VECTECH 威鐵克

VECTECH 205H

Hot-air BGA rework system

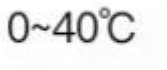
User Manual

Thank you for choosing our BGA rework system. This product is specifically designed for the rework and soldering of surface-mounted components. Please read this manual carefully before use, and keep it properly for future reference.

Contents

Chapter1 Precautions for use

1.1 Safety Instructions

Serious Warning	
	➢ There is a risk of electric shock. ➢ Do not touch live parts lightly, and non-professionals should not make changes lightly to prevent electric shock. ➢ In case of an emergency, please immediately press the red emergency stop switch. ➢ It is strictly prohibited to use the power cord when it is damaged. ➢ When not in use for an extended period, please turn off the power switch, disconnect the power supply, and unplug the power cord. ➢ When conducting circuit maintenance, pay attention to the power status. Please turn off the power before carrying out careful maintenance and spot checks. ➢ This product uses a three-pronged grounding plug and must be plugged into a three-hole grounding socket. Do not modify the plug or use an ungrounded three-pronged adapter, as this may cause poor grounding. If you need to extend the power cord, please use a grounded three-pronged power cord. ➢ The equipment contains dangerous voltage! When the system malfunctions and requires maintenance, it can only be repaired by relevant professionals, or by contacting the agent or manufacturer.
	➢ There is a risk of injury. ➢ Do not get the machine wet, do not disassemble or use the machine while it is in use, and do not pull the power cord. ➢ Please ensure the machine and its surroundings are kept clean. This will help reduce the likelihood of accidents.
	➢ During maintenance, be sure to cut off the power and air pressure. Non-professionals are not allowed to make any changes without authorization. ➢ This product is not designed for explosion-proof specifications and is strictly prohibited for use in potentially explosive environments.
warning	
	➢ Please do not manually move any movable parts to avoid damaging the machine. ➢ Ensure that you do not touch moving parts during work, as it may cause damage to the machine or result in accidents. ➢ During the machine's pause, please carefully check the situation before proceeding with manual operations, otherwise it may cause injury to the user or substantial damage to the involved objects.
	➢ When removing the equipment and accessories from the package, please seek assistance if necessary to prevent the packed items from falling or causing accidents. ➢ Pay attention to the support or guard plate on the upper part of the machine to prevent head collision. ➢ After moving the equipment to the appropriate workstation, make sure to place it on a flat surface to prevent accidents caused by tilting.
	➢ This product should be used or stored in a place with suitable temperature and humidity. ➢ The suitable temperature range is 0~40℃, and the humidity range is 30%RH~70%RH (without condensation).

<table>
<tr><td>  </td><td>➢ This equipment is relatively heavy. Please place it on a single layer and avoid stacking it, to prevent damage or accidents.
➢ Please do not stack objects within the working range of the machine.
➢ Before daily handling or moving, please ensure that the movable parts of the equipment have been secured before proceeding with the handling.
➢ After removing the packaging, please ensure that the movable parts of the equipment have been secured before use.</td></tr>
<tr><td>  </td><td>➢ Regular inspection, maintenance, and repair of this product will help ensure its performance and extend its service life.
➢ Please turn on the device according to the normal procedure.
➢ Please check whether there are any obstacles within the motion range of the motion mechanism before starting up.</td></tr>
<tr><td colspan="2">be careful</td></tr>
<tr><td>  </td><td>➢ Please do not discard the equipment packaging and foam.
➢ If the machine needs to be returned to the original factory or sales point due to factors such as maintenance, it should be fixed and packed in the original manner.
➢ Please place the packaged machine upright. Do not place it upside down or horizontally.
➢ The machine can only be placed inside the packaging after being reliably protected with foam, etc.
➢ The packaging is made of non-moisture-proof material. During transportation or storage, please avoid exposure to rain or moisture.
➢ Please refrain from restarting within 10 seconds after emergency stop or power off, as it may cause damage to the drive.</td></tr>
</table>

1.2 Precautions for Disassembly and Assembly

- Place the wooden box upright on the horizontal ground and remove the shock-absorbing protective film from the outer packaging;
- Remove the screws securing the wooden board using an electric tool, and open the cover plate;
- Use a forklift to transport the equipment to the appropriate workstation;
- Adjust the column base to ensure that the equipment is placed horizontally without any shaking. The adjustment method is shown in the figure below;
- Before using the equipment, it is necessary to remove the fixing parts on the moving shaft before proceeding with use;
- Check the machine and accessories for any missing or damaged parts. If there are any issues, please feel free to contact our company or the dealer.

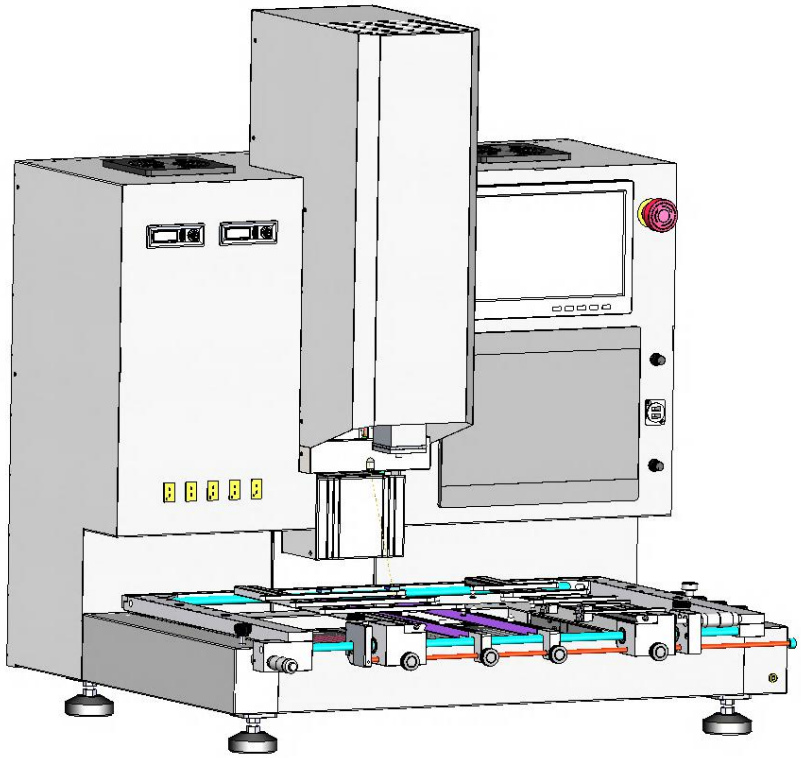
1.3 Adjustment Method for Column Base

1. Rotating the lock nut can fix the height of the column base. When the lock nut is fixed, the height cannot be adjusted; to adjust the height, the lock nut must be loosened.
2. Rotate the height adjustment nut to adjust the height of the column base.

Machine column foot drawing

Carefully inspect the machine and accessories for any missing or damaged parts. If there are any issues, please contact the manufacturer.

Chapter2 Product Introduction



2.1 Overview

The VECTECH205H hot air BGA rework system is an electronic component rework device primarily designed for soldering and reworking BGA chips. It can also be used for QFN, QFP, PLCC, SOP, or SMD surface-mount components such as connectors. This device integrates a touchscreen human-machine interface, high-precision temperature control system, optical alignment system, and multiple function mode selection, catering to the rework needs of different users for complex devices.

