Installation Manuel of Automatic solder paste Printer

SOUTHERN MACHINERY

Product model: CC Series

Version: V14.0.0.0

Production Date: 22.12.2019

Foreword

Thank you for choosing High Precision Auto solder Paste Printer manufactured by **Shenzhen   southern machinery sales and service co.,ltd** (hereinafter referred to as "printer"). Please read and understand the instructions carefully, for guaranteeing correct use of the product. Any mal-operation or incorrect use may result in product's failure to run normally and service life reducing, even directly damage the product.

The instructions are only applicable to the product and subject to change without notice.

Catalogue

Chapter I Company profile

Shenzhen equipment Co., Ltd. has many years of experience in SMT equipment and peripheral equipment technology development, process operation, technology services and other experienced engineering and technology team. We adhere to the "stable design concept, advanced technology level, rigorous manufacturing process, reasonable sales price and efficient payment method. For the purpose, we are elaborately building an international first class brand automatic vision solder paste stencil printer.

Based on scientific research and development, closely following the most advanced technology development steps of the world SMT industry, and adopting the modern production process, we have successfully developed CC, HP, CC-1200, CC-1500 and other automatic printers with world-class technology. We are guided by the spirit of "customer centered" and the spirit of striving for excellence and self transcendence. We always provide customers with high stability, high quality products and professional quality services.

1.1 To customer

Thank you for the use of Shenzhen Equipment Co. Ltd. the automatic vision printer,

Please carefully read this manual, the proper use of this product, this manual applies to CC-1200, CC,HP series products. Our

products and manuals are constantly improving, welcome to contact us for the latest information!

Chapter II   Safety and prevention of accidents

This machine is made with advanced technology and has high safety and reliability. In spite of this, safety rules for machine maintenance and damage reduction are required and strict compliance

2.1 basic safety knowledge

The user must use the machine according to the relevant rules of safety operation to avoid the failure and accident. This manual explains the knowledge of machine safety usage in detail, and ensures users operate and maintain the machine according to the relevant safety regulations, so as to prevent accidents.

2.1.1 User Responsibilities

The user shall ensure that the machine is operated only by the following persons:

✪   Familiar with the basic occupation safety and prevention knowledge, and received the operation of training personnel.

✪   The safety instructions and warnings about the contents of chapters known.

2.1.2 machine operating conditions

✪   The machine should be kept stable and must not be inclined or unstable. No severe vibration is allowed

✪   The machine should be in a clean working environment, appropriate temperature and humidity, avoid dust effecting on the printing quality.

✪   The power wiring can only be operated by professional electrician.

✪   The installation and commissioning of the machine shall be carried out by specially trained personnel

✪   Electrical equipment should be in order.

✪   Power should be in a normally closed state, only allow qualified personnel to open operation.

✪   Electrical structure should avoid exposure in the air.

✪   Before starting the machine, anything is ready.

✪   Familiar with the operation procedure of the machine.

✪   Affect safety of harmful fault can be instant excluded.

2.1.3 machine usage

✪   This machine is suitable for SMT surface mount components of surface mount technology in solder paste, red glue solder printing, any other deviation from the intention to use the original design machine shall be regarded as incorrect.

2.1.4 proper use

✪   Comply with all instructions in the use of information.

✪   Comply with the system of regular inspection and maintenance of the machine.

❖   **2.1.5 The company refuses to take responsibility for the injury or damage caused by the following reasons**

❖   Incorrect use of the machine.

❖   Not properly authorized, installation, operation and maintenance of the machine; attachment not correct, safety protection device is defective or not working.

❖   Do not follow the instructions relating to the use of transport machinery, installation, operation, maintenance and authorization information setting。

❖   Change the structure of the machine; Change the control program of the machine at will.

❖   The seriously damage caused by force majeure and the uncertain object from outside

2.2 Safety and risk

Although the machine adopts advanced technology and carries out safety design, but if used improperly, the harm to the user,

the damage to the machine parts or other resources, and such as hazards still exist.

NOTICE: only in case of emergency can we press this switch button. This key is self locked when pressed. This button must be rotated clockwise to reset the machine before the machine starts working again

Indicator Lamp：

POWER ON (Green): power indicator light, when the power is switched on, the green indicator light is on; when the power is switched off, the green indicator is off.

START/STOP (blue): continues/pause button, when the operation (STOP) is needed, press this button and the yellow indicator light goes out. To continue operation (START), press this button and the yellow light is on.

RESET (white): Reset switch, when working normally, the white light is off; when reset, press this button and the white indicator light is on.

The main power switch: installed in the middle part of the machine right before (as shown). Turn on the switch button, the total power machine is connected.

The machine front door and the back door: It is used for the protection of machine printing worktable. In the operation setting dialog box of the operation system, the door switch can be set up, which ensures that only when the front and rear doors of the machine are closed, can they start to work.

tri coloured lamp：

Red light - indicates abnormal alarm of the machine.

Green light - indicate the machine works normally.

Yellow light - indicates that the machine is on standby.
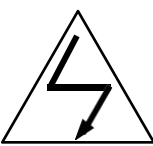
In the work, the system can self diagnose the failure, and can sound, light alarm and prompt the cause of the trouble.

Electronic control box： Equipped with Industrial Personal computer(IPC) and circuit control components etc.

2.2.1 safety warning signs

The safety warning label is attached to the machine in different locations to show that the personnel are installing, operating or maintaining the machine's attention. This machine USES the following safety warning labels::

WARNING 警告	
	MOVING PARTS INSIDE 里面移动部位
	KEEP YOUR HANDS OUT DURING OPERATION OTHERWISE, IT WILL CAUSE SERIOUS INJURY. 操作时手放外面 否则将造成严重伤害

WARNING 警告	
	HIGH VOLTAGE AREA 高压区域
	DO NOT TOUCH OTHERWISE, IT WILL CAUSE SERIOUS INJURY. 不要触摸 否则将造成严重伤害

警 告　WARNING	警 告　WARNING
高 压 注 意 **HIGH VOLTAGE**	手 指 注 意 **DO NOT TOUCH**
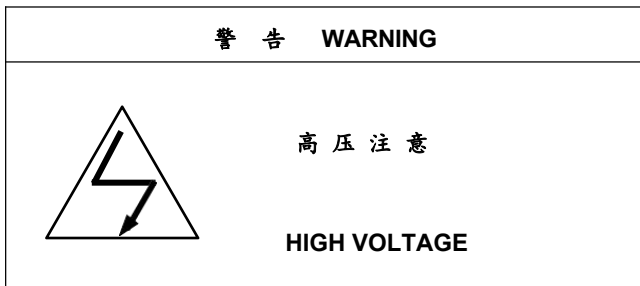
2.2.2 Routine safety operation inspection.

1) the machine is operated only when the safety device is in effect;

2) before turning on the machine switch, make sure that no one is harmed by the machine start;

3) check whether the safety device is damaged to ensure that the safety device works at least once the machine is out of work.

2.2.3 Operation and maintenance notice

✪　In automatic operation, the hand must be kept away from the equipment (especially when the PCB board is waiting for the material to appear in a stopped position, in fact, it will suddenly act)

✪　When the equipment is running, the operator can't leave.

✪　Do not touch your hands or other objects when the scraper head falls

✪　Check if the operation has been stopped when an error or repair is required

✪　Before checking and maintenance, make sure to turn off the main power switch and wait 3-5 minutes to make sure the equipment is fully shut down before you start working.

✪　When the machine is repaired, a warning sign should be attached to indicate the state of the machine in case the machine is started by others. Once the maintenance work is completed, the inspection shall be carried out to ensure that the installation is all installed and the function is normal.

✪　Use a specific lubricant

✪　Determine the standard maintenance period

✪　Clean the residual solder paste and then operate

✪　Make sure the power supply is grounded

✪　The special disk of the equipment is strictly forbidden to be used externally. It is strictly forbidden to carry out equipment independent operation on the industrial computer of the equipment; and it is not allowed to modify the machine parameters and procedure documents at will,

✪　When the machine is running normally, the illegal shutdown is strictly forbidden, and the illegal operation of software is strictly prohibited.

✪　It is strictly forbidden to modify the name of the software program folder, otherwise it may cause the program file to be lost

✪　The air used shall be filtered to remove dust, moisture, oil, etc.

2.2.4 Cleaning machine

✪ Users should use raw materials correctly, particularly in the use of solder paste which the shelf life is very short, the expired solder paste should be returned to the supplier or manufacturer. The remaining solder paste should be left as garbage disposal, couldn't be put back in the original packaging.

✪ In the process of use, should pay attention to add new solder paste, keep solder paste can roll forward when printing.

✪ If the solder paste contains solvents, the user should ensure that the ventilation is good and that the concentration of the vapors should be constantly monitored to avoid affecting the health of the operator.

✪ The cleaning paper used for cleaning is flammable and must follow the manufacturer's instructions

✪ The Stencil frame should be cleaned after use and put it in a safe place

✪ Clean the Stencil with ethanol and cleaning paper, and use compressed air to clean the stencil window. If the window is blocked, do not use hard metal needle to stab, avoid damage window shape.

✪ In the disposal of waste materials shall comply with the relevant provisions of the State Environmental Protection

2.2.6   Injury first aid

1. If swallow solder paste or glue, send to the hospital immediately.

2. If the solder paste or glue sticks to the skin, wash thoroughly with soapy water.

3. If solder paste or glue goes into the eye, use a large amount of water to wash.

2.2.7 Safe / dangerous

Attention :Before using the automatic printing machines, should check all safety devices.

Take Care

1. Turn off the main power switch before starting maintenance or repair.

2. If the safety device does not work, the machine should not be operated.

3. when operating the machine, it is not allowed to wear casual clothes.

4. Before operation, we must check whether the machine is damaged, whether there are loose parts, whether there are tools inside, so as not to cause accidents when the machine is running.

5.Always wear protective gloves when handling solder paste.

   Warning:

1) In the process of automatic printing, do not put your hand or head into the machine. Press the emergency brake switch button immediately and stop printing in case of emergency.

2) The operator should be especially careful when installing or unloading PCB board, because the hand may cause injury in the transportation system of PCB board.

PCB board.

1) In order to ensure the personal safety of the operator, the machine has the function of slowing down the operation speed of the whole machine when opening the front door and back door, and it cannot be shut down in any way.

2.Solder paste containing lead is a mixture of lead and tin with rosin base as flux, which is toxic to human body. Lead-free solder paste is recommended.

3) Inhalation of the flux can cause an allergic reaction; If the hand is contaminated, it can be brought into the body when eating, smoking or touching

Preventive measures:

1) Do not store the solder paste in the unsealed container, and do not keep the solder paste residue in the machine when it stops.

2) No steam is allowed in the machine.

3) Ensure the full ventilation and exhaust in the room, and pay attention to the environment quality when printing the solder paste. It is better to be windless and clean, the temperature is 23 ± 5 C°, and the relative humidity is less than 85%.

3) Do not touch other objects with contaminated hands.

5) Be sure to wash your hands before eating, smoking, and drinking water. Do not allow the solder paste to touch the skin and replace the contaminated clothing immediately.

Transport and delivery:

1) Machine packaging requirements: first use rainproof plastic cloth or vacuum plastic film to wrap the machine, and then pack it with wooden cases.

2) The wooden cases should be marked with anti - collision, anti - tilt, moistureproof and other markers.

3) Should remove the display, keyboard, tricolor lamp, scraper board and other vulnerable parts or non-fixed parts in transportation, and should be packed tightly in the box to prevent damage.

4) when the machine is transported, the moving parts should be fastened with the supporting parts. The slider shall be fixed with a red fixed clip, and the red lock will be removed when the machine is installed and used.

5) When transporting the work table plate and the supporting plate is fixed with long red bolts，then remove it when the machine is installed.

6) when transporting, the front and rear electrical boxes are fixed on the rack with red fixed blocks, and then removed it when the machine is installed and adjusted.

7) The base of the machine should be fastened with the bottom plate of the packing box.

8) The machine weighs about 1200Kg-1500KG and may need to be hoisted with a crane during transportation.

9) when the machine is received, open the packing box and check if the spare parts are missing according to the packing list

2) When the machine is lifted, the hoisting hook and the cushion board should be placed in the center of gravity of the machine.

Chapter III   Systems

3.1 functional characteristics

✪ Advanced upper visual/lower visual system, independent control and adjustment of lighting, high-speed moving camera, precise alignment of PCB and the stencil , ensuring printing accuracy of + 0.015mm.

✪ High precision servo motor drive and PC control, ensure the stability and precision of printing, unrestricted image pattern recognition technology, with + 0.01mm repeat positioning accuracy.

✪ The suspension type printing head has a high rigid structure with special design, and the squeegees pressure, speed and stroke are controlled by the computer servomotor to maintain uniform and stable printing quality. The squeegee beam is designed with special optimization structure and is light and beautiful.

✪ Optional manual/automatic the stencil cleaning function. Automatically and without auxiliary cleaning function, programmable control of dry, wet, or vacuum cleaning, cleaning time interval can be free to choose, can thoroughly remove the residue solder paste in the stencil, to ensure the quality of printing.

✪ Combined multi-function worktable can be set up by the PCB base plate to set the thimble and vacuum nozzle to make the clamping faster and easier.

✪ Multi-function plate processing equipment, can automatic positioning and holding all kinds of size and the thickness of the PCB board, with a mobile platform for the magnetic thimble and vacuum and vacuum box, effectively overcome the plate deformation, ensure uniform printing process.

✪ With "Windows 7 window" operation interface and rich software functions, it has a good man-machine dialogue environment, easy to operate, convenient, easy to learn and easy to use.

✪ It has the function of fault diagnosis, light alarm and prompt fault.

✪ The single/double-sided PCB substrate is available.

✪ Perfect printing of 0.3mm spacing of the pad.

Option: the following functions such as the user needs to choose, please and around the city of Shenzhen since the limited contact, as long as the increase in prices following the basic configuration of the price, you can meet your requirements.

✪ Balance type printing head
✪ rubber scraper
✪ Vacuum box
✪ Vacuum platform (for printing 0.4-0.6 mm thick thin plate)

3.2 SPECIFICATIONS & DESCRIPTION

3.2.1 optical system (Fiducially mark)

Fiducial Mark Detection	A CCD camera is used to identify the two landmarks on the stencil board and the substrate.
Alignment Mode	The position of PCB and the Stencil board was detected by camera, and the software of visual correction system was used to control the X - Y - Angle direction of the table, and the alignment of the stencil board and the substrate was realized.
Fiducial Mark Shape	Any shapes
Fiducial Mark Size	It can be made into a hole with various shapes of diameter or length of 1mm ~ 2.5mm, allowing a deviation of 10%.
Fiducial Mark Type	Open type: thin copper material with the surrounding Semi permeable type: transparent or translucent coating material available nickel, bronze etc.
Fiducial Mark Requair	Mark coating requirements for flat and smooth surface.

3.2.23.3 Dimension
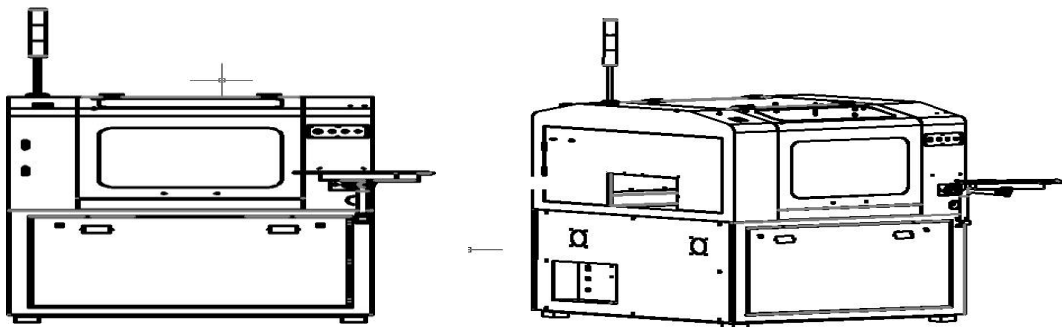
Figure 1-1machine dimension

3.4 The main parts of the system

The machine consists of three parts: mechanical, electrical and software

The mechanical part is composed of Z shaft lifting system platform, calibration system, transportation system, Stencil clamping system, PCB clamping system, visual motion system, squeegees motion system, squeegees lifting system etc.

the electric part is composed of IPC, driver, stepping motor and servo motor to signal monitoring system, pneumatic control system etc.

by the software. The motion control system, image processing system and operation interface and other components.

3.4.1 Transport system

Composition: including transport rail, transport belt wheel, and the convey belt, stepper motor, stopper device, guide rail width adjustment device.

Function: Automatic adjustment of the transportion of inlet and exit PCB, stop position and width of guide rail to suit different sizes of PCB.

3.4.2 The stencil clamping device

Component： Including the moving device and fixing device of the Stencil.

Function: The width of the clamping stencil can be adjusted, and the position of the stencil can be fixed and clamped.

3.4.3 PCB board flexible clamp and positioning device.

Component： Vacuum box component, vacuum platform, magnetic thimble, flexible clamping device, etc.

Function: The flexible PCB processing device can locate and clamp various sizes and thickness of PCB, with removable magnetic thimble and vacuum adsorption device to effectively control the deflection of PCB and prevent PCB deformation.

3.4.4 The Vision system

Component： It includes CCD movement part, CCD Camera device (camera, light source) and high resolution display. It is controlled by vision system software.

