Rev 1.1

华企正邦
HUAQI ZHENGBANG

Pick and Place Machine
User Manual
ZB3545TP

温州市正邦电子设备有限公司
WENZHOU ZHENGBANG ELECTRONIC EQUIPMENT CO., LTD

Introduction

Thank you for using this product. This operation manual provides relevant information such as ZB3545TP placement machine equipment parameters and operation instructions.

! Attention:

1. It is strictly prohibited to copy part of or the entire book (including software and programs) without authorization.

2. The contents of this book can be modified without prior notice.

3. We strive to be accurate in the preparation of the contents of this book. If you find a mistake, omission or suspicious part, please contact the dealer or the company.

4. The company is not responsible for the results of the error operation, whether it is related to the item (3) or not. Please understand.

! Attention：For safe use of the machine!

The operator of the chip mounter (hereinafter referred to as the machine), maintenance personnel and repair personnel shall carefully read the following safety precautions before using the machine, so as not to get hurt.

1. Basic precautions

(1) The operation of the machine is only limited to the operator who has mastered the operation of the machine.

(2) Please do not use this machine for other purposes. Otherwise, the company is not responsible for the resulting responsibility.

(3) Do not modify the machine. The company is not responsible for the accident caused after unauthorized modification.

(4) In order to prevent accident caused by unexpected start-up, please cut off the power supply before carrying out the maintenance, repair and cleaning.

(5) When unplugging the power plug, please hold the plug body instead of the wire and pull out.

2. Precautions for application

(1) Please take the necessary safety actions during transportation to prevent inversion or falling.

(2) Please take care of the equipment for shipment.

(3) Please put the machine in a stable place for installation.

(4) In order to prevent personal accident, before switching on the power supply, please confirm that the cable is not damaged, shedding, loose, etc.

(5) In order to prevent personal accident, before switching on the power supply, please confirm that the machine is safely grounded.

(6) In order to prevent accidents caused by unskilled operation, the repair and commissioning work shall be carried out by skilled technicians. When changing the components, please use the company's genuine parts. The company is not responsible for the accident caused by the use of non-genuine parts.

(7) In order to prevent the electric shock caused by unskilled operation, electrical repairing shall be entrusted to the professional staff.

(8) In order to prevent human injury, after repair, adjustment or spare parts replacement, please confirm that the screws and nuts are not loose.

3. Precautions for working environment

(1) Do not use the machine under the environment of high frequency welding machine and other noise sources (electromagnetic wave).

(2) Do not use the machine when the power voltage exceeds 10% of the rated voltage.

(3) When it thunders, stop using the machine and cut off the power.

Chapter 1 Prepare Work Before Use

1.Open the wooden box, take out the machine and accessories according to packing list and check whether all parts are in good condition. If you have any further question, please contact us. After-sale Service Hot Line: 400-692-6668.

No.	Name	Specification	Unit	Qty
1	Mounter Host	ZB3545TP	Set	1
2	Display Dell	Dell 18.5 "	Set	1
3	Display VGA Cable	1.5m	PC	1
4	Keyboard and Mouse Set		PC	1
5	Nozzle	502×1、503×2、504×2、505×1、506×1	PC	1
6	Nozzle Correction Substrate	Stainless Steel Substrate	PC	1
7	Magnet	Round	PC	4
8	Check the Nozzle	Solid Corrected Nozzle	PC	4
9	Inkpad	Red	PC	1
10	Power Cord	3×1.5㎡	PC	1
11	Toolbox	12.5 "	PC	1
12	Grease	Kunlun No.2 White	Bottle	1
13	Allen Key	8 Piece Suit	PC	1
14	Brush	1.5 "	PC	1
15	Stainless Steel Tweezers	VETUS-Anti-Static Precision Stainless Steel Tweezers	PC	1
16	Sealing Ring	Φ10×φ6×2.5	PC	5
17	0 Type Circle	Φ5×1	PC	10
18	Certificate of Inspection		PC	1
19	Operation Manual		PC	1

2.The equipment must be placed on a flat, strong desktop, and ensure the level of four feet adjustment.

3.Put the monitor, mouse, keyboard placed on the right side of the host.

Fig. 1-1 PC

4.Connect the monitor, mouse, and keyboard to the industrial computer: connect the monitor VGA cable and USB mouse and keyboard to the industrial computer as shown below.

Fig. 1-2 display connection

5.Connect the main power and monitor power: Connect one end of the power cord to the power connector of the device. Connect the plug to the socket at the other end and connect the monitor power plug to the built-in power socket of the device as shown below.

Fig. 1-3 Power socket

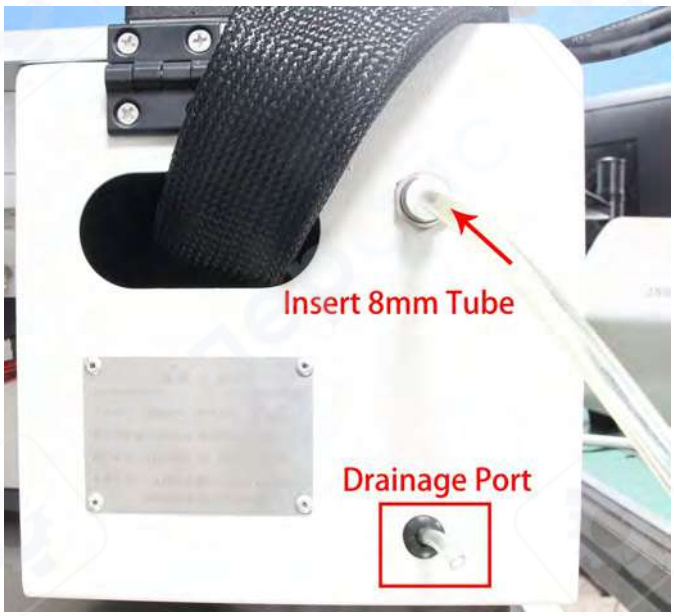


Fig. 1-4 Pipe connector

6. Connect the air source: insert the external air pipe into the air inlet on the rear side of the device as shown.

Fig.1-5 Air pressure adjust

Fig. 1-6 power switch

7. Adjust the pressure: pull up the gas source processing part knob to adjust the air pressure to 0.6Mpa as shown.

8. Turn on the main power switch: turn 90 degrees clockwise to turn on the main power supply.

9. boot test: double-click the computer desktop application shortcut icon  to enter the placement machine control system to detect whether the display, mouse, keyboard and other components are working properly.

10.Equipment and Material Preparation:

	Software and Material	Use and Tips
1	PCB Design Software	PROTEL、DXP Etc.（Download online and install to the machine）
2	PCB Source File	Convert to the mount coordinate file with Design Software (Can directly edit the Source File on the computer)
3	PCB	Prepare PCB(Without solder paste) for production
4	Component	Components for mounting (Resistors., CAP., IC, etc)
5	Double-sided Tape	For trial
6	Solder Paste Mixer	Stir well（increase activity, eliminate bubbles）
7	Solder Paste Printer	Print solder paste onto the PCB
8	Scraper	Used with mixer and Printer
9	Reflow Oven	For Welding

Chapter2 Equipment Summary

2-1 Equipment Constitute

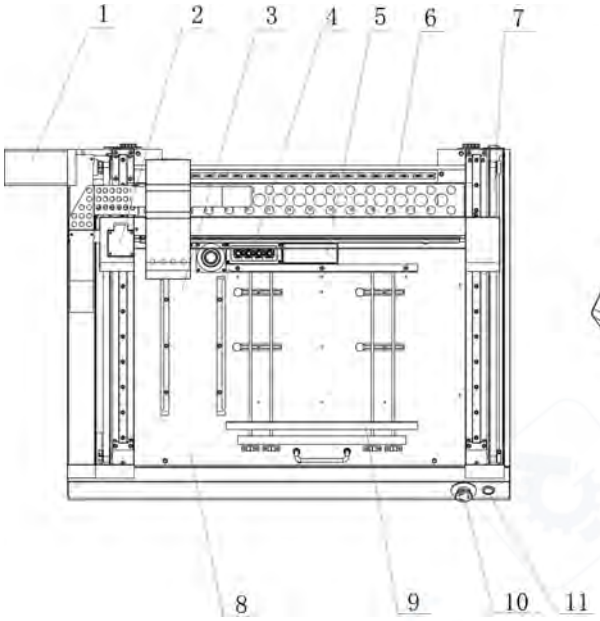


Fig. 2-1 Host View

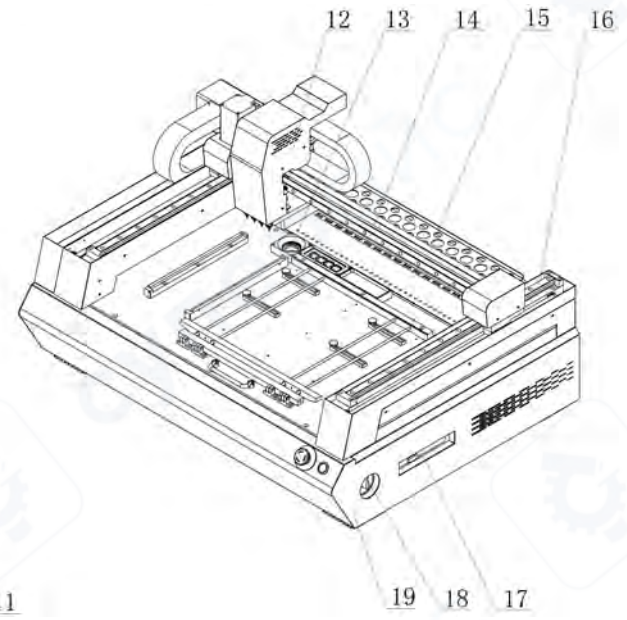


Fig. 2-2 Host Side View

1--Y-axis stepper servo motor	2--X-axis stepper servo motor	3--IC tray placement area	4--four-head high-speed camera
5--Pitching box	6--fFeeder mounting plate	7--Y-axis driving timing belt	8--Working table
9--PCB board clamping device	10--emergency stop switch	11--one button start button	12--head part
13--Large-size camera	14--X-axis linear guide	15--X-axis drive timing belt	16--Y-axis linear guide
17-Industrial Computer	18-Power Switch	19--Chassis	

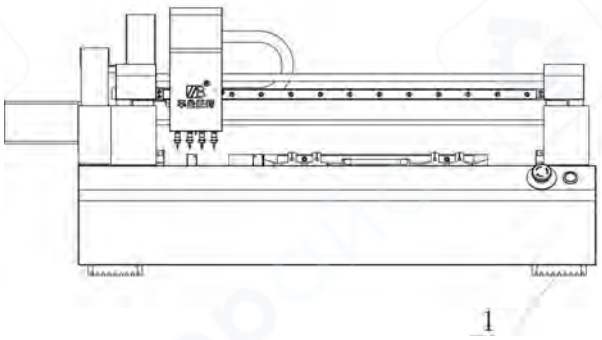


Fig. 2-3 Host front view

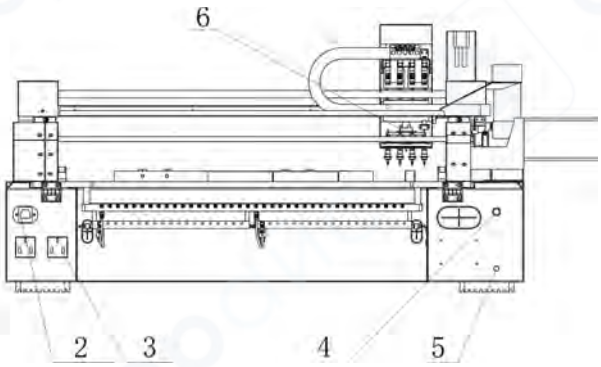


Fig. 2-4 Rear view of the host

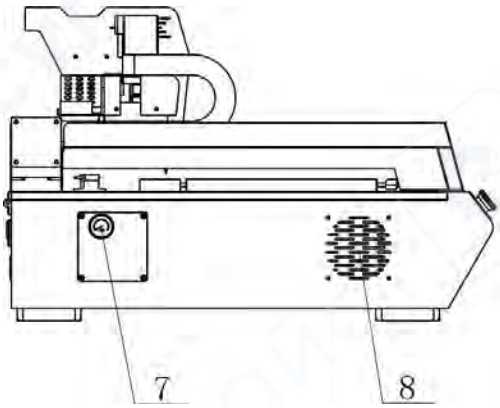


Fig. 2-5 Host left view

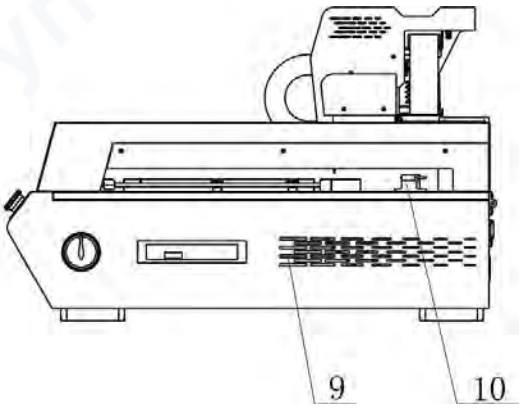


Fig. 2-6 Host right view

1--Rubber Mats	2--Power Cord Socket	3--Power Socket	4--Air source inlet
5--Drainage port	6--MARK point camera	7--Air source processor	8--Heat vent
9--Intake hole	10--Feeder anti-lifting photoelectric switch		

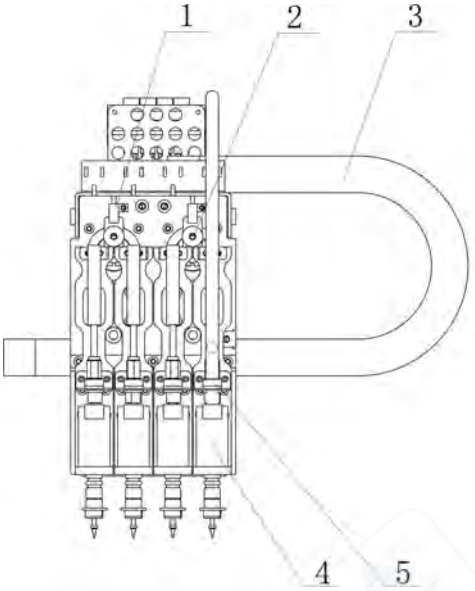


Fig. 2-7 Machine head front view

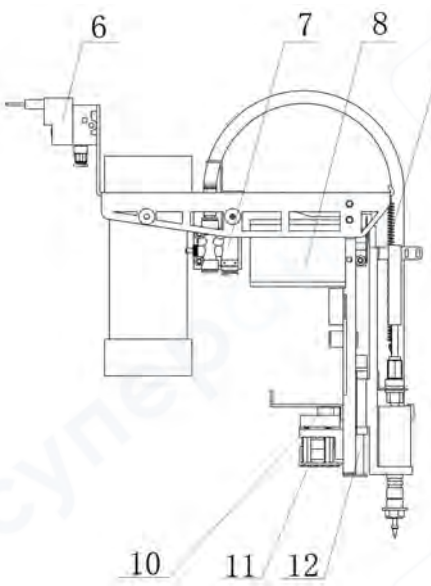


Fig. 2-8 Machine head left view

1--Z-axis Detection Photoelectric	2--Swing Bar Assembly	3--Engineering Towline
4--Rotary Stepper Motor	5--Rotary Sealed Copper Bushing	6-Vacuum Switching Solenoid Valve
7--Vacuum Generator	8--Z Axis Up and Down Motor	9--Reset Spring
10--MARK Camera	11--MARK Camera LED Light Source	12--Z-Axis Slide

2-2 X、Y、Z、A Axis Explanation

The machine has 4 axes for numerical control（X、Y、Z、A）

1、X、Y：

X: Left-right direction Y: Up and down direction

Unit:0.01mm Displayed as: X=000.00mm, Y=000.00MM.

2、Z axis：Height, Unit:0.01mm，Displayed as：Z=00.0mm；

3、A axis：Rotation angle of mount head, Unit:0.1°,

Displayed as=00.0, Counter clockwise as positive value.

2-3 File Type

1、 Coordinate File（.CSV）

a. CSV coordinate file:1. converted and output by PCB source file via DXP and other software

2.Use FlyerSMTLi edit online.

b. The file contains: NO.; Name; Type; Coordinate; Angle; Value

c. CSV files can be directly modified and saved with Excel.

2、 Production File(.H9Prj)

a. Formal production file edited via FlyerSMTLi.

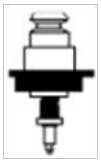
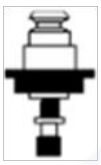
b. The file contains: CSV coordinate ； PCB ； Feeder ； Setting.

c. Edit and use by FlyerSMTLi only.

