Fully Automatic Sewing Control System
Operation Manual
(Generation-II HMI)

Feb. 2018 Ver. V1.1

Contents

Chapter I Introduction to Control System

1.1 Overview

Thank you very much for using the automatic template sewing machine control system of our company!

This system can match with the various types of template machine, satisfying different sewing requirements with satisfactory sewing effect for all sorts of cloth!

Before using, please read the Instruction carefully to ensure the correct use of this system. Please keep the instruction appropriately in order to check at any time.

In case of discrepancies between actual machine and this Instruction due to different machine configurations and software update, the operating functions shall prevail.

1.2 Functional Description

(1) One machine with multi-purpose, simple operation

➢ Full automatic template sewing machine can replace many kinds of special machinery such as traditional flat sewing machine, long arm sewing machine, bartack sewing machine, embroidery machine, etc. in certain circumstances to achieve multi-usage

➢ After placing the template well, the operating personnel only needs to press the start key, automatic processing can be completed, the operation is quite simple

➢ With standardized operation; the machine can work out amazing effects for a variety of stitches and a variety of fabric!

(2) The man-machine interface is friendly and easy to use

➢ ☐ 7 inches color LCD touch screen, with clear display, easy to touch

➢ ☐ Support display in both Chinese and English

➢ ☐ Up to 256M (or 128M) file storage space, to store and process **many files**

➢ ☐ Convenient file Collection (template making), modification, management functions

(3) Precise motion control technology with efficient sewing

➢ Using international advanced DSP chip, fast system run speed, high hardware integration, stable performance

➢ Support step-by-step, closed loop step-by-step, brushless DC, servo drive, using smooth curve for speed governing, smooth operation

➢ Compact mechanical structure, good rigidity, high sewing position precision, low noise

(4) The upper computer graphics editing software is easy to use

➢ Such files in dxf, dst, dsb, ai, plt, edi, tzf format that are generated by software such as Autocad, Coredraw are easily converted into processing files

➢ The software has comprehensive graphics editing functions, supports layer editing and adding various kinds of special sewing stitch lines

➢ With common control instruction set, customizable control instruction (functional code), high dexterity of action

➢ For each layer, each graphic, each stitch point, a variety of mechanical control commands can be inserted into, to meet the diversified and precise automatic sewing requirement

(5) Rich user parameter settings, comprehensive auxiliary functions

➢ Detail settings can be carried out for various mechanical actions

➢ Point position, painting line, automatic mold slot opening function of some equipment can be extended

➢ Support automatic identification of template, U Disk system updates, broken threads detection, continue sewing in power down, processing statistics, forecast for lack of bobbin thread, system self-test, parameter backup and recovery, encryption lock machine...

1.3 Notes

1.3.1 Safety Instruction

In order to avoid the possible risk and prevent damage to the device, please observe the following safety matters:

Note:

● Please don't carry out maintenance and debugging to electric system by non-specialists, this will reduce the safety performance of equipment, enlarge the fault, and even cause harm to the personnel and property losses.

- Some parts inside the case have high pressure; after the system is powered on, please do not open the case cover, in order to avoid accidental injury.

- Please do not pile up sundry around the control box, and in the process of using; remove dust on the surface of control box and the filter regularly, so as to keep good ventilation for the system, which is good for heat dissipation.

- Without authorization of the company, please do not make any change to the product arbitrarily, and the company shall not hold any responsibility for the consequences!

⚠️ **Warning:**

- **If it really needs to open the case cover, it must be carried out5 minutes after cutting off power and guided by professionals to contact components inside the electrical cabinet!**

⚠️ **Danger:**

- ☐ When the machine is at work, it is forbidden to contact with any moving part or open the control equipment, plug or pull out motor interface, otherwise it may cause personal injury or the machine not to work!

- ☐ It is forbidden for electrical equipment to work in places with humidity, dust, corrosive gas, flammable and explosive gas, otherwise it may cause electric shock or fire!

1.3.2 Work Environment

- ☐ Solid, level ground installation
- ☐ Good ventilation, healthy environment, less dust
- ☐ Temperature in work space: 5 to 40 ℃
- ☐ Relative humidity in work space: 30% to 90% without condensation

1.3.3 Power Supply Requirement

- Single-phase AC220V/50 to 60 HZ
- It needs to be equipped with the voltage regulation equipment when the power grid voltage fluctuation is more than 10%
- Equipment power is between 1.0 to 2.0KW according to different machine configuration

1.3.4 Grounding Requirement

● In order to prevent electric shock or fire accident of electrical equipment due to causes such as electric leakage, over voltage, insulation, etc., please make sure the electronic control with reliable grounding

● The grounding resistance should be less than 100 ohms, conductor length within 20 meters, conductor cross-sectional area greater than 1.0 square millimeters

Chapter II Description of Main Interface

2.1 System Power-up

Upon system power-up, the HMI displays the boot screen, when the spindle will automatically rotate for testing and reset other parts. The reset action is related to power-up reset parameters setup.

2.2 Main Interface of Processing

2.2.1 Display Instruction for Main Interface of Processing

The main interface of processing is automatically activated after the display of boot logo. The main interface of processing is shown below:
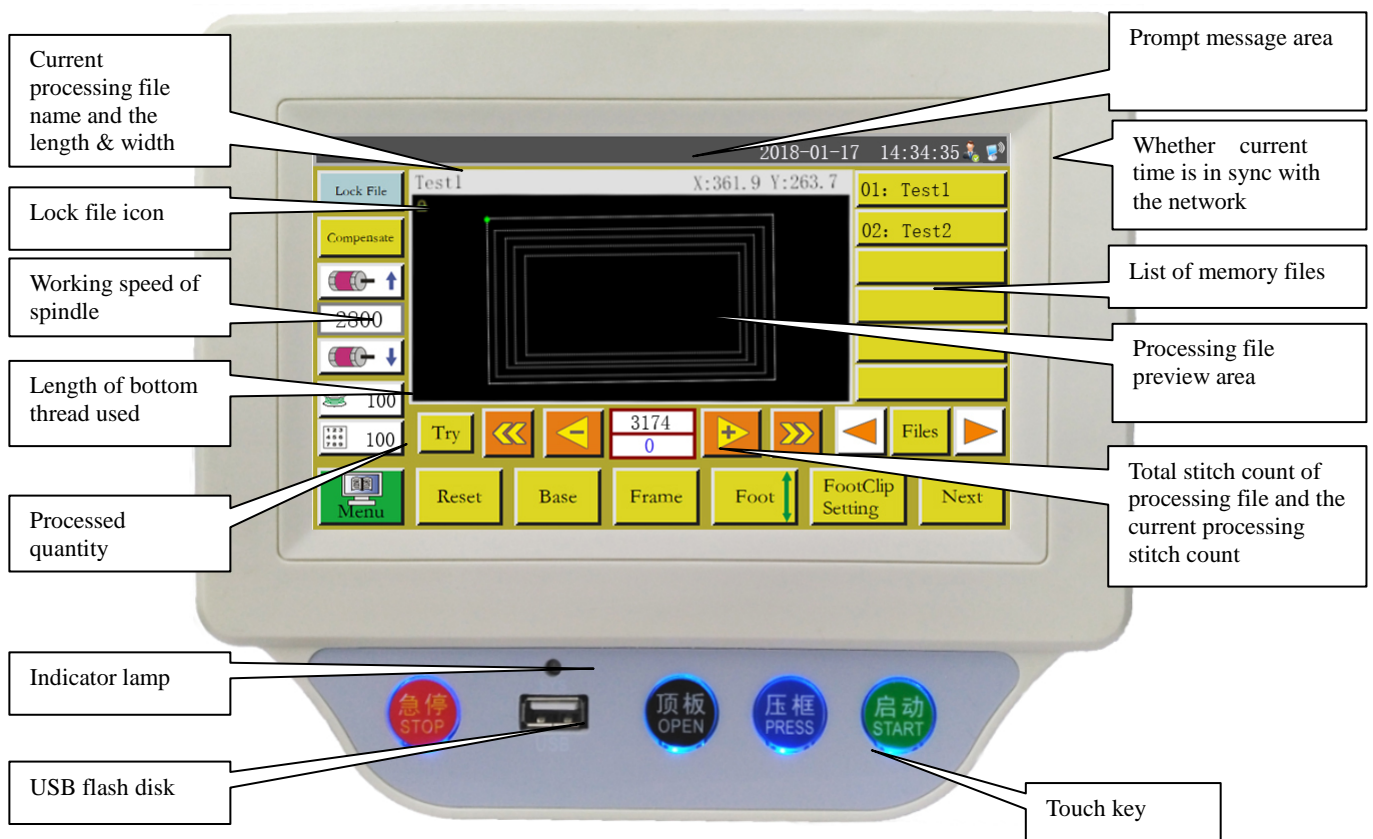

Fig. 2-1 Main interface of processing

Key functions in the main interface of processing are described as follows:
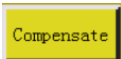
Processing file preview area: Show the currently selected file graph; click to switch between "full graph" (scale for optimal display) and "at ratio" (actual ratio to the processing range). When the processing graph is greater than 8,000 stitches, only "full graph" display mode is available.

List of memory files: Show the list of memory files; click to choose different processing files.

Lock File "Lock file" key: Lock the currently processed file to prevent misoperation. Once a file
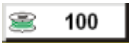
is locked up, other processing files can't be chosen, when ![lock icon] icon will appear in the preview area. Click once to lock, and click again to unlock.

Note: Automatic template recognition will work only in the locked state of "lock file". The recognized template is displayed in the "prompt message area", and the corresponding numbered file will be automatically selected. If the "template recognition mode" is set to "by file name", electronic tag (identifier) will be used to match the file name; if it is set to "by serial number of file", the serial number of file will be matched using a code scanner.

![Compensate] "Stitch compensation" key: Reverse stitching function. This is available (up to 10 stitches can be compensated) only at the last stitch of a curve

![Acceleration icon] "Acceleration" key: The rotating speed of spindle increases by 100 rpm. If this key is pressed and held (long-pressed), the speed will increase continuously until the set max. speed is reached. Arbitrary change to rotating speed can be prohibited by setting a password.

![Deceleration icon] "Deceleration" key: The rotating speed of spindle decreases by 100 rpm. If this key is pressed and held, the rotating speed will decrease continuously until the set min. speed is reached. Arbitrary change to rotating speed can be prohibited by setting a password.

![Bottom thread 100] "Bottom thread statistics" key: Show the used length of bottom thread. Press the key to enter the processing statistics interface.

![Processing 100] "Processing statistics" key: Show the finished quantity. Press the key to enter the processing statistics interface.

![Menu icon] "Main menu" key: Press the key to get into main menu interface.

![Try] "Trial" key: It is used to simulate the processing process based on graphical trajectory. When this key is depressed, XY axes rotate while the spindle is stationary.

![Segment fast reverse icon] "Segment fast reverse" key: Manually move back without load to the starting point of the previous continuous curve. Return without load means the spindle remains stationary while XY axes move. This key is used to preview the designated needle location or start the processing from the designated needle location.

![Segment fast forward icon] "Segment fast forward" key: Manually move forward to the starting point of next

continuous curve, when the spindle remains stationary.

"Single needle return without load" key: Press the key, and one stitch will retract at single step without load; continuous backward movement is activated when this key is pressed and held.

"Single needle forward without load" key: Press the key, and one stitch will go forward at single step without load; continuous forward movement is activated when this key is pressed and held.
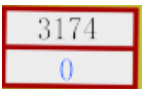
"Total stitch count setup" key: The number in the upper line indicates the stitch count of processing file, while the number in the lower line indicates the current stitch count. Press the key, when the "Jump stitch" setup window pops up.

Note: "Jump Stitch" window description: 0 … 9 : Number input for set value; CL : The set value returns to 0; ⊕ : The set value plus 1; ⊖ : The set value minus 1; ⟵ : Delete a digit from right to left   Cancel : Cancel current modification;   OK : Confirm current modification;

: Connection with wireless network has been established;   : Connection with cloud server has been established

"Page left" key: Turn the page to the left to view memory files.

"Page right" key: Turn the page to the right to view memory files.

Files "File" key: View all memory files.

Reset "Reset" key: Press the key, when the shafts start to rotate, while the machine is reset.

Base "Reference" key: Press the key to get into XY axes reference point setup page.

Frame "Manual press frame up/down" key: Press the key to switch between lifting and pressing of press frame.

Foot "Manual press foot up/down" key: Press the key to switch between lifting and pressing

of press foot.

FootClip Setting "Press foot thread clamp" setup key: Set press foot height or thread clamp strength.

Note: This function is not available unless the press foot type is set to motorized press foot in parameter software.

Next "Next interface" key: Press the key to get into test interface.

2.2.2 Test Interface Display Description

Bottom thread winding and other manual operations can be performed in the processing assist interface.
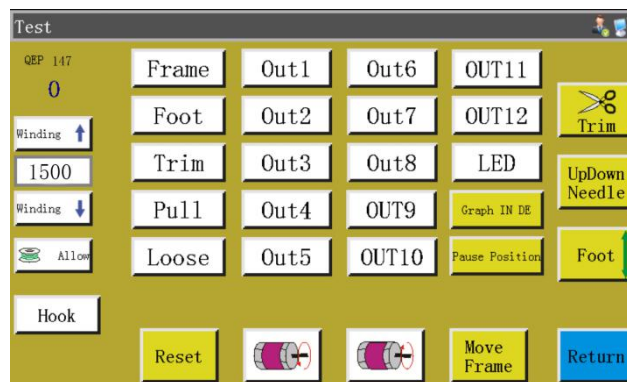
Key functions in the assist interface are described as follows:

Hook : Auto hook change. If the machine is designed with "auto hook change" feature, signal will be output for rotating hook change when the key is depressed.

Allow "Bottom thread winding on/off" key: Press the key to switch between "allow" and "prohibit". Activate "Allow" and press the "Start" switch to start the winding operation, when the spindle will wind the thread at the speed set in this page. The winding will stop if the start switch or **Return** is depressed again or the set winding time elapses. "Prohibit" means thread winding is prohibited.

0 : Show current rotational speed of spindle.

QEP 147 : Show current angle of spindle (0-999).

1500 : Set the winding speed of spindle.

⊕ "Spindle REV" key: Press the key, when the spindle starts to reverse and move slowly.

[Spindle FWD icon] "Spindle FWD" key: Press the key, when the spindle starts to rotate forward slowly.

[UpDown Needle icon] "Needle rod up/down" key: Press the key to switch between upper position (the highest point of needle) and lower position (the lowest point of need).

[Trim icon] "Trim" key: Press the key, when the machine sews one stitch to realize a complete trim operation.

Frame, **Foot**, **Trim**, **Pull**, **Loose**: Press the key, when the corresponding output is turned on; lift the key, when the output is turned off.
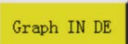
LED, **OUT1** … **OUT12**: Press the key, when the corresponding IO output function is always ON; press again to turn off the output. For some electric control, the LED lamp will be always ON.
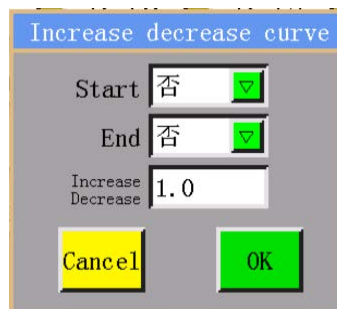
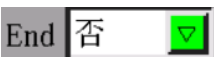Note: Please don't press and hold the electromagnet control output for long (e.g. **Trim** **Pull** **Loose**); otherwise, the electromagnet connected with this output may get damaged due to overheating!

Graph IN DE: Perform "+" and "-" setup simultaneously for each continuous curve of processing file. The interface is as follows:
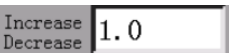

Start and **End** determine whether or not to perform "+" or "-" operation at the start or end of each continuous curve.

Increase Decrease 1.0 is used to set the length of increase/decrease in mm; positive number means the extension of curve, while negative number means the reduction in length of curve. If the increase of length is less than 1 unit of stitch length, the increase will be neglected; for example, if the stitch length in current graph is 3mm while the set increase is 5mm, only 1 unit of stitch length will increase actually.