2.2 Product Characteristics

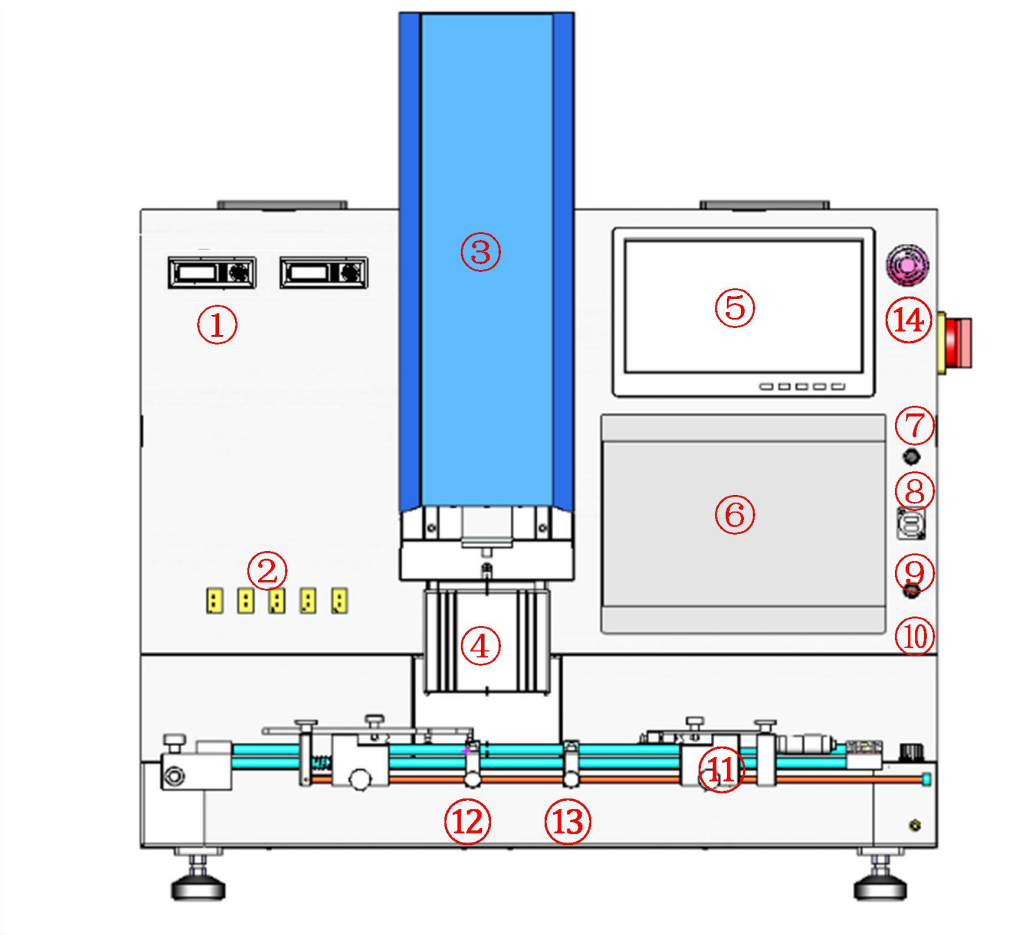
- Highly automated, it can complete chip desoldering, suction, and placement with just one click.
- Equipped with a high-power brushless fan, it generates constant temperature hot air with high air volume without the need for an external air source, thanks to the closed-loop sensor system.
- The top features a high-power heating design with dual heating cores, offering 8-segment temperature control. The entire machine boasts three-temperature zone three-dimensional heating, easily handling mirror reflective BGA, multi-layer BGA, metal shielding, and POP, ensuring a high success rate in soldering and desoldering.
- Utilizing a high-definition optical chromatic aberration prism alignment system for precise and clear alignment.
- Powerful cross-flow fan with automatic cooling control.
- The QUICKSOFT touch operation interface not only provides operation permission control, but also features a Profile analysis function that effectively analyzes parameters such as preheating speed, peak temperature, holding time, and heating rate.
- The quick-action magnetic suction mechanism of the air nozzle is equipped with multiple alloy hot air covers, making replacement simple and quick.

2.3 Product Specification

Name	Specification parameters
Power supply	AC 220V/50Hz
Power	6000W（Max）
Top hot air	2400W/100-400℃
Bottom hot air	1200W/100-400℃
Bottom preheating	Infrared 6*400=2400W
PCB size	400*400mm（Max）
Alignment method	Prism chromatic aberration alignment/accuracy ±0.02mm
Alignment camera	2.13-megapixel professional camera
Gas source	Requires the use of compressed gas
Platform movement mode	Micrometer fine adjustment
Contrast image display	10-inch high-definition screen
Software monitor	10-inch touch screen
External dimensions (L*W*H)	760x705x865mm
weight	About 90 kg

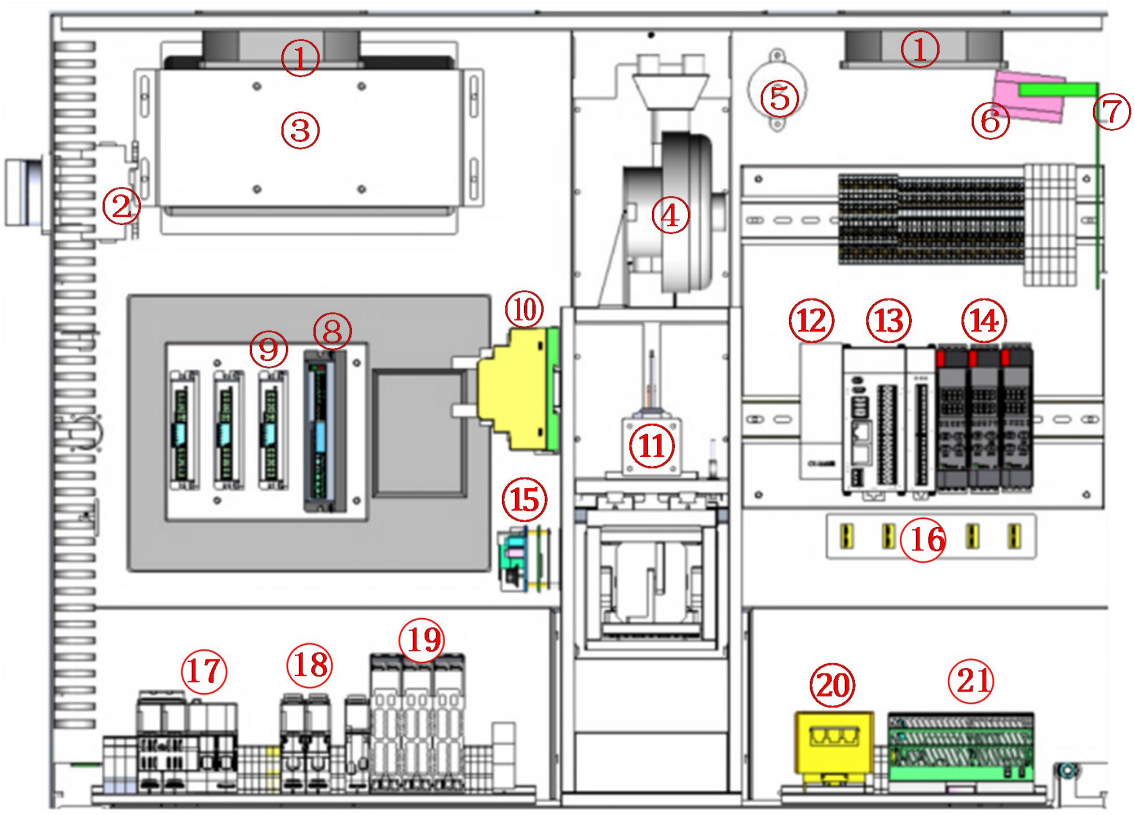
Chapter3 Component Description

3.1 Description of Complete Machine Components



Serial number	Name	Serial number	Name
1	Flow detection sensor	8	USB port 1 (CSV file curve export)
2	External temperature measurement K-type thermocouple	9	USB port 2 (for importing and exporting temperature parameters)
3	Upper heating section	10	Lower LED brightness adjustment knob
4	Prism section	11	Micrometer
5	Camera monitor	12	Lower heating section
6	touch screen	13	Preheating section
7	Upper LED brightness adjustment knob	14	Emergency stop button

3.2 Description of Electrical Control Cabinet Components



Serial number	Part name and model	Serial number	Part name and model
1	Cooling fan	12	Temperature acquisition module
2	Main power switch	13	PLC main body and expansion module
3	monitor	14	Thermostat module
4	Wind turbine	15	Camera board
5	Buzzer	16	External temperature sensor
6	Emergency stop knob	17	Leakage protection circuit breaker
7	Fan board	18	Air circuit breaker
8	touch screen	19	Solid-state relay
9	Stepper driver	20	wave filter
10	relay	21	Switching Mode Power Supply
11	Stepper motor		

3.3 Button Description

Button	Function Description
	Press it when a crisis occurs during the operation of the machine, The equipment has stopped operating urgently.
	Power switch, rotating it will power off or power on the device (At least 10 seconds should be waited before powering on again)
	Z: When manual operation is allowed, the Z-axis (i.e., the heating arm) can be adjusted up and down R: The R-axis (i.e., the suction rod axis) can be rotated and adjusted for angle under manual permission Zoom: allows for the zoom-in/zoom-out operation of camera images Focus: The camera focal length can be adjusted by increasing or decreasing it

3.4 PLC port description

PLC model	Input and output description	Port	Remarks
PLC main body	Input port	IN0	Upstream traffic detection
		IN1	Origin of Z1 axis
		IN2	Downstream flow detection
		IN3	
		IN4	Y-axis origin
		IN5	Origin of Z2 axis
		IN6	Z1 axis knob - pulse
		IN7	Z1 axis knob - direction
		IN8	Emergency stop
		IN9	Suction rod vacuum trigger
		IN10	Y-axis limit
		IN11	
		IN12	
		IN13	
		IN14	
		IN15	
	Output port	OUT0	Z1-axis pulse
		OUT1	Z1 axis direction
		OUT2	Z2-axis pulse
		OUT3	Z2 axis direction
		OUT4	Y-axis pulse
		OUT5	Y-axis direction
		OUT6	
		OUT7	
		OUT8	Start crossflow fan
		OUT9	Start the vacuum pump
		OUT10	Start vacuum solenoid valve
		OUT11	Upper flow solenoid valve starts
		OUT12	Start the low-flow solenoid valve
		OUT13	
		OUT14	
		OUT15	

PLC model	Input and output description	Port	Remarks
PLC expansion	Input port	IN0	Alarm from Z1 axis driver
		IN1	R-axis driver alarm
		IN2	Y-axis driver alarm
		IN3	Alarm from Z2 axis driver
		IN4	
		IN5	
		IN6	
		IN7	
	Output port	OUT0	Upper LED light source
		OUT1	Lower LED light source
		OUT2	Laser activation
		OUT3	Buzzer alarm
		OUT4	
		OUT5	
		OUT6	
		OUT7	

Chapter4 Software Operation Instructions

4.1 Safety Check Before Operation

When checking the circuit, if there is any damage to the circuit or any components are wet, do not immediately turn on the power! If removal or repair is required, please seek professional assistance!