Function: Up / down vision system, independent control and adjustment of lighting, high speed moving camera ensures fast and accurate alignment of the PCB and the stencil, and unrestricted image pattern recognition technology has 0.01mm identification precision.

3.4.5 Squeegees system

Component : The printing head (including squeegees lifting stroke adjusting device, the blade installation part), squeegees beam and driving part (stepping motor, synchronous gear driver).

Function: The suspended printing head has a high rigid structure with special design, and the squeegees pressure and speed are controlled by computer and the servo diver, which is convenient to adjust and maintain uniform and stable printing quality.

3.4.6 Automatic stencil cleaning device

Component: It includes vacuum tube, vacuum generator, cleaning liquid storage and spray device, rolling device, lifting cylinder and so on. The stencil cleaning device is installed in the back of the visual system, through the visual system determines the cleaning process, automatic cleaning of the stencil bottom surface. When cleaning, roll up the rolled paper and move it to the bottom of the stencil. The used cleaning paper is constantly winding to another drum. The cleaning interval can be freely chosen, and the cleaning schedule can be set according to the printing schedule.When wet cleaning, when the cleaning fluid in the storage tank is not enough, the system will alarm display, and it should be filled with cleaning fluid at this time. Dry cleaning, wet cleaning, vacuum cleaning, the cycle can be adjusted freely.

Function: Programmable automatic stencil cleaning device, with dry, wet and vacuum cleaning methods, thoroughly remove the residual solder paste in the stencil to ensure the printing quality.

3.4.7 Adjustable printing table

Component: Including the Z shaft lifting device (lifting base, a lifting screw, a lifting guide rail, damper and servo motor etc), moveable device (screw, guide and control X, Y, moving direction of the servo motor to automatically adjust the printing table (platform), magnetic needle top).

Function: Through machine vision, automatic adjustment of X table, Y and direction position deviation, to achieve accurate alignment of printing stencil and PCB board.

3.4.8 Operation control system

It is composed of industrial control computer, control software, driver, stepper motor, servo motor, counter and photoelectric sensor. Using the Windows 7 operating system software, advanced intelligent control, greatly facilitates the user.

3.5 Operational principle

The deviation value between PCB Mark and the stencil Mark is accurately identified and calculated by a high-precision image visual

Chapter IV Installation and adjustment

4.1 Unpack

After unpacking, firstly, please do the following work.

1) Check the items listed in the packing list.

2) Check whether the parts of the machine are damaged, including the other package of monitors, keyboards, tricolor lights and squeegees plates, and reinstall them on the machine.

A. Before starting the machine, be sure to remove the fixture which fixed the CCD during the transportation (check picture 4-1-1)

B. Before starting the machine, be sure to remove the fixture which fixed the squeegee during the transportation.(check picture4-1-2)

C. Before starting the machine, be sure to remove the fixture which fixed the stencil during the transportation (check picture 4-1-3)

D. Before starting the machine, be sure to remove the fixture which fixed the transportation guide rail during the transportation.(check picture4-1-4)

E. Before starting the machine, be sure to remove the fixture which fixed the table during the transportation.(check picture 4-1-5).

F. Before starting the machine, be sure to remove the fixture which fixed the spray during the transportation.(check picture4-1-6

1) Check whether there are any loosening and falling off of the joints, and whether the transmission belt has any shedding.

2) Check whether the slider on the linear guide is slipping or not.

3) Check whether electrical components are fixed and whether contact is good..

4) Please read the operating instructions carefully before starting up.
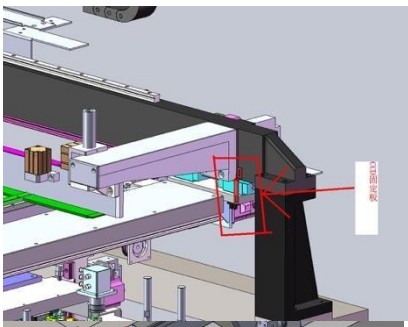
Picture 4-1-1 CCD fixture   Picture 4-1-2 squeegee fixture   Picture 4-1-3 stencil fixture
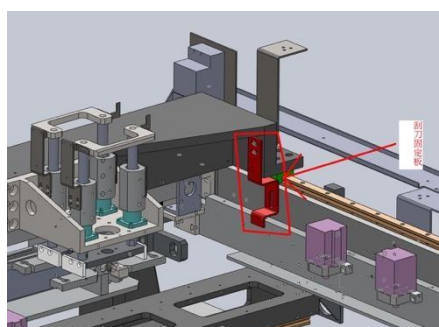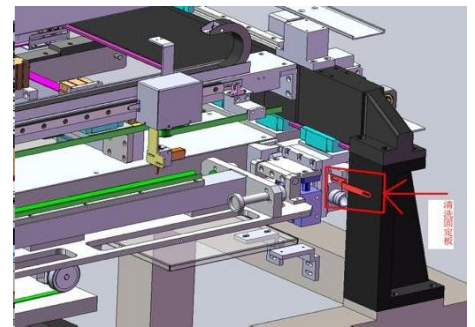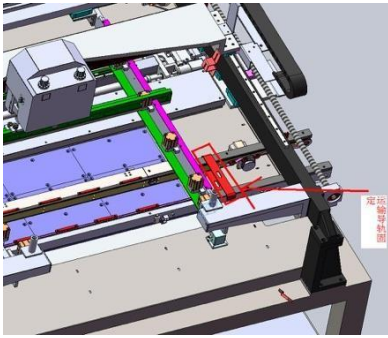
Picture 4-1-4Transportation guide rail fixture   picture 4-1-5 table fixture   picture 4-1-6 spray fixture
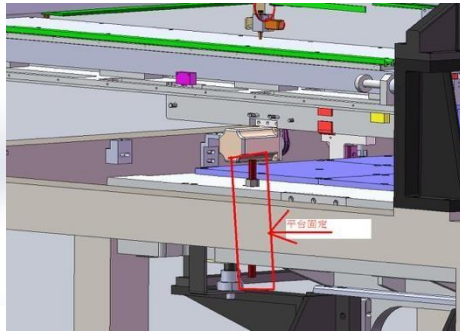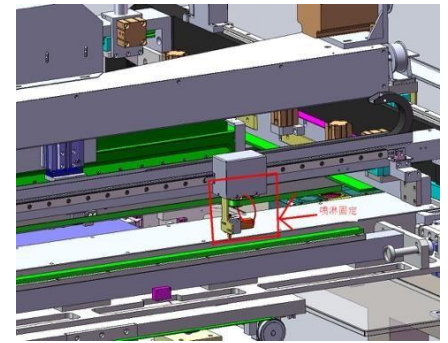
4.2 The operating environment

Ambient temperature: The best working environment temperature is between 23 ± 5 ℃

Relative humidity: The working environment of the series machine should be < 80%.

Storage conditions: Machine storage should be moisture-proof, dustproof, anti-exposure. During transportation, please avoid excessive humidity, vibration, pressure and mechanical shock.

Installation site: see machine outline, structure drawing

4.3 Equipment placement and height adjustment.

1. Move the machine to the selected location. Adjust the lower four adjustable feet of the machine (adjustable range: plus or minus 20mm) to determine the required equipment height.

2. Adjust the horizontal position. The adjustment method is below:

   A) Use a precision level gage (frame type level) to measure.

   B) With four adjustable feet, the machine can be adjusted repeatedly until it is completely horizontal..

   C) Lock the adjustable foot nut.

3. After the machine is returned to zero, ensure that the distance between the each side of the guide rail of the machine and the guide rail of the loader is greater more than or equal to 12MM, and the left and right positions of the machine guide rail are shown as follows:(check picture 4-2-1)
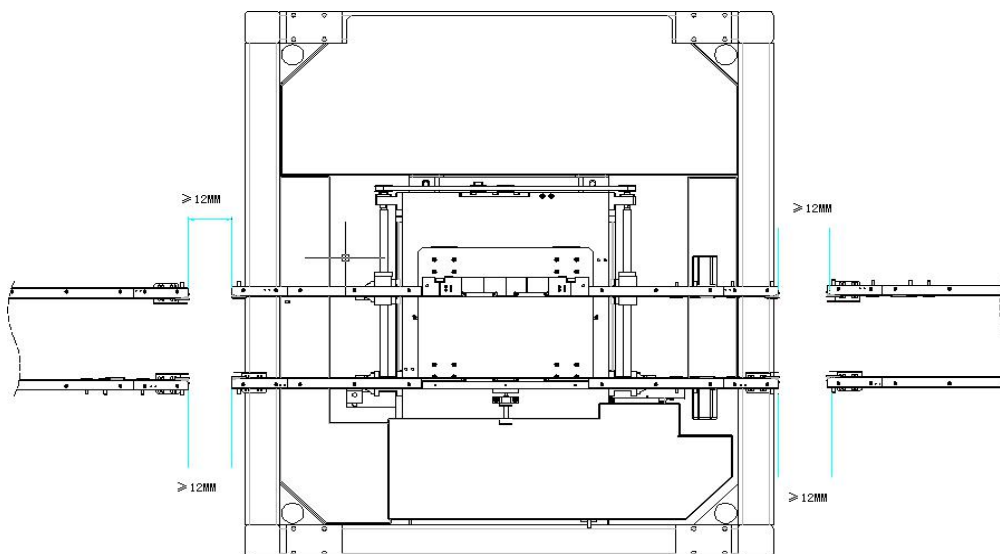
Picture 4-2-1 The machine guide rail distance position

4.4 Power source

1) Please use AC 220V and 50/60hz for stable power supply with rated current. If the voltage is not stable during the use of the machine, the user should prepare the stable power supply.

2) Please use the stable pressure of **4.5～6kgf/cm²** industrial air source

The air supply valve

Loader and unloader

Main power interface
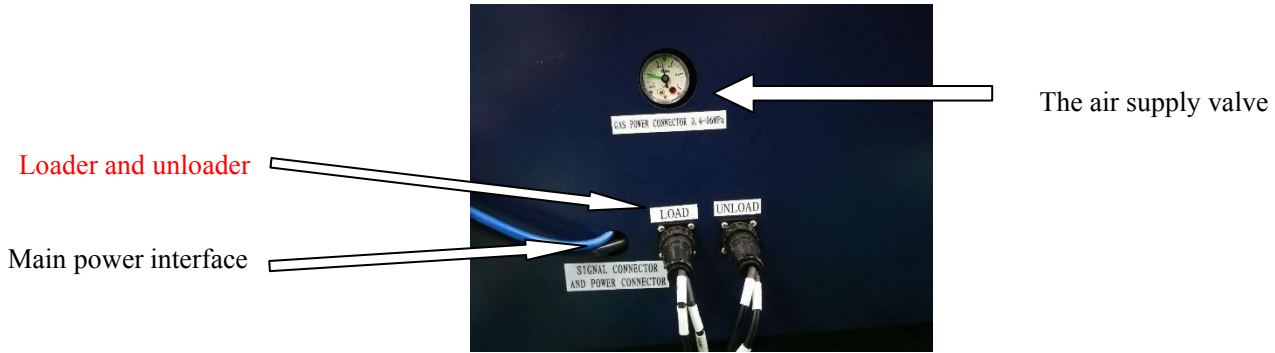
Picture 4-3-1

4.5 IPC control system installation

According to figure 2-4, the monitor, keyboard and mouse of the industrial computer control system are installed on the main machine of the printing machine, and connected with the industrial computerConnect, then switch on the power

Three color

Emergency button

LOGO

front door

Reset, start / pause, machine electric lights, LED lights switch (Note: from left to right)

Monito

Left inlet and exit

Left suction fan

The power indicator, the power switch (Note: from left to right)

Model number

Electrical source interface bit Check Picture 4-3-1
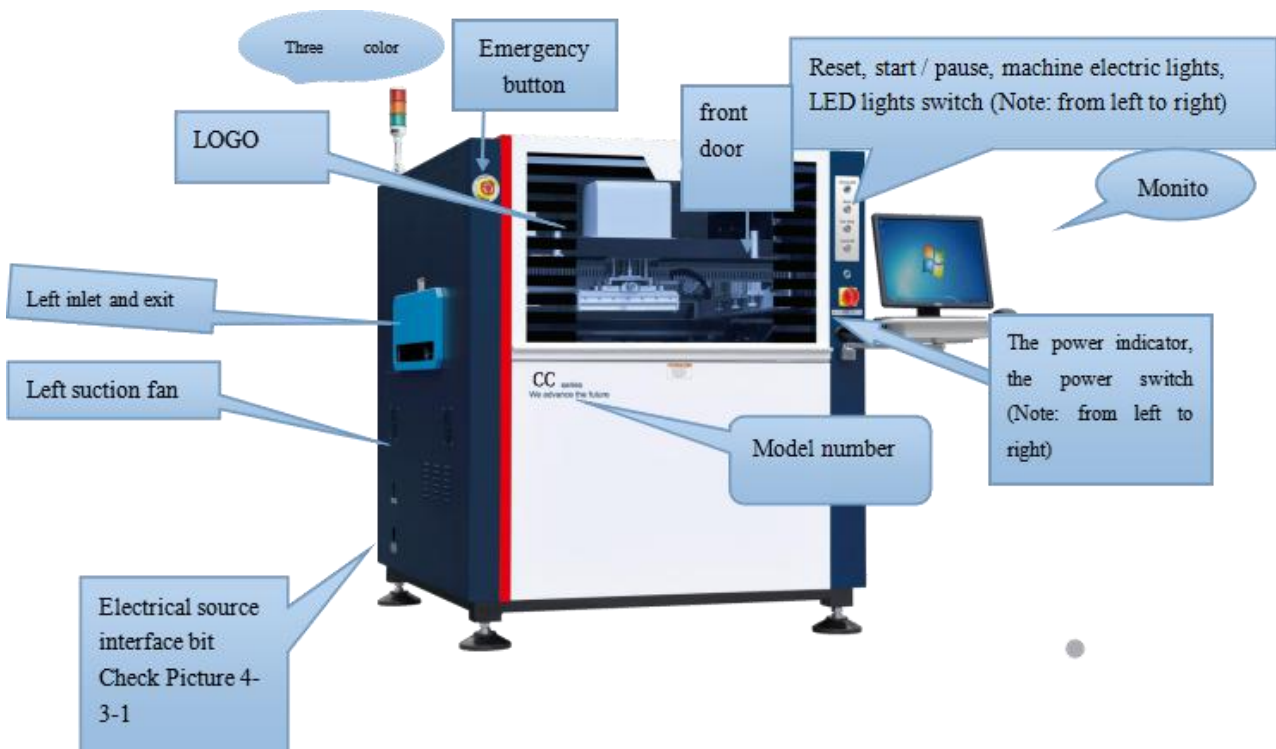
4.6 software installation

Picture 4-4-1

4.6.1 Software function profile

This software is the latest Aetter full automatic visual printing machine control software, with Windows win7 operation interface, powerful function, easy to set parameters, easy to operate, safe and reliable, easy to learn and easy to use

The application of this software in Aetter series automatic visual printing machine realizes the control of mechatronics, which greatly improves the automation degree and control precision of the machine and guarantees the printing quality.

This machine uses the software with the following functions:

1) setting of printing parameters.

2) machine parameter setting.

3) automatic adjustment of guide rail width.

4) visual system identification and automatic alignment of the stencil and PCB board.

5) the stencil and PCB board are automatically clamped.

6) automatic cleaning of the stencil.

7) automatic detection of I/O fault and sound and light alarm, indicating the cause of failure.

8) alarm record

9) production setting

10) automatic return to zero operation.

11) online PCB board counting.

12) quality inspection of printing.

4.6.2 software installation

The driver and operating system software have been installed before the machine is released. If you need to re install during the operation, please follow these steps..

1)   enter figure 4-5 when the host is just started.Use the keyboard up and down arrow to select key, select "OneKey Ghost" click "Enter" on the keyboard to Enter the computer's OneKey Ghost interface. (Figure 4-6)
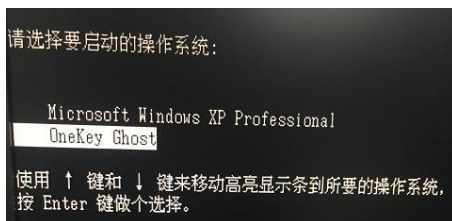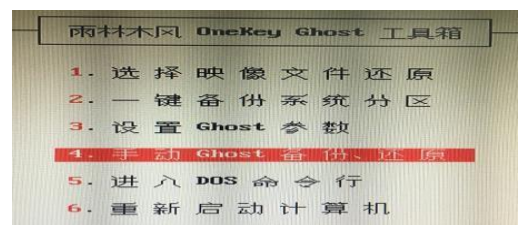
Figure4-5   Figure4-6

1)   To use this "OneKey Ghost" recovery system specific methods are as follows:
Figure 4-6 select "GHOST 4. manual backup, restore, press" click "Enter "key on the keyboard, enter the 4-7 interface. Select" OK ", click on the" Enter "key on the keyboard, enter the computer GHOST interface, use the keyboard selection key" Local "" Partition "then chooses" From Image "(see Figure 4-8).

