Rev 1.1

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.

Diretoury

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.

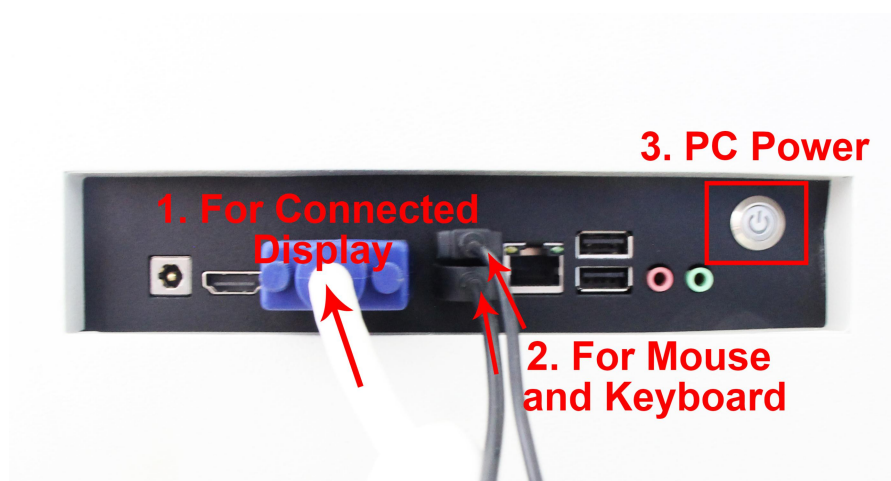3.Put the monitor, mouse, keyboard placed on the right side of the host.

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.
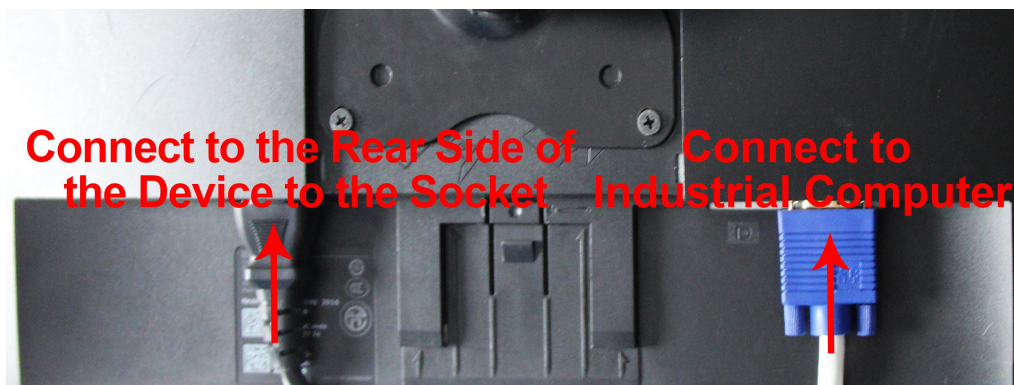
Fig. 1-2 display connection

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.
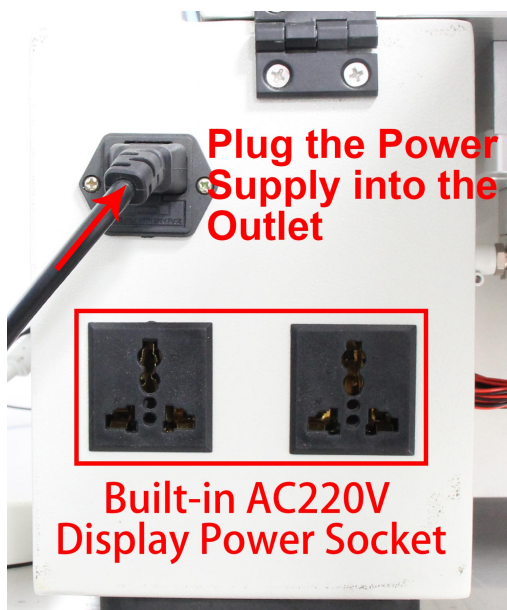

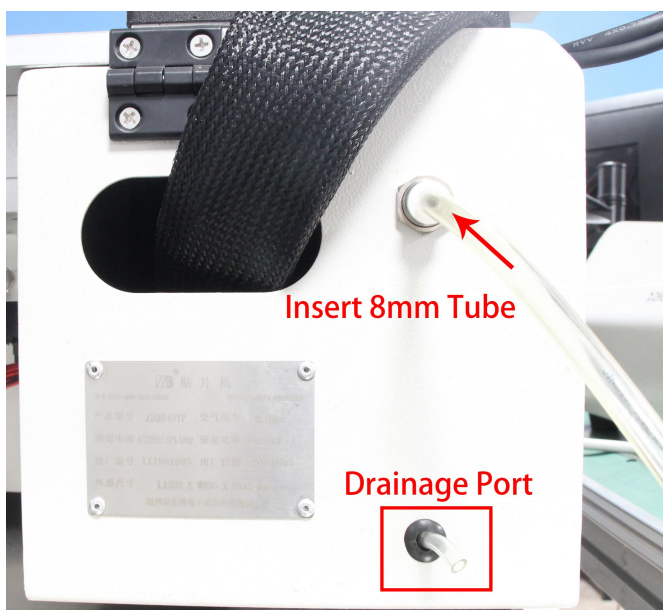Fig. 1-3 Power socket

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.
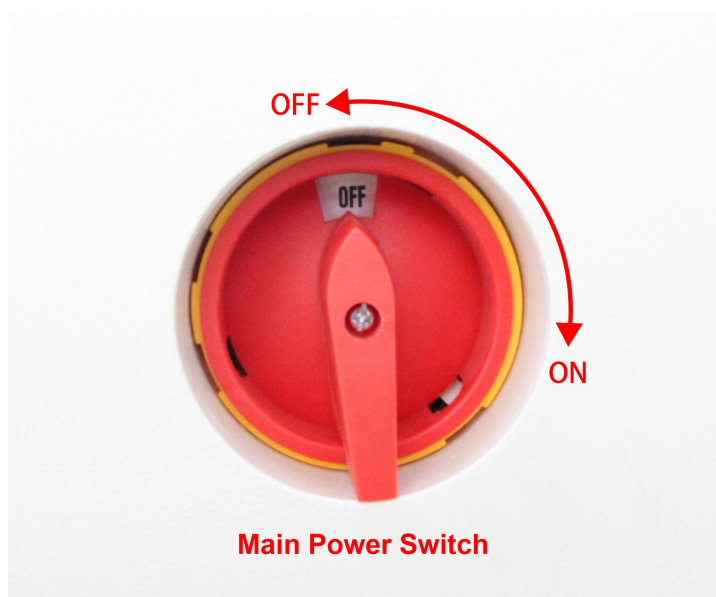

Fig.1-5   Air pressure adjust

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
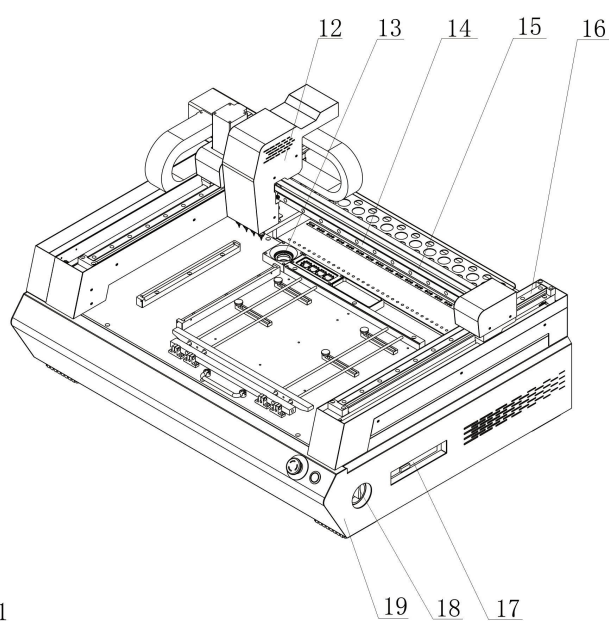
2-1 Equipment Constitute
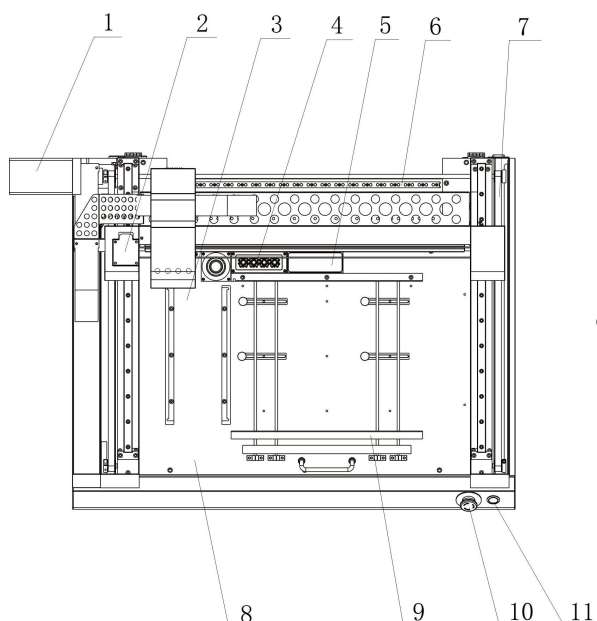
Fig. 2-1 Host View

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	
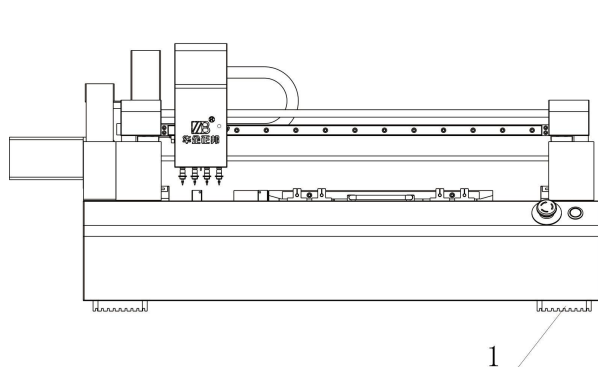
Fig. 2-3 Host front view
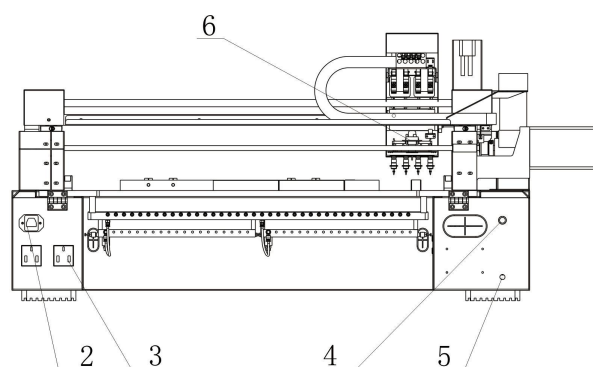
Fig. 2-4 Rear view of the host
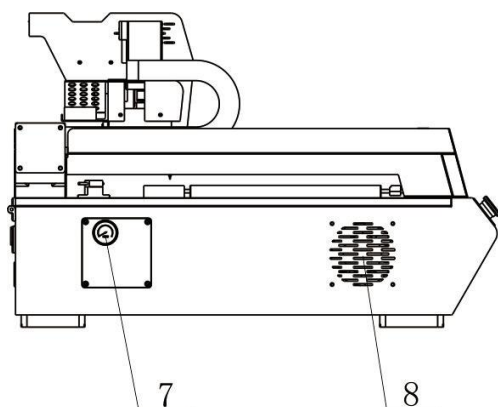
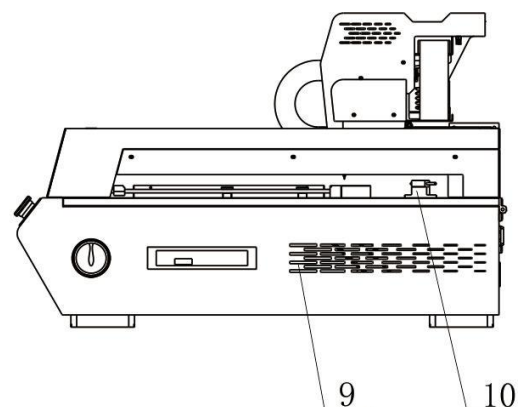Fig. 2-5 Host left view

Fig. 2-6 Host right view

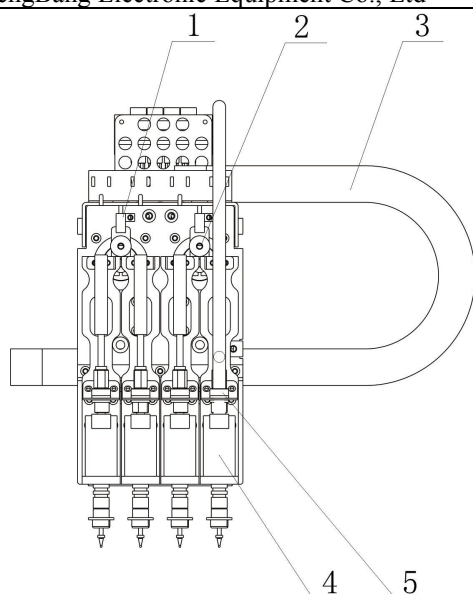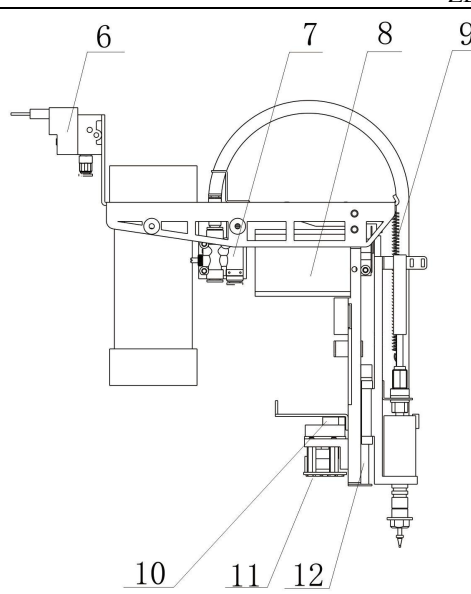|			
1--Rubber Mats	2--Power Cord Socket	3--Power Socket	4--Air source inlet
5--Drainage port	6--MARK point camera	7--Air source processor	8--Heat vent
9--Intake hole	10--Feeder anti-lifting photoelectric switch		

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

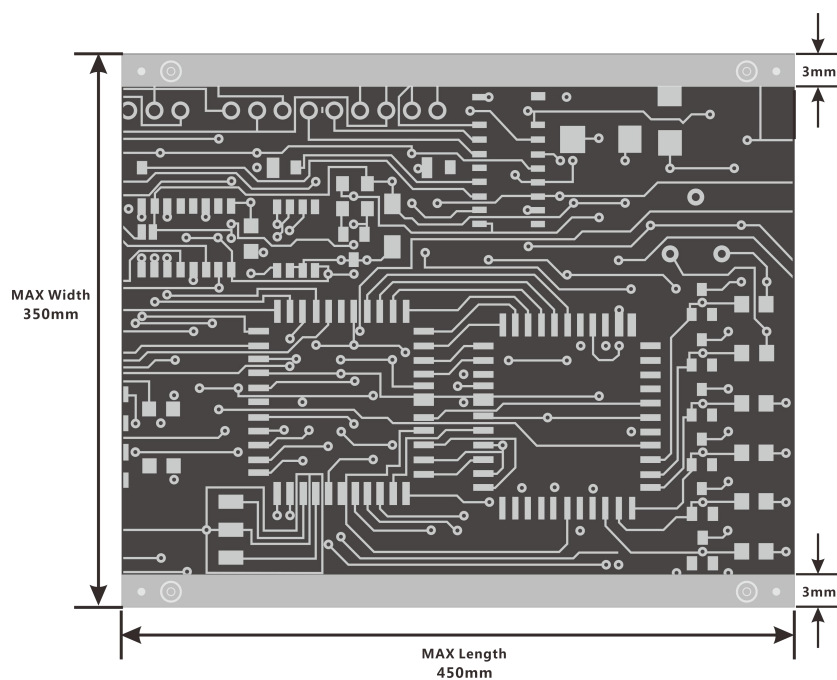| NO.	Outer Diameter	Inner Diameter	Shape	Application
502	Φ0.7mm	Φ0.4mm		0402
503	Φ1.0mm	Φ0.6mm		0402、0603 etc. (Equivalent Size)
504	Φ1.5mm	Φ1.0mm		0805、1206、1210、SOT23 etc. (Equivalent Size)
505	Φ3.5mm	Φ1.7mm		SOP8、SOP14、1812、2220、QFN etc. (Equivalent Size)
506	Φ5.0mm	Φ3.2mm		QFN、TQFP、BGA、or ≤22mm