When the graph below is set to "Start: Yes", "End: Yes" and "Increase/decrease: 9", the situation as shown in the figure on the right will occur.
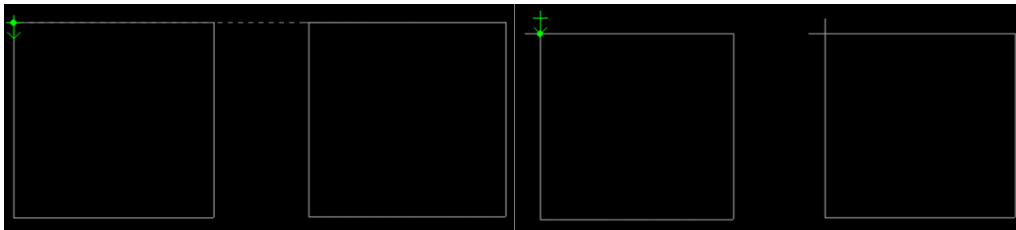
Pause Position: Press the key to get into the suspension position interface that is used to set the positions (up to 6) of suspension during sewing operation.
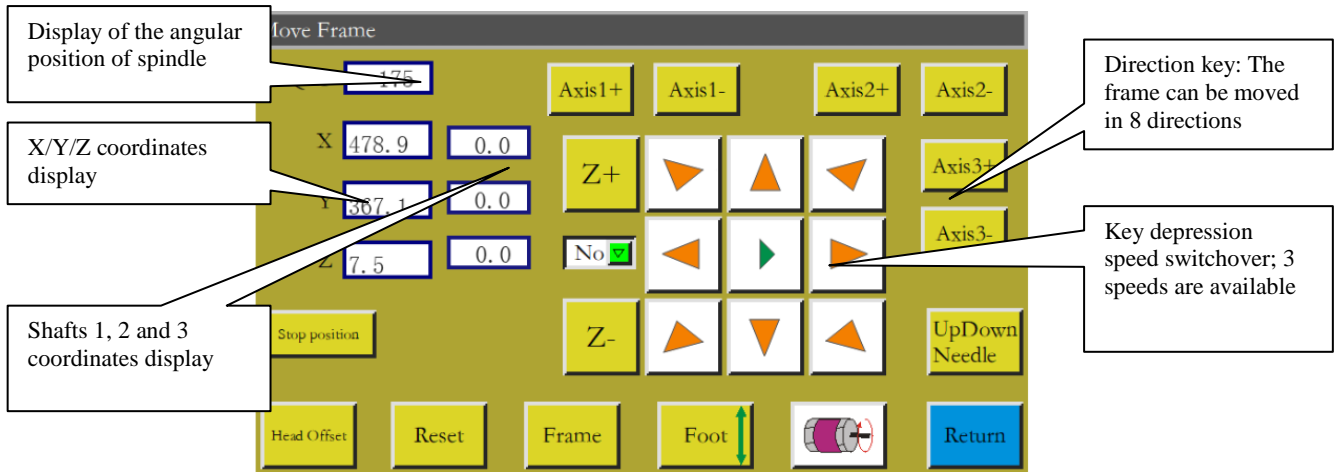
Return "Previous interface" key: Press the key to go back to the main interface of processing.

Move Frame "Manual frame movement" key: Press the key to get into the manual frame movement operation interface.

Thread winding: Press touch key "Start" at the bottom of the screen in this interface, and confirm, when the spindle motor will rotate for thread winding at the set speed, while **Stop** key appears at original position of **Return**; click this key to stop winding operation. The winding operation can also be stopped by pressing "Start" and "Emergency stop" buttons. The speed can be regulated through **Winding ↑** **Winding ↓** during winding operation.

2.2.3 Display Instruction for Manual Frame Movement Interface

Click on **Next** and **Move Frame** successively in the main interface of processing to get into the manual frame movement interface. In the manual frame movement interface, it's possible to move the frame manually and control the rotation of each shaft.

Display of the angular position of spindle

X/Y/Z coordinates display

Shafts 1, 2 and 3 coordinates display

Direction key: The frame can be moved in 8 directions

Key depression speed switchover; 3 speeds are available

Move Frame

175

X 478.9   0.0

Y 367.1   0.0   Z+   No ▽

Z 7.5   0.0   Z-

Axis1+   Axis1-   Axis2+   Axis2-

Axis3+

Axis3-

UpDown Needle

Stop position

Head Offset   Reset   Frame   Foot   Return

Key functions in the manual frame movement interface are described as follows:

▶ , ▷▷ , ▶▶▶ "Frame movement speed switching" key: Click to switch among low, medium and high speeds. Correspond to patterning speeds 1, 2 and 3 in "user parameters".

8 direction keys like ▶ : Move in X and Y directions.

"Z+", "Z-", "shaft 1+", ... "shaft 3-": Rotate corresponding shafts manually; some of the shafts have no effect on certain machines.
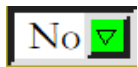
No ▽ :The default is "No", indicating that the manual frame-shift operation cannot be performed before resetting. You can select "Yes" to perform a temporary manual frame-shift operation before reset. If it has been reset, this function is invalid.
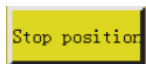
Stop position : The current X and Y coordinates are set to the stop coordinates of X and Y axes after resetting.

Head Offset : Enter the head offset interface for setting the offset position of heads 2 and 3 in relation to head 1. Head 1 is a sewing head. Desired functions such as laser cutting head and brush head can be assigned to heads 2 and 3.
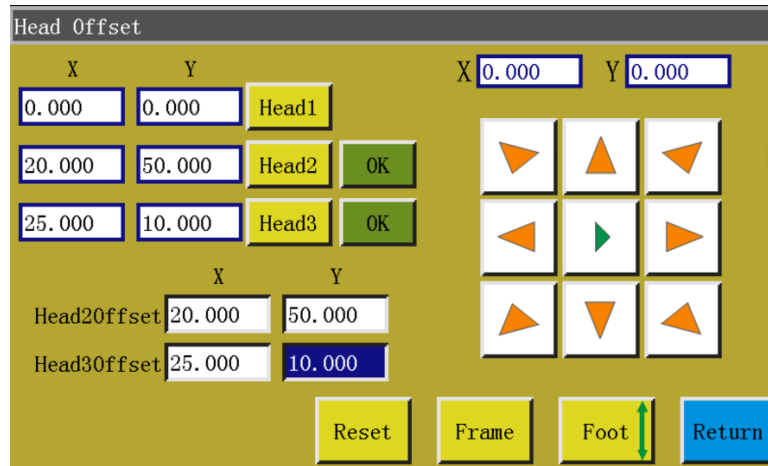
Click Head1 , when the coordinates of head 1 become the coordinates employed in

X 0.000   Y 0.000 . Set the values of heads 2 and 3 in relation to
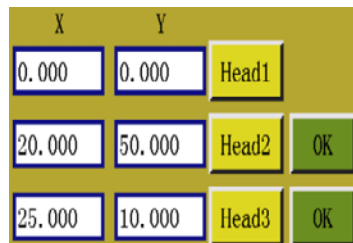
head 1 below, and will change correspondingly; click OK to save

the settings.

UpDown Needle "Needle rod up/down" key: Press the key to switch between upper position (the highest

point of needle) and lower position (the lowest point of need).

Return "Return" key: Press the key to return to the previous operation interface.
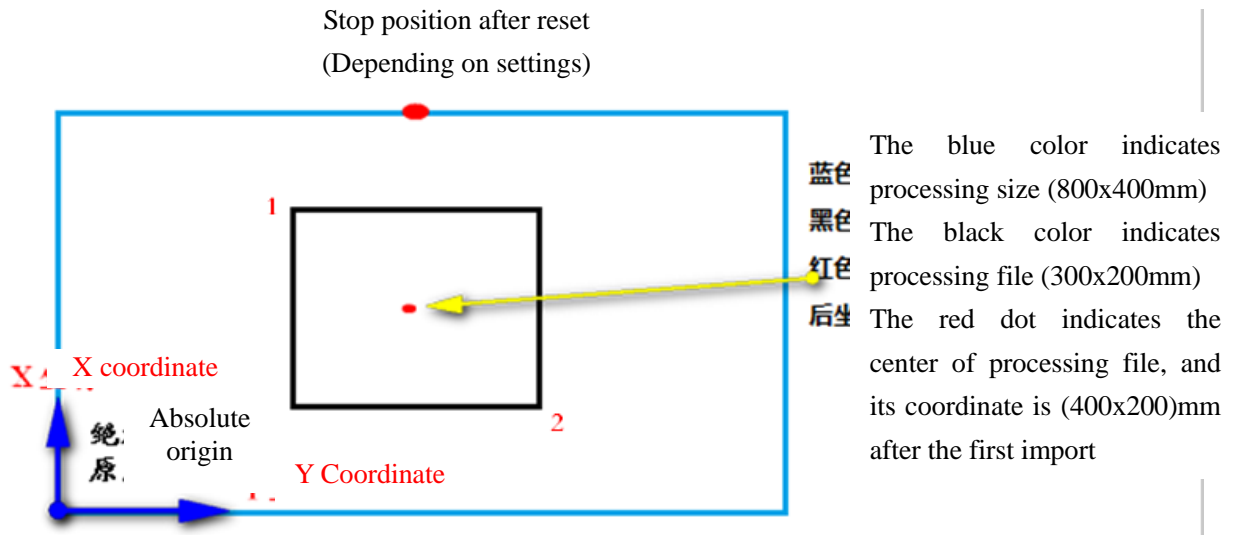
2.2.4 Display Instruction for Reference Setup Interface

Click Base in the main interface of processing to get into the reference point setup interface.

The template reference point can be set in this interface.
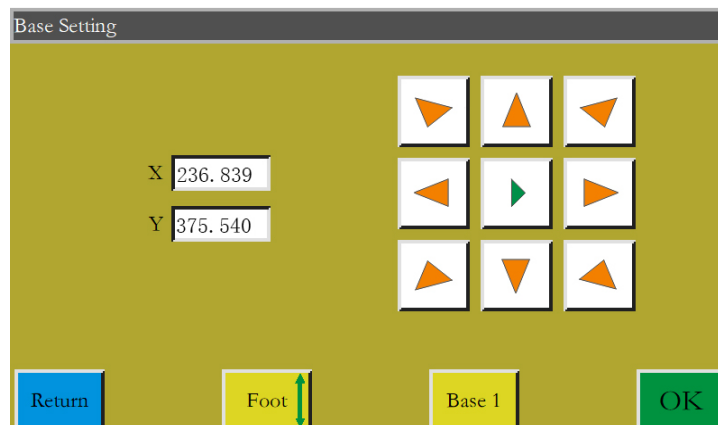
Reason for reference point setup:

When the processing file generated through the software in upper computer is imported into the memory and previewed for the first time, the system puts the file at the center of the processing range (click the "Processing file preview area" to switch the display mode), and writes this position information into processing file. As shown in the figure below:

Stop position after reset
(Depending on settings)

The blue color indicates processing size (800x400mm)

The black color indicates processing file (300x200mm)

The red dot indicates the center of processing file, and its coordinate is (400x200)mm after the first import

X coordinate

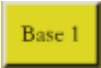Absolute origin

Y Coordinate

The fabricated template is placed on workbench in the position that may be as shown in the figure below:

Template pattern
Slotting position
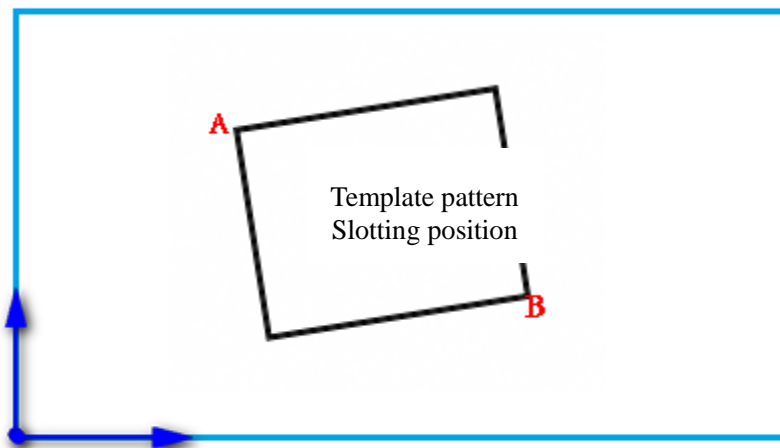
Hence, it's necessary to align reference point 1 with A, and reference point 2 with B. Adjust the position of processing pattern in the system so that it corresponds to the template slotting position.

Detailed steps are as follows:

1) Select the file for which the reference point should be set up in the main interface of processing, and place the corresponding template. Click **Reset** to enter the reference point

setup interface, and the system will automatically move the frame to reference point 1.

2) If dual reference points are set up in upper computer software, the upper left corner of the interface will indicate "set up reference point 1". See whether the reference point 1 is located at template slot A; in the case of offset, click the arrow keys to move the point until they coincide with each other.

3) Click [OK] to finish the setup of reference point 1. The system automatically moves frame to reference point 2, when the upper left corner of interface indicates "set up the second reference point". Click direction keys to move the frame so that reference point 2 coincides with the position of template B. To return to re-set reference point 1, click [Base 1] key to switch to reference point 1 for setup.

4) Click [OK] to finish the setup of reference point 2, when the system automatically returns to the main interface of processing. The system will write this position into processing file, while the processing preview area pattern will be adjusted to correspond to the position of template. Upon the completion of reference point alignment, additional alignment is not needed as long as you don't modify this file and template. If the upper computer does not set up dual reference points, the sewing start point will be taken as reference point 1 by default, in which case the system will return to main interface of processing after the alignment of reference 1. By setting up system parameters, it is possible that reference alignment is not needed at the first use. Please consult the manufacturer for detailed settings.

2.2.5 Process Statistics Interface Display Instruction

Click [100] or [100] in the main interface of processing to enter the processing statistics interface. In this interface, you can view the processing quantity, time, bottom thread length and other information.
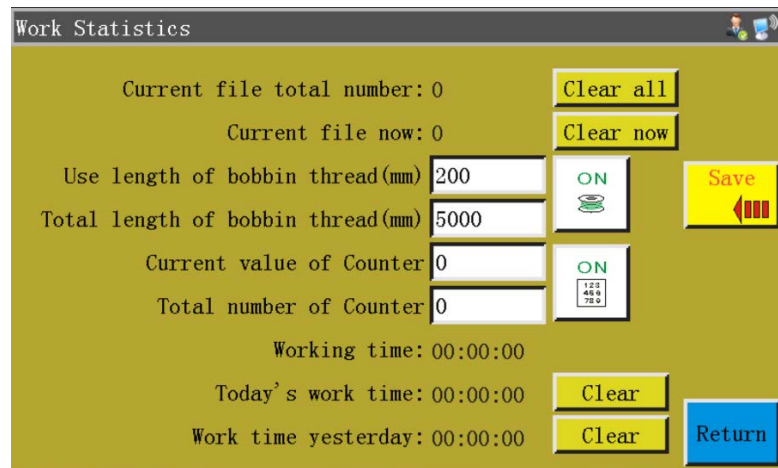
The interface is described as follows:

"Total finished quantity for this file": Refer to the total quantity finished within all time for the current processing file. Click "Clear history" to clear zero.

"Total quantity for current file on current day": Refer to the total quantity finished within current day for the current processing file. Click "Clear current day" to clear zero.

: Parameter setup shortcut. "ON" means to set "User parameters" - "Statistics settings" - "Count by the piece settings are valid: Yes". If the setting "Continue after the piecework is finished: No" is activated, when the "Current value of count by piece" reaches or exceeds the "Total count by piece", the start of processing will receive the message "Full count" and can't function.

"Current value of count by piece": Refer to the total times of finishing the processing of file. The value increases by 1 every time when a processing cycle is finished. It can't be turned off.

"Total count by piece": Refer to the times of fulfilling the objective of processing file.

: Parameter setup shortcut. "ON" means to set "User parameters" - "Statistics settings" - "Bottom thread count settings are valid: Yes", which means the used length of bottom thread is subjected to statistics in every cycle of processing. If the setting "Stop when bottom thread is used up: Yes" is activated, the length of bottom thread needed for next continuous curve will be estimated at the beginning of processing; when this length is greater than (total length - initial length of bottom thread), the system shows the message reading "Bottom thread used up" and can't function.

"Used length of bottom thread (mm)": Refer to the used length of bottom thread; when it is set to , the value will be accumulated to the bottom thread of the length needed for current file after the start of file processing.

18

"Total length of bottom thread (mm)": Refer to the initial total length of bottom thread in rotating hook settings. Estimation formula at winding: Total length = Mean perimeter of rotating hook x Rotation speed x Winding time.

"Operating time": Show the sum of cumulative processing time. Only the time of "in service..." status is subjected to statistics.

"Current-day working hours": Show current-day processing time. Click "Clear" to clear 0.

"Working hours yesterday": Show processing time yesterday. Click "Clear" to clear 0.