Figure 4-8
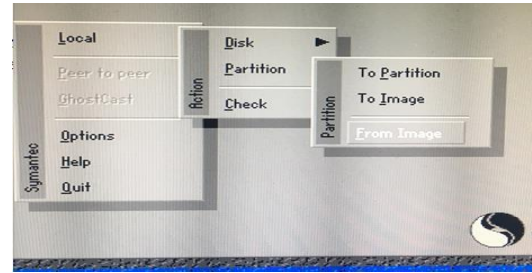
Figure 4-7

Use the keyboard to click "Enter" button, enter the 4-9 interface, using the keyboard keys to find backup system, the factory default exists "E disk" as shown in Figure 4-10. Find the GHO format file, "C-PAN.GHO".
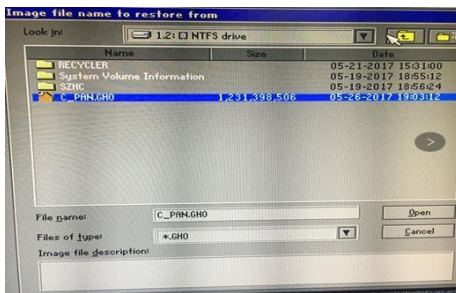
Figure 4-9
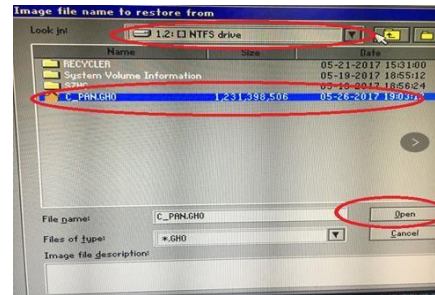
Figure 4-10

According to the above operation, have to click the "Enter" button, as shown in Figure 4-11. At this time, the selection of "Yes", click "Enter", the installation will appear as shown in Figure 4-1, reinstall the system installed, use the keyboard to choose "Reset Computer" system will reboot into the new system
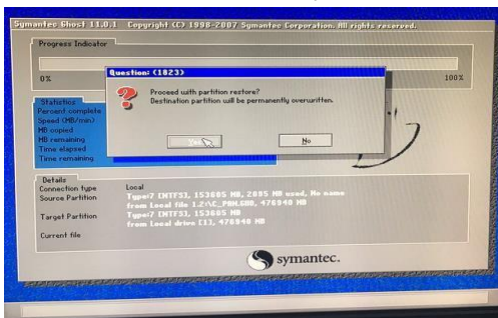
Figure4-11
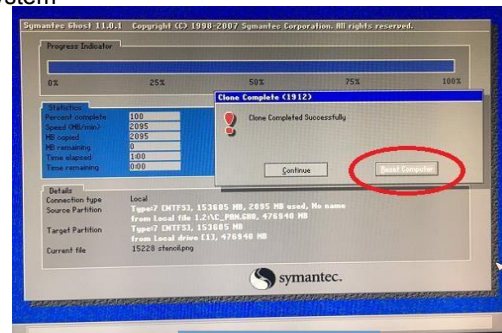
Figure4-12

Chapter V Production workflow

5.1 Check before starting

- ✪ Please check the resistance value of the main power switch is less than one ohm when is turn off. And when it is turn on the resistance value is +∞;
- ✪ Please check the resistance value of output end 36V DC is greater than 2 kilohm;
- ✪ Please check the resistance value of output end 24V DC is in the range of 0.5 to0.9 kilohm.
- ✪ Please check the resistance value of output end 12V DC is in the range of 0.3 to 0.4 kilohm.
- ✪ Please check the resistance value of output end 5V DC is in the range of 40 to 60 ohm.

✪ Please check the supply of voltage and air pressure is in accordance with the requirements

✪ Please check if all wiring connections are in good conditions, Whether there is short circuit (Please contact after sales if short circuit)

✪ Check whether the equipment has a sound grounding; the resistance value of earth wire and foot screw is less than 1 ohm.

✪ Check whether the pneumatic system is leak, if there is water in the air inlet filter device and whether it works normally.

✪ Check the tightness of machine conveyor belts is suitable.

✪ Check if there is irrelevant residue left in electric cabinet, and whether all sockets in the electric cabinet are good;

✪ Check if there are tools left in the machine inside;

✪ According to the requirements of the PCB, to prepare the corresponding screen and solder paste;

✪ Check whether magnetic thimble and vacuum suction cups are put to the worktable in accordance with the PCB size;;

✪ Check if the cleaning paper are put well, check the level in the tank (the level should be above the liquid level sensor);

✪ Check whether the emergency brake switch can get bumped；

✪ Check whether the tri-color light work normally, check the front and back doors are clogged.

Note: Please contact after-sales if you have any questions about starting inspection..

5.2 Preparation before production

5.2.1 Stencil preparation

1）The thickness of Stencil and the size of the window are directly related to the quality of solder paste printing, thus affecting the quality of products. The stencil should be wear-resistant, porous, burr free, toothless, smooth, smooth, solder paste permeable, stencil small tensile, good resilience and so on.

2) According to the size of the stencil frame, move the support plate to the ruler indicating the corresponding scale position of the

Stencil, then lock the Stencil frame. .

The digital requirements of the two sides of the stencil frame are the same

Figure 5-1

5.2.2 Solder Paste preparation

1. In SMT, solder paste selection is one of the key factors that affect the quality of products. Different solder paste determines the maximum speed of printing, and the viscosity, wettability, and the size of the metal powder will affect the final printing quality.

2. The selection of the solder paste should be considered according to the cleaning method, the weldability of the components and the circuit board, the plating of the plate, the pin distance of the components, and the needs of the users.

3. When the solder paste is selected, it should be used according to the instructions.

4. The solder paste can not be used directly from the freezer. It must be returned to the temperature at about 25 C at room temperature (specified according to the instructions). The solder paste temperature should be kept at the same temperature as the room temperature.

5. Before using solder paste, we must stir until the paste becomes thick paste, then stir the solder paste with the squeegees, and it will fall down naturally..

6. In use, the solder paste should be evenly coated on the stencil, and the solder paste is beyond the open position of the stencil,

1. Turn on the main power switch.

2. Enter the main screen printing machine interface, pop-up [Go Home]dialog box.

3. Click [Go Home] dialog "start" button, let the machine moving parts back to the origin site.

4. Go Home completion, access to the [permission management] page, select your own identity, except the operator, all three kinds of permissions need to enter the password to confirm the identity. After the identity is confirmed, the "Start" toolbar appears in the window..

5. Create a new file, click [start] the "new project" icon on the toolbar, [create a new directory] appear in the center of the window dialog box, type the new file name in the file directory bar, and click the "OK" button.

6. After the file is created successfully, the program automatically pops out [data entry first page] dialog box like figure 6-3-3. If the dialog is not popped, you can click the "data entry" icon and enter the data entry "first page" dialog box.

7. In the [data entry first page] dialog box, PCB is set up to enter the name, model, length, width, thickness and transportation speed parameters of the PCB board to be produced. (as introduced in detail in Chapter sixth).

8. Click the next button in the first page of data entry to enter data entry [second page]. Input the parameters of the PCB board in the data entry [second pages], such as the guideway clamping, the movement of the baffle cylinder, the adjustment options, the PCB positioning and the MARK point setting, etc.

1. PCB positioning:

1) Click "squeegees back", move it to the rear position;

2) Click "width adjustment" to automatically transfer the transport guide to the PCB width that is suitable for production.

3) Click the "moving baffle cylinder" to move the baffle cylinder to the PCB stop position. At this time, the PCB will be placed at the entrance of the transport guide.

4) Open the "stop cylinder switch" in the PCB positioning option, and the axis of the stop cylinder shaft down to the stop position.;

5) Click the "transportation switch" in the PCB positioning options , delivered the PCB to the stop cylinder position, eyes observe whether PCB is stopped in the middle of the transportation guide, if not, you will need to adjust the stop cylinder position - use "←、↑、→、↓" arrow keys to adjust it, until the PCB position is in the right place.

6) Close the "transport switch" and stop the transport; At the same time, the PCB suction plate valve is opened and the PCB board is vacuumed. Close the "stop cylinder"

7) Open the "platform top plate" switch, the table rises up; open the guide clamp switch to fix PCB board; click "CCD return", CCD Camera will return to original position; click " the Z axis up", PCB board will rise up to close to the stencil bottom position;

8) Observe the alignment of the stencil and PCB board, and adjust the stencil frame and positioning clamping device to align it with the PCB .

9) Close the "stencil frame fixed valve" and " stencil frame clamping valve", open the "Y orientation cylinder", fix and clamp the stencil.

10) Click the "Z axis down", make the work platform to take place.

10. In the data entry [page 2] dialog box, click the "MARK settings" button, the MARK setting bar is available.

1) The distance x and y from the edge of the PCB board are obtained respectively from the two diagonal PCB board markers.," " To double-click the red circle on the white picture, pop up an input dialog box and enter the corresponding X and Y values;

2) Collect the identification point, click the "PCB MARK 1" button in the MARK setting bar, enter the fingure 4-10 {custom template }interface

3) in the template [customization dialog] interface, according to the "manual speed setting. Use the arrow keys on the keyboard (←↑→↓) using the mouse to move to find the logo image, click" display "," image "," search "," set the template "," custom template "button or click the automatic positioning button, image positioning. Then, click "OK", back to the data

entry [page second] dialog box;

4) According to the 2), 3) steps, make the PCB Mark 2, stencil Mark 1, stencil Mark2 template ;

5) After the mark has been collected, click [second page] dialog box "confirm" button, the pop-up "whether to return or delivery platform in the prompt box, select" yes ", return to the main window screen printing machine.

Note: the above instructions are detailed in the sixth chapter

5.2.4 Squeegees installation

1. Open the machine front door.

2. Move the squeegee beam to the appropriate position, and install the clamper with blade onto the head of the squeegee;

3. Enter the main interface of the machine, click the "squeegees Settings" icon on the "start" toolbar, enter the "printing" dialog box, and make the setting of the squeegees lift stroke.;

4. The approprite Squeegee stroke adjustment: with the squeeges to the lowest position, the blade is right on the stencil.

Note: Before the blade is installed, check whether it is flat or not, no defect.

5.2.5 The squeegees pressure and speed

The pressure and the speed of squeegees are two important technological parameters in the printing of the stencil..

Squeegee speed: The principle of selection is that the speed of the squeegee is related to the stickiness of the solder paste and the minimum pin spacing of SMD on the PCB board. The viscosity is strong, while the speed of the squeegee is low, and vice versa. Generally start with small pressure, slowly increase, until the good solder paste is printed. The speed range is 15 ~ 50mm/s.The blade speed should be reduced properly when printing the fine spacing, generally 15 ~ 30mm/s, to increase the staining time of the solder paste at the window, thereby increasing the solder paste on the PCB solder; The speed is usually 30 ~ 50mm/s when printing wide spacing element.(> 0.5mm pitch is wide spacing, < 0.5mm pitch is fine spacing). The machine blade speed allows setting range of 0 ~ 80mm/s.

Squeegees pressure: *The pressure directly affects the printing effect, ensuring that the solder paste is clear, the surface is smooth and the thickness is suitable. The pressure is too small, the solder paste quantity is insufficient, produces the false welding; The pressure is too strong, resulting in bridge connection. Therefore, the blade pressure is generally set to 0.5 ~ 10kg..*

5.2.6 Snap-off speed and snap-off length

Snap-off speed: Refers to the separation speed of PCB and the Stencil, the starting separation speed must be very slow, then PCB can drop rapidly after complete separation. Slow separation is beneficial to the formation of clear edges of solder paste ,especially for the fine spacing. It is generally set to 3mm/s, fast separation can easily destroy the shape of the solder paste.

This machine allows setting range of 0 ~ 20mm/s.

The Separation time of PCB and the stencil: The time required for PCB to separate from the stencil after printing. The time is too long, it is easy to remain some solder paste on the bottom the stencil, the time is too short, not conducive to the standing of the solder paste. It is generally controlled in about one second.

The machine is used to control the variable with the length of the mold, which is generally set to 0.5 ~ 2mm.This machine allows setting range of 0 ~ 10mm..

5.3 Trial production

After the above preparation work is done , trial printing can be carried out. The operation method is following:

1. Click the "start" button in the upper right corner of the main interface and follow the instructions of the dialog box on the operating interface to complete the automatic printing of a PCB board (see the instructions in chapter 6 for details).

2. If the test result does not meet the quality requirements, the parameter setting or input printing error compensation value should be re-established (see chapter 6, 6.3.1.4 "production Settings" dialog box).If the inspection result meets the quality requirement, the production can be officially started.

3. Solder paste printing quality requirements:

This machine sets the thickness of solder paste between 0.1 and 0.3mm, and the area of solder paste cover welding pad is over 75%, which meets the quality requirement.

5.4 Production flow chart:

```
Turn on the main power → Open the air source → Turn on the machine power switch → Enter the machine main screen
                                                                                        ↓
Create a new file ← Pass word Select permissions ← Back to zero
        ↓                              ↓ Pass word
Parameter setting          Open existing file
        │                              ↓
        └──────────────→ Manual stencil position
                                   ↓
                              Save file
                                   ↓
                           Start production
                                   ↓
                              PCB enter ←┄┄┄┄┄┄┄
                                   ↓                    Continue to
                             PCB located               produce
                                   ↓
                          Vision correction
                                   ↓
                        Printing solder paste
                                   ↓
                          Cleaning stencil ──────→
                                   ↓
                           Stop production
                                   ↓                Turn off the total power
                           Drop out interface
                                   ↓                        ↑
Turn off the main power    OMATION  Turn Off the air switch
```

Chapter VI　OSD Operating System Description

6.1 system start-up

Turn on the main power switch of the machine and automatically enter the main window screen:

Turn on the main power switch ——→ turn on the air source switch ⟶ turn on the main power switch of the machine ⟶ enter ⟶

the main screen of the machine

6.2 Main window composition

Main screen toolbar

Time　display

Main screen tool 2

| Simplified Chinese | I/O Check | Motion | Add Alcohol | Cleaning | Squeegee To Rear | Squeegee To Front | | 2021-08-17　08:59:25 |

New　Open　Data Input
Produce Setting　Home　By Pass
Reset　Mute　TroubleGuide
Alarm Record　Product Report　SPC
Calibration　Manual Clean　Machine Parameter
Config SQG　Production　Exit

Start　Menu　Help

Start　Pause　Stop

User Level
Manufacturer

Production Status
Product Stop...

Program File
D:\SZHC\data\1\1.prj
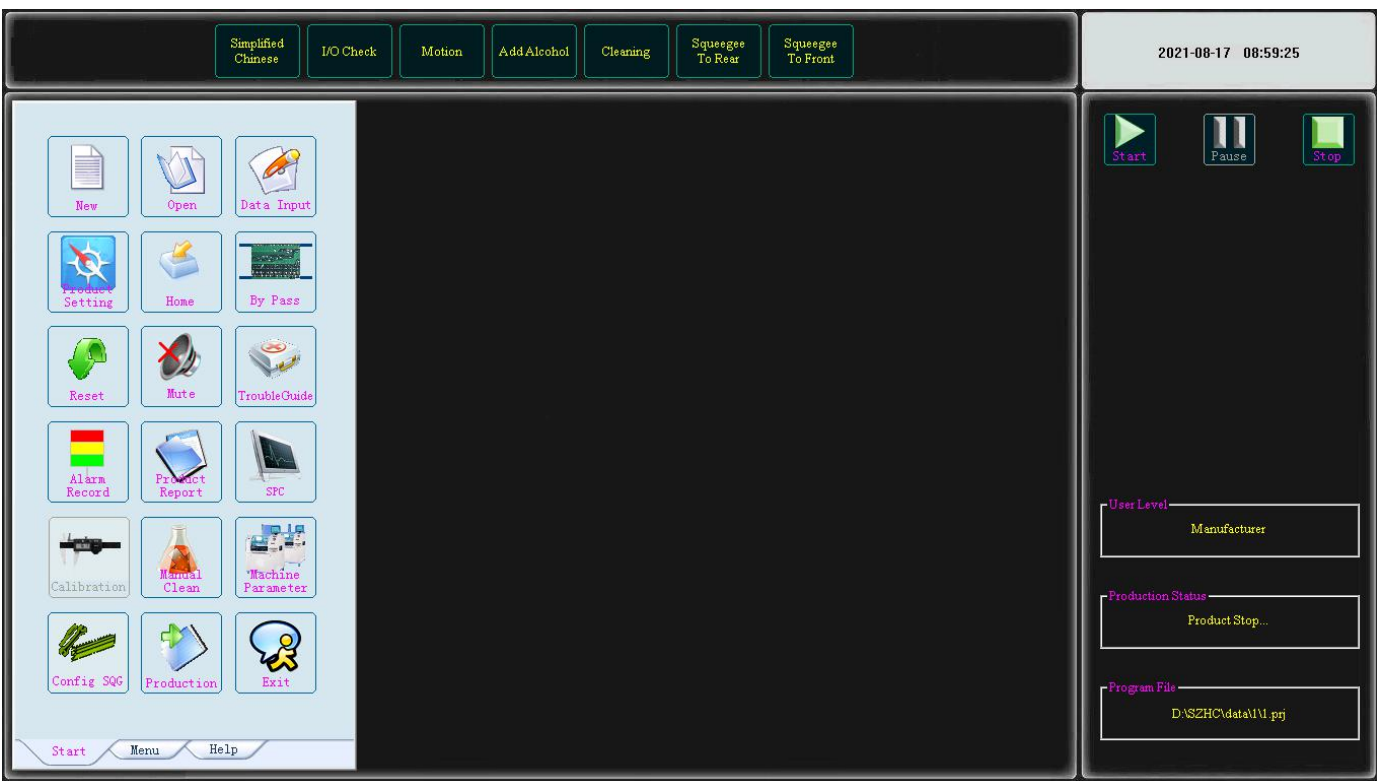
Figure 6-1　Main window screen

The main window consists of five parts:

◆　　Main menu

◆　　Main screen toolbar 1

◆　　Main screen toolbar 2

◆　　Time display bar

◆　　status bar

6.3 main menu

As shown in Figure 6-2, the main menu contains [start], [menu], [help] three control commands, and the start toolbar has been displayed on the main screen

Figure 6-2 main menu

6.3.1.0 Start toolbar

Click on the main menu of each item appears in the main interface has left the toolbar. If click [start], [start] toolbar appears as shown in Figure 6-3, can carry out new project [open the project][data entry, production] [setting] [machine zero] [PCB transport], [reset] , turn off the buzzer, [fault query, alarm records], [the establishment of production report, SPC], calibration, manual cleaning machine, set parameters, squeegees, production [interface], [exit] and other operations.