Be careful with electricity usage to prevent electric shock hazards.

When the machine is newly installed or has been idle for a long time, it is essential to conduct the following safety checks before powering it on and operating it:

(1) Check whether the power supply is at the rated voltage.

(2) Check whether the equipment is properly grounded.

(3) Ensure that no irrelevant objects are left on the movable parts of the machine.

(4) Check whether the moving parts are fixed.

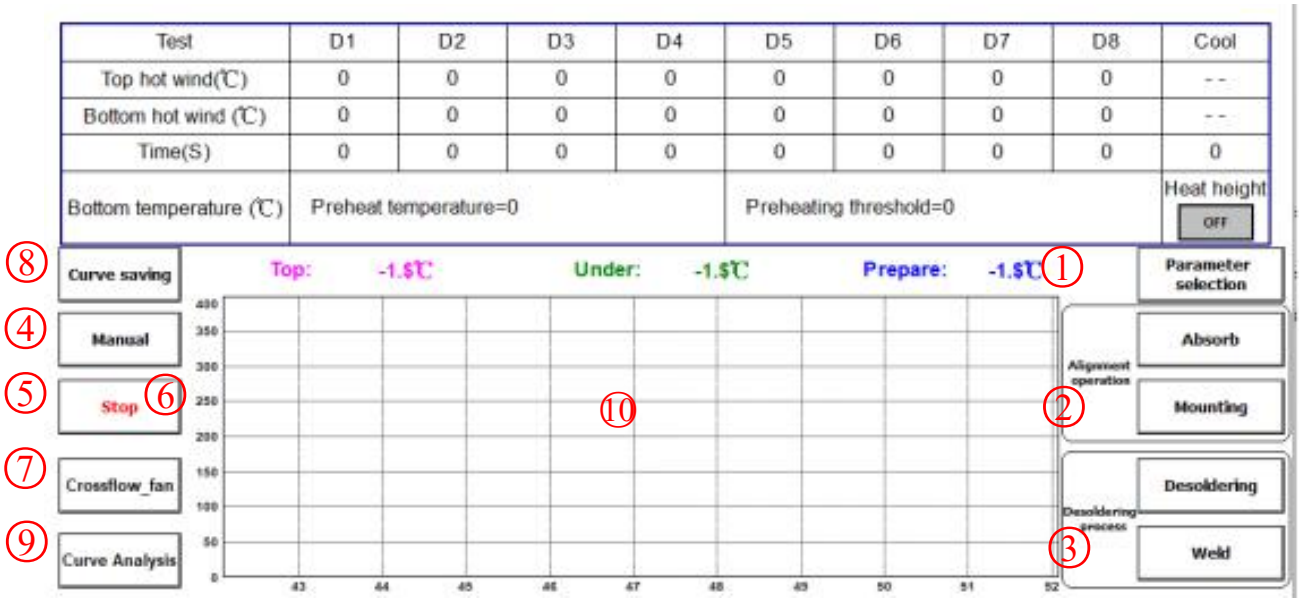
(5) Check whether the emergency switch is pressed.

(6) Check whether the main power switch is in the OFF state.

(7) Push and pull the movable parts by hand to check if they move smoothly.

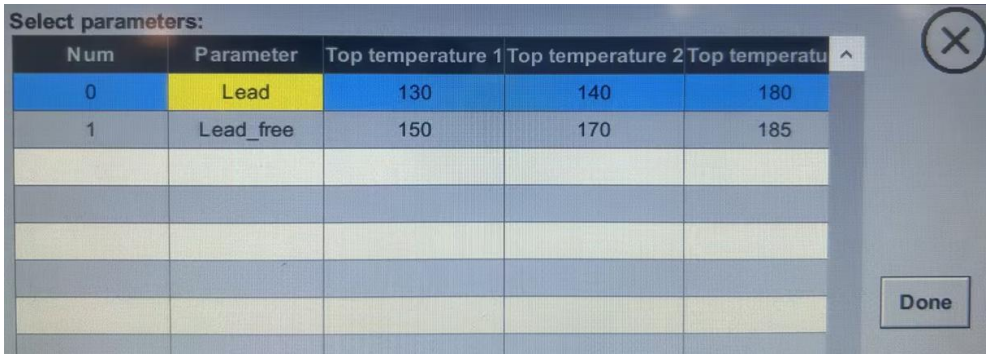
4.2 Introduction to Each Operation Interface

4.2.1 Main Page



(1) Parameter selection: Clicking " Parameter selection " will bring up the saved parameter list page.

Select the temperature parameter you wish to set, and then click the "Confirm" button on the right.



The selected temperature parameter data is displayed in the table on the main page.
We provide lead-based process parameters and lead-free process parameters as templates for reference:
There are lead-based processes (Lead) and lead-free processes (Lead_free).
(2)Alignment operation:

Suck:Click 

The device starts to perform the suction operation.

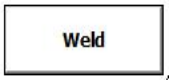
Mounting: Click 

here to initiate the mounting operation on the device.

(3) Desoldering process:

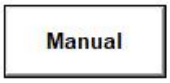
Desoldering: Click 

means that the device will start the desoldering operation.

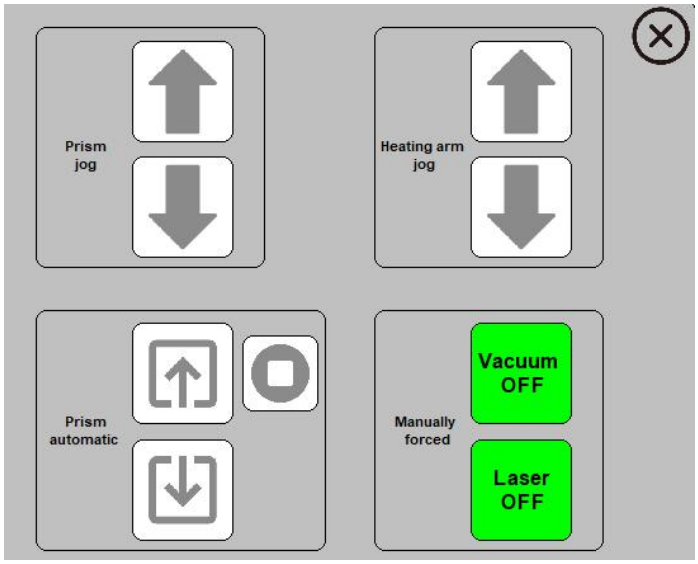
Welding: Click 

the button initiates the welding operation on the equipment.

(4) Manual interface:

Click 

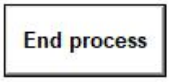
to enter the manual interface.



The buttons are respectively the jog in and jog out buttons with prisms, the jog up and jog down buttons for the heating arm, the automatic in and out buttons for the prism, the forced switch button for the vacuum, and the forced switch button for the laser.

(5) Stop button:

When pressed 

during the execution of a process, the process will not continue, and all axes will return to the waiting position.If the system is being heated, pressing the button will not proceed with the process. After all axes return to the waiting position, the cooling process will be initiated, and the stop button will change to 

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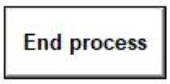
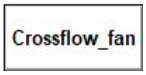
(6) End of process:

Clicking 

will immediately stop the cooling.

(7) Crossflow fan button:

The cross-flow fan (excluding the disassembly and soldering process and alignment operation) can be manually turned on by pressing 

the button.

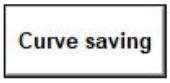
If it displays in red 

, it indicates that the cross-flow fan is working. Click again to turn off the cross-flow fan.

(8) Curve saving:

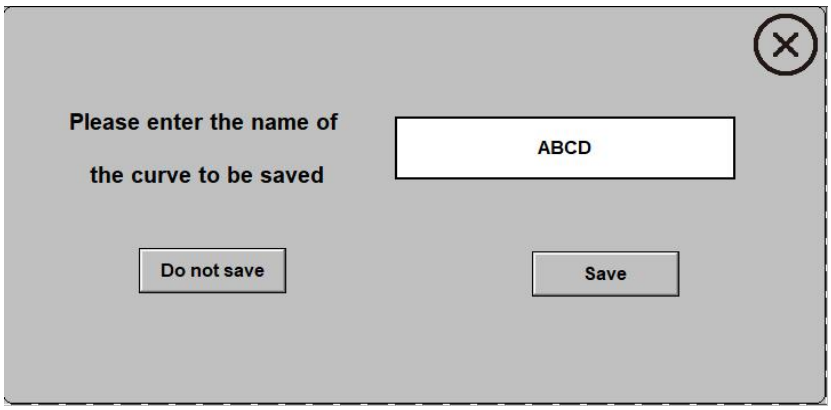
When the preheating threshold reaches the set temperature and the operation of the upper and lower fans is detected to be normal, temperature data recording will begin.

