I. Introduction to Product Characteristics

1. Both printing and reballing stations are quickly positioned by X and Z axes.

2. Touch screen control, no complex Settings, simple and easy to operate.

3. This machine is a semi-automatic equipment integrating printing and reballing, which can realize different specifications of BGA printing (printing surface without devices) and reballing function, and the overall compatibility is strong.

4. The wire change is simple and fast, and the feeding mode is manual loading and unloading.

5. The whole machine has done anti-static treatment.

6. Printing scraper is the industry standard elastic edge scraper to prevent the overflow of tin paste (or fluder).

7. The brush lifting parts have the clip design to prevent the leakage of tin balls (tin balls are stored inside the brush) and the brush has a certain elasticity, and are equipped with this workpiece, which is convenient for manual automatic ball adding.

II. Installation Requirements

1. Far from flammable, explosive, corrosive gases or liquids.

2. Avoid many wet places, and the air humidity is less than 90%.

3. Ambient temperature-10℃ ~40℃, to avoid direct sunlight and sun exposure.

4. Operating environment without dust, floating fiber and metal particles.

5. The installation plane shall be flat, firm and without vibration.

6. Never place heavy objects on the fuselage.

7. Avoid the influence of direct air flow from the air conditioner, heater, or ventilator.

8. The wiring of the equipment must be operated by qualified professional and technical personnel, the main line is 1.5 square mm, and the equipment must be well grounded.

9. When the power supply is disabled, the main switch is turned off, and the power plug must be unplugged for long-term shutdown.

III. Product Specifications and Technical Parameters

1. Power supply: 220V $\pm$ 10% AC 50 / 60 Hz

2. Power: 400W

3. BGA treatment size: 210mm x 165mm x 15mm (length x width x height)

4. Applicable chip: maximum compatible 160mm x 120mm x 4mm (length x width x height)

5. Operation mode: 7 ″ HD touch screen

6. Tin ball size: 0.35mm-0.76mm

7. Plant ball yield: 95%

8. Positioning mode: mechanical positioning (pin positioning) + vacuum adsorption

9. Overall dimension: L 930mm x W 630mm x H 780mm (length x width x height)

10. Machine weight: about 120kg

11. Appearance color: RAL9002 gray and white + gray

Relevant parameters are only operational guidelines, and the specific parameters are subject to the physical object

IV. The Main Structure of the Appearance

(1) Structure introduction
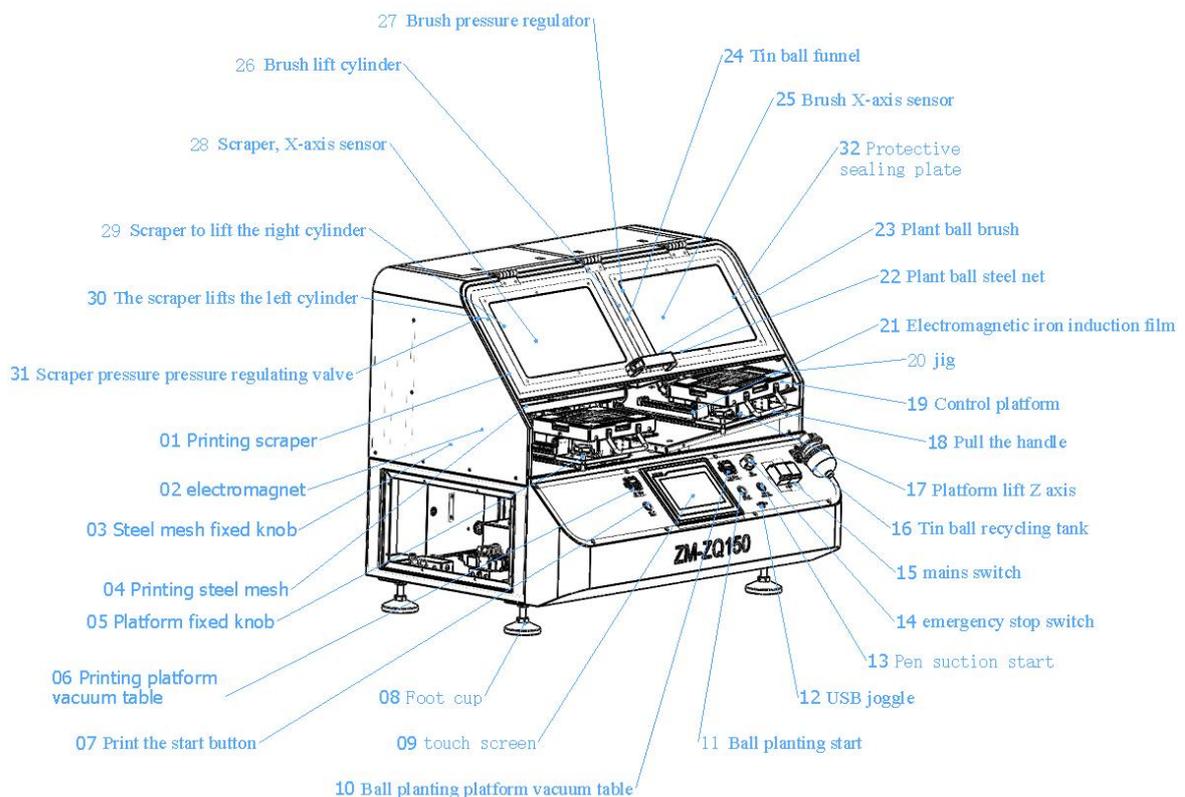
(2) Function introduction