2.3 Main Menu Interface

Press [Menu] key in main interface of processing to enter the main menu interface, as shown in the figure:
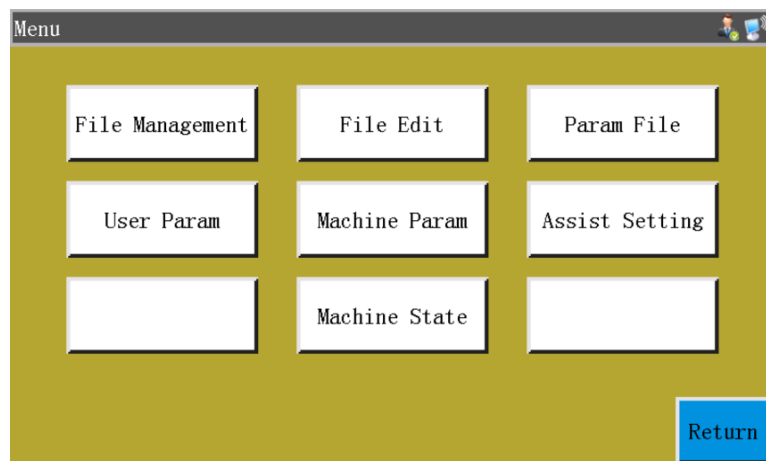
File management: Manage, import and export the files in memory and USB flash disk.

File edition: Create new sewing graphs or edit & modify original graphs.

Parameter file: Write parameters into the system, and export system parameters in the form of file; the transfer of files between memory and USB flash disk, etc.

User parameters: The parameters frequently used by user; parameters are adjusted based on processing requirements to realize convenient processing and improve processing efficiency.

Machine parameters: Only accessible to machine assemblers.

Assist settings: Used for processing assist settings and testing, etc.

Network file: (Temporarily unavailable)

Machine state: For remote administration device to report various status of machine for solutions.

Chapter III File Management

File management is performed to import, export and delete files in USB flash disk and memory. The system only recognizes the processing files with extensions .KLW and .SLW. Processing files are created with PC graph edition software delivered with machine or through file capture.

3.1 Memory File Management

Press File Management key in main menu interface to enter file management interface as shown in the figure below:
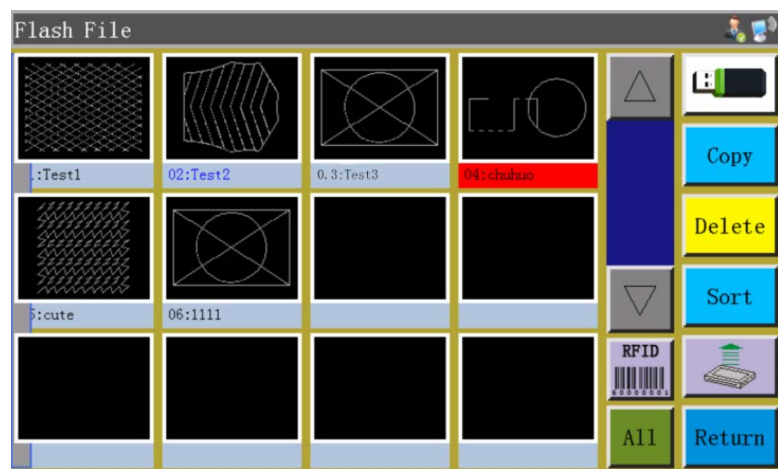
The system memory can store up to 999 processing files, of which the total size shall not exceed 128M. Support file names in Chinese and English (case sensitive); each file name can consist of up to 15 Chinese characters or 30 characters (the displayed number of characters may vary depending on the interface). In the case of wrong format of processing file or file corruption, no preview is displayed here.

Click to select a file, when the selected file turns red; the selected file shall be handled as needed.

Key description:

Copy Copying file: Copy the currently selected file. File copy can be created by clicking "Copy" and entering the new file name.

Delete Deleting selected file: Delete the currently selected one or more files.

Sort Sorting file: Insert the currently selected one or more files into designated location. For example, select "002:TEST2", click Sort , enter "1" into the pop-up dialog box, and click "OK".

The file ranks first and turns into "001:TEST2".

"Electronic tag and barcode write" key: The function is determined by "User parameters" - "Other settings" - "Template recognition mode: By file name/file number".

If the recognition is by "file number", it means the processing file is matched by scanning barcode with scanner. Method of binding processing file to barcode: Click this key after selecting the processing file, enter the desired barcode value into the pop-up "Barcode" window, and click OK to return. At this point, the set barcode is displayed on the graph.

If "By file name" is selected, it means the file name in IC card is recognized using electronic tag reader so as to match processing file. Method of binding processing file to electronic tag: Click this key after selecting the processing file, and click "Yes" in the pop-up confirmation window; when the card reader beeps once, it means the file name has been successfully written into electronic tag; at this point, the interface title bar shows that file name.

 Select all files: Select all files under the directory.

Export file: Copy one or more files from the memory into the root directory of USB flash disk. If a file exists with the same name in the USB flash disk, a message will appear reading "The file already exists. Do you want to overwrite it?"

: The current storage space occupancy ratio, through which you can make clear understanding of the storage occupancy.

 File in USB flash disk: Click to enter the "file in USB flash disk" interface.

3.2 Management of Files in USB Flash Disk

Insert the USB flash disk, and press key in memory management interface to switch to the USB flash disk file management interface as shown in the figure:
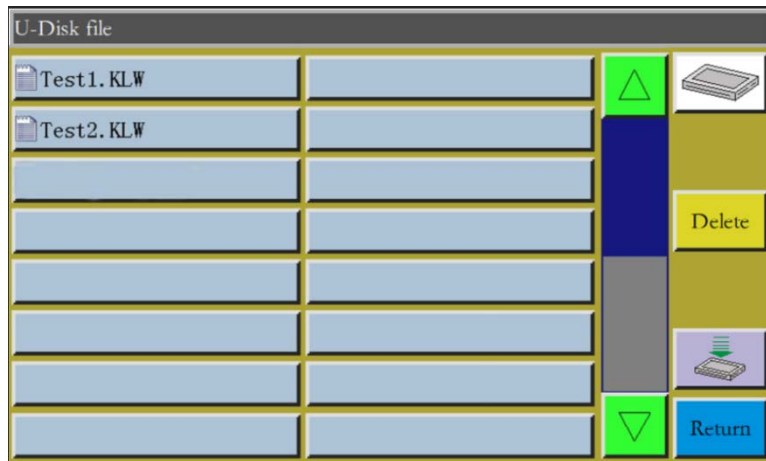
USB flash disk file management supports up to 15 Chinese characters or 30 characters display. If USB flash disk is accessed through file management, the files and folders in .klw and .slw formats under root directory of the USB flash disk are displayed by default; if USB flash disk is accessed through parameter file, the files and folders in .xhp format under root directory of USB flash disk will be displayed by default. Support multi-level folder operation; it is recommended that folders be used for classification management where there are a lot of files.

Click to select a file, when the selected file turns red; the selected file shall be handled as needed.

Key description:

Import files: Copy the selected one or more files from USB flash disk to the memory space, and replace the file with the same name (if any).
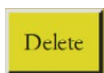
"Delete" key: Delete one or more selected files.

Memory file: Click to return to the memory file interface.

"Return" key: Return to the main menu interface or parent folder.

Note: If the processing file in .SLW format can't be recognized or imported, please connect the motherboard and upgrade the version of control system. See section 7.7.
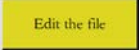
Chapter IV File Editing

File capture (patterning) is used to create new processing files, or to add sewing paths, etc. to existing processing files. Where it's necessary to create complex and accurate graphs, the included sewing control software is recommended for better results.

4.1 Main Interface of File Editing

Press [File Edit] key in the main menu interface to enter the main interface of file editing as shown in the figure:
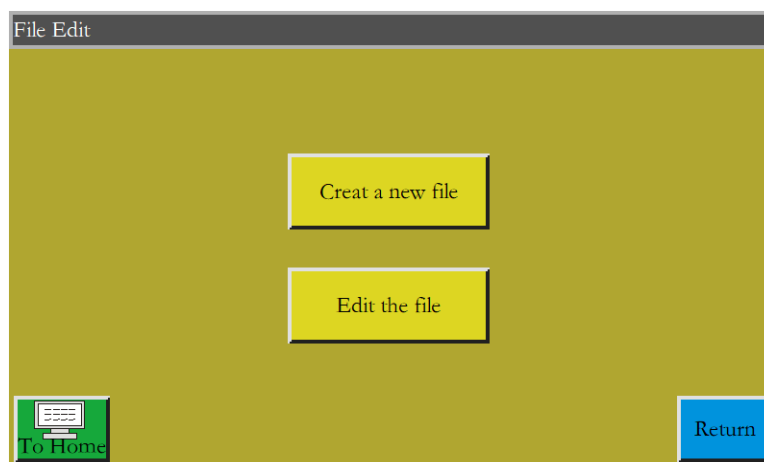

[Creat a new file] : Create new capture file.

[Edit the file] : Make modification or other edits based on the file selected in the main processing interface.

4.2 Capturing Graphs

Pressing [Creat a new file] in file editing interface pops up a new file naming window. See the figure below:
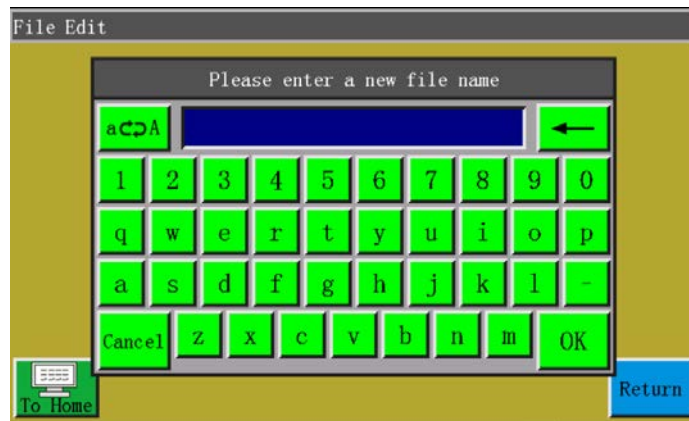
After entering the name, press [OK] or [Edit the file] to enter graph capture interface as shown in the figure below:
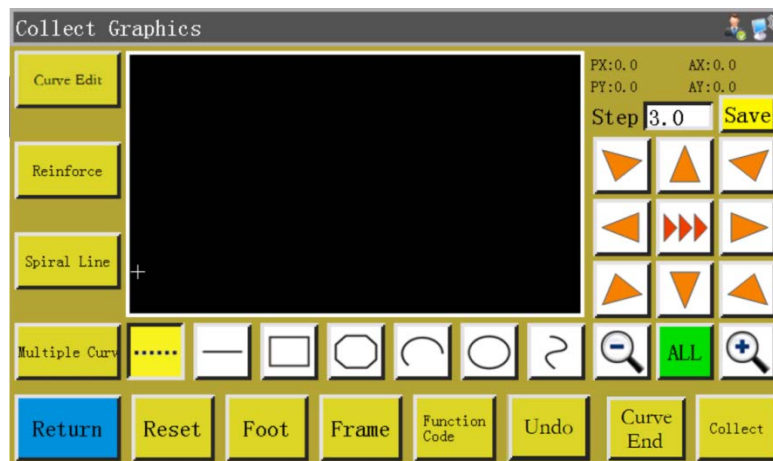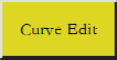

The function keys of capture interface are as follows:

"PX", "PY": Indicate the X and Y coordinates of current cursor point with respect to the previous capture point.

"AX", "AY": Indicate the coordinates of current cursor point with respect to the absolute origin.
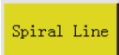
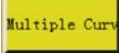Step 3.0 : The distance between stitches in sewing settings; the default is 3.0mm, while the range is 1~50mm.

[▶], [▶▶], [▶▶▶] "Frame movement speed switching" key: Click to switch among low, medium and high speeds.

[Curve Edit] "Curve editing" key: The key will only light up when graph is captured. Press the key to enter the curve editing interface for curve editing.

[Reinforce] "Bar tacking" key: Press the key to get into bar tacking sewing settings.

24

Note: The bar tacking preset is set up before graph capture. Reinforce the edited graph in "Curve editing".

Spiral Line "Helix" key: The key setup requirements automatically generate helix graph.

Multiple Curv "Multi-curve key": Press the key to get into multiple sewing settings.

······ "Idle capture" key: Press the key once; when the background turns yellow, the current capture segment is idle. It is displayed with dotted line.

— Press the key once; when the background turns yellow, the current capture segment is straight line.

▭ Press the key once; when the background turns yellow, the current capture segment is rectangle (determined with 2 points).

◯ Press the key once; when the background turns yellow, the current capture segment is polyline segment.

◠ Press the key once; when the background turns yellow, the current capture segment is arc (arc determined with 3 points).

◯ Press the key once; when the background turns yellow, the current capture segment is circle (circle determined with 3 points).

⌇ Press the key once; when the background turns yellow, the current capture segment is curve (curve determined with more than 3 points).

🔍 "Zoom-out" key: Press the key to zoom out of the captured file graph. Click on the graph preview area to move the graph.

🔍 "Zoom-in" key: Press the key to zoom into the captured file graph.

ALL "Display switch" key: Press the key to switch between full-scale display and proportional display.

Function Code "Insert function" key: Press the key to access function code inserting operation.

[Undo] "Cancel capture" key: Press the key once to cancel the capture of previous step.

[Curve End] "Curve generation" key: When polyline segment and curve are captured, press the key to finish the capture of current segment.

[Collect] "Capture" key: Press the key to determine the current cursor location or finish the capture of current segment. If some areas of the generated graphs go beyond the processing range, they can't be generated.

[Save] "Save file" key: Press the key to save the current capture file. The saved file can be displayed directly in the preview area of main interface.

4.3 Idle Capture

Press [·····] key in "capture graph interface, when the key background turns yellow (idle mode is activated automatically when the capture interface is activated for the first time), which means the current segment of capture is in idle mode (idle: Only frame is moved, while the spindle is not sewn) as shown in the figure below:
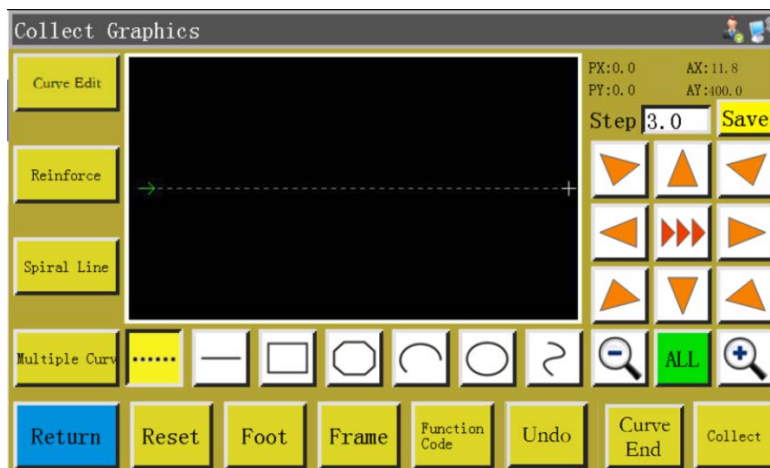
In the case of idle capture, two points generate an idle segment.

The absolute origin or the end point of previous capture segment is the first point of idle capture and displayed as red cursor. Press the key to move cross cursor to desired position, and press [Collect] key to generate idle segment.

If it's necessary to insert function code at the end of this segment, please refer to the operation procedure for function code setup. This operation can be performed at any time before the generation

of graph.

4.4 Straight Line Capture

Depress the ⎯ key in main interface of file capture, when the key background turns yellow, which means the capture of current segment is in straight line mode as shown in the figure:

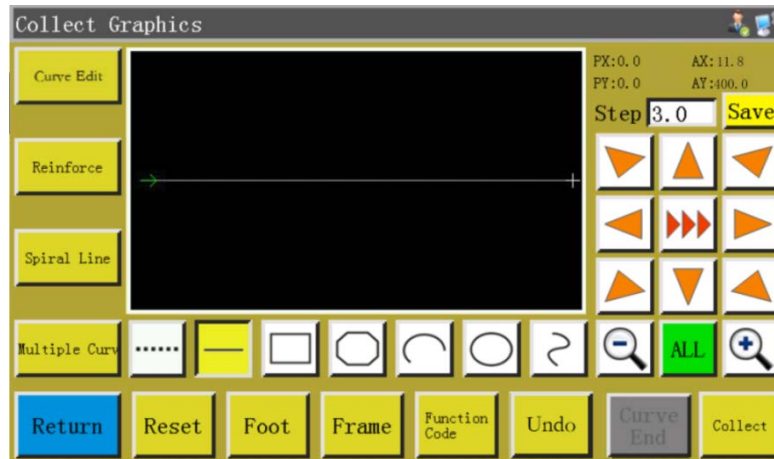In the case of straight line capture, two points generate a segment of straight line.