After the soldering is completed and the heat dissipation lasts for one minute, this button will appear.

Press 

to enter.

(If there is a fault during this period, the curve save button will not be displayed, and curve saving will not be possible.)



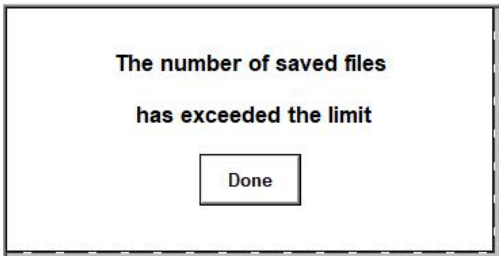
Enter the curve name and click the "Save" button.

Note: The curve name can be a combination of numbers and letters, with a maximum length of 10 characters.

(a) If the save is successful, the following prompt will be displayed.

(b) If you save without entering a name, the following prompt will be displayed.

(c) If the number of saved files equals 100, the following prompt will be displayed.

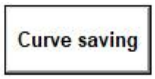


After deleting the file, you can rename and save the curve information.

If an alarm occurs during runtime, the curve file cannot be saved.

(9)Curve analysis:

(a) Curve selection

Click 

to enter the curve analysis page.

Click 

the dropdown box and select the curve name you wish to analyze.

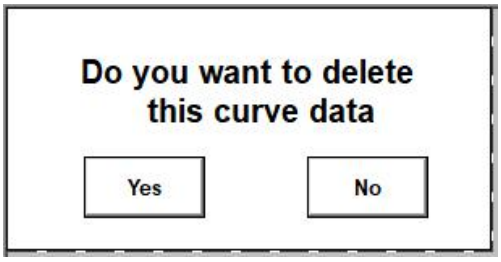
As shown in the test.csv file, press "OK" and the curve will be displayed. Press the small box to check and display the specified CH channel curve.

Note: After entering the curve analysis page, you need to wait for a few seconds before selecting from the dropdown box for curve selection.

(b) Curve deletion:

First, select the curve you wish to delete. Once the curve image is displayed, clicking 

on it will bring up the following prompt box.



Press "Yes" to delete the curve. Press "No" to exit the operation of deleting the curve.

(c) Data analysis

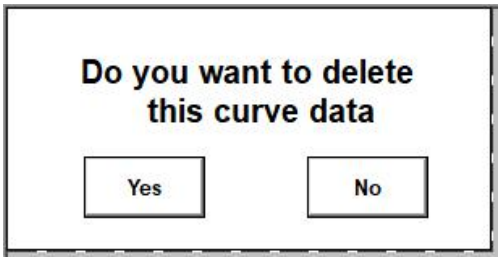
First, select the curve to be analyzed from the dropdown list, and then press Done to display the saved temperature curve.

You can conduct corresponding analysis on the CH channel temperature data. Fill in the temperature range to be analyzed in the input box of the table.

For temperatures ranging from 90℃ to 100℃, from 160℃ to 200℃, and above 200℃,press Query Search to analyze and generate data.

(d) Data clearance

You need to log in as a user first. Pressing on Clear Data will bring up a prompt box. Clicking "Yes" will delete all stored files



(e) Exporting data:

Insert the U disk and click Export Data .

Note: The USB flash drive should be of USB 3.0 or higher standard

1) If the export is successful, the following prompt box will pop up.

2) If the export fails, the following prompt box will pop up.

3) If no USB flash drive is inserted, the following prompt box will pop up.

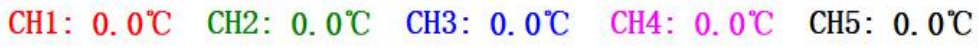
Note: Please be patient as there are too many exported files. The maximum waiting time will not exceed two minutes.

(f) Parameter information:

Click on the parameter name to display the information about the used parameters. Click anywhere in the parameter information table to close the parameter information.

(10) CH1-CH5 temperature switching

Clicking on any position within the real-time temperature curve graph will switch to the CH1-CH5 temperature curves



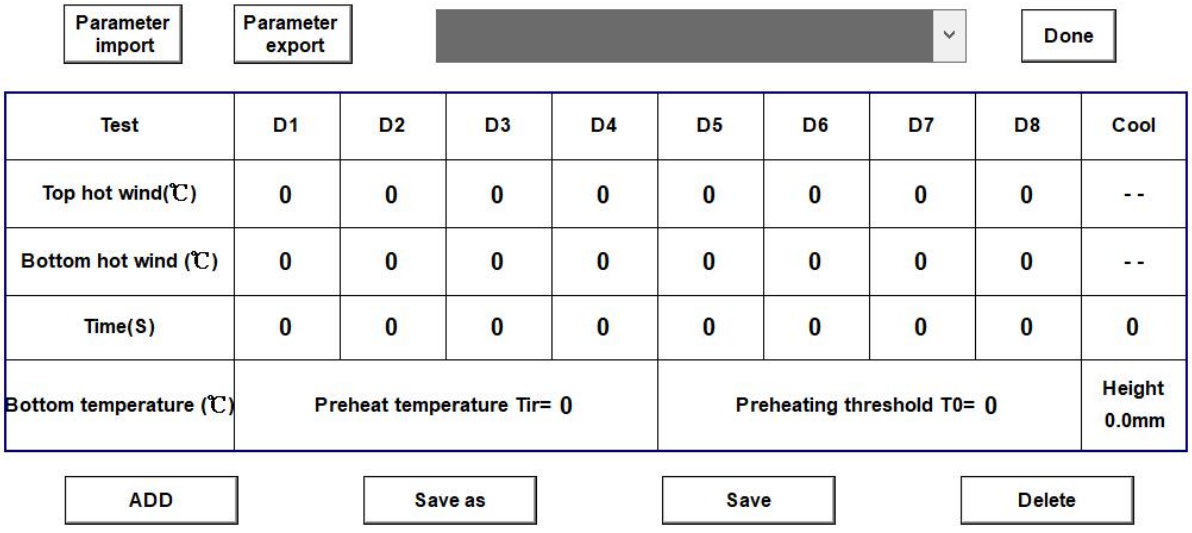
Clicking any position within the real-time temperature curve graph again will switch to the upper, lower, and preheating temperature curves

4.2.2 Parameter Setting

You need to log in before entering this page.

This page allows for the import and export of parameters, as well as the addition, deletion, and saving of parameters.

Fill in the setting data according to the required settings. The input box will have restrictions to avoid entering incorrect values or exceeding limits.



(1) Import and export of parameters:

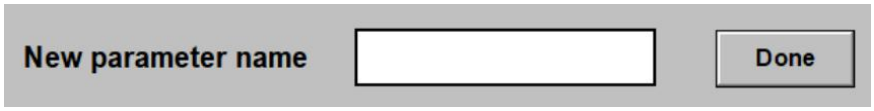
Insert the U disk, and after the touch screen detects the U disk for 10 seconds, click Parameter import or Parameter export to perform parameter import and export operations.

The imported parameters must be derived from a file exported from the machine.

There are corresponding prompt boxes for successful or failed import and export of parameters.

(2) Add parameters:

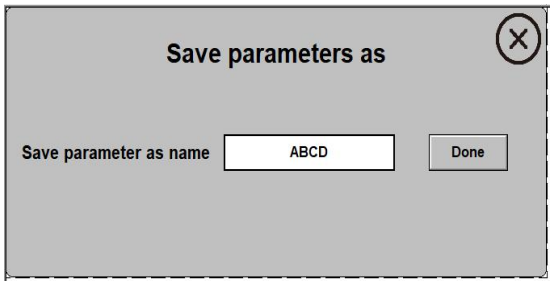
Clicking on ADD it will pop up the following prompt box.



After setting the parameter name, click the "Confirm" button. The window will automatically close after saving successfully. Then, set the parameters according to the process, and click "Save" after setting is complete.

(3) Save as:

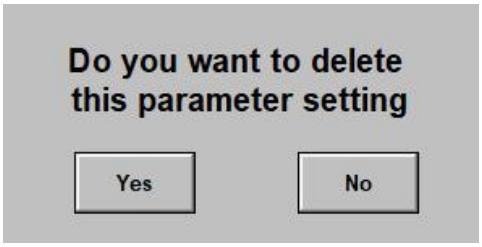
Clicking Save as will pop up the following prompt box.



Enter the name of the saved parameter, and click "OK" to save the currently set temperature parameter value.

(4) Deleting parameters:

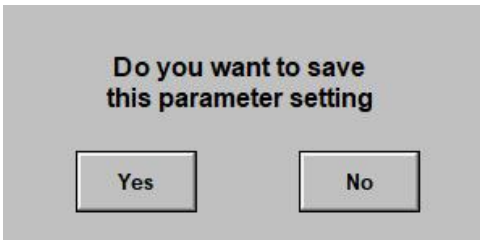
After selecting the parameters to be deleted, clicking Delete will pop up the following prompt box.



Press "Yes" to delete the parameter setting. Press "No" to exit the parameter deletion operation.

