



Operating instruction of QM81 type visual chip mounted machine

Start heart and force Create glorious
Start force to be one Win future together
Convenient Reliable Safety Feel ease

Yueqing Qihe Electrical Technology Co., Ltd

—— www.qhsmt.com ——

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1 Preface

Thank you very much for your purchase and use of the fully automatic visual placing machine (hereinafter referred to as the "Equipment") produced by Yue qing Qihe Electronic Technology Co., Ltd. This device works by picking it up from a component provider (e.g., Feeder), calibrating the coordinate position through the vision system, and then attaching it to the supplied circuit board.

1.1 Safe use

The device includes a feed area, a work area, and a control area. If the equipment is not operated correctly, it may cause damage to personnel and equipment. Basic skills of the operator include software editing, maintenance of basic system hardware and additional devices such as feed racks.



Before using the equipment

- You must read the instruction before using the device, and fully understand the content of the instruction before operating.
- After reading this manual, please keep it by your side, so that you can inquire any doubt at any time.
- This equipment is prohibited to be operated by irrelevant personnel.
- In order to ensure the safe operation and maintenance of equipment, the operator must be aware of the potential hazard area of the equipment.
- If the operator changes the equipment without the prior consent of Yueqing Qihe Electronic Technology Co., Ltd., or fails to maintain the equipment in accordance with the method of this application instruction, the safety of the equipment may be seriously damaged.
- In no case shall the equipment be modified or repaired by any method not recognized by Yue qing Qihe Electronic Technology Co., Ltd.

1.2 Precautions

1. In case of any abnormality, failure or power failure, please cut off the power of the machine and unplug the power plug from the socket to prevent accidental start.
2. When pulling out the power plug, please hold the plug and pull it out, do not pull the wire.
3. Please take necessary safety measures to prevent upside down and falling accidents when lifting and moving.
4. Please take good care of the wooden case and foam.
5. Please place the machine in a horizontal position.
- 6, in order to prevent electric shock, leakage, please keep the ground clean and dry, must be grounded.
7. In order to prevent personal accidents, please do not put your hands in the working area of the machine.
8. In order to prevent accidents and electric shock accidents caused by unskilled operation, please entrust personnel with professional electrical knowledge or relevant technical personnel of our company to repair and maintain the electrical equipment.
9. Do not use it under the influence of noise sources (electromagnetic waves) such as high-frequency welders.
10. Do not use it when the power supply voltage exceeds $\pm 10\%$ of the rated power supply.
11. In case of thunder, please stop using and unplug the electricity.

Note: Before power on the equipment, ensure that the equipment is reliably grounded, pay attention to personal safety. (The ground wire of the three-plug power cord is ensured to be effective)

1.3 About the guarantee

In case of abnormal phenomena of the equipment, the protection content is as follows:

Guarantee content: free maintenance service will be provided in case of failure due to material or manufacturing problems of components of the equipment.

Guarantee period: from the delivery date, the whole machine is guaranteed for one year, the nozzle is guaranteed for one month, and the belt is guaranteed for three months.

No guarantee is provided in the following cases:

1. When the storage device is damaged, it does not guarantee the loss of data stored in it, so it is necessary to prepare backup at ordinary times.

2. Error action of the system or data damage due to virus infection or other reasons caused by running programs unrelated to equipment operation.

3. Aging over time, or abnormal phenomena caused by natural wear and tear of equipment (such as paint, electroplating, depreciation of consumables, etc.).

4. Weak sensory changes that do not affect the quality and performance of the equipment (such as controller action sound, motor rotation sound, air pump sound, etc.)

5. The use of environmental conditions caused by abnormal phenomena (such as: water, powder and impure substances, dust on machinery and equipment, oil stains, etc.).

6. Earthquake, typhoon, flood, fire, lightning and other natural disasters or accidents. Imperfections or errors in equipment maintenance.

2 Know the equipment

2.1 Equipment introduction

In the sixth generation of product QM61, achieved significant results at the same time, the company's research team, determined to launch the seventh generation of product QM81 with higher speed, accuracy and efficiency.

The design highlights of this model are:

1:Eight heads and three visual designs. One HD visual detection nozzle, two lower visual detection circuit board placement.

2:the guide rail slider and the structure of the screw, the performance is more stable, more smooth operation.

3:the use of private server motor, the machine will never lose step.

4:The speed has been increased by 1.2 times on the original basis.

5:The assembly line segment function is added. When the machine is pasting the board, the assembly line can automatically save the board, and the pasting efficiency is higher.

2.2 Hardware features

The external size of the equipment is 1285*1385*1420mm, mainly composed of working head, upper and lower vision system, worktable, Feida installation board, etc. Voltage AC220V or AC110V, power 1000W.

2.3 Software Features

The software is developed by the company independently, with independent intellectual property rights, full Chinese interface, easy to use.

2.4 Coordinate system specification

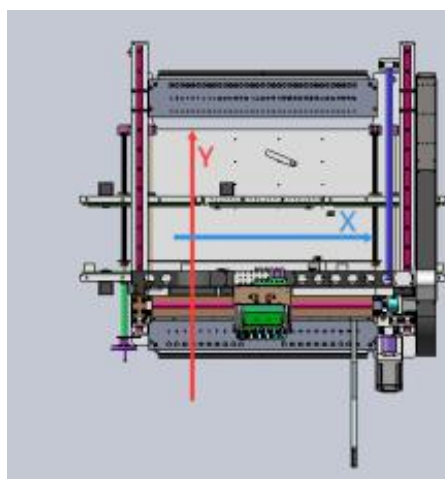


图 1-1

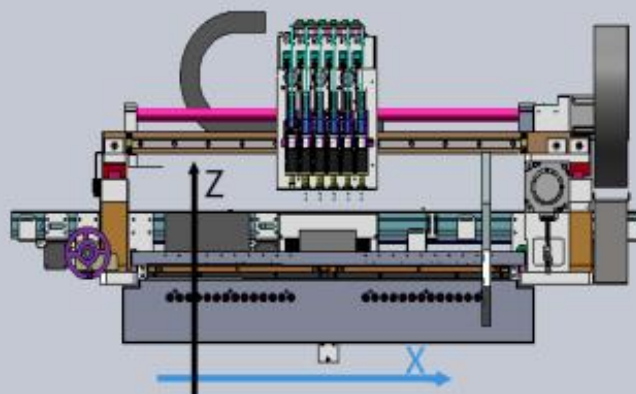







图 1-2

Figure 1-1 and Figure 1-2 are the coordinate system of this equipment.

XY axis movement range: 490*730mm.

Z axis movement range: 19mm.

2.5 Suction nozzle specifications

Suction nozzle type	legend	Apply to encapsulate
502		0402
503		0603,0805
504		0805, 1206, 1210, 2512
505		3528, 5050, SOP-8
506		TQFP、SSOP

2.6 PCB specification

This equipment is suitable for the maximum mounting range of 400mm*600mm, can carry out the assembly operation.

2.7 The control panel

- 1、lighting: lighting machine
- 2、computer power: open the computer
- 3、Single step button: subdivide each mount action to facilitate user debugging
- 4、Start/stop button: that is, start mounting or stop mounting.
- 5、Pause/Continue button: Use this button to pause and continue the program during the installation process.
- 6、STOP emergency/switch button: in case of an emergency during operation, press the button to cut off the power supply of the equipment.

Note: The button should be turned on when running the device.