2-6 Substrate   Limitation

Fig. 2-9 Substrate Limitation

2-7 Menu Composition
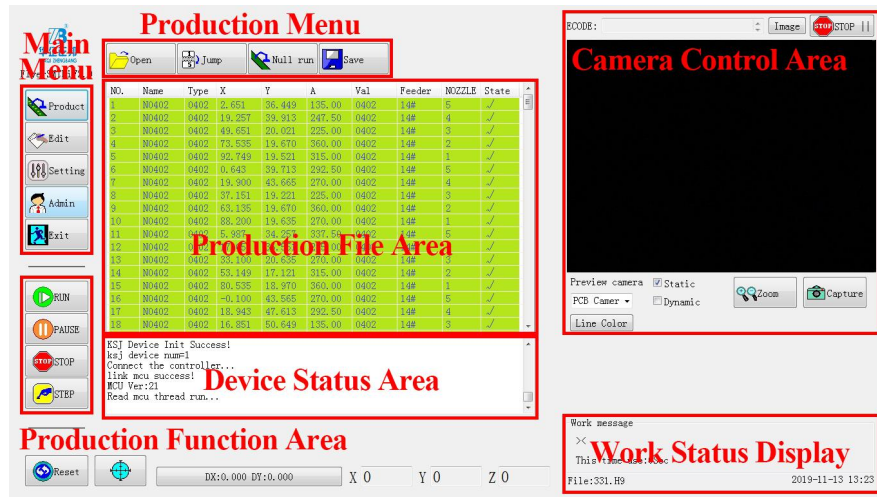
Fig. 2-10 Basic Manual
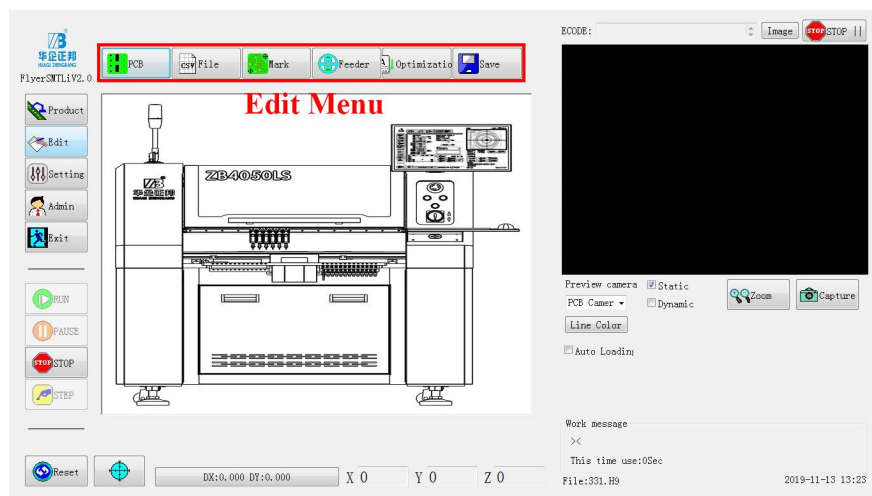
Fig. 2-11 Edit Menu
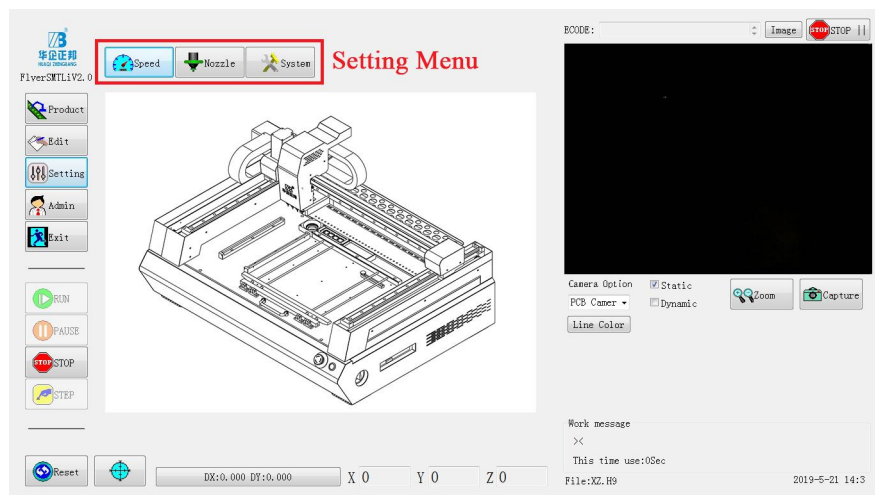
Fig. 2-12 Setting Menu

Fig. 2-13 Coordinate Edit

Chapter3 System Setting

3-1 Speed Setting
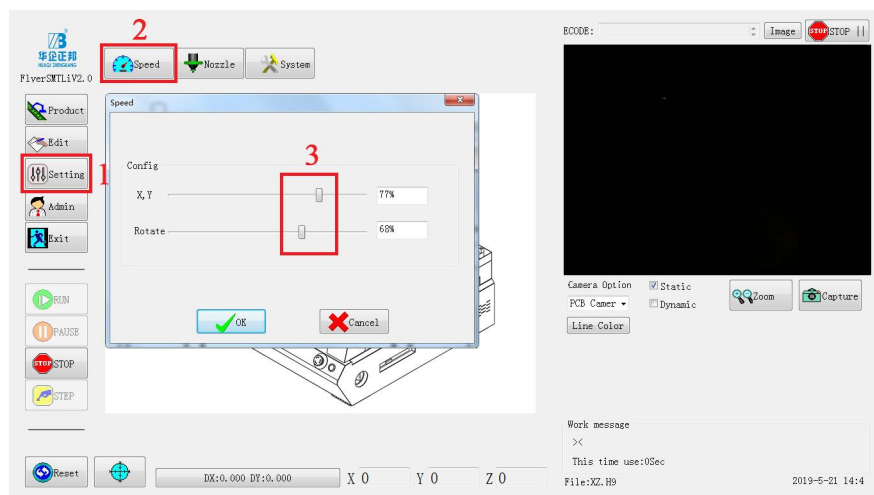
Fig.3-1 Speed Setting

Step：1.Setting 2. Speed 3. Adjust the speed (Higher value, Higher Speed).

!Attention: Adjust the Z axis speed in the feeder edit.

3-2 Nozzle Calibration

Tool Preparation：

NO	Name	Qty	Attention
1	Correction Substrate (Stainless Steel)	1	With Machine
2	Round Magnet	4	
3	Inkpad	1	
4	Nozzle	6	
5	Solid Nozzle	6	
6	Paper (A5)	1	Self-Match

3-2-1 Nozzle Calibration and PCB Camera Offset
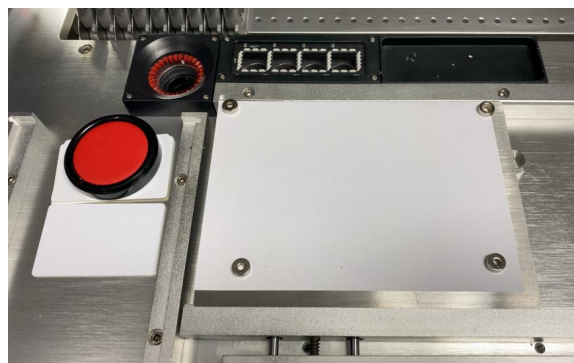
Fig.3-2 Inkpad Location

1.Fix the 4 round magnets on the calibration substrate with paper(A4)

2.Adjust the width of guide rail ≥correction substrate，place the substrate on the left side of the guide plate and click"Load"to send the substrate to the mount position and clamp it.

3.Place the inkpad as the picture shows.
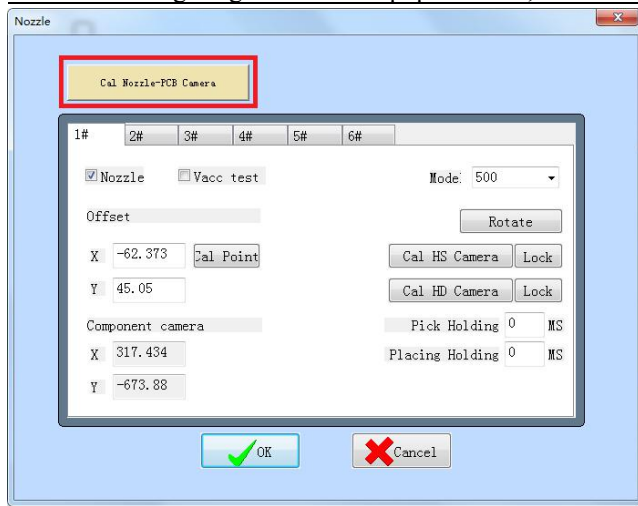
Fig.3-3 Nozzle Calibration
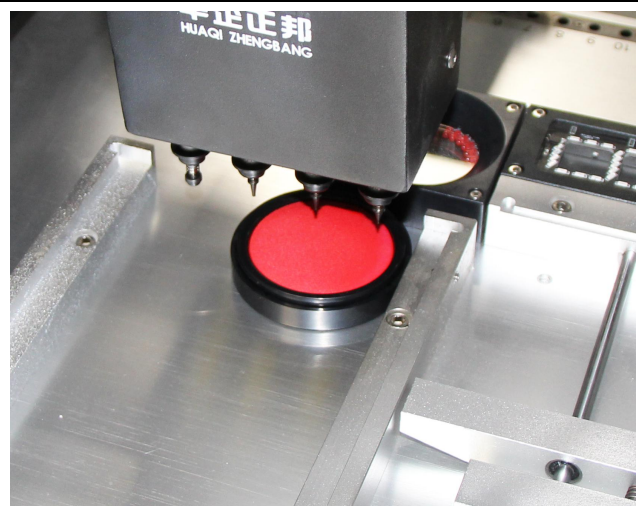
Fig.3-4 Stick inkpad
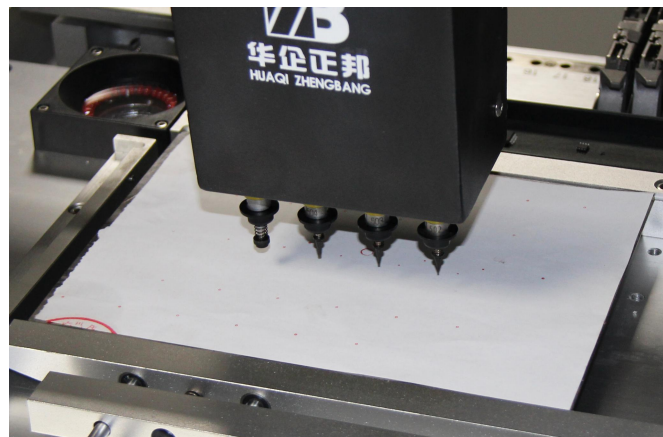
Fig.3-5 Mark Point

4.Click "Nozzle Correction-PCB Camera", stamp 4 nozzles to the inkpad center from 4 different angles and then move them to the paper to repeat the mark point.

Fig. 3-6 Coordinate Correction

5.Select the nozzle(need correct),click"Cal Point"to edit，Click"goto"to position the camera to the mark point, adjust the coordinate is aligned with the mark point center, click "OK" to complete the nozzle correction.

6.Refer to step 5 to complete the other nozzles calibration one by one.

3-2-2 Nozzle Calibration and HD Camera Offset
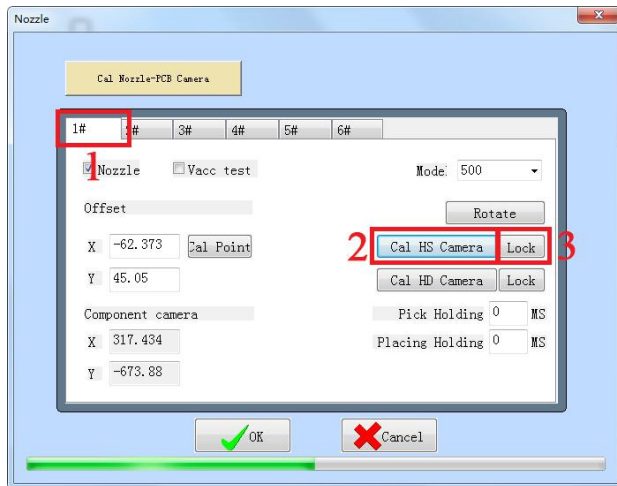
Fig.3-7 HD Camera Correction   Fig.3-8 Calibration Process
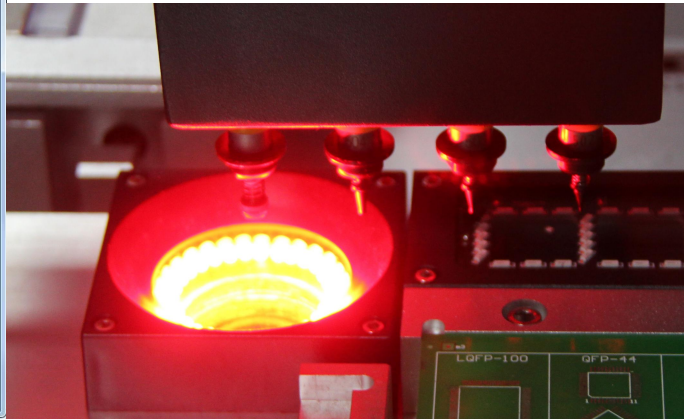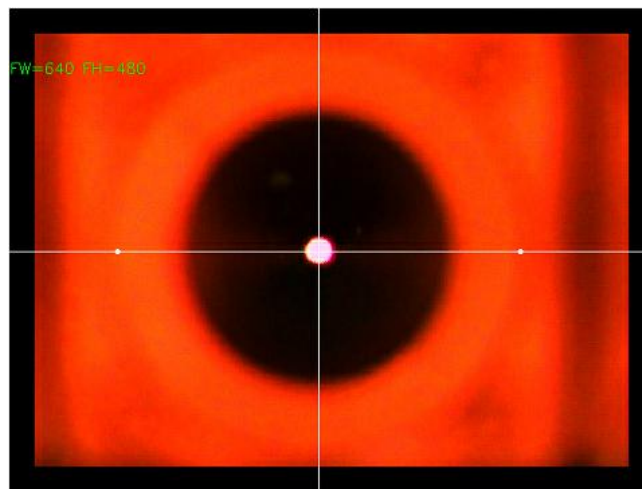
Fig.3-9 Correct Result

1、Install 4 solid nozzle（Random delivered）,select the nozzle(need corrected)；click "HD Camera Calibration"，then nozzle starts to automatically calibrate. Then, click"View"to confirm the coordinate is aligned with the center of the nozzle. If failed, calibrate it again in the same way.

2、Refer to step 1 to complete other nozzle correction one by one.

3-2-3 Nozzle Calibration and High Speed Camera Offset
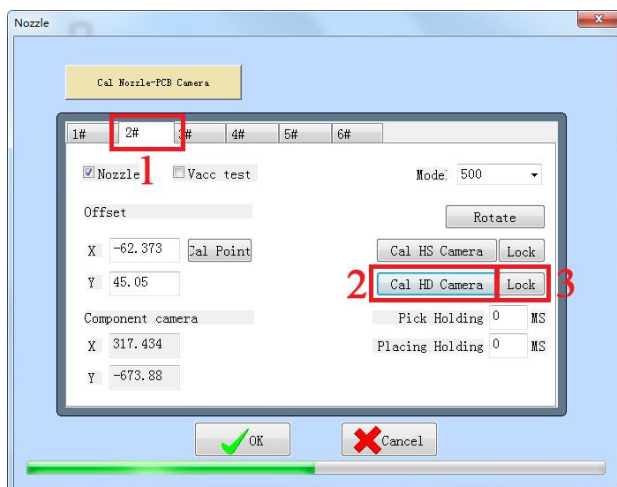
Fig.3-10 HD Camera Correction   Fig.3-11 Calibration Process

1、Select the nozzle(need calibration),click "High Speed Camera", nozzle starts to automatically correct. After finished, click "View" to confirm the coordinates are aligned with the nozzle center. If still offset, calibrate it again in the same way.
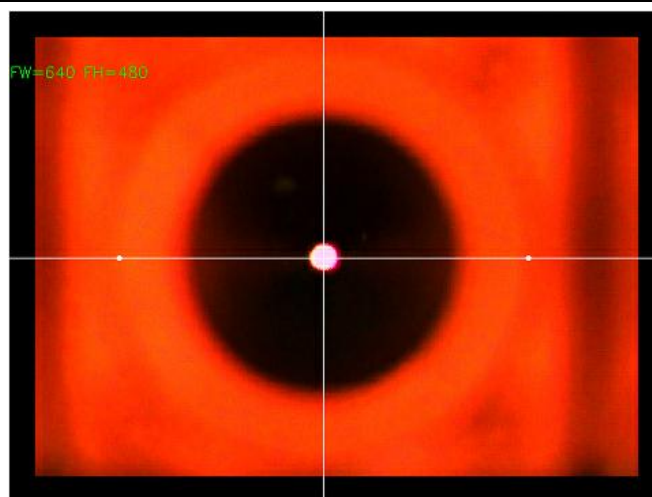
Fig.3-12 Calibration Result

2、Refer to step 1 to complete other nozzle correction one by one.

3-3 System Setting

1. Language: Chinese ↔ English

Select the desired language, click "Confirm" to save the data, exit the software and then log in again to switch languages.

2. Mount Mode

Running type: The placement mode is completed one by one in the order of the components of the production file.

3. Throw Coordinate

The machine supports the position modification. First, place the throwing box on the work table behind the rail,then click "scraping coordinate" to move the head to the top of the box to save the data(Subject to the watch nozzle above the box).

4. Throw Time

Delay time setting, subject to factory setting (50ms), advice: Don't modify the data privately.

5. Automatic reset

If you active this function, when times of mounting reached target number, device will be reset automatically to ensure the accuracy of the data. According to the number of setting required for production to save date.

6. Conveyor Delay

In order to match the speed of the transfer board, set the delay time of the stop board. When the PCB board reaches the 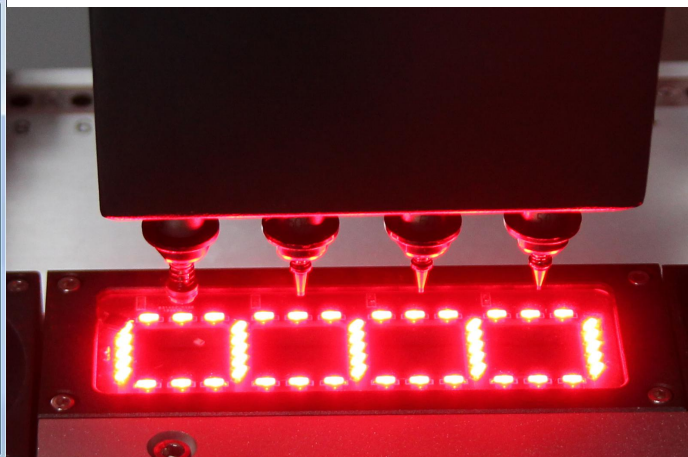position of the baffle cylinder, the baffle cylinder is retracted after the delay time is counted to prevent the PCB board from overshooting and causing the position to stop.

