder used for drilling each screw hole.

2. "0010 Y1 workpiece move to: 0.000 after screwing is completed" is inserted by pressing the "Finish move to" shortcut command key on the hand-held programmer (or pressing the "More commands" key will bring up the "More commands" menu). "The "More Instructions" menu will pop up, insert the instruction "1. Workpiece move to after screwdriving" on page 3, item 1). (This instruction must be added, otherwise the machine will be in the "stop" state after screwing, and after replacing the finished parts, you still have to press the "start button" to work. This instruction has two important functions: ① When the program is executed to this programming point, it means that the screws of the workpieces on the Y-axis have been finished, and the system will detect the signals from the sensors to determine

whether the workpieces with screws finished are replaced, and whether the workpieces to be punched are replaced. If the workpiece replacement is completed, the machine will start to screw the workpiece in Y1 axis after the system detects that the workpiece has been put on the fixture tray and reaches the length of "delay time after detecting the workpiece" set by the user, otherwise, it will wait for the replacement of the workpiece. After the workpiece is processed, the Y1 axis moves to the specified "0.000" coordinate position, which is convenient for the user to replace the workpiece.

[**"Workpiece inspection start four-axis machine double Y-axis" case**]: Double Y-axis machine, Y1 and Y2 axis are working. In the Y1 and Y2 axis of the fixture tray were placed on two workpieces, each workpiece has 2 screw holes, a total of 8 screw holes, the use of feeder 1 feed. When finish playing the screws of a Y-axis workpiece, the count value of the workpiece will be increased by 2, and every time after playing a Y-axis workpiece, the corresponding Y-axis needs to be moved to the "0.000 coordinate" to facilitate the user to replace the workpiece. **Relevant settings:** In the "Set Counter" option in the "Navigation Interface", set "Counter On" to "On", and then set "Counter On" to "On". Then set the value of "Accumulate amount per time" to 2. In this way, after each time the machine finishes hitting the products on a certain Y-axis, the value of "Current counted" will be automatically added to the value of "Accumulate amount per time". **Screenshot of the program:** as inFigure 0 .61 shown in Figure 1.61.

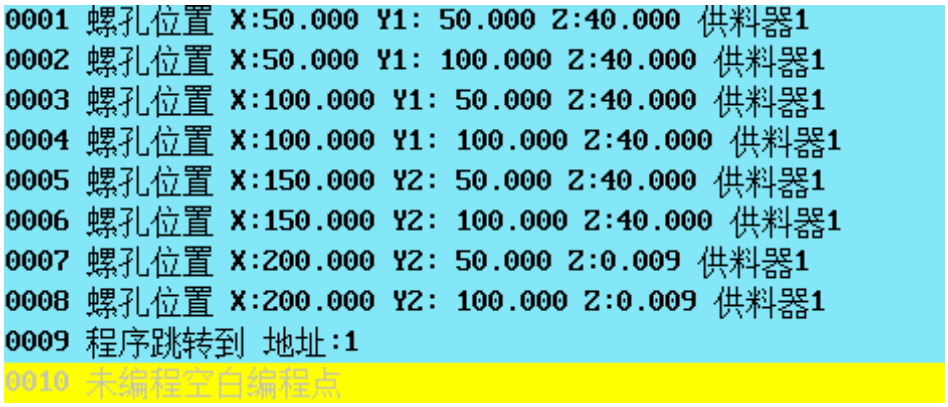


Figure 0 .61 Screenshot of the program for the case "Workpiece inspection to

The program is explained below:

1. "8 lines of programmed points at addresses 0001 to 0008" indicate the coordinates of the screw holes in the Y1 and Y2 axes entered, and the feeder used for

drilling the individual screw holes.

2. "0009 Program Jump to Address: 1" is inserted by pressing the "Program Jump" shortcut command key on the handheld programmer (or pressing the "More Commands" key will bring up the "More Commands" menu). Press "More Instructions" to bring up the "More Instructions" menu, and insert the instruction "9.) In the "Programming Area", the program jumps to the specified programming point "Address 0001" and then loops from top to bottom when the program is executed at this programming point. When Y1-axis (Y2-axis) is switched to Y2-axis (Y1-axis) in the program, Y1-axis (Y2-axis) will move to the '0.000' coordinate position of Y1-axis (Y2-axis) by default, and at the same time, the system will detect the signals of the sensors of Y1-axis and Y2-axis and judge which Y-axis has already been replaced with the workpiece, and the workpiece is put on the fixture tray after the system detects it. After the system detects that the workpiece has been put on the fixture tray and reaches the length of time set by the user for "delay after detecting the workpiece", the machine will start to drive the screws corresponding to the workpiece on the Y-axis, or else wait for the replacement of the workpiece.

第2章 Key Description

2.1 Handheld Programmer Keys Description

2.1.1 Individual key descriptions

1.  "Emergency Stop Button" can be pressed directly on the programmer to stop the machine in an emergency.
2.  Go to the "Navigation Screen".
3.  Manual Z-axis upward movement.
4.  Manual Z-axis downward movement.
5.  Manually move the X-axis to the left.
6.  Manually move the X-axis to the right.
7.  Manually move the Y-axis forward.
8.  Manual Y-axis backward movement.
9.  Switches the feeders. Effective when the number of feeders is ≥ 2.
10.  Switches the Y-axis. Valid when the system is dual Y-axis (quad).
11.  Manual movement speed "slow, medium, fast" three speed switching.
12.  The X, Y, and Z axes perform a return-to-home motion.
13.  The machine stops, and when the machine runs again after the stop, it starts scanning again from the first line of the "Programming Area" downwards.
14.  This function allows you to "undo" a programmed point while editing the programmed point in the "Programming Area". This function can be used up to 30 times to prevent misoperation.
15.  This function allows you to "redo" a programmed point while editing the programmed point in the "Programming Area". This function can be used up to 30 times to prevent misoperation.
16.  OK to enter options or OK to enter dialog box contents.
17.  Exit the current window or cancel the operation.
18.  Deletes the programmed point selected by the cursor in the "Programming

Area"; used as a delete key in the input state of the dialog box.

19. 插入空行 Insert an "Unprogrammed Blank Programming Point" at the address of the programming point selected by the cursor, and move the following programming points down one line in sequence.
20. 切换 Under the window of "Setting Screw Hole Coordinates and Programming", the cursor switches between "Programming Area" and "Shortcut Menu and Status Bar"; under the interface of Motion Preview, the cursor can switch to the editing area of "Output Signal". In the motion preview interface, the cursor can be switched to the "Output Signal" editing area.
21. 上页 Page up or left, quick line breaks.
22. 下页 Page down or right to quickly change lines.
23. 向上 In the "Programming Area", the cursor of the programming point is moved up one line; in the navigation interface, the cursor is moved up one line; in the state of text input box, the cursor is moved up one line; in the "Shortcut Menu and Status Bar", the option is switched to the "Left". "In the "Motion Preview Interface", when the machine is in the "Stop" state, the blue blinking pixel will be moved upwards.
24. 向下 In the "Programming Area", the cursor of the programming point is moved down one line; in the navigation interface, the cursor is moved down one line; in the state of text input box, the cursor is moved down one line; in the "Shortcut Menu and Status Bar", the "Right" switching option; in the "Motion Preview Interface", when the machine is in the "Stop" state, the blue blinking pixel point is moved down. "In the "Motion Preview Interface", when the machine is in the "Stop" state, the blue blinking pixel point is moved downward.
25. 校准启动 Enter calibration mode.
26. 光标启动 When the cursor is at the point of the screw hole position, press this key, the machine starts running directly from the screw hole position corresponding to the current cursor line to punch the screw.

2.1.2 Composite Key Description

1. 开始 / 暂停 Compound key:

(1) When the machine starts in the "Stop" or "Pause" state, press this button to run the machine.

(2) When the machine is in the "Run" state, press this key to pause the machine. After the pause When the machine is running again, machining will continue from the current screw hole location.

(3) The machine is in the "running" state, when the machine suddenly appeared (slippery teeth, floating lock) alarm, pop-up alarm prompt box, then press this key, the machine will lift the alarm, and from the next screw hole point to start the implementation of playing screws.

(4) The machine is in the "running" state, when the machine suddenly appeared (slippery teeth, floating lock) alarm, pop-up alarm prompt box, then press the "Cancel" key, the machine will lift the alarm, and then press this key, the machine will start from the first screw hole position to re-execute the screw playing. Press this key again, the machine will start to execute screwing again from the first screw hole position point.

2. 

Compound key:

(1) (1) In the "Programming Area", a single-step screwdriving action is executed for the programming point of the screw hole currently selected by the cursor in the yellow background line. ② In the "Motion Preview Interface", when the machine is in the "Stop" state, a single-step screwdriving action is executed for the screw hole corresponding to the "blue blinking pixel point".

(2) The machine is in the "running" state, when the machine suddenly appeared (slippery teeth, floating lock) alarm, pop-up alarm prompt box, then press this key, the machine will lift the alarm, and from the current screw holes to continue to perform the implementation of screws.

(3) The machine is in the "running" state, when the machine suddenly appeared (slippery teeth, floating lock) alarm, pop-up alarm prompt box, then press the "Cancel" key, the machine will lift the alarm, and in the "stop" state, then press the key again, the machine will perform a single-step screwdriving action. At this time, press the "Cancel" key, the machine will lift the alarm and be in the "Stop" state, then press this key again, the machine will perform

single-step screwing action.

3. 

Compound key:

(1) At the "Programming Area" cursor, enter the coordinates of the programmed points for the screw holes with automatic line feed.

(2) Input for the number '1' in the input dialog state.