3 The preparatory work

3.1 Preparation of air compressor

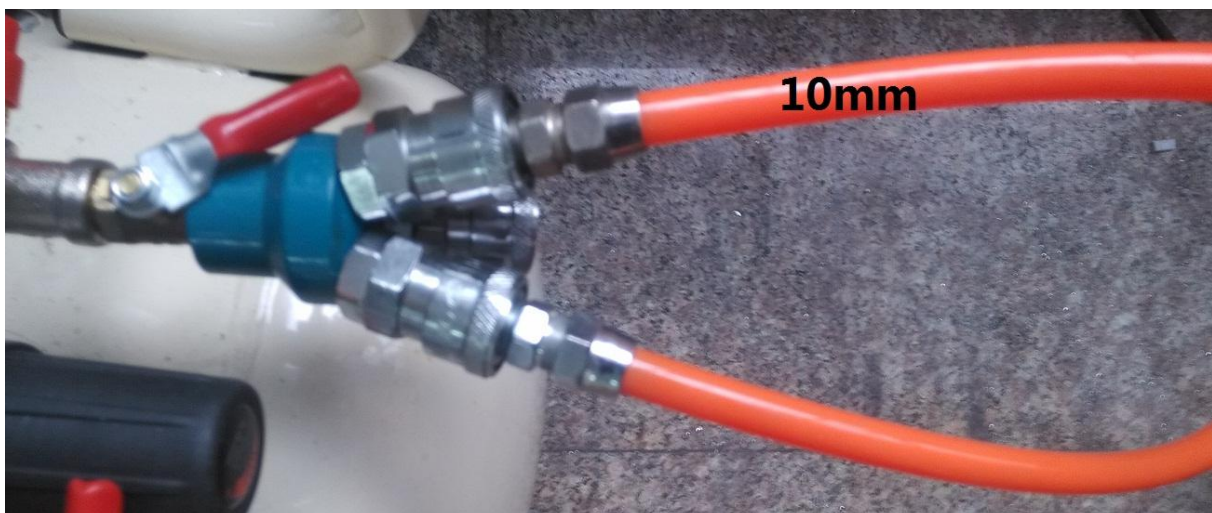
You need an air compressor when you get the machine

(一) Air compressor parameter requirements:

1. Tank capacity: greater than or equal to 55L
2. Discharge capacity: greater than or equal to 95L/min
3. Maximum pressure: greater than or equal to 0.7MPa (100psi)

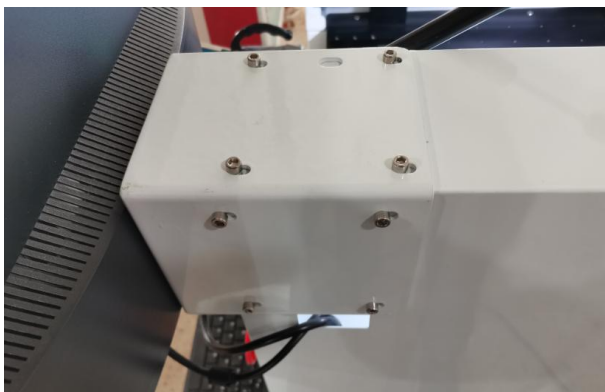
(二) Commissioning of air compressor;

1. Start when air compressor is adjusted to 6.2 kg
2. When the air compressor is adjusted to 7.3 kg, it stops
3. The air compressor outlet pipe is 10 mm in diameter



3.2 Installation of the display

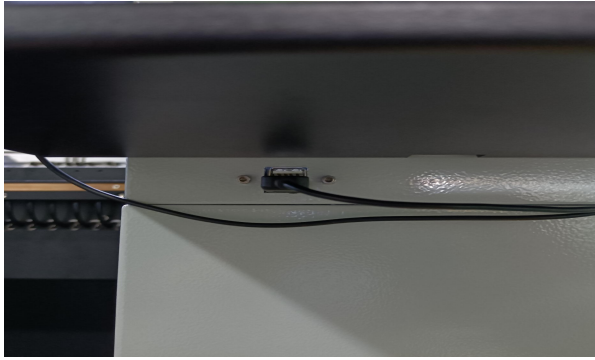
- 1, Place the monitor on a flat position and install the monitor bracket, making sure the direction is correct.
- 2, Install the monitor stand into the machine and plug in the power cord and VGA cable.



3.3 Installation of keyboard bracket

- 1, Screw the keyboard tray onto the machine.
- 2, Plug the keyboard cable and mouse cable into the USB interface below through the small port, and arrange the keyboard and mouse.



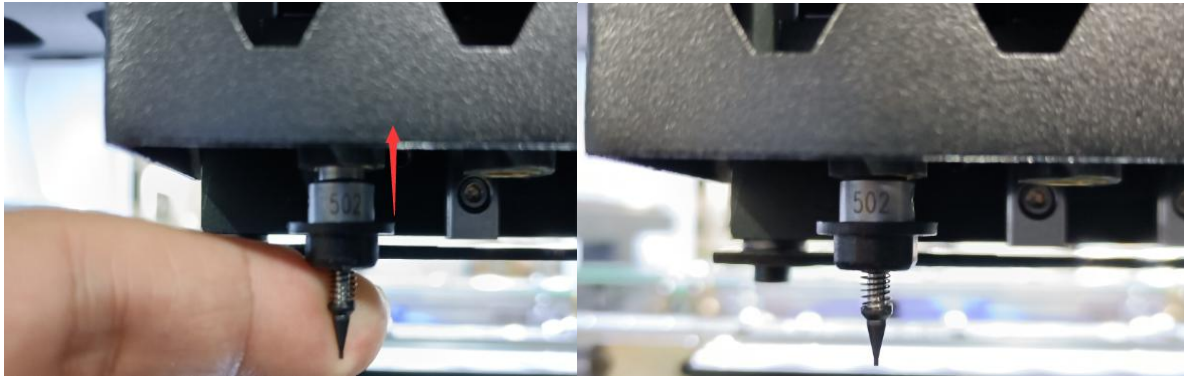


3.4 Installation of oil-water separator

- 1 Pull the top lid on the wire.
- 2 Turn the lid to decrease clockwise and increase counterclockwise.
- 3 Then press the lid back on to complete the adjustment.