7. Conveyor Speed

Set the speed of loading and unloading of PCB

8. Conveyor Speed

Since the board detection sensor is not in the same vertical position as the damper cylinder, it is necessary to set the board delay time to ensure that the PCB board can reach the damper cylinder position.

9. Open Lid(Cover Status)

Open cover and suspend: if the front and rear cover is opened during the operation of the device, the device will immediately switch to the suspended state.

If the cover is opened during operation, the device will immediately switch to the low-speed operation mode.

10. Use of Guide Rail

SMT:Switch to the pick and place mode to meet the mounter's three-stage transfer plate mounting requirements.

Inspection conveyor:Switch to the conveyor mode and use the mounter as the convyor (select this mode when multiple devices online backend devices are not mounted).

Chapter 4 System Edit

Process

| PCB | File | Mark | Feeder | Export |
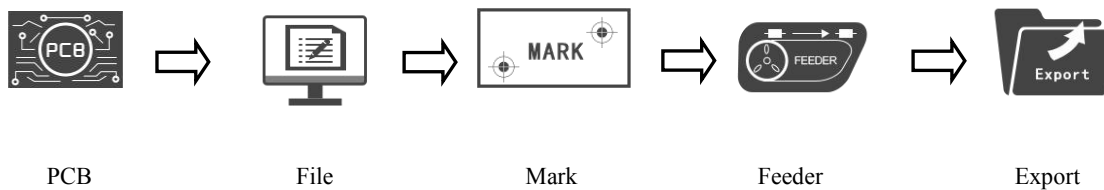
Preparation：

Turn on the machine and connect to the air source, take another PCB to be produced, adjust the width of the rail (depends on PCB size), and then place the PCB at the front end (left side) of the rail, and click "Load" to transport the PCB to the mounting area and clamped.

4-1 How to edit PCB

4-1-1 How to edit origin
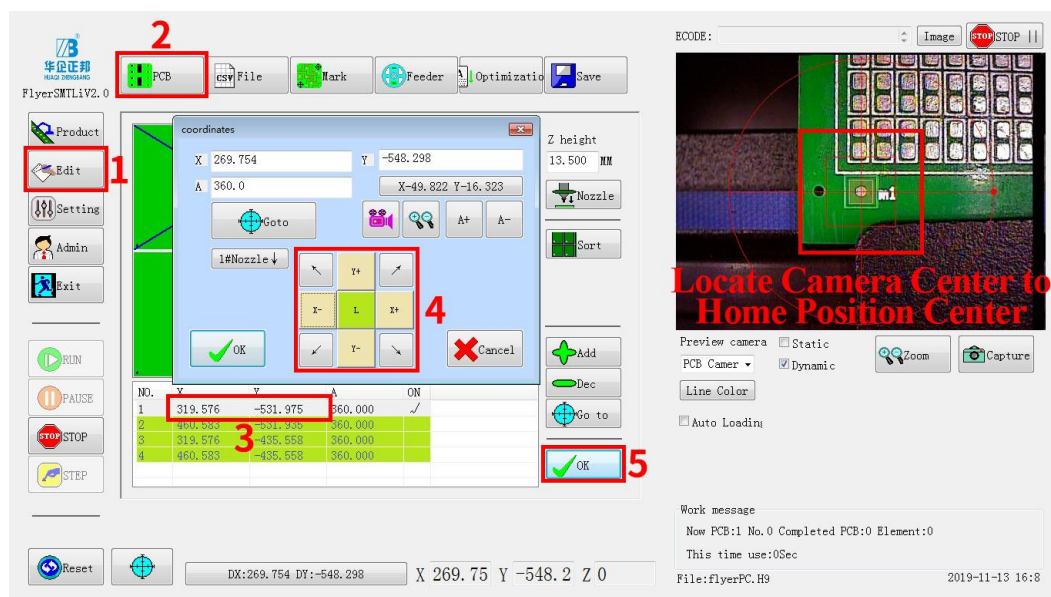
Fig.4-1 Origin Edit

Select" Edit—PCB" to enter the PCB management interface.

Double-click X/Y content to edit coordinate, locate camera center to the PCB origin position, and click "Confirm" to save it.

！Attention：

Origin subject to the setting when the PC component is exported.

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.

4-1-2Mutiple Board

Enter the PCB, click "Add" or "Reduce" to add the number of boards.

Select the multi-board, double-click X/Y to move the camera cross to the origin, and click "Confirm" to save it.

Board needs to be done, just "√" under "ON" column.

4-1-3 Multi-Board Form
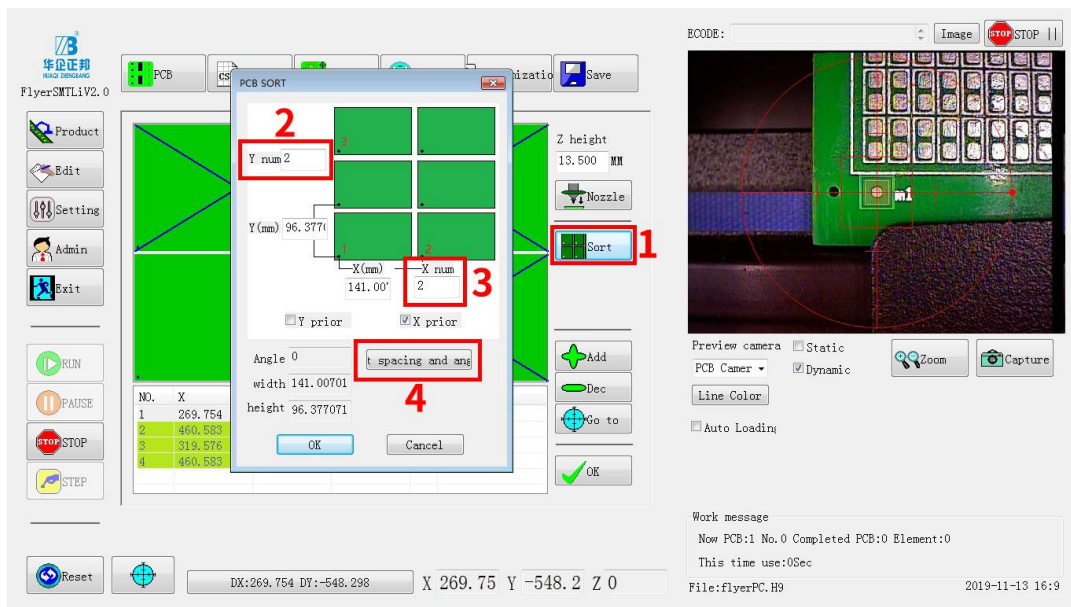
Fig.4-2 Multi-Board Form
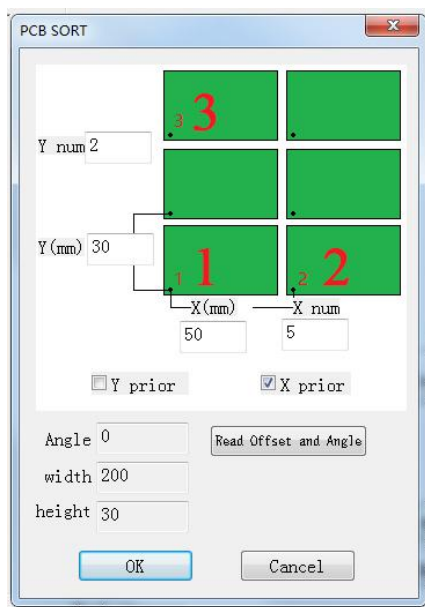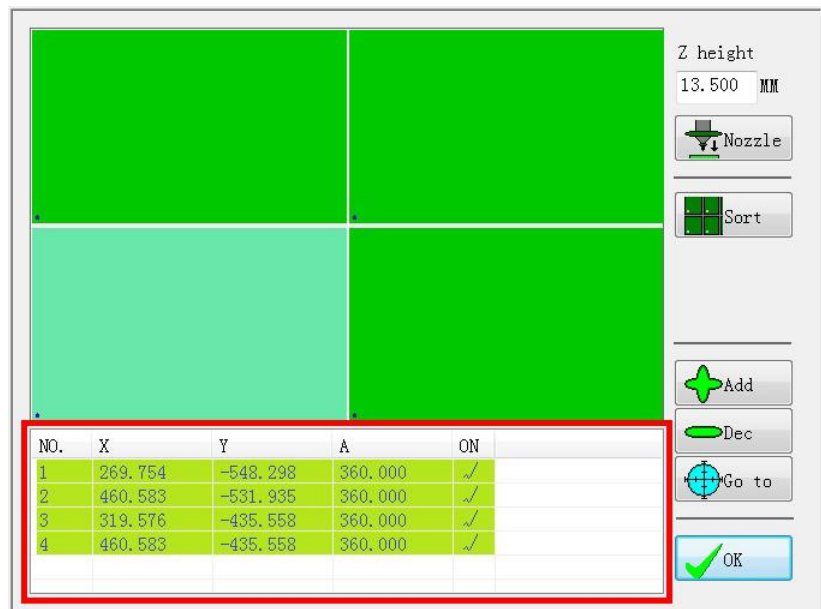
Fig.4-3 Edit Space   Fig.4-4 Arrange coordinate automatically

For the arrangement of multiple board for quick edit.

1.After origin is completed, click "Sort" to edit the parameter.

2.Edit the number of board in X and Y axis

3. Click "Get Spacing and Angle" and then move the coordinate alignment in order according to the prompt

4.the origin of left lower corner of the multi-board；

5.the origin of the lower right corner of the multi-board；

6.the origin of the upper left corner of the multi-board.

Then click "Save" to generate collating coordinates automatically.

！Attention：

A few board have flipped 90°or other angles ，import angle values in the "Flip A" item.

4-2 How to edit file

！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)

4-2-1 Convert PCB origin files to CSV coordinate files
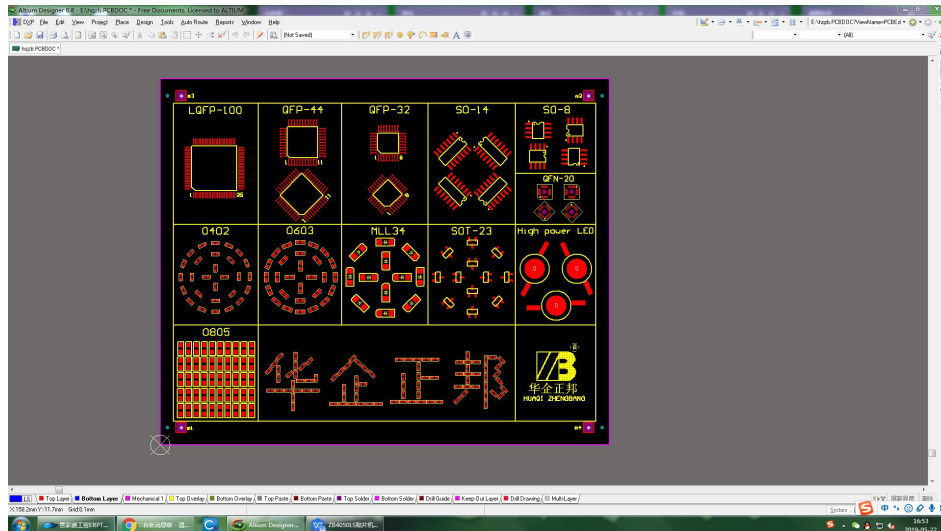
Fig.4-5 Program Import

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

Fig.4-6 Origin Setting
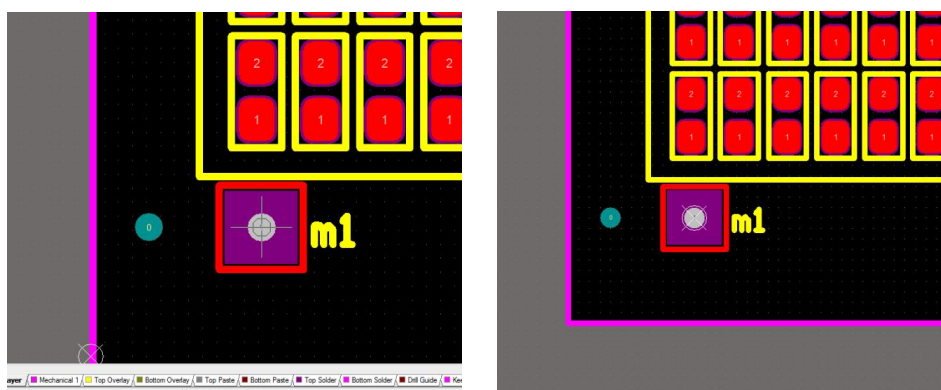
Fig.4-7/8 Origin Setting

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

！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.
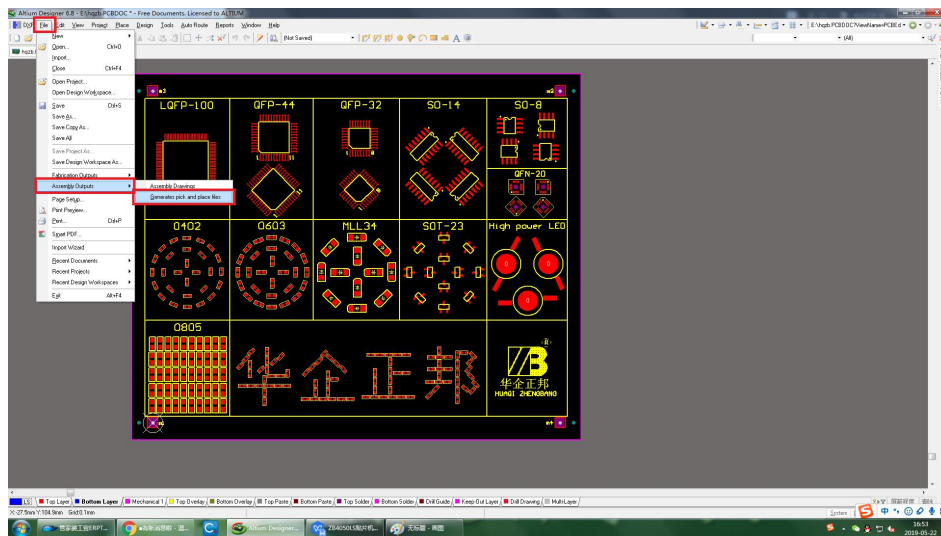
Fig.4-9 Output Coordinate File

3.Output File：Click on "Files - assembly output - Generates pick and place files" to output the coordinate file.
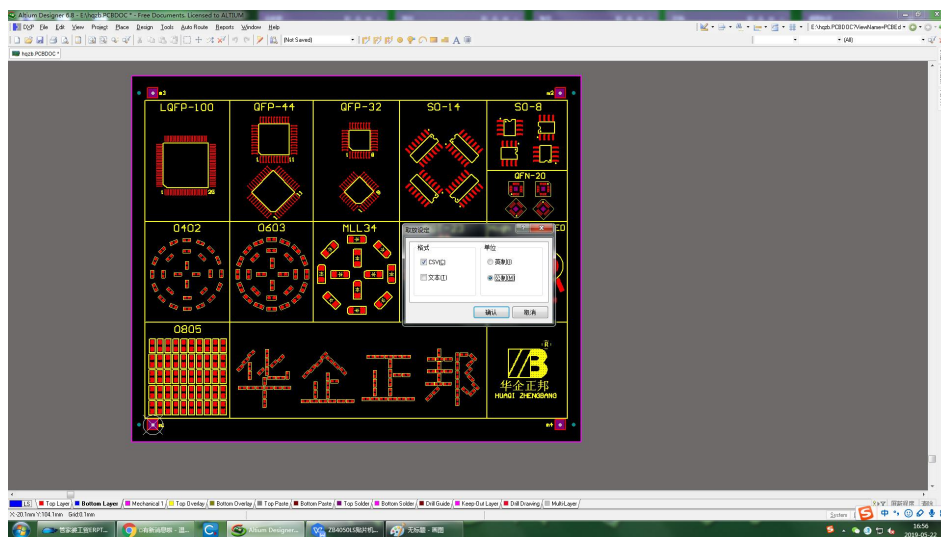
Fig.4-10 Select output format

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

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

4-2-2 How to import file
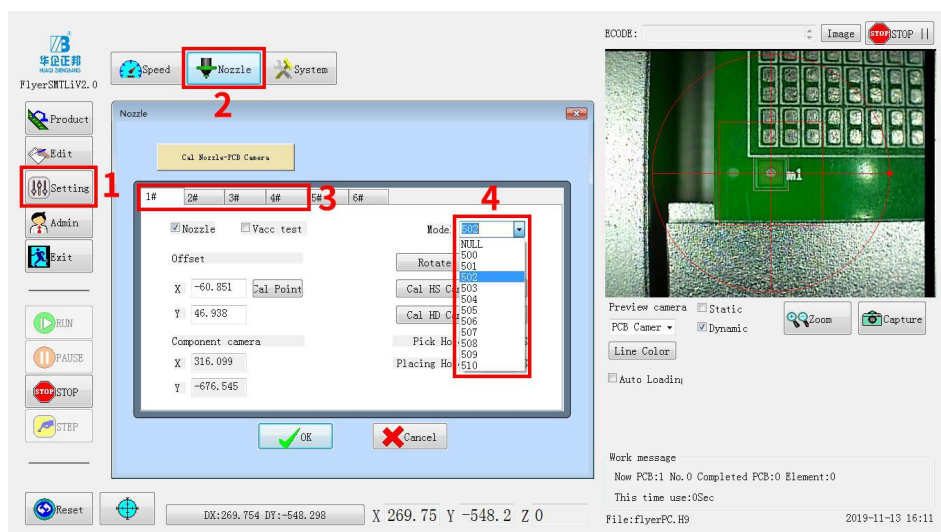
Fig.4-11 Set the Nozzle

1. Install the nozzle: Select the appropriate nozzle to install on the patch head according to the quantity of the material.