The absolute origin or the end point of previous capture segment is the first point of straight line capture. Press the key to move cursor to desired position, and press Collect key to generate straight line.

4.5 Rectangle Capture

Press ▢ key in main interface of file capture, when the key background turns yellow, which means the current segment capture is in rectangle mode as shown in the figure:

In the case of rectangle capture, two points with different X and Y coordinates generate a

rectangle.

The absolute origin or the end point of previous capture segment is the first point of rectangle capture. Press the key to move cursor to desired position, and press [Collect] key to generate rectangle.

4.6 Polyline Segment Capture

Press [⬡] key in main interface of file capture, when the key background turns yellow, which means the current segment capture is in polyline segment mode as shown in the figure:
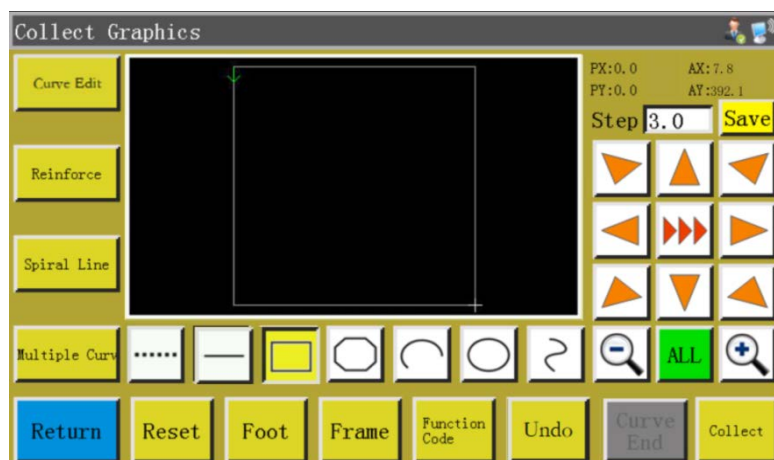

In the case of polyline segment capture, up to 127 consecutive points can be handled, and the line segment will be generated by two points determining straight line.

The absolute origin or the end point of previous capture segment is the first point of polyline segment capture. Press the key to move cursor to desired position, press [Collect] key to identify the capture point, and move for several times to determine capture points; upon completion, press [Curve End] key to generate the polyline segment linking the points up.
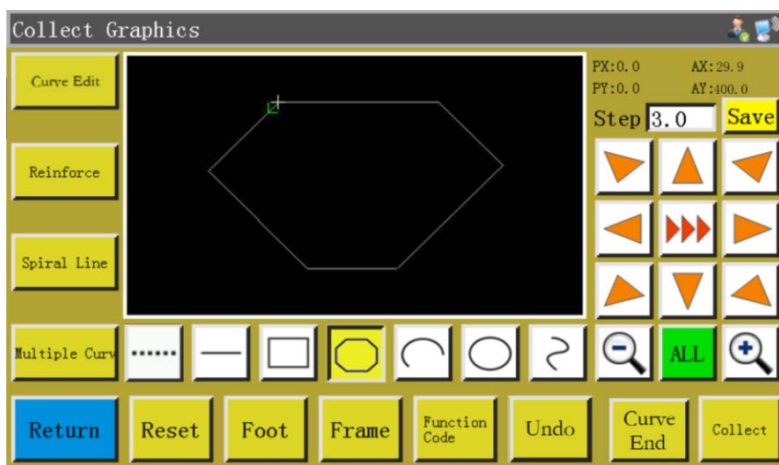
4.7 Arc Capture

Press [⌒] key in main interface of file capture, when the key background turns yellow, which means the current segment capture is in arc mode as shown in the figure:

In the case of arc capture, any 3 points that are not in the same straight line generate an arc: The first point is the start point of arc, the second point being the height reference point of arc, and the third point being the end point of arc.

The absolute origin or the end point of previous capture segment is the first point of arc capture. Press the key to move cursor to desired position, and press [Collect] key to identify the arc height reference point; press key to move to the desired position, and press [Curve End] key to determine the end point of arc to generate the arc.

To draw accurate arc, reference coordinate values are needed, and it's necessary to make the height reference point in the perpendicular bisector of line between start point and end point.

4.8 Circle Capture

Press [○] key in main interface of file capture, when the key background turns yellow, which means the current segment capture is in circle mode as shown in the figure:

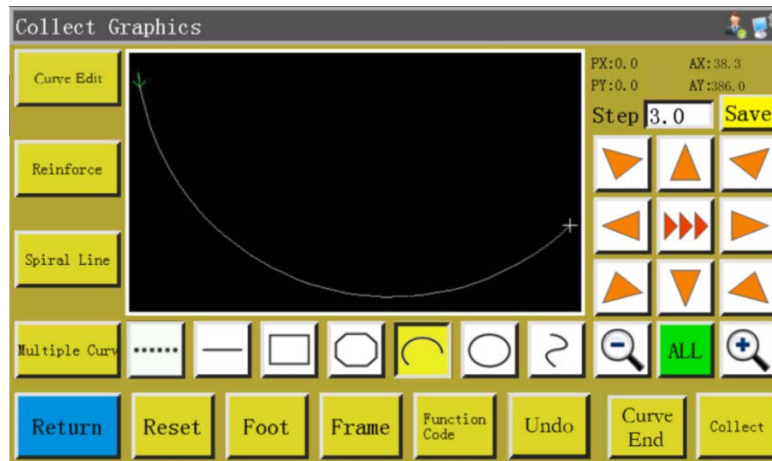In the case of circle capture, any 3 points that are not in the same straight line generate a circle.

The processing sequence: The first point (start point) > The second point > The third point > The first point (end point).

The absolute origin or the end point of previous capture segment is the first point of circle capture (the start point and end point of circle). Press the key to move cursor to desired position, and press [Collect] to identify the second reference point; press the key to move to the desired position, and press [Collect] key to determine the third reference point to generate the circle automatically. In the meantime, the press frame moves to the start point of circle.

Where accurate circle is needed, it is recommended that the distance between the first and second points should be the diameter of circle; the third point should be in the perpendicular bisector of the diameter line determined by the first and second points, and its distance from the diameter line should be the radius of circle.

4.9 Curve Capture

Press [∂] key in main interface of file capture, when the key background turns yellow, which means the current segment capture is in curve mode as shown in the figure:
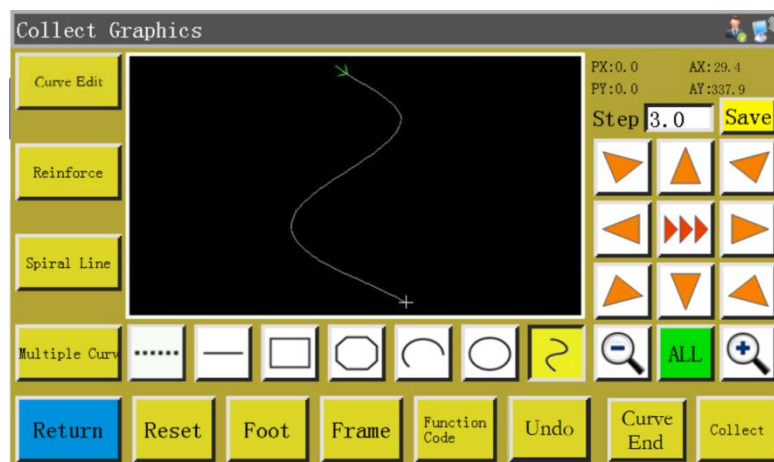
In the case of curve capture, up to 127 consecutive points can be handled, and the Bezier is generated by the degree of arc of the neighboring 4 points. The capture point shall be as dense as possible at the turning so as to achieve optimal curve effect. The capture of less than 3 points can generate curve.
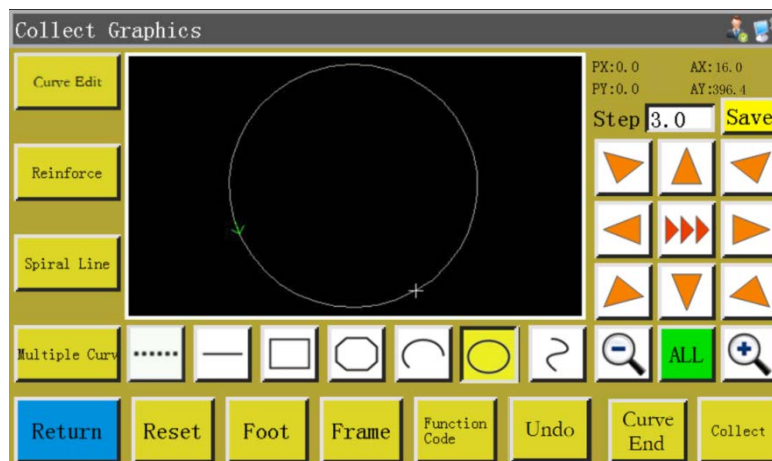
The absolute origin or the end point of previous capture segment is the first point of curve capture. Press the key to move to desired position, press [Collect] key to identify the capture point,

and move for several times to determine capture points; upon completion, press [Curve End] key to generate the curve.

4.10 Multiple Curves
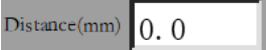
In the case of file capture, if the current capture curve (except idle and straight line capture) requires multiple sewing, it's necessary press [曲线多重] key to get into multi-curve setup interface as shown in the figure:
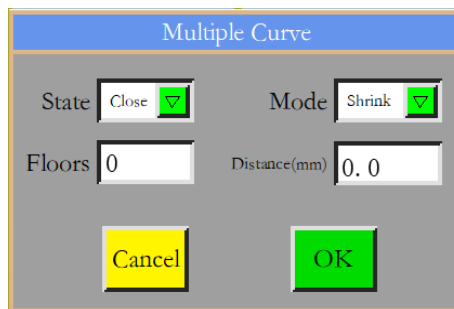
[State Close ▽] State ON/OFF: Determine whether multi-curve sewing is employed or not for next capture.

[Mode Shrink ▽] Mode selection: There are two modes available for selection, i.e. internal shrinkage and external expansion. Internal shrinkage means the offset shrinkage at designated spacing based on capture graph; external expansion refers to the offset expansion at designated spacing based on capture graph.

[Floors 0] : Indicate the increased number of curves; the range of entry: 1~20.

[Distance(mm) 0.0] : Indicate the distance between stitch threads; the range of entry: 0.1~20.0mm.

Select multiple sewing as needed, and set the offset distance and the number of offset layers. Upon completion of the setup, press [OK] key to save current settings and go back to the main interface of capture graph.

For instance: Set the state to "ON", the mode to "internal shrinkage", the number of layers to "5", and the spacing to "3.0"; click "OK" and perform a "rectangle capture" to get the curve as shown below; all the 5 rectangles inside are generated on a multi-curve basis.
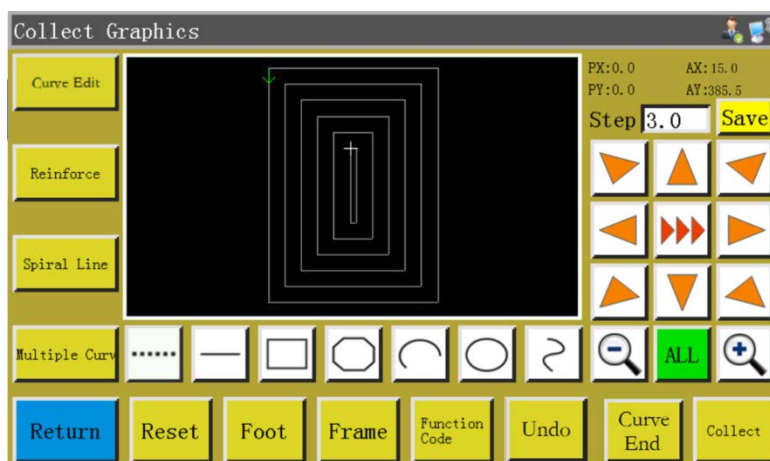
4.11 Reinforcement Preset

If current file capture segment requires start & end or overlap reinforcement sewing, press

Reinforce key to enter reinforcement setup interface as shown in the figure below. Upon completion

of setup, the OK key must be depressed to put the settings into force. If the subsequent graphs

require no reinforcement, you can click Cancel or set the value to 0, and press OK .
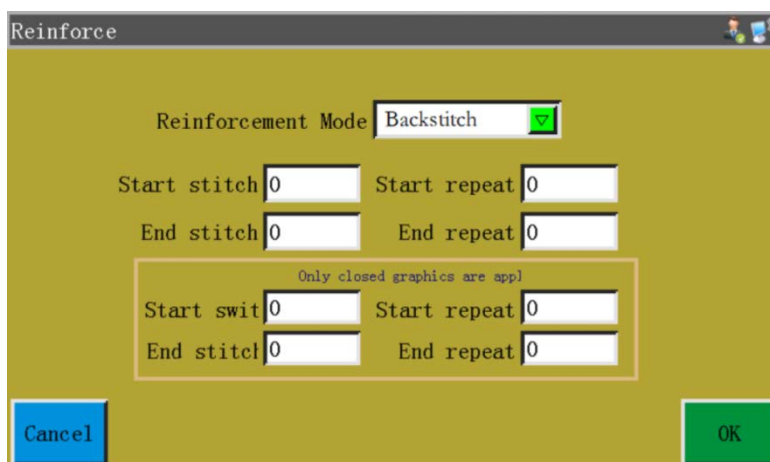
Reinforcement Mode Backstitch ▽ Reinforcement mode selection: There are three

reinforcement modes available, i.e. backstitch, shrinkage suture, and lambdoidal suture.

Backstitch: Perform overhanding near the start point or end point of sewing curve for

reinforcement. Set the backstitch count and stitch count as needed. If the set value is 0, no backstitch

will be performed. Upon completion of the setup, press OK key to save current settings.

Closed graph reinforcement means to sew designated number of stitches forward after the end

point (i.e. stitch start point) is reached, and then return to the stitch start point; overlapping

reinforcement is performed between these two points. Closed graphs refer to enclosed graphs composed of circle, rectangle, and polygon whose start points are completely coincident with end points.

Shrinkage suture: The stitch length is reduced based on the default stitch length for bar tacking sewing. If the default stitch length is 3mm, the parameters set as shown in the figure below mean all stitch lengths within the distance of 9mm from start point of curve are 1.5mm, while the stitch length in other parts is 3mm by default.
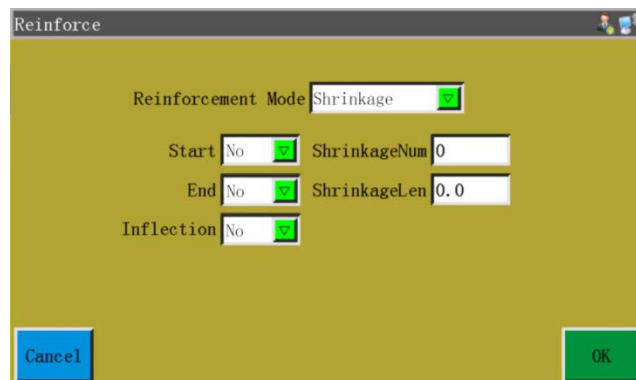
Lambdoidal suture: V or N-shaped bar tacking sewing. The parameters set as shown in the left figure below bring about the reinforcement effect shown in the right figure.
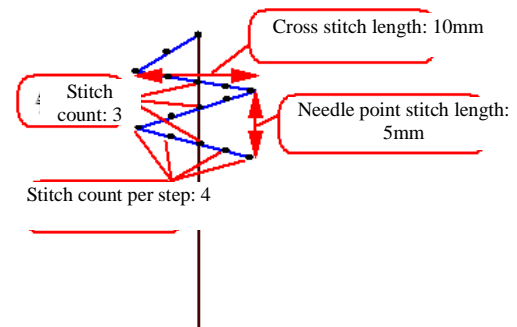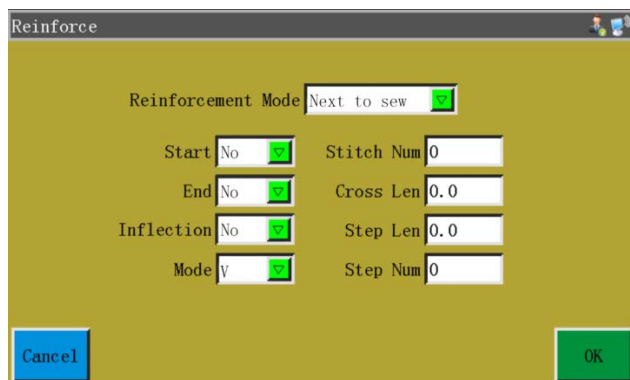
4.12 Function Code

If it's necessary to add function code the latest completed capture segment during file capture, you can press [Function Code] key to enter function code setup interface as shown in the figure:
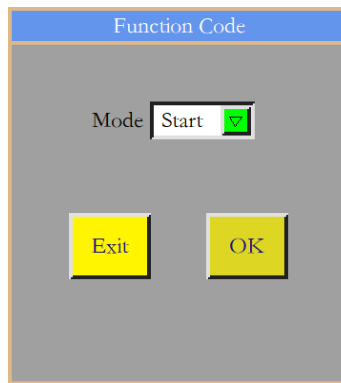
Select the place to which function code should be added: Start, end, and click 确定 to show the following interface:

There are 18 function codes:

输出IO Set the IO number to be output and its high and low levels; when the function code is encountered, the corresponding IO outputs corresponding level.