Figure 6-3 〈start〉 tool bar

6.3.1.1 Create new file

Click the toolbar in the "new file" icon to create a new directory] [pop-up dialog box, enter the correct project name in the file directory, click "OK" button to complete the creation of the new project; click "Cancel" to cancel the create a new directory. As shown in figure 6-4:

Figure 6-4 〈make new file〉dialog box

6.3.1.2 Open File

Click the open file button in the start toolbar, and the pop-up dialog box displays the list of information, including the file name, the

last modified date, and the storage location, as shown in figure 6-5:
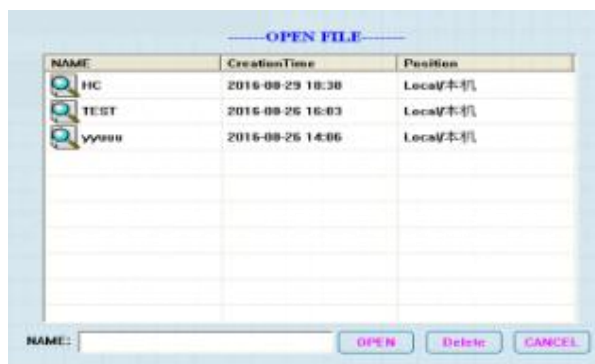
Figure 6-5 〈OPEN FILE〉 dialog box

In the file list, select the file that you want to open, and the name bar displays the selected file name

- ✪   Select the file you want to open, click the open button to open the file, and the calling program dialog box is closed. The main screen's status bar displays the currently open file

- ✪   Select the file that you want to delete, click the delete button, delete the selected file, return to the caller dialog box, and wait for the next instruction

- ✪   Click the Cancel button to quit the calling dialog box and do nothing

6.3.1.3 Data entry

This function is to set or modify the PCB parameter settings and squeegees pressure, transportation, printing, cleaning and other parameters, the operation methods as follows:

1. Click the Toolbar "data entry" icon pop-up [page 1] data entry dialog box, in the dialog box can be "PCB settings", "stencil settings", "Transport Settings", "control" (the system default is automatic), "printing settings", "release settings", "cleaning set", " picture settings", "scheduled production number" setting parameters. As shown in figure 6-6:

Figure 6-6 〈date entry page1〉dialog box

✪ Transport setting bar: the transport width is automatically generated according to "PCB board width +1", and the user can not change it. If necessary, the input value must be greater th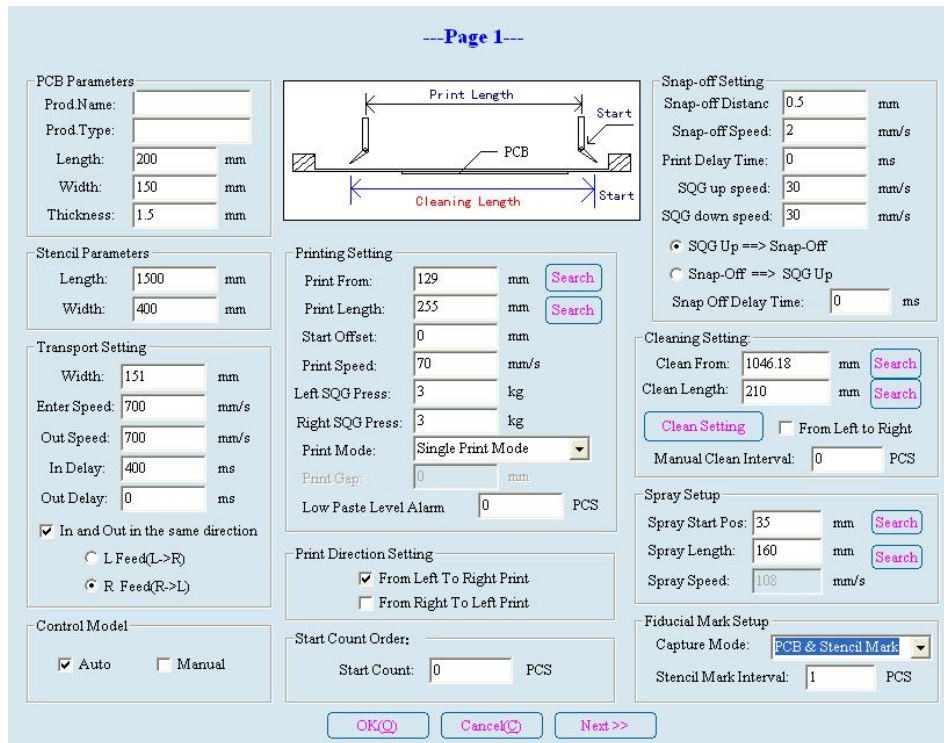an the width of PCB board. The speed of transportation, the delay in place and the direction of the access board, the user can set according to his own needs..

✪ Control mode bar: the default control mode is automatic, and can be changed it by manual if needed. Select "automatic" button, the production, cleaning and other operation automatic completion; Choose the manual, then the production is divided into several steps, need to be identified, cleaning method is changed to "hand washing", in the process of normal production, the machine will according to the figure 6-3-3 dialog the entered "cleaning intervals" finish production stop automatically after a certain number of products, and "artificial cleaning" dialog box, as shown in figure 6-3-18, waiting for manual cleaning screen.

✪ Printing setting bar: printing starting point and the length of the numerical automatically generated by the software, the user can also modify according to the actual situation of production and click the "move" button next to the printing starting point, the printing shaft will move to the starting location; Click the "move" button next to the print length button, and the print axis will move to the printing terminal position. Printing method -- single scraping, double scraping..

✪ Predetermined production quantity column: can set the number of PCB board

✪ The snap-off column Settings: snap-off length, snap-off speed, pause time, squeegees slow rise and squeegees slow down, the user can according to the need to change it, but it is recommended to use the default values. There are two types of snap-off ways: firstly release the squeegees then snap-off, or firstly snap-off then release the squeegees, after choosing the way of firstly snap-off then release the squeegees, then can set the "snap-off height"

✪ Cleaning setting bar: the starting value of cleaning can not be set. After entering the width of PCB board, the cleaning starting point will be automatically generated. Click the "move" button next to the cleaning starting point, and the printing axis moves to the starting position; Select "clean back and forth", in the normal production process, implement two-way cleaning. Click the "clean advanced Settings" button to enter the dialog box of figure 6-3-4.

Figure6-7 〈cleaning advanced option〉

➤ Three types of Cleaning methods: wet , dry and vacuum cleaning, after each cleaning method has a washing time Settings, in addition, this interface can also enter the cleaning interval, cleaning speed, cleaning liquid and cleaning delay transfer paper number, users can set up according to their own needs.

✪   The image setting bar: can set the visual correction method -- double or single image, select double images when there is a stencil, and select single images when there is no stencil; the printing accuracy can also be set.

Parameter setting: if the input value exceeds the set range of the machine, the screen will display the error message of "input beyond range" and tell you the range of machine Settings for the input parameter.

2.   After the above parameters are set, click "ok" on the interface of data entry first page and return to the main window screen. Click cancel, cancel the above Settings, the machine is still the previous input parameter, and back to the main window screen..

3. Select [data entry page 1] dialog box on the "next > >", will pop up "the next step is to adjust the transport conveyor width" prompt dialog box, click the "ok", then adjust the guide rail width into [the data entry page 2]. Figure 6 - 8 :
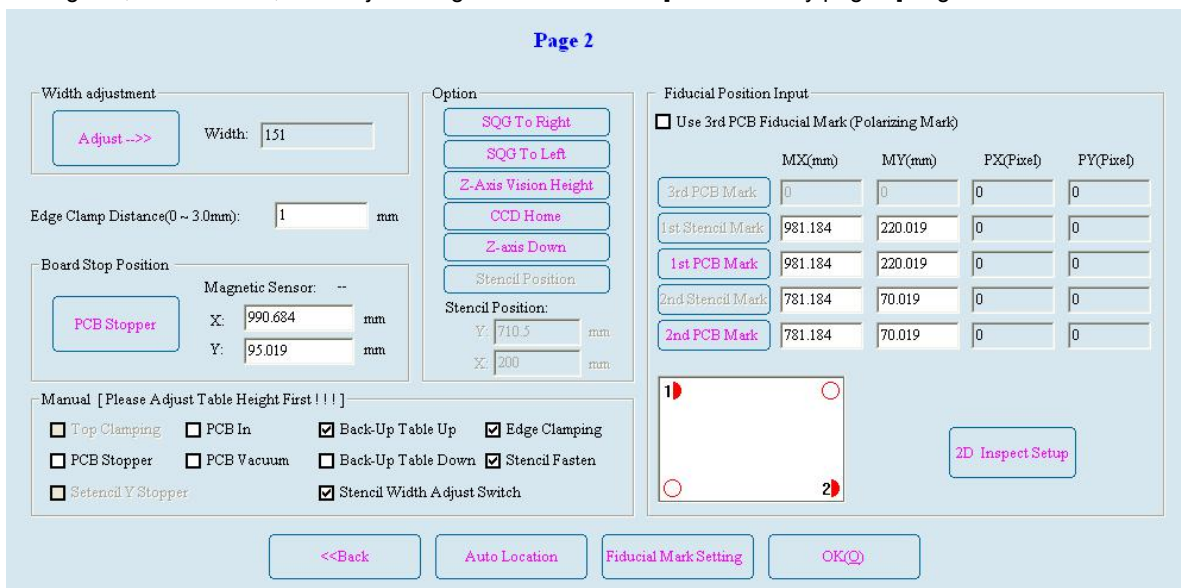
Figur6-8 〈Data entry, pages2 〉 dialog box

In [page second] data entry dialog box can be "width adjust", "baffle cylinder moves", "squeegees back," Z axis to take place ","

CCD return "," Z axis rising "," adjusting the squeegees positioning and other parameters.

✪   Guide rail width adjustment column: click "adjust" button, guide rail will be adjusted according to the width shown on the right.

✪ Baffle cylinder movement bar: click "move baffle cylinder position", and the baffle cylinder will move according to the X and Y of the stop sensor.

✪ PCB positioning bar: "pressing plate in place" will only be used when producing thin PCB, Do not use it when producing thick PCB, and get damaging the pressure plate device.

✪ Adjust the options bar, click on the "Z axis up" button, complete the Z axis rise, become the Z axis up button sag "Z axis decline" button, click on the "Z" button and complete the Z axis down movements, the Z axis decline button protruding into the Z axis up button.

✪ MARK point setting: "2D check template setting" is not available by default. If the user needs to use this function, need to contact the manufacturer.

✪ **PCB positioning debugging operations**

The first line to confirm the PCB lifting platform ⟶ Moving baffle cylinder ⟶ Open the limit cylinder ⟶ Turn on the transport switch ⟶ PCB enters the board from the entrance ⟶ Close the transport switch ⟶ Close the limit cylinder (back) ⟶ Platform roof ⟶ Guide clamp ⟶ CCD return ⟶ Turn on the Z axis and raise the hand alignment frame (align the stencil position with the PCB pad) ⟶ Open the stencil frame retaining valve ⟶ Open the frame clamp valve ⟶ The Z axis drops (the Z axis falls to the image taking position) ⟶ Click the next button, select the PCB board, and exit the [data entry second page] dialog box

Note: click on the "Z axis up" button to place the PCB support block at the top of the roof, and manually place the PCB on the support block to confirm whether the upper surface of the PCB panel is flush with the surface of the middle platen of the guide rail.

1) Click [data entry page 2] dialog box in the lower left corner of the "auto location" button to set up the PCB location.

2) Mark point collection: Click the "Z axis back to the image position" button to make the working table move to the image location. Click the "MARK point Settings" button and MARK point Settings options are available.

3) Choose custom PCB marking point, click on the [data entry page 2] dialog box in the picture of the white on the corresponding hollow red circle, red become solid red semicircle hollow circle, and the pop-up Mark point location Settings dialog box, and PCB for the landmark edge to the distance of the x, y, machine of more efficient and convenient to find the landmark. As shown in figure 6-9:

Figre6-9 〈Mark Input〉dialog bar

Click PCB Mark 1 to appear in the template customization dialog box, as shown in Figure 6-10

Figure 6-10 〈 Make Template 〉

✪ LED control bar with five single box labelled Arabic Numbers, these radio buttons in varying degrees, to adjust the brightness of the picture, when making PCB landmark image acquisition, the user can choose different buttons to adjust the brightness of LED1, LED2, in order to collect images to more clearly.In the process of image acquisition, users can also select different buttons to adjust the brightness of LED3 and LED4, so as to achieve better results.

✪ Search the marker bar: select the type of marker according to the actual situation

5) Click the figure 6-3-7 "move" in the dialog box, and then according to the dialog < manual movement speed Settings > move the arrow keys on the keyboard with the hand (← ↑ → ↓) or use the mouse to move, to find the logo image, then click the "matching" image orientation (i.e. red square landmark images inclusive) shown in Figure 6-11:
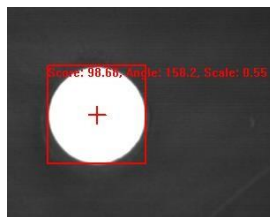

Figure 6-11 Landmark image

6) In Figure 6-11 the template control bar, click the button to confirm the continuous box below (the effect of this method and the "matching"), and then click "confirm" button to return [page second] data entry dialog box shown in Figure 6-12.

| Real-time display | → | Collect picture | → | Search area | → | Setup Template | → | Custom template |
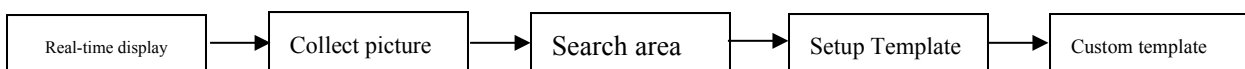
Figure6–12

7) In FIG. 6-3-7[template customization] dialog box, click "confirm" in the lower right corner, the mark point is collected, the data is saved, and the dialog box is returned to [data entry page 2].Click cancel, cancel this collection, image data is not saved, return to [data entry to page 2] window.

8) Refer to operation 7,8,9,10, find "[stencil mark 1], [stencil mark 2]", "[PCB mark 2]", "Mx", "My", "Px", "Py", value

6.3.1.4 Production settings

Click the Toolbar "product Settings" icon pop-up dialog box [set] to quickly change the production and transportation, visual inspection, cleaning, printing and other production, detection and other settings set (such as door switch sensor settings). At the same time it can compensate the working table lifting error and squeegee stroke error. As shown in figure 6-16:

Product Setting

Product Settings
- ☑ Vision calibration
- ☐ PatternMatch Result
- ☑ Image Display
- ☐ 2D Inspection
- ☑ Clean
- ☑ Print
- ☑ Simulate Product
- ☐ Display Adjust Window

Other Settings
- ☑ Use Buzzer
- ☐ Gate Safety Sensor
- ☐ Use Wiper paper sensor
- ☐ Use solvent sensor
- ☐ Z Down to Print Pos First Clamp
- ☐ Use PCB Vacuum
- ☐ Use Coarse Resolution
- ☐ Use SPI Offset Adjust

Figure 6-16 〈production setting〉

6.3.1.5 Machine zeroing

1. Click the Toolbar "machine zero" icon in the main window will pop-up "now return to zero operation?" dialog box, select "no", the machine still return to the main window screen; "yes", [zero] pop-up dialog box, as shown in figure 6-17..

2. Click the start button, the machine zero operation on the main screen appears in the upper right corner of the current location [dialog box], display each axis current coordinates, not complete zero operation, click "exit" at this time, some function on the machine is not available. As shown in figure 6-18:
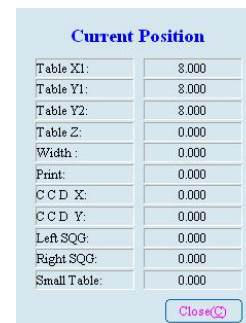
SM Automatic Screen Printer

Wait.........Home Position

Start(S)   Exit(X)

Current Position	
Table X1:	8.000
Table Y1:	8.000
Table Y2:	8.000
Table Z:	0.000
Width :	0.000
Print:	0.000
C C D X:	0.000
C C D Y:	0.000
Left SQG:	0.000
Right SQG:	0.000
Small Table:	0.000

Close(C)

figure6-17 〈Machine zeroing〉

figure 6-18 〈current position〉

When the machine is returned to zero, click "exit" to display the main interface, which activates the operation buttons in the toolbar.

6.3.1.6 PCB transport

1. In the start toolbar, click the "PCB transport" icon, the dialog box appears, which is used only for board operations, without printing or checking function, as shown in figure 6-19:

2. You can set the number of boards, click " PCB transport start", transport system work, every board, [transport PCB] dialog box will display the number of PCB boards; Click "reset transport PCB", the number of boards has been cleared, and the number of boards can be entered again. Click exit to return to the main window screen.. Picture.