(5) Save parameters:

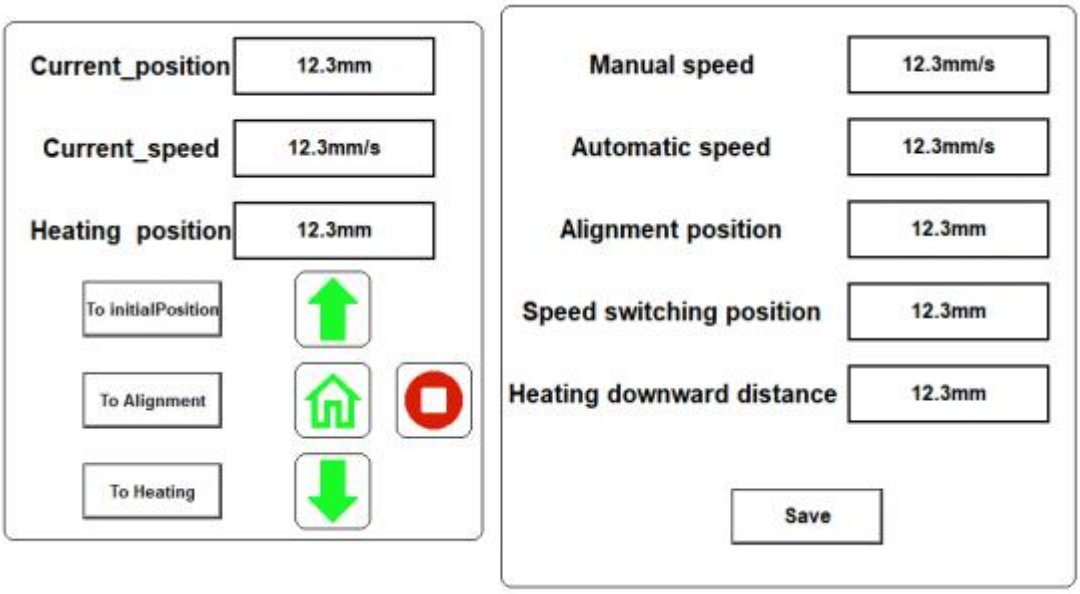
After modifying the settings, clicking Save will pop up the following prompt box.



Press "Yes" to save this parameter setting. Press "No" to exit this parameter saving operation.

4.2.3 Advanced Settings

You need to log in to access this page.



(1) Setting of each axis

Jog teaching (Jog speed is set to manual speed):

Click  to perform an upward jog, click  to perform a downward jog, and click  to stop moving to the specified position.

Click  to return to the original point, and click  to move the alignment position.

Click  to move the heating position. (The moving speed is automatic speed).

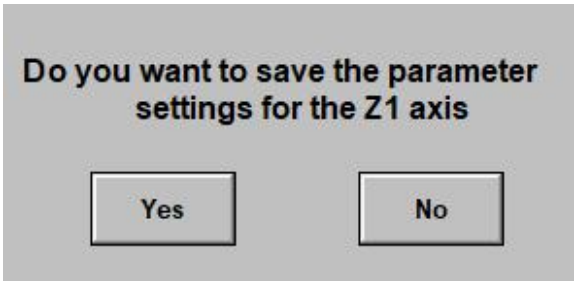
Note: After pressing to the initial position, alignment position, and heating position, the up and down jog position adjustment can only be performed after reaching the position.

Welding position switch: After turning on the heating position, in welding mode, the Z1 axis descends to a fixed heating height and will not touch the chip again. When turning off the welding position, that is, when the Z1 axis is heated, the suction rod will descend and touch the chip to probe the position.

Z1 axis speed switching position: The position for switching between fast and slow speeds can be set.

Z1 axis heating downward distance: In the disassembly and welding mode, the downward distance of Z1 axis before heating is executed.

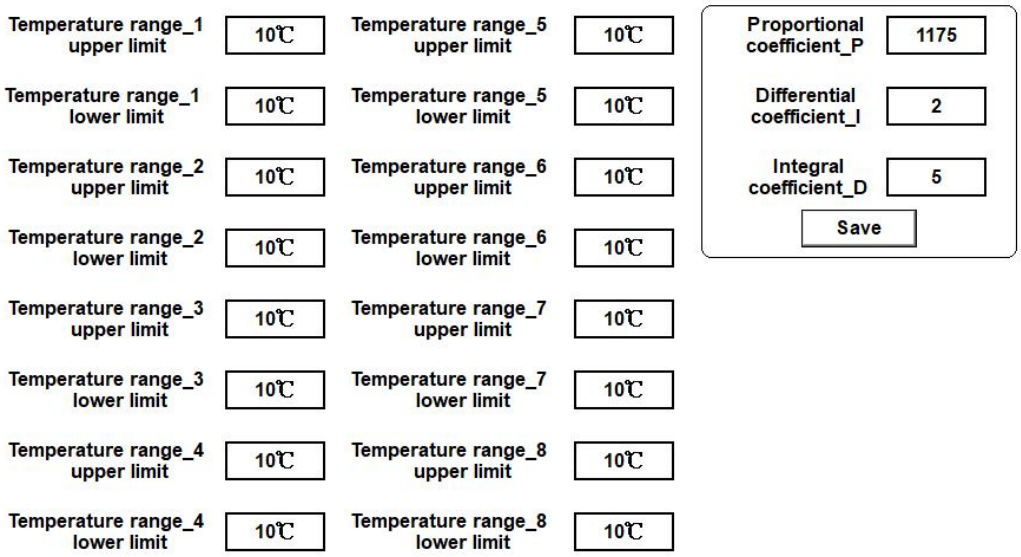
Save: After pressing the save button, a save confirmation dialog box will pop up, as shown below.



Press "Yes" to save the parameter settings. Press "No", and the parameters will revert to the previously saved values.

(The Z2 axis and Y axis are similar to the Z1 axis)

(2) Upper heating setting



Upper and lower limits of temperature range:

At the end of each heating period, the difference between the actual temperature value and the set temperature value is compared. If the temperature difference for that period exceeds the set upper or lower limit, it indicates an abnormal temperature. A fault indicating abnormal temperature will be reported, and heating will be stopped for cooling purposes.

PID parameter setting:

The PID parameters of the thermostat can be adjusted based on the heating conditions to optimize its output responsiveness and temperature control stability.

The settings for lower heating and preheating are similar to those for upper heating.

After a 5-minute preheating period, the system will assess the upper and lower temperature limits, and an error will be reported if the temperature is abnormal.

(3) Temperature calibration

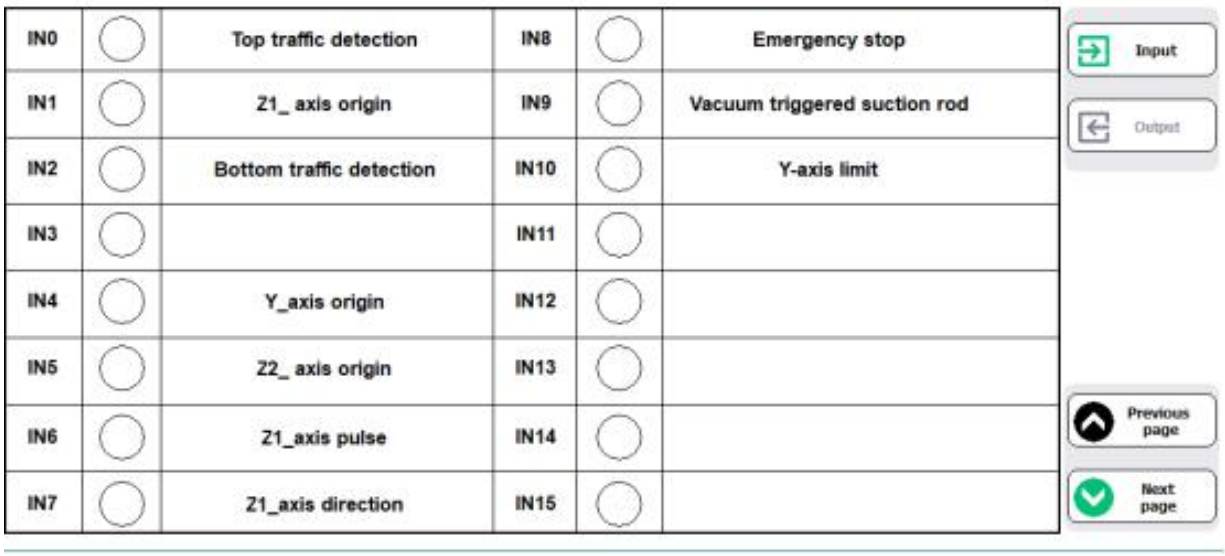
Upper heating temperature coefficient: Set the temperature coefficient to ensure that the displayed upper heating temperature closely matches the actual temperature reaching the PCB board. The lower heating temperature coefficient and preheating temperature coefficient have the same function as the upper heating temperature coefficient.

Upper temperature detection, cavity temperature detection, and external temperature measurement temperature coefficients 1-5: Set the temperature coefficients to ensure that the temperature displayed by the external temperature measurement closely matches the actual temperature reaching the PCB board. External temperature measurements 1-5, upper temperature detection, and cavity temperature detection are all used for temperature measurement and display purposes.