2. set the nozzle: according to the installed nozzle click "set - nozzle" to select the corresponding nozzle model
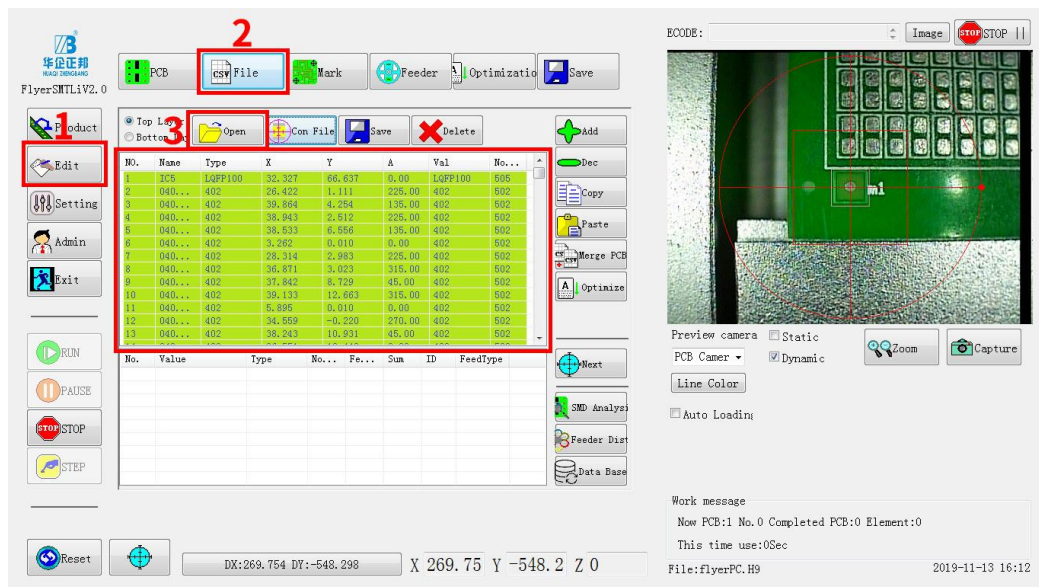
Fig.4-12 Import File

3. **Import**：Select "Edit - File" to enter the file editing interface, click "Open File" to find the CSV coordinate file converted from the PCB design file, and import it into the placement software.

4.**Compensation Angle Deviation**：Click "Confirm File" to move the coordinate alignment component center (default upper right corner component) according to the system prompt to perform angle deviation compensation.
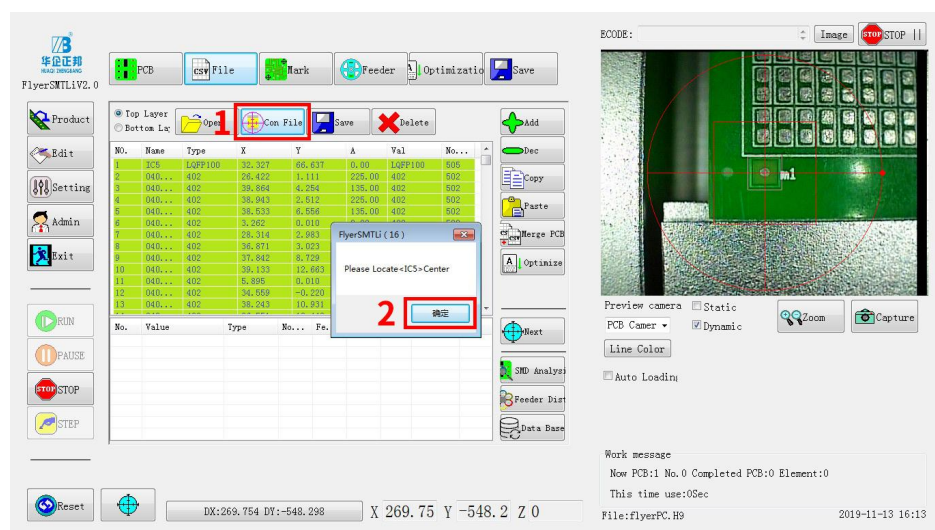
Fig.4-13 Confirm File
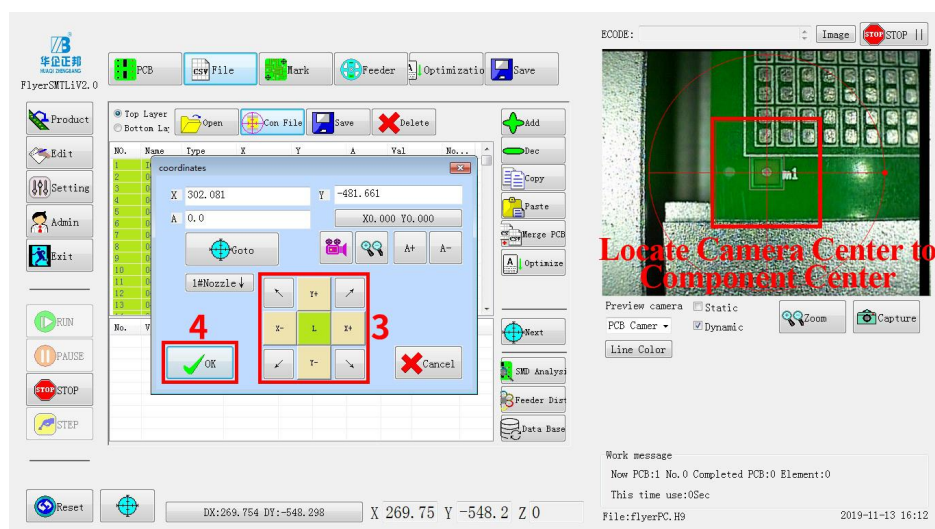
Fig.4-14 Confirm Coordinate
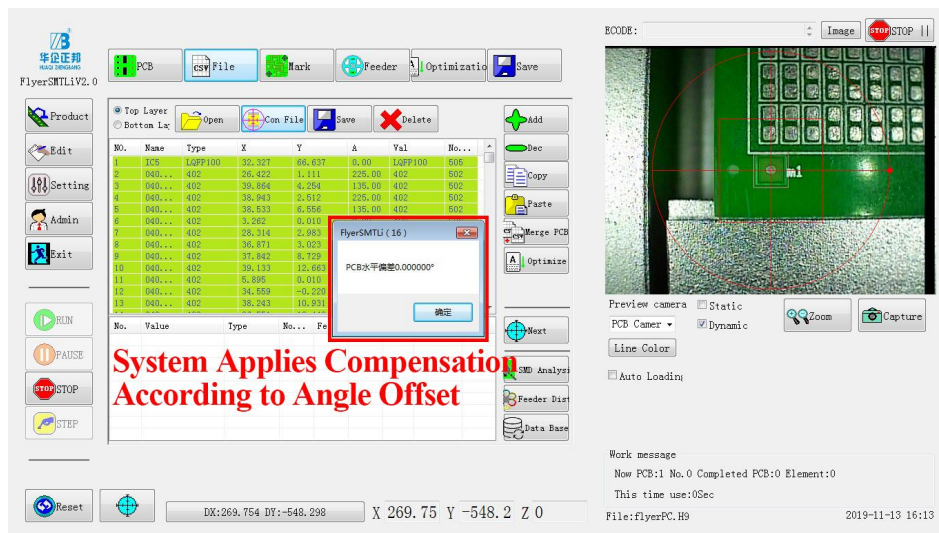
Fig.4-15 Compensation Angle

！Attention：

There is a gap between the guide rail and the PCB. After the board is loaded, the PCB angle cannot be guaranteed to be completely correct. Therefore, the angle deviation compensation operation must be performed after importing the CSV coordinate file. Otherwise, the position may be offset when mounting.
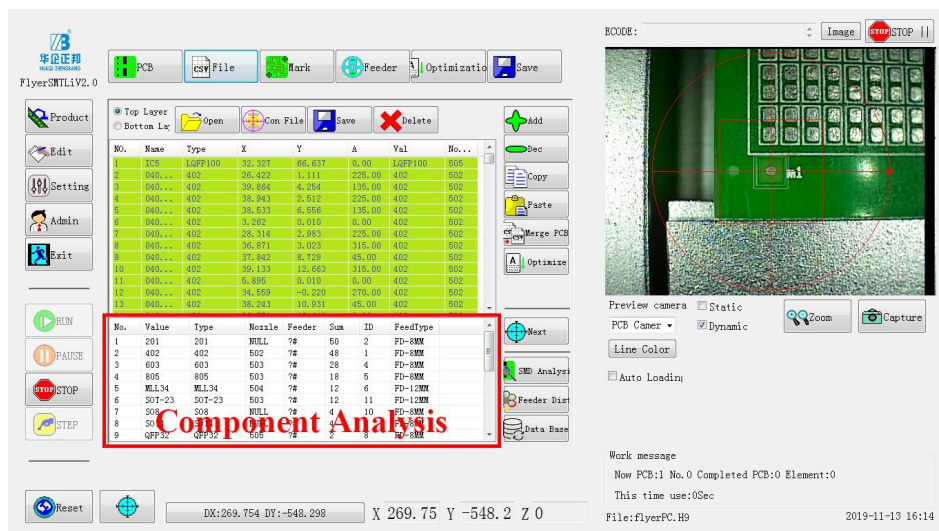
Fig.4-16 Component Analysis

4. **Component analysis：**Click the "Analyze Components" to analyze the file data and display the data in the file list.

According to the component package setting, the model of the mounting nozzle (refer to the nozzle type corresponding to the package)
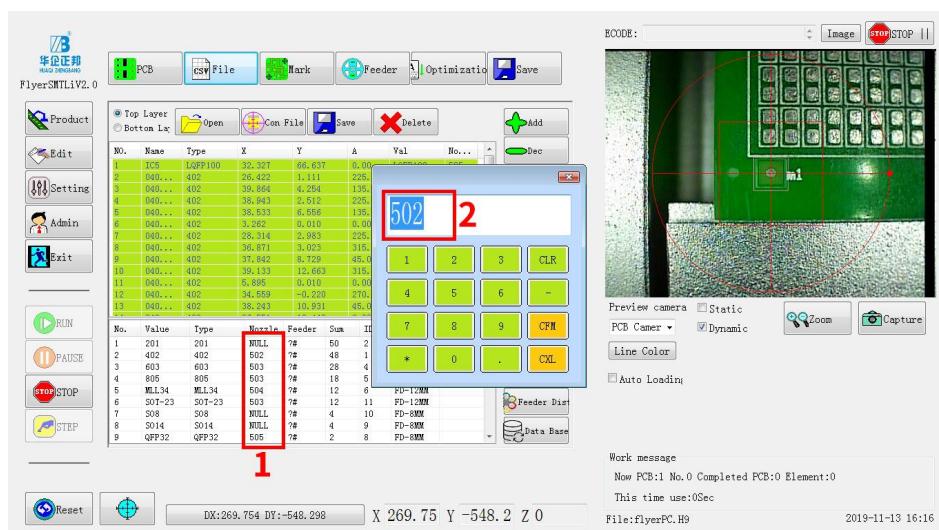
Fig.4-17 Nozzle Edit

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

Feeder Model
(Width 8mm Separation Distance Fixed 4mm)

MODEL YKW1-M1100-030
S/N Y-84-0000057117

Fig.4-18 Feeder Model

Feeder Model
(Width 16mm)

MODEL KW1-M3200-200(PA2903/27)
S/N CL-16-00421100   MADE IN JAPAN

Fig.4-19 Feeder Model
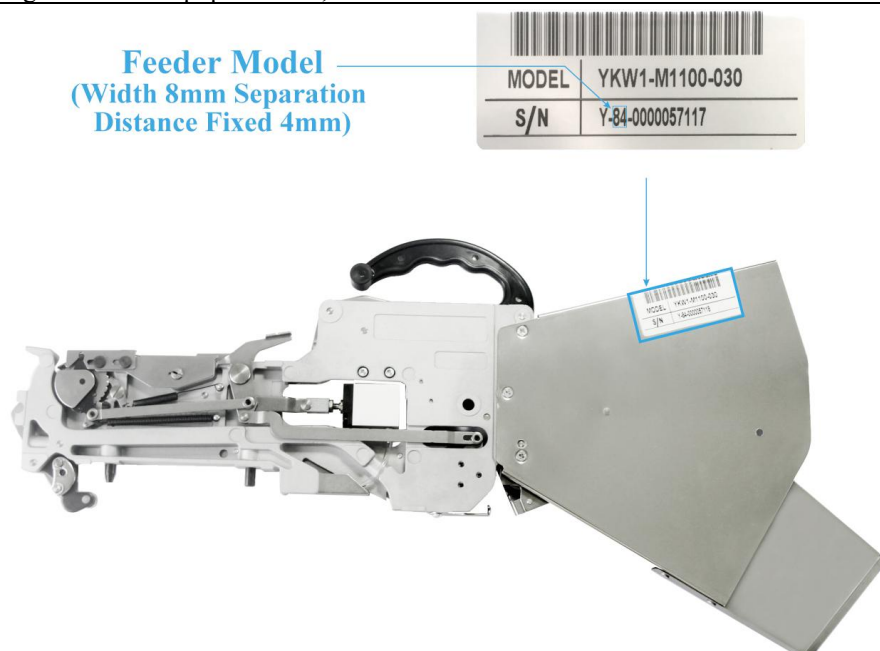
Feeder Model
(Three Tubes)
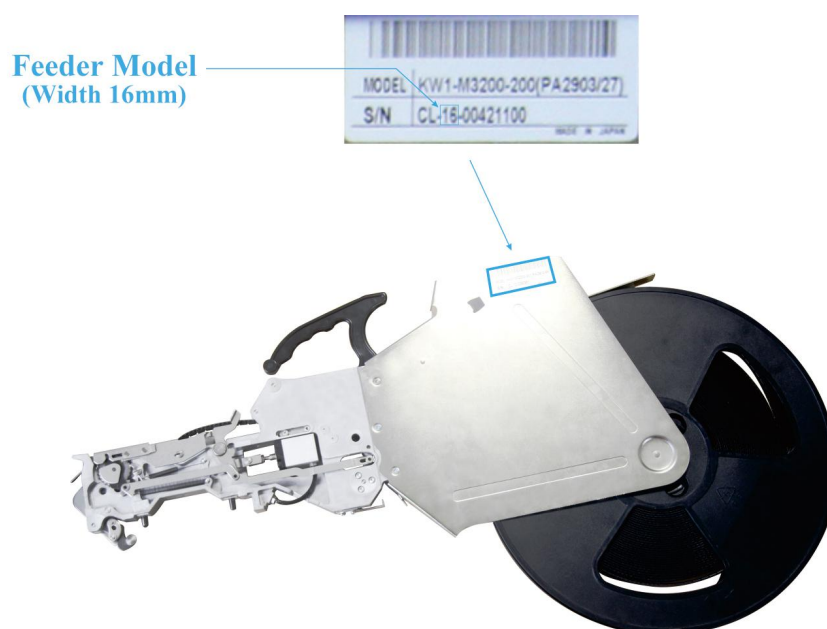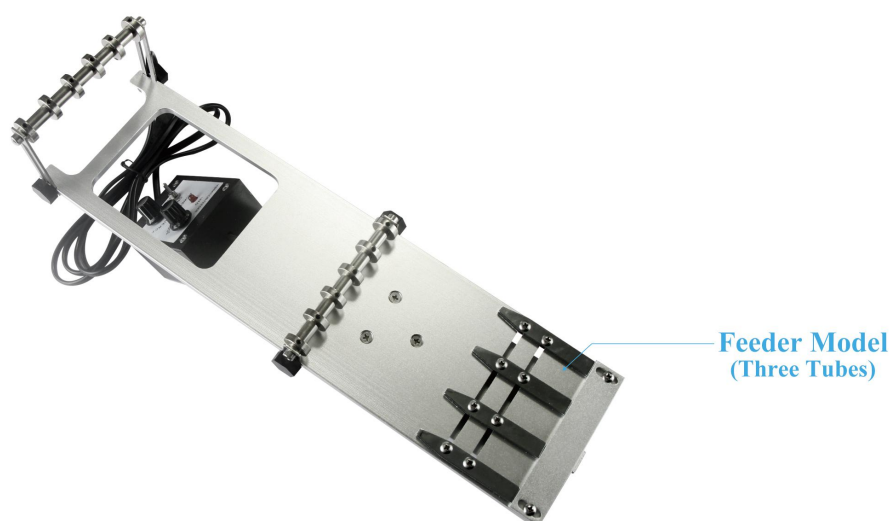
Fig.4-20 Feeder Model
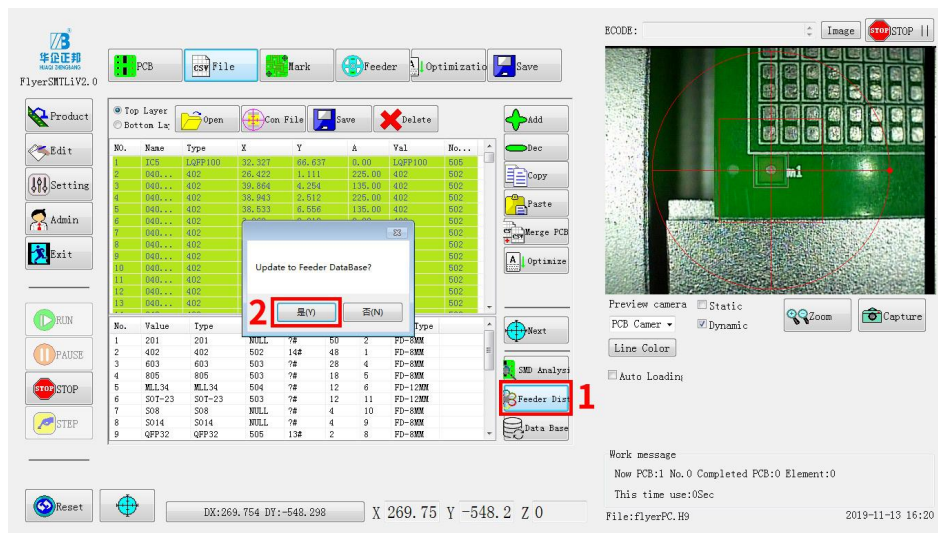
Fig.4-21 Material Station Allocation
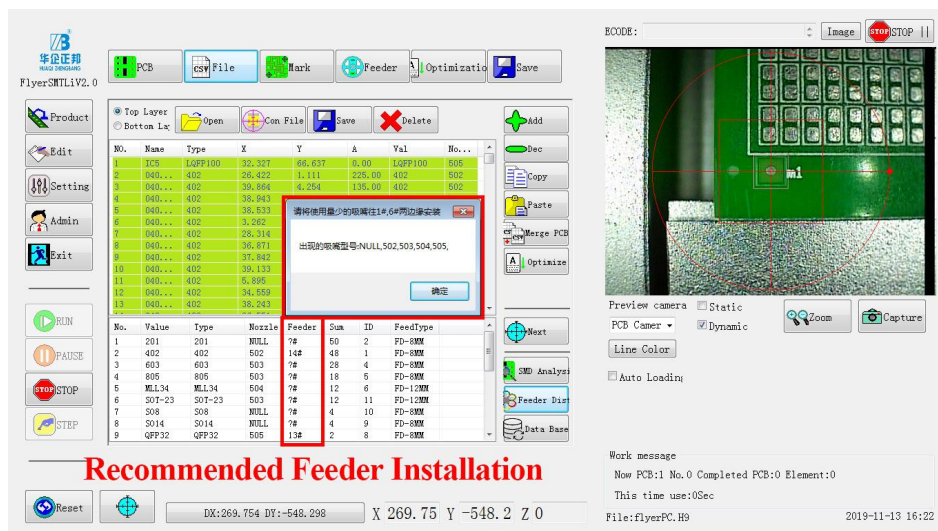
Fig.4-22 Location Recommendation

6.**Material Station Allocation**：Click the "feeder distribution" to provide 3 important data based on the contents of the file.