3.5 Installation of suction nozzle



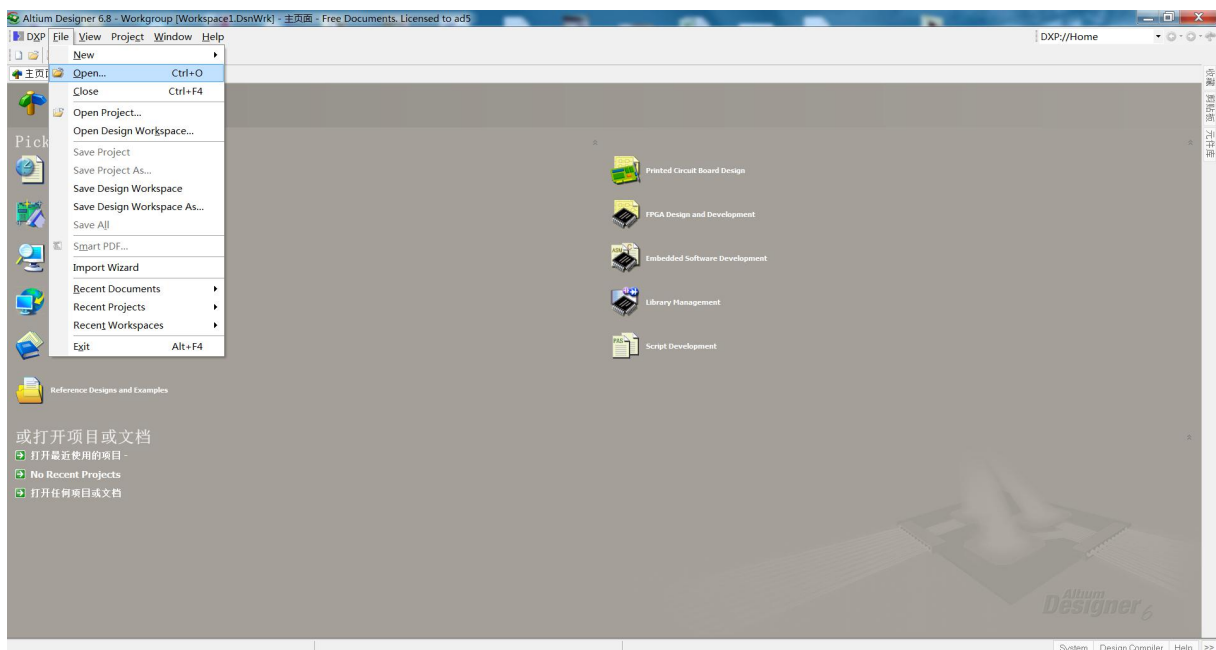
Prepare a suction nozzle and push it up to complete the installation.

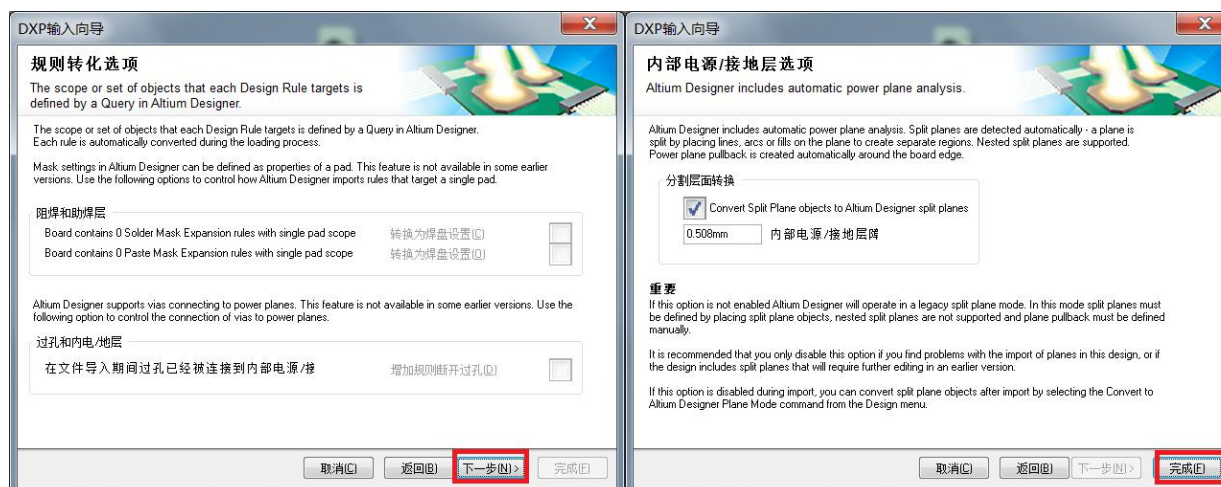
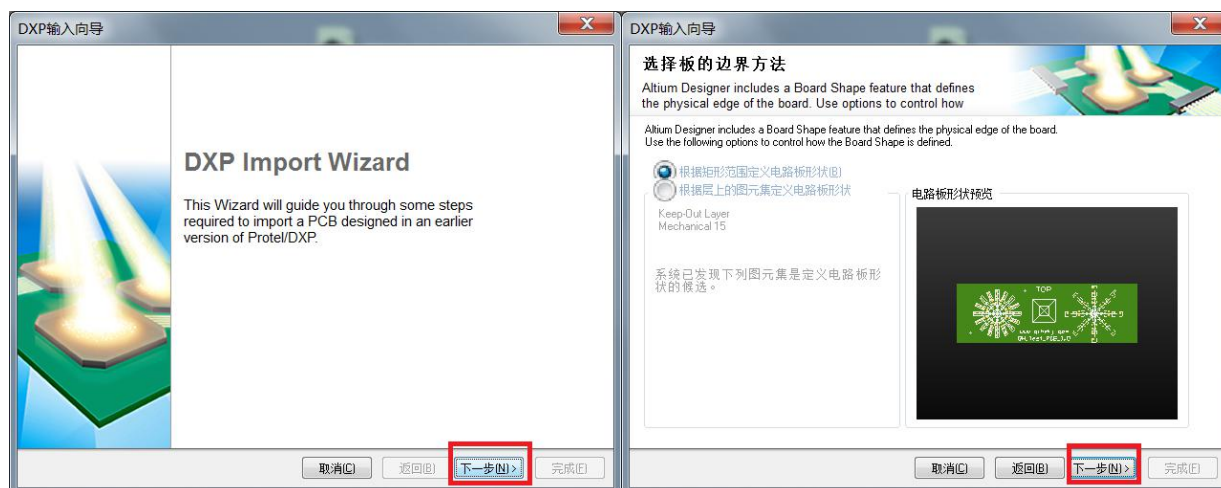
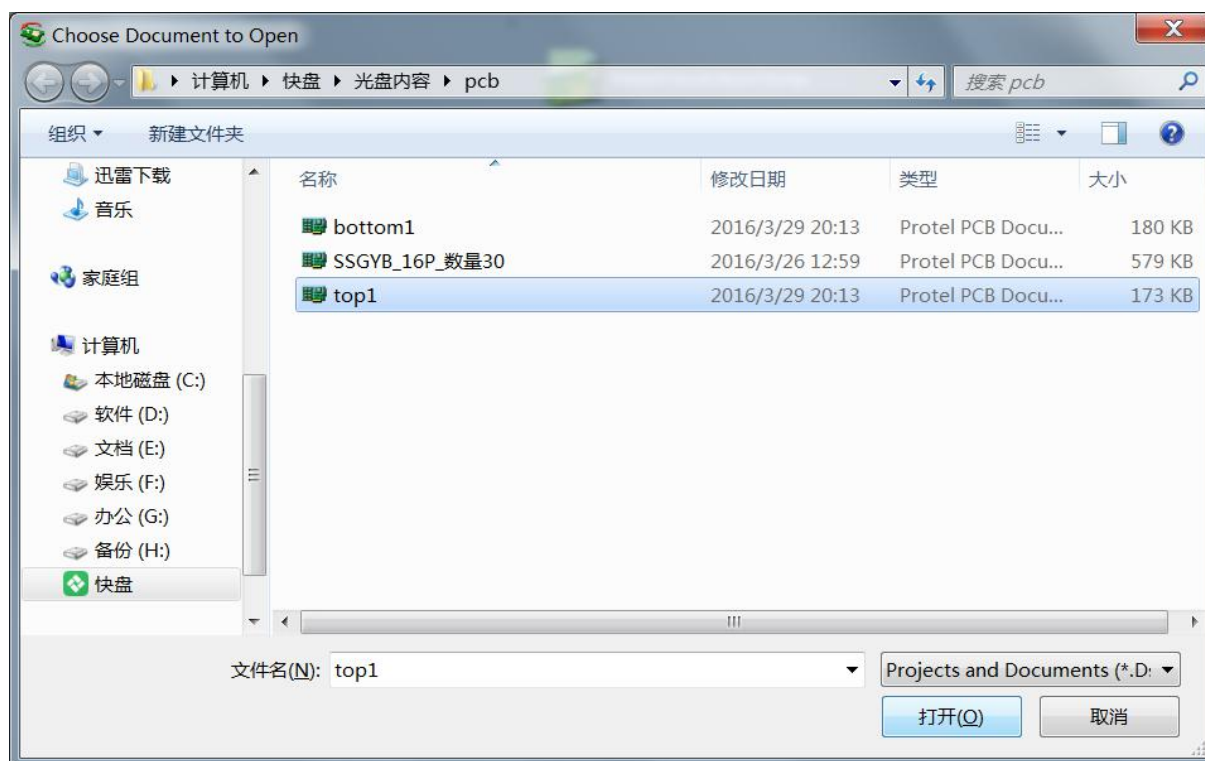
When the suction nozzle needs to be replaced, hold the motor with your hand and then pull it down to complete the disassembly.