ord	name	use	usage method
1	Printing scraper	Left and right scraper, scraping flux (or tin paste)	Run left and right
2	electromagnet	The suction platform fixed it to the print / bulb position	Manual operation + system control
3	Steel mesh fixed knob	Fixed printing / planting ball steel net	hand operation
4	Printing steel mesh	Printing flux (or tin paste)	Pin positioning + steel mesh fixing knob for fixing
5	Platform fixed knob	After the equipment turns off the power supply and stops working, the platform is fixed	hand operation
6	Printing platform vacuum table	Show the value of the vacuum adsorption of the platform during printing, so as to judge whether the treatment device and the product are stable at work	SC
7	Print the start button	Start the printing process	control
8	Foot cup	Support and adjust the height	Turn the body clockwise and lower it counterclockwise
9	touch screen	operation panel	touch control
10	Ball planting platform vacuum table	Show the value of the platform vacuum adsorption during the reballing, so as to judge whether the treatment device and the product	SC
11	Ball planting start	Start the implantation process	control
12	USB joggle	USB extension port	USB connecting line
13	Pen suction start	Start the vacuum of the pen to absorb the extra tin balls inside the steel net	control
14	emergency stop switch	Emergency stop during abnormal equipment or special circumstances	Press to stop, and open after clockwise rotation

15	mains switch	Control the power supply and the protection	hand operation
16	Tin ball recycling tank	Store tin balls	/
17	Platform lift Z axis	The platform rises to make the treatment tool fit with the steel mesh	SC
18	Pull the handle	Pull the handle to facilitate the access of the platform	hand operation
19	Control platform	Position the vehicle with vacuum and positioning pin structure	/
20	jig	The BGA vehicle was placed, and the acupoints were designed according to the BGA size	/
21	Electromagnetic iron induction film	Whether the induction electromagnet adsorbs to the platform	SC
22	Plant ball steel net	The tin ball is attached to the BGA corresponding pad through the mesh	Pin positioning + steel mesh fixing knob for fixing
23	Plant ball brush	Store the tin balls and bring the ball inside the steel mesh	SC
24	Tin ball funnel	Pour the tin balls into the brush through the funnel	hand operation
25	Brush X-axis sensor	Whether the induction brush X-axis is in place	SC
26	Brush lift cylinder	Control the brush up or down	SC
27	Brush pressure regulator	Adjust the falling pressure of the brush	hand operation
28	Scraper, X-axis sensor	Whether the induction scraper X-axis is in place	SC
29	Scraper to lift the right cylinder	Drive the right blade up or down	SC
30	The scraper lifts the left cylinder	Drive the left scraper up or down	SC
31	Scraper pressure	Adjust the pressure of the scraper	hand operation

	pressure regulating valve		
32	Protective sealing plate	Reduce falling dust	hand operation

V. Program Setting and Operation

(1) Use method of "debugging mode"

1. Turn on the power switch to power on the whole machine. The touch screen will display (Figure 2); then touch the "Debug Mode" button for a digital input dialog box such as (Figure 1) (the initial password set by the company is 8888). Click the upper right button of Figure 2 to switch the language.

Figure 1

Figure 2

2. After entering the password, click the confirmation button to enter the "Debug mode" as shown in (Figure 3).
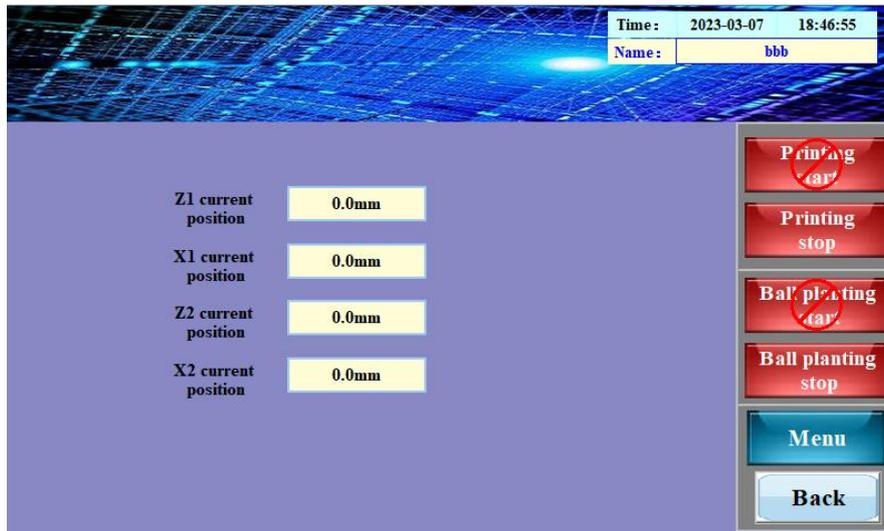
Figure 3

Basic introduction of the debugging mode:

Z1 current position: Displays the current position status of the printed Z-axis.

X1 Current Position: Displays the current position status of the printed X-axis.

Z2 current position: Displays the current position status of the planted sphere Z-axis.

X2 Current Position: Displays the current position status of the planted sphere X-axis.

Date: displays the current year, day and seconds.

Name: Displays the formulation parameter name currently called.

Printing start: Click on the device to start the printing process.

Printing stop: after clicking the device to stop the printing process and reset operation.

reballing start: Click on the device to start the reballing process.

reballing stop: click the device to stop the planting process and reset operation.