----By Pass----

Quantity: [0] pcs

Qty for Stop Production [0] pcs

Start   Reset PCB Qty   Exit(X)
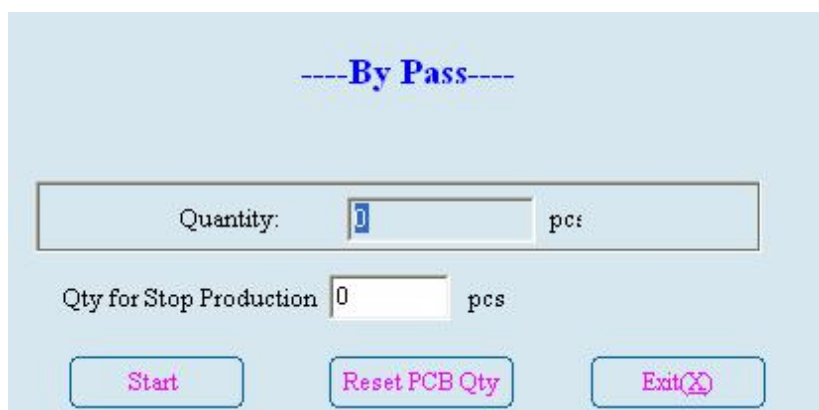
6.3.1.7 Reset

When the machine breaks down or presses the emergency brake, the screen displays [alarm] dialog box and the buzzer alarm. As shown in figure 6-3-14, the following operations are performed::

Figure6-20 【Alarms】

1. Select "turn off the buzzer" and stop the buzzer;

2. After troubleshooting, click the "close alarm window" or "clear the alarm" button to return to the main window.

3. At this time, multiple operation buttons are turned off. Click the "reset" icon on the start toolbar and activate the operation buttons in the toolbar to operate.

6.3.1.8 Turn off buzzer

When the machine comes to the alarm in the production process, the red light of the tricolor light flashes and the buzzer calls. Click the "off buzzer" icon button in the start toolbar to close the buzzer.

6.3.1.9 Common Error Check

When the machine breaks down, you can open this dialog box to find out the cause of the trouble and solve it:

1. In the start toolbar, click the troubleshooting query button, and the troubleshooting dialog box appears, as shown in figure 6-21:
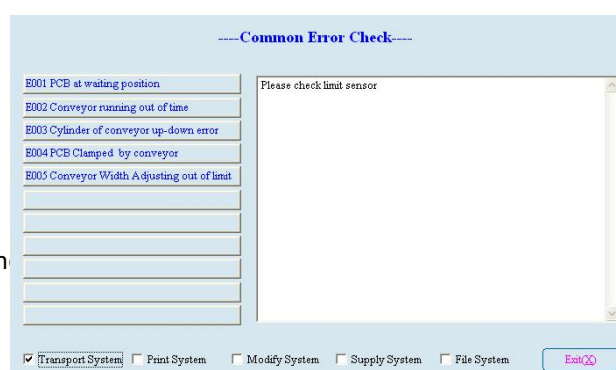
2. In the dialog box, select th⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯⋯", "supply system", "file system" check

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box, you can query the common faults of the above systems;

3. The mouse is moved on the navigation bar on the left side of the [fault query] interface, and the cause of the failure occurs on the right side;

4. Click exit to go back to the main window screen

6.3.1.10 Alarm Record

The system will automatically diagnose the cause of the fault and record the alarm time and the cause of failure when the machine has a malfunction of the buzzer and the red light is on. Click the "alarm record" icon button on the start toolbar to appear the alarm record dialog box. shown in Figure 6-22: display time and previous alarm records.

Figure6-22 〈alarm Record〉

Drag the left mouse button to select an alarm record, click "clear" to clear the alarm record;Click exit to return to the main window screen.

6.3.1.11 Production Report

Show the relevant production record and record the general situation of the corresponding products. The steps are as follows:

In the start toolbar, click the production report icon button to appear in the production report dialog box. Shows the number of successful production, the number of defective PCB, the number of cleaning times, the number of alarms, the time to start production and stop production. Product profiles can also be described. Click exit to return to the main window screen., as shown in Figure 6-23
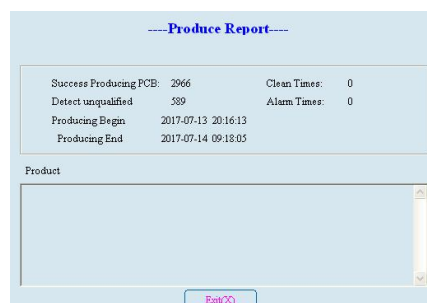
6.3.1.12 Set-up SPC

Figure 6-23 〈 production report 〉

Its function is to detect its own ability index. To use this function, we must contact the original factory's aftersales to complete the operation on site.

6.3.1.13 Manual cleaning

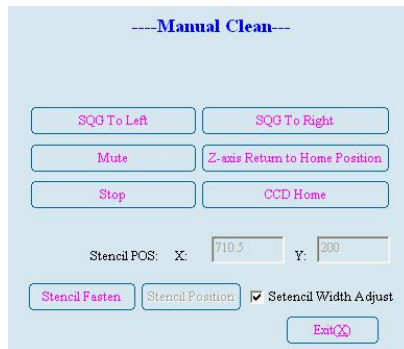Click on the Toolbar "manual clean" button, the pop-up dialog box] [manual cleaning], as shown in Figure 6-24.

Figure 6-24 〈manual Clean〉

The buzzer rings when the [manual cleaning] dialog box pops up. Click the "close alarm" button to close the buzzer. The location of the Stencil can be viewed on this dialog box, and the loading and unloading of the Stencil can also be made.

Manual cleaning method: click "CCD return" , so that the CCD can return to the origin position and open the front door of the machine. At this time, the hand can be reached under the Stencil for manual cleaning.

6.3.1.14 machine parameters

Click the machine parameter icon on the start toolbar, and then pop up the machine parameter settings interface, as shown in figure 6-25:
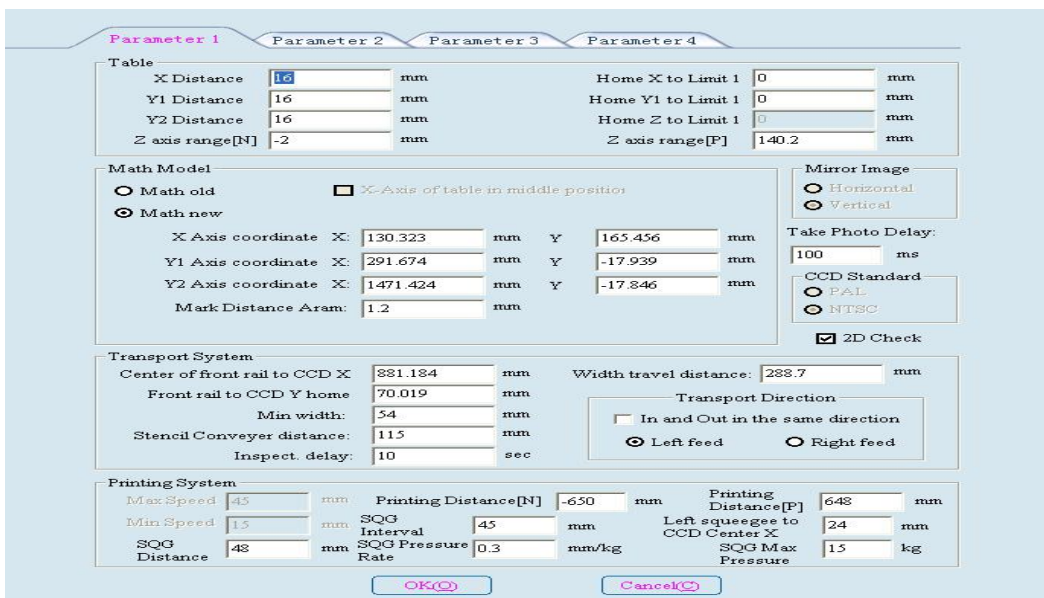

Figure 6-25 〈The machine parameters 1〉

1. "Machine parameter 1" can set the relevant parameters of the platform, transportation system, printing system and open 2D detection function;

2. After setting correctly, select "machine parameter 2" and pop up "machine parameter 2" dialog box, as shown in figure 6-26:
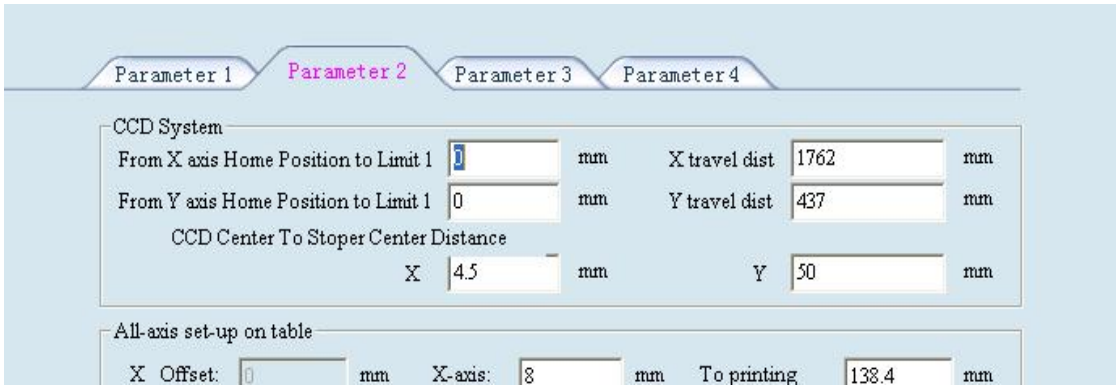
Figure 6-26

Note: "Machine parameter 2" can set the relevant parameters of camera system, platform axis, cleaning system, inspection system, product and printing compensation;

3. After setting correctly, select the " parameters 3 ","parameter3" pop-up dialog box, as shown in figure6-27:

Figure 6-27 〈 parameters3〉

Note: "Machine parameter 3" can set the parameters of each stroke of the moving axis and other settings;

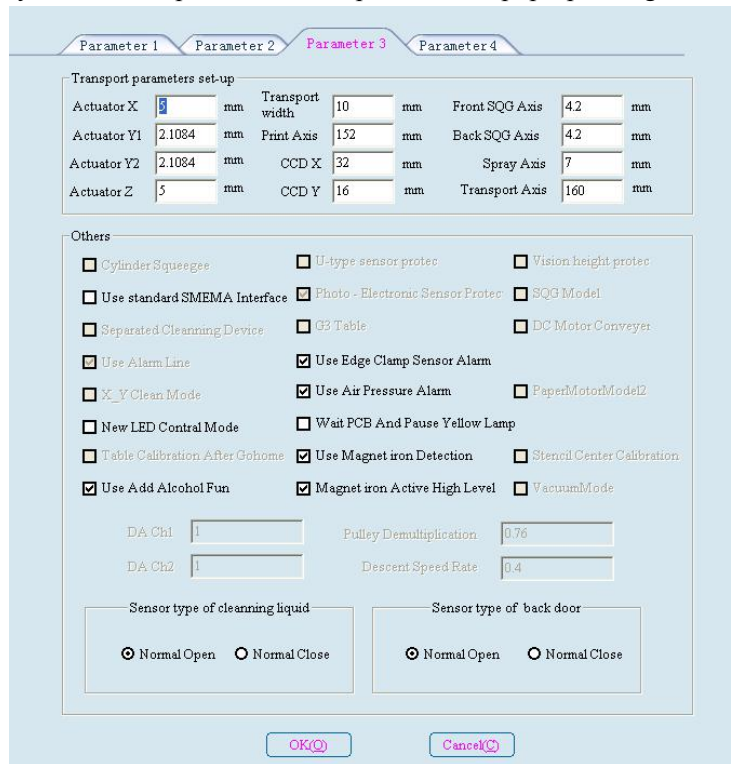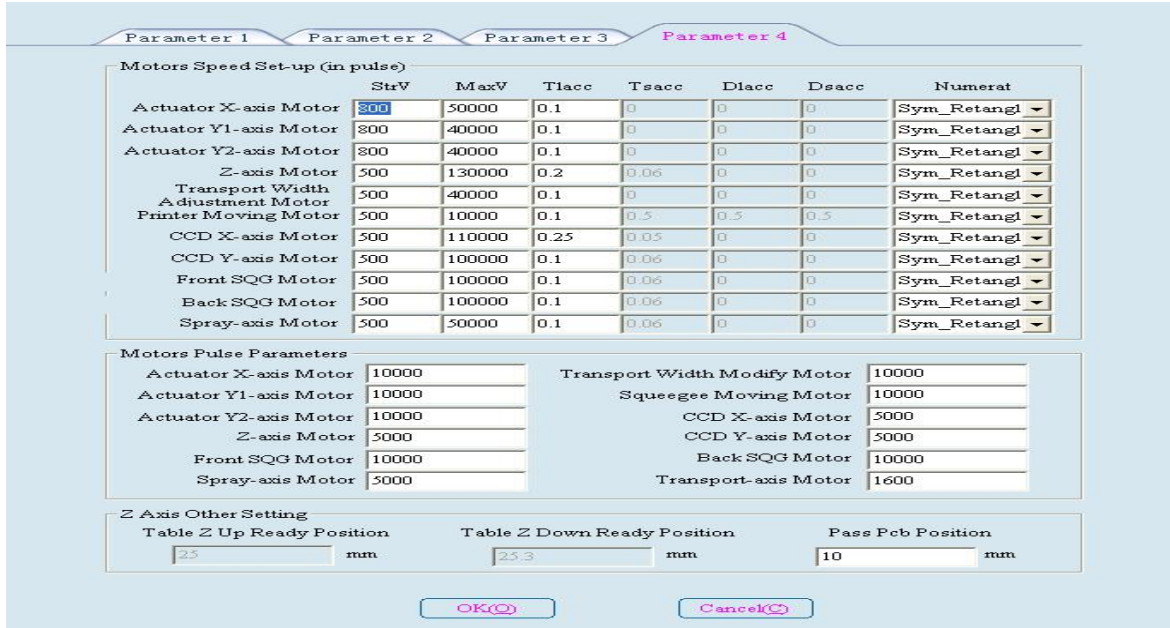4. After setting correctly, select the " parameter 4", and pop out the "parameter 4 "dialog box, as shown in figure 6-28;

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Note: In "machine parameter 4", the speed curve and the motor speed can be set.

After the correct setting, click Finish to return to the production main interface and complete the machine parameter settings

6.3.1.15 Squeegee setting

Click on the Toolbar "SQG settings" button, the pop-up "printing" dialog box, as shown in figure 6-29:

Figure 6-29〈Squegee setting〉
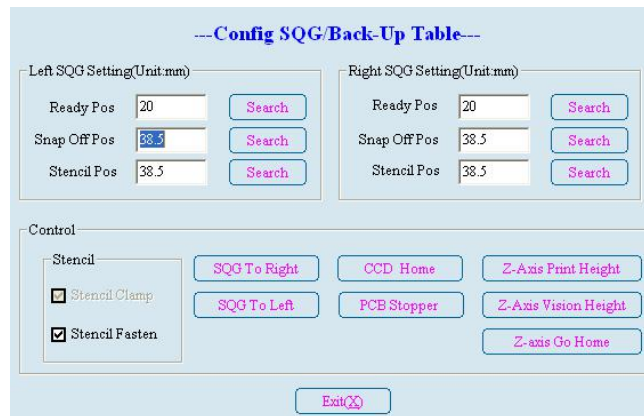
✪   It can set the front and back squeegees and the platform's stroke, and complete the back and forth squeegees and the small platform to carry out the lifting operation.

✪   It can control the forward and backward of the printing axis, the return of the CCD, the return of the stop cylinder and the movement of the z-axis.;

✪   Click exit to return to the main interface.

6.3.1.16 Production interface

When the machine is in production, the display screen as shown in figure 6-30:

图 6-30〈生产界面〉

Figure 6-30〈Production interface〉

The production interface shows production mode, PCB information, file saving path, current coordinates, setting state, production status and motion status, etc.

✪   Click the "output clear" button on the interface, so that the production status of the "production column" shows 0.

✪   In the production process, press the start / pause button (the yellow button in the tricolor button) on the machine, the machine is paused, the production settings, the data entry, and the manual cleaning button are available.

➢ Click the production settings button to pop up the production settings dialog box, as shown in figure 6-16;

➢ Click the data entry button to pop up the first page of the data entry dialog box, as shown in figure 6-6;

➢ Click the manual cleaning button to pop up the manual cleaning dialog box, as shown in Figure 6-24

✪ In the production process, click on the "stop" button, the interface will show whether or not you need to exit the production and prompt, in accordance with the wizard to complete the stop production operation, return to the main interface.

✪ Click on the "back to the main interface production" button to return to the main interface.