输入IO Set the level for which the entered IO number should be detected. If the function code is encountered, subsequent operations shall be performed when the corresponding IO is at high or low level.

延时 Set the delay time. The delay time that corresponds to the "single point" or "all points" function code.

新速度 Assign new sewing speed to a certain point or all points.

上暂停 Upper pause function code; when this function code is encountered, the spindle stops at upper stop position.

下暂停 Lower pause function code; when this function code is encountered, the spindle stops at lower stop position.

剪线 Trim function code; when this function code is encountered, the thread is cut without stopping the spindle.

Z轴速度 Edit the Z-axis speed; when this function code is encountered, the speed of Z-axis motor will be consistent with the edited speed.

抬压框 "Press frame up" function code; when this function code is encountered, the press frame goes up, while the spindle stops at upper part.

落压框 "Press frame down" function code; when this function code is encountered, the press frame goes down without spindle stopping at upper part.

拐点开始 Knee start function code; when this function code is encountered, knee is started

拐点速度 Knee speed function code; when this function code is encountered, the spindle rotates at the function code speed.

拐点结束 Knee end function code; when this function code is encountered, knee sewing comes to an end while the sewing speed is restored.

电机夹线1 Motor thread clamp function code; the thread clamp strength when the function code is encountered.
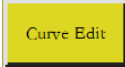
电机夹线2 Motor thread clamp function code; the thread clamp strength when the function code is encountered.

电磁铁夹线 Electromagnet thread clamp function code; the thread clamp level when the function code is encountered.

XY相对移动 Relative motion function code; when this function code is encountered, XY move relative to each other.

压脚升降 "Press foot up/down" function code; when this function code is encountered, you can determine whether have press foot go up/down or not based on the function code.

Press the key to add function code as needed; choose "single point" or "all points" for adding function code; select necessary instructions; set the corresponding requirements; click "Save" to add. Alternatively, you can edit the graphs in capture graph interface, click [Curve Edit] to enter curve editing interface, use [◄] [►] to choose the graphs to be handled (the graphs turn blue when chosen), and click [Function Code] to get into the following interface:
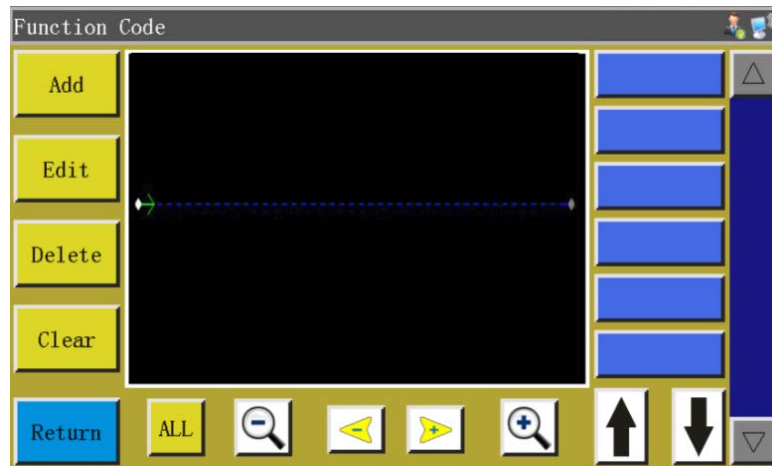
The curve is displayed in the form of needle points in this interface; select the position you want to edit (when a certain needle point turns red), when function codes can be added, edited, deleted and removed at the location of that needle point. When a function code is assigned to a certain point, that point will turn green. Click on this point, when the set function code appears on the right.

4.13 Curve Editing

"Curve editing" means to edit the captured graphs more comprehensively.

[Curve Edit] light up after the graph is edited, which indicates the editing is available. Click [Curve Edit] to enter the following interface:

The function keys can't be edited unless the graphs to be handled are selected (turn blue if chosen) using .

Step Set the stitch length of graph to be handled (the stitch length ranges from 1 to 50)

Reverse Reverse the sewing process of the selected graph, that is to say, the stitching is performed in reverse order.

Stitch Edit : Click this key after selecting the graph, when all needle points are displayed on the graph; the interface is as follows:
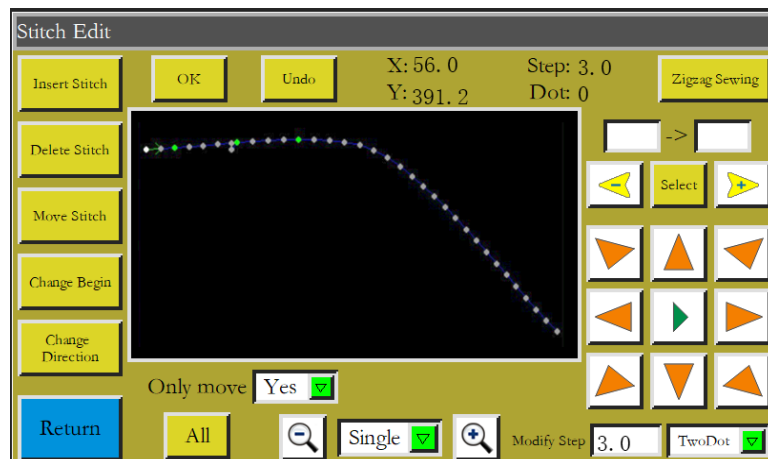
A certain needle point can be added, deleted, translated or changed. (When a point turns green, it means the function code has been assigned to that point)
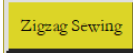
Add needle point and translate needle point: Activate this function, turn a certain point into a red point, use direction keys to set the position to which needle point should be added or translated, and click the lighted "OK" key.

Delete needle point: Turn a point into a red one, and click on "Delete needle point" to delete that

point.

Change start point: Turn a point into a red one, and click "Change start point" to set that point to the start point.
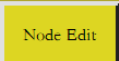
Change direction: Change the sewing direction of graph.

Zigzag stitch: Select "multiple choices" in [🔍] [Single ▽] [🔍], select more than two neighboring points that should be subjected to zigzag stitching, and click [Zigzag Sewing] to show the following interface:
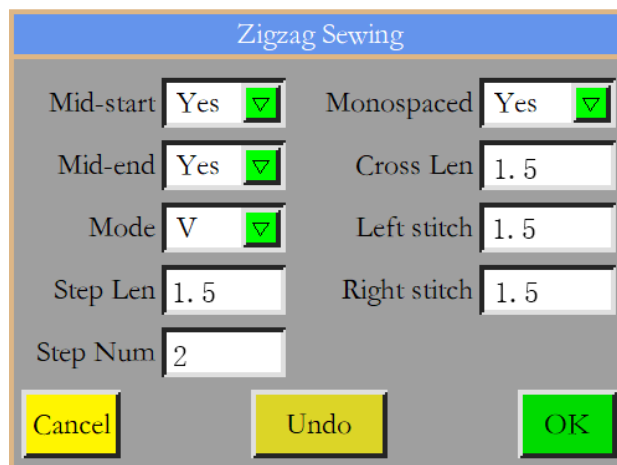
Set up the parameters of zigzag stitch; [Mode V ▽] zigzag patterns are in V shape or N shape. Click [OK], when the result is as follows:
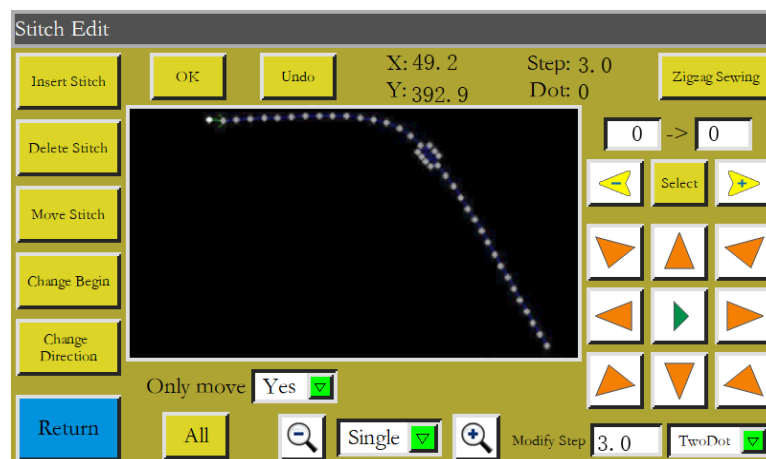
[Node Edit] : The entire curve is presented in the form of many nodes so that the curve can be changed by adding, deleting and translating the nodes. Moreover, even the start point and the

direction of the entire curve can be changed (the key operation mode is the same as needle point editing). The interface is as follows:
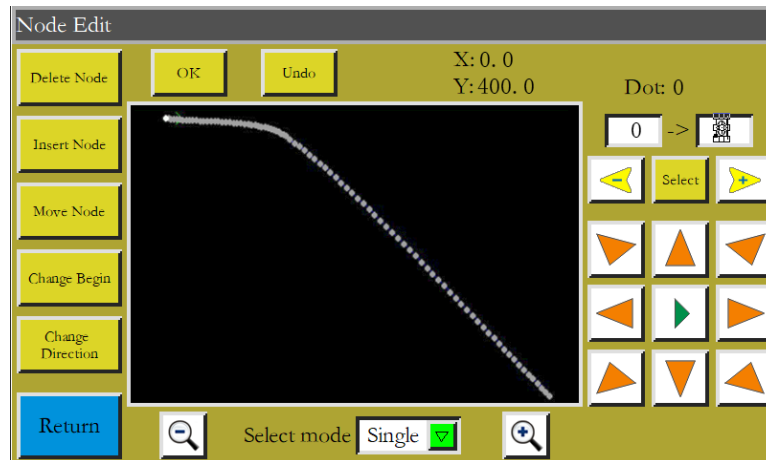
Copy "Copy" key: Copy the same curve with certain X and Y offset from the original curve.

Curve Switch Curve transformation: Enter the curve transformation interface as follows:
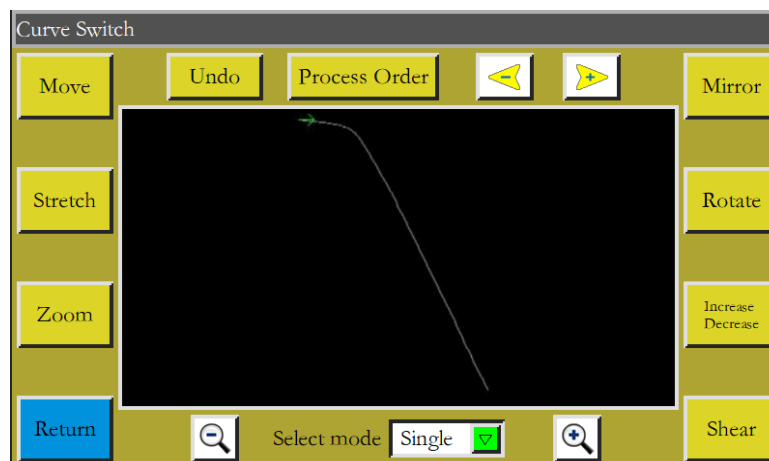
This curve can be changed or edited by setting up parameters such as pan, stretch, scale, rotation, mirroring, increase/decrease, and shear.

Select mode Single ▽ Select the method and select the curve you want to edit through

◁ ▷ .

Undo "Undo" key: Undo the edition of the previous step.

Process Order Enter the processing sequence interface to view the processing sequence of curve.

Move Set the position of X and Y of the curve that will be selected for translation, and move the curve to that position. (Note: It can only be seen when zoomed out)

Before translation:
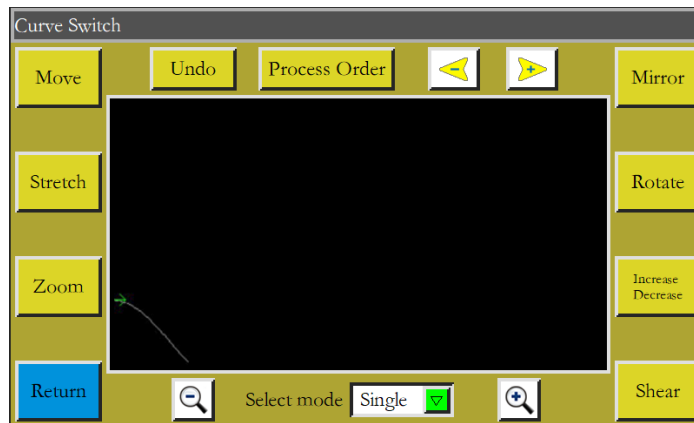
After translation:
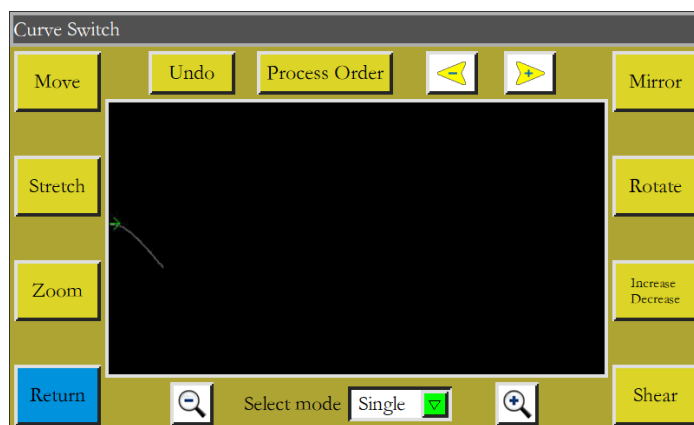
Stretch Select the graph to be handled, set the horizontal-to-vertical ratio of the curve, and click "OK",

when the graph will be stretched based on the set parameters.

Zoom The selected curve is scaled by the set curve ratio.