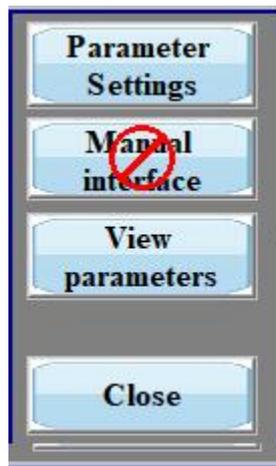Menu: Click on to open the "Menu" window (Figure 4).

Figure 4

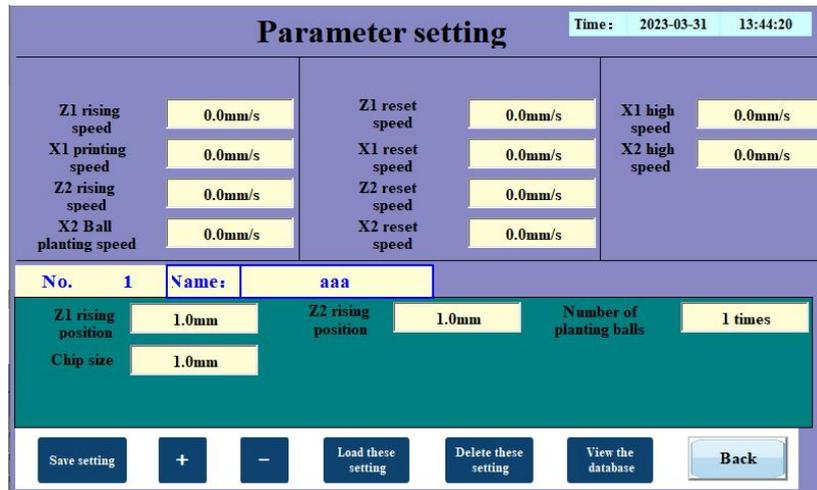① Parameter setting: Click to enter the "Parameter Settings" window (Figure 5).

Figure 5

Introduction to the parameter setting interface:

Z1 rise speed: Click to set the running speed of the printed lift Z axis.

X1 Printing speed: Click to set the running speed of the printing moving X-axis.

Z2 rising speed: Click to set the running speed of the planting ball lifting Z-axis.

X2 rising speed: Click to set the running speed of the planting ball moving the X-axis.

Z1 reset speed: Click to set the reset speed of the printed lift Z-axis.

X1 reset speed: Click to set the reset speed of the printed mobile X-axis.

Z2 reset speed: Click to set the reset speed of the planting ball lifting Z-axis.

X2 reset speed: Click to set the reset speed of the planting ball moving X-axis.

X1 Fast Speed: Click to set the fast speed for printing moving X axis.

X2 Fast speed: Click to set the fast speed of the planting ball for moving the X-axis.

Group 1: Displays the current formula group number.

Name: Set the current formulation group name.

Z1 rising position: click to set the rising height of the printing lift platform.

Printing chip size: Click Set the printing station chip size.

Z2 rising position: click to set the rising height of the planting ball lifting platform.

Ball chip size: click Set the ball station chip size.

Number of single ball movements: click to set the number of X axis operation flow of the ball station.

Save data: Click to save the current formula data, then pop up a prompt, as shown in Figure 6; When the saved formula name is consistent with the current formula group name, Figure 7 will pop up. Click "Cancel" to cancel the save and click "confirm" to save the data.
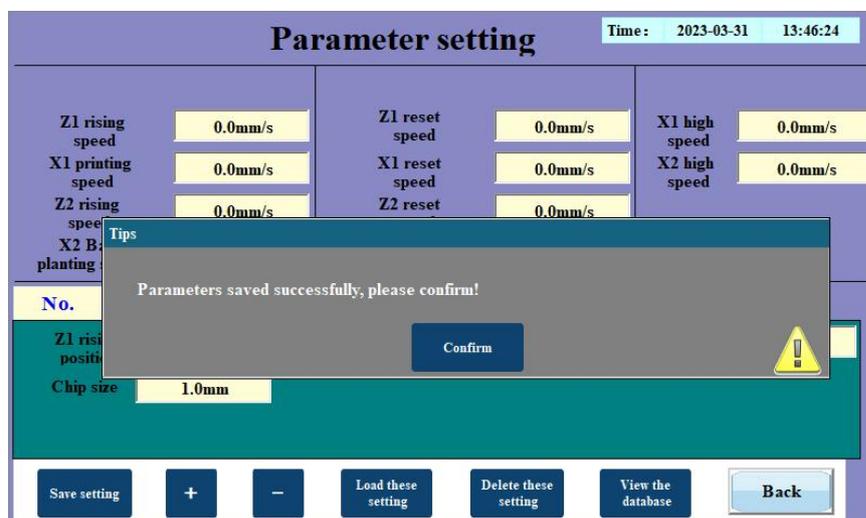
Figure 6

Parameter setting

| Time: | 2023-03-31 | 13:47:22 |

| Z1 rising speed | 0.0mm/s | Z1 reset speed | 0.0mm/s | X1 high speed | 0.0mm/s |
| X1 printing speed | 0.0mm/s | X1 reset speed | 0.0mm/s | X2 high speed | 0.0mm/s |

Tips

BGA model name already exists, overwrite the current curve!