4. 

Compound key:

(1) "Program Jump to" shortcut command key.

(2) Input dialog box state for the English letters 'abc' case input (continuous press will automatically switch letters), pinyin 'abc' input or digital '2' input.

5. 

Compound key:

(1) The "Current Count" value of the "Counter" is cleared to zero.

(2) Input dialog box state for the English letter 'def' case input (continuous press will automatically switch letters), pinyin 'def' input or digital '3' input.

6. 

Compound key:

(1) Shortcut command key to "move the workpiece to" after screwdriving is completed.

(2) Input dialog box state for the English letter 'ghi' case input (continuous press will automatically switch letters), pinyin 'ghi' input or digital '4' input.

7. 

Compound key:

(1) "Batch Y" shortcut key.

(2) Input dialog box state for the English letter 'jkl' case input (continuous press will automatically switch letters), pinyin 'jkl' input or digital '5' input.

8. 

Compound key:

(1) Shortcut to "Batch set Z-axis coordinates".

(2) Input dialog box state for the English letter 'mno' case input (continuous press will automatically switch letters), pinyin 'mno' input or digital '6' input.

9. 

Compound key:

(1) "Workpiece Copy" shortcut key.

(2) In the input dialog box state for the English letters 'pqrs' case input (press

continuously then the letters automatically switch), pinyin 'pqrs' input or digital '7' input.

10. 

Compound key:

(1) When programming in the Programming Area, press this key to bring up the "More Instructions" window, which contains all the instruction sets.

(2) Input dialog box state for the English letter 'tuv' case input (continuous press will automatically switch letters), pinyin 'tuv' input or digital '8' input.

11. 

Compound key:

(1) Enter the Campaign Preview screen.

(2) Input dialog box state for the English letters 'wxyz' case input (continuous press will automatically switch letters), pinyin 'wxyz' input or digital '9' input.

12. 

Compound key:

(1) "Cursor to line" shortcut operation key. The user enters the "address" number of the programming area and presses the "OK" key to change the cursor to the corresponding line.

(2) Input for the number 'Decimal Point' in the input dialog state.

13. 

Compound key:

(1) Controls the machine's "Move to Specified Coordinates" shortcut operation key. After the user enters the X, Y, and Z axis coordinates, press the "OK" key, and the machine's "electric batch head" will move to the entered coordinate position.

(2) In the input dialog state, it is "space" input or numeric "0" input.

14. 

Compound key:

(1) In the "Programming Area", select the programming point for the screw holes, press the key, and the machine will automatically move to the corresponding coordinate position.

(2) Switching the input method in the input dialog box or inputting a "minus sign" for numerical values.

2.2 OLED Liquid Crystal Display Description

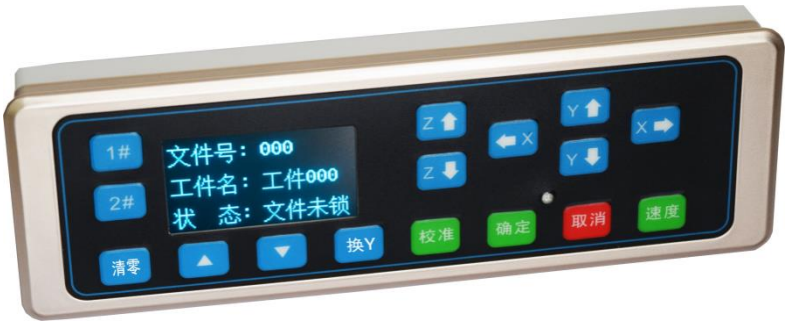
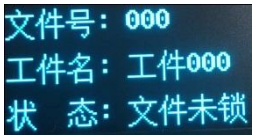


Figure 2 .1 OLED liquid crystal display

1. 

The OLED LCD can display the currently opened project file number, the name of the workpiece, as well as the status of the current project file or the status of the machine, the current count value of the workpiece, prompt messages, and so on.
2. ▲ Decreasing file numbers, long on time and fast.
3. ▼ Document number increments, long by fast increments.
4. 清零 The "Current Count" value of the "Counter" is cleared to zero.
5. 换Y Change the Y-axis.
6. Z ⬆ For calibration operation, manually set the Z-axis to move upward.
7. Z ⬇ For calibration operation, manually set the Z-axis to move downward.
8. Y ⬆ The Y-axis is manually set to move forward during the calibration operation.
9. Y ⬇ For calibration operation, manually set the Y-axis to move backward.
10. ⬅ X During calibration operation, manually set the X-axis to move to the left.
11. X ➡ During calibration operation, manually set the X-axis to move to the right.
12. 校准 Enter the "Calibration Mode" (see details.):**0User's Guide Chapter 1 User's Guide 1.8 calibrations**).
13. 确定 Make sure that "Calibration" is complete and use it in conjunction with

the "Calibrate" button.

14. 

Cancel the calibration operation.

15. 

Manual movement speed "slow, medium, fast" three speed switching.

16. 

Switch to Y1 axis; function selection.

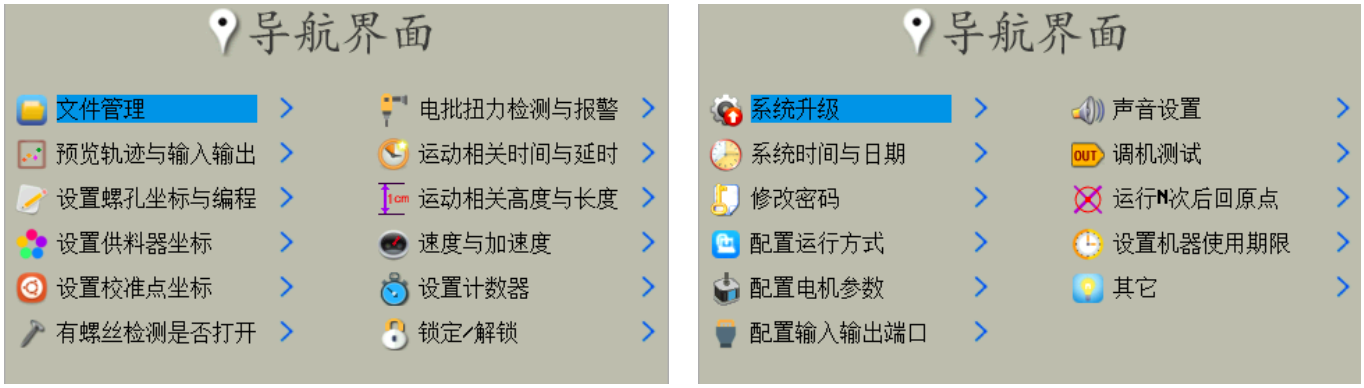
17. 

Switch to Y2 axis; function selection.

第3章 Description of the navigation interface

All the configurations of this system can be found from the navigation interface. Users can navigate with one click and configure according to the process during the use.

Press 导航界面 to enter the "Navigation" interface, as shown in Figure 3.1.Figure



3 .1 Figure 3.1.

3.1 Document management

Press 向下 , 向上 to move the cursor or press 上页 , 下页 to quickly flip the page to move the cursor to the "File Management" option, press 确定 to enter, as shown in Figure 3.2.Figure 3 .2 Press to enter, as shown in Figure 3.2. Press

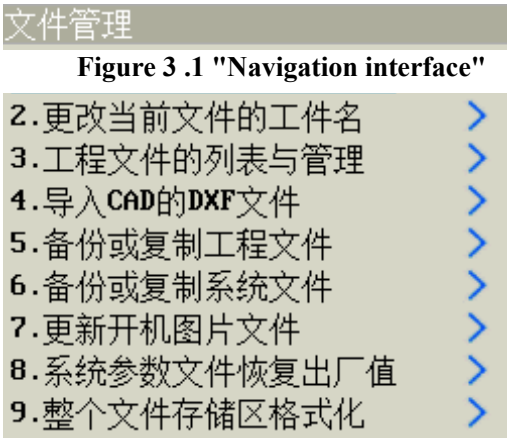


Figure 3 .1 "Navigation interface"

向下 , 向上 to move the cursor and switch to different functions. All the file management in the system is concentrated in this function.

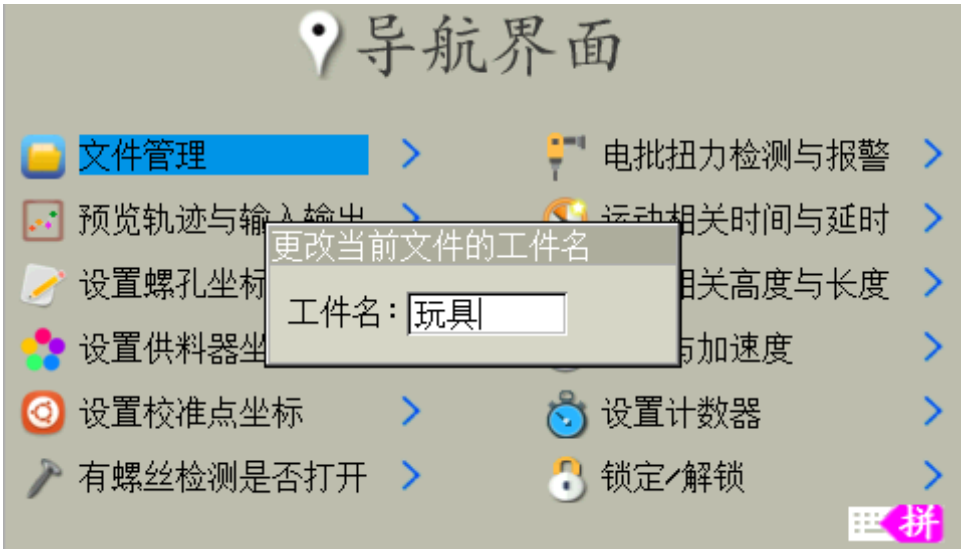
3.1.1 Create or open a new project file

Enter the "New or Open Project File" option, enter "File No." (range 0~999) in the pop-up input box, and then press 确定 to confirm, and then the editable "Workpiece Name" input box will pop up. Immediately after that, an editable "Workpiece Name" input box will pop up, users can change the "Workpiece Name" according to their own needs, and finally press "OK". At this time, there are two situations: ① If there is a project file corresponding to the file number, then directly open an existing project file. ② If there is no project file corresponding to the file number, then create a new blank project file, and automatically set the new project file "file number" for the input box to enter the number, "workpiece name" for "workpiece +" (for example: "workpiece + file number"). file number" (e.g., if there is no corresponding project file for the input file number 666, the file number of the new project file will be "666" and the name of the workpiece will be "Workpiece 666").