Mirror Make horizontal and vertical mirroring changes to the selected curve. As follows:

Before the change:
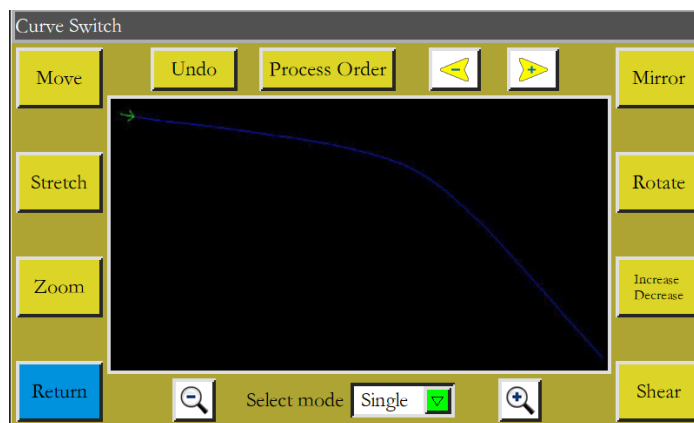
After horizontal mirroring change:
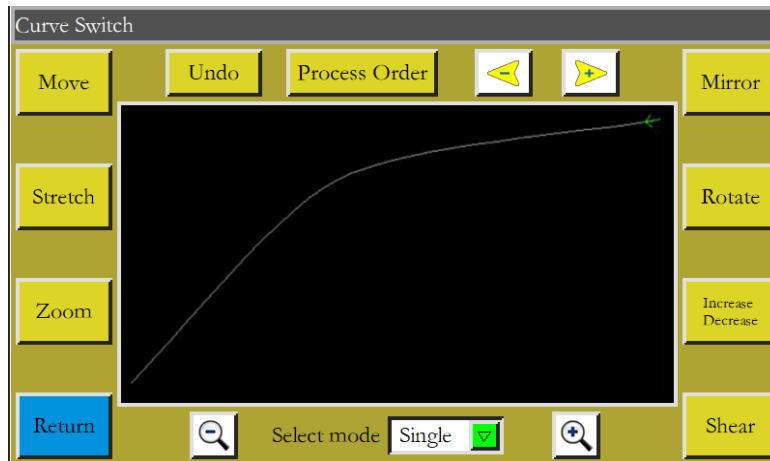
Shear Cut the selected graph at a set angle as shown below:

Before cutting:
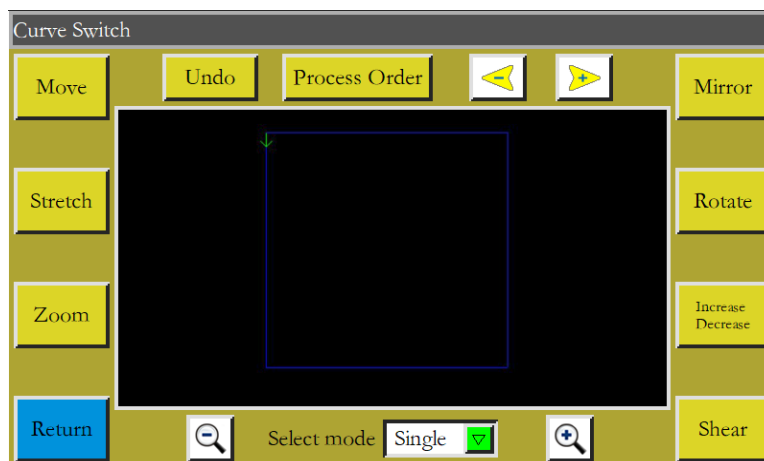
The graph vertically sheared by 5 degrees:
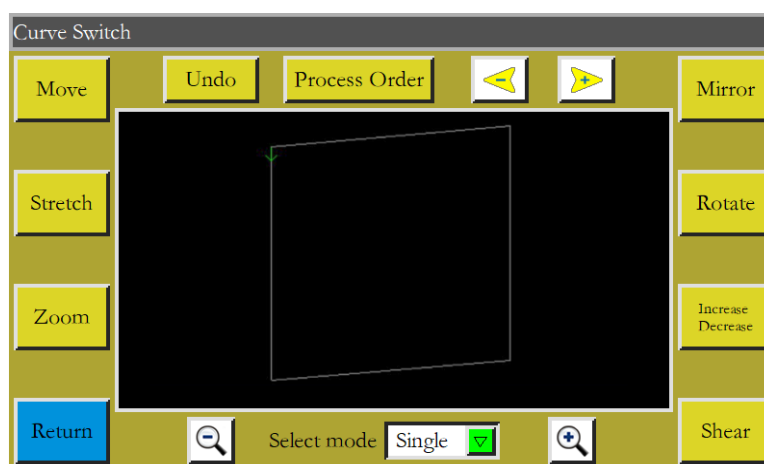
Increase Decrease : Choose to increase or decrease the curve by a number of millimeters at the start or end of the

selected curve. Refer to **Graph IN DE** in 2.2.2

Chapter V Parameter File

Parameters may vary depending on usage scenarios. The parameter file management interface is used to import and export parameter files, manage multiple parameter files, and select one of the parameters in memory as the parameter actually used in the system.

5.1 Memory Parameter File Interface

Press Param File key in the main menu interface to enter the memory parameter file interface as shown in the figure:

The interface displays parameters files stored in the system. Click on the file name to make it red, and then click Write , when a prompt message pops up reading "In progress, please wait..." and then reading "Operation succeeded"; then, the system returns to the main interface, which means the selected parameters have taken effect. All the set values and other hidden parameters in "User parameters" and "Mechanical parameters" will be modified by this parameter file.

The key functions are described as follows:

Write : Write the selected parameter file into control board as a parameter actually used. The parameter file imported to the system from USB flash disk can't take effect unless "Write" is clicked on.

Write : Delete one or more selected parameter files.

Export : Export all the parameters used by the current system to USB flash disk. Click "Export" to enter the new file name, when the specified file name will be generated in USB flash disk with extension .xhp.

Return : Return to the menu page.

: Return to the main page.

Copy one or more files from the memory into the root directory of USB flash disk. If a file exists with the same name in the USB flash disk, a message will appear reading "The file already exists. Do you want to overwrite it?" Make the choice at the end.

: Click to enter the "parameter file in USB flash disk" interface. The system will list the files and folders with extension .xhp, and support multi-level folder operations.

Select the name of the parameter file to be imported into the machine in the USB flash disk parameter file interface, and click to copy the file to the memory space. Select the file in the way as mentioned above, and click **Write** to make the parameter take effect.

Note: The parameter file varies depending on equipment model. Mixing is prohibited. Even the equipment of the same model may have different optimal factory parameter configurations due to slight differences in their mechanical structures. Hence, it is recommended, after the purchase of machines, to export factory parameters for each machine and save them with different file names for future use.
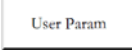
The detailed steps for exporting parameters:

a) Insert USB flash disk;

b) Enter the "Parameter file" interface, and click "Export";

c) In the pop-up dialog box, enter numbers or letters as the file name of exported parameter, and click OK to save it to the USB flash disk.

Chapter VI User Parameters

User parameters are principally used by users. Parameters are adjusted based on processing requirements so as to realize convenient processing and improve processing efficiency.

6.1 User Parameters Interface

Press [User Param] key in main menu interface to enter the user parameters interface as shown in the figure:
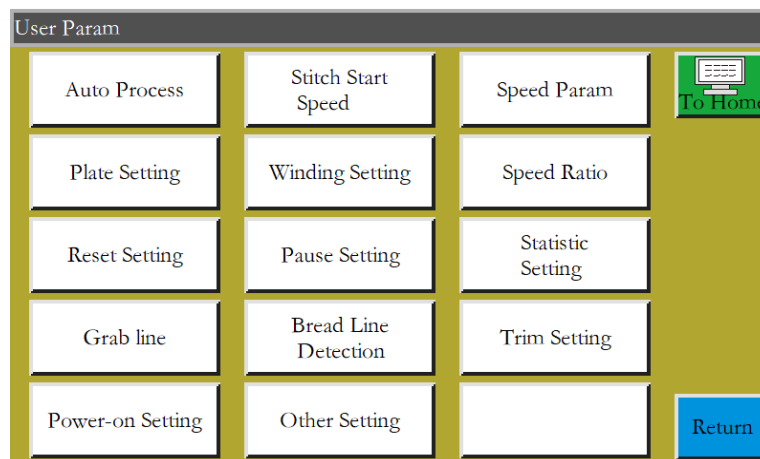
Parameter classification description:

Automatic processing: Set the parameters of sheet pressing, thread cutting and foot pressing, etc. during automatic processing.

Stitching start speed: Set the start speed of the first stitches, and whether stitching should be started slowly or not.

Speed parameter: Set the running speed of spindle and XY axes.

Sheet pressing settings: Set relevant parameters for sheet pressing.

Winding setting: Set winding parameters.

Speed override: Set the spindle processing speed override.

Reset setting: Set relevant parameters such as the speed at the time of reset, and whether the pressure plate is put down or not.

Pause setting: Set the parameters used when pausing.

Statistics setting: Set related parameters of processing statistics.

Thread grab setting: Set the thread trimming and stitching start thread grab position parameters.

Thread break detection: Set relevant parameters for break detection.

Trimming setting: Set relevant parameters for trimming.

Power-up initialization: Set the parameters that need to be initialized when the machine is powered on.

Other settings: Set parameters relating to cycle processing and interface display.

Take automatic processing as an example, where the interface is as follows:
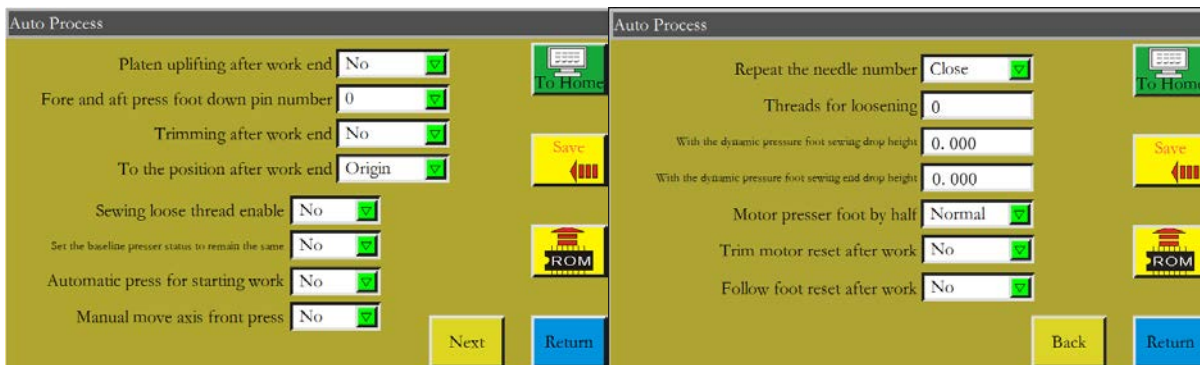
"Restore" key: The "Restore" key can be used to restore the pre-modification parameters before the set parameters are saved.

6.2 Introduction to User Setting Parameters

Parameter classification	Parameter name	Range	Default	Parameter meaning and remarks
Auto Process	Platen uplifting after work end	Yes/No	Yes	
	Pore and aft press foot down pin nu	0-8	0	
	Trimming after work end	Yes/No	Yes	
	To the position after work end	Origin/Secondary origin	Secondary origin	The "origin" means absolute coordinate origin; "Secondary origin" refers to the secondary origin (offset point) added to the file
	Sewing loose thread enable	Yes/No	No	

	Set the baseline presser status to remian	Yes/No	No	
	Automatic press for starting work	Yes/No	Yes	
	Manual move axis front press	Yes/No	No	
	Repeat the needle number	Close/1/2	Close	"1"/"2" means that when the stitching is started, the first needle position is sewn for 1/2 additional times before the sewing of next needle position. "Close" means the sewing is not repeated.
	Threads for loosening	0~255	0	
	With the dynamic pressure foot sewing drop height	0-4	0	
	With the dynamic pressure foot sewing end drop heigh	0-4	0	
	Motor presser foot by half	Normal/Halve /Enlarge	Normal	
	Trim motor reset after work	Yes/No	Yes	
	Follow foot reset after work	Yes/No	Yes	
Stitch start speed	Speed of the first stitches (rpm)	100-3000	300	(Adjusted as needed) Acceleration from standstill to maximum sewing speed requires up to 5 stages. Excessively high acceleration may cause the initial stitches to be smaller.
	Speed of the second stitches (rpm)	100-3000	600	
	Speed of the third stitches (rpm)	100-3000	1000	
	Speed of the fourth stitches	100-3000	1600	

	(rpm)			
	Speed of the fifth stitches (rpm)	100-3000	2000	
	Back needle speed (rpm)	100-3000	1500	
	Slow speed start	Yes/No	No	
	Start 2 needle is low speed	Yes/No	No	Slow: Increased at fixed rate; above-noted acceleration settings are invalid
	End 2 needle is low speed	Yes/No	No	
Speed Param	The highest speed of the spindle (rpm)	100-4500	2800	Limit the max. working speed in the main interface of processing.
	Frame moving speed (mm/min)	100~100000	15000	The moving speed of press frame in idling segment during normal sewing operation
	Frame inching speed (mm/min)	100-20000	5000	Preview stitching press frame's moving speed when capturing or modifying files
	Simulation speed(mm/min)	100-60000	8000	Moving speed of test sewing track
	Play version of speed 1 (mm/min)	100-20000	500	The speed that corresponds to ▶ icon among the 8 direction keys during manual frame shift or file capture.
	Play version of speed 2 (mm/min)	100-20000	1200	The speed that corresponds to ▶▶icon among the 8 direction keys.
	Play version of speed 3 (mm/min)	100-20000	2600	The speed that corresponds to ▶▶▶icon among the 8 direction keys.
	Head 2 speed (mm/min)	0-2000	0	XY moving speed of head 2

				(e.g., for laser cutting)
	Head 3 speed(mm/min)	0-2000	0	XY moving speed of head 3 (e.g., for laser cutting)
	Continuous inching speed	Reduce/Lowest/Normal	Reduce	
Plate Setting	Prohibit sewing when uplifted	Yes/No	Yes	
	Pedal operating sequence	Normal/Special	Normal	
	Pedal operating mode	1STA/2STB/3STC/2ST/3ST	2ST	The operation mode varies depending on mechanical structure (with/without self-locking feature) of foot switch.
	Sewing clip line start angle	1-990	1	
	Sewing clip line end angle	1-990	1	
	Trim clip line start angle	1-990	950	
	Trim clip line end angle	1-990	50	
Winding Settings	Winder machine state	Allow/Prohibit	Allow	Set the 🔵 允许 default state of processing assist interface
	Winding speed	100-4500	1200	Set the default rotation speed for winding in the processing assist interface
	Winder timer (s)	1~63000	70	Set the time from start to automatic stop of winding in processing assist interface
Speed Radio	High speed radio (%)	1-100	100	Actual speed of spindle in main interface = Set speed * High speed override
	Med-high speed radio (%)	1-100	90	

	Med-low speed radio (%)	1-100	70	
	Low speed radio (%)	1-100	60	
Reset settings	Reset when the clamp down	Yes/No	Yes	
	Manual reset after lifting clamp	Yes/Random	Any	
	Return origin mode	XY /X priority/Y priority	XY	"XY " means to return to the origin simultaneously; : "X priority" means X axis returns to the origin first, and then Y axis returns thereto.
	Back to the origin of speed(mm/min)	100-20000 100~8000	8000	X and Y axes speed when returning to the origin
	Extension axis reset speed (mm/s)	1-2000	160	
Pause Settings	Trimming threads in pause	Yes/No	Yes	"Yes": Automatic thread trimming. "No": No automatic thread trimming
	Stitches position in pause	Down position/Up position	Up position	
	Uplifting the plate in pause	Yes/No	Yes	
	Pause switch type	Self lock/Ordinary	Self lock	"Self lock" means the switch cannot automatically bounce when depressed; "Ordinary" means the switch can automatically bounce when depressed.
Statistics Setting	Bobbin line reset when power on	Yes/No	No	"Yes" means the "used length of bottom thread" is cleared after power-up

	Stopping working after the Bobbin line	Yes/No	Yes	"Yes" means the operation is stopped when the used length of bottom thread reaches the total length
	Effective of the Bobbin line alarm	Yes/No	Yes	"Yes" means automatic statistics of the used length of bottom thread during operation
	Piecework reset when power on	Yes/No	Yes	"Yes" means "current value of count by piece" is zero-cleared after power-up
	To continue after work piece	Yes/No	Yes	"No" means the operation stops when "current value of count by piece" reaches the "total count by piece".
	Effective of the piece alarm settings	Yes/No	Yes	
	Work time statistics	Yes/No	Yes	"Yes" means the processing time statistics feature is enabled.
Grab line	Trim catching position	0-200	0	
	Swing start catching position	0-200	0	
Bread Line Detection	Automatic break detection	Yes/No	Yes	"Yes" means to stop the operation and give a prompt when thread break is detected
	Cutting for the break line	Yes/No	Yes	"Yes" means the thread is automatically cut upon detection of break
	Ignore the pin number when sewing	1-255	3	No break detection is performed for the initial set stitch number
	Check threads of the broken	1-255	2	Thread break is confirmed by

	in effect			continuous detection of break at the set stitch number
	Delay when broken threads (s)	0.01-255.00	0.20	Set the delay time and take actions against break after confirming thread break
	QEP2 as bobbin thread detection	Yes/No	No	Some machines employ B encoder for bottom thread detection
Trim Setting	Speed of the spindle trimming (rpm)	10-2000	260	
	Starting delay of trimming (s)	0.01-6.55	0.12	
	Duration of drawing threads (s)	0.01-6.55	0.12	
	Dial line off delay presser foot (s)	0.01-6.55	0.12	
	Delay for loosening threads(s)	0.01-6.55	0.00	
	If trims threads after sewing move	Yes/No	Yes	
	Whether to use the wiper	Yes/No	Yes	"No" means the wiper is turned off
	Motor shear line mode	Back and forth/single	Back and forth	
	Shear line travel motor	1-100	25	
	Flat knife grip delay (ms)	1-350	1	
	Back a knife speed ratio	10-100	100	
	Loose line start mode	Angle/Delay	Angle	
	Loose line angle	0-999	850	
Power-on	Stitches to the up position	Yes/No	Yes	
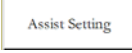
Settings	when powered on			
	Frame automatic back to the origin	Yes/No	No	
	Motor lock when powered on	Yes/No	Yes	
	Presser foot lift when powered on	Yes/No	Yes	
Other Setting	Air detection?	Yes/No	No	"Yes" means to stop and give an alarm if low air pressure is detected during operation
	Whether to circular processing	Yes/No	No	"Y" means the same file is processed in a cyclic manner after startup
	Circular work time (min)	1-65535	1440	Total cycle time; cycle processing is stopped when time is up
	Circular work gap(s)	0-20	2	The interval between the completion of processing and the restart of processing during processing cycle
	Work end position	Origin/Right/ Sewing P0S/Default	Origin	Origin: The point where the XY axis coordinates are both 0 Right: Rightmost point of the processing range Sewing P0S: The first sewing point of processing file Default: Stop after processing
	Template recognition mode	File Number/File Name	File Name	File Number: Barcode recognition mode File Name: Electronic tag

				recognition mode
	Interface style	Classic/ Simplicity	Classic	Classic: Three-dimensional keys Simplicity: Flat keys
	Movement mode before starting work	XY /X priority/Y priority	XY	
	The needle back	0-160	0	
	Connect extension screen	Yes/No	No	"Yes" means the display screen can be connected to extension screen to display working files and other information
	Enable voice prompt	Yes/No	No	"Yes" means to turn on voice prompt
	Enable Blackout Memory	Yes/No	Yes	After restarting the electricity, continue sewing progress before power failure, continue sewing.
	The file is valid when the electronic label leaves	Yes/No	No	

Chapter VII Assist Settings

Auxiliary settings are used to test hardware input & output, network, time and system upgrade, etc.