A. Synchronize the component parameters to the feeder settings.

B. Recommend the best feeder installation location.

C. Mentioned which types of nozzles are used.
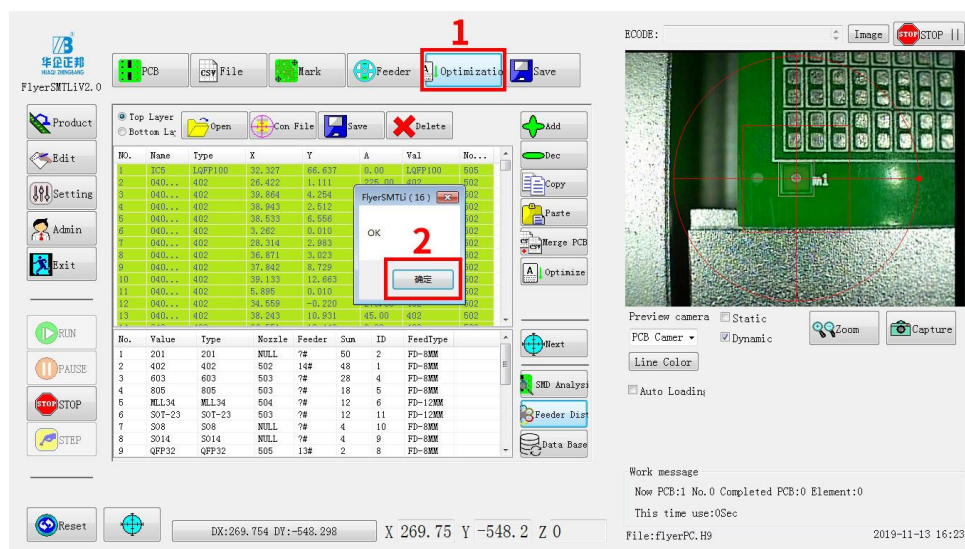
Fig.4-23 Optimization

7.**Material Installation**：Install the component-mounted feeder onto the patch according to the station's recommended station installation serial number.

8.**Optimization:**Calculate the optimal placement order based on component picking and placement.

4-2-3 Create and edit CSV coordinate file online
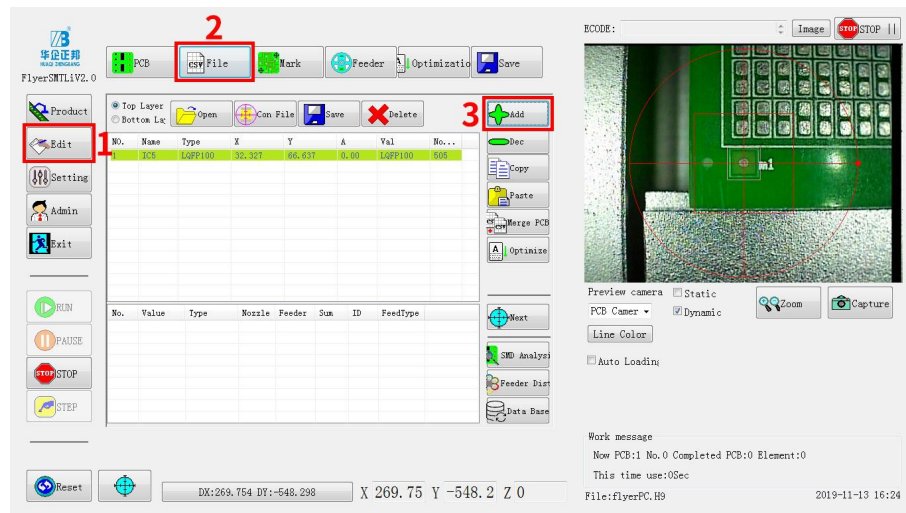
Fig.4-24 Create Coordinate

1.**Add Coordinate**：Select "Edit - File" to enter the file editing interface, click "Add" to add coordinates,
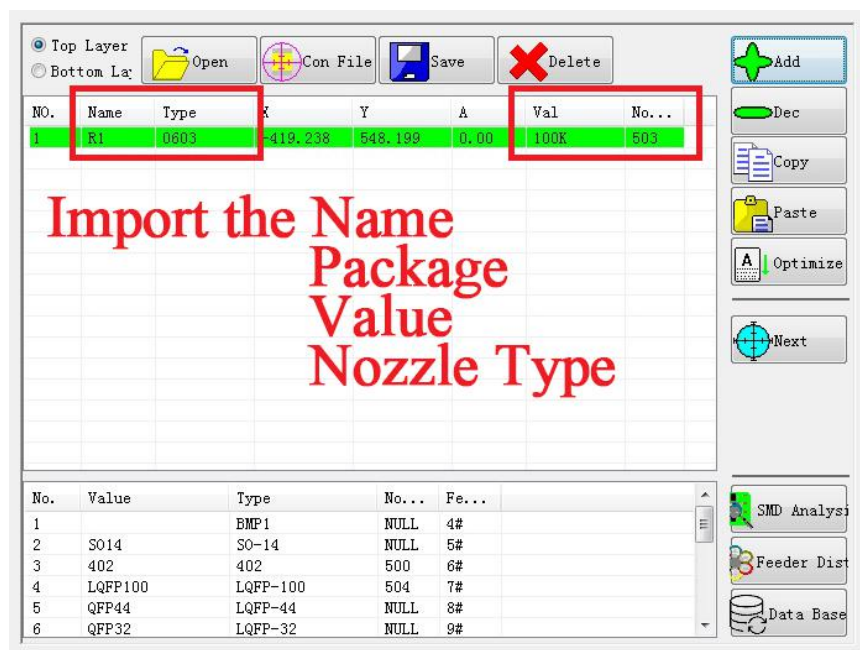
Fig.4-25 Edit Basic Parameters

2.**Edit Basic Parameters**：Import the component name, package, value, and placement nozzle model.
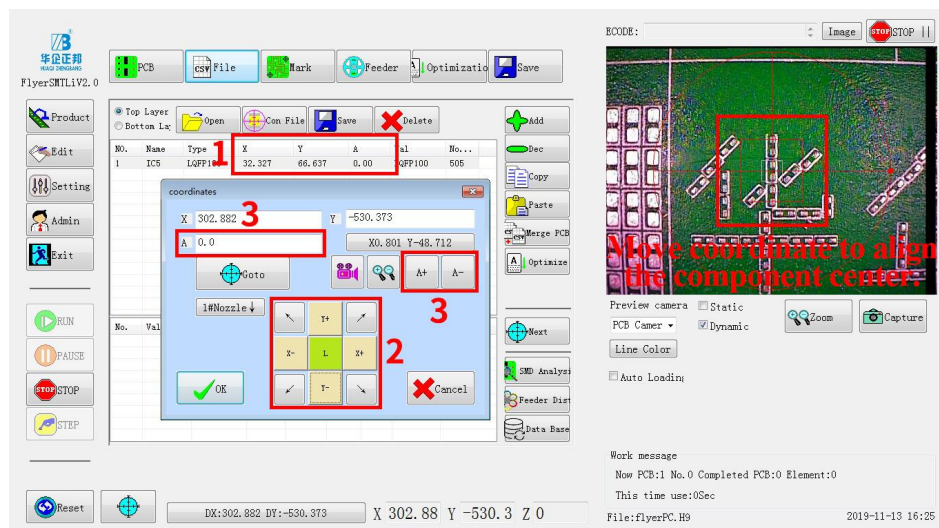
Fig.4-26 Coordinate Position
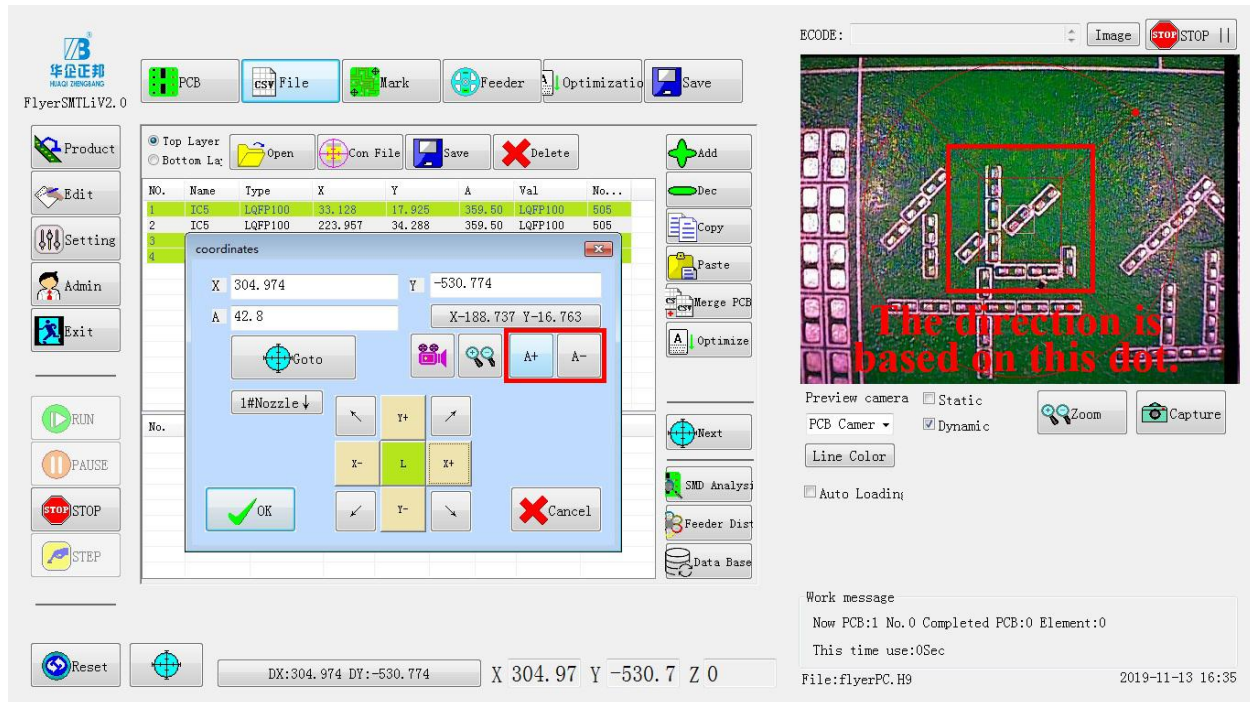
Fig.4-27 Edit Angle

3.**Coordinate Edit**：Double-click the "X or Y coordinates" to pop up the coordinate edit box and move the coordinates to the center of the PCB component pad.

Import the mounting angle or click "A+ A-" to adjust the angle, click "Confirm" to save the data and complete the coordinate edit.

4.**Add other Component Coordinates**：Refer to step 1, 2, and 3 above to add and edit all component mounting coordinates.

5.**Order Optimization**：After all the components have been edited, click "Optimize" to optimize placement order automatically, according to the coordinate position. Click "Save" in the lower right corner to save the latest CSV coordinate file.

6.**Component Analysis**；**Station Allocation**：Refer to 4-2-2, steps 3, 4, and 5 to complete component analysis and station assignment.

4-3 Mark Edit

4-3-1 Mark Position Method

Select "Edit - Mark" to enter the identification configuration, click "Mark1 - Edit" to pop up the coordinate editing box, move the coordinates to Mark1, and click "Confirm" to save Mark1.
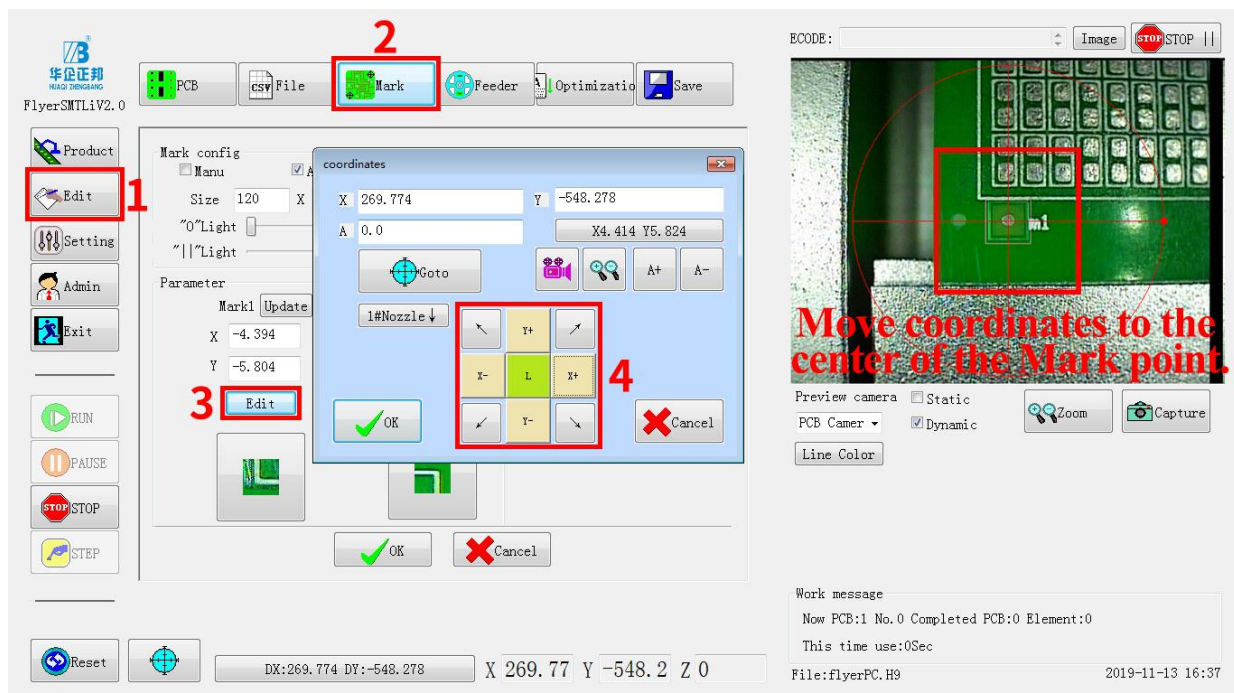
Fig.4-28Edit Mark1

Click "Mark2 - Edit" to pop up the coordinate edit box, move the coordinates to Mark2, and click "Confirm" to save Mark2.
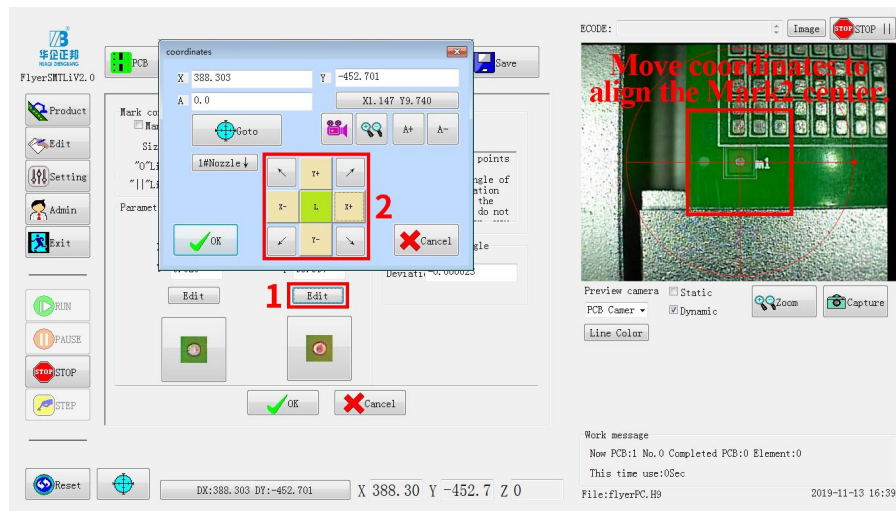
Fig4-29 Edit Mark2

！**Attention：**

The PCB design is not made by Mark, and the points or components on the PCB can be arbitrarily positioned as identification points.

It is recommended that Mark1 be positioned in the lower left corner of the PCB. Mark2 is positioned in the upper right corner of the PCB.