Note: In the "Setting Screw Hole Coordinates and Programming" window, press 切换 to switch the cursor to the icon in the "Shortcut Menu and Status Bar", and press 确定 to create or open a new project file.

3.1.2 Changing the artifact name of the current file

Go to the "Change artifact name of current file" option to rename the artifacts of the current project file. Press 移到光标 # − to switch the input method, the current input



method type is shown in the lower right corner of the display.

3.1.3 List and manage project files

When there are a lot of project files on the machine, this function can be used to browse the project files by pages, and can also "open" or "delete" the project files.

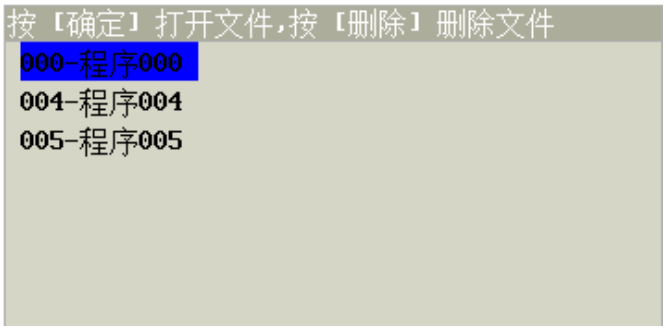
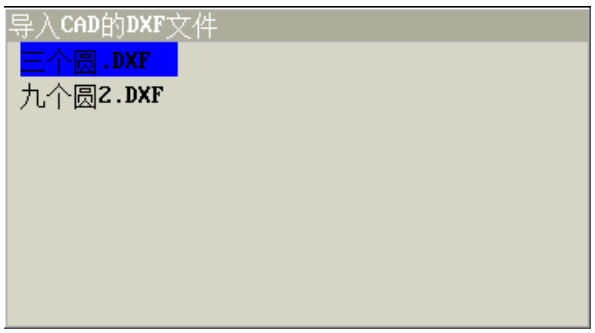


Figure 3 .3 The "Change artifact name of the current file" window.

Figure 3 .4 "List and Management of Project Files window.

3.1.4 Importing DXF files from CAD

Save the AutoCAD drawing file as AutoCAD 2000 DXF format file (**Note: it must be the file of 2000 version, the length of the file name is no more than 8 characters, in which a Chinese character is 2 characters, and a number or letter is 1 character**), and then save it to the "DXF file" folder in the SD card. folder in the SD card, and then operate the function item, select the file you need to import from



the SD card, press the "OK button", you can start to convert the graphics file to the project file used by this system.

The system recognizes only the CAD graphic element "circle", the rest of the graphic elements are automatically filtered out. the relative position of the screw holes in the DXF file of the CAD is scaled proportionally, the shape remains unchanged. the sequence of the CAD drawing and the machining sequence after

Figure 3 .5 The "Import CAD DXF file" window.

importing into the system are the same (in the programming area, you can reorder the programming points of the screw holes coordinates by pressing the "More Instructions" button and selecting the "Ordering of screw holes" command). (In the programming area, you can press the "more commands" key and select the "order of screw holes" command to reorder the programming points of the screw hole coordinates). After the import is completed, you can press the "Preview Trace" key to check the preview graph to confirm whether the import is successful or not.

3.1.5 Backup or copy project files

This function utilizes SD card or handheld programmer as storage to realize the copying of project files between different machines. For example, if there are several machines machining the same workpiece, the user only needs to program the machining program on one machine and then copy the corresponding project file to other machines.

Copying with a handheld programmer is more suitable for on-site machine-to-machine copying, while copying with an SD card not only allows for machine-to-machine copying, but also allows for backup by transferring the SD card to a computer.

The following five options are available for the project file copy operation:

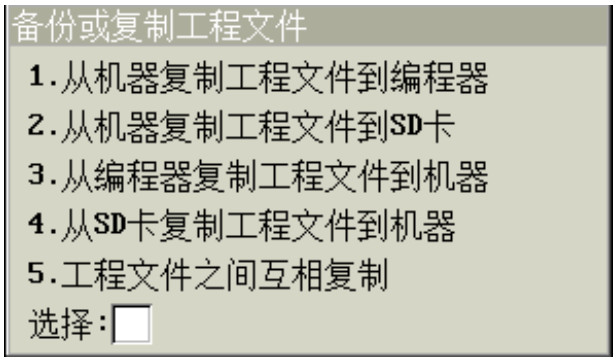


Figure 3 .6 "Backup or copy project file"

1. Copying project files from machine to programmer

This operation copies the currently open project file to the handheld programmer.

As shown inFigure 3 .8 shown, select the location to be stored to the programmer by moving the blue cursor (if there is already a file in that storage area, it will be overwritten).

As shown inFigure 3 .7 As shown in Figure 3.8, after editing the "new file name", press "OK" again to store.

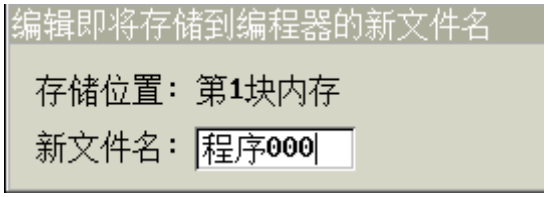


Figure 3 .7 "Edit new file name to be stored in the

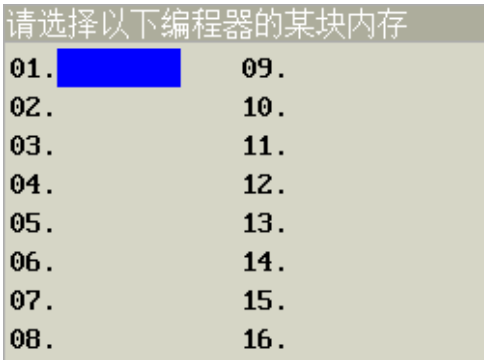


Figure 3 .8 Selection of the storage location for "Copying the project file from

2. Copying project files from machine to SD card

This operation copies the currently open project file to the SD card.

As shown inFigure 3 .9 As shown in Figure 3.9, after editing the "new file

name", press "OK" again to store.

3. Copying project files from the programmer to the machine

This operation copies a project file stored in the handheld programmer and replaces the project file currently open on the machine.

Figure 3 .9The "Copy project file from

Select the project file to be copied from the programmer's memory by moving the blue cursor, and then press OK to start copying.

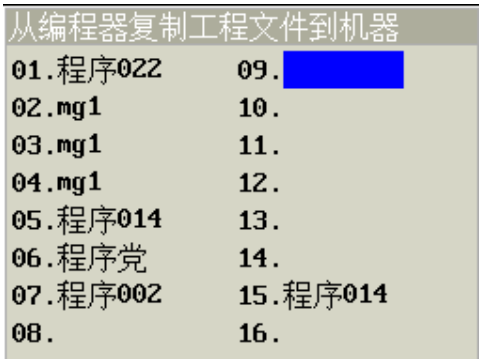
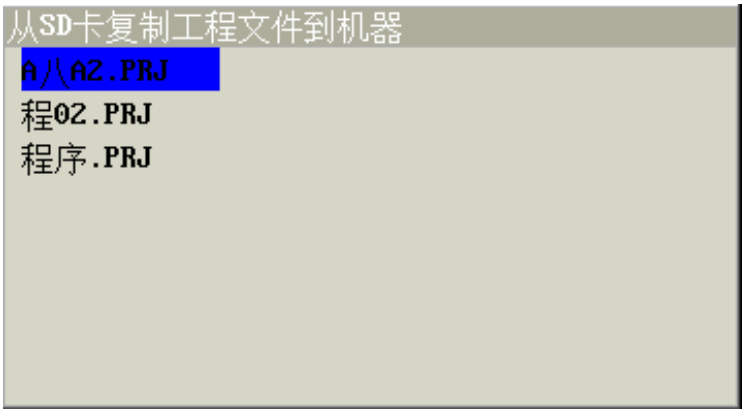


Figure 3 .10 Window "Copy project file from

4. Copying project files from SD card to machine

This operation copies a project file from the SD card and replaces it with the project file currently open on the machine.



Select the project file to be copied by moving the blue cursor, and then press "OK" to start copyir **Figure 3 .11 The "Copy project file from SD card to**

5. Copying project files to each other

This operation replaces one project file with another by copying it from the same machine.

This function focuses on copying backups of project files within the machine.