If on the [production] Settings interface is selected "show adjust window", for the machine movement status to "offset regulation," in the upper right corner of the production screen will pop up offset calibration dialog, as shown in figure 6-3-25.Through the movement platform, the PCB board and Stencil are more accurate.
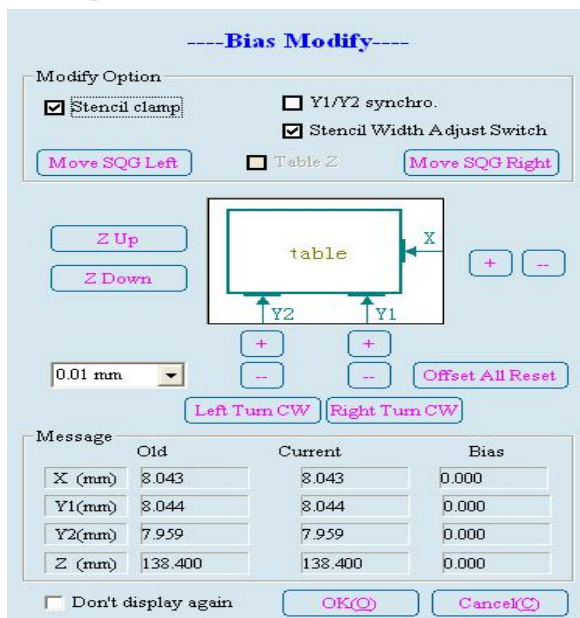
Figure6-32<Bias Modify>

6.3.1.17 Exit

1.Click the exit button on the start toolbar to display the exit CC full automatic printing dialog box, as shown in figure 6-34:

Figure 6-34 〈Exit the CC full automatic printing system〉

3. "Exit the CC program while exiting the WINDOWS system. Do you want to continue?"Prompt box, click [no (N)], and return to the main window screen; Click [Yes (Y)] to exit the CC program and close the WINDOWS system..

6.4 menu toolbar

Click the [menu] in the main menu to appear [menu toolbar], as shown in Figure 6-35, There are five categories: [file], [operation], [setting], [view], [permission management].

figure6-35 〈 menu〉

6.4.1 File

Click the menu toolbar on the "file" button in the main window display menu [file], as shown in Figure 6-36.

Figure 6-36 〈file menu〉

1. Click "open project" button, pop-up dialog [box procedure call], as shown in Figure 6-5 (see 6.3.1.2);

2. Click the Save button to save the printer print parameter settings file for the next operation;

3. On the premise that the current file is not empty, click "save as" button to pop up the "create new directory" dialog box, as shown in figure 6-3-1.

   Enter the correct project name in the file directory column, click ok, and save as operation. Click cancel button to cancel save as operation. Regardless of the success, the file that the program opens is still the original project file..

4. Click the back button to exit the to [file menu],return to the [the menu toolbar]

6.4.2 operation

Click the "operation Menu" icon button on the menu toolbar，Show the action menu in the main window, as shown in figure 6-38 [menu] operation has eight parts: [machine zero], the [reset], [online], [production reset], [squeegees backward], [squeegees forward], [solder paste mixing], [return]

✪ Click the "machine return zero" button to pop up the machine reset dialog box, as shown in Figure 6-17 (see 6.3.1.5);

✪ Click the "reset" button to reset the machine (see 6.3.1.7);

✪ Click the "online work" button or select the checkbox., The CC automatic printing machine will send the information of exiting and entering the PCB board to the loader machine;

✪ Click the "output zero" button, and "will the output be cleared?"Prompt box, click "confirm" to clear the previous print quantity, click "cancel" not clear;

✪ " squeegee backward" and "squeegee forward" to complete the movement;

✪ Click "Solder mixing" button, pop-up dialog box] [Solder mixing, as shown in figure 6-39. According to the actual situation, choose Paste stacking position, and the mixing length, number of stirring settings, click the "start mixing", complete the paste mixing action, click the "close" button to close the dialog box.

Figure 6-39 〈Solder paste mixing〉

✪ Click the [return button] to quit the [operating menu]and return to the [menu toolbar]

6.4.3 View Menu

Click on the [menu toolbar] icon "view" button in the main window display menu [view] as figure 6-40 ,[operation menu] is divided into six parts. They are [production report], [record] [alarm record] [operation log], [current position], [return]

Figure 6-40〈check menu〉

- ✪ Click the production report button to create the production report dialog box, as shown in Figure 6-23 (see 6.3.1.11);
- ✪ Click the alarm record button to pop up the alarm record dialog box, as shown in Figure 6-22 (see 6.3.1.10)
- ✪ Click the "current position" button, pop-up dialog box] [the current position, as shown in Figure 6-18, display the current coordinate values of each axis.
- ✪ Click the return button to exit [View menu] and return to [menu toolbar]

4.4 Permission Management

Click the "permission management" icon button on the menu toolbar to display [permission management] in the main window, as shown in figure 6-4-5.It contains four rights, namely operator, technician, engineer, original factory after sale.
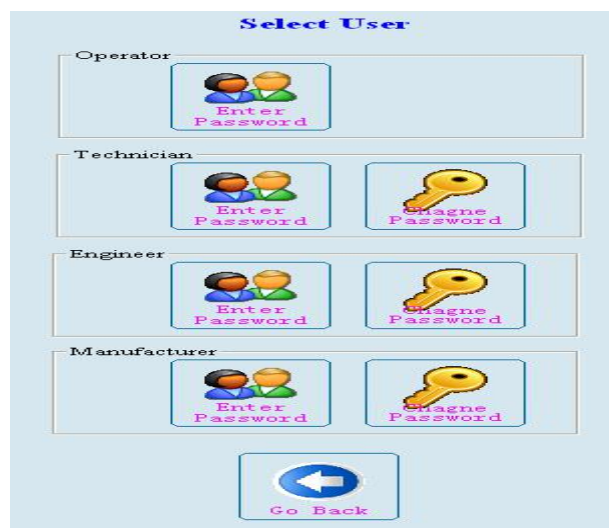
Figure 6-41〈Pemission Management〉

- ✪ Operator: only for production operation, manual cleaning, return to zero, reset operation;
- ✪ Technician: it can be modified and operated sqeegee parameters, SPC tools, and stencil automatic correction except for machine parameters 1~4.;
- ✪ Engineer: it can be modified and operated all parameters except for machine parameters 1~2.;
- ✪ After sale: with the highest operating authority, all parameters can be modified and operated.

Selecting authority other than the operator after clicking on the "enable access," popup/password dialog box, enter the correct password, click on the "confirm", enable the corresponding permissions, as shown in figure 6-42:

Figure 6-42 〈enter password〉

Select the person other than the operator, click [modify password], and then start the password settings dialog box, as shown in figure 6-43:

Figure 6-43 〈password setting〉

The password change operator is as follows:

1) First, enter the correct original password (CC) in the old password column. check

2) After checking correctly, enter a new password;

3) When the new password is confirmed, click ok to complete the password change. Click cancel to cancel the password change and still use the old password of the previous Settings. Click the return button to exit [View menu] and return to [menu toolbar]

6.5 Help toolbar

Click Help in the main menu to appear [help toolbar], as shown in figure 6-44, which is divided into [fault query], [software registration], [version information] three blocks

figure6-44〈help>

6.5.1 Recommend

Click the troubleshooting query icon on the help toolbar to raise the trouble query dialog box, as shown in Figure 6-21 (see 6.3.1.9)

6.5.2 Software Register

Click the software registration button on the help toolbar to pop up the software registration dialog box, as shown in figure 6-45

Figure 6-45〈software regist〉
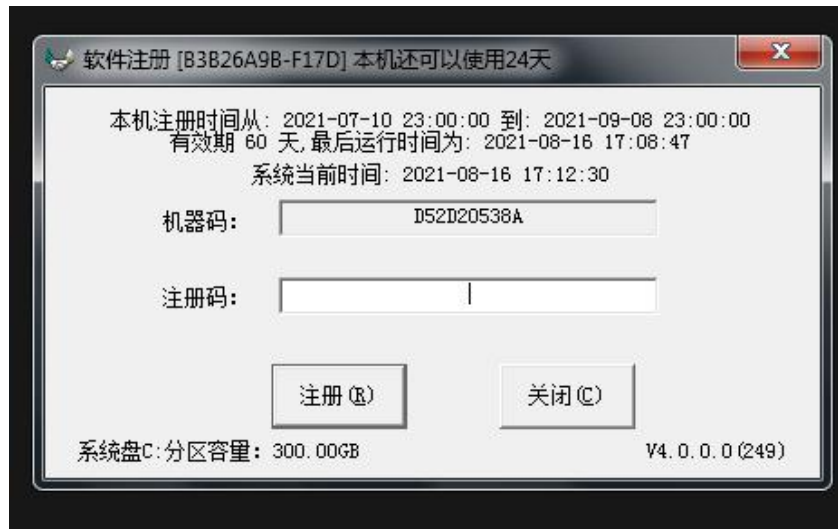
During use, if the pop-up "Lifetime version of the Run-time software, please contact the manufacturer to buy the official version" or "trial version has expired, please contact to buy a genuine" prompt, should contact the manufacturer immediately for the software registration code, registration and open [software] dialog box, enter the correct code in the "registration code" column, click the OK button.

6.5.3 Version Information

Click the version information button on the help toolbar to pop up the dialog box on the CC visual automatic printer, as shown in figure 6-46:

Figure 6-46〈about CC〉

✪   This dialog box can understand CC software copyright code and use restrictions;

✪   Click the[OK] button to go back to the main window screen

6.6 Main screen toolbar 1

SOUTHERN MACHINERY   **Intelligent SMT Reel Storage**

Welcome inquiry

1. Please visit : www.smthelp.com

2. Find us more: https://www.facebook.com/autoinsertion

3. Know more our team: https://cn.linkedin.com/in/smtsupplier

4. Welcome to our factory in Shenzhen China

5. Google: automatic tin soldering

6. Looking forward to your email: info@smthelp.com

www.smthelp.com

As shown in Figure 6‑47, the main screen toolbar 1 includes [language transitions] [I/O check], [motion control], [Stencil cleaning], [squeegee to left], [Squeegee to right] commonly used item shortcuts

Figure 6-47〈Main screen toolbar 1〉

6.6.1 Language transformation

In the English operating system, the interface shows the default in English; in the Chinese operating system, the interface shows default in Chinese ,You need to change the default language, and click the first button in the main screen toolbar 1] to convert the language

6.6.2 I/O check

The function is to check all input points and output points of the control system and determine whether the operation is normal:

1. Click the I/O test button in the main screen toolbar 1] to display the input check dialog box, as shown in Figure 6‑48:
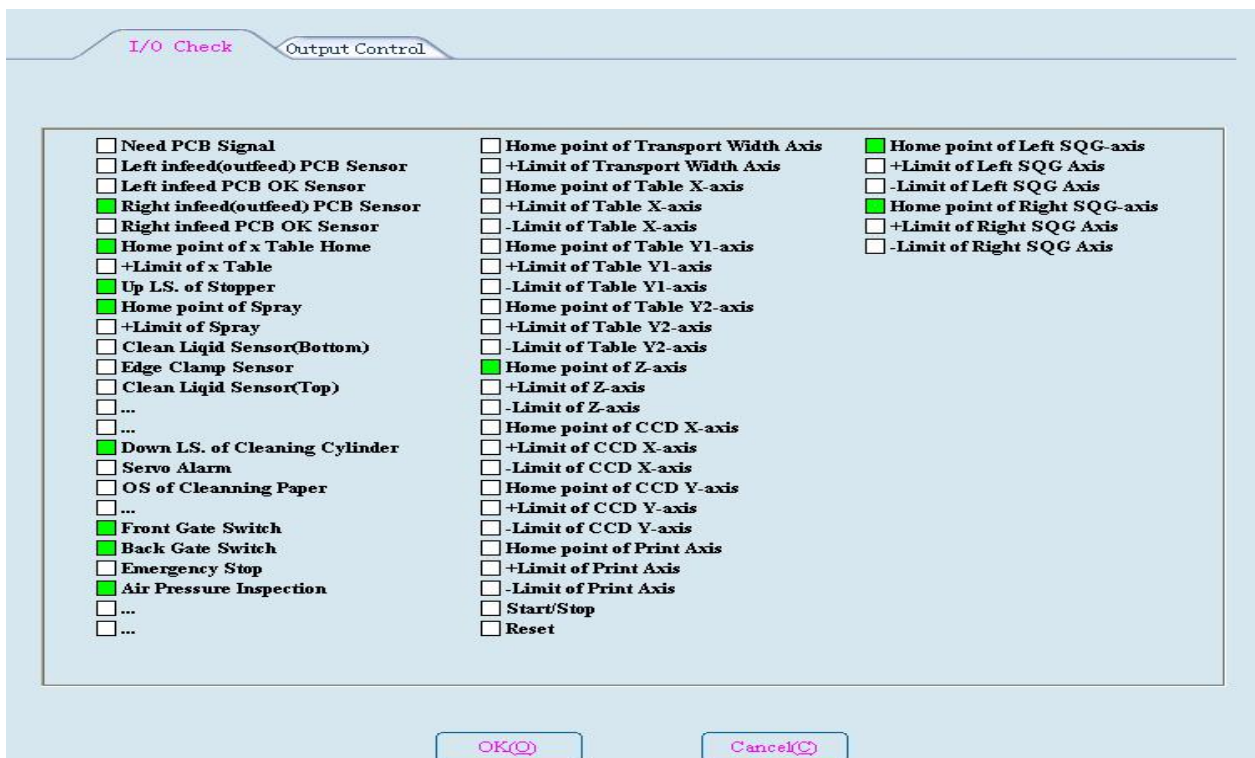
2. The box in front of the dialog box, such as "red", indicates the signal that has been detected at this point. If it is white, it indicates

that the input signal is not detected at the moment。

3. Click the "output control" above the dialog box in Figure 6 - 48 dialog box to display the output detection dialog box, as shown in Figure 6 - 49
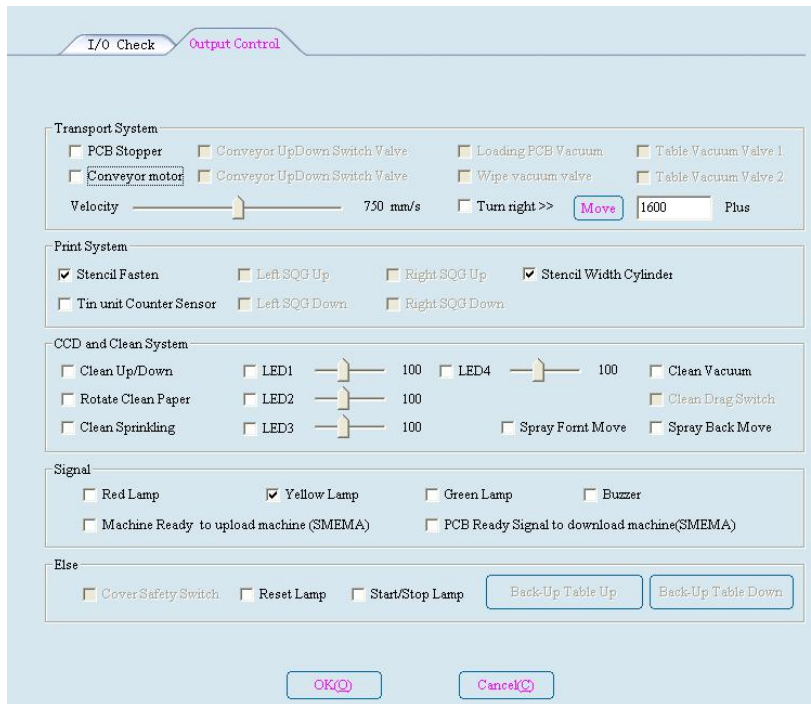
Figure 6-49 〈I/O output Control〉

4. In this dialog box, one by one after the activation of the white box for each item and observation of transportation system, printing system, motor, CCD and cleaning system of the cylinder, solenoid valve control output detection and alarm signal output to detect.

5. Click "OK" or "cancel" to return to the main window screen.

6.6.3 Motion Test

Click the [toolbar in the main screen 1] "motion control" button, the pop-up "motion control dialog, as shown in figure 6-50:

Figure 6-50〈Motion test〉

45

✪ One by one input motor control shaft, squeegee or guide rail, and so on, click "move" button, so that axis, squeegee, or guide rail movement. The movement to the origin position shows "ON", leaving the origin position to display "—";Move to the limit position to display "ON" and leave the limit position to display "—".

✪ Click "stop" to stop the movement of the axis, squeegee, or guide rail. Click back to "return" to the main window screen

6.6.4   Clean Stencil

Click the "stencil cleaning" button in the main screen toolbar 1], and then pop up the screen cleaning dialog box, as shown in figure 6-51:

Figure 6-51 〈Clean Stencil〉
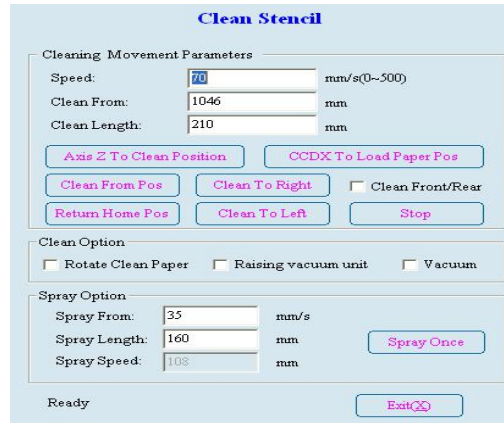
Input cleaning speed, cleaning starting point, cleaning length and other parameters; Click "forward cleaning", "wash backward" or "clean back and forth" to determine the direction of cleaning. Click "transfer paper", "spray cleaning solution", "lift" and "vacuum suction" button to clean.