2-4 Device Parameters

System	Project	Content
Mounting System	Mounting Numbers	4 PCS
	Mounting Precision	0.025 mm
	Mounding Angle	0～360°
	Theoretical Speed	7500 PCS/h
	Normal Mounting	6000 PCS/h
	Visual Mounting	5000 PCS/h
	Suction Nozzle Type	Juki Series Nozzle
	Applicable Element	RC (0402, 0603, 0805, 1206 etc)
		LED Lamp Beads (0603, 0805, 3014, 5050 etc)
		Chip (SOT, SOP, QFN, BGA etc)
PCB	PCB Minimal Size	<5.5 mm
	PCB Maximum Size	10×10 mm
	PCB Thickness	350×450 mm
	PCB Warping Allowable Value	≤2 mm
Feeder Tank	Type	YAMAHA CL Materials Feeder
	Feeder	8mm 12mm 16mm 24mm 32mm
	Numbers	38 level
	Tubular Materials Feeder	YAMAHA YV materials feeder
	IC Tray	Postposition 1 PC Tray
X/Y/Z Axis	X/Y Axis Moving Range	655×575 mm
	Z Axis Moving Range	12 mm
Visual System	A Visual Camera	CCD High-Definition Camera
	Numbers of Visual	6PCS(parts camera, PCB camera, High Speed Identification*4)
	Recognition Capability	MAX.22*22mm
Control System	PC System	MicrosoftWIN7
	Operational Software	Researching and Development Independently
	Compatible File Format	CSV、TXT.format
	Program Method	Support online and offline ways
Basic Parameter	Air Pressure	0.8 Mpa
	Vacuum Mode	Vacuum Generator
	Air Pressure	-80 kpa
	Power	500W
	Power Supply	AC220V±10% 50Hz
	Outline Size	L 1185× W 840 × H 560 mm
	Net Weight	123kg

2-5 Nozzle

NO.	Outer Diameter	Inner Diameter	Shape	Application
502	Φ0.7mm	Φ0.4mm		0402
503	Φ1.0mm	Φ0.6mm		0402、0603 etc. (Equivalent Size)
504	Φ1.5mm	Φ1.0mm		0805、1206、1210、SOT23 etc. (Equivalent Size)
505	Φ3.5mm	Φ1.7mm		SOP8、SOP14、1812、2220、QFN etc. (Equivalent Size)
506	Φ5.0mm	Φ3.2mm		QFN、TQFP、BGA、or ⩽22mm

2-6 Substrate Limitation

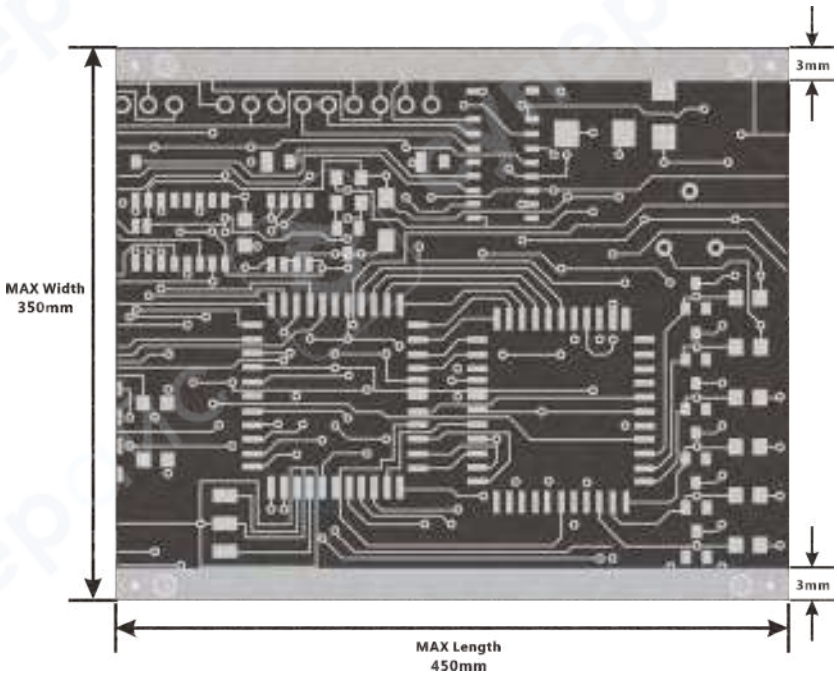


Fig. 2-9 Substrate Limitation

2-7 The Composition Of the Menu

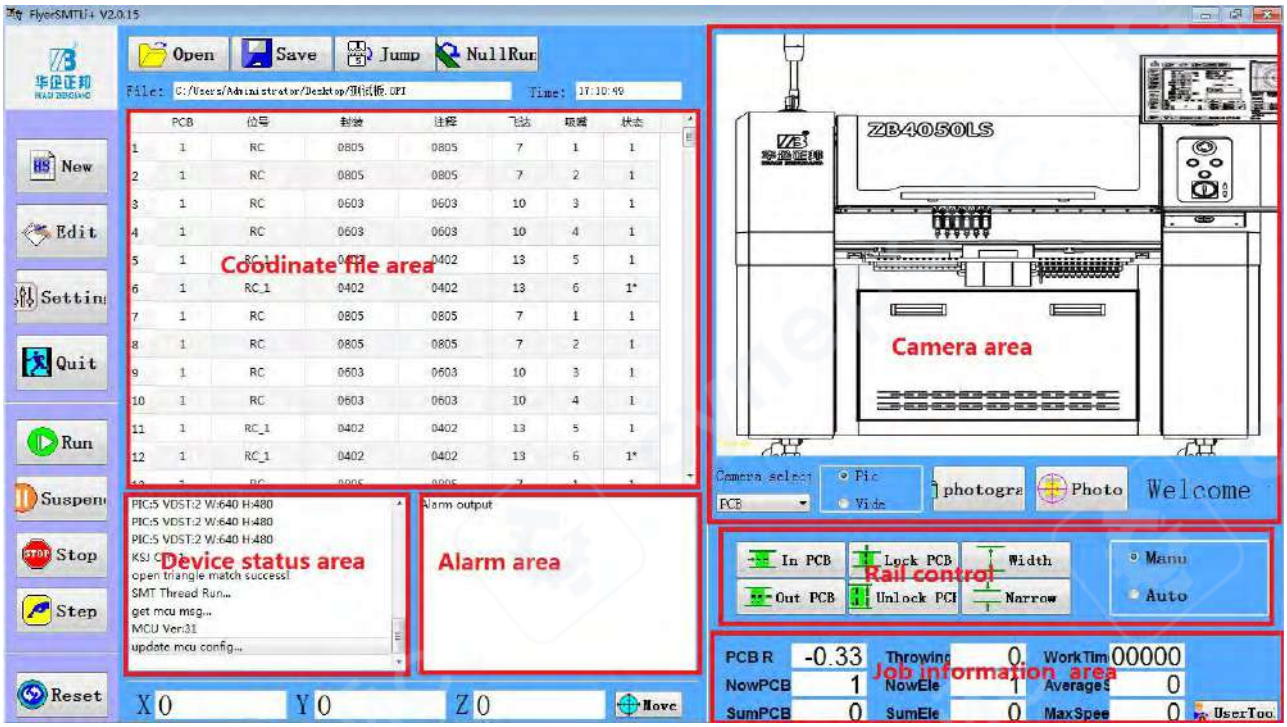


Fig.2-10 Main Menu

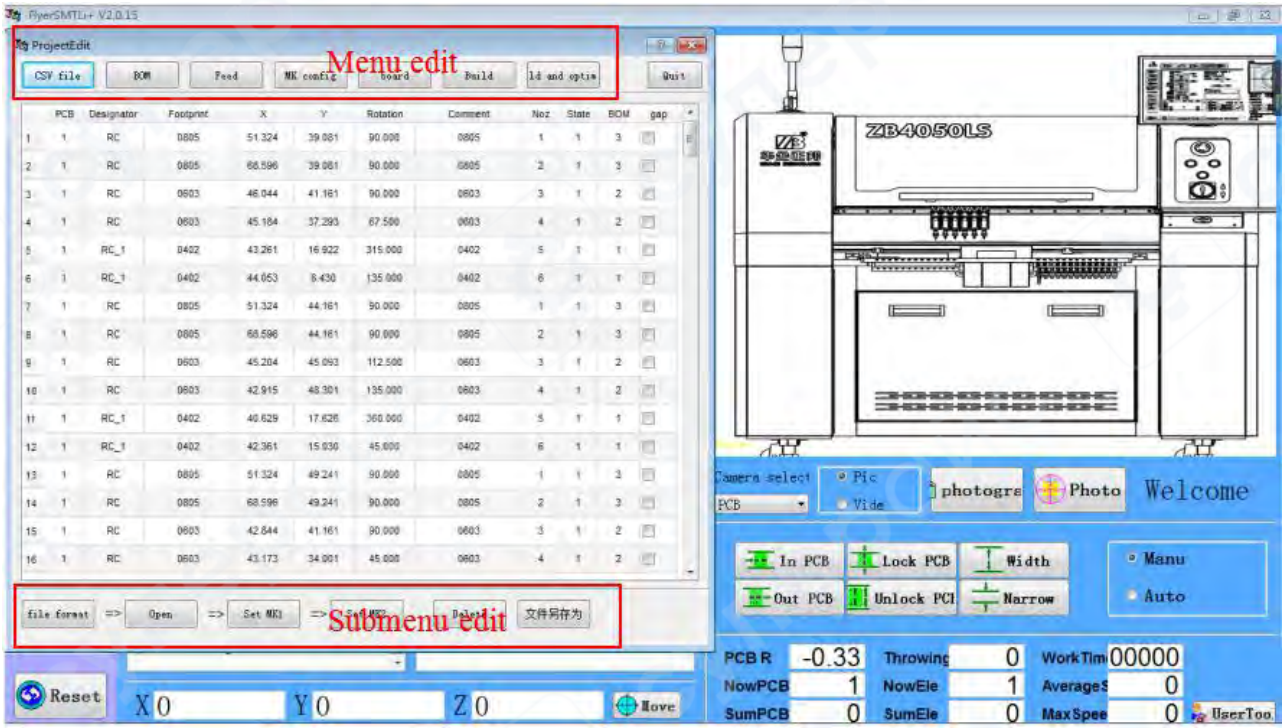


Fig.2-11 Project Edit

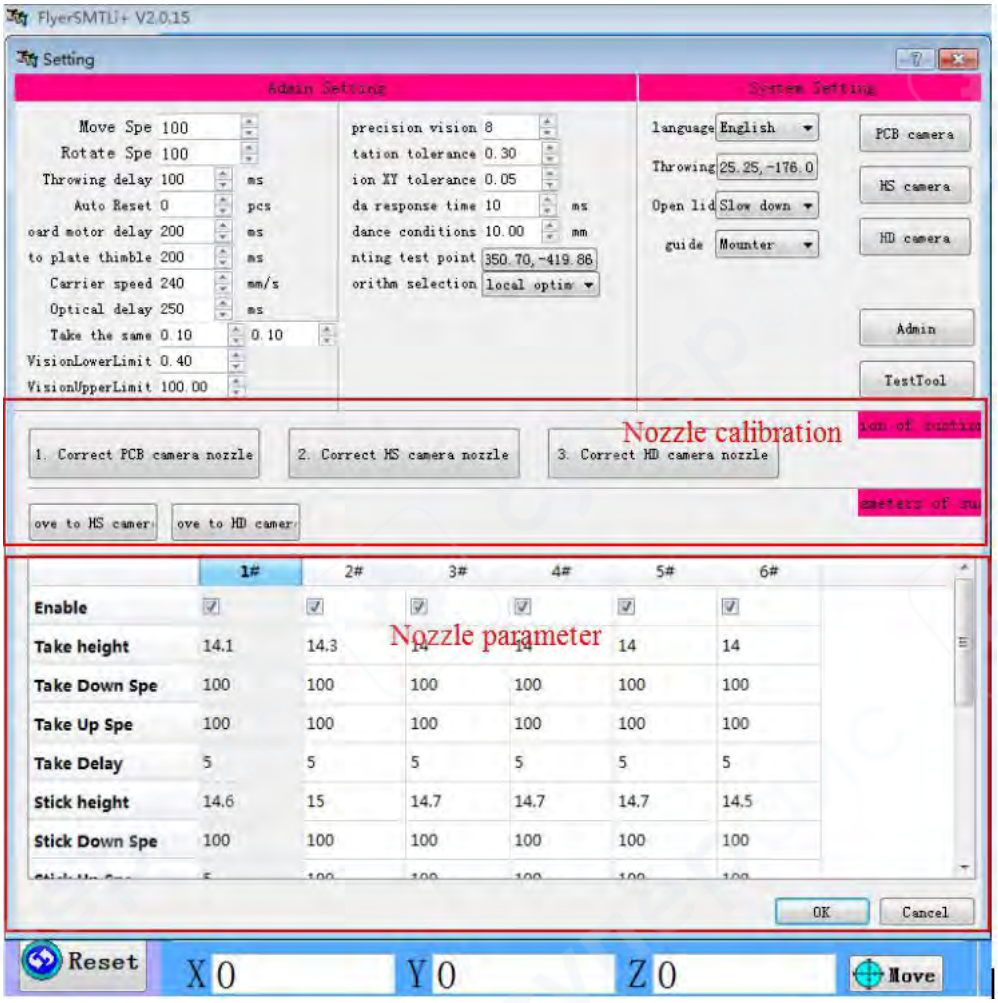


Fig.2-12 Setting Edit

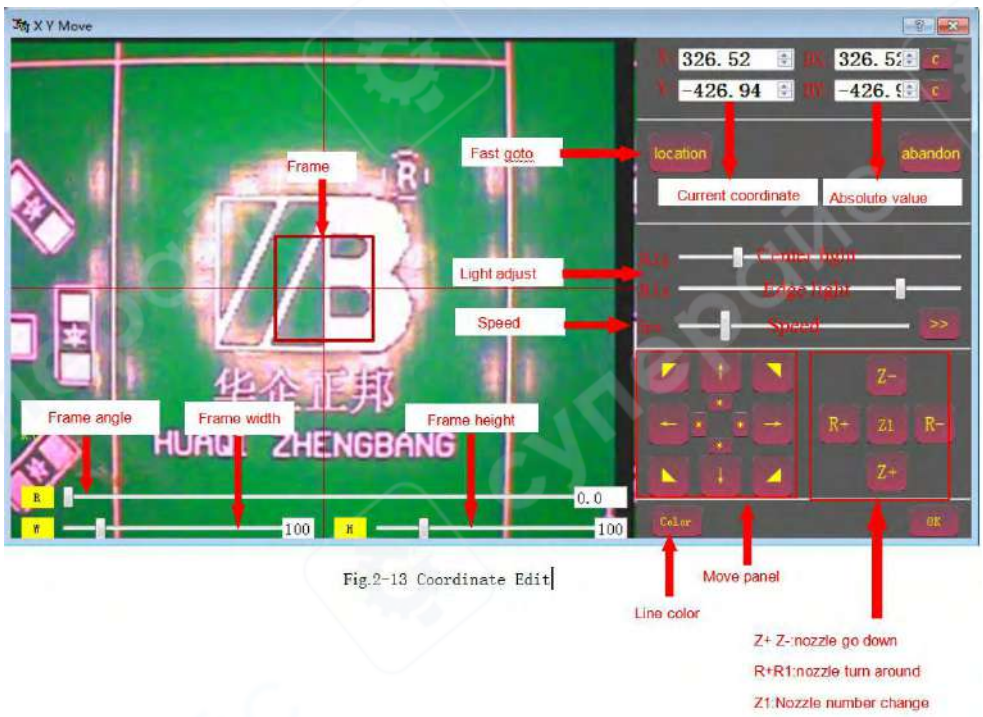


Fig.2-13 Coordinate Edit

Chapter 3 System Edit

3-1 CSV

！Attention：

If you have a PCB original file, you only need to export the CSV coordinate file and import it into the placement machine. You do not need to edit the placement coordinates of the component. (See 4-2-1, 4-2-2 for details)

If there is no PCB origin file, only the component coordinates can be added by the placement machine. (See 4-2-3 for details)

3-1-1 Convert PCB origin files to CSV coordinate files

1.Program Import： Run DXP（Altium Designer ），Import the PCB origin files.

Fig.4-5 Program Import

2.Origin Setting：Click“Edit—Origin—Setting”， Align the lower left corner insert via, MARK or lower left corner component pad as the origin.