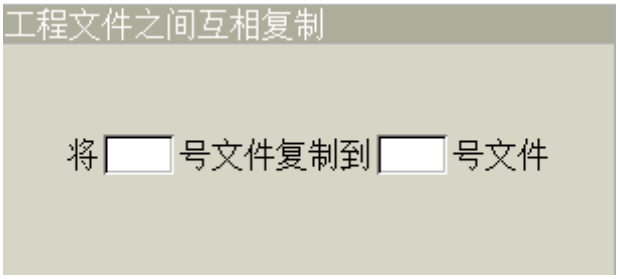


Figure 3 .12 The "Copying project files to each

3.1.6 Backup or copy system files

Using a handheld programmer or SD card, copy the configuration file of the system parameters that have already been set up on one machine to other machines of the same model, without having to repeat the setup on other machines. The configuration file is saved in the "Configuration File" folder in the root directory of the SD card with the file extension "CFG". The copied content includes the machine parameters and the default values of each setting.

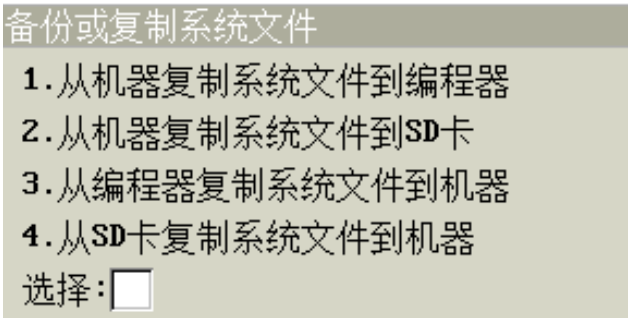


Figure 3 .13 "Backup or Copy System Files

1. Copying system files from the machine to the programmer

As shown inFigure 3 .14 As shown in Figure 3.14, the configuration file is copied from the machine to the handheld programmer, and the cursor position can be moved by pressing the "Up" and "Down" keys.

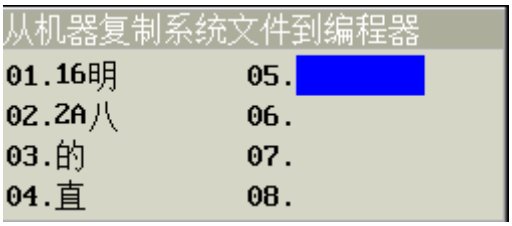


Figure 3 .14 "Copying System Files from Machine to

Pressing "OK" at the cursor will bring up a dialog box as shown inFigure 3 .15 After editing the new file name, press "OK" to save. (There are a total of 8 memory areas that can overwrite the previous configuration file)

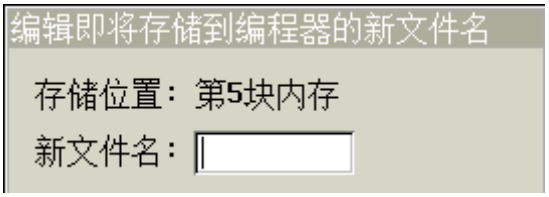


Figure 3 .15 "Edit new file name to be stored in the

2. Copying system files from machine to SD card

Copy the configuration file from the machine to the SD card. After editing the

new file name, press OK to save it.

Figure 3 .16 The "Copy System Files from Machine to

3. Copying system files from the programmer to the machine

To copy the configuration file from the handheld programmer to the machine, press the UP and DOWN keys to move the cursor position. Pressing "OK" at the cursor position will bring up a dialog box as shown in Figure 3.17.Figure 3 .17 After editing the new file name, press "OK" to save. (There are a total of 8 memory areas that can overwrite the previous configuration file.)

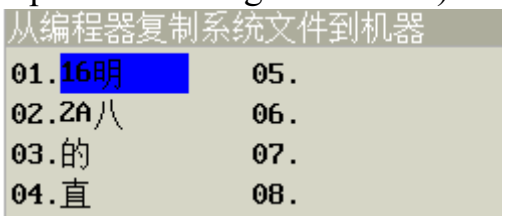


Figure 3 .17 "Copying System Files from

4. Copying system files from SD card to machine

Copy the system file from SD card to the machine, press "Up" and "Down" key to move the cursor position. Pressing "OK" at the cursor position will bring up a dialog box as shown inFigure 3 .18 After editing the new file name, press "OK" to save.

Figure 3 .18The "Copy System Files from SD Card to

3.1.7 Update boot image file

Users can change the boot screen according to their own needs, make a 480*272 pixels, 24-bit color bitmap file (PS is recommended, save the format as XXX.BMP, the XXX file name can't be more than 8 characters, 1 Chinese character occupies 2 characters, 1 English or digital occupies 1 character), save the file to the SD card root

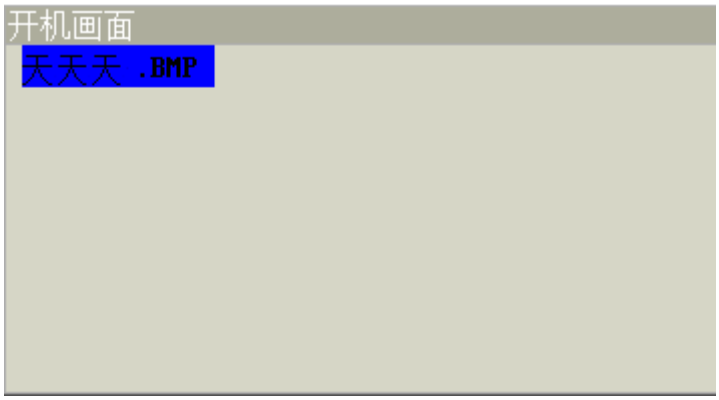


Figure 3 .19 Selecting the "Power On Screen" Window

directory in the "boot screen" folder, insert the SD card, select the picture you want to update, and then press "OK" to start updating. Save the file to the "Boot Screen" folder in the root directory of the SD card, insert it into the SD card, select the picture you want to update, and then press "OK" button to start updating.

3.1.8 System parameter file restoration of factory values

System parameters are initialized. After initialization, all parameters are restored to the initialized set values of the system.

3.1.9 Entire file storage area formatted

Format the entire file storage area in the Motion Control Card (the storage area in the Handheld Programmer is not affected), be sure to back up your data with an SD card before formatting! After formatting, the data is not recoverable, so please operate with caution!

3.2 Preview Tracks and Inputs and Outputs

This option allows you to access the Motion Preview Screen. It can also be accessed by pressing the 预览轨迹 wxyz 9 key on the handheld programmer.

3.3 Setting Screw Hole Coordinates and Programming

From this option, you can access the "Setting Screw Hole Coordinates and Programming" window, and then perform programming operations.

3.4 Setting the feeder coordinates

If the machine is a "suction" feeder, the feeder coordinates need to be set. If the machine is a "blow" feeder, the feeder coordinates do not need to be set. See (**0User's Guide Chapter 1 User's Operating Guide 1.4.1 Aspirated Feeding**)

3.5 Setting the coordinates of the calibration point

When the "horizontal or vertical" position of the workpiece is moved on the machine, it is necessary to calibrate the coordinates of the screw hole so that the originally set coordinates can be used. Before calibration, the coordinates of the calibration point must be set. For details, see (**0User's Guide** Setting the calibration point coordinates Setting the coordinates of the calibration point**1.8.2 Setting the coordinates of the** calibration point)

3.6 There are screws to detect whether it is open or not

This option relates to whether "Screw Detection" is turned on or off. If it is turned on, the system will detect whether the feeder is supplied with screws, and if the feeder is supplied with screws, the system will detect that the "Screw Signal" is valid, and if the feeder is not supplied with screws, the system will not detect the "Screw Signal", i.e. the "Screw Signal" is invalid. If the feeder is not supplied with screws, the system cannot detect the "screw signal", i.e. the "screw signal" is invalid; if it is turned off, the system will not detect whether the feeder is supplied with screws or not. For details see (**0User's Guide** for details. **1.2 Configuration of machine motion-related parameters**)

3.7 Torque detection and alarm for electric batches

This option is related to the presence or absence of "Torque Detection" and whether the "Alarm" is on or off. If there is "torque detection", the batch will detect the size of the batch torque during the screwing process, and if the torque reaches the set value, it will send a "blocking signal" to the system, indicating that the screwing is

completed; if there is no "torque detection", the batch will not detect the size of the batch torque during the screwing process. If there is no "torque detection", the wrench will not detect the size of the wrench torque during the screwing process. For details, please refer to (**0User's Guide** Chapter 1 User Operation Guide **1.2 Configuration of machine motion-related parameters**)

3.8 Motion-related time and delay

All parameter configurations in the system involving machine motion time and delay are centralized in this option configuration.

The meaning of each parameter is as follows:

Screwing time: The value of "Screwing time" is equal to the value of the time when the "Torque detection of the batch" is "None" and the batch is screwing without judging the "blocking signal". When the "signal" is "no", the value of the length of time for turning on the electric screwdriver is equal to the value of the time for turning on the electric screwdriver.

Delay time after screwing: After screwing a screw, let the wrench have a stable time before lifting up, this value can be set to "0".

Take (blow) screws after the delay: ① machine for the "suction" type feeding mode, the electric batch to the feeder to take the screws to open the vacuum valve in the Z-axis before lifting the length of the screws to ensure that the screws sucked stable; ② machine for the "blowing" type feeding mode, the machine will send a signal to request screws before the screws from the feeder by the compressed gas blown out in the pipe transmission, there is a certain transmission distance, it will take some time to send the screws to the electric batch head at the locking payment. ② When the machine is "blowing" feeding mode, the system will send a signal to request screws before the machine plays screws, and the screws will be blown out by the compressed gas from the feeder, and transmitted in the pipeline with a certain transmission distance, which takes a certain time before the screws can be sent to the head of the electric batch to be locked and paid. Users generally need to set this parameter when configuring parameters.