Click exit to stop cleaning and return to the main window screen

6.6.5 Squeegees movement

Click the "squeegee back" and "squeegee forward" button in the [main screen toolbar 1]. You can move the print axis forward and backward, which is convenient for users

6.72 Main screen toolbar 2

As shown in figure 6-52, including 2 main picture toolbar [start], [pause], [stop] shortcut button used items.

Figure 6-52 〈Main screen toolbar 2〉

1)   Open the already installed project file and click the start button to show whether to load the stencil. Prompt box, as shown in figure 6-53

Figure 6-53

2) Click on [Y] in figure 6-53 dialog box to appear the [manual cleaning dialog box for loading the stencil,

3) Click on [Y] in figure 6-54 dialog box, front and rear squeegees are raised, at which point the user can add solder paste, and click [no (N)] to raise the front and back squeegees

4) Check whether there is a PCB board on the guide rail. According to the preparation of the operation wizard before the start, the main window will show the "production interface", as shown in figure 6-30.

5) After the machine starts production, press the "start pause" button on the machine to make the machine run and suspend the conversion operation

6) In the production process, click on the "stop" button on the screen, the interface will display "whether you need to quit production" and other prompts, according to the wizard to complete the stop production operations, production stopped, returned to the main window

6.8 Time display bar

Used to display the current system time and the CC flag, as shown in figure 6-55

2021-08-17 09:00:34

Figure 6-55〈Time display bar〉

6.9 Status bar

Used to display the currently used permissions, production status, and open project files, as shown in figure 6-56

权限等级
原厂售后

生产状态
生产停止中…

当前工程文件
D:\SZHC\data\RightCross\RightCross.prj

Figure 6-56〈status bar〉

Chaper VII care and maintenance

A good machine only proper maintenance, they can better play to its function, shorten the working cycle, reduce the manpower and material resources, extend the service life, to keep the CC printer printing quality, the life of the machine, please follow the regulation and maintenance of this chapter.

7.1 matters needing attention

Set up daily and regular maintenance system for equipment, and be carried out by qualified personnel who are familiar with the equipment. Maintenance should be an eight-hour cycle, and if the ambient temperature or PCB board is higher, the shorter maintenance cycle is also necessary to avoid dust removal..

NOTIC

Only those who have received special training and who are familiar with all safety inspection regulations are qualified to maintain the machine

Be careful：

Rough and unapproved cleaning fluids may damage, contaminate machine worksurfaces and surface plastic surfaces, and can only be cleaned with a specified cotton or gauze (not hair) and cleaning fluid. Especially the screw rod, guide rail and motor spindle and other precision standard parts. When cleaning the machine with alcohol as a cleaning liquid, immediately wipe off the alcohol residue on the surface of the machine parts and the surface of the printing surface, so as not to damage the machine..

When using lubricants, users should check their performance so as not to affect the lubrication effect (guide, screw, bearing, etc.).If the machine works under special conditions, please consult with the manufacturer about the type of lubricant used.Do not use ordinary grease in any way to avoid damage to the precision parts. The recommended oil and grease, as well as the screw rod, the correct cleaning lubrication method of guide rail is attached at the last part.

WARNING:

Alcohol is flammable and should be treated with extreme caution when cleaning the machine. Do not mix with other substances to avoid personal injury and machine damage.

WARNING:

1. The main power switch for the machine must be cut off before maintenance and repair;

2. When the safety device is not working properly, it is not allowed to turn on.;

3. Operators are not allowed to wear casual clothes and must wear protective gloves when handling solder paste.;

4. Before starting the machine, check whether the machine is damaged, whether there are tools inside, whether the parts are loose, so as not to hinder the operation of the machine or cause an accident.;

7.2 Equipment routine maintenance, inspection items and inspection cycle

Check item			Inspection cycle		
Machine parts	Spare parts	Check maintenance content	everyday	weekly	monthly
Working table	ball screw	Clean, grease lubricated			√
	lead rail	Clean, grease lubricated			√
	table	cleaning		√	
	cable	Is the cable coating damaged or not?			√
squeegee	ball screw	Clean, grease lubricated			√
	lead rail	Clean, grease lubricated			√
	motor	wear pattern			√
	cable	Is the cable coating damaged or not?			√
cleaning device	Cleaning paper	Replace after use	√		
	ethyl alcohol	Check the level and fill the alcohol	√		
	Alcohol nozzle	Use wire to clear small spouts		√	
	filter tube	Turn on the filter and clean the strainer			√
visual part	ball screw	Clean, grease lubricated			√
	lead rail	Clean, grease lubricated			√
	cable	Is the cable coating damaged or not?			√
Stencil	placement location	Correct, fixed	√		
	Top surface, bottom	Cleaning and wear	√		
PCB transport sectors	convey belt	Is the tension tight or smooth?			√
	Stop sylinder	wear pattern			√
	Worktable roof block screw	wear pattern	√		
air pressure	pressure gage	pressure setting	√		
	air filter apparatus	Clean and work properly			√
	All the air path	Leak situation			√
Other	Whole equipment	cleaning		√	

7.3 The equipment needs refueling or grease lubrication part.

position	parts	Lubrication	lubricating method	lubrication interval
Work platform, squeegees, vision, cleaning, etc.	Lead rail slider	Recommended oils	From the mouth of the injection	bimonthly
	linear guide rail	Recommended oils	spray	bimonthly
	ball screw	Recommended oils	From the mouth of the injection	once every month
PCB transport section	Transport roller	automobile oil	injection	once every month
	BEARING	automobile oil	injection	once every month
	Width guide rail	Recommended oils	From the mouth of the injection	bimonthly
	Width adjusting screw	Recommended oils	From the mouth of the injection	bimonthly

7.4 Equipment maintenance content

7.4.1 Stencil frame fixed part

1. Check the position of the stencil frame

   1) Check whether the lock cylinder used to adjust the position of fixed the stencil frame is loose or not.

   2) Check whether the cylinder installation of fixed the stencil frame is loose or not.

   3) The former guide rail and rear guide shaft used for the adjustment of stencil frame should be cleaned and lubricated periodically.

   4) The parallel degree of the left and right support plate and the working table, and the equal height of the two support plates.
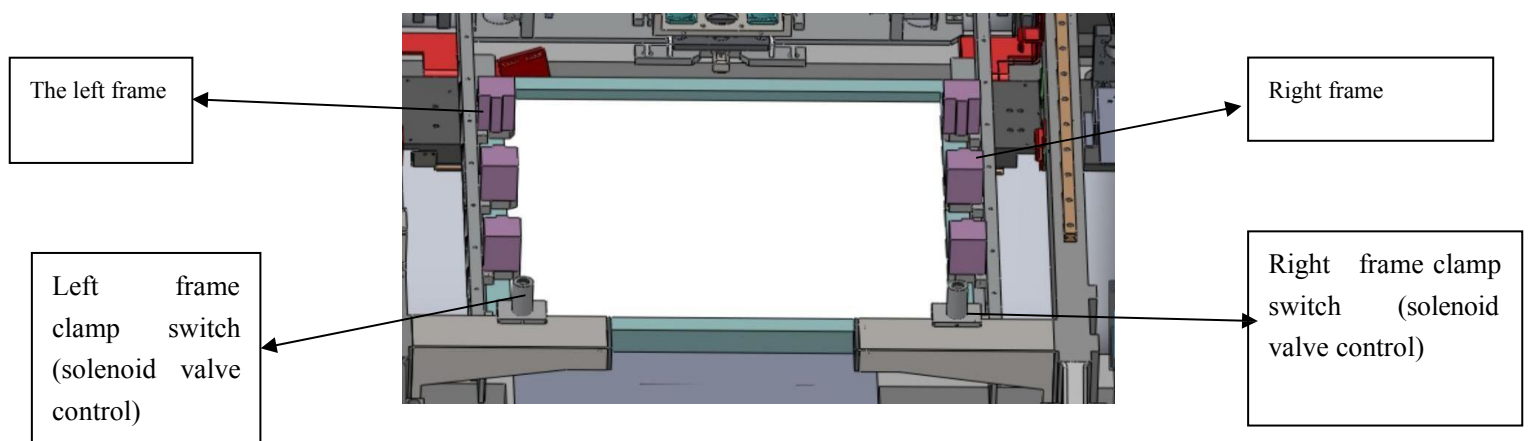
The left frame

Right frame

Left frame clamp switch (solenoid valve control)

Right frame clamp switch (solenoid valve control)

Figure 7-1 Stencil frame fixing part

2. Stencil cleaning

   2) The residual solder paste on the stencil will affect the adhesion, precipitation, thickness and printing quality of the solder, and the timely cleaning the stencil is the necessary condition for the accurate printing. A certain number of PCB boards are printed

(according to the use case, generally printing 0.3mm fine spacing of PCB every 1~3 pieces of PCB), and a cleaning is carried out to remove the attachment at the bottom of the stencil. If the cleaning is not done in time, the stencil window is easily blocked by the solder paste, which affects the printing quality.

2) There are three ways of cleaning: automatic dry cleaning, wet cleaning and vacuum suction. The cleaning tool is used to wipe the paper, and the cleaning liquid is recommended to use industrial alcohol.

3) Automatic cleaning according to alcohol in POTS (located in the front of the machine frame) at the bottom of the liquid level sensor switch shows cleaning fluid level, when cleaning fluid level below the liquid level switch system will alarm and show the cause of the alarm. Industrial alcohol should be added to the alcohol box at this time. Methods the following:

    a)   Open the lid of the alcohol on the left side of the machine.;

    b)   Injection of cleaning fluid (industrial alcohol);

    c)   The alcohol box is filled and the lid is covered again.;

Note: The cleaning fluid should be selected to pay attention to its safety information and whether it is suitable for the selection of solder paste.

7.4.2   Cleaning part

1. The small exit of the alcohol nozzle is likely to be blocked by the fine slag in the alcohol, which can result in the unsmooth or uneven flow of the cleaning fluid, which affects the cleaning. When the nozzle orifice is blocked, use a small steel wire (with a diameter of 0.3) to gently guide it to check whether the alcohol outflow is uniform..

2. Check whether the wiper is fully parallel to the stencil, and should be adjusted if it is not completely parallel. It should be checked whether the two cylinder movement is normal, balanced and not stuck. And adjust accordingly..

3. Remove the rubber strip to clean each vacuum tube, if the strip deformation or aging should replace it.

Suggestion: In order to save cost, many users will use cleaning paper on the front and back, and CC recommends that the cleaning paper can only be used for one time at most. Otherwise, it will seriously affect the printing quality due to unclean cleaning..

Figure 7-2   Cleaning paper installation

4. After cleaning, the paper should be replaced in time. The replacement method is as follows.:

    a) Move the cleaning device to the starting position;

    b) Open the back door of the machine and remove the used dirty paper from the roller;

    c) Install the clean paper onto the rollers;

    d) The size of the cleaning roll paper is: Pipe length: 450 x outer diameter 21mm.

Be careful:

    1) The stencil window is blocked, do not use hard metal needle to stab, avoid damage window shape. The stencil should be

removed, cleaned with a clean brush and alcohol, and then blown dry with an air gun. The back-up stencil should be kept in a special place to avoid damage.
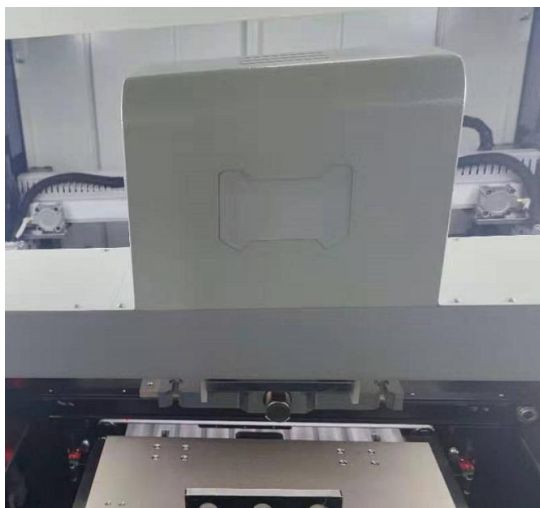
2) The upper and lower parts of the stencil are worn to a certain extent to make the paste printed onto the PCB board uneven, and the stencil should be replaced at this time.

Cleaning of the filter tube: the lower cover of the machine should be opened every month. The filter pipe is located in the lower part of the table Z shaft, and the vacuum filter is removed, cleaned and cleaned.

7.5 squeegees system

7.5.1 squeegee part

1. Move the squeegee beam to the suitable position, loosen the top knob of the squeegees to remove the holder;
2. Loosen the screw 2 on the squeegee clamper and remove the blade;
3. With cotton dipped a little alcohol, clean the squeegee clamper and blade.;
4. Reinstall the squeegee clamper and the blade;
5. If the blade is badly worn or distorted, it should be replaced.

Rear squeegee

front squeegee

Figure 7-4 squeegee parts

7.5.2 squeegee drive part

1. Lubricate the wire rod and the linear rail.
2. Remove the squeegee cover, and check whether the connection part of the drive and down movement is tight.
3. Check whether the connection part of the movement front and rear driving the squeegee is appropriate.
4. Loosen the connecting bolts on the connector tensioning seat.
5. Adjust the position of the tension seat according to the need.
6. Tighten the connection bolts on the connector tensioning seat.
7. Whether the inductive electric eye has the stain of solder paste and not sensitive..

Note: ① The connector should not loose when adjusting..
   ① When the connector is adjusted, the resonant sliding phenomenon caused by looseness should be avoided.
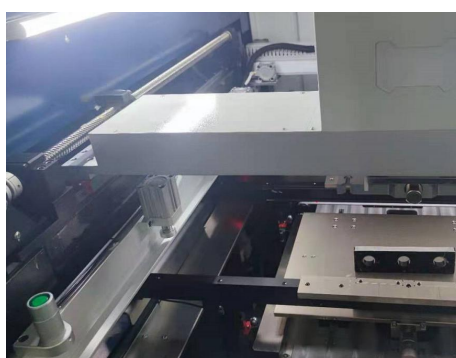
Ball-Screw drive squeegee

Figure 7-6 Squeegees Ball-Screw adjustment

7.6   Printing work platform

7.6.1   working table

1. Use clean cotton cloth with a little alcohol to clean the top pin, support block, work table.;

2. Cleaning table X, Y1, Y2 sensor and transport guide width sensor;

   Caution: Do not use organic solution: ammonia, etc.

3. Remove the front cover plate and clean the guide rod and straight line with clean cotton cloth;

4. Clean and lubricate ball screws and linear guides at both sides of the work platform;

5. Clean lubrication motor lead screw shaft.

Note: The parallelism of the two transport guides and the parallelism of the working platform have been adjusted before delivery.


When the PCB thimble is not used, it must be taken back to the toolbox. The bottom and top should be cleaned once a week.

Figure 7-8 Printing table and transportation guide

7.6.2   Z shaft lifting platform

1. Clean dirty things in a machine, such as solder paste;
2. Clean and lubricate the lifting screw rod and the guide rail; clean the electric eye.
3. Check the safety protection platform Z axis parts regulation is reasonable: such as collision avoidance nut, the safety electric eye.

Z shaft parts are cleaned once every month. Please use a professional cleanser for cleaning
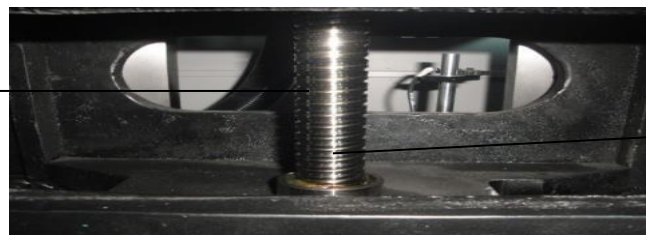
Platform Z axis part

Figure 7-9 Z axis lifting part

7.6.3 Transportation guide rail

1. Check whether the side clamp mechanism is moving smoothly, whether there is a hairpin phenomenon in the floating structure, check whether there is residual solder paste in the side clamping mechanism, and must always clean and lubricate;

2. Check the wear of the slideway screw used in the limiting rail, the flatness of the two middle pressure plate and the parallelism of the front and rear rail when the image is taken;

3. Check whether the photoelectric sensor is normal;

4. Moving guide rail intermediate pressure plate requires flexible activities, no residual solder paste, should be checked and cleaned.;

5. Adjust the tightness of the conveyor belt;

6. Clean the inlet and outlet boards electric eye;

7. The upper and lower guide rail is smooth and clean and lubricated.

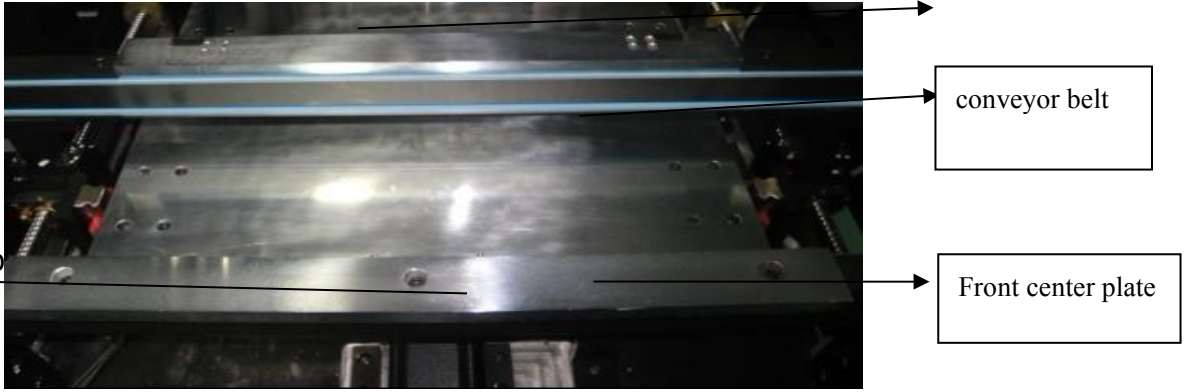It is better to clean up the solder paste and other objects before leaving work every day. Once a week

conveyor belt

Front center plate

Figure 7-10 The side clamp structure of middle plate
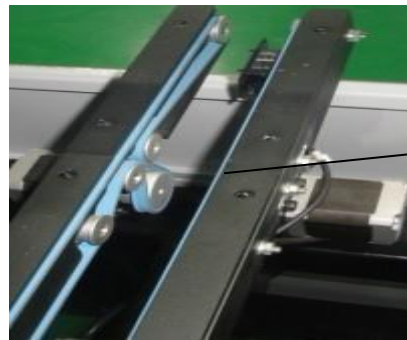

Figure 7-11 Small platform and moving rail clean lubrication

Transport belt, rail, transport belt, general cleaning once a week, can not use oil to rub, will easily slip, use air guns to clean dust

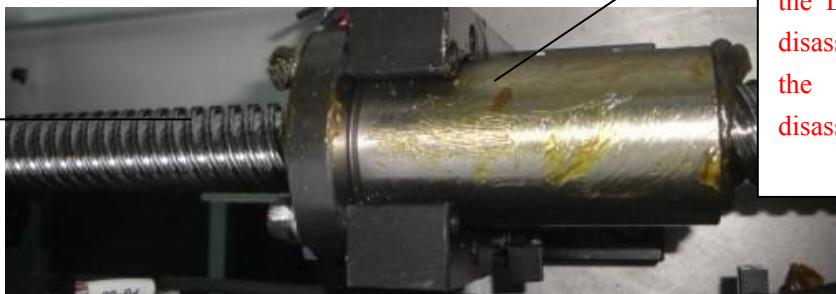Figure 7-12 Conveyor belt tension

7.7 The CCDY and X.

7.7.1 CCD Y

Check the use of CCD Y wire rod and guide rail and clean lubrication.