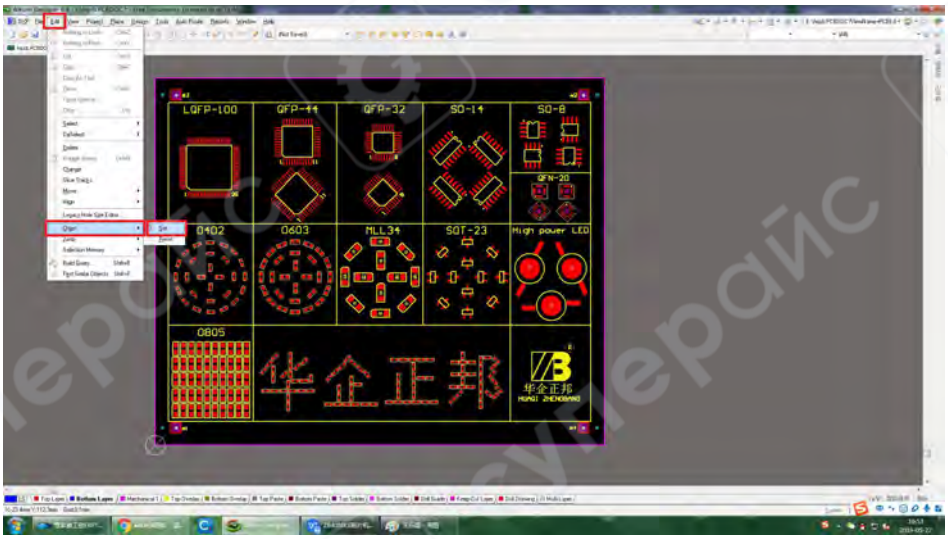
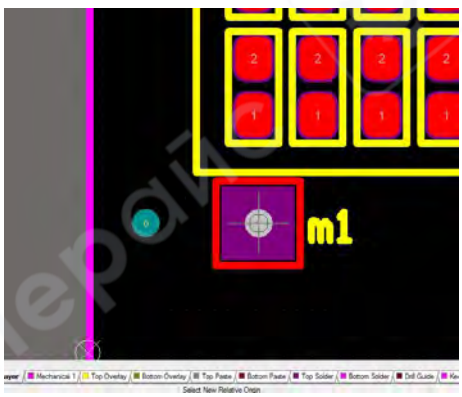


Fig.4-6 Origin Setting



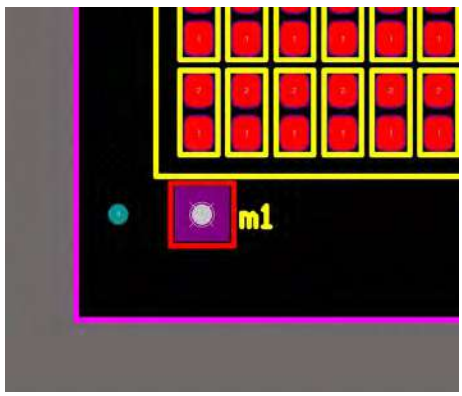


Fig.4-7/8 Origin Setting

！Attention：

Origin usually be set in the bottom left corner. Consider cut of the edge accuracy of PCB is not as required, it is recommended to select the lower left corner insert via, and the MARK or lower left corner component pad is more suitable for the origin.

3.Output File：Click on "Files - assembly output - Generates pick and place files" to output the coordinate file.

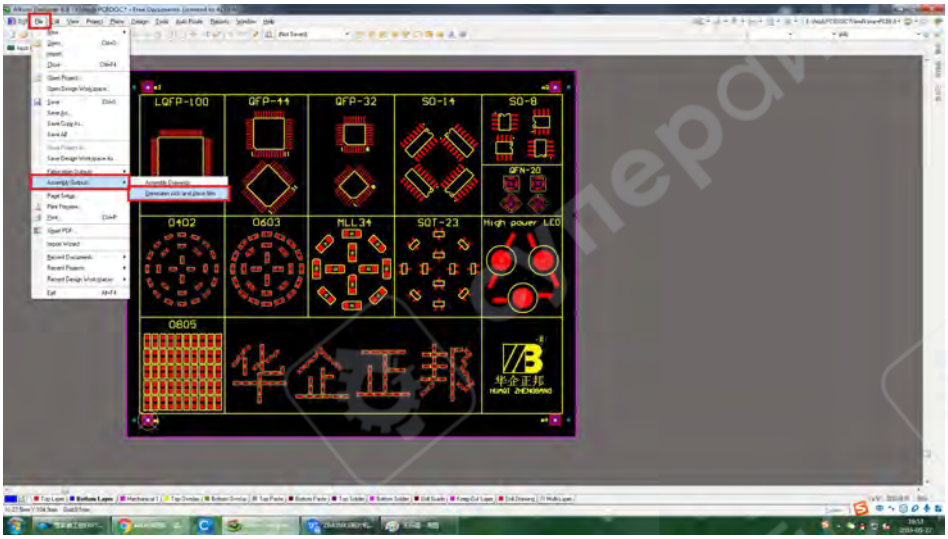


Fig.4-9 Output Coordinate File

Select Format：CSV. Unit: Metric, click "OK" to generate a CSV coordinate file.

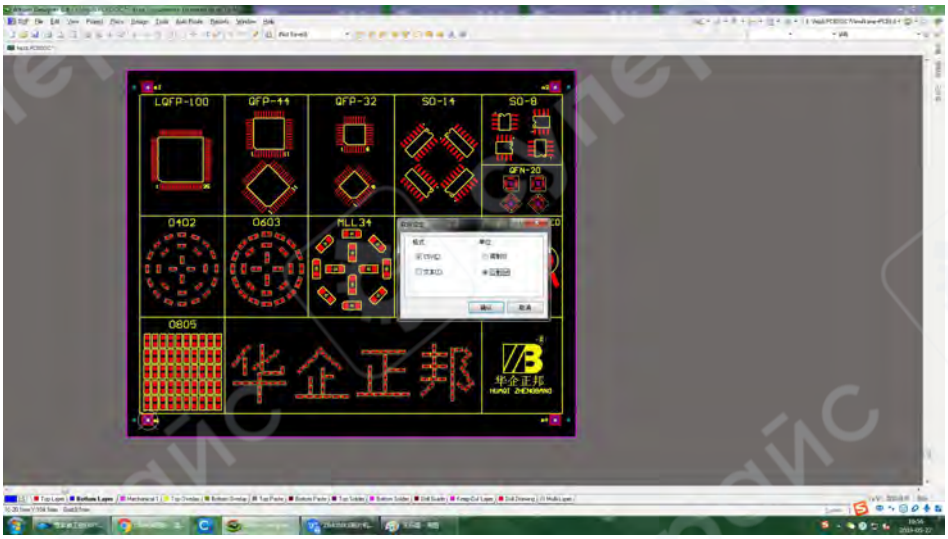


Fig.4-10 Select output format

The output file is saved in the same folder as the PCB origin file by default.

3-2 New project Creation

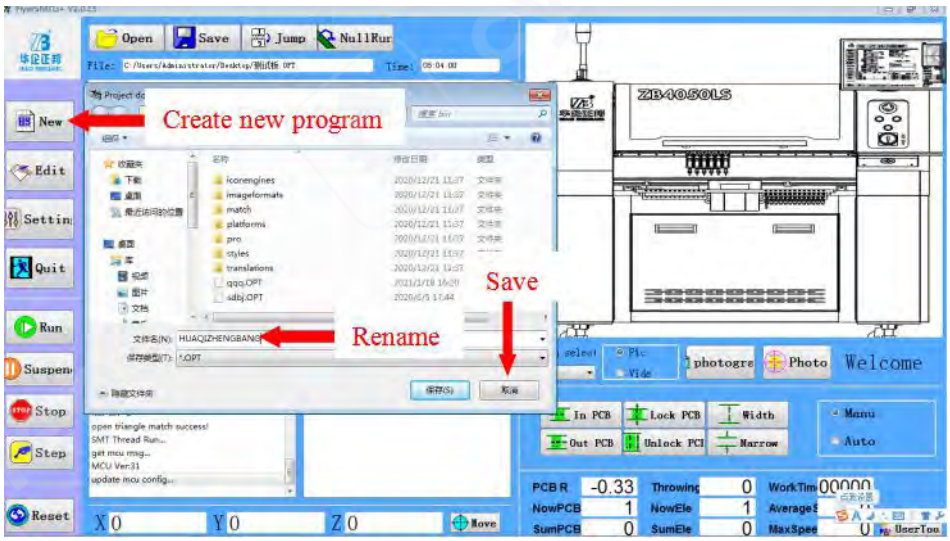


Fig. 3-7 New project Creation

3-3 Coordinate File Edit

3-3-1 Coordinate File Edit Sequence

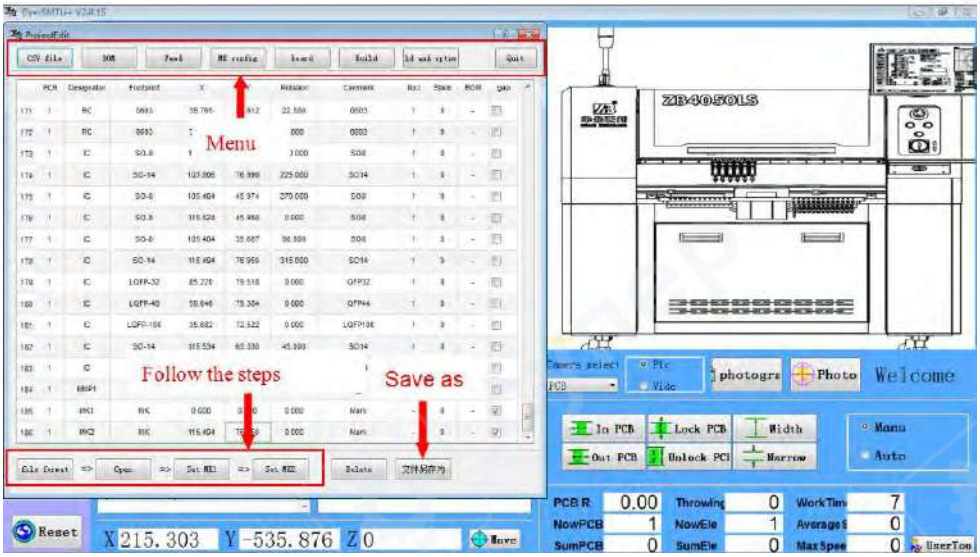


Fig.3-8 Coordinate File Edit Sequence

3-3-2 File Format Edit

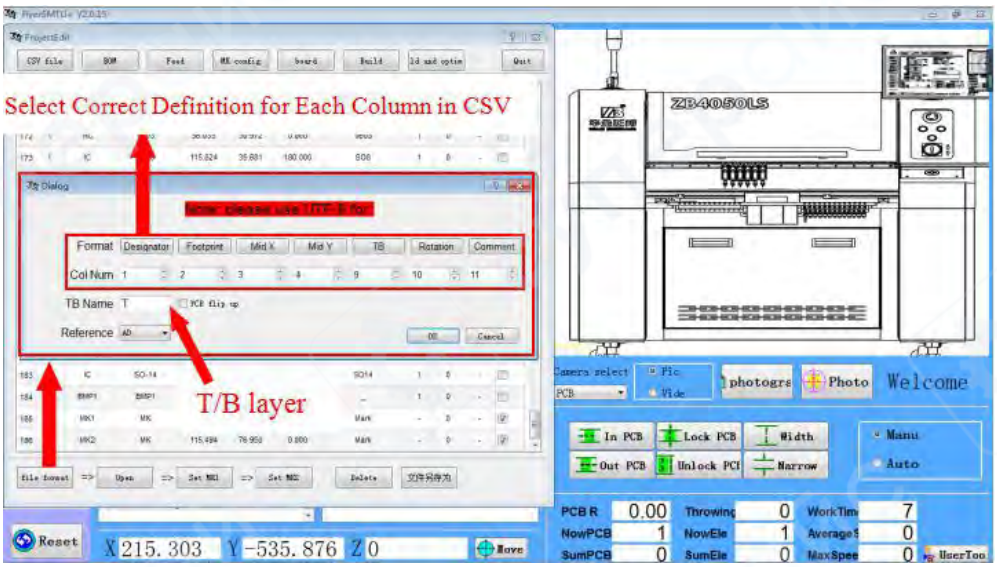


Fig.3-9 File Format Edit

3-3-3 How To Open The File

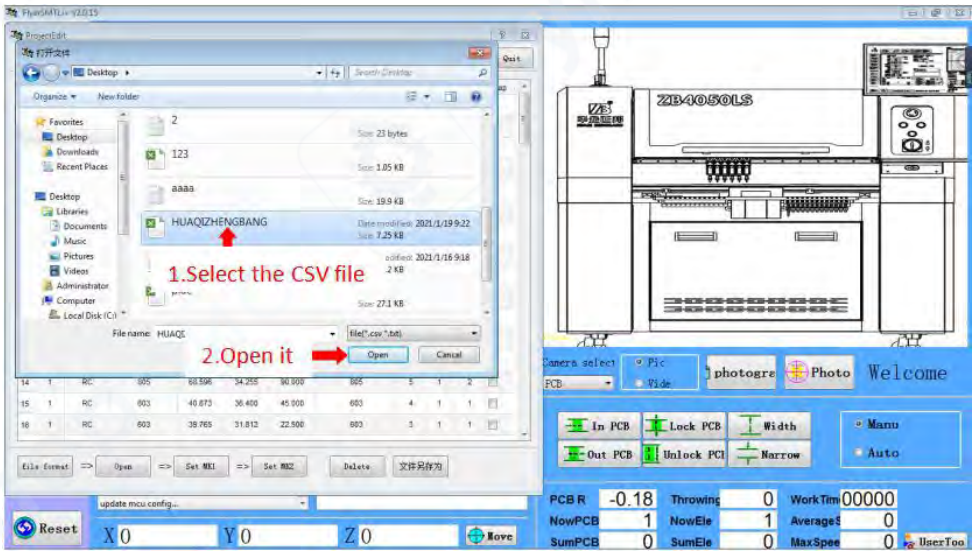


Fig.3-10 Open the CSV file

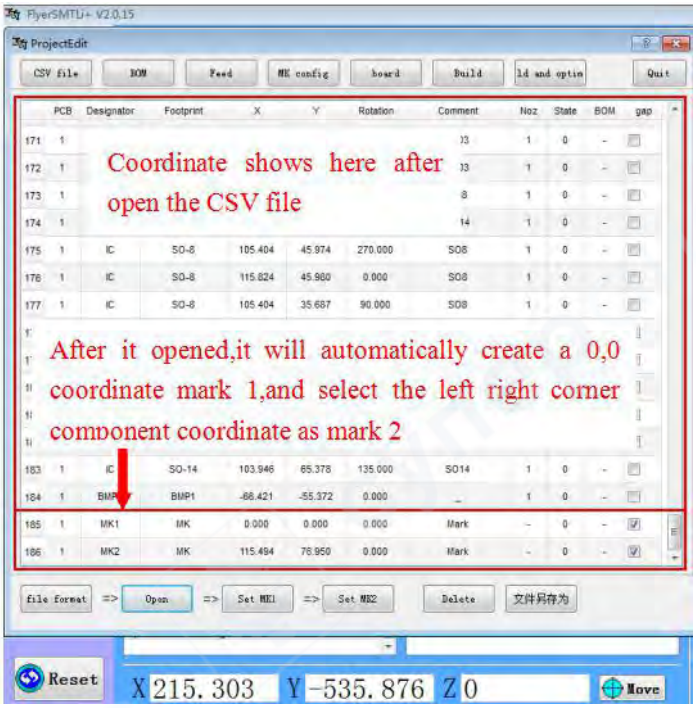


Fig.3-11 After opened

3-3-4 MARK Point 1 Set

Fig.3-113-12 MARK Point 1 Set

3-3-5 MARK Point 2 Set

Fig.3-13 MARK Point 2 Set

3-3-6 MARK Point Coordinate Change

! Note:

In actual applications, many users' original files do not have standard MARK points. At this time, the component pads need to be regarded as MARK points. However, because the component pads will be unstable due to the solder paste printing position, you need to set the pads first. Use it as a MARK point after determining the PCB deviation angle, then change the MARK point to other suitable positions, such as plug-in vias, etc.

Fig.3-14 New MARK1 Set

Fig.3-15 New MARK2 Set

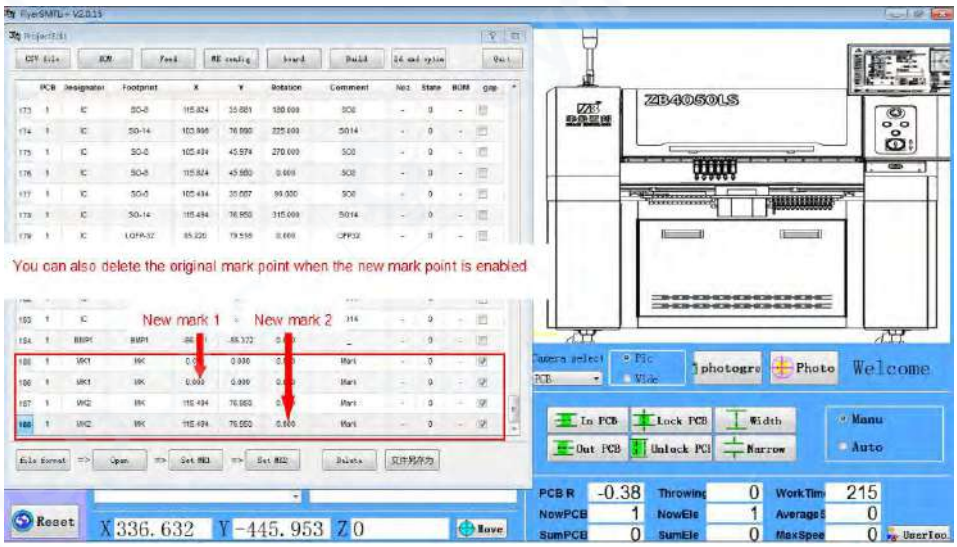


Fig.3-16 After MARK Point Changed

3-3-7 Check -Modify -Coordinate

! Note:

When the MARK point is set correctly, check the component coordinates one by one. The cross cursor should be aligned with the center of the component. Otherwise, the MARK point needs to be reset if it is not set properly. If you want to modify the current component coordinate position when checking the coordinates, move the lower right direction key to complete the movement. Then click the OK button in the lower right corner to save the currently modified coordinates, and click the X button in the upper right corner to not save the current coordinates

Fig.3-17 Check-Modify-Coordinate

! NOTE:

The following right-click menu introduction (search and replace, rotation compensation of the same SMD, split multiple of the same SMD) and other functions are only called when needed, and can be skipped if they are not needed.