Float lock time: This time is for float lock alarm, in the "Navigation interface" "Warrant Torque Detection and Alarm" option, "Torque Detection" is "Yes" and

"Alarm" is "On", "Blocking Signal" appears less than or equal to "Float Lock Time". In the "Navigation interface" option of "Batch Torque Detection and Alarm", if "Torque Detection" is "Yes" and "Alarm" is on, and the time of "Blocking Signal" is less than or equal to "Float Lock Time", it will be considered as "Float Lock Time". When the "Float lock time" is less than or equal to the "Float lock time", the alarm is considered to be a float lock alarm. For example, "screwing time" is set to 0.5 seconds, "floating lock time" is set to 0.2 seconds, when the electric batch is turned on, if the "blocking signal" is detected in 0.1 seconds, then the machine will immediately turn to the "blocking signal". When the electric batch is turned on, if the "blocking signal" is detected at 0.1 second, then the machine will stop immediately and display the floating lock alarm at the same time.

Delay time after detecting the workpiece (workpiece detection start-up mode): When the machine is started by "workpiece detection start-up", the corresponding Y-axis will be in a static state after the product is detected by the "workpiece detection sensor", this delay time is for the user to have enough time to fix the product. This delay time is for the user to have enough time to fix the product.

Blow cleaning time: the machine blows to clean the opening time of the solenoid valve for cleaning the electric batch suction nozzle after each screwdriving.

Delay time after Y1 clamps the workpiece: after the fixture disk on Y1 axis clamps the workpiece, the Y1 axis waits without action.

Delay time after Y2 clamps the workpiece: after the workpiece is clamped by the fixture disk on the Y2 axis, the Y2 axis does not move and waits for the time.

Duty cycle time of the request screw pulse signal (air supply): ①This time is valid when "Screw Detection" is turned on ("Screw Detection" is turned on or off in the "Navigation" option), indicating the duty cycle time (valid level time) of the request screw signal sent by the system to the feeder. (The "Screw Detection" on and off is set in the "Navigation Screen" in the "Screw Detection On or Off" option.) It indicates the duty time (effective level time) for the system to send the request screw signal to the feeder. Before machine screwing, the system will send a request screw signal to the feeder, and at the same time, constantly detect whether there is a "screw signal", if the feeder feeds within the "duty cycle of the request screw pulse signal", that is, the system detects the "screw signal". If the feeder is fed within the duty cycle

of the "request screw pulse signal", i.e. the system has detected the "screw signal", the request for screws is successful, and the system immediately stops sending the request screw signal to the feeder, and the fetching is successful; if the feeder is not fed within the duty cycle of the "request screw pulse signal", i.e. the system does not detect the "screw signal", the system stops sending the request screw signal to the feeder. If the feeder is not fed within the "duty cycle time of the request screw pulse signal", i.e. the system does not detect the "screw signal", the system stops sending the request screw signal to the feeder, but it will continue to detect the "screw signal", because there is a delay time for the feeder to be fed, and if it is detected within the "waiting or cycle time after requesting a screw", the feeder will be fed successfully. In the "wait or cycle time after requesting screws", if the "screw signal" is detected, then the request for screws is successful and the feeding is successful, if the "screw signal" is not detected, then the request for screws fails, and the request will be sent up to 5 times, and the alarm will be raised if the request exceeds 5 times. If the "screw signal" is not detected, the request for screws fails, and a maximum of 5 requests will be sent. ②This time is invalid when "Screw Detection" is turned off.

Waiting or cycle time after requesting screws (blowing and feeding): ①This time is valid when "Screw Detection" is turned on, and it indicates the waiting time for detecting "Screw Signal" every time the system sends a signal requesting screws. Before the machine screws, the system will send a request screw signal to the feeder, and at the same time constantly detect whether there is a "screw signal", if there has been no "screw signal" detected within the time period, it will send a request screw signal to the feeder again. If the time period has not been detected "screw signal", it will send a request for screw signal to the feeder again, and then continue to detect whether there is a "screw signal", up to 5 times to send a request, more than 5 times will be alarmed; if the request is not more than 5 times, the system detects the "screw signal", then the machine no longer sends a request for screws this time to send a request for signals, the Pick up materials successfully. ②This time is invalid when "Screw Detection" is off.

The configuration method is detailed in (**0User's Guide** in the **1.2 Configuration of machine motion-related parameters**)

3.9 Motion related height and length

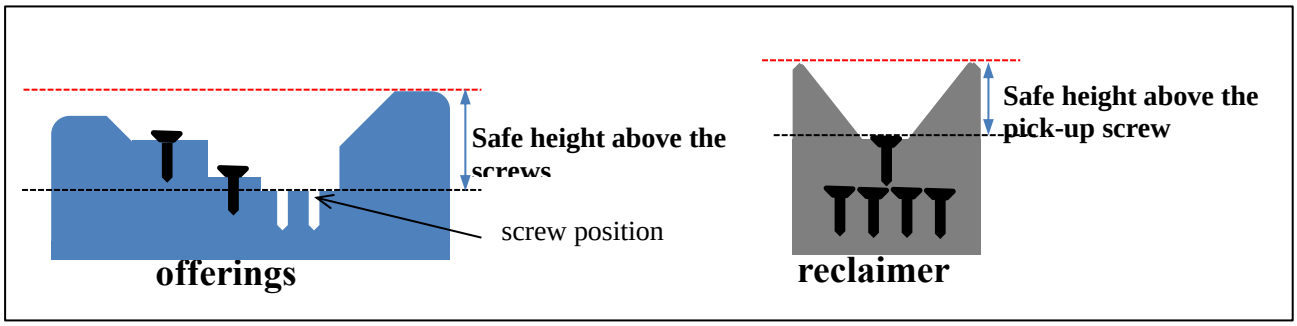
Parameters related to the safety height of the machine when driving screws and the need to set the "follow-up length" when the "downward pressure driving method" is "Z-axis motor downward pressure" in the system are concentrated in this option. Configuration.

The meaning of each parameter is as follows:

Safe height above the screw: the absolute height from the lowest screw hole location point on the workpiece to the highest point on the workpiece surface. Schematic diagram asFigure 3 .20 is shown.

Safe Height Above Pickup Screw: The absolute height from the screw position on the feeder to the highest point on the feeder surface. Schematically shown inFigure 3 .20 is shown.

Follow-up length (Z-axis motor pressing method): ① When the machine's "pressing down screwing method" is "pneumatic pressing", this parameter setting is invalid; ② the machine's "pressing down screwing method" is "Z-axis motor" "press down", when the machine is driving screws, the electric screwdriver with the screw attached first moves to the top of the screw hole surface. At this time, the screw tip is above the surface of the screw hole mouth, and then moves at the "follow-up speed"



(the value is between Set in the "Speed and Acceleration" option in the "Navigation Interface") and drive the screw downwards. The depth driven in is the "follow-up length". ③The follow-up length is generally slightly longer than the thread length of the screw and should be adjusted according to the actual situation. "Z-axis motor pressing method" finished

The schematic diagram after screwing is shown in Figure 3.21.

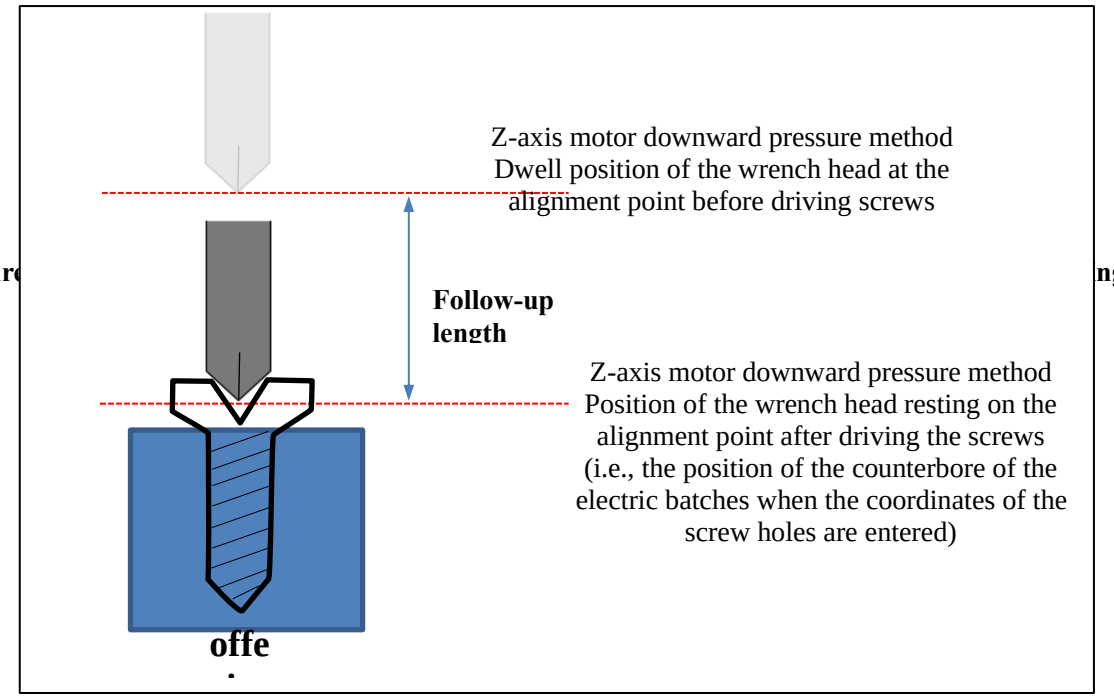


Figure 3 .21Schematic diagram of the "Z-axis motor downward pressure method" after

3.10 Velocity and acceleration

All the speed and acceleration parameters of the system are concentrated in this option configuration. Such as "XYZ axis working speed", "follow up speed (Z axis motor downward pressure mode)", "start and stop speed", "the acceleration of each ", "Maximum speed", "Home speed", "Manual speed". The latter 5 parameters can only be configured by the manufacturer (see: Manufacturer's Operating Instructions).