3.6 Export of coordinate files

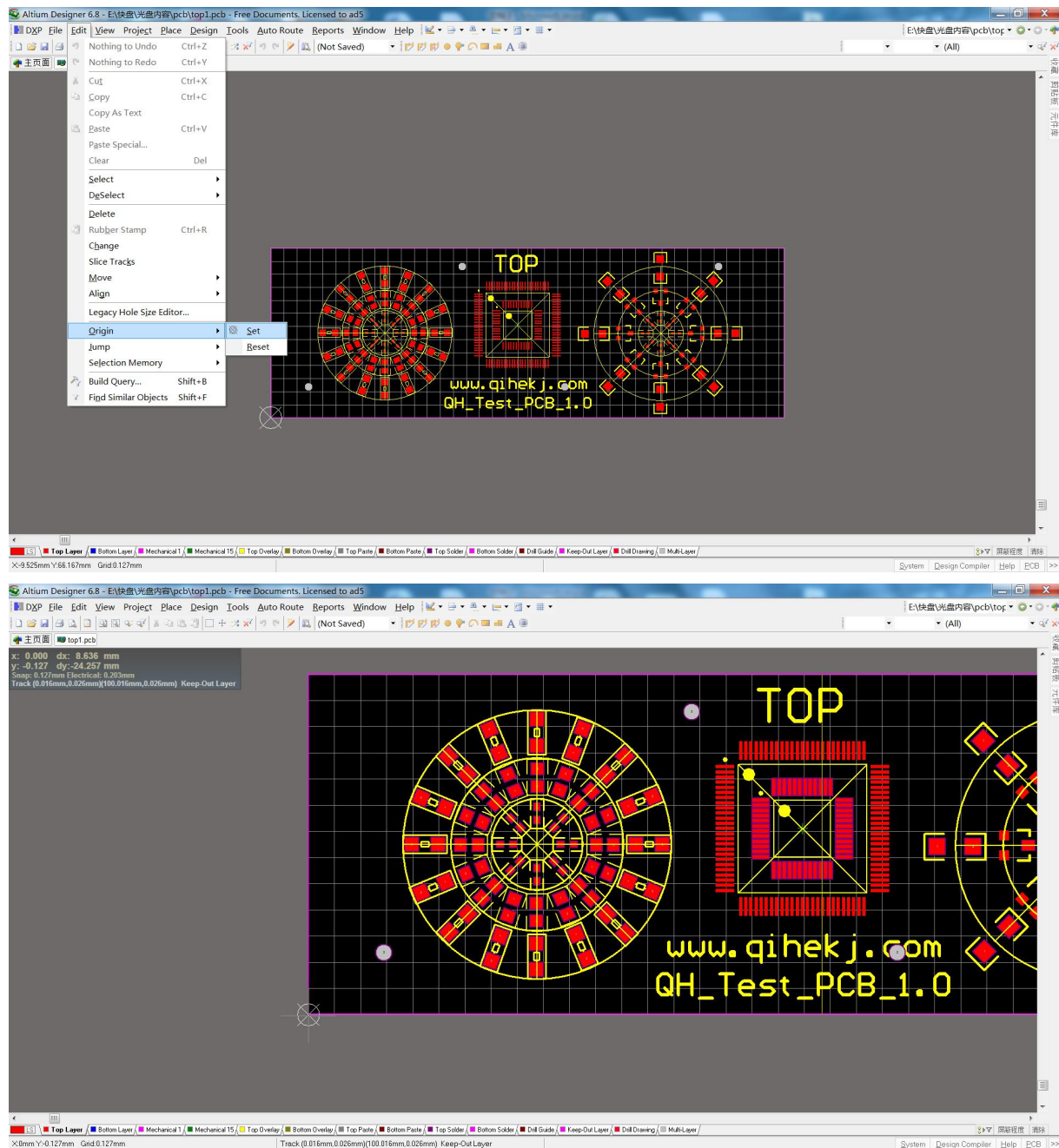
3.6.1 ALTIUM Designer (DXP) Coordinate file export