4.2.4 I/O Input (output) Monitoring

Click 

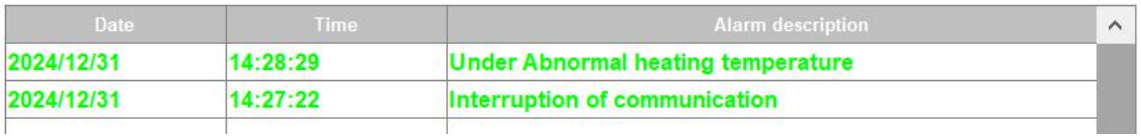
on the navigation bar to display the input monitoring information.



You can click the output button on the right to switch between output monitoring. Click the Previous and Next buttons to switch pages.

4.2.5 Alarm Record

Click **Alarm record** on the navigation bar to view the alarm record information, including the time and date of the alarm occurrence and the alarm content.

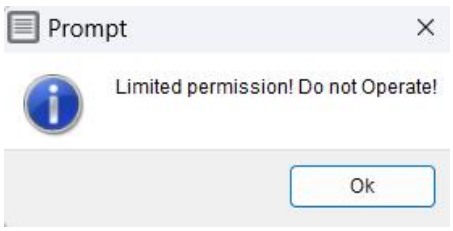


If the alarm content appears, click **Alarm reset** to reset the fault. If the reset is successful, the alarm content will change from red to green.

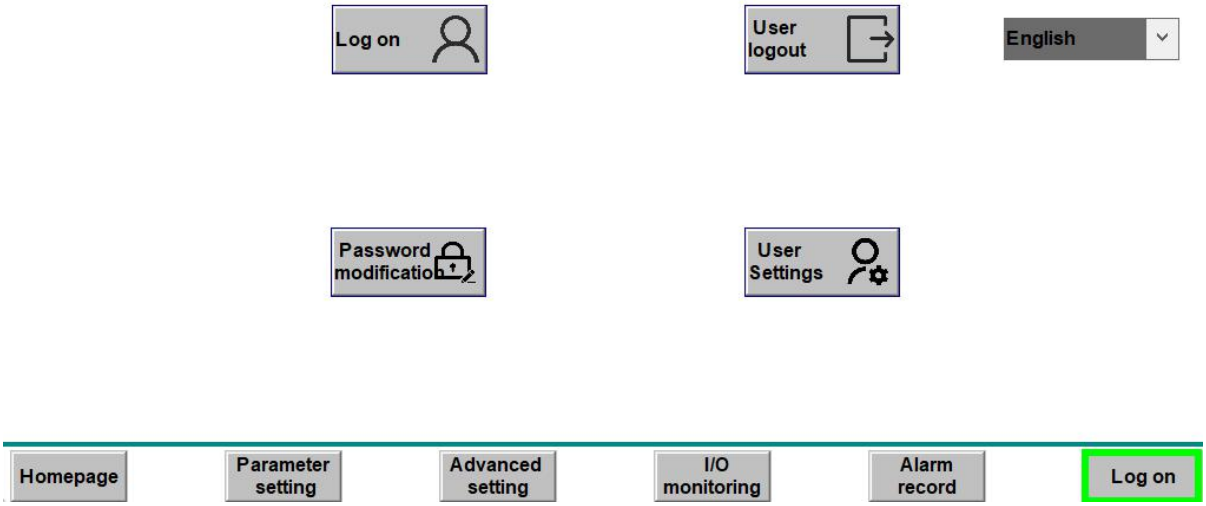
If the fault is still reported after resetting, meaning the alarm content remains in red, it is necessary to check whether there are any issues with the wiring and hardware. If the problem cannot be resolved, please contact our company in a timely manner.

4.2.6 User Login

Clicking on the navigation bar **Parameter setting** and **Advanced setting** will pop up a prompt box indicating that access is not authorized.



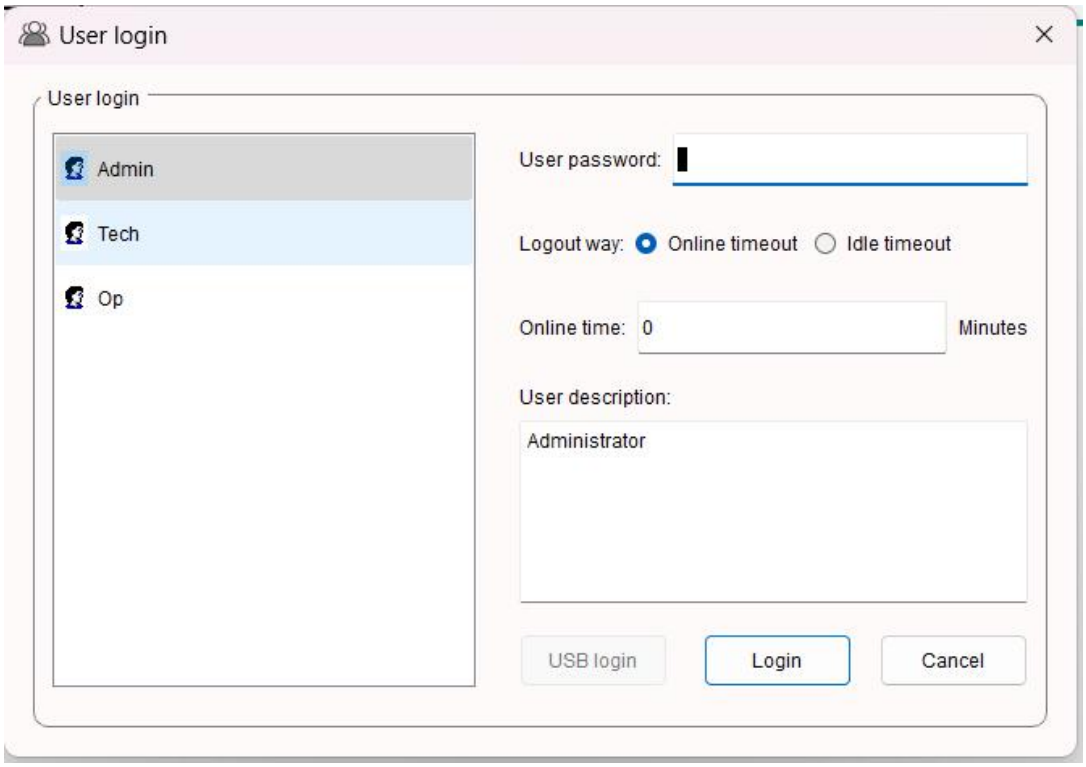
You need to log in before entering the pages for parameter settings and advanced settings.



(1) User login:

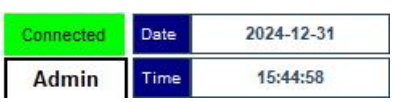
Click 

on the navigation bar to access the user login page.



The user names are Admin (administrator), Tech (technician), and Op (operator), and the passwords are all 123. After entering, click "Login".

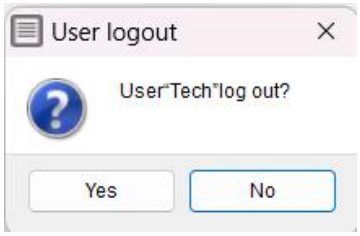
After successful login, the display bar at the top will show the currently logged-in user's name.

For example: 

(2) User logout:

When the user clicks 

, a confirmation page for user logout will pop up.

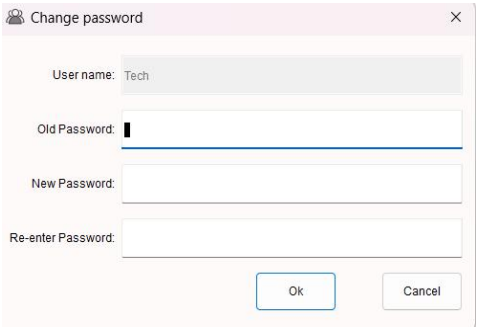


Click "Yes" to log out for the logged-in user.

(3) Password modification:

To change your password, click 

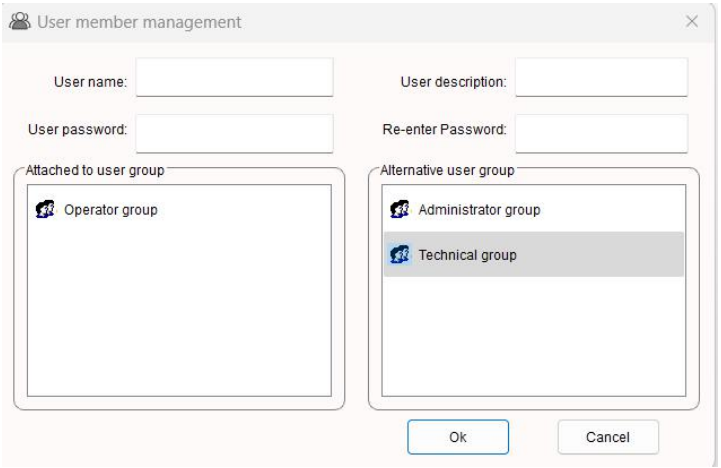
on the button.