7.7.2 CCD X

1. Check the Camera Drive X for the use of the screw and guide rail and clean lubrication

2. Check whether the optical glass of the splitter prism is dirty and wipe it with a lint free cotton cloth with a small amount of alcohol

3. Check that the baffle cylinder is wearing and leaking, and whether the magnetic work is sensitive or normal.

4. To clean the electric eye.

5. When necessary, the CCD optical axis is aligned

6. CCD cross beam is thoroughly cleaned

The CCD part of maintenance generally cleans the surface, unless the LED in the CCD is disassembled to repair, the CCD can not be disassembled

Camera Y direction lead screw

Figure 7-13   CCD-Y Rail
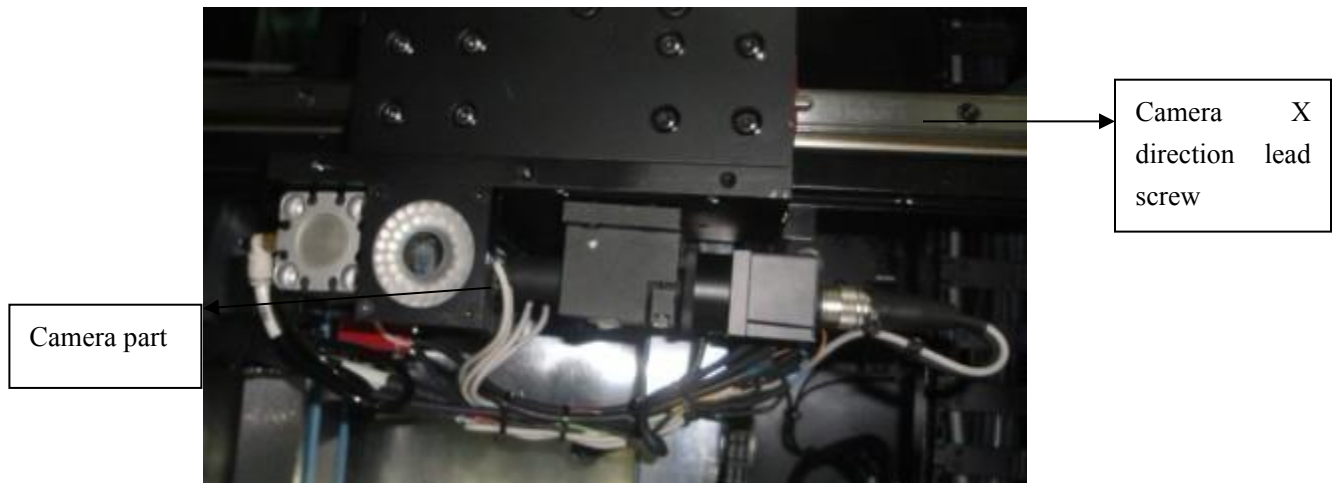
Camera part

Camera X direction lead screw

Figure 7-14 CCD-X crossbeam

7.8 Pneumatic system

1. Check the connection of each airway, especially the pipeline for cleaning fluid.

2. Open the pneumatic components cabinet door before the machine starts working;

1) check whether the air filter works properly;

2) check the air leakage of each pneumatic component and pipeline;

3) check and adjust the pressure on the pressure gauge according to the airway schematic diagram to make the pressure meet the requirements..

- ➢ Total air pressure：6Kgf/cm^2
- ➢ Stencil frame clamping pressure：5 Kgf/cm^2
- ➢ Vacuum suction pressure: 6Kgf/cm2.

7.9 Different USES, recommended oil or grease.

7.10 The cleaning and lubrication of screw rod and guide rail.
7.10.1 Cleaning and lubrication of screw rod

1. Check whether the lubrication effect is good after 2 to 3 months on the ball screw. If the grease is very dirty, wipe off the grease with a clean dry cotton cloth. It is usually necessary to check and replace the grease every year

2. Considering the accumulation of dust, it is possible for the external material to enter and work in the process of mechanical installation, and the lubricating grease should be added to the single sealed nut.Do not add grease directly to the screw rod unless otherwise specified.

3. According to the size and length of the screw rod, determine whether the amount of grease in the nut is sufficient.Move the nut, check the screw groove that has been contacted with the nut to lubricate the grease enough, if not enough, add in time.

7.10.2 Cleaning and lubrication of guide rail

1. Check whether the lubrication effect is good after 2 to 3 months in the guide rail. If the grease is very dirty, wipe off the grease with a clean dry cotton cloth. It is usually necessary to check and replace the grease every year.

2. Grease the grease with a grease gun in the slide. Do not add grease to the guide unless otherwise specified.

3. Depending on the size and length of the guide rail, determine whether the amount of grease in the slider is sufficient. Move the slider to check whether the lubricant grease is sufficient in the guide groove that is in contact with the slider, if not enough, to be added in time..

Note: For the Haydn stepping motor, apply the grease to the guide wire rod directly after cleaning the dirty grease with the clean and dry cotton cloth, and rotate the screw rod, so that the nut can be moved around the screw.But be careful not to leave other dirt on the screw, especially hard material.

Figure 7-17 Cleaning and lubrication of screw rod and guide rail.

Chatper VIII Common failure analysis and troubleshooting.

8.1 operation control system

Common faults	Failure cause	Removal method
After the machine is switched on, there is no working: the tricolor light has no indication and the computer screen is not displayed.	1) the main power switch in front of the machine is not opened; 2) total power failure; 3) indicator light failure.	1) Turn on the power switch; 2)Check main power switch and circuit; 3)Replace the indicator light
The device cannot start	1)The fuse in the electronic control 2)Other faults	1) Replace fuse; 2)Troubleshoot according to computer screen instructions
The computer can't start.	1)There is a floppy disk in the starter; 2)Operating system failure, running file missing.	1)Take out the floppy disk from the launcher; 2) Reinstall the machine operation software.
The device action is interrupted and a process cannot be completed	1) The corresponding sensor failure may be caused by dust on the photoelectric switch	1)Wipe it clean and then return to normal
The cylinder has no action	1) insufficient air pressure; 2) air leakage or blockage of air pipeline; 3) poor contact of control circuit.	1) Check the total air pressure 2) Check air filter and air line; 3)Check the control voltage and signal of the solenoid valve that controls the cylinder

8.2 transit system

Common faults	Failure cause	Removal method
PCB board stays in the waiting position	There are PCB boards on the transportation guide rail.	1)Take the PCB boards out of the guide rail and reoperate
Transit timeout	1) Transport belt slipping; 2)Transport motor failure or transport unit control failure	1)Adjust the belt elasticity 2)Check the conveyor motor
After printing PCB plate has not been released	1)The signal sent into the width modulation motor is not in good contact; 2)Drive failure. 3)The belt is loose or the belt falls off; 4)Transport motor failure; 5) The width is out of the limit	1) Check wiring; 2) Replace the driver 3)Adjust the belt tightness; 4)　Repair or replace the transport motor; 5)　Check the limit sensor

8.3 Vision system

Common faults	Failure cause	Removal method
No images were detected.	1) the camera power supply is broken; 2) the signal cable connected to the camera and image capture card is not in good contact.	1) check and replace the camera power supply; 2) check signal cable circuit.
No images were detected.	1)　Camera -Camera X axis motor abnormal; 2) Camera -Camera Y motor is abnormal.	1) replace Camera -Camera X axis motor; 2) replace Camera -Camera Y axis motor.
The platform adjustment is not in place and no image can be detected	1)The platform regulates the X axis, the Y axis and the theta direction of the motor operating abnormally.	1) replace the motor

8.4 Squeegees system

Common faults	Fault reason	Removal method
Scraper no action	1) poor contact of signal line into the scraper or driver 2)Belt loosing or belt dropping; 3)The scraper motor fault.	1)Check the line; 2)Adjust belt tightness; 3)Repair or replace squeegee motor
Scraper movement exceeds the limit	1)Limit sensor fault	1)Check or change the limit sensor
The scraper can not rise or fall	1) The stepper motor or drive is not working well; 2) The connector is out of contact	1) Is the stepper motor or drive damaged?; 2) Check the contact is reliable.
Printing is not complete	1) the pore blockage of the stencil or the spacing between the stencil and PCB is too large; 1)2) uneven coating on the stencil; 3) the large proportion of irregular large metal particles in then solder paste is too large to block the pores.	1) Clean the window hole and the bottom of the stencil; 2) Select the suitable solder paste and make the solder paste printing effectively cover the entire printing area; 3) Choose metal powder size and window 4)The size corresponding to the solder paste.

Collapse, bridge	1) Too much pressure on the scraper; 2) too much residual solder paste on the bottom surface of the stencil; 3) solder paste is too low or too low in metal to maintain the adhesion of solder paste.	1) adjust the pressure; 2) Re fixed printing plate; 3) Select the appropriate solder paste viscosity; maintain appropriate temperature for printing.
Uneven thickness	1) the stencil does not match well with PCB; 2) uneven thickness and uneven thickness of PCB bonding pad; 3) uneven mixing of solder paste (uneven viscosity).	1) adjust the relative position of stencil and printing plate; 2) control the flatness of the coating of PCB; 3) thoroughly stir the paste before printing.
Jagged edges appear (poor resolution)	1) insufficient viscosity of solder paste; 2) the whole wall of the stencil has burr and is not smooth; 3) the coating of PCB welding plate is too thick or the edge of welding wax is broken.	1) select solder paste with a slightly higher viscosity; 2) strictly control the coating thickness when making the plate; 3) check the hole processing quality before printing.
thickness inadequacy	1) uneven coating on the stencil; 2) the material for making the stencil is too thin; 3) improper squeegee pressure (too small); 4) the plating layer of PCB is too thick.	1) select the suitable stencil; 2) select solder paste suitable for particle size and viscosity; 3) adjust the squeegee pressure; 4) reduce PCB thickness setting.
solder paste icicles	1) the spacing between the stencil and PCB is too large; 2) the solder paste is too viscous.	1) properly adjust the small clearance; 2) choose the proper viscosity of the solder paste.
offset	1)1) the location accuracy of the equipment itself is not good; 2)2) when the solder paste is printed, the uniformity of the opening part of the stencil is poor; 3) a kind of tension caused by scraper and its friction factor to the stencil.	1) adjust the positioning accuracy of the equipment; 2) select the suitable viscosity solder paste; 3) strengthen the printing pressure on the stencil.

8.5operation document

| Common faults	Fault reason	Removal method
file read error	File does not exist or data is missing	Re device file
file copy error	Disk error	Check if the disk is damaged or write protected
File deletion error	The file is being invoked by another process	Close this file

Chapter VX appendix

Attached 1 recommended aluminum frame size.

Attached 2 printing defects and cause analysis table.

Analysis of the reason of the uneven thickness of solder paste.

Attachment 1: the recommended aluminum frame size.
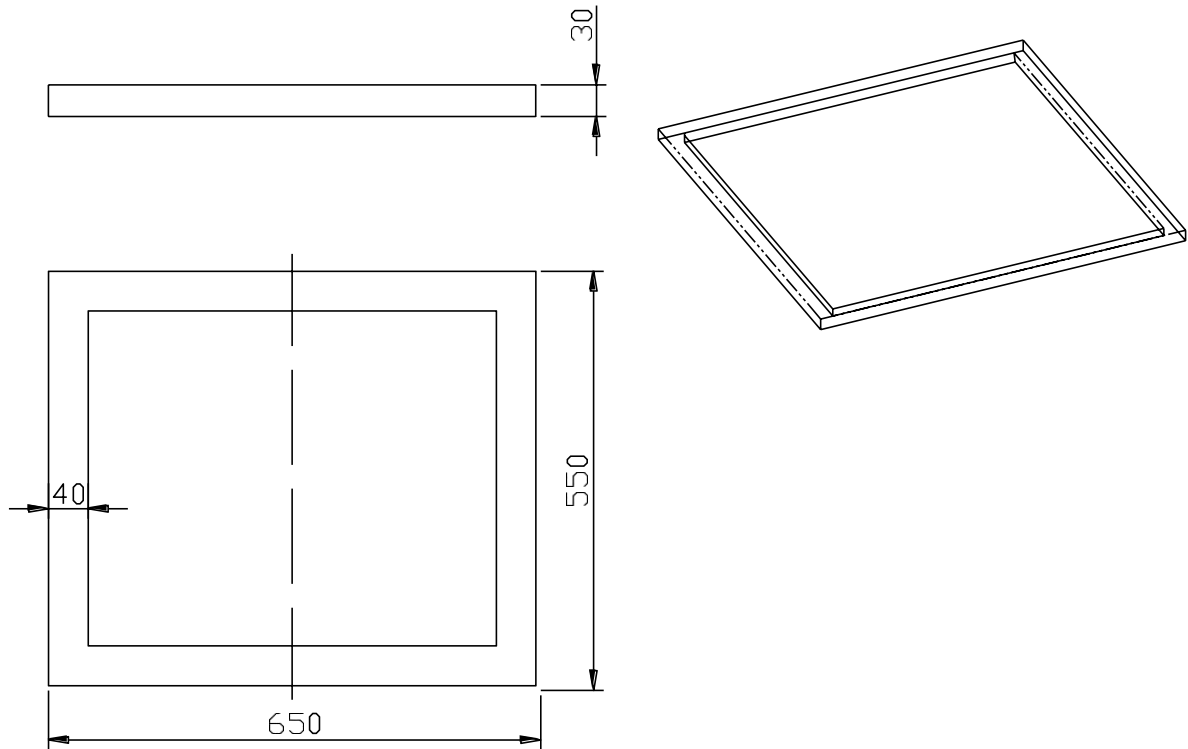
(Note: the screen openings are centered in the center of the net frame

2.container loading list

1. Annex 3: to analyze the causes of uneven thickness of solder paste

2. The hardware part of the machine

1 Whether the lifting platform is clean: if it is too dirty, it can cause uneven surface. If there are solder paste on the surface of the platform, or other sundries..

2 Whether the thimble is good or not, the correct way is to press the top of the thimble with the hand, and gently can not shake it.

3 The stencil is not parallel to the PCB board: if it is found that it is not parallel, it should notify the after-sales service to correct it.

4 Whether the copper foil of PCB is oxidized or not good: QC in the production line is strictly controlled.

3. Part of the parameter settings for the machine

1 Squeegee pressure setting: if too little pressure will cause insufficient amount of solder paste on the PCB board, too much pressure will cause the printing to be too thin

2 Speed of printing: because the solder paste needs time on the PCB through the Stencil, the improper speed will directly affect the printing result.

3 The tension of the stencil and the thickness of the stencil: if the tension of the stencil is too small, it will affect the quality of the stripper, and whether the stencil is blocked or clean. When the thickness of the stencil is 0.1mm, the thickness of the paste is 140 + 30.When the thickness of stencil is 0.15mm, it is 170-plus or minus 30.If the printed solder paste is in this range, it is normal.

4 If the solder paste is not evenly stirred, the particle size of the solder paste will not be consistent, and whether the solder paste is out of date or the variety specification is wrong.

5 The stencil offset speed control: if too fast, it will cause a sharp spike, which will lead to poor solder paste printing.

6 The amount of solder paste on the stencil is too low or the viscosity is too low;Under normal conditions, the minimum amount of solder paste is 500g.

7 The opening hole of stencil is unreasonable and needs to be improved; For some materials, the solder paste printing quality can be improved by improving the opening shape of stencil.