Confirm   Cancel

Chip size   1.0mm

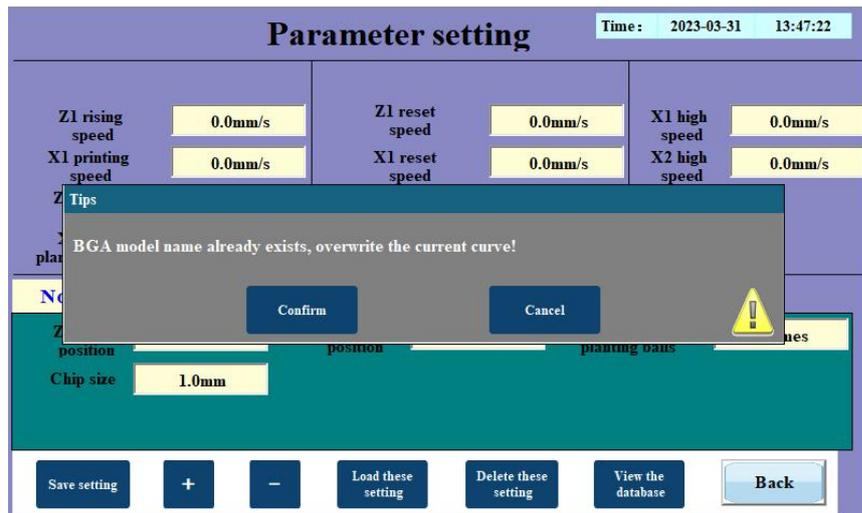| Save setting | + | − | Load these setting | Delete these setting | View the database | Back |

Figure 7

+: Click the "+" button to release the formula data of the next group number.

- -: Click the "- -" button to call out the formula data of the previous group number.

Application data: Click the current formula group data, and the parameter confirmation interface will pop up in Figure 8, and return to the debugging interface after confirmation.
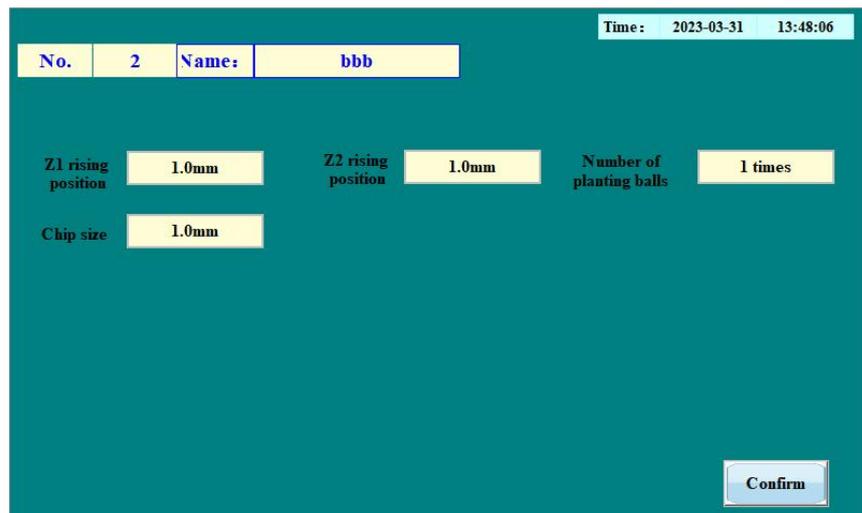

| Time: | 2023-03-31 | 13:48:06 |

| No. | 2 | Name: | bbb |

| Z1 rising position | 1.0mm | Z2 rising position | 1.0mm | Number of planting balls | 1 times |
| Chip size | 1.0mm |

Confirm

Figure **8**

Delete data: Click to delete the data of the current formula group, and the confirmation interface will pop up in Figure 9. After "confirm", delete the current data, and "cancel", "cancel".
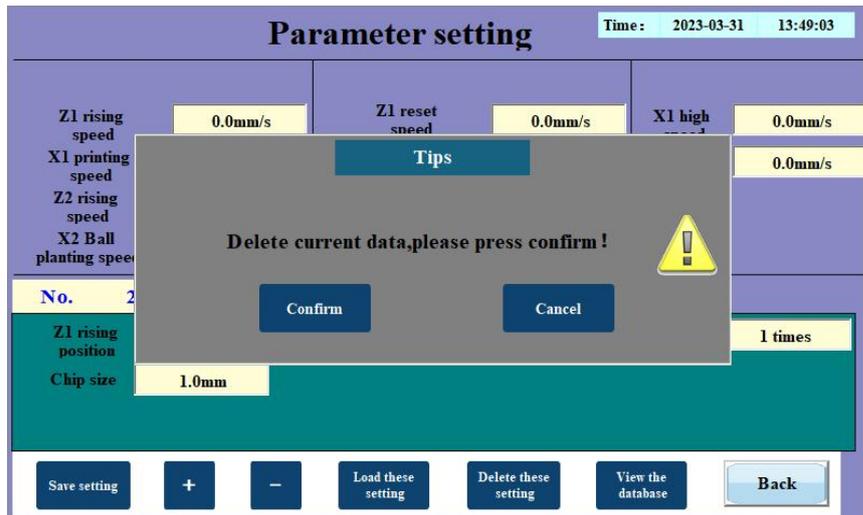
Figure 9