4-3-2 Mark Recognition Methods

Fig.4-30 Recognition Methods

1.**Manual Identification Method：** After the production starts, when the PCB position is offset, you need to manually adjust the coordinates to align the MARK1 and MARK2 centers for calibration.

2.**Automatic Identification Method：** After production is started, the system finds and calibrate MARK based on the set MARK image automatically.

3.One by one Identification: Multi-board is calibrated one by one.

！**Attention：**

Mark Automatic Identification Offset caused by PCB placement offset, PCB edge cutting irregularity. Therefore, the recognition range should not be too large, otherwise the system will not be able to recognize. The recommended range does not exceed 1.5 times the outer diameter of Mark, and don't appear the similar points in the identification area.

4-4 Feeder Edit

Type	Ribbon Feeder	Vibration Feeder(Tube)	IC Tray
Feeder No.	FD001-FD064	TP065-TP100	TP065-TP100
Coordinate	First Component Center	First Component Center	The first center in the lower left corner of the tray
Quantity	Actual Amount	Total (1)	Total Number (Y direction line)
Offset	0	0	Offset1：Position the center of the first component in the lower right corner of the tray Offset2：Position the center of the first component in the upper right corner of the tray
Other Parameters	Consistent Editing		

4-4-1 Ribbon Feeder Edit
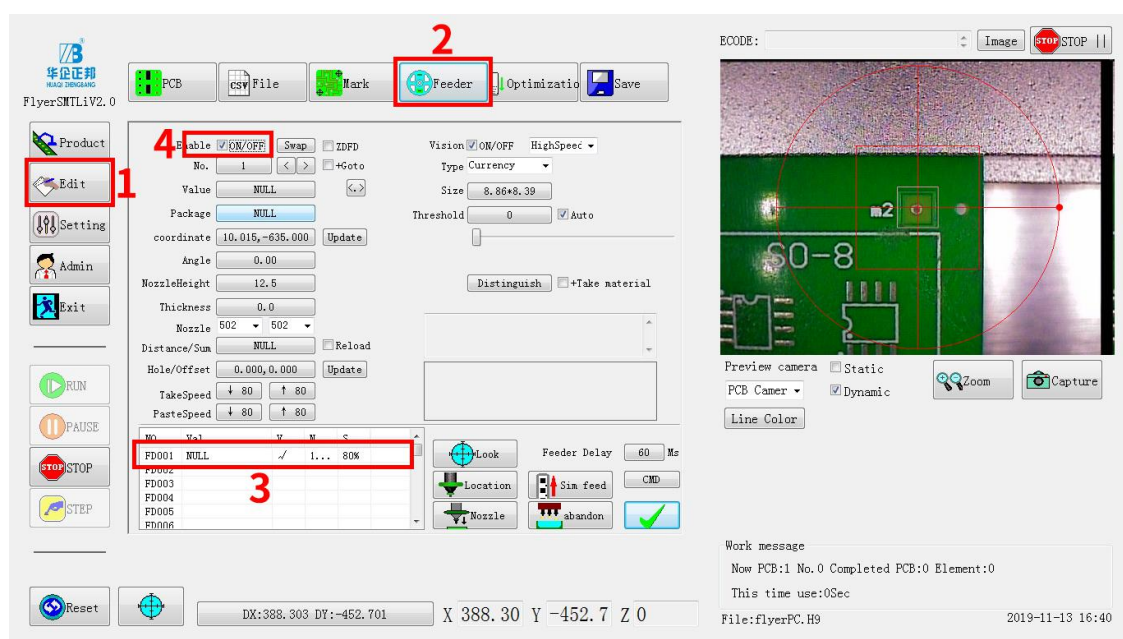
Fig.4-31 Open Switch

1.**Open Feeder**：Select "Edit—Feeder" to enter the feeder editing interface, click the feeder number in the feeder list, and click "Start" to open.

2.**Parameters Setting**：Import the value, package, angle, take-up height, component thickness and speed.

The number of trays and tray offsets are only for the IC tray, and the ribbon feeder doesn't need to be set.

！Attention：

The feeder component values and packages must be consistent with the values and packages of the corresponding components in the CSV file (Including case letter).

When editing the file for the component location, if the synchronization date is selected to the feeder, the above date will be synchronized automatically, needn't edit it again.

3.**Coordinate Correction**：Click "Coordinate" to pop up the coordinate editing box, click "Position" to locate the system preset coordinate position, then click "Single Feed" to open the feeder cover, adjust the coordinates to align the center position of the component, and click "Confirm" to save the coordinates.
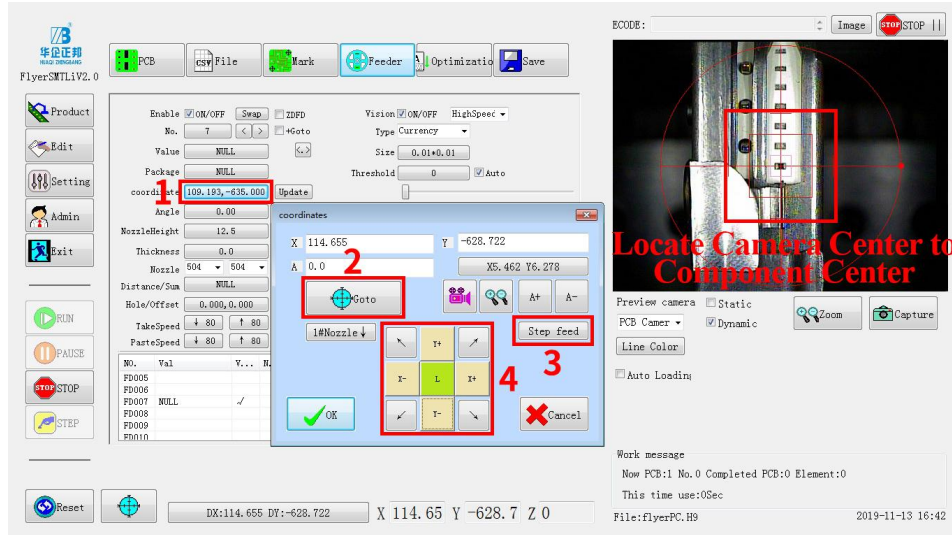
Fig.4-32 Coordinate Correction

4.**Visual Registration**：Turn on the vision switch, select the recognition camera and component type, turn on the reclaim function, click "analog recognition" to start picking up the component to the camera for identification.

Then adjust the threshold slider to stabilize the shape of the locking component and complete the visual registration of the component.
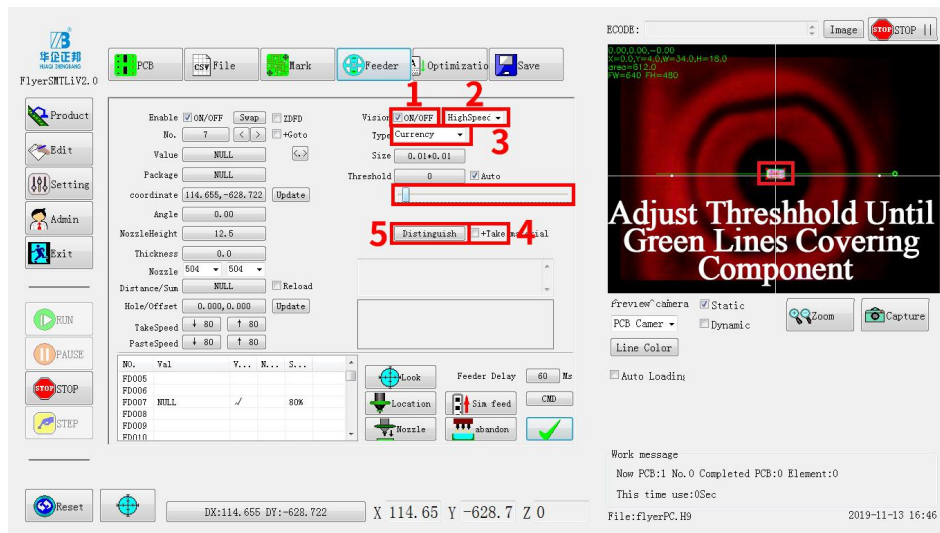
Fig.4-33 Visual Registration

！Attention：

According to the identification type corresponding to the component package selection, select the general class if the type is unclear.5.Complete the edit of other feeders refer to the steps above.

5.**Complete the rest feeder setting following previous instructions.**

6.**Swap:** Point exchange pop-up dialog box enter the feeder serial number to be exchanged and press OK to realize the exchange function of two feeder parameters.
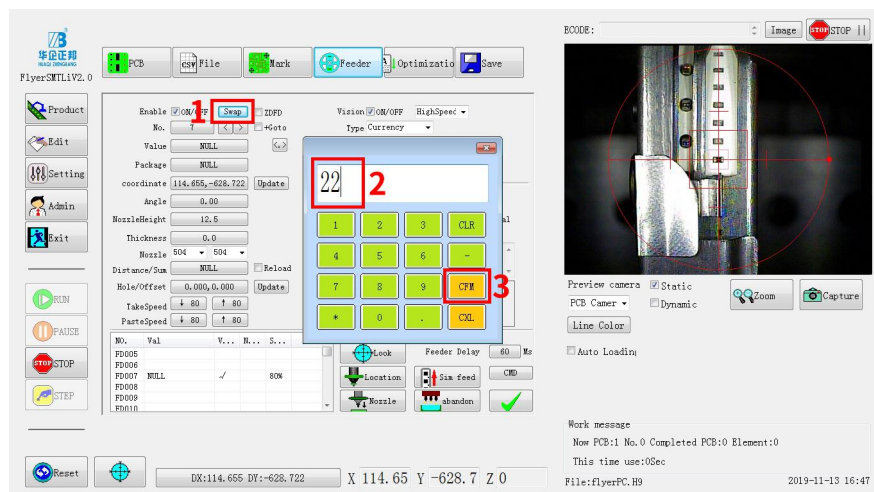
Fig.4-34 Swap Feeder

7.Re-load: Re-load is only used for the IC tray type component. After checking the reload, the total number of input components will pop up in the dialog box, and then press the OK button to enable the reload function. After the reload is enabled, the total number of components will be recounted and the total number will be re-loaded.
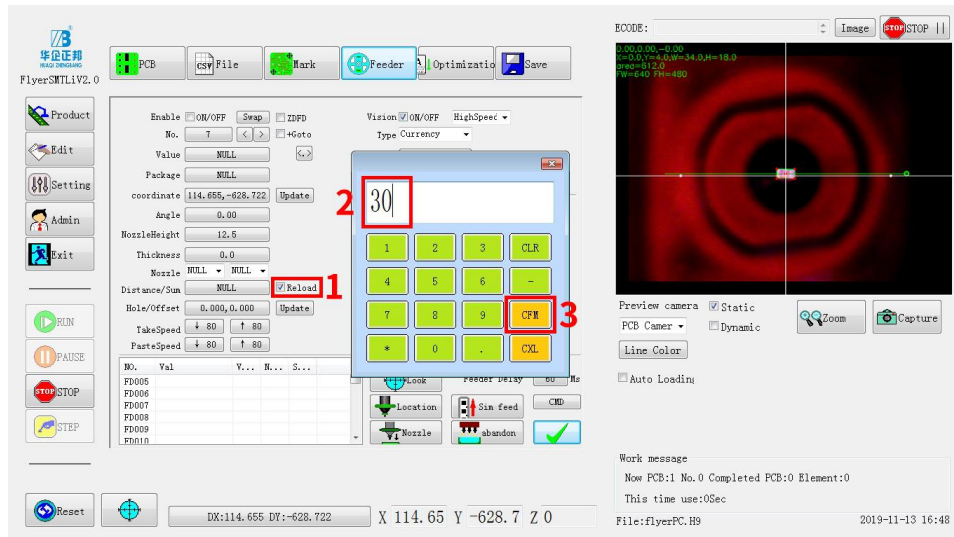
Fig.4-35 Reload

8. **CMD**:Feeder coordinates automatically assigned, click the CMD , select feeder array, fill in the first feeder number then moved to the corresponding feeder coordinates, then fill in the last feeder number also moved to the corresponding coordinates, then press the START button will be out of all of the feeder coordinates according to the array spacing equal.
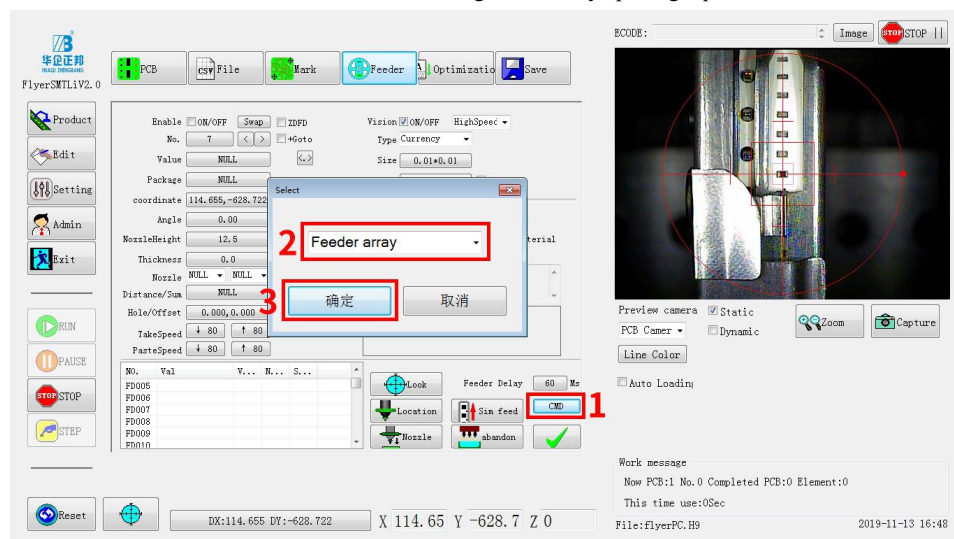
Fig.4-36 Feeder Array
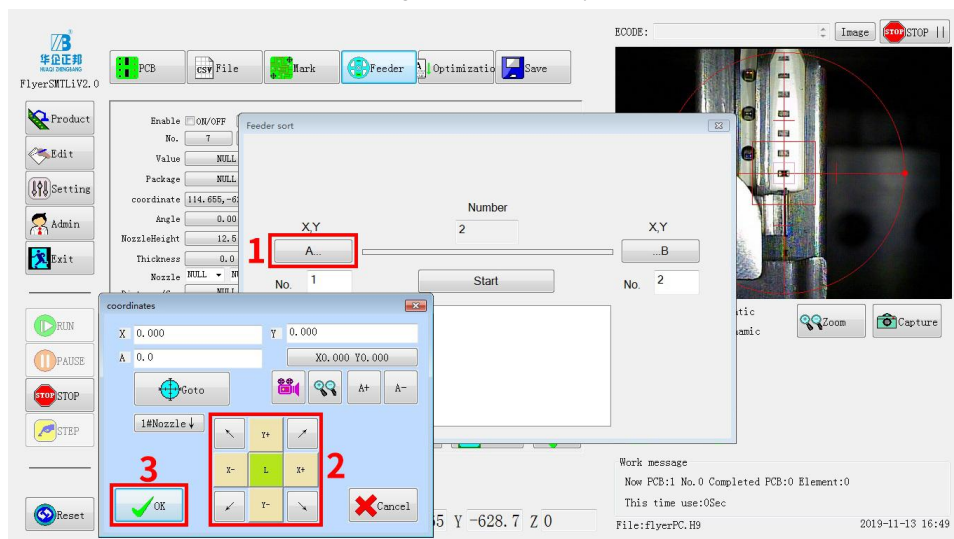
Fig.4-37 Edit Coordinate

9. **ZDFD:** After ticked ZDFD, the corresponding feeder will no longer vent air. The original corresponding standard feeder can be used as the vibration feeder.
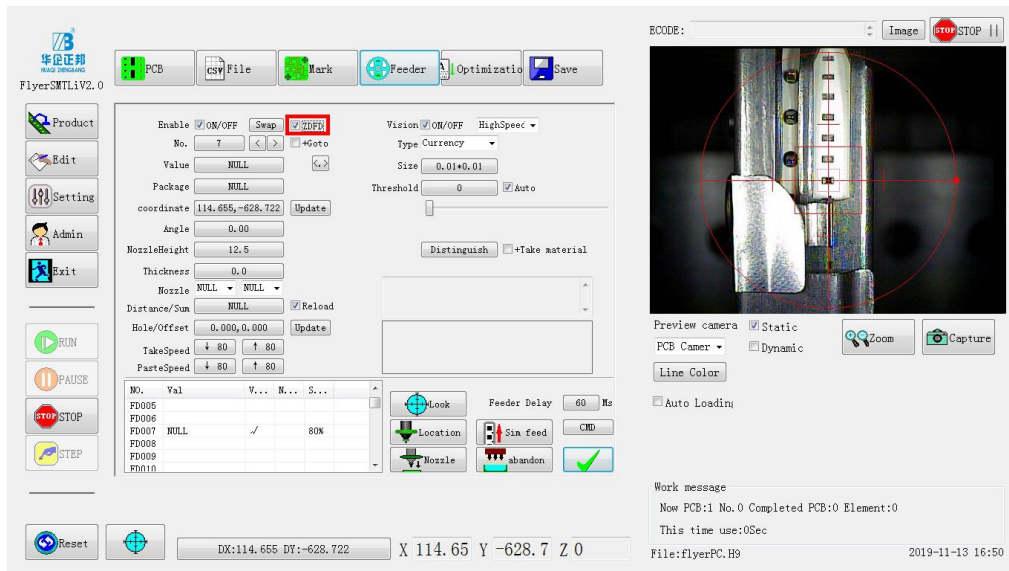
Fig.4-38 Activate Tube Feeder