The meaning of each parameter is as follows:

XYZ axis working speed: This speed is the usual speed of XYZ motor axis movement when working. In dual Y-axis mode, the speed of Y1 and Y2 are both the speed of Y-axis, that is, the working speed of Y1 and Y2 are the same normally, and the parameters of Y1 and Y2 cannot be set separately and individually.

Follow-up speed (Z-axis motor downward pressure mode): ① machine "downward pressure screwing mode" for "pneumatic downward pressure", this parameter setting is invalid; ② machine "downward pressure screwing mode" Z-axis motor downward pressure", the machine in the screw, adsorption of screws in the electric head first moved to the screw hole surface above the surface of the screw tip

in the screw hole mouth surface above, and then "follow up speed" downward screws, into the depth of the depth that is "Follow-up length" (this parameter is set in the "movement-related height and length" option in the "navigation interface").

3.11 Setting the Counter

This function is used for counting the pieces during the screwing process. There are two ways of counting: ① Insert the "Workpiece Counter" instruction when writing the program in the "Programming Area", and when the system runs to this programming point, the value of "Current Counted" will be added to the value of "Increase Number"; ② Instead of inserting the "Workpiece Counter Instruction" in the program, the "Navigation Interface" is used to count the pieces in the process of screwing. When the system runs to this programming point, the value of "Current Counted" will be added to the value of "Increase Number"; ② Instead of inserting the "Workpiece Counter Instruction" in the program, you can set the "Set Counter" in the "Setting Counter" option in the "Navigation Interface". Instead of inserting the "Workpiece Counter Instruction" in the program, select "Open" in the "Set Counter" option in the "Navigation Interface", and the value of "Current Counted" will be automatically added to the value of "Counted Each Time" every time the machine finishes punching the product on a certain Y-axis. The value of "Current Counted" will be automatically added to the value of "Accumulated Amount" every time the machine finishes punching a product on the Y-axis. In this option, you can set the "Current Count" value and the "Alarm Limit" value. If the "Current Counted" value exceeds the "Alarm Limit" value, the machine stops because of an overflow. If you do not want to use the workpiece count limit, set the Alarm Limit value to 0.

Note: If the "Workpiece Counter Instruction" is inserted in the program and "On" is selected for "Counter On" in this option, the values of " The value of "Current counted" will be totalized accordingly. Just choose one of the counting methods.

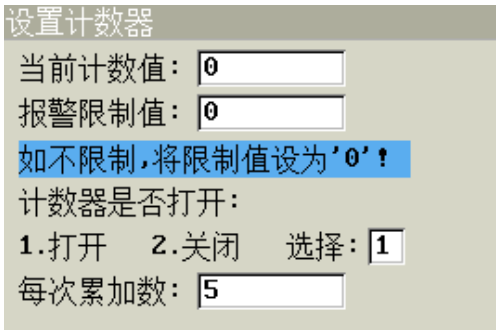


Figure 3 .22 "Setting the Counter Window

3.12 Lock/Unlock

This system can perform "File Lock/Unlock", "Machine Lock/Unlock", and "OLED Keyboard Lock/Unlock".

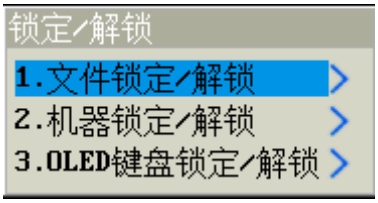


Figure 3 .23 "Lock/Unlock

3.12.1 File Lock/Unlock

When the currently opened project file is not locked, the icon displayed in the status bar is , at this time, both the currently opened project file and the parameter settings of the machine can be modified; when the currently opened project file is locked, the icon displayed in the status bar is , at this time, the currently opened project file cannot be modified, but the parameter settings of the machine can be modified.

3.12.2 Machine Lock/Unlock

When the machine is in the unlocked state, the machine's parameter settings can be modified, whether the currently opened project file is locked with the current file's own locking/unlocking settings; when the machine is in the locked state, the status bar displays the icon , then all the project files and all the machine's parameter settings are locked and cannot be modified.

3.12.3 OLED keyboard lock/unlock

"OLED Keyboard" means the keyboard on the OLED liquid crystal display on the machine.

This function allows you to "lock" or "unlock" the OLED keypad. When "locked", the keys on the keyboard are disabled to prevent misuse; when "unlocked", the keys on the keyboard are valid.

3.13 system upgrade

Put the application files into the "Upgrade Program" folder in the root directory of the SD card, insert the SD card into the end of the handheld programmer, enter the function item, enter the number '2' after the application items that need to be upgraded, and enter the number '1' after the application items that do not need to be upgraded, and finally press "OK" to start the update. The default value for the application that doesn't need to be upgraded is '1', finally press "OK" to start the update.

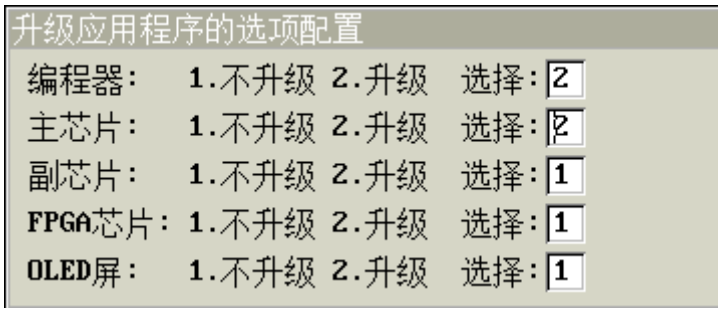


Figure 3 .24 "Upgrade Application Options Configuration window

3.14 System time and date

Set the date and time of the system. (**Note**: This function is limited when the

system restricts the use of the date.)

3.15 Configuring the operation mode

This option must be configured by a factory professional after entering the transfer password. (See: M ons)

Figure 3 .25 "System Time and Date

3.16 Configuration motor parameters

This option must be configured by a factory professional after entering the transfer password. (See: Manufacturer's Operating Instructions)

3.17 Configure input and output ports

This option must be configured by a factory professional after entering the transfer password. (See: Manufacturer's Operating Instructions)

3.18 Sound Settings

This function is used to turn on or off the handheld programmer's key sounds, the machine's system beeps, and alarm sounds.

3.19 computer simulation test

This function is mainly used when installing and deploying the machine, the prerequisite is that the hardware wiring of the peripheral devices has been correctly configured with the input and output ports of the motion controller. This function can independently control "Cylinder downward pressure", "Suction", "Electric batch", "Blow cleaning", "Lifting Z-axis after sucking screws", "Blow cleaning", "Blow cleaning", "Blow cleaning", "Blow cleaning" and "Blow cleaning". This function can independently control "Cylinder down", "Suction", "Electric batch", "Blowing cleaning", "Lifting Z-axis after sucking screw", "Sending request signal for blowing feeder", and it can check the signal status of general-purpose input/output ports and origin inputs, and debug and change the signal status of the general-purpose output ports.

The functions are as follows:

1. **Individual control of cylinder down pressure**. It is possible to control the lower pressure cylinders 1/2/3 of the electric batches separately. In the pop-up box, pressing "number 1" means start, pressing "number 0" or exiting the window means no start.
2. **Independent control of suction**. Cylinder 1/2/3 suction screws can be controlled separately, press the "number 1" to start, in the pop-up box, press the "number 0" or exit the window to indicate that it does not start.
3. **Separate controls for batches**. It is possible to control batches 1/2/3 separately,

pressing the "number 1" means start, in the pop-up box, pressing the "number 0" or exiting the window means no start.

4. **Independent control of suction cleaning**. It is possible to control the suction cleaning solenoid valve 1/2/3 separately. In the pop-up box, press the "number 1" to activate, and press the "number 0" or exit the window to deactivate.
5. **The Z-axis is lifted after sucking the screws**. You can control the Z-axis to suck the screws of the feeder 1/2/3 respectively, press "number 1/2/3" to control sucking the screws corresponding to the feeder 1/2/3 respectively and lift up the Z-axis, press "OK" or "Cancel" key to exit. Press "OK" or "Cancel" to exit.
6. **Send a request signal to the air blow feeder**. You can send the screw request signal of blow feeder 1/2/3 separately, press "number 1/2/3" to send the screw request signal to blow feeder 1/2/3, and press "OK" or "Cancel" to exit. Press "OK" or "Cancel" to exit.
7. **Prohibit the machine from pressing the Start/Reset/Emergency Stop button**. If the user presses the "Start/Reset/Emergency Stop" button when the machine is in the normal "running" state, the system will exit the "Motion Preview Interface" or the machine will not be in the "working" state. If the user presses the "Start/Reset/Emergency Stop" button, the system will exit the "Motion Preview Interface" or the machine will be inactive, and the signal status of the input port corresponding to the "Start/Reset/Emergency Stop" button cannot be viewed normally. However, users can select "2. Disable (automatically release after power off and restart)" in this option, at this time, if users trigger the "Start/Reset/Emergency Stop" button again, the system will not respond to the "Start/Reset/Emergency Stop" function of the corresponding button, and can be used for the "Start/Reset/Emergency Stop" function of the corresponding button. In this case, if the user triggers the "Start/Reset/Emergency Stop" button again, the system will not respond to the "Start/Reset/Emergency Stop" function of the corresponding button, and you can check the signal status of the input port corresponding to these three buttons in the "Motion Preview Interface", and then the system will be automatically released after power failure and restart, and the

"Start/Reset/Emergency Stop" function corresponding to these buttons will be restored. 。 When the user selects "1. No Prohibit", the "Start/Reset/Emergency Stop" function of these 3 buttons will be normal.