1 Open file

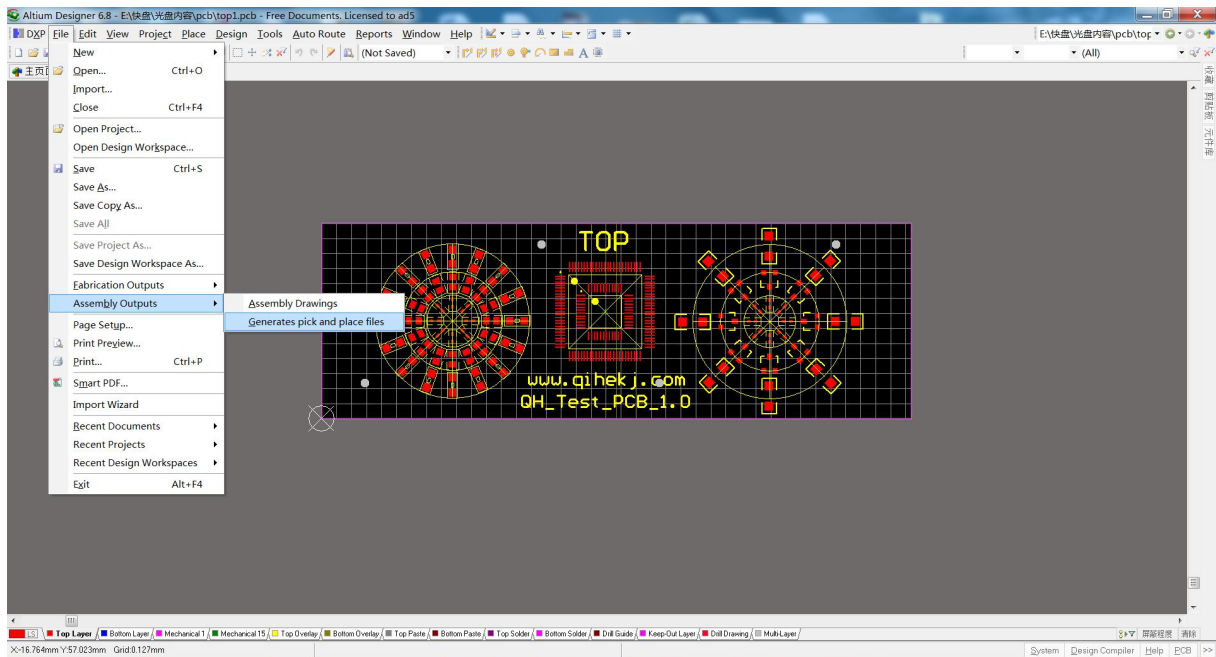




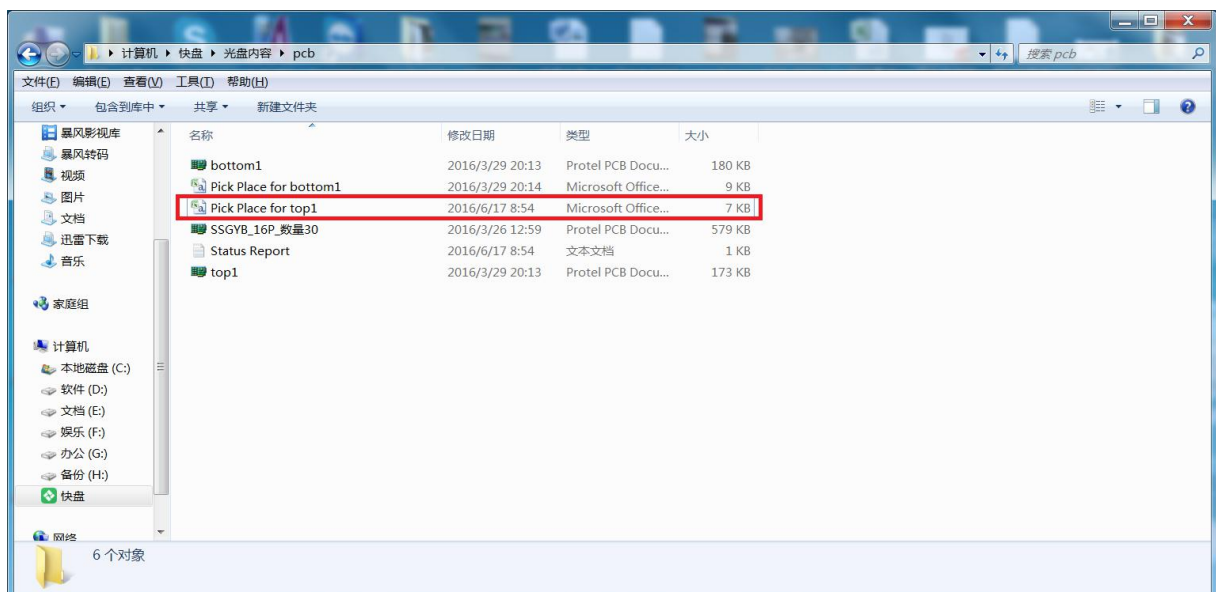
2 Set the Origin. Click edit-origin-set and select the lower left corner of the file as the Origin.