View data: view the formula group database, click "Load" to load the current formula group data, as shown in Figure 10.
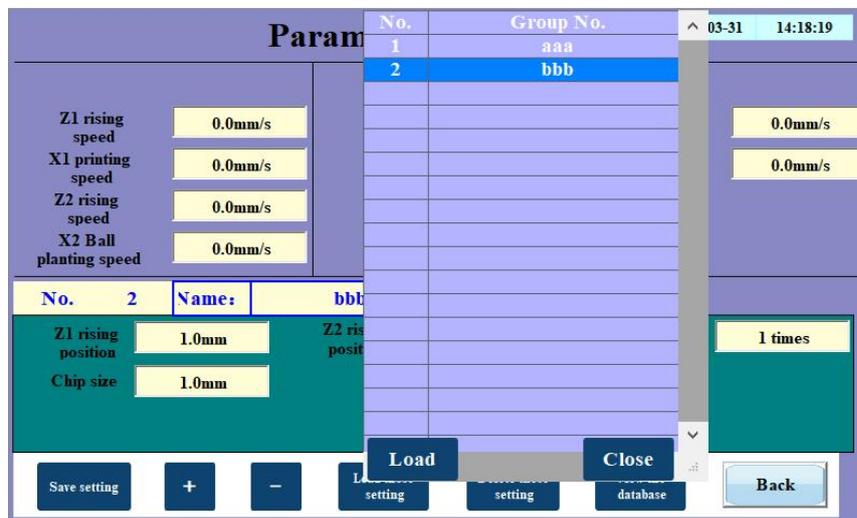

Figure 10

② **Manual interface: Click the next manual interface to enter the printing manual interface, as shown in Figure 11.**
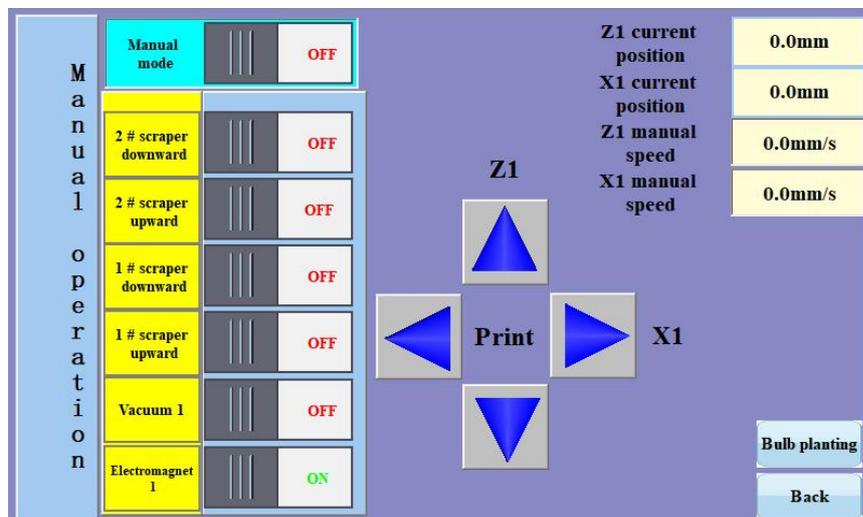

Figure 11

Specific introduction of the manual interface:

hand operation:

Click the "print" upper, left and right keys, can control the X1 / Z1 two axes for operation.

Z1 current position: Displays the current position of the printing lift Z-axis.

X1 Current Position: displays the current position of the print move X-axis.

Z1 manual speed: set the point moving speed of the printing Z-axis.

X1 Manual speed: Set the point movement speed of the ball.

Manual mode: After on, manual operation can be output.

Under the left cylinder: click the left scraper of the press cylinder out.

On the left cylinder: click the left scraper cylinder of the printing station.

Under the right cylinder: click the right scraper cylinder out.

On the right cylinder: click the right scraper cylinder of the printing station.

Printing vacuum: click to manually turn on or close the printing station vacuum.

Printing electromagnet: click to open or close the printing station electromagnet.

reballing: Click to enter the reballing manual operation interface, as shown in Figure 12.

Return: Click to return to the main operation interface.
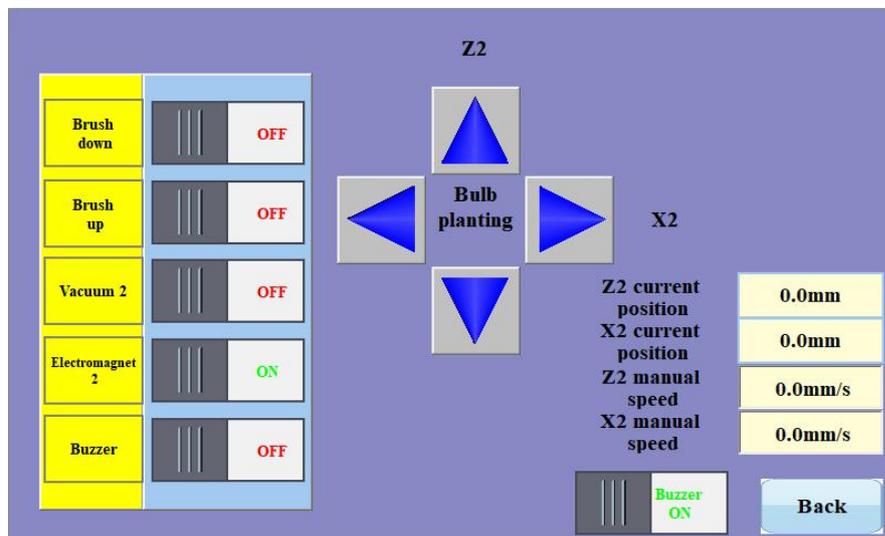
Figure 12

Under the cylinder: click the station cylinder out.

On the ball cylinder: click the printing station cylinder retraction.

Ball vacuum: click to manually open or close the ball station vacuum.

Ball electromagnet: Click to open or close the ball station electromagnet.