8. **View Input Port Signals**. This function allows you to view the signal status values of all general-purpose input ports, home inputs, and in the Motion Preview Screen.
9. **View or debug the signals of the output ports**. This function allows you to view the signal status values of all general-purpose output ports, which can also be viewed in the Motion Preview Screen.

3.20 Run N times and return to the home position

Due to the mechanical structure of the machine or motor belt wear and other issues, the machine may lead to positioning deviation after a long time running, then you can open the machine to run N times after the return to the origin function, set the number of times N, so that the machine counts as 1 time for each hit on a certain Y-axis of the workpiece, and will return to the origin once after N times of hitting.

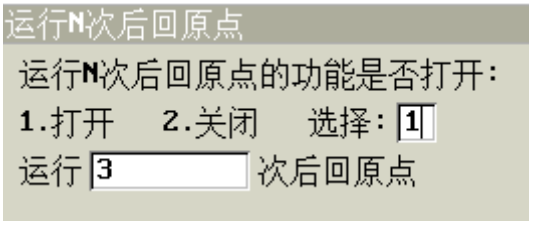


Figure 3 .26 "Return to home after N runs"

3.21 other than

3.21.1 Edit input and output port names

3.21.1.1 Edit Input Port Name

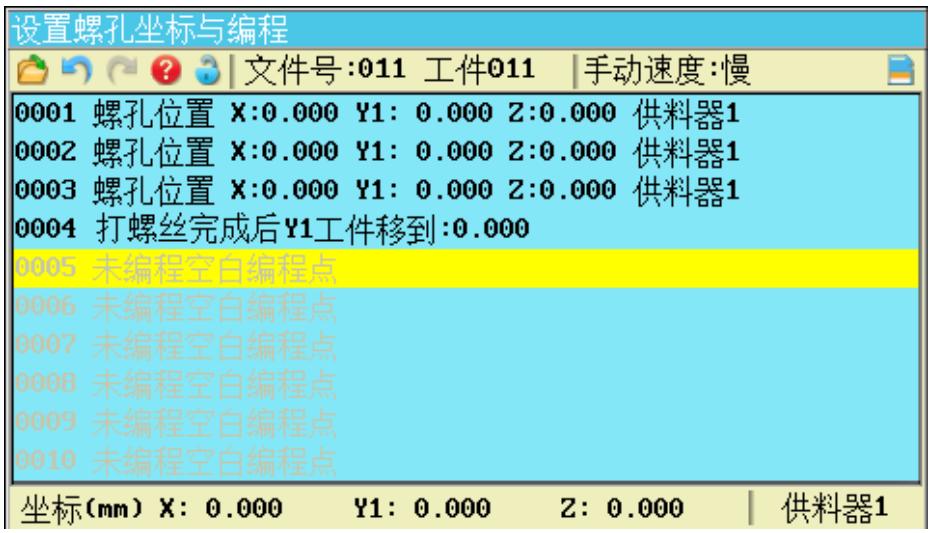
The default names of the programmable universal inputs are "Universal Input 01" to "Universal Input 18". In order to improve the readability of the program, the user can change the name of each programmable universal input according to the function of the port application, so as to make the program more clear and easy to understand. In order to improve the readability of the program, the user can change the name of each programmable universal input port according to the function of the port application to make the program more clear and easy to understand.

3.21.1.2 **Edit Output Port Name**

The default names of the programmable universal output ports are "Universal Output 01" ~ "Universal Output 14", in order to improve the readability of the program, the user can change the name of each programmable universal output port according to the function of the port application, so as to make the program more clear and easy to understand. In order to improve the readability of the program, users can change the name of each programmable universal output port according to the function of the port application to make the program more clear and easy to understand.

4.Programming Interface Description

When the machine is powered on, the first thing to enter is the "Setting Screw Hole Coordinates and Programming" window, which is mainly used for the user to



edit the program.

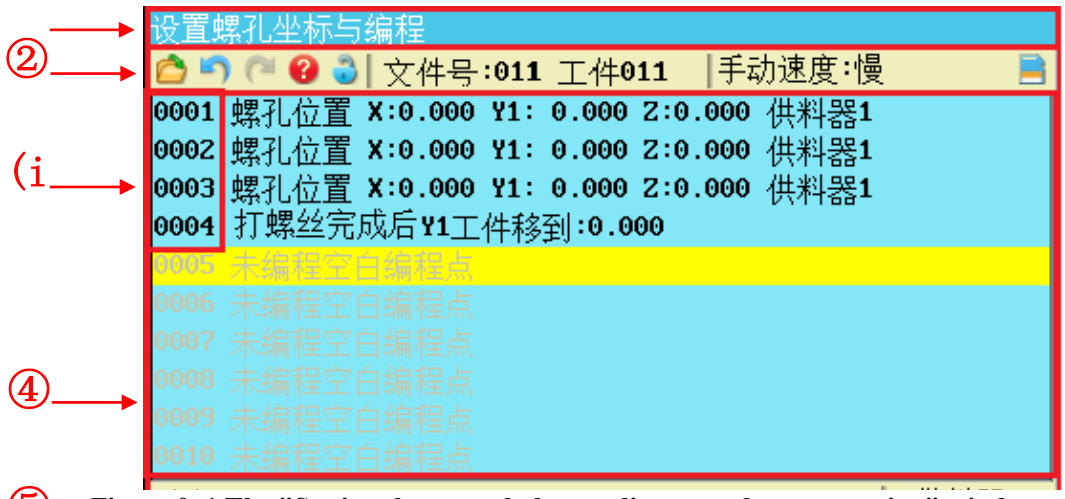


Figure 0 .1 The "Setting the screw hole coordinates and programming" window.

Figure 0 .2 Sections of the "Setting screw hole coordinates and programming window".

Table 0 .1 Description of the sections of the "Setting screw hole coordinates and programming window".

serial number	Implications
①	Window Name
②	Shortcut menu and status bar
(iii)	Programming Point Address

④	programming area
⑤	Real-time coordinates of machine axes and current feeder

1. 设置螺孔坐标与编程 Indicates that the current window name is "Setting Screw Hole Coordinates and Programming".
2. The "Open File" icon. Under the window of "Setting Screw Hole Coordinates and Programming", press 切换 to switch the cursor up and down between "Shortcut Menu and Status Bar" and "Programming Area", and press 向上 and 向下 to switch the cursor to other icons. Press and to switch the cursor to other icons. Select the icon, press 确定 to open it, input "File No." (range 0~999) in the pop-up input box, and then press "OK" to confirm, then the editable "Workpiece Name" input box will pop-up immediately. Immediately after the pop-up editable "Workpiece Name" input box, the user can change the "Workpiece Name" according to their own needs, and finally press "OK" button. At this time, there are two situations: ① If there is a project file corresponding to the file number, then directly open an existing project file. ② If there is no project file corresponding to the file number, then create a new blank project file, and automatically set the new project file "file number" for the input box to enter the number, "workpiece name" for "workpiece +" (for example: "workpiece + file number"). file number" (e.g., if there is no corresponding project file for the input file number 666, the file number of the new project file will be "666" and the name of the workpiece will be "Workpiece 666").
3. "Undo" and "Redo" status indicator icons. The number of "Undo" and "Redo" times can be reached 30 times when editing the programmed points in the "Programming Area" of the "Setting and Programming of Screw Hole" window. "If the icon is grayed out at , there is no operation to "Undo" or "Redo".
4. Indicates that the processing file has been edited and needs to be "debugged", and indicates that the processing file has been "debugged".
5. The file is not locked, The file is locked, The machine is locked.
6. 文件号:011 工件011 Display the file number and workpiece name of the

currently opened project file, "011" is the file number and "Workpiece 011" is the workpiece name.

7. 手动速度:慢 The manual movement speed is divided into three speeds, "fast, medium, and slow", and is switched in turn by pressing the 手动速度 key.

8. SD card inserted, No SD card.

Attention:

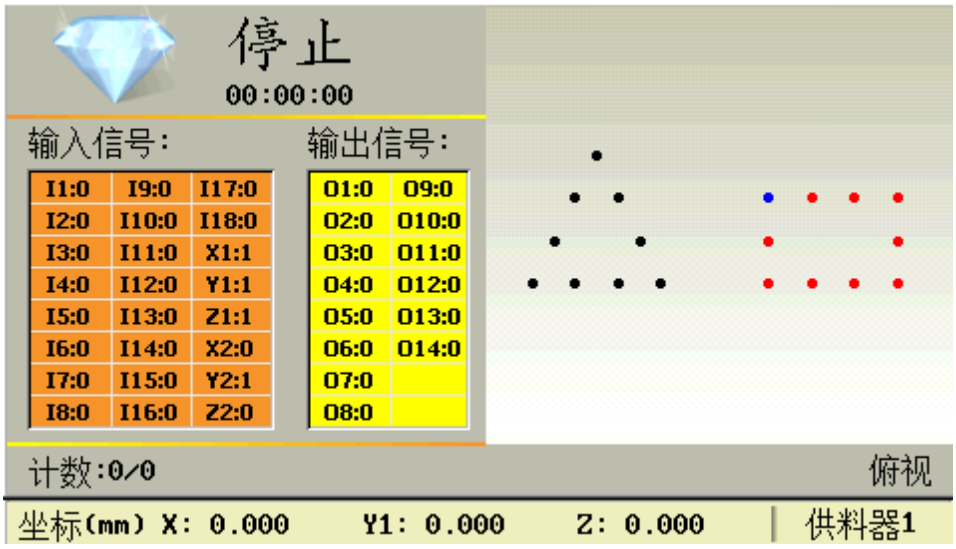
SD card insertion method, as shown inFigure 0 .3 shown in Figure 4.3. At the same time, please do not delete the folder that comes with the system in the root directory of the SD card!