3-3-8 Search And Replace

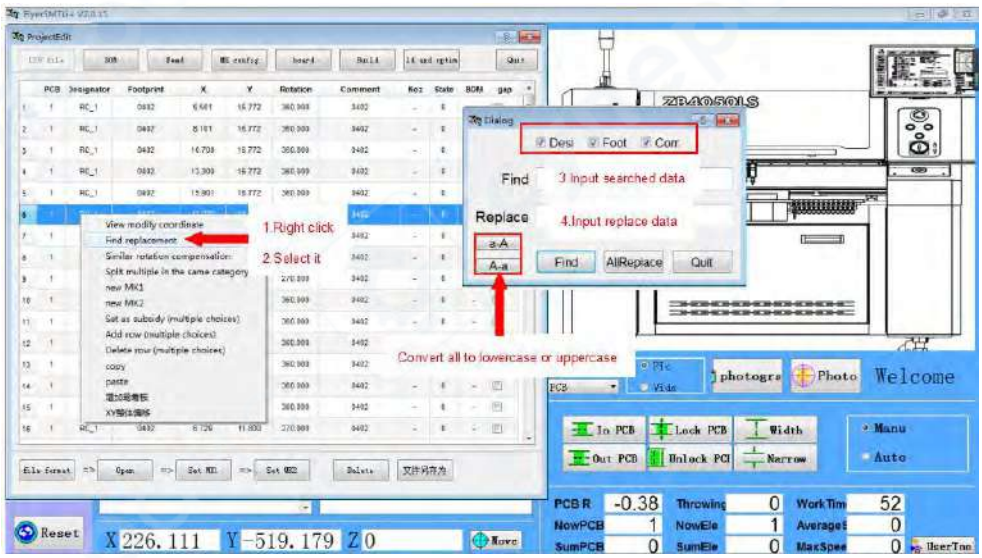


Fig.3-18 Search And Replace

3-3-9 Rotation Compensation Of The Same SMD

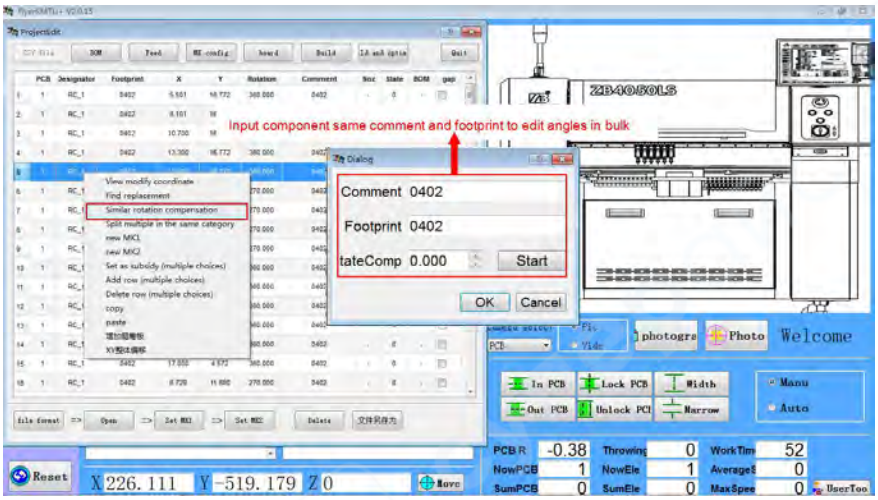


Fig.3-19 Rotation Compensation Of The Same SMD

3-3-10 Split Multiple Of The Same SMD

Multiple splits of the same type is suitable for situations where the supply efficiency of a single feeder is insufficient with a single component and a large number. The input split quantity software will automatically modify the original comment to -X the same quantity to install multiple feeders The device supplies the same materials, which is especially suitable for the occasions where LED lamp beads are mounted.

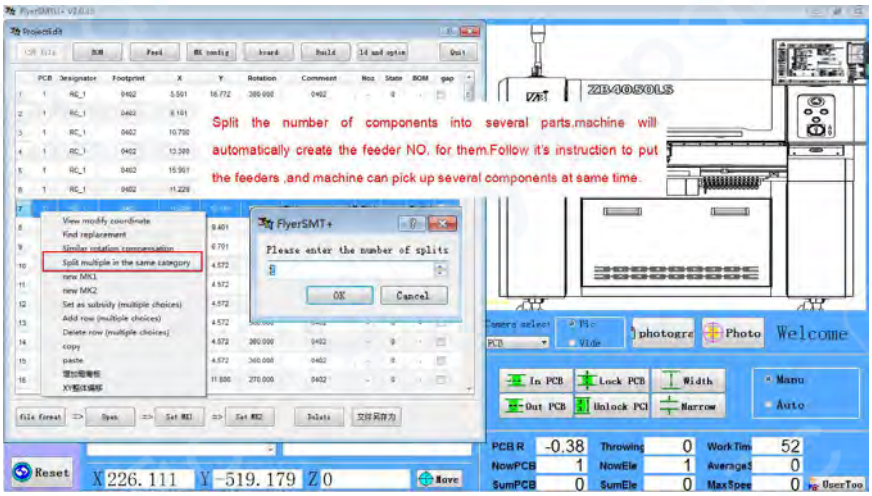


Fig.3-20 Split Multiple Of The Same SMD

3-3-11 Manual Edit SMD Component coordinate (If Without the original CSV file)

Step 1: Refer to Chapter 3-2 for the new project

Step 2: Add and set MARK1 and MARK2. The operation method is the same as the MARK point position change. Refer to Chapter 3-3-6.