Bezzer: Click to manually test the buzzer status.

Z2 current position: displays the current position of the Z-axis.

X2 Current Position: displays the current position of the ball X-axis.

Z2 manual speed: Set the Z-axis point movement speed of the planting ball.

X2 Manual speed: Set the point movement speed of the ball.

Beeper: Turn the buzzer function on or off.

Return: Click on to return to the printing manual operation interface.

③ Parameter view: Click to view the formula group data of the current application, as shown in Figure 13, click OK to return to the debugging interface.

Figure 13

④` Close: Close the Menu interface

(2) Use method of "operation mode"

Return to the boot screen (Figure 1); click "Operation Mode" to enter the operation screen (Figure 14). Function introduction of operation mode:
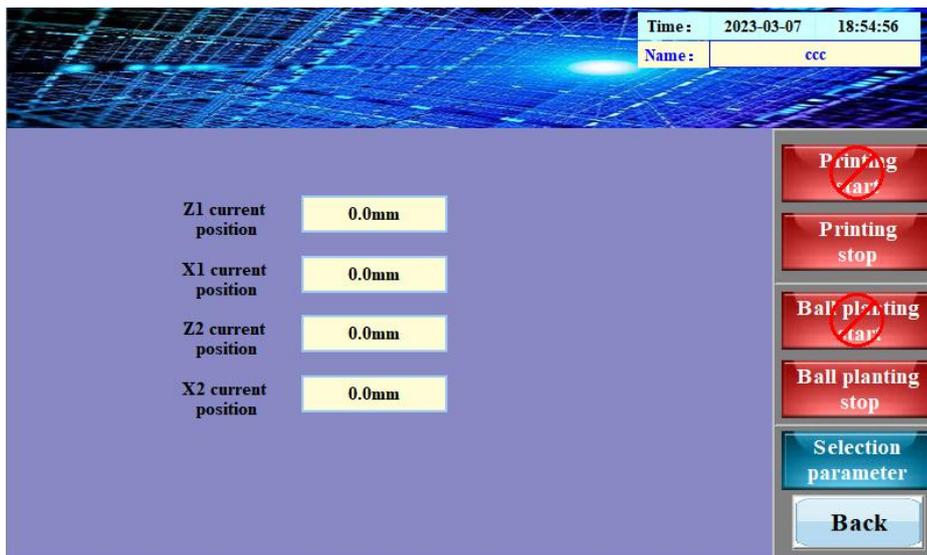

Figure 14

Select parameter: select the data stored in the database, click the button to pop up the storage data information list subwindow (Figure 15), then click the data group name (select the name, the current line becomes blue), then click "load" in the lower part of the subwindow, the group data will be selected and automatically switch to (Figure 16), and click "Application data" This set of data to be the operation parameters during the working process; click the "OK" button in (Figure 17), and the screen switches back to the operation mode interface of (Figure 15).
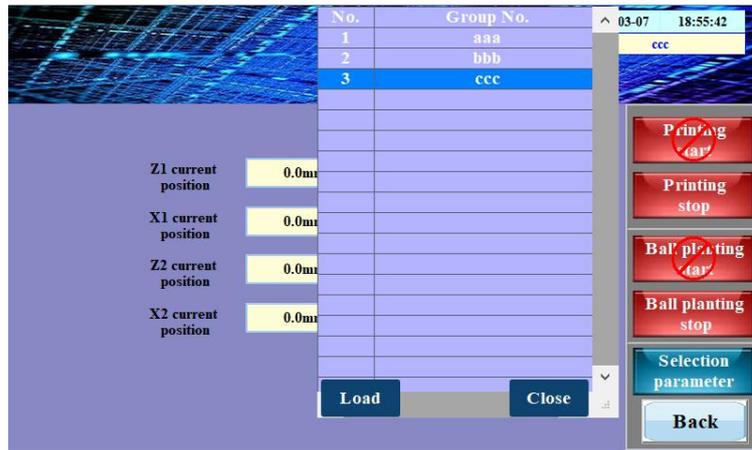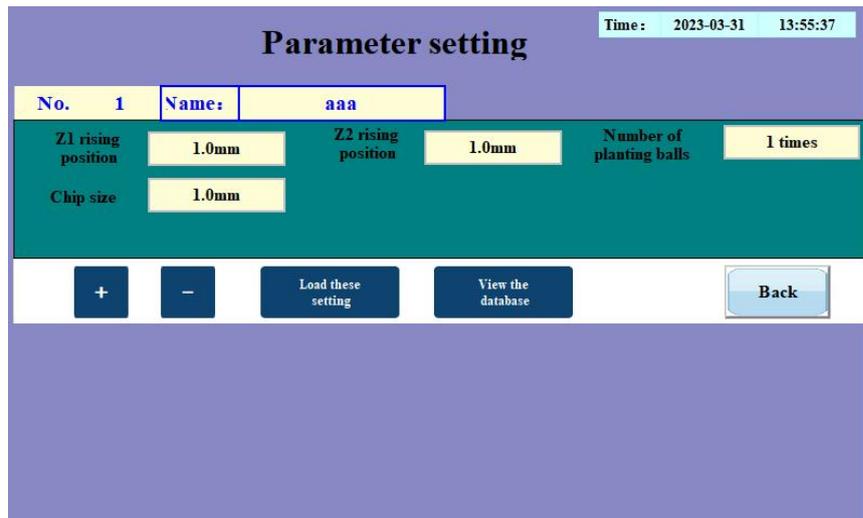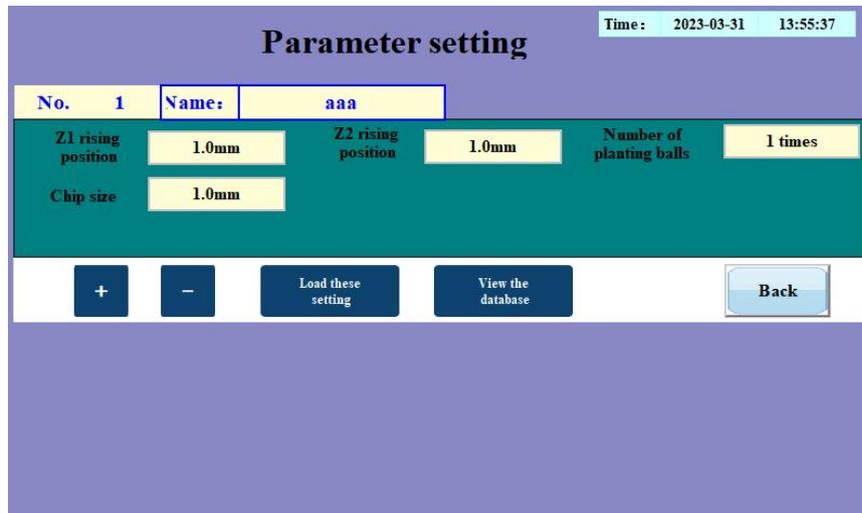
Figure 15