7.1 Assist Settings Interface

Press [Assist Setting] key in main menu interface to enter the assist operation interface as shown in the figure:
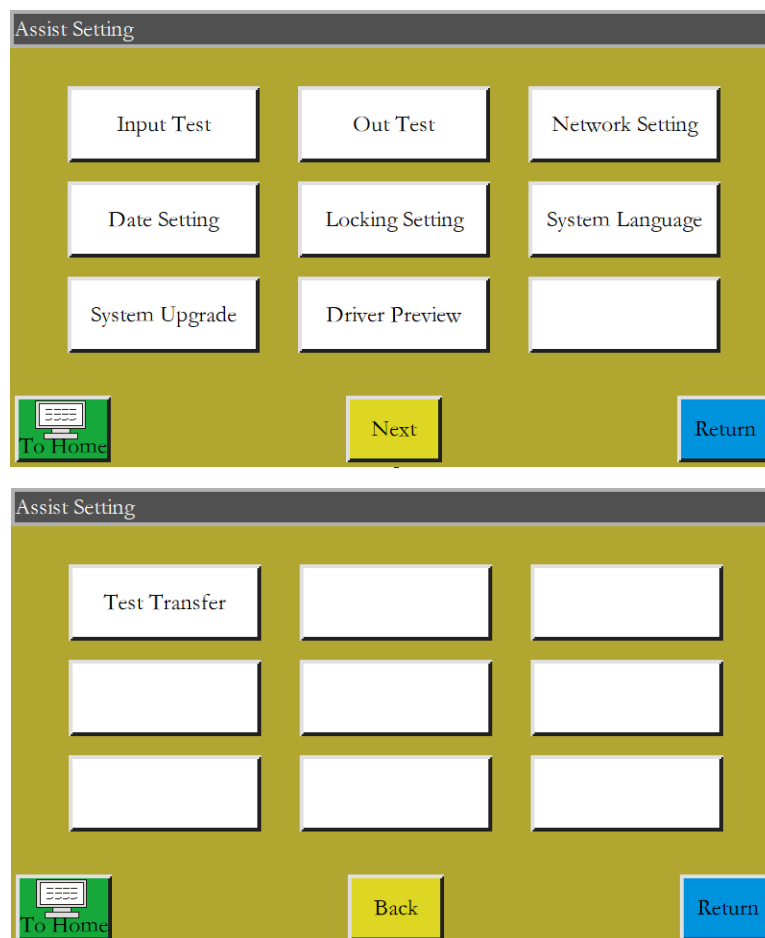
The key functions are described as follows:

Input test: Test if input port is normal.

Output test: Test if output port is normal.

Network settings: Set up wireless network and remote control, etc.

Date settings: Set the system time.

Lock settings: Set the administration password, use restrictions, staged unlocking and so on.

System language: Set the system language of screen. There are three languages, i.e. Simplified Chinese, Traditional Chinese, and English to be chosen from.

System upgrade: Used to upgrade the firmware version of motherboard and display screen.

Drive preview: Preview current, subdivision and other parameters of drive for each shaft.
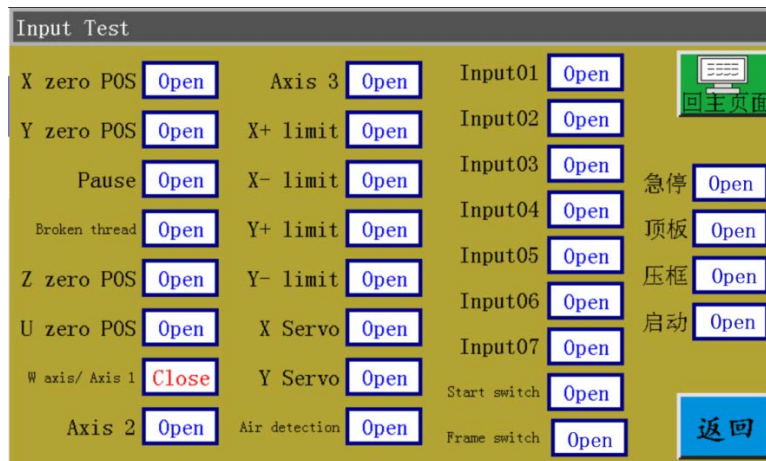
(Modification is not available on screen)

Test transmission: Used to test whether the communication between display screen and motherboard, and to view logs, etc.

7.2 Input Test

Used to test if the external input circuit is in good condition.

Press | Input Test | key in the assist operation interface to enter the input test interface as shown in the figure:
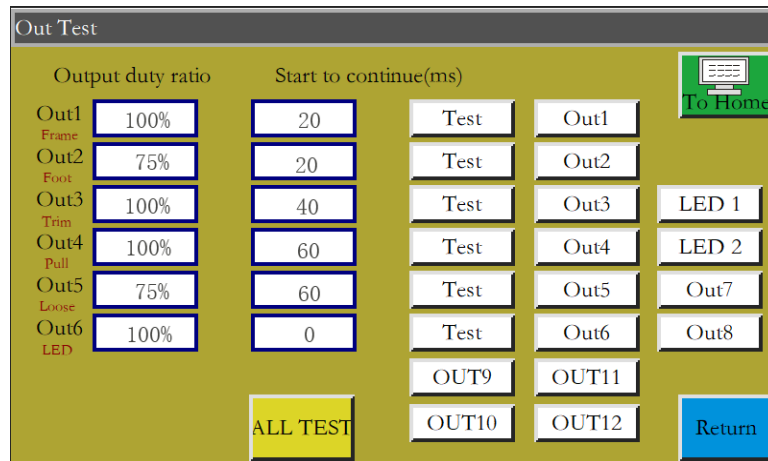

You can manually trigger relevant sensors and check whether the input status has changed, and determine if the sensor or hardware is in good condition.

7.3 Output Test

Used to test whether output control is in good condition.

Press | Out Test | key in assist operation interface to get into output test interface as shown in the figure:

Test the corresponding output as needed.

For trimming, wiping and relaxation electromagnet outputs, one click corresponds to an on/off cycle of equipment electromagnet; if the key is held, ON state will continue. Holding the key too long may result in overheating induced damage to electromagnet.

For solenoid valve outputs such as press frame and press foot, one click corresponds to one motion cycle of cylinder, and another click will return the cylinder to its initial state.

The OUT1, OUT2... function depends on specific device load, and some outputs are not used.

Lamps 1 and 2 are used to control "SYS" indicator lamp ON/OFF on screen, and correspond to red and blue lamps, respectively.

When ALL TEST is clicked, it shows the message reading "In progress, please wait...", which indicates a full output test is being performed; the prompt box will not be closed until the test is completed.

7.4 Network Settings

Used to set up wireless network connection.

Press Network Setting key in assist operation interface to enter the network setup interface as shown in the figure:
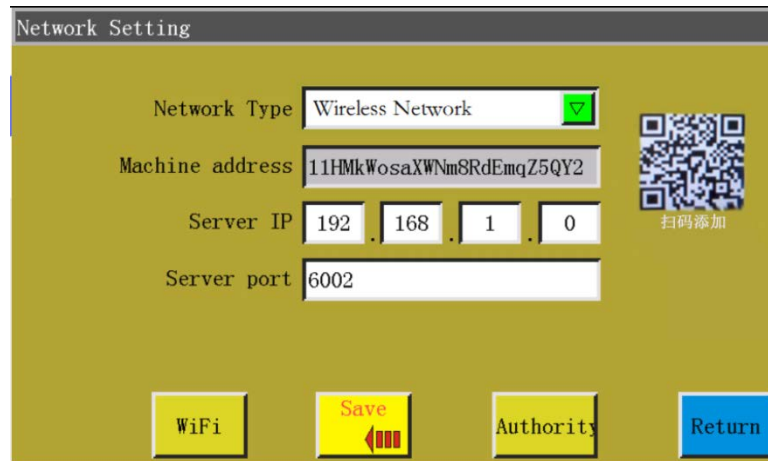
Device address: Show the unique address code of current device. The companion APP "Xing Huo IoT" can be used to scan the QR code address of this interface to add the device to the APP for device management.

Server IP: Used to connect a server with a specified IP in LAN to perform LAN control & management. If one of the four input boxes is blank or 0, it means that an external cloud server is automatically connected.

Server port: Used to connect a server with designated IP and port on LAN. If the port is 0 or null, it means an external cloud server is connected.

WiFi : Click to enter the wireless network setup interface and automatically search for hotspots available for current location as shown in the figure below. Click " Refresh ", when WIFI hotspot is searched for again. The number at upper right corner of each hotspot indicates signal strength; the larger the number, the better the signal. Click on hotspot name and enter the password to connect the hotspot. Once the connection is established, the IP address obtained by the current device will be displayed. In the meantime, the [icon] in upper right corner of the screen indicates the established connection with wireless network and server.
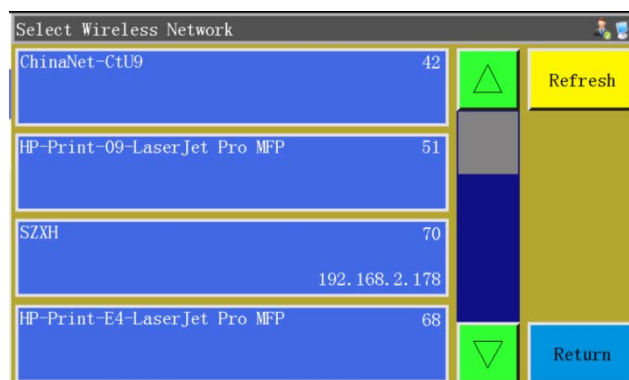
`Authority`: Click to enter the permission management interface. It is possible to add or delete the mobile login account of APP "Xing Huo IoT", and to set each account for accessing part or all of the dozens of functions of the device.

7.5 Date Settings

Used to set the system time (e.g., "year, month, day, hour, and minute") displayed in the upper right corner of the screen.

Enter the administration password to get into the setup interface. The interface is as follows:
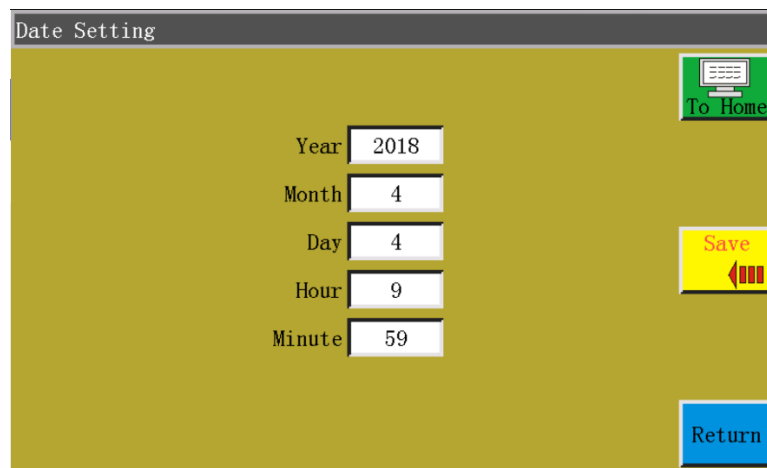

The time is displayed in a 24-hour system accurate to "second".

`Save` "Save" button: Click this key to save the set date and time. If the motherboard is equipped with a battery, the time is updated at next startup even if the power was turned off so as to ensure accurate time.

Accurate time helps sewing better, and enables the accurate recording of the time of problem in alarm log, thereby facilitating troubleshooting and problem analysis.

7.6 Lock Settings

Press `Locking Setting` key and enter the administration password in the assist operation interface to enter the lock setup interface as shown in the figure:
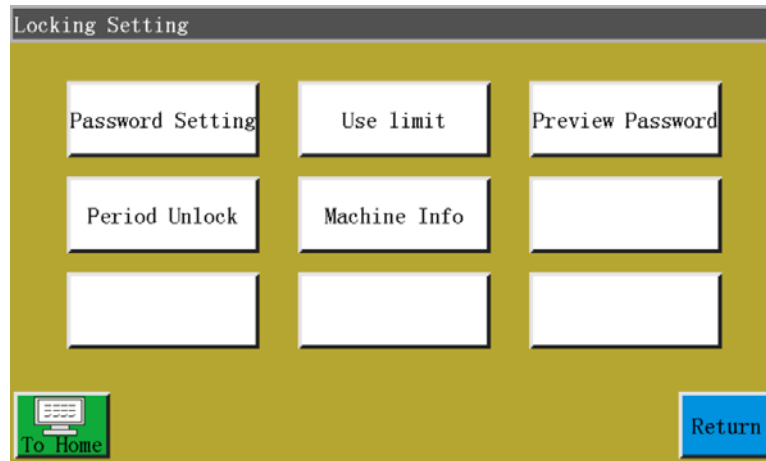
Note: The electric control is designed with four types of passwords, of which the functions are defined as follows:

Administration password: Enabled in "Lock settings" - "Use restrictions". Administration password is the password with the highest privilege. You can change other passwords if you know the administration password.

Mechanical parameter password: Enabled in "Lock settings" - "Password settings". Once the mechanical parameter password is set up, it's impossible to enter the "mechanical parameter" setup interface without entering the correct password.

User parameter password: Enabled in "Lock settings" - "Password settings". Once the user parameter password is set up, it's impossible to enter the "user parameter" setup interface without entering the correct password.

Other passwords: Enabled in "Lock settings" - "Password settings". The settings can be established using upper computer parameters software. You have to enter "other passwords" in order to use file management, lock files, adjust the spindle speed in main interface, and delete processing statistics information.

Lock setup interface is used to set whether to lock machine at fixed time, and to manage lock password, etc. Time-limited operation such as installment can be realized.

If the equipment is provided with use restrictions, when the set time elapses, a dialog box will pop up in the main interface of processing to prompt you to enter a specific unlock password in order to release the present lock.

Note: This function is only for manufacturer instead of customers. Improper use of this feature may cause the machine to be locked up.

7.7 System Language

Set the system language of screen. There are three languages, i.e. Simplified Chinese, Traditional Chinese, and English to be chosen from. The interface is as follows:

Click on the desired language, when a pop-up window reading "Prompt: This operation confirmed?" appears Select "Yes", and the language used in the screen will be changed to the set language.

7.8 System Upgrade

Press System Upgrade key in assist operation interface to enter the system upgrade interface as shown in the figure:
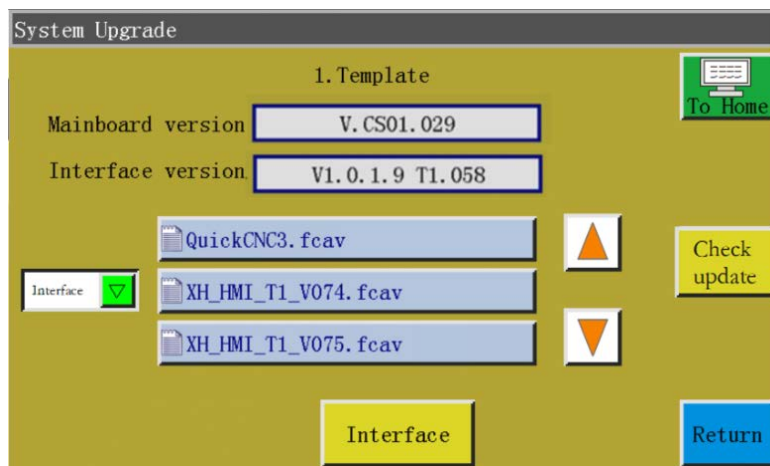

Mainboard version V. CS01.029 : Show current motherboard version information. "CS01" represents the type of system, and remains unchanged after upgrade; "029" represents the branch version number that can be changed through upgrade: It can be upgraded to a higher version or fall back to a lower version.