3 File Outputs: Click on File-Assembly Outputs Pick and Place Files and select CSV- Metric.

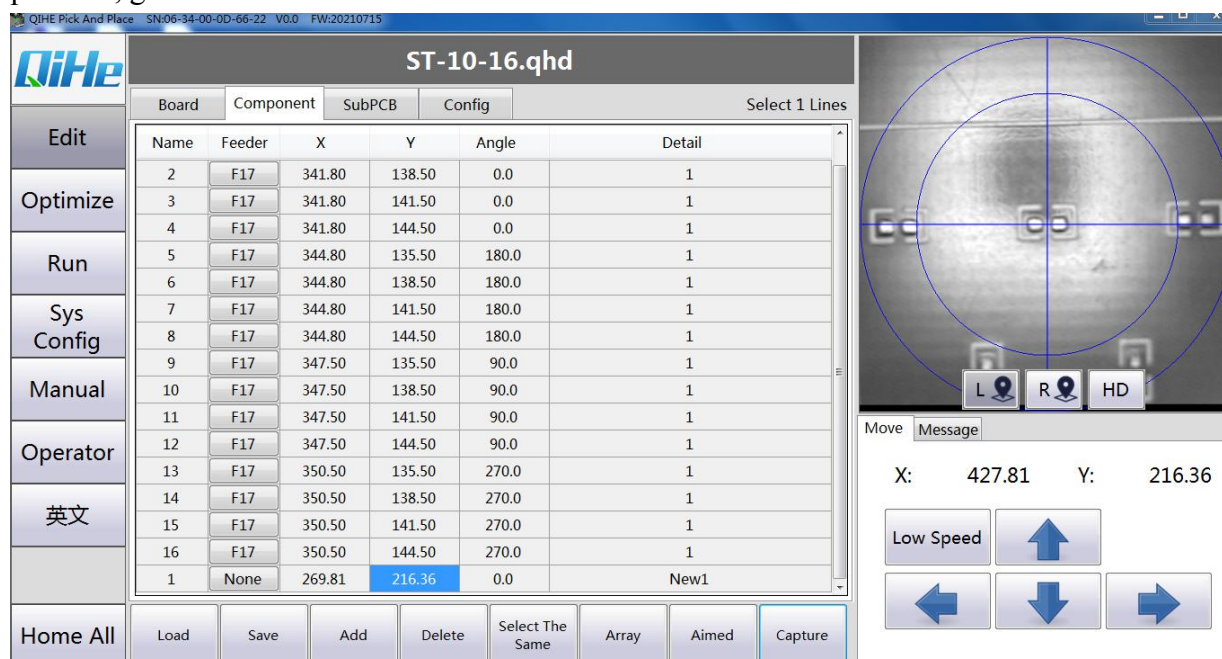


4 You can find the exported CSV file in the corresponding folder of the PCB file

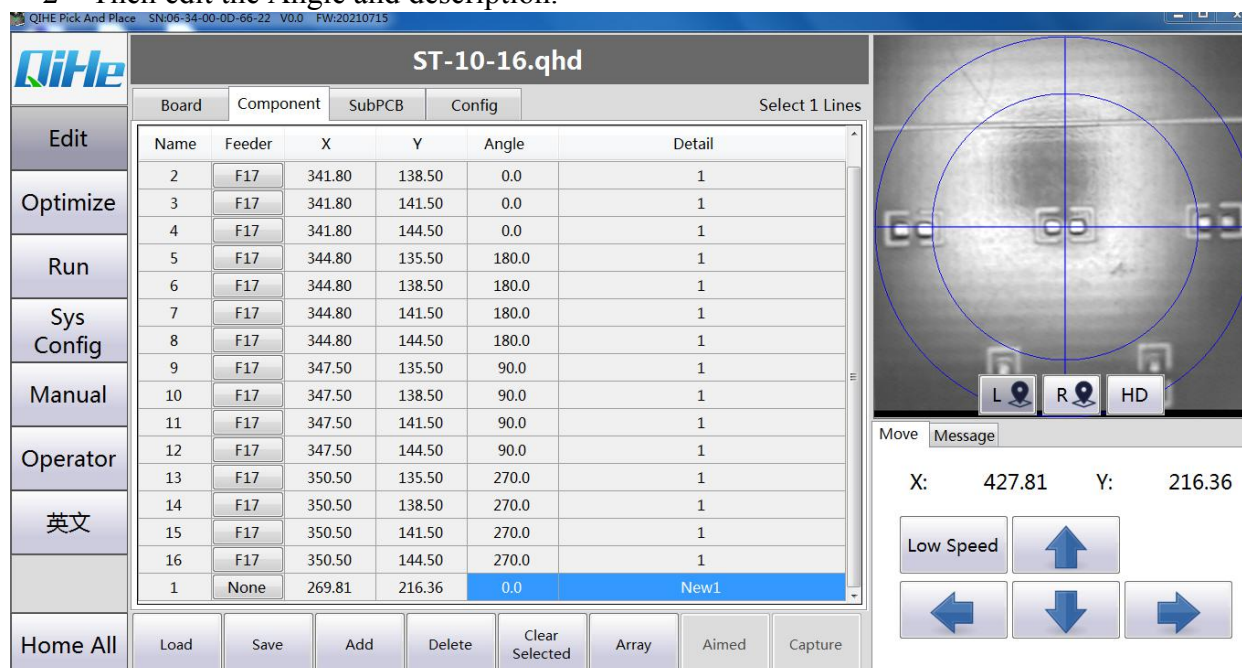


3. 6. 2 If you don't have a coordinate file

1 Manually add a coordinate, then move the lower vision camera to the corresponding position, grab the coordinate.



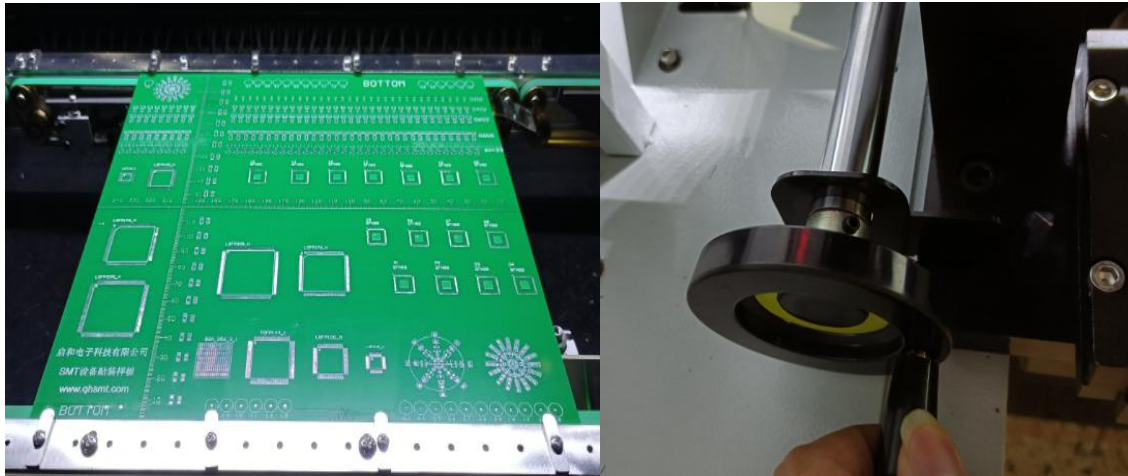
2 Then edit the Angle and description.



Note: Do not use Excel to modify the exported coordinate file, otherwise the software will not be recognized.