10.Precise: Checking the precision identification will enable the high-definition camera's precise recognition function. The identified components will be corrected multiple times, and the placement accuracy will be higher but the efficiency will be reduced. It is suitable for high-precision applications that neglect efficiency.
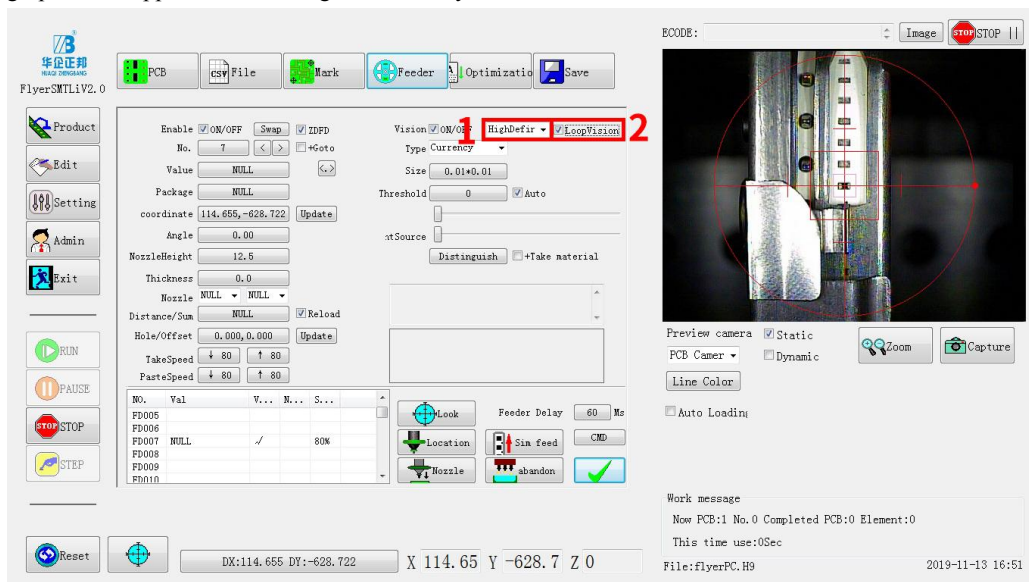
Fig.4-39 Precise Visual Recognization

4-4-2 Edit IC Tray Offset
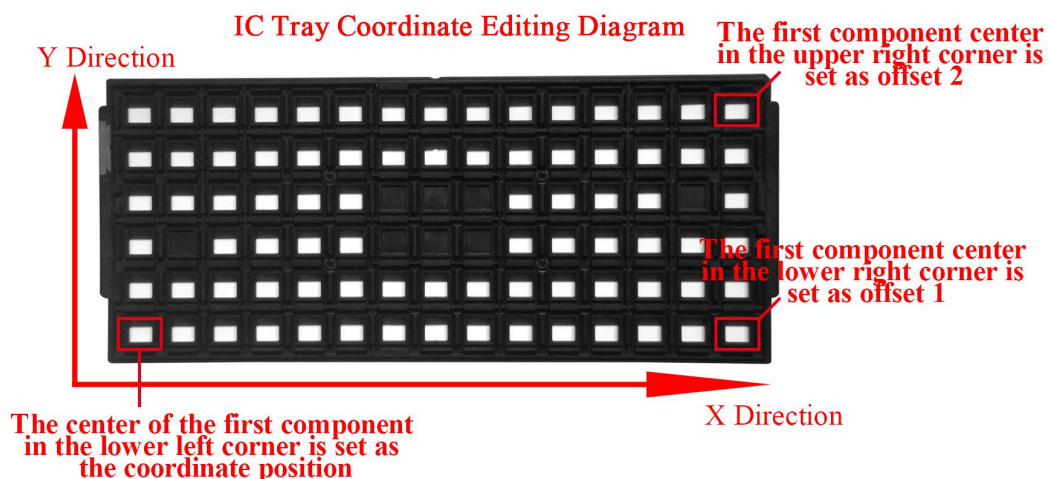
Fig.4-40 IC Tray Coordinate Editing Diagram

1.**Coordinate Adjustment**：Click "Coordinates" to move the coordinates to align the first component center in the lower left corner of the tray.
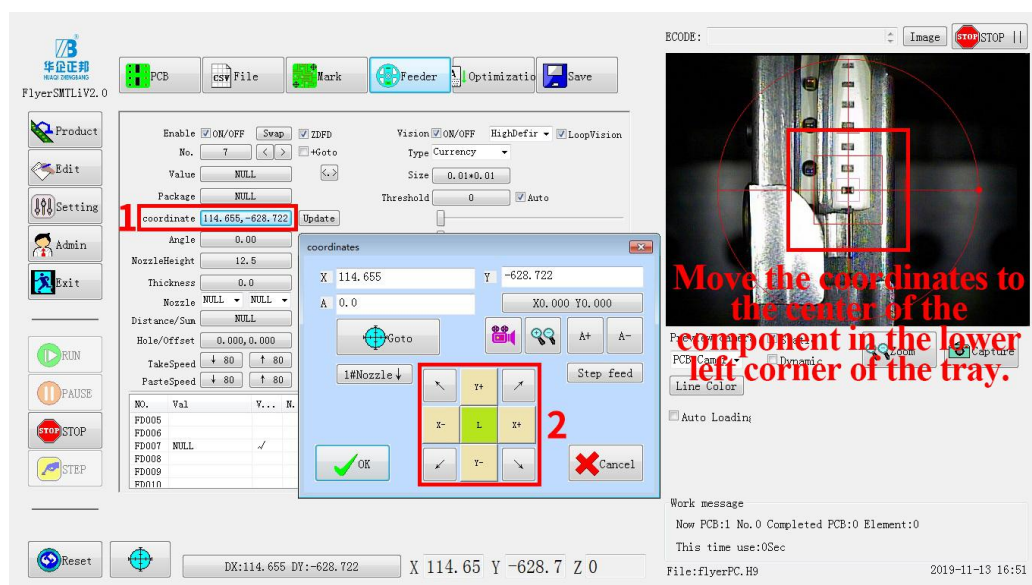
Fig.4-41 IC Coordinate

2.**Number Import**：Import the total number of pallet components. (Y direction lines)
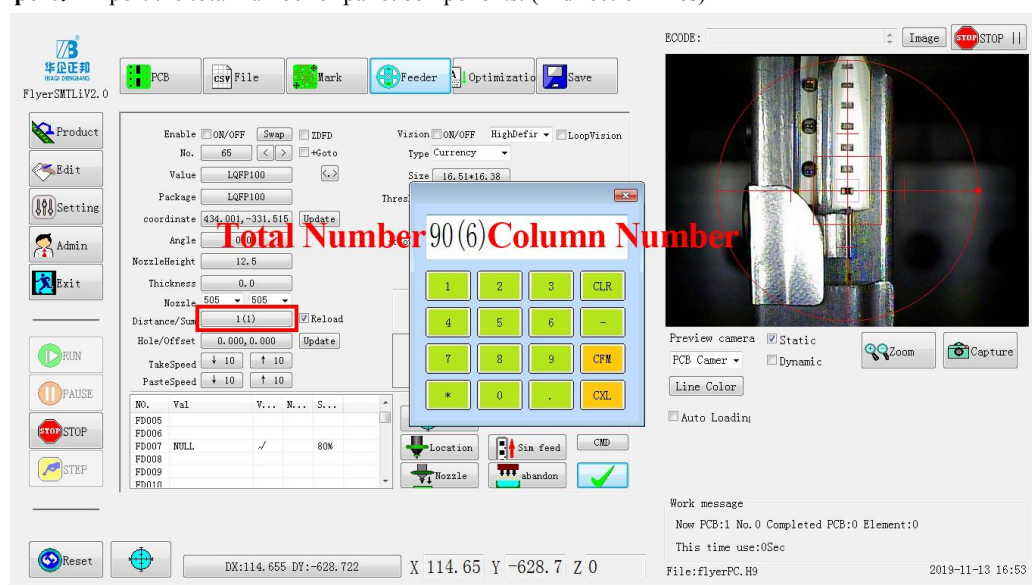
Fig.4-42 IC Number

3.**Edit Tray Offset1**：Click "Offset" to move the coordinates to the first component center in the lower right corner of the tray, and confirm the saved coordinates.
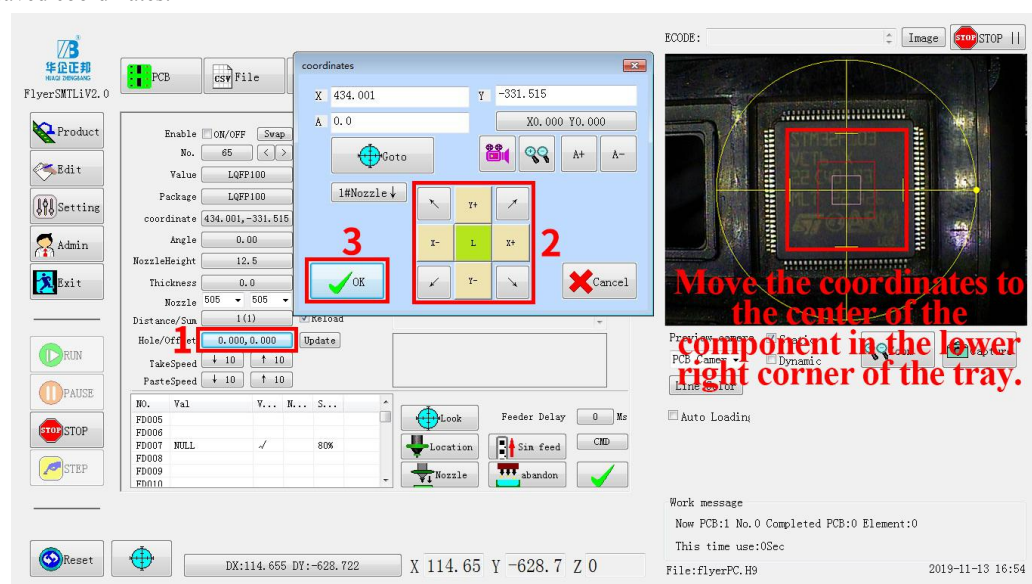
Fig.4-43 IC Offset

4.**Edit Tray Offset**：Then, move the coordinates to the top right component center in the upper right corner according to the system prompt, and confirm the saved coordinates to complete the offset editing.
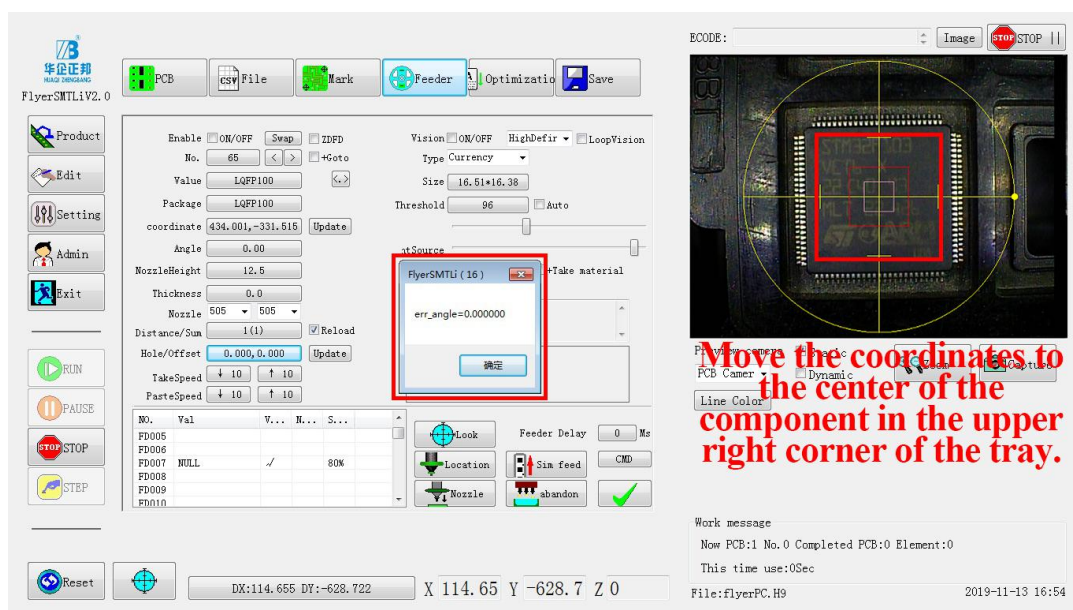
Fig.4-44 IC Offset

4-5 Export Program
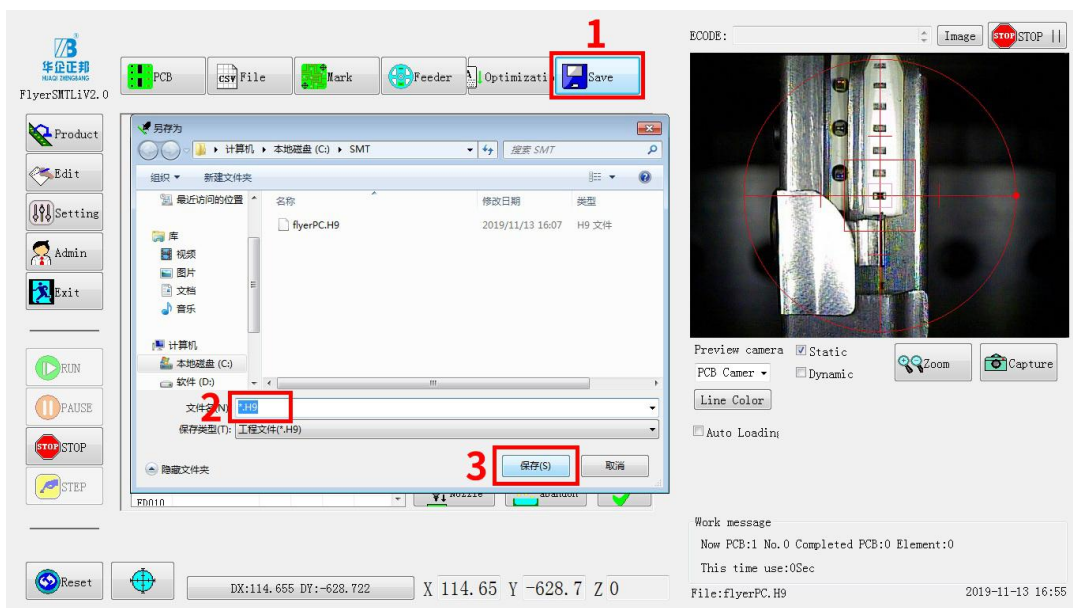
Fig.4-45 Export Program

After editing the parameters, click "Save" in the upper right corner to export the H9 program file, or you can switch to "Production" mode to produce the placement.

Chapter 5 Production & Placement

Process：

No.	Process	Content
1	Boot	Turn on the Device and enter system(Detail in the boot ready)
2	Origin Reset	Automatic
3	PCB Load	Adjust the rail width and load the PCB
4	Trans Mode Setting	Set mode based on requirements(Automatic & Manual)
5	Program Import	Import the edited production placement program
6	Material Load	Load material based on file station allocation date
7	Mount	Start mounting
8	Ending	End the system and cut off the power
9	Daily Maintenance	Daily maintenance as required

！ DANGER：

Start running immediately after the device is turned on, to avoid injury! Never put your hands and head into the machine work area.

！ Attention：

To ensure the accuracy of the device data, the reset operation will be performed after each startup.

5-1   How to import program
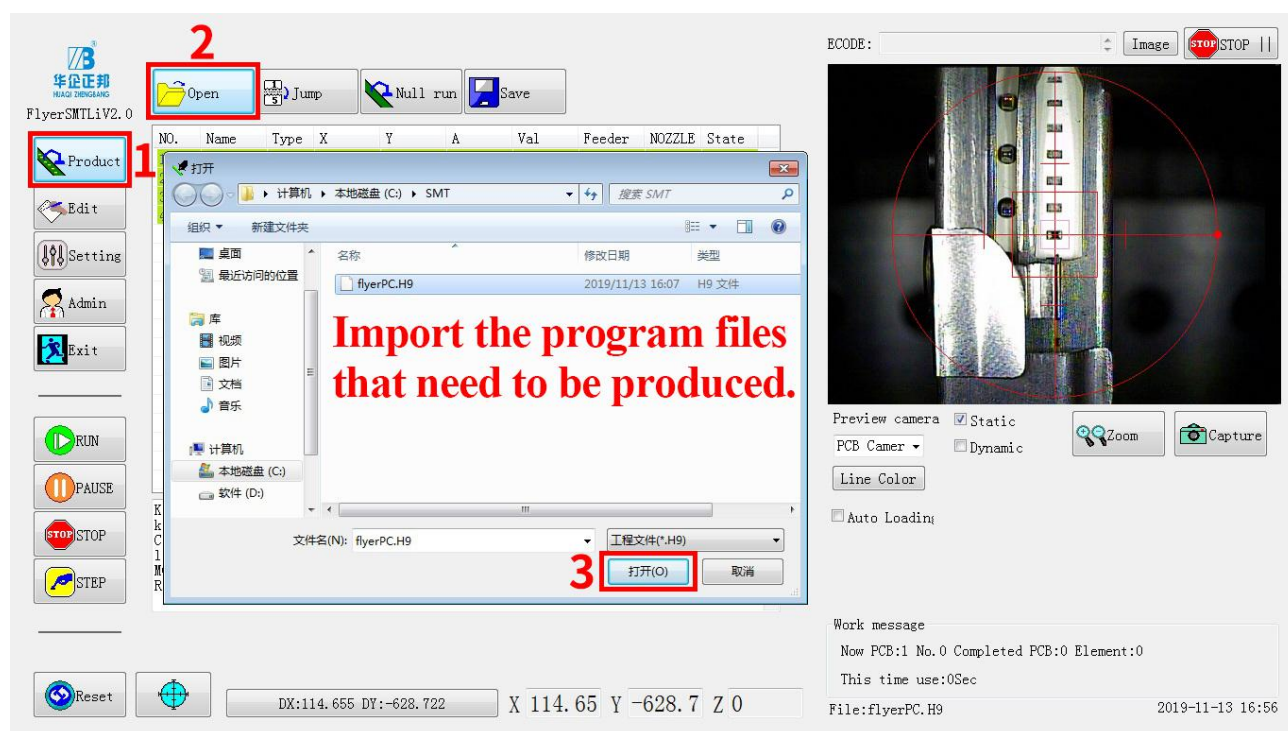
Fig.5-1 Imput Program

1、**Import program**：Click " Production "→" Open"，import the program that need to be processed.