Figure 16

Figure 17

Note: "Operation mode" and "debugging mode" operate basically the same, the difference is:

"Debug mode" has user permission restrictions (need to enter a password to access), the parameters can be set and modified.

The "Operation mode" has no user permission limit (no password is required), and the parameters cannot be set and modified.

VI. Advanced Parameter Setting

The entry method of the advanced parameter setting interface is: after entering the debugging mode, click the hidden button in the upper left corner, pop up the password input interface (Figure 18), and enter the highest level password (the initial password is 719729, please change and save the password in time after starting up)
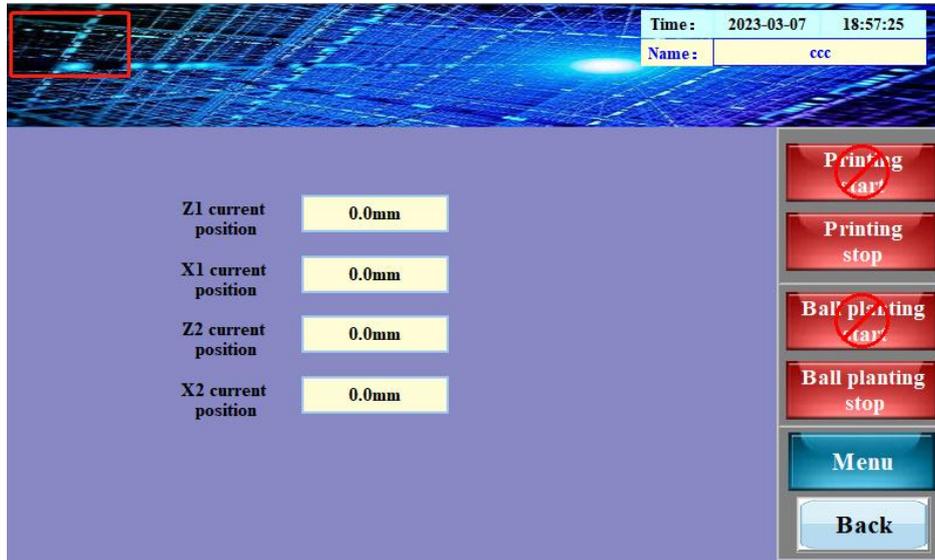

Figure 18

The advanced parameter interface is divided into three parts: I / O monitoring, password modification and parameter calibration. Figure 19.
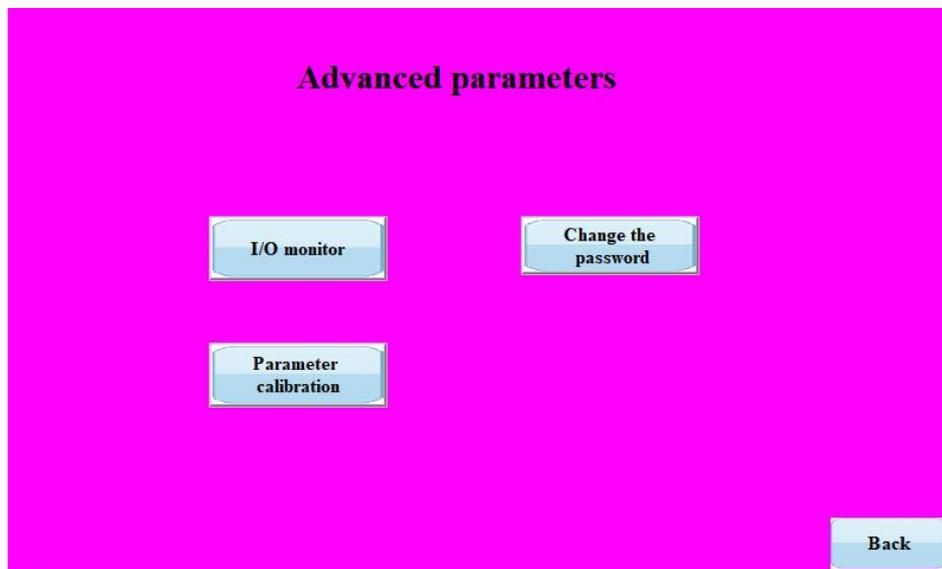

Figure 19

I / O monitoring: When problems occur, monitor each input and output signal, so as to quickly judge the problem according to the changes of the input and output signal. The specific picture is shown in Figure 20.