3.7 PCB installation operation

Put the PCB on top of the table and then clamp it tight

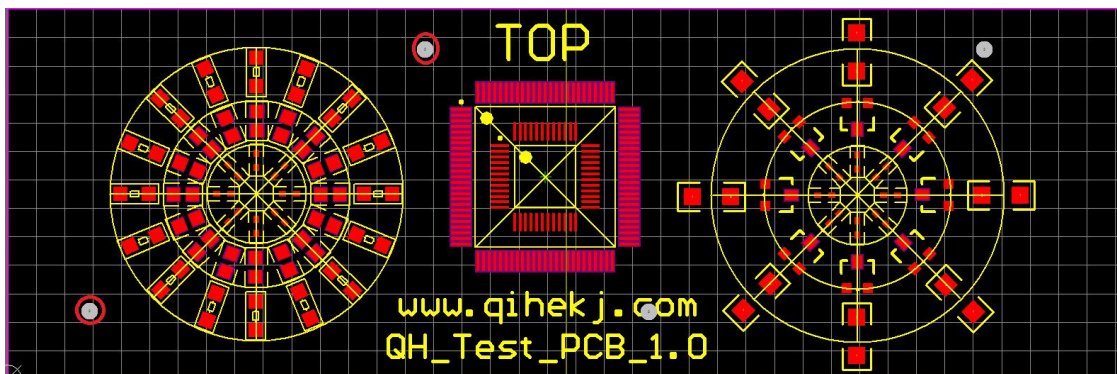


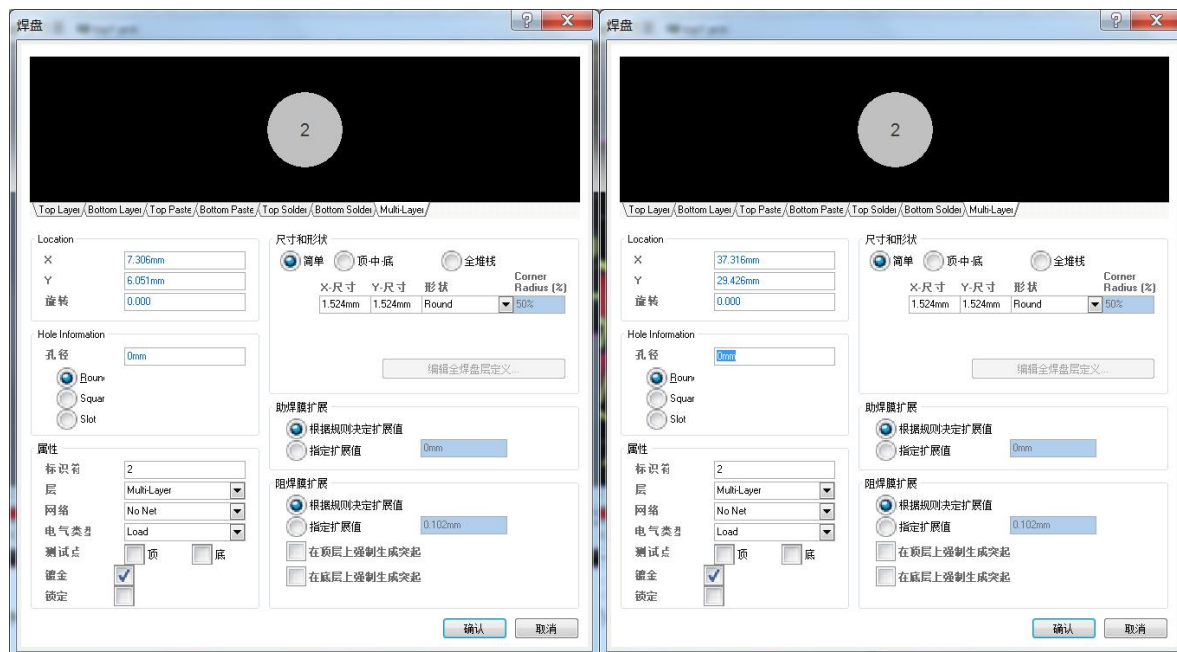
3.8 MARK point set

3.8.1 When there are mark points in PCB drawings

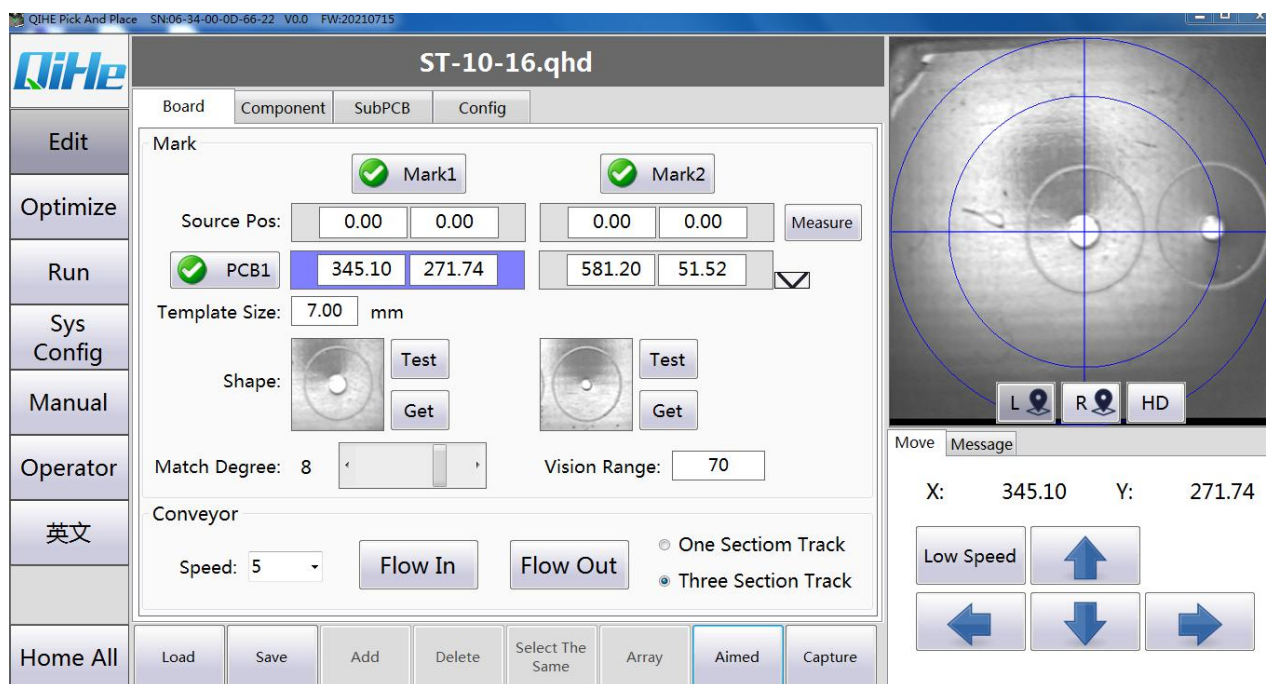
1 Select the diagonal point of the circuit board as the mark point (if there is no standard mark point, we can use solder pads instead).

Double-click the mark point position and write down the drawing coordinates (mark 1:7.306, 6.051 mark 2:37.316, 29.426).





2 Enter the PCB coordinates in the drawing coordinates, and then use the vision camera to find the corresponding mark point coordinates. Click the blank of the actual coordinates and click the "grab coordinate" button. At the same time, grab the template image.



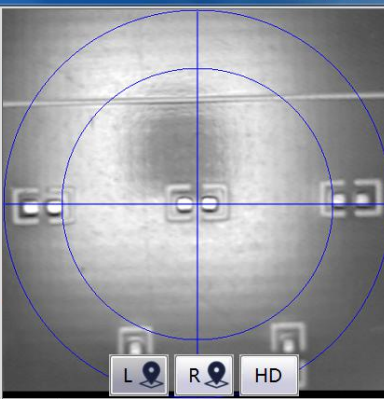
We can choose two pads or any two points as mark points.

QIHE Pick And Place SN:06-34-00-0D-66-22 V0.0 FW:20210715

ST-10-16.qhd

Board	Component	SubPCB	Config	Select 2 Lines		
Name	Feeder	X	Y	Angle	Detail	
1	F17	341.80	135.50	0.0	1	
2	F17	341.80	138.50	0.0	1	
3	F17	341.80	141.50	0.0	1	
4	F17	341.80	144.50	0.0	1	
5	F17	50.69	-55.81	180.0	1	
6	F17	58.73	-55.68	180.0	1	
7	F17	344.80	141.50	180.0	1	
8	F17	344.80	144.50	180.0	1	
9	F17	347.50	135.50	90.0	1	
10	F17	347.50	138.50	90.0	1	
11	F17	347.50	141.50	90.0	1	
12	F17	347.50	144.50	90.0	1	
13	F17	350.50	135.50	270.0	1	
14	F17	350.50	138.50	270.0	1	
15	F17	350.50	141.50	270.0	1	
16	F17	350.50	144.50	270.0	1	

Home All Load Save Add Delete Clear Selected Array Aimed Capture



Move Message

X: 403.83 Y: 216.06

Low Speed

← ↓ →

QIHE Pick And Place SN:06-34-00-0D-66-22 V0.0 FW:20210715

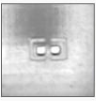
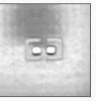
ST-10-16.qhd