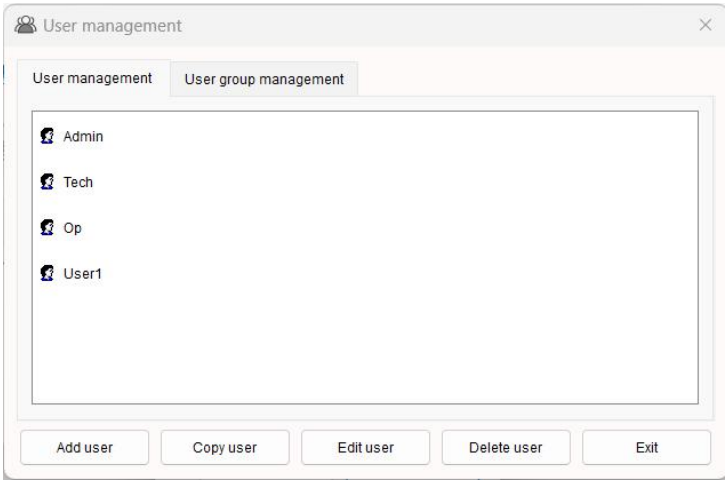


Enter the old password and the new password, then press the "Confirm" button to complete the password change.

(4) New user settings (only accessible with admin login):

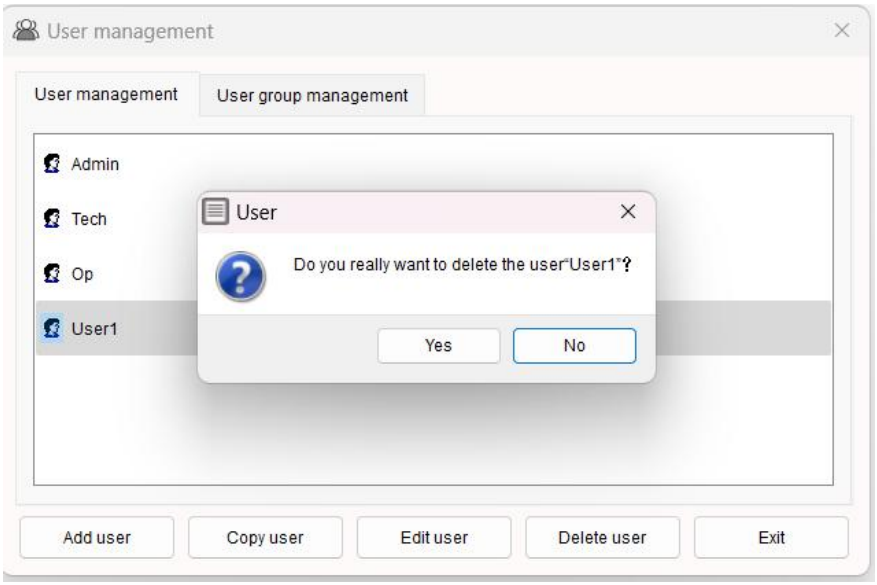
Add new users and modify user groups. Adding a new user: Enter the user name, user password, and confirm the password by re-entering it. Select the user group, click the "Confirm" button, and complete the operation of adding a new user.





The newly added users have been included in the list.

Delete user: Select the user you wish to delete, and then click Delete user . A confirmation prompt box for deletion will appear.



Click "Yes" to complete the user deletion operation.

(5) Switch between Chinese and English

Click the dropdown box

Click on the language you want to switch to, and the system language will be changed to the selected language.

Chapter5 Description of Counterpoint Process

⚠Note: Due to vibrations during transportation, the precise alignment function of the equipment may exhibit deviations. Before opening the package and using it for the first time, it is recommended to calibrate the system. The specific calibration steps are as follows:

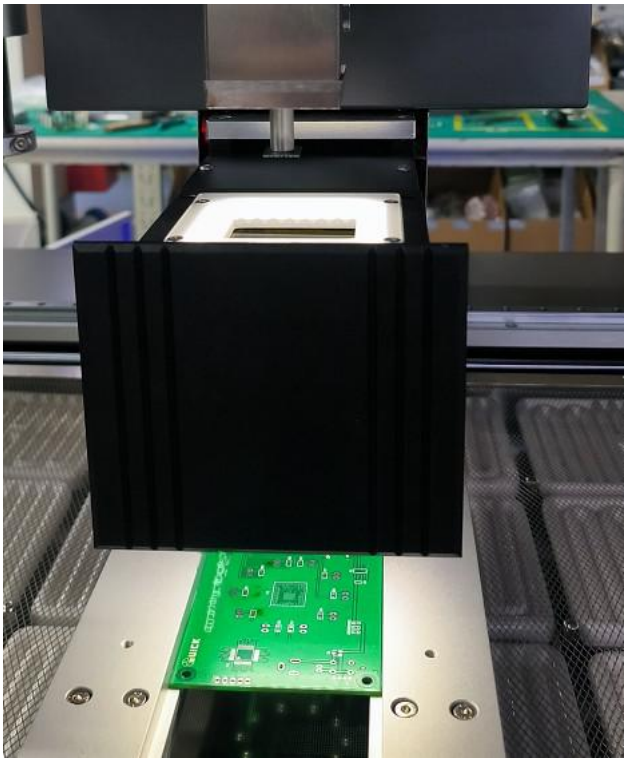
(1) Determine whether the equipment needs to be calibrated.

① Prepare a set of alignment correction jigs, as shown in the figure below:

② Snap the upper module of the alignment module into the lower module, as shown in the figure below:

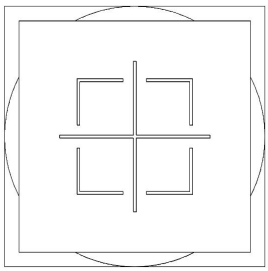
③ Fix the entire module onto the device, align it with the center point, and press the "Suck" button on the software. The device will automatically suck

Take the upper module, (please note that you cannot move the bracket in subsequent operations, otherwise, all previous operations will need to be redone), as shown in the figure below:

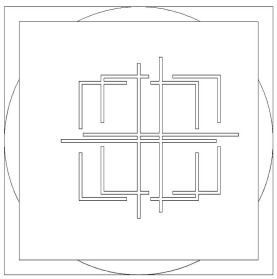


④ After suctioning the chip, the alignment prism automatically extends, adjusts the image to a certain size, and then adjusts the clarity, so that the images of the upper and lower modules are simultaneously clear on the video. Determine whether calibration is needed according to the following diagram

The images of the upper and lower modules overlap, requiring no calibration

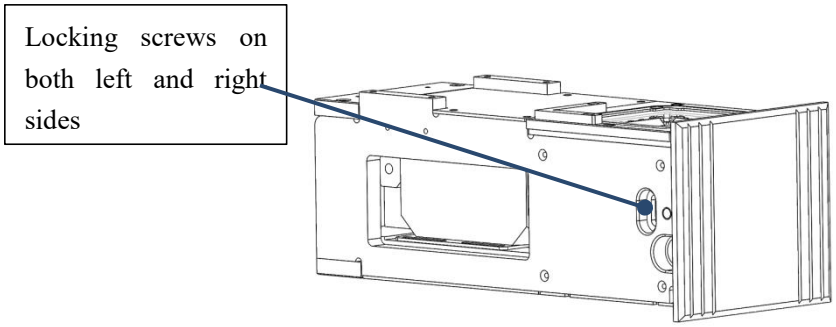


The images of the upper and lower modules do not coincide, and calibration is required

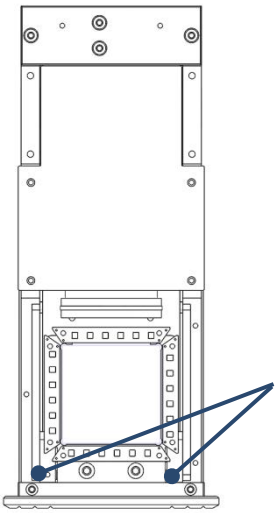


(2) Calibration steps

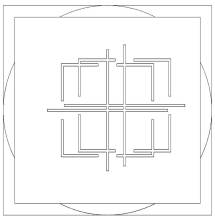
①Loosen the locking screws on both sides of the prism and prepare to start adjusting and calibrating. The screws do not need to be fully tightened.



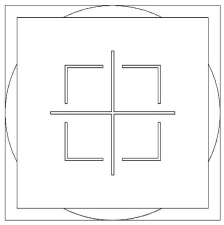
② Adjust the adjusting screw of the prism



③ Adjust the images of the upper and lower modules to coincide



1 Turn the screw on the right clockwise to move the upper module image to the upper left, and counterclockwise to move it to the lower right. The movement in the left-right direction is larger, while the movement in the up-down direction is smaller



2 Turn the screw on the left clockwise to move the upper module image upwards and to the right, and counterclockwise to move it downwards and to the left. The movement in the horizontal direction is larger, while the movement in the vertical direction is smaller

3. By adjusting the two screws on the left and right, the solder ball image can be moved in a zigzag pattern until the images overlap

④ Assemble in the order of disassembly, tighten - lock the screws: alignment calibration is complete.
⑤ After installing the decorative plate, perform alignment confirmation again to determine whether the calibration and alignment are successful this time.