Step 3: Manually add edit coordinates

Fig.3-21 Manual Edit SMD Component

3-4 BOM List Edit

3-4-1 BOM List Edit Process

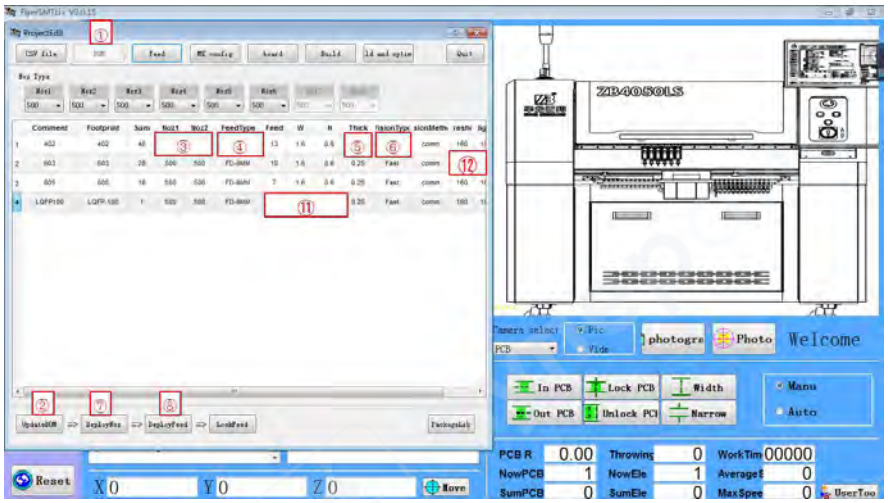


Fig.3-22BOM List Edit

① Turn to BOM List ② Update BOM List

③ 2 Nozzle Selection ④ Feeder Type Selection

⑤ SMD Thickness Input ⑥ Visual Type Selection

⑦ Nozzle Distribution ⑧ Feeder Distribution

⑨ Nozzle Installation ⑩ Feeder Installation

⑪ SMD Size Edit ⑫ Threshold&Light Edit

3-4-2 Switch To BOM List&Update BOM List

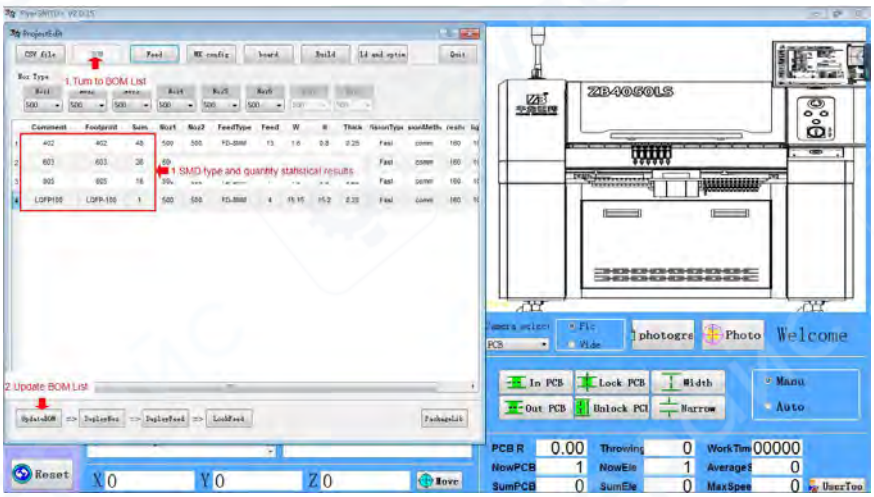


Fig.3-23 Update BOM List

3-4-3 Nozzle Type Choose

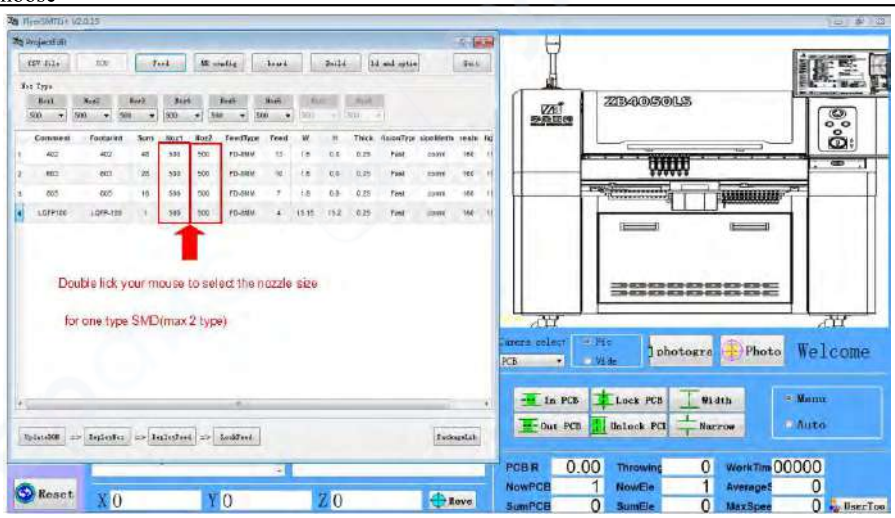


Fig.3-24 Nozzle Type Choose

3-4-4 Choose Feeder Type

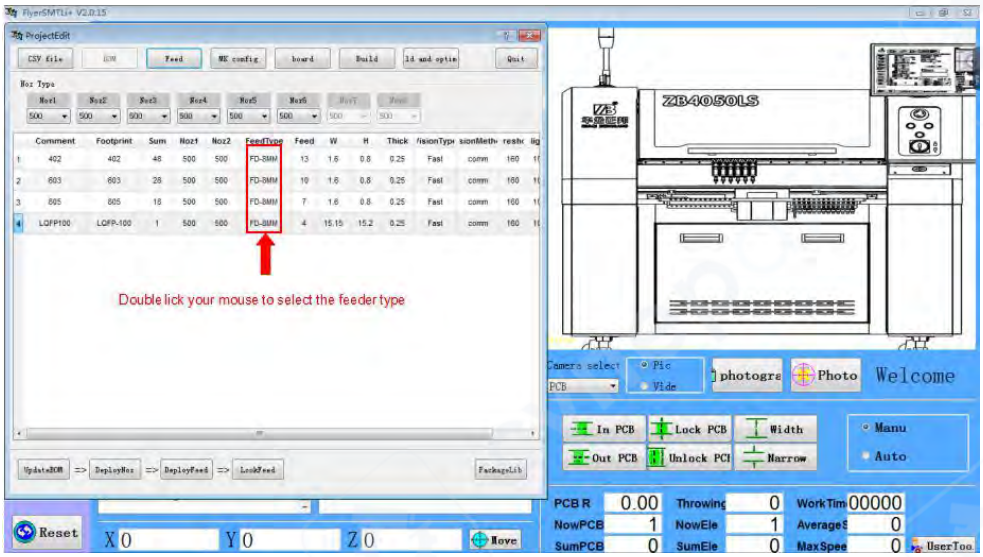


Fig.3-25 Choose Feeder Type

3-4-5 SMD Thickness Edit

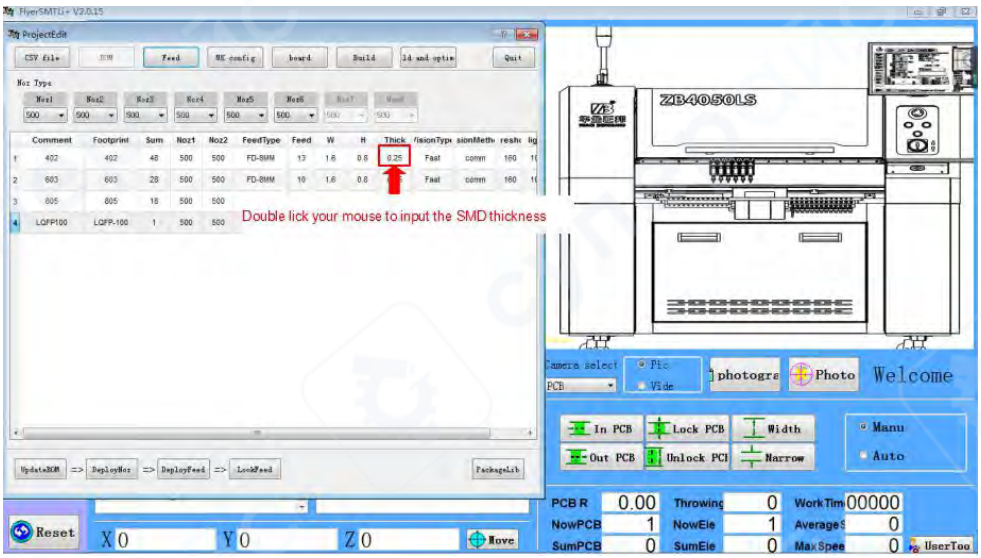


Fig.3-26 SMD Thickness Edit

3-4-6 Choose Visual System type

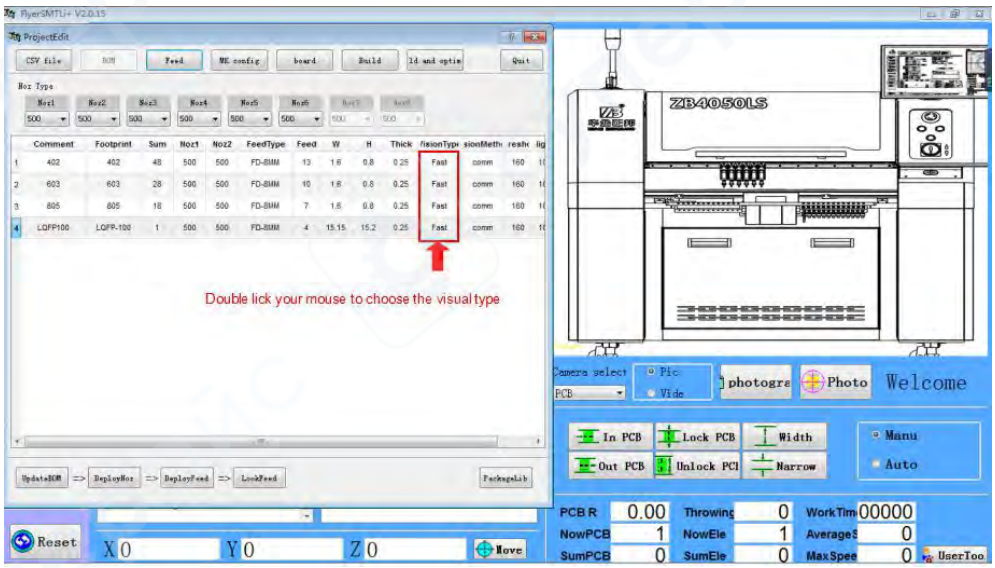


Fig.3-27 Choose Visual System Type

3-4-7 Deploy Nozzle&Deploy Feeder &Install nozzle&Install Feeder

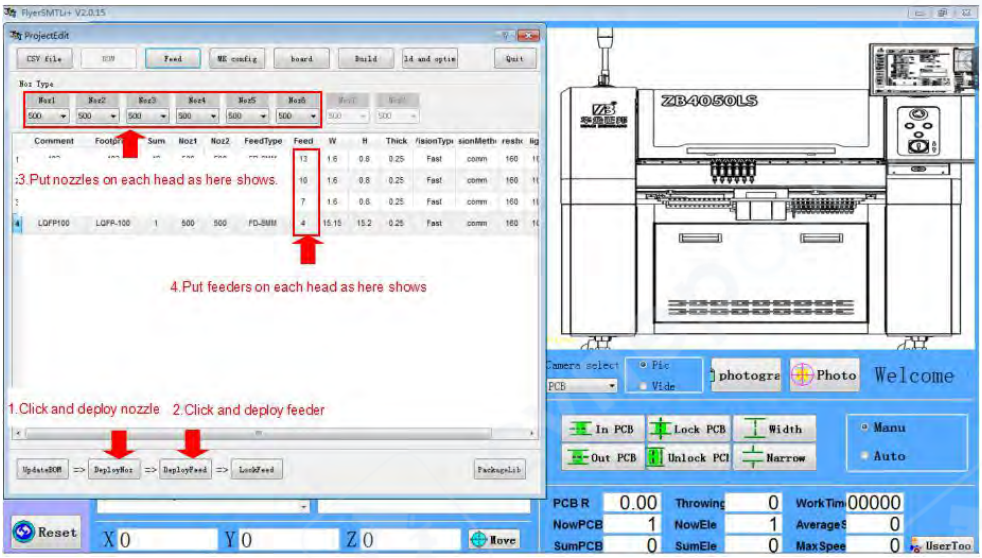


Fig.3-28 Deploy Nozzle&Deploy Feeder

3-4-8 SMD Length&Width Edit

Fig.3-29 SMD Length&Width Edit

3-4-9 Threshold And Light Source Edit

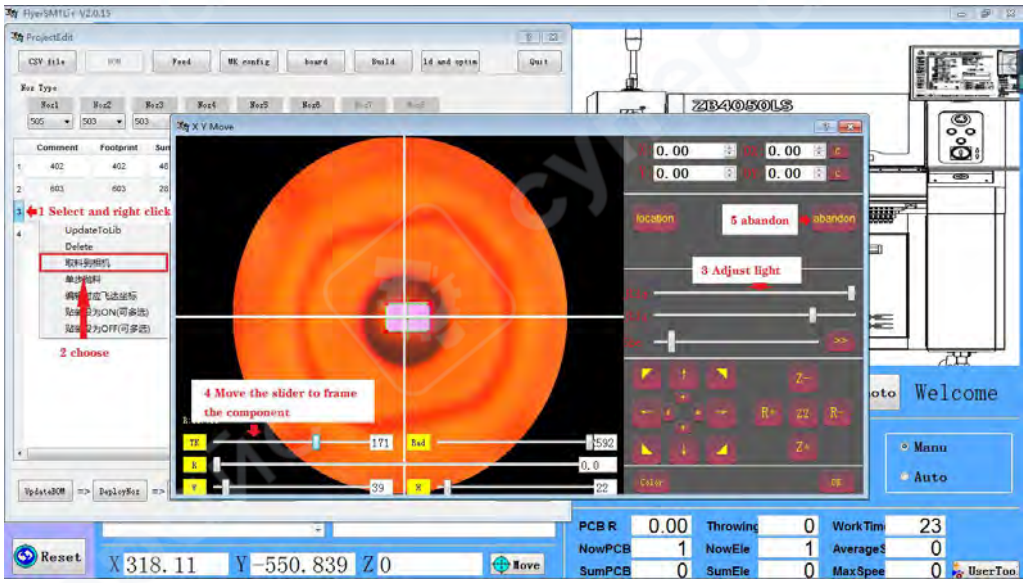


Fig.3-30 Threshold And Light Source Edit

3-4-10 Check The feeder Is In Component Center Or not

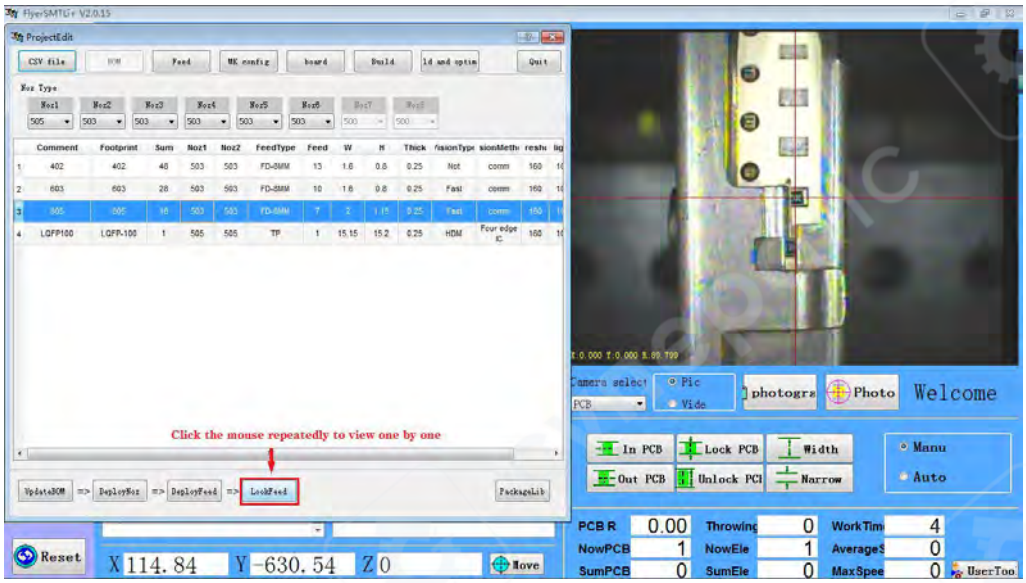


Fig.3-31 Check The feeder

3-4-11 SMD Package Lab Edit

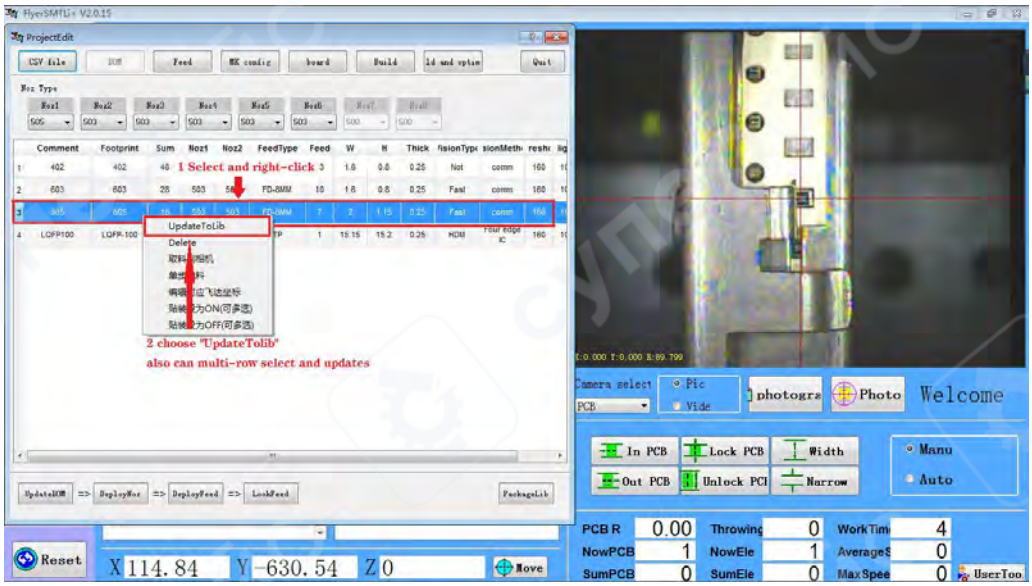


Fig.3-32 Update The SMD Package To The Lab

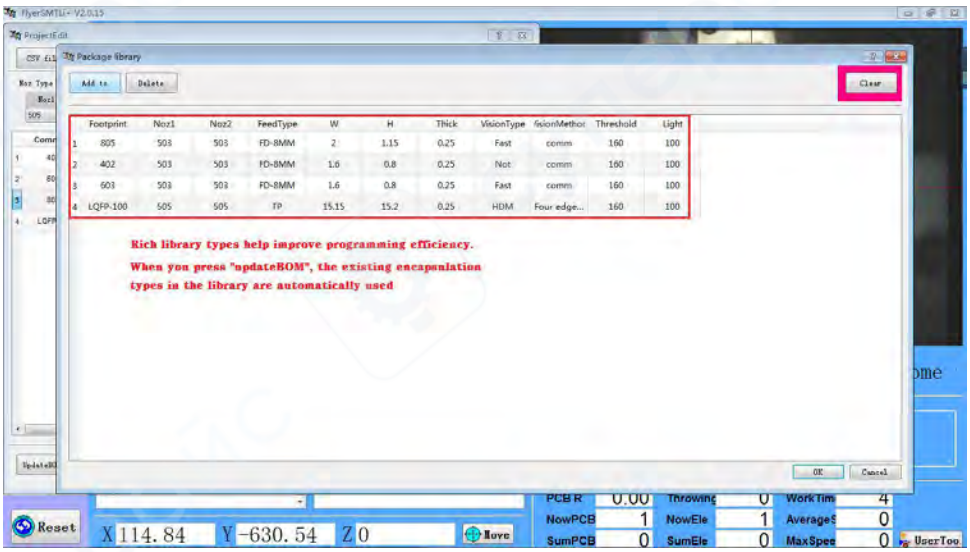


Fig.3-33 SMD Package Lab Edit

3-4-12 Mount options

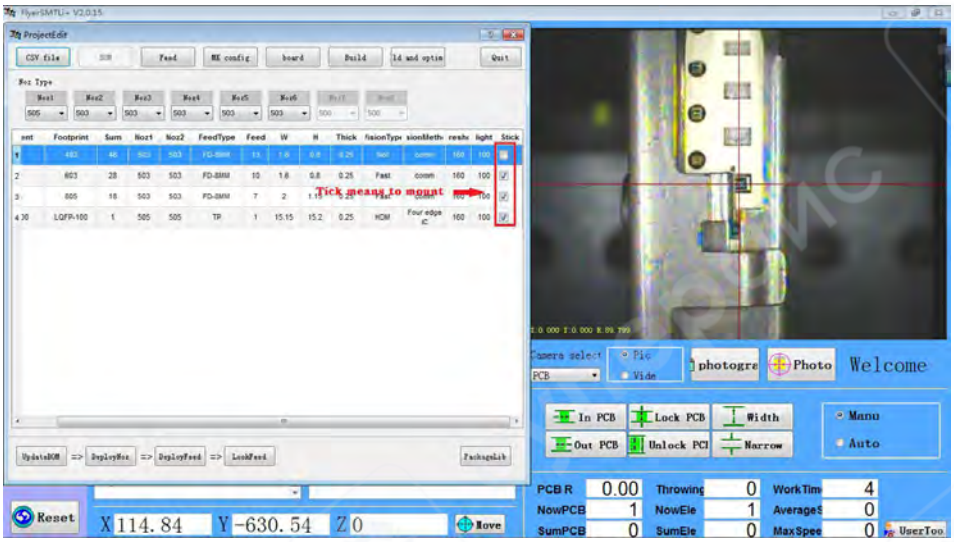


Fig.3-34 Mount options

3-5 Feeder Edit

3-5-1 Feeder Edit Detail Intoduce

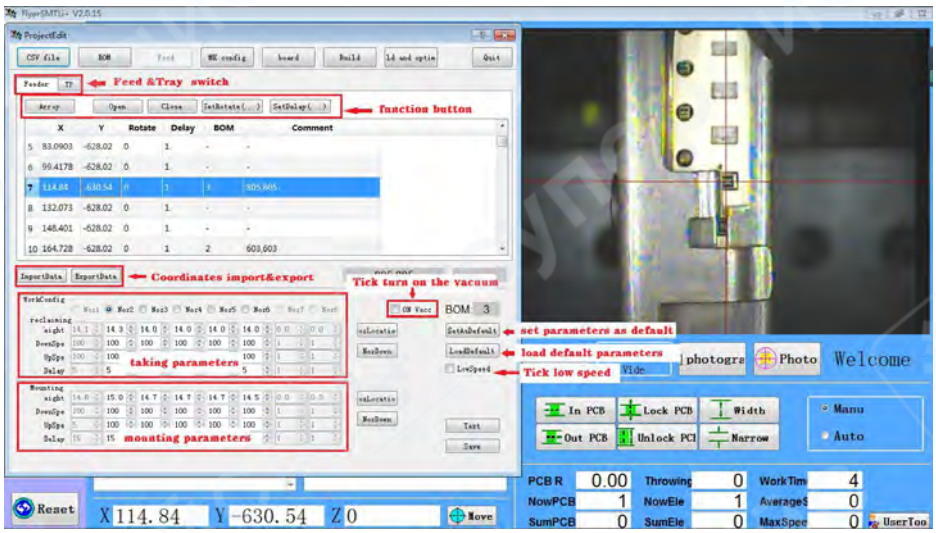


Fig.3-35 Feeder Edit Detail

3-5-2 Feeder Array

Note: The function of the feeder array is to quickly array the corresponding feeder coordinates when the initial coordinates of the feeder are not determined, but the accuracy of the feeder coordinates from the array needs to be fine-tuned .

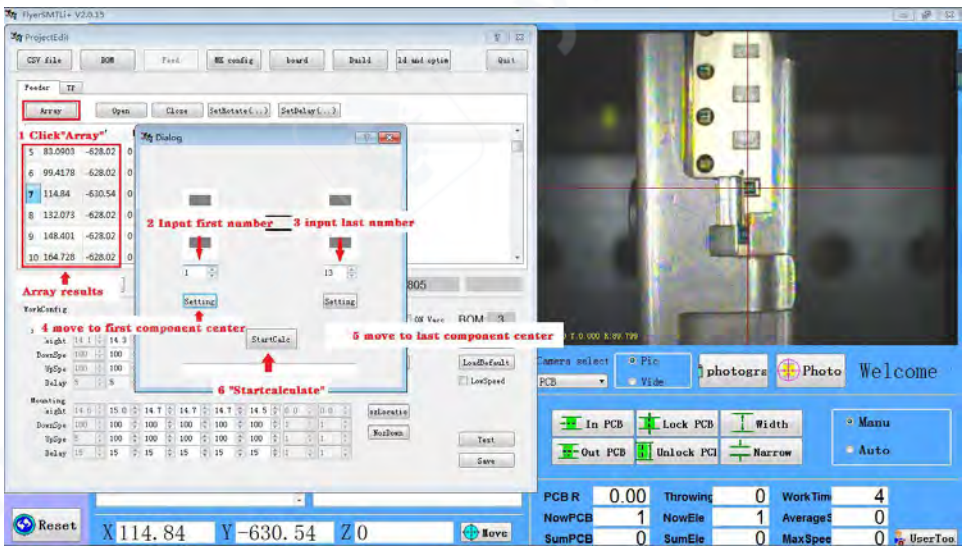


Fig.3-36 Feeder Array

3-5-3 Feeder Open & Close

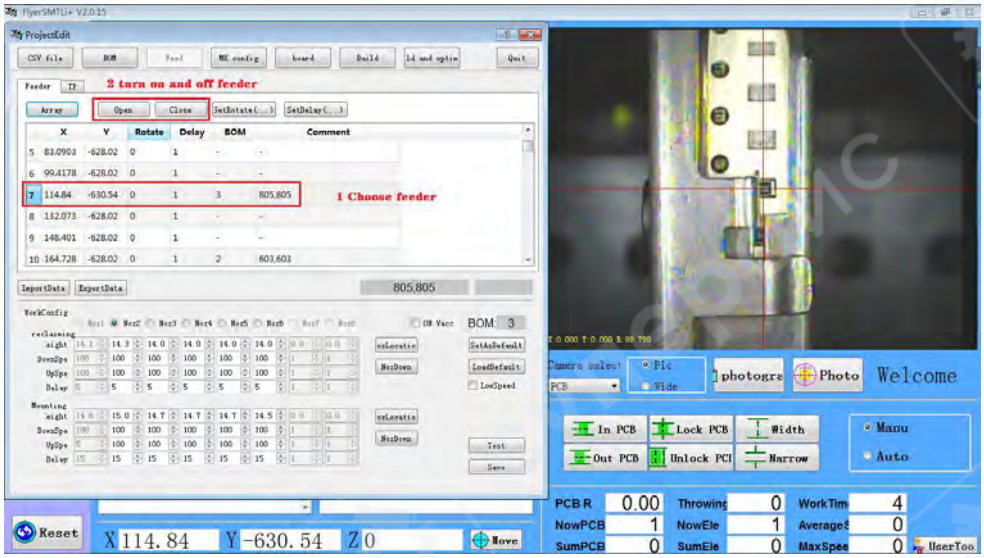


Fig.3-37 Open The Closed Feeder

3-5-4 Set multiple angles (rotate) & multiple delays (delay)