Interface version V1.0.1.9 T1.058 : Display the current screen interface version information. "058"

indicates the branch version number

Interface ▽ : Click to switch the display of interface in USB flash disk or motherboard upgrade

file.
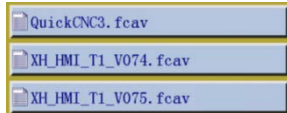
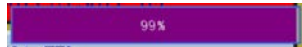QuickCNC3.fcav
XH_HMI_T1_V074.fcav : Upgrade package directory that is automatically read after the insertion
XH_HMI_T1_V075.fcav

of USB flash disk; display the interface or motherboard upgrade files under all folders and current

directory.

Interface : "Upgrade" key: Two kinds of "Upgrade" keys (Interface and Mainboard)

are available and selected through automatic match with Interface ▽ . Select the upgrade file and

click this key for upgrade.

The system upgrade steps in the figure are as follows:

1) Receive the corresponding upgrade file from the supplier. The extension of interface

upgrade file is .fcav (e.g. XH_HMI_T1_

V074.fcav), and that of motherboard upgrade file is .TFL (e.g., TZD_CS01.TFL). Put the

file(s) in USB flash disk.

2) Insert the USB flash disk and enter the "System upgrade" page.

3) Select the desired type of upgrade: Motherboard or interface.

4) Find the upgrade file and select the file to be upgraded.

5) Click Mainboard or Interface .

6) **The prompt message reading "In the upgrade, do not power off!" pops up. Do not turn
off the power until this prompt disappears; otherwise, you may need to return the
product to its manufacturer for repair.**

7) In the case of motherboard upgrade, a progress bar 99% will pop up to

show the progress of the upgrade. It takes about 10 seconds to reach 99%. Wait for about

half a minute, the motherboard will be restarted, and the buzzer will ring once to indicate

successful upgrade. In the case of interface upgrade, no progress bar will appear. In about

half a minute, the display screen will be restarted to indicate successful upgrade.

Description of related error prompts:

(1) Upgrade interface prompt: "Error in upgrade file type"

　　Cause: a. The upgrade file is not selected; b. The upgrade file is corrupted or not suitable

for the present system.

　　Solution: Reinsert the USB flash disk or put the correct upgrade file therein.

(2) For the upgrade of motherboard, the prompt message reading "No valid upgrade file found"

appears.

　　Cause: No upgrade file is selected

　　Solution: Insert the USB flash disk, select a valid upgrade file, and click "Upgrade".

(3) For the upgrade of motherland, a prompt message reading "Wrong upgrade file" appears

　Cause: The upgrade file is corrupted or not suitable for the present system

　Solution: Use the upgrade file of which the type is the same as current system type; for example,

　　CS01 can only use the CS01 upgrade file. Check whether the upgrade file in USB flash

　　disk is correct.

(4) The progress bar remains at 1% after "Motherboard upgrade" is clicked.

　　Cause: The communication between screen and motherboard is abnormal

　　Solution: Check whether the connection wire between screen and electric control is in good

condition, and restart. If the problem remains unsolved, the product should be returned to its

manufacturer for troubleshooting.

7.9 Drive Preview

　　Display detailed parameters for each shaft of the system drive. The drive preview interface is as
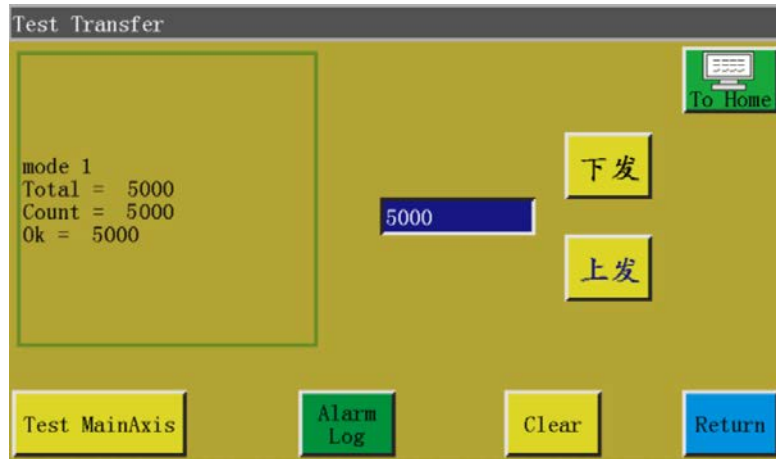
follows.
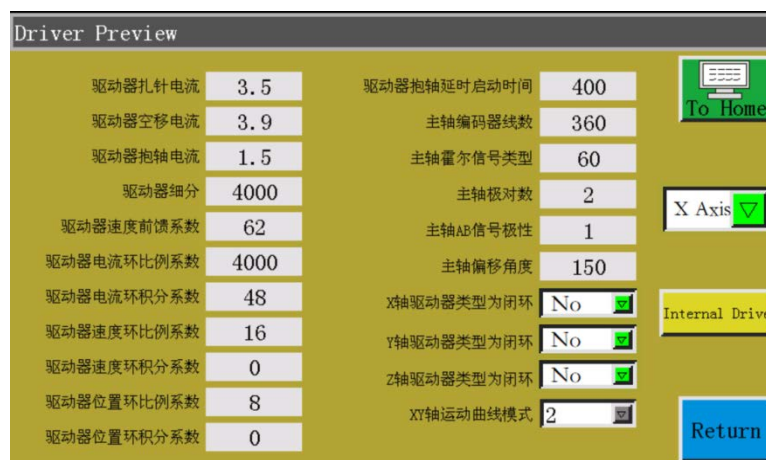
X Axis ▽ Selection box: Select the drive parameter information to be viewed. (The parameters

can't be modified on the screen)

7.10 Test Transmission

Used to test whether the communication between screen and motherboard is in good condition. The test transmission interface is as follows:


Enter the value you want to test in 5000, and click 下发 or 上发, when the test result will appear on the left window. If the values of Total, Count, and Ok are the same or very close to each other (within a difference of 1%), it means the communication between screen and motherboard is normal.

Clear : Clear the test result on the left.

Test MainAxis : Click this key once, the running current of spindle will decrease, and the normal current can't be restored until the power is turned off and restarted. Used to test whether the spindle can function properly under no load.

Alarm Log : The alarm log can be viewed. The alarm log interface is as follows:
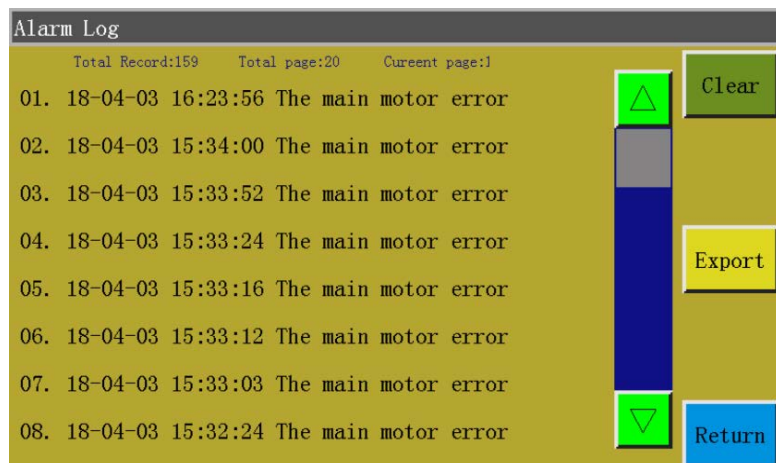
Export "Export" key: Export the alarm log as a file to a USB flash disk for convenient troubleshooting and anomaly statistics.

Clear "Clear" key: Clear all contents of alarm log.

Chapter VIII Machine Status

When an operator finds any anomaly in equipment, the abnormal status of equipment can be reported to the LAN server through local area network to prompt technicians to perform maintenance; moreover, the current equipment status is displayed on the console in real time.

The machine status interface is as follows:
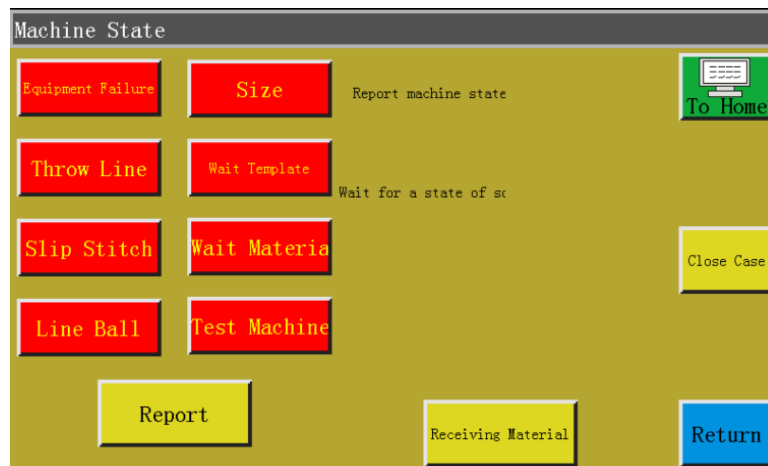
The operator shall select the machine status to be reported, and click ⬛Report to bring up the following interface:
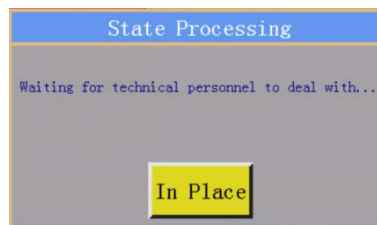
Upon the arrival of technician at the equipment, he/she can click ⬛In Place, when the machine status displayed on console reads "Waiting for solution". When ⬛Close Case is clicked after the removal of anomaly, the machine status displayed on console returns to normal.

Appendix I: Information Prompt and Solutions

1. "Pressure box didn't put down"

Cause: The press frame was not dropped before resetting, processing, file capture and file modification

Solution: Click 压框 to drop the frame.

2. "These is no reset"

Solution: Click 复位.

3. "X-axis drive open circuit"

Cause: a. X-axis motor is not connected

b. Loose motor interface

Solution: Turn off the power and check the motor line for connection anomaly.

4. "The bottom thread has been used up"

Cause: The bottom thread required by pre-processed file is longer than the remaining bottom thread (total length of processing statistics interface - initial length of bottom thread)

Solution: a. Use the bottom thread statistics function to replace the bottom thread and modify relevant length information;

b. Where the bottom thread statistics function is not used, you can click ON to disable it. See Section 2.2.5 and "User Settings".

5. "The quantity of work is full"

Cause: In the processing statistics interface, the "current value of count by piece" increases to the "total count by piece"

Solution: a. If the processing statistics function is used, it's necessary to modify the "current value of count by piece" or the "total count by piece" so that the former is less than the latter.

b. Where the processing statistics function is not used, you can click ON to disable it directly. See Section 2.2.5 and "User Settings".

6. "File range out of bounds"

Cause: a. The length and width of the processing file are beyond the processing range

b. The length and width of the processing file is within the processing range, but the absolute coordinates are beyond the processing range (if imported first into a machine with large processing range, the file will incorporate absolute coordinates and then be exported to a machine with small processing range)

Solution: a. Reduce the size of processing file

b. Import the processing file generated directly through upper computer. See Section 2.2.4.

7. "Opening state"

Cause: The touch key on top panel is pressed, thus the top panel being open.

Solution: Click the "top panel" key on touch key pad.

8. "No working file"

Cause: The lock file is open.

Solution: Check whether the graphic interface indicates a lock file flag. If so, just click 锁文件.

9. "The main motor error"

Cause: a: The spindle motor circuit is open or the encoder cable is not connected.

b: Spindle motor is damaged

Solution: a. Check if the motor cables are properly connected, and if the encoder cable is connected.

b. If the motor cables are properly connected, it's necessary to replace spindle motor, test the spindle with [image] in powered-on state, or manually rotate the motor to check if QEP changes on the screen.

10. "Connecting the main control board"

Cause: a: The connection between motherboard and screen is out of order

b: The screen goes wrong

c: The motherboard is damaged

Solution: a. Check whether both ends of cable are properly connected, restart, and replace screen cable.

b: Replace the screen to check if it functions properly

c: Change motherboard to check if the screen gives a similar alarm.

11. "Couldn't find X zero signal"

Cause:　　a. X motor direction error;

b. X motor position sensor failure;

c. Failure to move due to excessively large load in X direction of motor

Solution:　a. Enter the manual frame shift interface and test X motor rotation;

b. Enter the "input test" interface, and manually trigger the position input signal to check if it can be detected

c. Turn off the power and manually push press frame to check if the load is too large and gets stuck.

12. "Motor scissors are not in place"

Cause:　　a. The encoder cable of motor with Z signal malfunctions

b. Parameter setting error

Solution: a. Press and check if the motor is properly connected or if the motor is in good condition

b. Rotate the motor manually to check whether the W axis/axis limit signal indicator of motherboard changes.

c. Check if the parameter settings exhibit conflict.

13. "The main motor direction error"

Cause:　　Spindle rotation direction is wrong

Solution: Use parameter modification software to correct the spindle moving direction or modify the spindle motor direction or spindle encoder direction in shaft operation mode in mechanical parameters.

14. "X-axis driver hardware over-current"

Cause:　　a: Poor contact of X-axis motor base

b: Damaged X-axis stepping motor or short circuit of motor cable

c: Motherboard hardware problem

Solution: a: Confirm that the flashing mode of X stepping motor alarm indicator on motherboard is "1 green and 5 red's"; if not, it means false alarm.

b: Reinsert X motor cable and restart the machine

c: Change X axis motor

d: Change the motherboard

15. "Motor foot in fault"

Cause: No motor limit signal is detected when motor press foot is reset

Solution: Check motor press foot related base for looseness; check whether the z signal limit signal input changes in the input test interface;

16. "Head board cannot be connected"

Cause: a. The connection between head board and control board is out of order

b. Head board is damaged

Solution: a. Check whether the connection is abnormal or replace connection cable

b. Change the head board.

17. "Air pressure is insufficient"

Cause: a: Air supply equipment exception results in insufficient air pressure

b: Abnormal input of control board

c: Abnormal parameter settings or wiring error

Solution: a: Check whether the barometric pressure is normal

b: Short-circuit the input and gnd with tweezers and check if the input changes at "Assist settings" - "Input test" side

c: Check whether the parameters are set abnormally. In normal condition, the input is "normally closed". In the case of insufficient pressure, it should be opened, when the LED will light up for alarm.

18. "Electrical fault, please contact the manufacturer"

Cause: Hardware failure

Solution: Contact the manufacturer

19. "Grab line motor is not in place"

Cause: No motor limit signal is detected when motor press foot is reset

Solution: Check motor press foot related base for looseness; check whether the z signal limit signal input changes in the input test interface; check whether the parameters are improper.

20. "Input IO1 timeout error"

Cause: No signal is detected at this input port

Solution: Enter "input test" interface, and manually trigger the position input signal to check whether it can be detected

21. "Foot follow error"

Cause: Press foot zero input port detects no signal

Solution: Check the IO port set for follower press foot alarm in parameter setup software, manually trigger the IO port and check whether it can be detected

Appendix II: Quick Start Guide

(1) Start the machine

Install the equipment and connect the power supply. Turn or press the power switch to start the machine. Get into the main interface of processing as described in Section 2.2.1 after the logo appears. Where bottom thread winding is needed, refer to Section 2.2.2.

(2) Set up processing file

Copy the .KLW processing file generated by the PC sewing editing software into the USB flash disk; insert the USB flash disk into the USB interface of equipment; click 菜单 -> 文件管理 -> in the main interface of processing to get into "USB flash disk" interface, click the name of the file to be processed to make it turn red, and click to copy the file into memory. Press 返回 -> 返回 to return to the main processing interface. Select the file to be processed on the left, when the processing pattern can be previewed in the middle of interface. If "file capture" function is used to create processing file, see Chapter IV.

(3) Place the template

Put the fabric to be processed into the prepared template, click 复位, and click 压框 to make press frame get into rising state. Place the template under press frame, and click 压框 so that the press frame can go down and press the template

(4) Align with reference

See Section 2.2.4

(5) Start the processing

Press start button in the main interface of processing, and the machine will start the processing based on pattern. Upon completion of processing, the system automatically returns to the reset origin or other set points.

Note:

1. If the processing is not performed for the first time (it has been copied into memory for reference alignment, and the automatic template recognition function has been enabled), only two steps will be needed: Place the template -> Start the processing

2. If other information prompts are displayed, refer to Appendix I.

3. If the processing is repeated after processing, you have to click other buttons upon completion of one processing cycle and enter parameter setup interface to cancel cycle processing.