Chapter6 Analysis of Solutions to Common Electrical Faults

6.1 Failure to Operate

Fault type	Reason	Solution measures
The device cannot be started normally	The switch power supply has a problem with insufficient voltage	The air switch is not closed or the power switch needs to be replaced
	Circuit breaker disconnection and tripping	Press the circuit breaker switch. If the circuit breaker switch cannot be pressed, check the circuit and restart it.
	The emergency stop button has been pressed	Turn out and release the emergency stop knob
Device communication abnormality	The PLC switch is in the STOP state	Adjust to RUN state
	There is a problem with the switch power supply, which has caused the PLC to not be powered on	Replace the switch power supply
	Touch screen malfunction	Replace the touch screen
	The communication network cable is loose	Insert tightly

6.2 Limit Sensor Fault

Fault type	Reason	Solution measures
The limit sensor is out of power	The sensor connecting cable is loose	Check and connect
The limit sensor cannot be triggered	The sensor is damaged	Check and replace
The sensor intermittently sends signals	Loose or worn sensor cable	①Tighten and ②replace with new parts

6.3 Stepper Driver Fault

Fault type	Reason	Solution measures
Stepper driver reports a fault	1. Circuit fault	inspect
	2. Configuration or hardware issues	Check or replace

6.4 CSV File Reading Failure

Fault type	Reason	Solution measures
The CSV file cannot be read	1. U disk is not properly plugged in	Check and re-insert (wait for 10 seconds)
	2. The available storage capacity of the USB flash drive is insufficient	Check and replace
	3. Transmission line inside the electrical cabinet has become loose	Check for re insertion
	4. The USB flash drive cannot be recognized	Check and replace

6.5 Heating Failure

Fault type	Reason	Solution measures
Not heated	1. Temperature sensor fault	Check or replace the solenoid valve
	2. Heating core failure	Check or replace the heating core
	3. The temperature exceeds the set limit temperature	Adjust parameters
	4. The temperature difference between the two temperature zones on the left and right is too large	Check the heating core
	5. Solid-state relay fault	Check or replace the solid-state relay
	6. Circuit fault	Check the circuit
	7. Thermostat failure	Check or replace the thermostat
	8. Controller fault	Check or replace the controller

6.6 Fan Failure

Fault type	Reason	Solution measures
The fan is not operating	1. Circuit fault	Check the circuit
	2. Fan board card failure	Check or replace the fan board card
	3. The wind speed is not given	Check the operation mode
	4. Fan start-stop relay fault	Check or replace the relay
	5. Fan failure	Check or replace the fan

6.7 Vacuum Pump Failure

Fault type	Reason	Solution measures
The chip cannot be suctioned	1. Vacuum pump failure	Check the vacuum pump
	2. Fault in opening the solenoid valve under vacuum	Check the vacuum solenoid valve for proper operation
	3. Blockage in pipeline	Conduct segmented testing of pipelines, replace and clean blocked pipelines

6.8 Motion Positioning Deviation Fault

Fault type	Reason	Solution measures
The positioning of the axis movement is not accurate	1. Loose screw rod components	Check the circuit
	2. Home sensor fault	Check or replace the fan board card
	3. Loose motor screws	Check the operation mode
	4. Stepper motor out of step due to improper operation	Initialize after resetting

NOTE During the operation process, if you have any questions, please contact us in a timely manner for technical support!

Chapter7 Maintenance

Remarks:

Only original consumables and accessories can ensure reliable functionality.

When the equipment is not in use, please turn off the power switches of all components and disconnect the power plug.

 **be careful:**

After the equipment is powered off, the heater casing still retains residual heat. Please perform cleaning work only after the equipment has been powered off and cooled down. Do not use any dangerous or flammable solvents for cleaning.

Cleaning components:

* Use a clean cloth or lint-free cloth to remove dust from the equipment.

Note: The BGA rework system is a precision device. Do not make any modifications to the device to avoid affecting its normal use.

7.1 Daily Inspection of Machine

① Check whether there are flammable or explosive materials near the equipment.

② Check whether the working voltage is correct.

③ Clean the vacuum suction pad. Check whether the vacuum suction pad is corroded or damaged. If so, please replace it.

④ Check whether the fan airflow is normal.

⑤ Check whether the zero position of each axis is correct.

⑥ Test the motion and communication performance of the machine.

⑦ Check whether the emergency button can be pressed and rotated normally.

⑧ Clean the working environment surrounding the machine.

⑨ Check whether the external screws of the machine are tightened.

⑩ Record the equipment status during each shift.

⑪ Run the test program.

Safety instructions:

	There is a risk of electric shock Make sure to open the door of the electrical control cabinet only after the power has been turned off.
	Replace the control power unit after cutting off the power for 5 minutes. During this period, please do not touch the wiring terminals!
	There is a risk of electric shock and injury After the maintenance is completed, please do not forget to remove the tools from the electrical control cabinet and confirm that the door of the electrical control cabinet is properly closed.
	During maintenance, warning signs such as "Do not power on" and "Do not switch on the power" should be posted at the main power control cabinet and related control boxes to prevent unauthorized personnel from turning on the switch.

7.2 Inspection of Machine Components

Inspection when the power is OFF (not working)						
Inspection items	Check position	Daily	Monthly	Quarter	6 months	1 year
Confirm whether the screws/bolts are loose/shaking	Screws for protective plates and cover plates	√	√	√	√	√
	Locking bolts for each mechanical shaft	√	√	√	√	√
	Bolts/screws around the shaft					√
	Bolts/screws for motors, etc					√
Confirm whether the connecting socket is loose, and tighten it if necessary	External connection socket on the machine	√	√	√	√	√
	Machine cable unit		√	√	√	√
Conduct a visual inspection to check for external defects. Remove any adhering dust, etc.	Machine appearance	√	√	√	√	√
	External cable	√	√	√	√	√
Check for any bending or positional deviation. Repair or properly place it if necessary.	Positions of each axis of the machine	√	√	√	√	√

Inspection when the power is ON (during operation)						
Inspection items	Check position	Daily	Monthly	Quarter	6 months	1 year
Confirmation of the work area	Each axis position					√
Gently shake the cable with your hand to confirm if there are any broken wires	External cable category				√	√
Press each robot arm with your hand to confirm if there is any shaking.	All moving parts					√
Check whether the human-machine interaction interface functions properly, including various buttons and button lights, and whether the emergency stop button can power off the drive. If there is a touch screen, check whether the touch screen functions properly.	Operating software, emergency stop button.	√	√	√	√	√
Confirm whether there are any abnormal sounds or vibrations during operation.	whole	√	√	√	√	√

7.3 Maintenance Cycle of Equipment-related Components

Unit	Project	Inspection and maintenance	Maintenance cycle			
			Everyday	Monthly	Every 6 months	Every 12 months
Power Supply switch	Main power supply Switch panel	Main power switch	√			
		Emergency stop knob	√			
Motivation structure transmission	Proximity switch	Proximity switch	√			
	Cable	Wear and tear of cables and connection of connectors			√	
	Operation	Abnormal noise/vibration	√			
	Transmission mechanism	Is there any looseness			√	

Note: Users can choose relevant maintenance content based on the specific structure of the equipment!

7.4 Maintenance Cycle of Equipment Heating Components

Unit	Project	Inspection and maintenance	Maintenance cycle			
			Everyday	Monthly	Every 6 months	Every 12 months
Heating up	Heating function	Is it heating normally	√			
	Temperature verification	Run the fixed program and check the temperature fluctuation		√		
Lower heating	Heating function	Is it heating normally	√			
	Temperature verification	Run a fixed program and check for temperature fluctuations		√	√	
Verification of temperature measurement port	Temperature verification	Use a temperature calibrator to verify			√	

7.5 Maintenance Cycle of Equipment Alignment Components

Unit	Project	Inspection and maintenance	Maintenance cycle			
			Everyday	Monthly	Every 6 months	Every 12 months
Chip mounting	SMT accuracy	Verify the accuracy using the alignment fixture. If there is any deviation, refer to the instruction manual for calibration		√		

7.6 Maintenance of Emergency Stop Button

The emergency stop button is a safety device that must be pressed in dangerous situations. After pressing the emergency stop button, it locks and remains activated. The current operation mode is immediately stopped, all movements and heating are halted; fault and error messages appear; and the machine cannot be restarted. The fault alarm can only be cleared after the emergency stop button is pulled out.

7.7 Maintenance of the Motion Mechanism

The equipment is a precision device that requires regular maintenance to maintain good lubrication. It is necessary to strengthen maintenance and upkeep, regularly clean dirt and oil stains, and ensure that the equipment operates in good condition. This can avoid frequent malfunctions, reduce downtime, and extend the service life of the machine.

Although the lubrication interval may vary depending on usage conditions and service environment, lubrication should be performed approximately every 3 to 6 months. It is recommended to add lubricating grease to the ball screws and guide rails. If the color of the lubricating grease changes, it should be replaced.