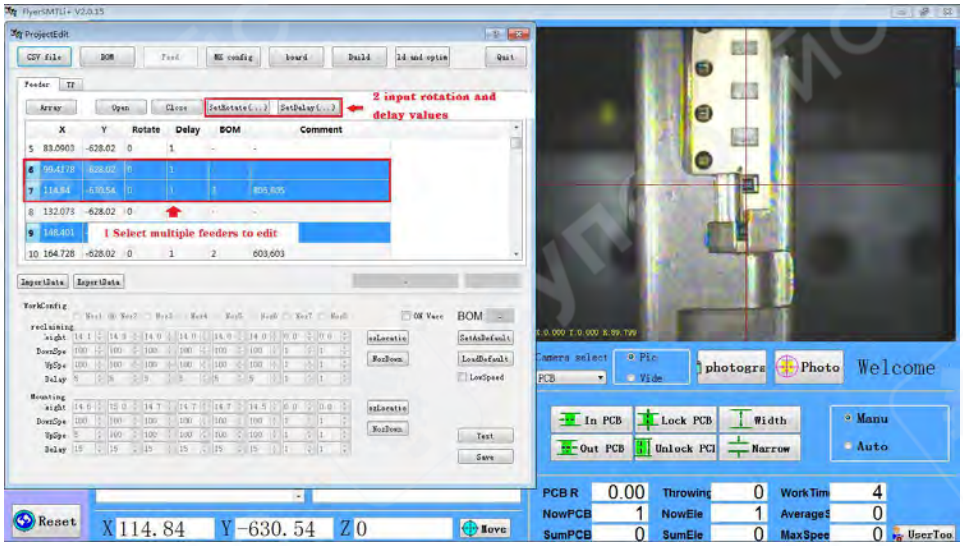


Fig.3-38 Set Rotate And Delay

3-5-5 X、Y Axis Coordinate Edit

Fig.3-39 X、Y Axis Coordinate Edit

3-5-6 Feeder Coordinate Input And Output

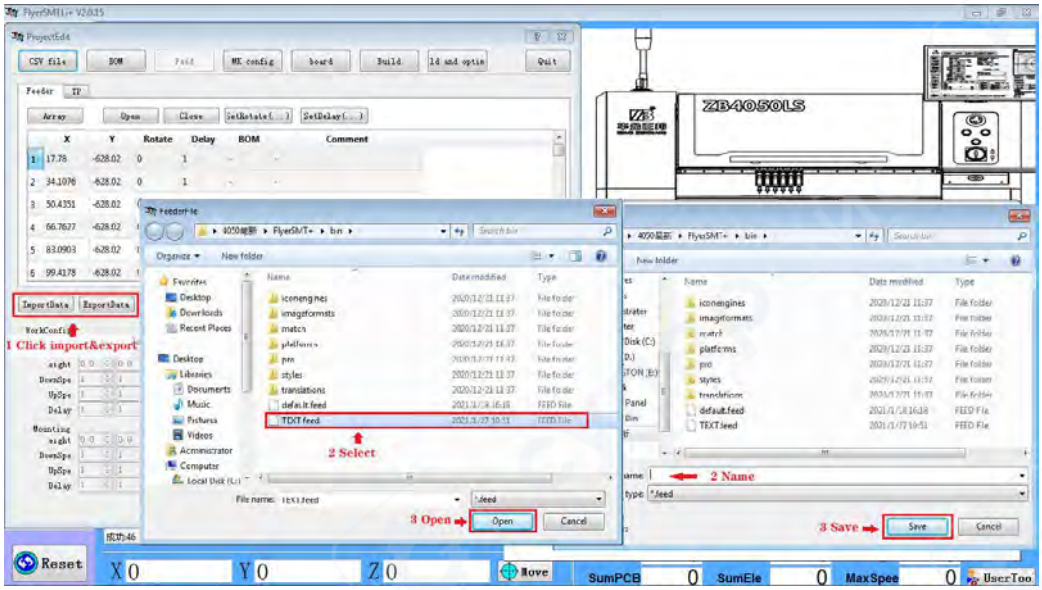


Fig.3-40 Feeder Coordinate Input And Output

3-5-7 IC Tray Edit

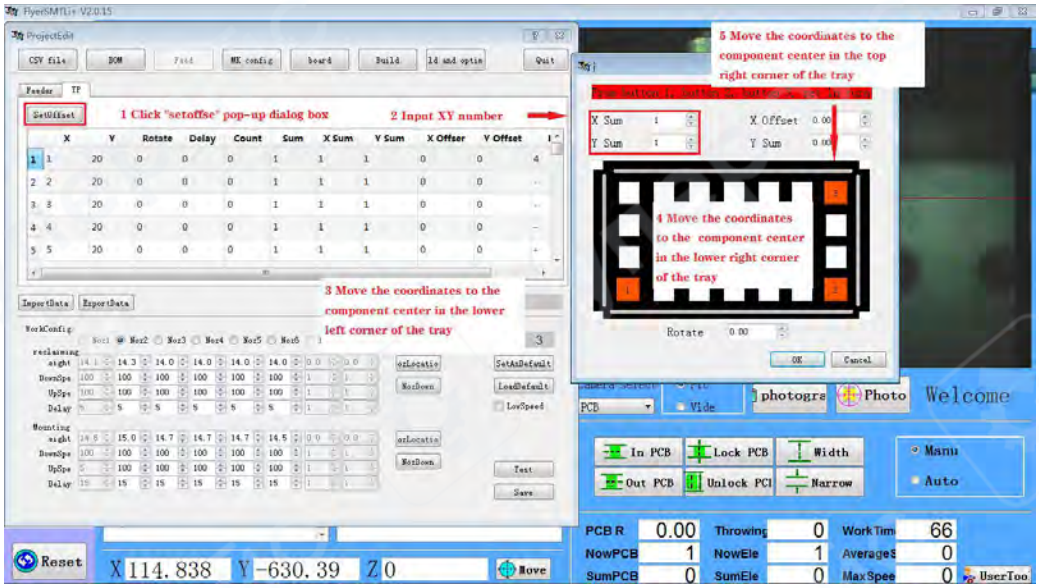


Fig. 3-41 IC Tray Edit

3-5-8 Feeder Pick and Place configuration

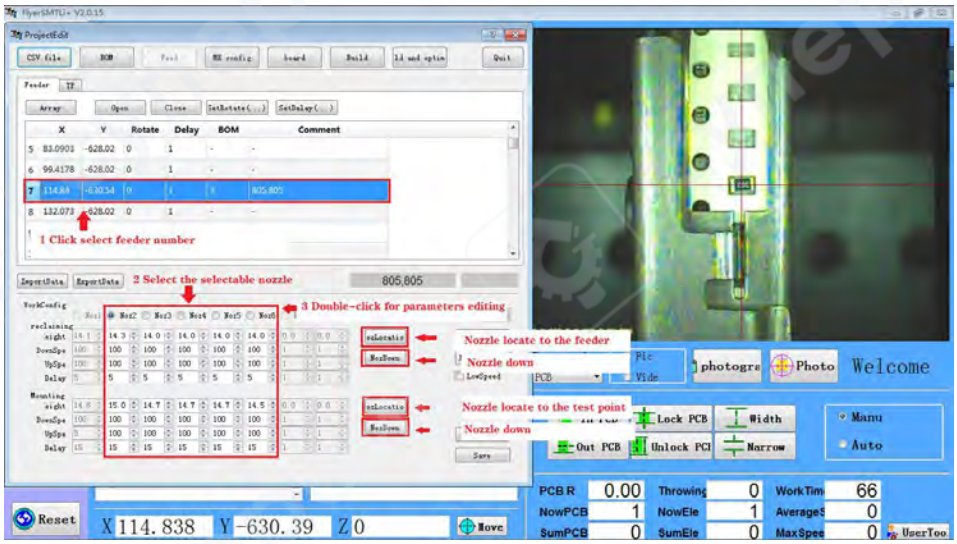


Fig.3-42 Feeder Pick and Place Configuration

3-5-9 Feeder type

According to the feeder model corresponding to the component package setting, the corresponding feeder model identification method is as shown below.

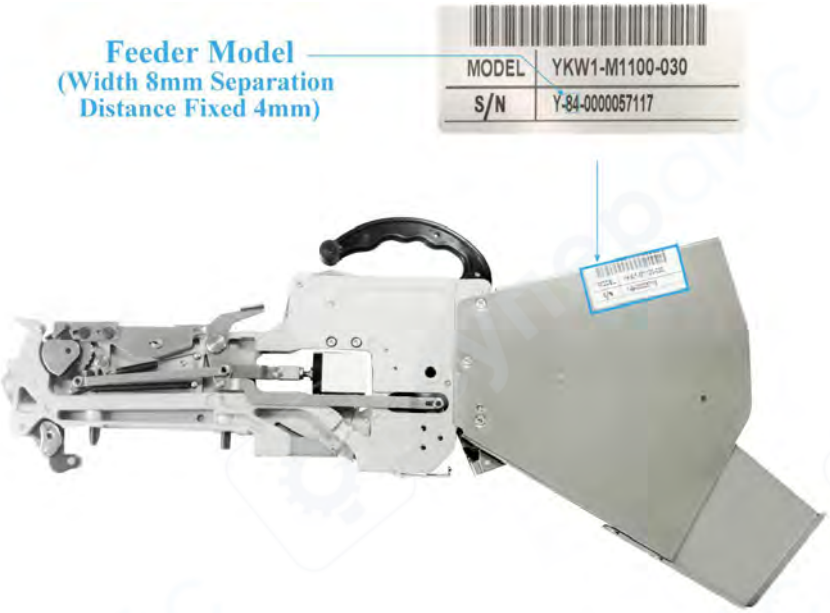


Fig.4-18 Feeder Model

Fig.4-19 Feeder Model

Fig.4-20 Feeder Model

3-6 MARK Point Configuration

Fig.3-44 MARK Point Configuration

3-7 PCB Array

3-7-1 PCB Array

Fig. 3-45 PCB Array

3-7-2 PCB Array Coordinate Check and Modify

Fig.3-46 PCB Array Coordinate Check and Modify

3-7-3 Create a PCB Array To A Single PCB &Split A Single PCB to Multiple Board

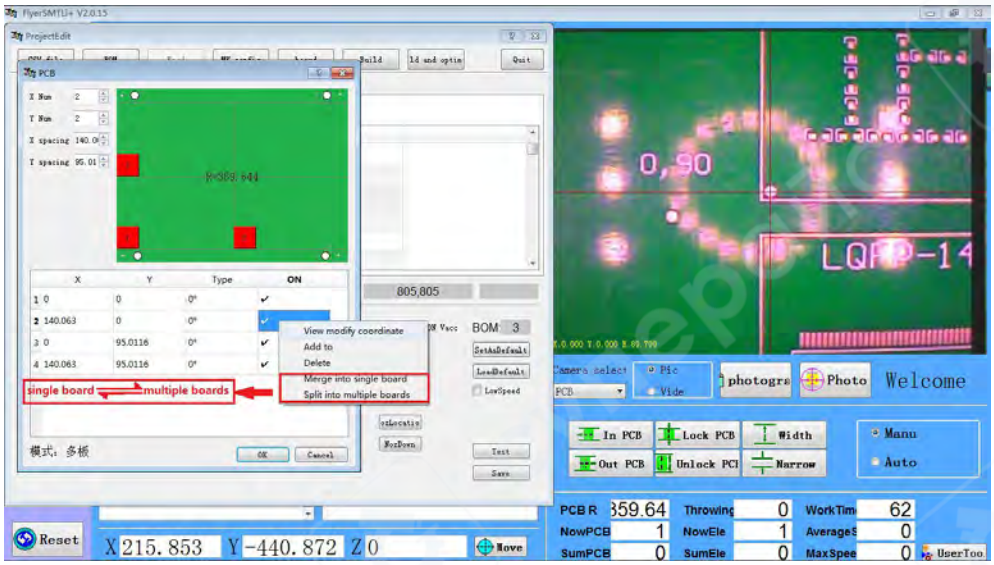


Fig.3-47 Create a PCB Array To A Single PCB &Split A Single PCB to Multiple Board