NO.	Name	Type	X	Y	A	Val	Feeder	NOZZLE	State
228	N0402	0402	88.200	19.635	270.00	1K0402	11#	1	
229	N0402	0402	88.200	17.035	270.00	1K0402	11#	2	
230	N0402	0402	88.200	14.435	270.00	1K0402	11#	3	
231	N0402	0402	88.200	11.835	270.00	1K0402	11#	1	
232	N0402	0402	88.200	9.235	270.00	1K0402	11#	2	
233	N0402	0402	88.200	6.635	270.00	1K0402	11#	3	
234	N0402	0402	90.135	20.270	360.00	1K0402	11#	1	
235	N0402	0402	92.749	19.521	315.00	1K0402	11#	2	
236	N0402	0402	91.849	17.719	45.00	1K0402	11#	3	
237	N0402	0402	91.449	15.519	45.00	1K0402	11#	1	
238	N0402	0402	92.151	13.419	135.00	1K0402	11#	2	
239	N0402	0402	93.451	11.119	135.00	1K0402	11#	3	
240	N0402	0402	92.551	9.321	225.00	1K0402	11#	1	
241	N0402	0402	90.449	9.921	315.00	1K0402	11#	2	
242	N0402	0402	52.635	12.570	360.00	1K0402	11#	3	
243	IC16	S...	90.214	68.374	45.00	SO14	42#	4	
244	IC17	S...	78.626	68.414	135.00	SO14	42#	4	
245	BMP1	BMP1	-50.100	-76.200	0.00		NULL	NULL	

Fig.5-2 Unmatched Status

NO.	Name	Type	X	Y	A	Val	Feeder	NOZZLE	State
228	N0402	0402	88.200	19.635	270.00	1K0402	NULL	NULL	
229	N0402	0402	88.200	17.035	270.00	1K0402	NULL	NULL	
230	N0402	0402	88.200	14.435	270.00	1K0402	NULL	NULL	
231	N0402	0402	88.200	11.835	270.00	1K0402	NULL	NULL	
232	N0402	0402	88.200	9.235	270.00	1K0402	NULL	NULL	
233	N0402	0402	88.200	6.635	270.00	1K0402	NULL	NULL	
234	N0402	0402	90.135	20.270	360.00	1K0402	NULL	NULL	
235	N0402	0402	92.749	19.521	315.00	1K0402	NULL	NULL	
236	N0402	0402	91.849	17.719	45.00	1K0402	NULL	NULL	
237	N0402	0402	91.449	15.519	45.00	1K0402	NULL	NULL	
238	N0402	0402	92.151	13.419	135.00	1K0402	NULL	NULL	
239	N0402	0402	93.451	11.119	135.00	1K0402	NULL	NULL	
240	N0402	0402	92.551	9.321	225.00	1K0402	NULL	NULL	
241	N0402	0402	90.449	9.921	315.00	1K0402	NULL	NULL	
242	N0402	0402	52.635	12.570	360.00	1K0402	NULL	NULL	
243	IC16	S...	90.214	68.374	45.00	SO14	NULL	NULL	
244	IC17	S...	78.626	68.414	135.00	SO14	NULL	NULL	
245	BMP1	BMP1	-50.100	-76.200	0.00		NULL	NULL	

Fig.5-3 Matched Status

2.**Match Parameter**：Automatically generate a production list after importing the program and automatically match the corresponding feeder number and nozzle number

5-2 Production & Placement

NO.	Step	Content
1	Production	Normal automatic production placement mode
2	Single step	Single step production placement mode
3	Jump	Jump to any component as the initial placement position to produce
4	Trial mount	Non-suction production mode
5	Feed	Specified component or feeder feed production

5-2-1 Automatic Production

1.Click "Start" to recognize and calibrate the mark offset.
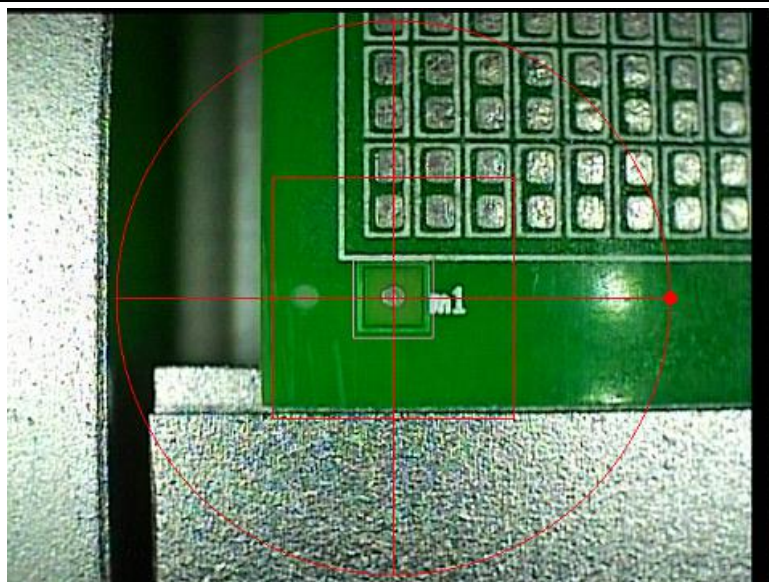
Fig.5-4 Mark1 Calibration
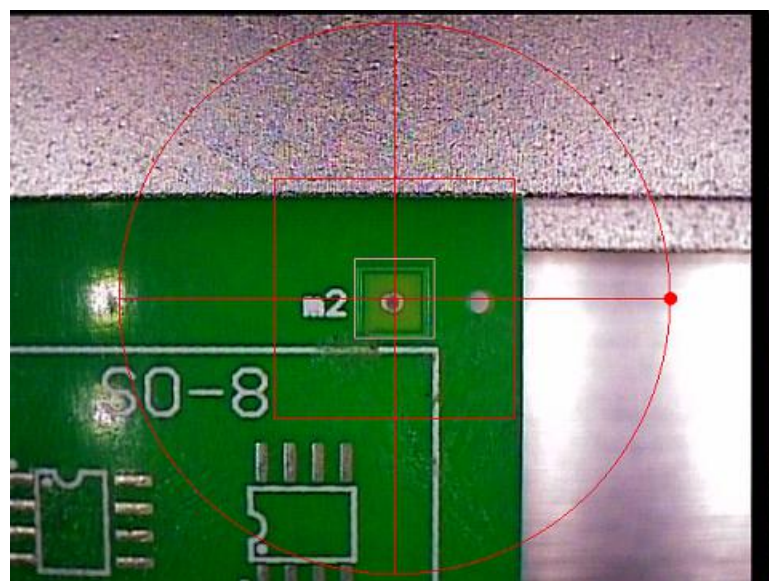
Fig.5-5 Mark2 Calibration

2.After the Mark calibration, the reclaiming and visual correction (material with the calibration enabled by the feeder) are automatically performed and placed until the production of this program is completed.

3.Pause：If you need to stop adjusting settings and continue production, please click "Pause".

After pausing the settings, click "Start" to continue production.

4.Stop：If you give up or interrupt the production no longer, please click "Stop"

Click "Start" after stopping will restart production from the beginning.

5-2-2 Single Step Production

Single-step execution is mainly for machine debugging, program calibration, troubleshooting, etc., and each step can be clearly observed.

1. Click "Single Step" to recognize Mark1 and adjust the coordinate correction offset.

2. Click "single step" to recognize Mark2, adjust the coordinate correction offset，

3. Step by step "single step", the system gradually withdraws material, visually corrects, and gradually installs until the production is completed.，

4. Click "Pause" and then click "Start" to switch to normal production automatic placement until the production is completed.

5-2-3 Jump Production

If operator quit during production process and want to continue to work or skip some components, jump production can be adopted to solve problem.

1.Click "Jump" and input PCB NO. and component NO.

2.Then refer to normal production and single step production to operate.

Jump to specified component location of PCB and take it as the starting placement position for this production automatically.

3.Production completed or click "Stop" to return to normal production mode.
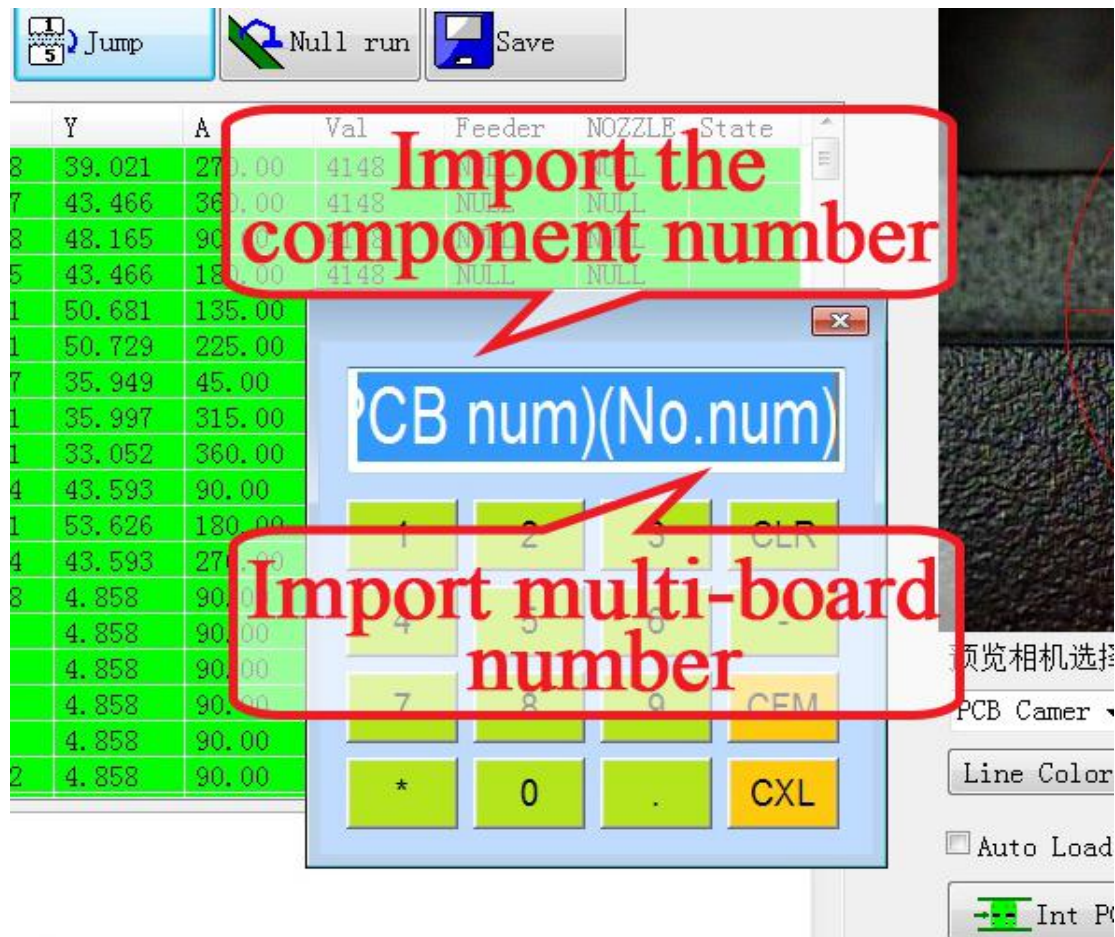
Fig.5-5 Jump Production

！Attention：

The placement mode must be adjusted to the sequential placement mode when using jump production, and the jump function cannot be used in the independent placement mode.

5-2-4 Trial Production

Trial Production is mainly for machine warm-up and operation training.

Click the "empty", the system will automatically start to complete the Mark calibration, and not pick up the component placement until the program is installed.

In the middle, you can click the "pause" and "stop" to terminate the operation.

5-3 Feed Production

The system supports specified feeder and component feeding.

5-3-1 Specified Feeder Feed

1.Import the production program, click "Match" system to match the parameters automatically.

2.Click the "Feeder" in the title to clear all feeder parameters.

3.Click "Start" to start the feed production.

NO.	Name	Type	X	Y	A	Val	Feeder	NOZZLE	State
228	N0402	0402	88.200	19.635	270.00	1K0402	NULL	1	
229	N0402	0402	88.200	17.035	270.00	1K0402	NULL	2	
230	N0402	0402	88.200	14.435	270.00	1K0402	NULL	3	
231	N0402	0402	88.200	11.835	270.00	1K0402	NULL	1	
232	N0402	0402	88.200	9.235	270.00	1K0402	NULL	2	
233	N0402	0402	88.200	6.635	270.00	1K0402	NULL	3	
234	N0402	0402	90.135	20.270	360.00	1K0402	NULL	1	
235	N0402	0402	92.749	19.521	315.00	1K0402	NULL	2	
236	N0402	0402	91.849	17.719	45.00	1K0402	NULL	3	
237	N0402	0402	91.449	15.519	45.00	1K0402	NULL	1	
238	N0402	0402	92.151	13.419	135.00	1K0402	NULL	2	
239	N0402	0402	93.451	11.119	135.00	1K0402	NULL	3	
240	N0402	0402	92.551	9.321	225.00	1K0402	NULL	1	
241	N0402	0402	90.449	9.921	315.00	1K0402	NULL	2	
242	N0402	0402	52.635	12.570	360.00	1K0402	NULL	3	
243	IC16	S...	90.214	68.374	45.00	SO14	NULL	4	
244	IC17	S...	78.626	68.414	135.00	SO14	NULL	4	
245	BMP1	BMP1	-50.100	-76.200	0.00		NULL	NULL	

Fig.5-7 Clear Feeder Parameters

5-3-2 Specified Component Feeding

1.Switch to "Mark Edit" mode and select manual identification.

2.Return to the production interface and import the production program，

   Click "Match" to match the related program parameters.

3.Click "Start", enter the Mark point to recognition and calibration status

4.Then click "Status" in the title to set all components to the mounted status.

NO.	Name	Type	X	Y	A	Val	Feeder	NOZZLE	State
228	N0402	0402	88.200	19.635	270.00	1K0402	11#	1	√
229	N0402	0402	88.200	17.035	270.00	1K0402	11#	2	√
230	N0402	0402	88.200	14.435	270.00	1K0402	11#	3	√
231	N0402	0402	88.200	11.835	270.00	1K0402	11#	1	√
232	N0402	0402	88.200	9.235	270.00	1K0402	11#	2	√
233	N0402	0402	88.200	6.635	270.00	1K0402	11#	3	√
234	N0402	0402	90.135	20.270	360.00	1K0402	11#	1	√
235	N0402	0402	92.749	19.521	315.00	1K0402	11#	2	√
236	N0402	0402	91.849	17.719	45.00	1K0402	11#	3	√
237	N0402	0402	91.449	15.519	45.00	1K0402	11#	1	√
238	N0402	0402	92.151	13.419	135.00	1K0402	11#	2	√
239	N0402	0402	93.451	11.119	135.00	1K0402	11#	3	√
240	N0402	0402	92.551	9.321	225.00	1K0402	11#	1	√
241	N0402	0402	90.449	9.921	315.00	1K0402	11#	2	√
242	N0402	0402	52.635	12.570	360.00	1K0402	11#	3	√
243	IC16	S...	90.214	68.374	45.00	SO14	42#	4	√
244	IC17	S...	78.626	68.414	135.00	SO14	42#	4	√
245	BMP1	BMP1	-50.100	-76.200	0.00		NULL	NULL	√

Fig.5-9 Set the Placement Status

5.Select the component that needs to be replenished,

   Click on the status bar of the component,

   Set the component to be unmounted.

   The system in which the status bar has been smashed is considered to be in the mounted state.

   Placement is no longer performed in this production process;

   The system with the status bar blanked is considered to be unmounted.

   Only install the components of this part after starting the program.

NO.	Name	Type	X	Y	A	Val	Feeder	NOZZLE	State
228	N0402	0402	88.200	19.635	270.00	1K0402	11#	1	√
229	N0402	0402	88.200	17.035	270.00	1K0402	11#	2	√
230	N0402	0402	88.200	14.435	270.00	1K0402	11#	3	√
231	N0402	0402	88.200	11.835	270.00	1K0402	11#	1	√
232	N0402	0402	88.200	9.235	270.00	1K0402	11#	2	√
233	N0402	0402	88.200	6.635	270.00	1K0402	11#	3	√
234	N0402	0402	90.135	20.270	360.00	1K0402	11#	1	
235	N0402	0402	92.749	19.521	315.00	1K0402	11#	2	
236	N0402	0402	91.849	17.719	45.00	1K0402	11#	3	
237	N0402	0402	91.449	15.519	45.00	1K0402	11#	1	
238	N0402	0402	92.151	13.419	135.00	1K0402	11#	2	
239	N0402	0402	93.451	11.119	135.00	1K0402	11#	3	
240	N0402	0402	92.551	9.321	225.00	1K0402	11#	1	√
241	N0402	0402	90.449	9.921	315.00	1K0402	11#	2	√
242	N0402	0402	52.635	12.570	360.00	1K0402	11#	3	√
243	IC16	S...	90.214	68.374	45.00	S014	42#	4	√
244	IC17	S...	78.626	68.414	135.00	S014	42#	4	√
245	BMP1	BMP1	-50.100	-76.200	0.00		NULL	NULL	√

Fig.5-10 Unmounted Status

6. Click "Start" to start the feeding production until all the feeding components of this program are mounted.

！Attention：

The specified component feeding production is only applicable to the manual identification of Mark points. To enable automatic identification of Mark point identification, it must be switched to manual identification or converted to the specified feeder mode for feeding production.

5-4 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 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!