Figure 0 .3 Schematic diagram of SD card

9. Pinyin input, number input, lowercase letter input, uppercase letter input. It will be displayed in the character input state and you can switch the input method by pressing . 移到光标 # −

4.Campaign Preview Screen Description

Press 开始 暂停 or 预览轨迹 wxyz 9 to enter the interface, and continue to press 预览轨迹 wxyz 9 to switch between "top view, front view and left view", as shown in Figure 5.1.Figure



0 .1 Press the key to switch between the "top view, front view and left view" as shown in Figure 5.1. When the machine is stopped, press 取消 to exit the screen.

Figure 0 .1 Motion preview screen

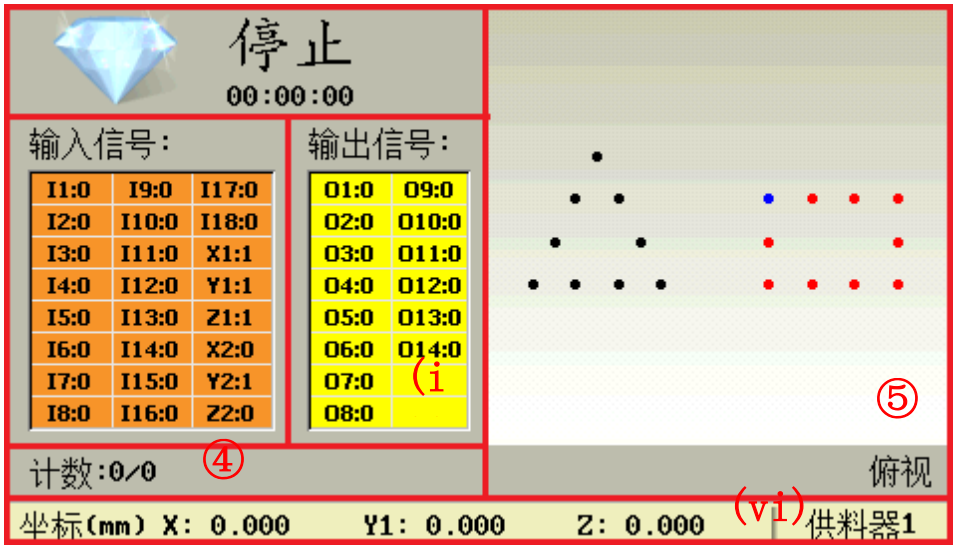


Figure 0 .2 "Sections of the Campaign Preview screen.

Table 0 .1 "Description of each section of the Campaign Preview Screen

serial number ①	Implications ②
①	Machine status display

②	Input Signal View
(iii)	Output Signal Viewing and Control
④	Workpiece Counter
⑤	Three-view preview
(vi)	Real-time coordinate display for each axis and current feeder

3.22 Campaign Preview Interface Features

Machine status display. The machine movement state has "run", "pause", "stop" three kinds of state. Run" means the machine is working; "Pause" means the machine is paused, and when it starts again, the machine will continue to work from the programmed point of the paused screw holes; "Stop" means the machine is stopped, and when the key is pressed again, the machine will start from the "Programming Area No. 1". Stop" indicates that the machine is stopped, and when the 

key is pressed again, the machine will start scanning down again from "line 1 of the programming area", and perform whatever action it encounters. The machine's working hours are recorded under the machine's movement status.

Input signal view. "I1～I18" indicates 1～18 input signal ports; "X1(X2)" indicates X1(X2) axis motor home signal input port; "Y1(Y2)" denotes the Y1(Y2) axis motor home signal input port; "Z1(Z2)" denotes the Z1(Z2) axis motor home signal input port. The back of the port corresponds to the current state of the input signal, "0" means that there is a signal input to the port, and "1" means that there is no signal input to the port.

Output signal view and control. "O1~O14" indicates 1~14 output signal ports. The back of the port corresponds to the current state of the output signal, "0" means that the output signal is in the "off" state, "1" means that the output signal is in the "on" state. "0" means the output signal is in the "off" state, "1" means the output signal is in the "on" state. In the motion preview interface, press the "Switch" key to switch to the "Output Signal" editing area, press the "Up" and "Down" keys to select different signal editing area. Press "Up" or "Down" key to select different signal editing box, and press "0" or "1" to change the corresponding output signal state,

which is convenient for users to install and debug.

Workpiece counter. The first number refers to the "current counted" value, and the second number refers to the "alarm limit value". There are two ways of counting: ① Insert the "Workpiece Counter" instruction when writing a program in the "Programming Area", and when the system runs to this programming point, the value of "Current Counted" will be added to the value of "Increase Number"; ② Insert the "Workpiece Counter" instruction when writing a program in the "Programming Area". (ii) do not insert the "workpiece counter instruction" in the program, but press 导航界面 to enter the "navigation interface", press 向下 , 向上 to move the cursor or 上页 , 下页 to quickly turn the page to move the cursor to the option, press to move the cursor to the "workpiece counter". Go to 设置计数器 option, press 确定 to pop up the setup window, select "Open" for "Counter" option, and the value of "Current Counted" will be automatically added to the value of "Counted Each Time" every time the machine finishes hitting the product on a certain Y-axis. The value of "Current Counted" will be automatically added to the value of "Accumulated Amount per Count" after the machine finishes punching a product on the Y-axis. In this option, you can set the "Current Count" value and the "Alarm Limit" value. If the "Current Counted" value exceeds the "Alarm Limit" value, the machine stops because of an overflow. If you do not want to use the workpiece count limit, set the Alarm Limit value to 0.

Three-view preview. Displays one of the top, front and left views of the screw hole coordinates. When the machine is stopped (not available in running or paused state), press the "Preview" button to switch between the top, front and left views.

Real-time coordinate display of each axis and current feeder. Displays the real-time dynamic coordinate values of the X, Y (Y1 or Y2), and Z axes and the current feeder while the machine is running.

3.23 Motion Preview Interface Featured Applications

1. **Screw hole position pixel points are shown differently**. In the motion trajectory diagram, the color points appearing in a total of: black, red, blue, white four color points. The "black point" indicates that the screw hole position has

been finished; the "red point" indicates the screw hole position to be punched; the "white blinking point" indicates that the machine is running to punch the screw hole position; The "blue blinking point" indicates that when the machine is in the stop state, the pixel point of the screw hole corresponds to the programming point of the screw hole in the line where the yellow cursor is located in the background "programming area".

2. **Screw hole pixels are automatically resized**. After entering the coordinates of the screw holes in the "Programming Area" and entering the "Motion Preview Interface", when the total number of screw holes is not too many, the pixels of the screw holes will be automatically displayed as large pixels; when the total number of screw holes is too many, the pixels of the screw holes will be automatically displayed as small pixels. When the total number of screw holes is not too many, screw hole pixels are automatically displayed with large pixels; when the total number of screw holes is too much, screw hole pixels are automatically displayed with small pixels.
3. **Graphical operation aids programming**. In the machine stop state, through the "up" and "down" keys to select the "blue blinking point" in the "motion preview trajectory map" to carry out graphical operation to assist programming (Note: the "blue blinking point" corresponding to the screw hole position point and the background "programming area" where the yellow cursor is located). "to carry out graphical operation to assist programming (**Note: the screw hole position point corresponding to the "blue blinking point" matches and corresponds to the programming point of the line where the yellow cursor is located in the "programming area" of the backstage**).
   (1) **Application Scenario 1**: If you want to start running from a certain screw hole position, you can't quickly determine from the "Programming Area" which is the "Screw Hole Position Programming Point" to start running? At this time, you can enter the "motion preview interface", in the machine is stopped, through the "up" and "down" buttons to quickly locate and select the user wants to start the operation of the When the machine is stopped, use the "up" and "down" buttons to quickly locate and select the "Screw Hole

Programming Point", i.e., the "blue blinking point", and then press the 

key on the hand-held programmer, then you can start working directly from the current screw hole point.

(2) **Application Scenario 2**: If you want to modify the coordinates of a certain screw hole position on the fixture plate, but you can't quickly determine which is the "screw hole position programming point" you want to look for from the "programming area"? At this time, you can enter the "motion preview interface", in the machine is stopped, through the "up" and "down" buttons to quickly locate and select the user wants to find the Screw hole programming point" that is, "blue blinking point", press "Cancel" key to exit the motion interface, you can directly match and locate the corresponding programming point in the "Programming Area", then press "Cancel" key to exit the motion interface. Press the "Cancel" key to exit the motion interface, then it can directly match and locate to the programming point corresponding to the "programming area", and then press the "OK" key to modify the coordinates of the "programming point".

4.It is convenient to install and deploy. In the motion preview interface, press 

to switch to the "output signal" editing area, press "up" and "down" to select different signal editing boxes, and press "0" or "1" to change the status of the corresponding output signal, which is convenient for users to install and debug the machine. Press "0" or "1" to change the status of the corresponding output signal, which is convenient for users to install and debug.