3-8 Build Project & Build And Optimize

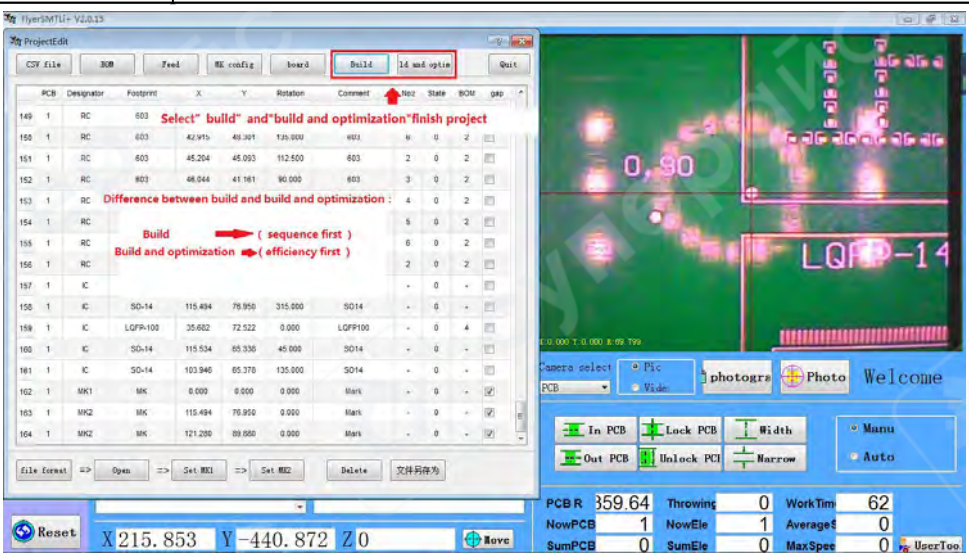


Fig.3-48 Build Project

3-9 Program Save

Fig.3-49 Save Project

Chapter Ⅳ: Production

4-1 Input Project

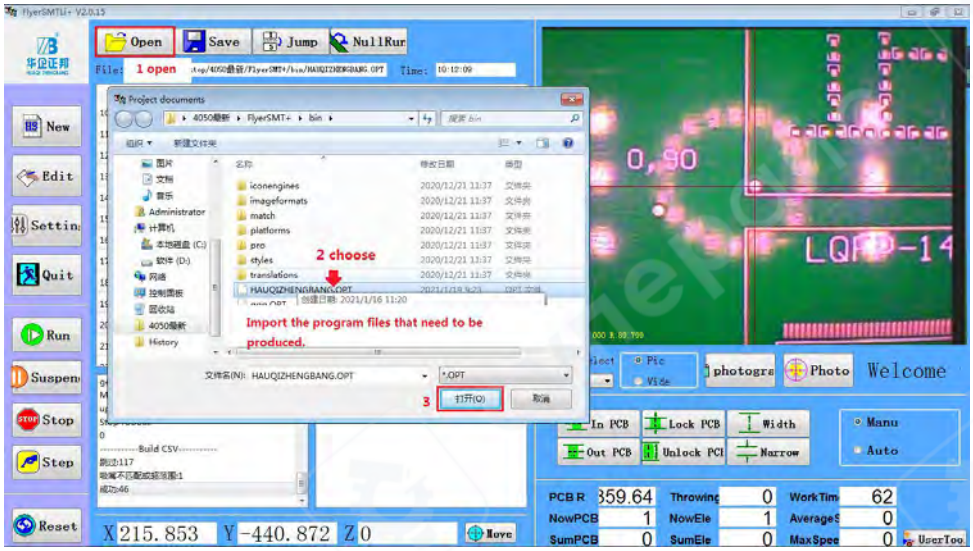


Fig.4-1 Input Project

4-2 Production

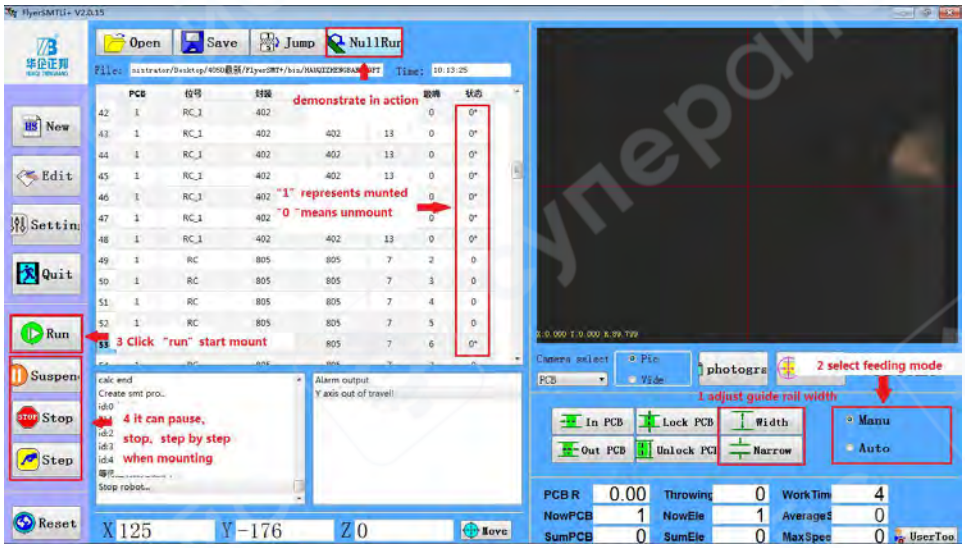


Fig.4-2 Production

4-3 Replenish Placement

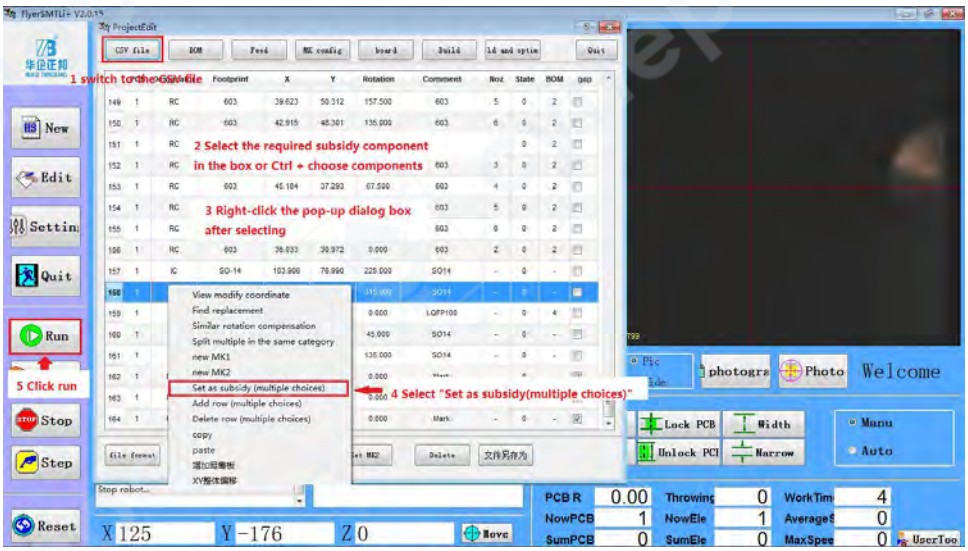


Fig.4-3 Replenish Placement

4-4 Jump Placement

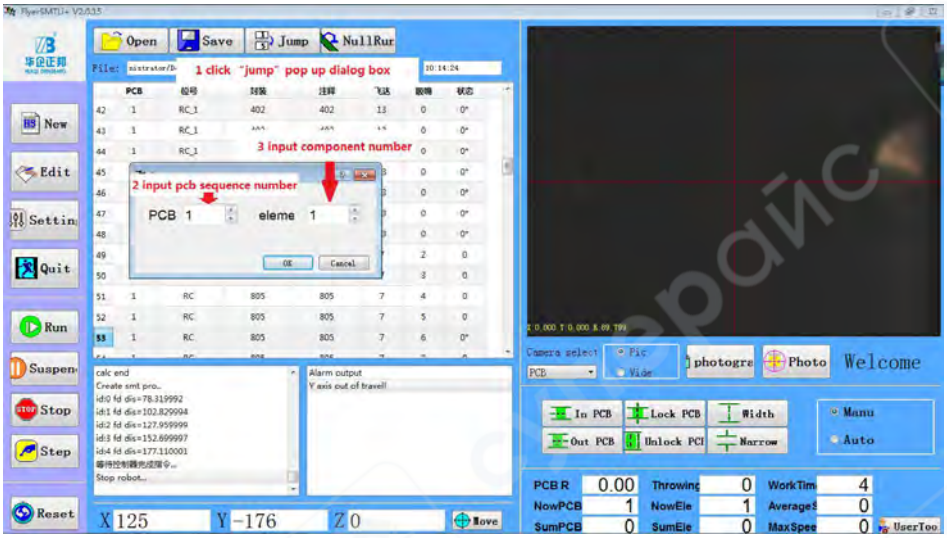


Fig.4-4 Jump Placement

4-5 End & Turn off the Machine

1、Click "Exit" to exit the placement machine control system

2、Click the Windows Start Menu—Turn off.

3、Turn off the power switch on the right side of the main unit to cut off the power.

! Attention :

Before turning off the power, be sure to turn off the computer first, otherwise it may cause the computer malfunction ;

Please ensure that the program has been saved before exiting the system, otherwise it may cause the program lost.

! DANGER :

Click "Start" switch and the machine will start production immediately ;

To avoid body injury, do not put your hands in the machine during operation, and do not move your face and head close to the machine ;

Be sure that there is no one using the machine before starting the machine ;

Be sure that there is no objects installed in the machine, anything will prevent the machine from running (adjustment tools, etc.) before starting the machine.

Chapter Ⅴ: System Settings

5-1 User Settings

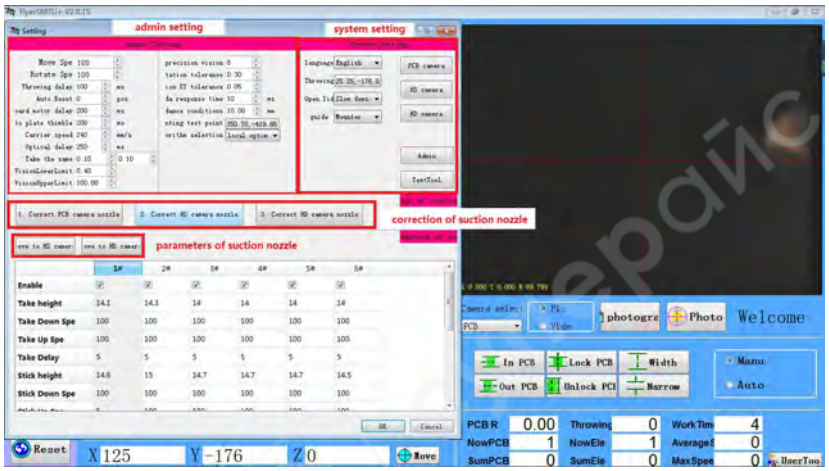


Fig. 5-1 System Settings

1. Movement speed: X, Y axis movement speed setting range 1-100 (common parameters)
2. Rotation speed: the setting range of the rotation speed of the nozzle rotating motor is 1-100 (common parameters)
3. Throwing time: the holding time when the vacuum is disconnected and switched to blowing when throwing
4. Automatic reset: when the value is filled in, the reset will be executed automatically after the filled value is counted to ensure the accuracy of the data
5. Arrival motor delay: Since the arrival detection sensor and the baffle cylinder are not in the same vertical position, it is necessary to set the board delay time to ensure that the PCB board can reach the position of the baffle cylinder
6. The delay time of the ejector pin to the board: In order to match the board transfer speed, set the board delay time. When the PCB board reaches the position of the baffle cylinder, the baffle cylinder will retract after the delay time is counted to prevent the PCB board. Overshoot causes inaccurate position.
7. Transfer speed: The default speed of the conveyor belt when transferring PCB boards is 240mm/s (note: too fast speed will cause the transfer stepper motor to lose steps)
8. Electro-optical delay of transmission board: It plays a filtering role and is used to filter false detection signals of PCB with digging holes
9. Simultaneous fetching conditions: when the suction nozzle fetches the material, the relative feeder position deviation is within the set range, and the same fetches automatically, otherwise it cannot be fetched simultaneously
10. The lower limit of the visual pass rate: when the component size is lower than the set value, it will be judged as unqualified (calculated according to the percentage of the component size)
11. The upper limit of visual pass rate: when the component size is greater than the set value, it will be judged as unqualified (calculated according to the percentage of the component outline size)
12. Precision visual closed loop times: the maximum number of times when precision components are identified and corrected multiple times
13. Precision vision rotation tolerance: the maximum allowable angular deviation when identifying precision components
14. Precision vision XY tolerance: the maximum allowable position deviation of the XY axis during precision component recognition
15. Feida response time: the time required for action response after Feida is powered
16. High component avoidance condition: when the component height ⩾the set value, it will be automatically arranged to the last single placement
17. Mounting test point: test the coordinate position during mounting
18. In-depth optimization algorithm selection: the type of path algorithm used when optimizing and constructing the project

5-2 System Settings

1. Language: Chinese and English operating system can be switched by selecting language
2. Throwing coordinates: This machine supports the function of modifying the position of the throwing box. First, place the throwing box on the work surface behind the guide rail, and then click "Throwing coordinates" to move the placement head to the top of the box and save the data. . (According to the visual inspection nozzle to the top of the material box)
3. Lid opening execution: the execution action when the equipment cover is opened, select one of deceleration or stop

4. Guide rail purpose: 5 modes of the transfer board track are available (mounter, connection table, three-stage light board, two-stage light board, single-stage) according to the equipment model, and cannot be switched at will

5. Other parameters set by the system are factory debugging parameters and cannot be modified at will, otherwise it will cause the risk of equipment paralysis!

5-3 Nozzle calibration

Tool required to calibrate nozzle：

Squ.	Name	QTY	Mark
1	Calibration substrate (stainless steel)	1	
2	Round magnet	4	
3	Inkpad	1	Machine come with
4	Nozzle	6	
5	Solid Nozzle	6	
6	A5 Paper	1	Provide by Customer

5-3-1 Correct the offset of the nozzle and the PCB camera

1. Fix the A5 white paper on the calibration substrate with 4 round magnets,

2. Adjust the width of the guide rail to be slightly larger than the width of the corrected substrate. Place the substrate on the left side of the guide rail and click "Incoming Board" to transport the substrate to the mounting position and clamp it.

3. Place the ink pad in the middle of the high-speed camera,

Fig.5-2 Inkpad Position

4. Click to correct the offset between the PCB camera and the suction nozzle, the 6 suction nozzles stick the ink at different angles and then move to the white paper to repeat the marking

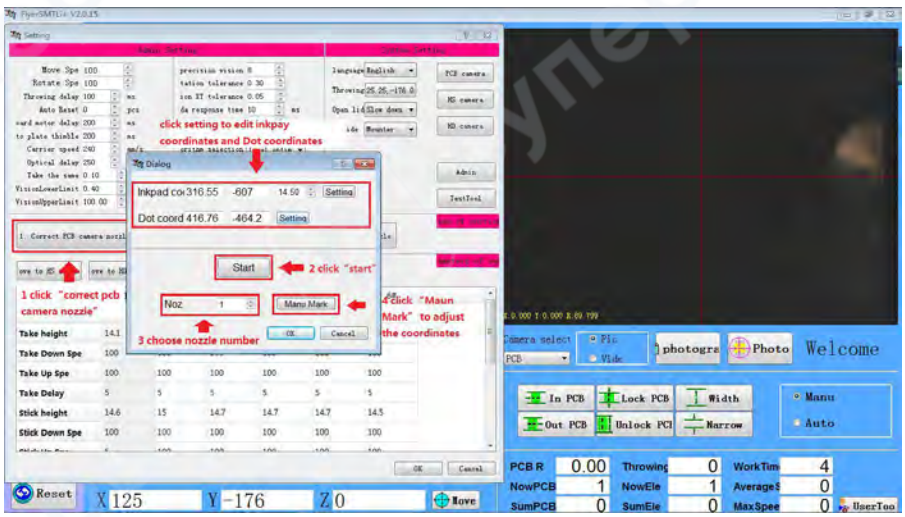


Fig.5-3 Nozzle calibration

Fig.5-4 Stick Ink

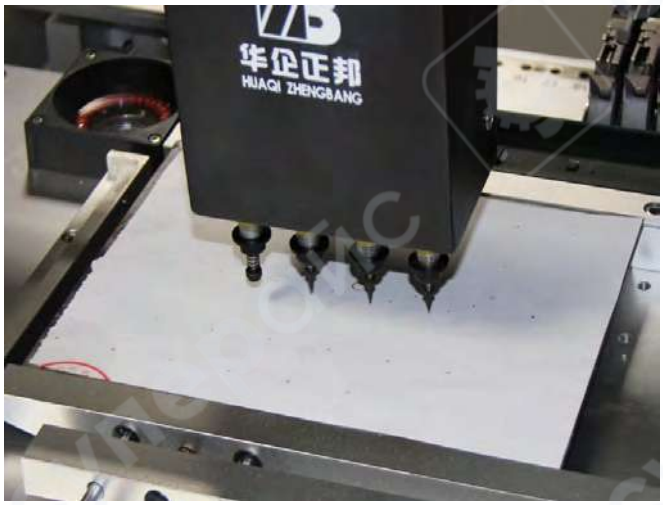


Fig.5-5 Placement by mark

5. Then select the nozzle serial number and click "manual mark" to pop up coordinate editing, click "Locate" and position the camera to the white paper mark point, adjust the coordinate to the center of the mark point, and click "OK" to keep the data to complete the nozzle calibration. Complete all nozzle calibration.

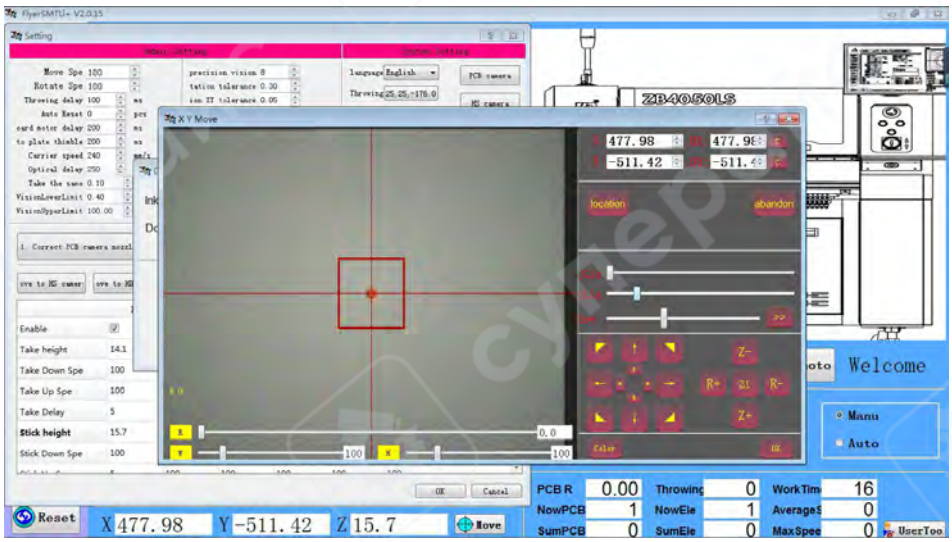


Fig.5-6 Coordinate Calibration

5-3-2 Correct the offset between the fast camera and the nozzle

1. Select the nozzle that needs to be corrected, and then click "Correct HS camera nozzle", the nozzle will start to correct automatically, click "OK" after the correction is completed, if there is any offset, perform the correction again in the same way

Fig.5-7 Fast Camera Process Calibration

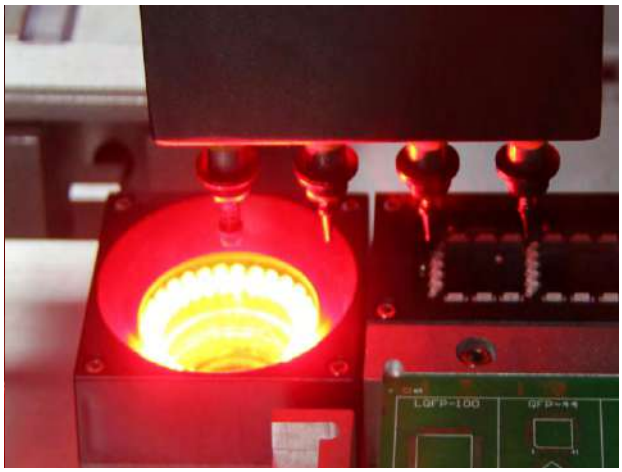


Fig.5-8 physical image

Fig.5-9 Result

2、Follow the step 1 to complete the other suction nozzles that need to be corrected one by one.