Figure 20

Password modification: the permission password can be modified and saved, the initial password of level 1 is 8888 level 2 initial password is 888888 level 3 initial password is 719729, as shown in Figure 21 (after opening the machine, please modify and save the initial password in time)
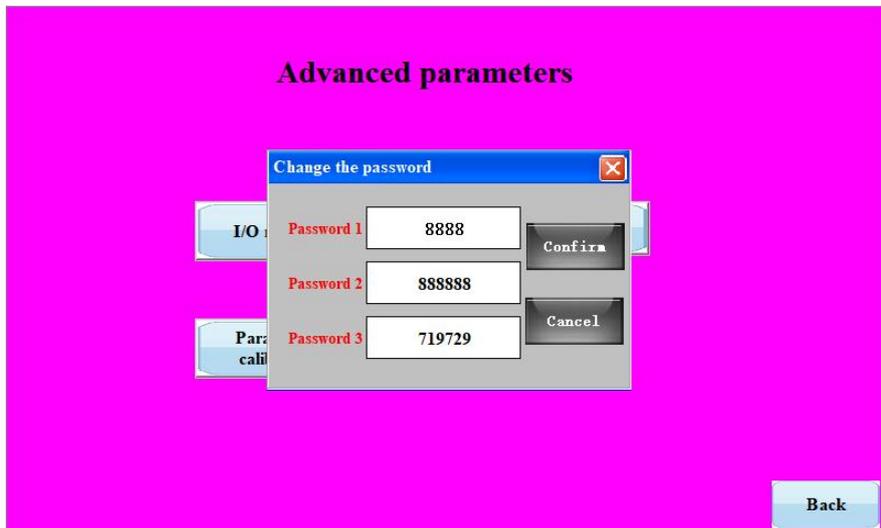

Figure 21

Parameter calibration: Set the printing and the ball center calibration by manually moving the X-axis and the center of the steel mesh, record the current position and fill in the interface.

Note: This operation is only for machine hardware replacement, contact under the guidance of our personnel.

VII. Equipment Repair and Maintenance

(1) Maintenance and replacement of the steel stencil

1. Click the stop button to reset the device;

2. Unsen the fixing nut and remove the mesh.

3. Use a dust-free cloth, dip in a little alcohol to wipe and clean the steel net.

(2) Machinery maintenance

1. Keep the machine console clean and clean at any time;

2. Clean the machine table regularly, clean up the residual tin paste and tin balls;

(3) the maintenance of the transmission parts

1. Keep the slide rail surface clean at any time, without sundries. And add lubricating oil regularly (at least once a month).

2. Check each transmission component regularly; whether there is loose, damage to the transmission mechanism, etc.

(4) Maintenance of the electrical parts

1. The surface of the touch screen, keep clean at any time, use LCD screen cleaning agent.

2. Check the line every quarter, find the line aging, to replace in time.

(5) Brush cleaning

1. Regularly replace and clean (refer to the replacement video).

2.Remove and replace the brush every 2 days. Use a dust-free cloth dipped in alcohol or cleaning agent to clean the brush as a whole, and finally blow dry with an air gun

VIII. Safety Precautions

(1) ZM-ZQ 150 reballing machine uses AC220V power supply, which may cause damage to the equipment and even endanger the personal safety of the operator. Therefore, the following matters must be strictly observed:

1. The power supply used in this product is AC220V, and the total power is 400W; before use, we must check whether the power supply in the use place can meet the standard for safe use.

2. Do not operate near flammable and explosive gases or liquids;

3. When operating the touch screen, strictly use metal or sharp objects with edges and corners, and avoid scratches on the surface of the touch screen;

4. If there are metal objects or liquids falling into the inside of the ball table, it should be immediately cut off the power supply, unplug the power supply, and clean up and check in time;

5. When the ball table is abnormal and does not work, immediately disconnect the power supply and notify the technical service personnel for maintenance;

(2) under any of the following circumstances, and other damage caused by such behavior is not within the scope of the company's guarantee!

1. Do not use the equipment according to the conditions described in the operating manual;

2. Reasons other than the company's products;

3. Renovation and maintenance not carried out by the Company;

4. Not used in accordance with the use method specified by the company's products;

5. The level of the company's science and technology at that time is unpredictable situation;

Ⅸ. Troubleshooting

1.Servo alarm: Contact our technical personnel to obtain the fault code under their guidance, in order to analyze and handle the fault.

2.Abnormal printing or ball vacuum adsorption: Check whether the chip or fixture is correctly placed and whether there are gaps; Check if the equipment air source is connected normally (equipment working air source: 0.5-0.7MPa); Check if there are any impurities such as solder balls between the fixture and the chip; Check if the vacuum air pipe has fallen off.

3. Abnormal signal detection of the cylinder in place: Check if the equipment's air source is connected normally; Check if the corresponding cylinder air pipe of the equipment has fallen off; Adjust the cylinder magnetic induction switch.

4.Motor abnormal noise: Check if the photoelectric limit switch is normal.

5. Equipment abnormal action: When the equipment encounters unpredictable faults, immediately press the emergency stop button and turn off the air switch. Contact our technical personnel for analysis and handling.