5-3-3 HD Camera Process Calibration

1. Install 6 solid nozzle heads (Machine come with it), select the nozzle that needs to be corrected, and then click "Correct HD camera nozzle", the nozzle will start to correct automatically, and click "OK" to complete the correction. , If there is an offset, correct it again in the same way

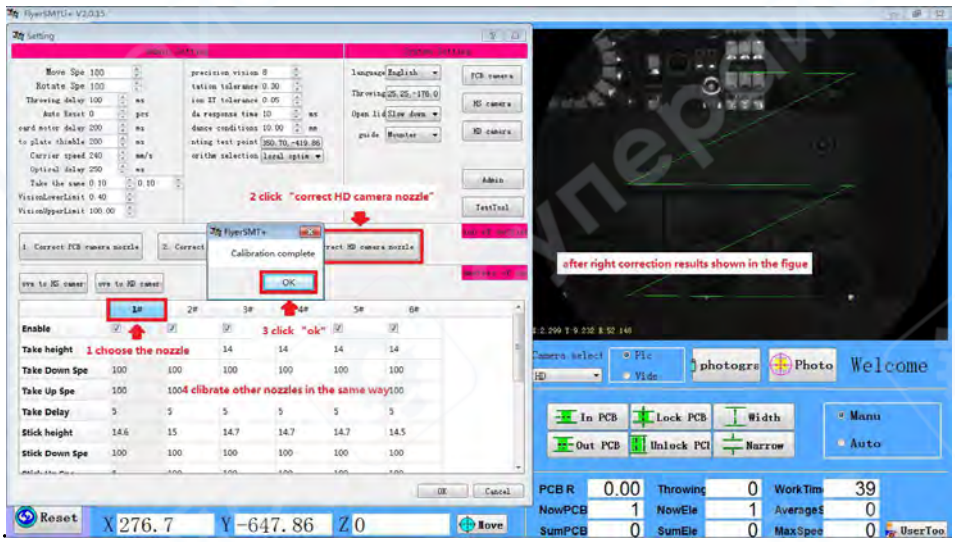


Fig.5-10 HD camera process Calibration

Fig.5-11 physical image

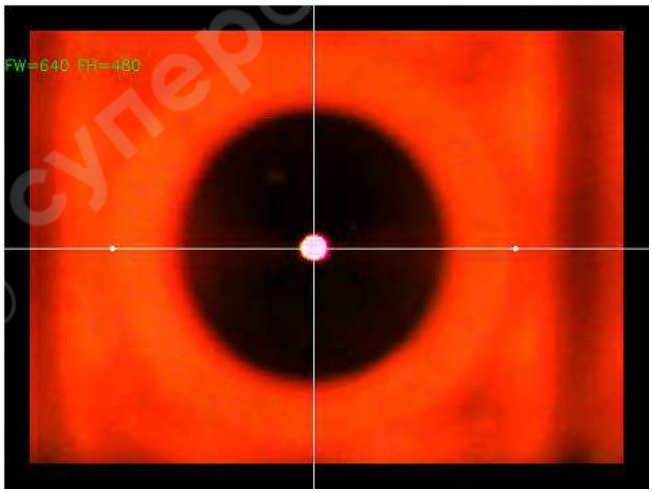


Fig.5-12 Result

2. Refer to Step 1 to complete other suction nozzles that need to be corrected one by one.

5-3-4 Check Fast Camera & Check High Speed Phase Verification Result

1. After correcting the offset between the fast camera and the nozzle, check the center of the nozzle one by one to verify the correction results

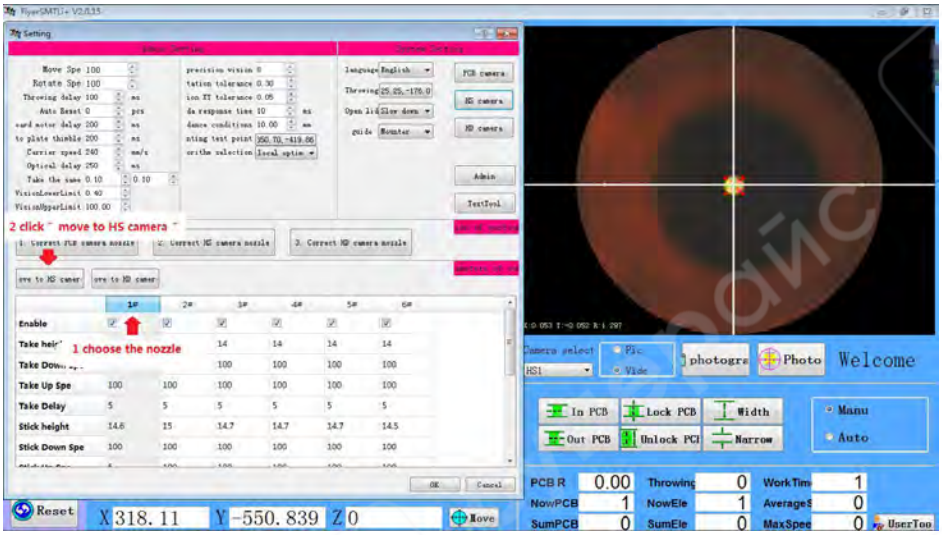


Fig.5-13 View the center of the quick camera nozzle

2、After correcting the offset of the HD camera and the nozzle, check the center of the nozzle one by one to verify the correction results

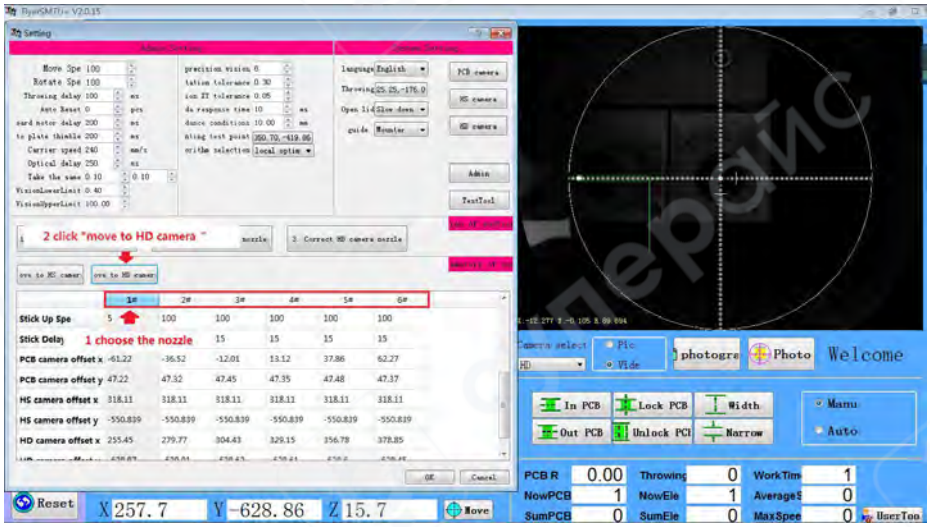


Fig.5-14 View the HD camera nozzle center

5-4 Nozzle Parameters

5-4-1 Nozzle Pick and Place Parameters

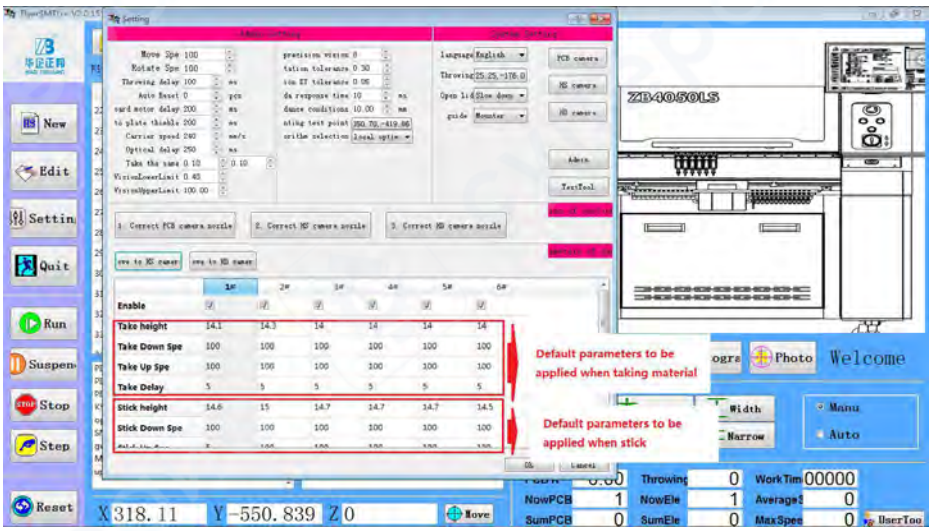


Fig. 5-15 Nozzle Pick and Place Parameters

5-4-2 Offset of nozzle relative to camera coordinate

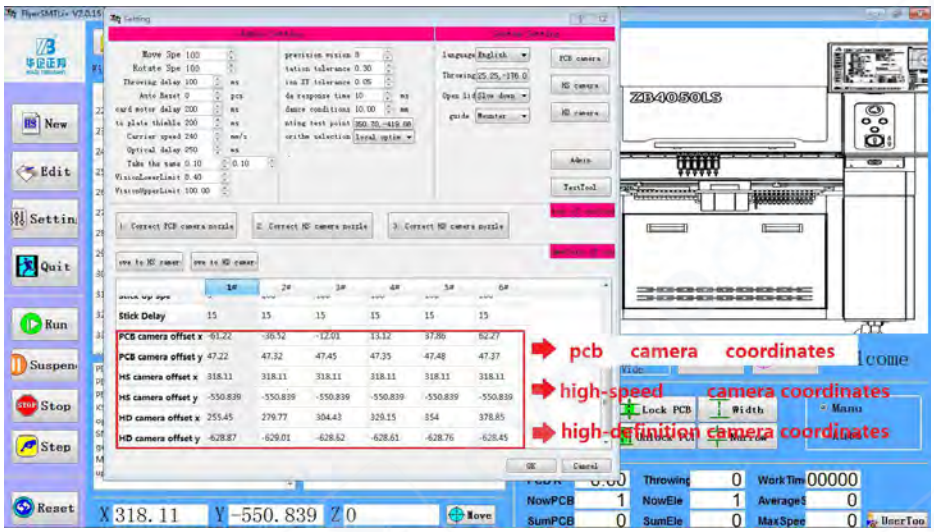


Fig.5-16 Offset of nozzle relative to camera coordinate

5-4-3 Get The Height Of The Material

Fig.5-17 Get The Height Of The Material

5-4-4 Get Placement Height Value

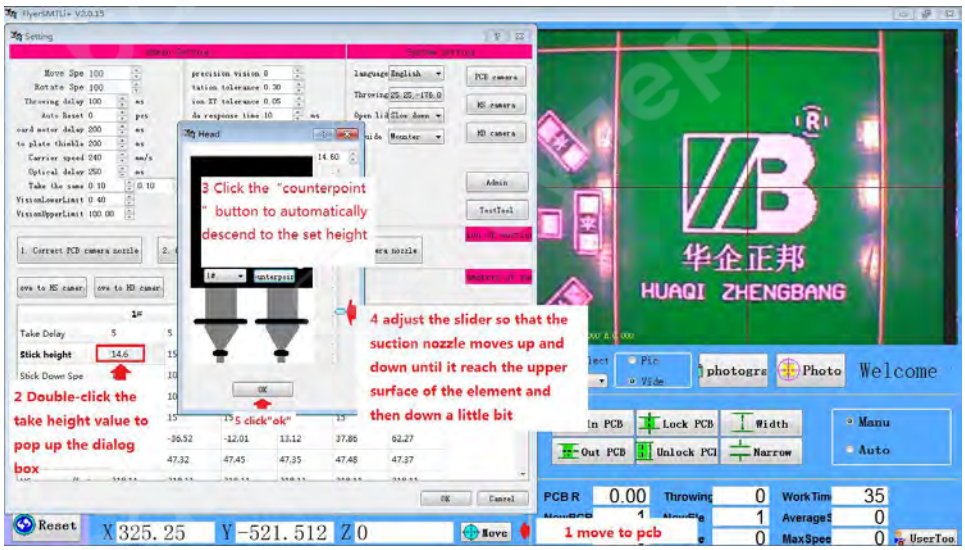


Fig. 5-18 Get Placement Height Value

Chapter 6 Maintenance

6-1 Daily Maintenance

1.Check if the tip of the nozzle is worn or damaged, and there is no solder paste inside the nozzle that might stuck or blocked air pipe. It must be replaced or cleaned;

2.Check the PCB camera lens for dust or debris, and clean it with a soft cloth if necessary;

3.Check for any remaining components or debris on the feeder and clean if necessary;

4.Check the components of the camera lens with or without dirt, if necessary, clean with a soft cloth;

5.Check the workbench table for any debris and extra components, and clean it with a brush if necessary;

6.Check whether the pressure gauge of the equipment barometer is within a reasonable range (reference value 0.6Mpa);

7.Check whether there is any water in the oil cup of the gas source treatment part and drain it;

8.Check and clean the throwing box and sort the useful materials;

9.Check the transfer guide rails and transfer with no debris, and clean with a soft cloth if necessary.

6-2 Weekly Regular Maintenance

1. Check the X-axis screw for any particles or debris on it, and clean if necessary;
2. Check the X-axis guide grease for hardening and residue adhesion;
3. Check the Y-axis screw for any particles or debris, and clean if necessary;
4. Check the lubricating oil of the Y-axis guide rail for hardening and residue adhesion;
5. Check the air pneumatic joint for leaks and replace if necessary;
6. Check the air tube for aging or distortion, and replace if necessary;
7. Check the feeder board for any components or debris that fall into the air outlet and must be cleaned.

6-3 Monthly Regular Maintenance

1. Check if the brightness of LED is sufficient. If it is not bright, replace the entire LED component;
2. Check the 4 sensors on the transfer mechanism and wipe them with a clean rag;
3. Check the Z-axis rotating motor shaft and the oil seal contact part for air leakage, and add a small amount of white grease;
4. Check the X-axis linear guide to remove dust and residue and apply new grease.
5. Check the X-axis ball screw to remove dust and residue and apply new grease.
6. Check the Y-axis linear guide to remove dust and residue and apply new grease.
7. Check the Y-axis ball screw to remove dust and residue and apply new grease.
8. Check the widened linear guide to remove dust and residue and apply new grease.
9. Check the Z-axis linear guide to remove dust and residue and apply new lubricant;
10. Check that the outer silicone ring of the nozzle holder is loose or slide upward to prevent the motor from rotating and replace if necessary;
11. Check whether there is any component inhalation in the filter of the vacuum generator assembly, clean and replace if necessary;
12. Check the fan filter for dust accumulation, remove the filter for cleaning, and replace if necessary.

! DANGER：

To prevent accidents from starting unexpectedly, please perform maintenance after turning off the power.

! WARN:

Can not be blown with a wind gun, the air gun will blow dust and debris into the machine, attached to the guide rail, screw, lens, otherwise it will affect the normal operation of the machine.

! Attention：

Do not use organic solvents to scrub the surface of the machine, as it will damage the surface of the machine.

6-4 Nozzle Clean

1.Please use alcohol-contained ultrasonic cleaner to clean the alcohol in the nozzle with an air gun.

2.It takes about 5 minutes to clean by ultrasonic 。

3.For dirt that cannot be cleaned by an ultrasonic cleaner, please use a soft cloth soaked in alcohol to brush it.

4.After cleaned, apply grease to the nozzle slider to prevent the rust of nozzle inside.

! Attention：

Do not use solvents other than alcohol (propanol, etc.). If a high-viscosity grease such as grease is used, the nozzle slider will not return smoothly.

Chapter 7 Trouble Shooting

7-1 Throw

Example	Reason	Measure
Chip Dropping	1. Brightness of the light source is not set properly	Check the brightness of the light source and reset
	2. Improper brightness attenuation setting	Check brightness decay and reset
	3. Improper visual threshold setting	Check the visual threshold to reset the visual threshold and re-register the component image
	4. The photo filter time is too short	Increase the camera shooting delay time
	5. Unacceptable suction	Check the nozzle concentricity and check the feeder coordinates

7-2 Suction

Example	Reason	Measure
Suction tomb	1. The nozzle isn't high enough	Reset Z-axis height
	2. Feeder coordinates are not accurate	Recheck the position of the feeder coordinates
	3. Nozzle different suction	Check and replace the nozzle
	4. Reclaiming time is too short	Increase the reclaiming time
	5. Insufficient air pressure	Increase air pressure
Suck Nothing	1. Nozzle doesn't reach component	Reset Z-axis height
	2. Solenoid valve damage	Check and replace solenoid valve
	3. Vacuum generator damage	Check replacement vacuum generator
	4. Nozzle blocked	Block the nozzle or replace the nozzle
	5. Nozzle mismatch	Replace the larger size nozzle , then increase the negative
	6. Air circuit blockage or air leak	Replace the trachea

7-3 X/Y axis

Example	Reason	Measure
X/Y axis don't work	1. X.Y axis reach the limit switch	Press reset to return to the origin and then move
	2. Z axis is not in the protected state	Press the reset switch to return to the origin and check if the Z axis is stuck
	3. Servo motor damage	Replace the servo motor
	4. Servo motor disconnection	Replace the motor lead cord
	5. Servo drive damage	Replace the stepper drive

7-4 Placement

Example	Reason	Measure
Place Tomb	1. Solder paste is not sticky enough or over time	Replace the solder paste and reprint the PCB
	2. Z axis is too fast	Reduce Z axis mounting speed
	3. Solder paste printing shift	Readjust the position of printer
	4. Z axis can't reach the PCB	Reset Z axis height distance from PCB
	5. Placement time is not enough	Increase placement retention time
Overall placement offset	1. Reference point position is not right	Relocate the reference datum point
	2. Paste deviation	Recalibrate the sticker
	3. PCB clamping is not flat	Recalibrate the mounting PCB position
	4. Mounting speed is too fast	Reduce mounting speed
Components Mounted Inaccurate	1. Suction is different	Check and replace the nozzle
	2. Feeder coordinates aren't inaccurate	Recheck the position and reset feeder coordinate
Mounting Angle Error	1. Rotate motor damage	Replace the rotating motor
	2. Nozzle Mismatch	Replace larger size nozzle
Sticker doesn't fit	1. The head switch is off	Open the sticker switch
	2. Plywood placement is not in the mounted state	Change to Not mount as placement status

7-5 MARK Point

Example	Reason	Measure
Can't catch the MARK point	1. Recognition range is too small	Increase the recognition range
	2. Mark point image isn't updated	Update Mark point image
	3. The light source is not bright enough	Adjust the brightness of the Mark point source
	4. Mark point features aren't obvious	Re-find two points defined as Mark points
	5. Mark point deviation is too large	Transfer guide rail is too wide to adjust the width of the small guide rail.

7-6 Power Supply

Example	Reason	Measure
No Power	1. Fuse Damaged	Check and replace the fuse
	2. Poor connection	Check the tightening plug and check if there is a problem with the power supply

Chapter 8 After Sales Service

The warranty period of the machine is 12 months after the date of purchase. If non-artificial damage happens during the warranty period, we will repair it free of charge. If it's artificial damage or exceeds the warranty period, we will charge the appropriate maintenance cost and lifetime maintenance as appropriate.

◆ Revision History

Rev	Date	Rev. Page	Content
1.0	2019.4		First
1.1	2019.11		1. Add overall route optimization module 2. Add PCB array consolidation 3. Add feeder NO swap module 4. Add tube feeder mode for every location 5. Add IC tray auto reload function 6. Add feeder auto loacting function with array 7. Add cover open slowdown-or-stop function 8. Add conveyor multiple choice

Specification, appearance, etc. are subject to change without notice!

The final interpretation of this operation manual belongs to the company!

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