Mark

Source Pos: 50.69 -55.81 58.73 -55.68 Measure

PCB1 395.79 215.93 403.83 216.05

Template Size: 7.00 mm

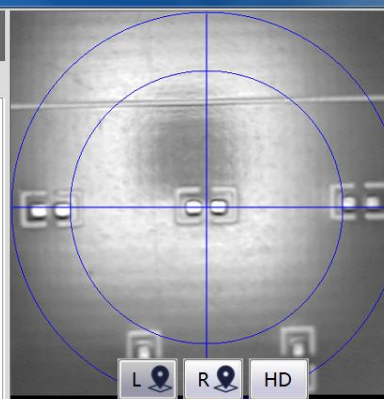
Shape:  Test Get  Test Get

Match Degree: 8 Vision Range: 70

Conveyor Speed: 5 Flow In Flow Out

One Section Track Three Section Track

Home All Load Save Add Delete Select The Same Array Aimed Capture



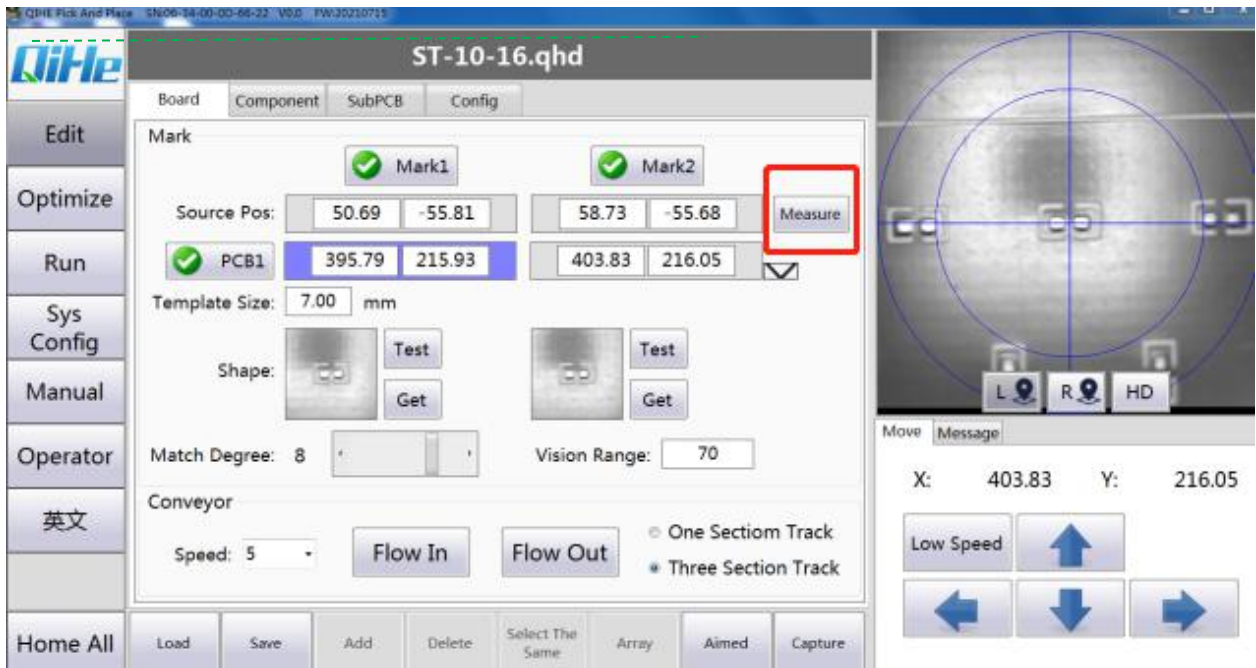
Move Message

X: 403.83 Y: 216.05

Low Speed

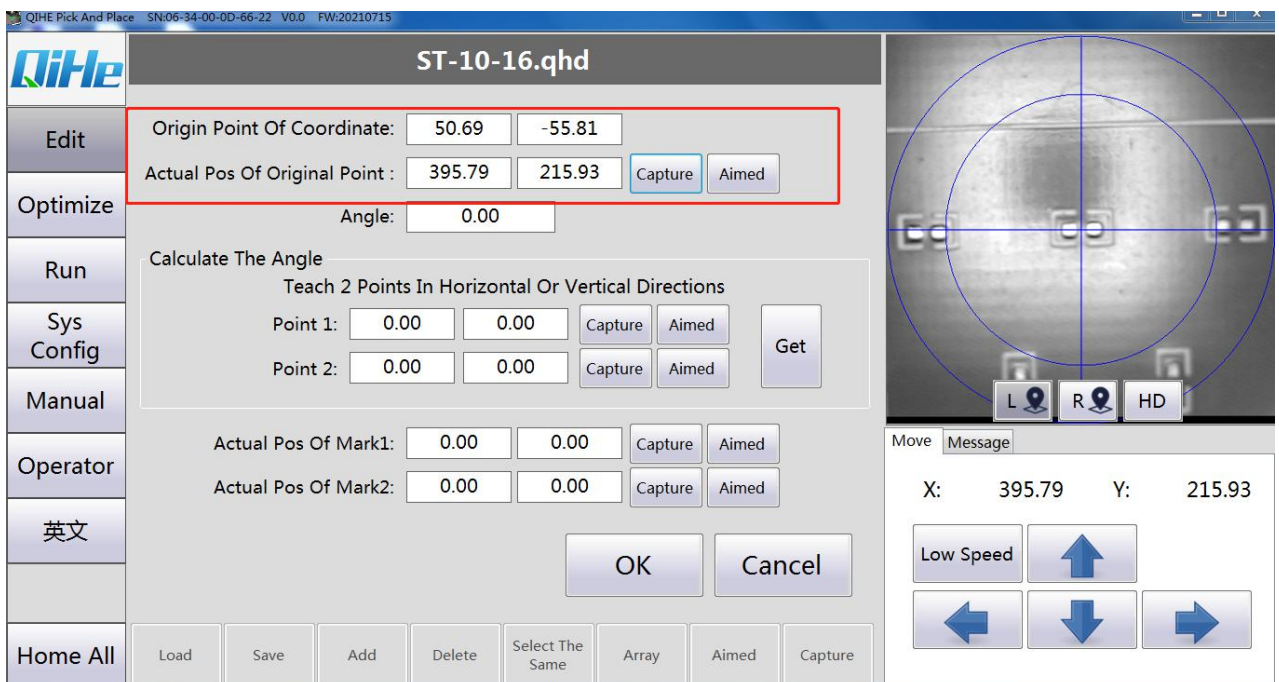
← ↓ →

3. 8. 2 When there is no mark point in PCB drawing

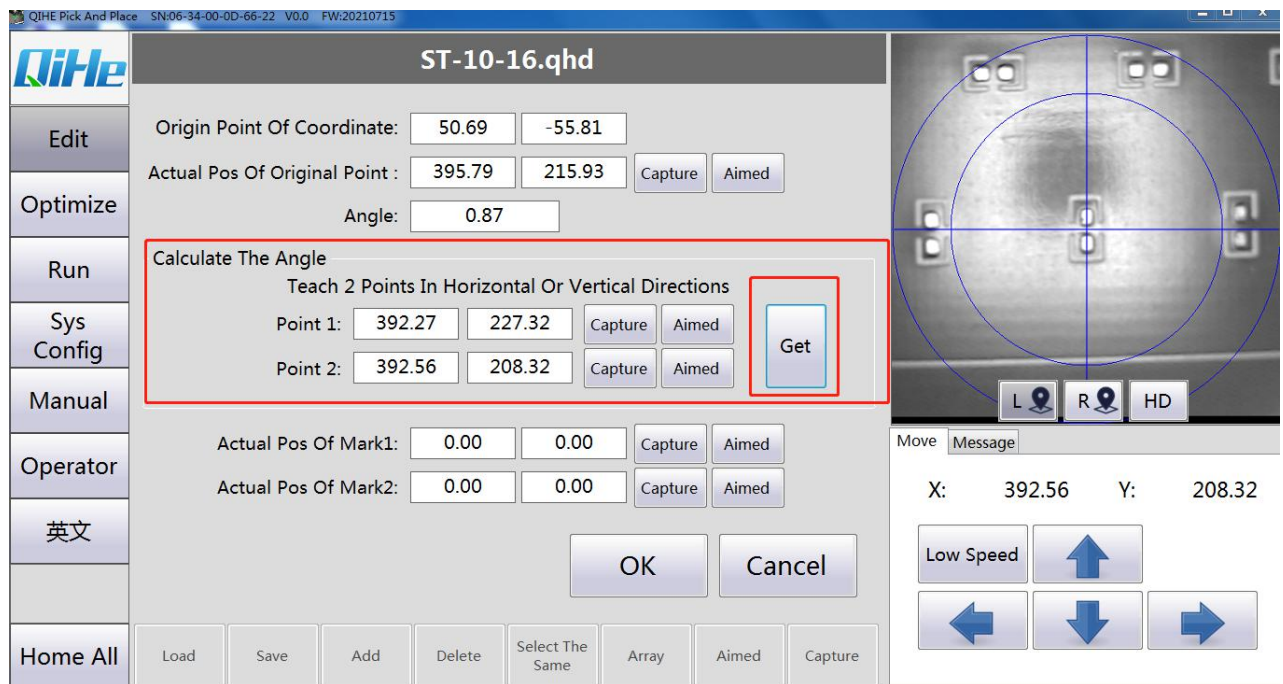


Click on Measure and then Edit

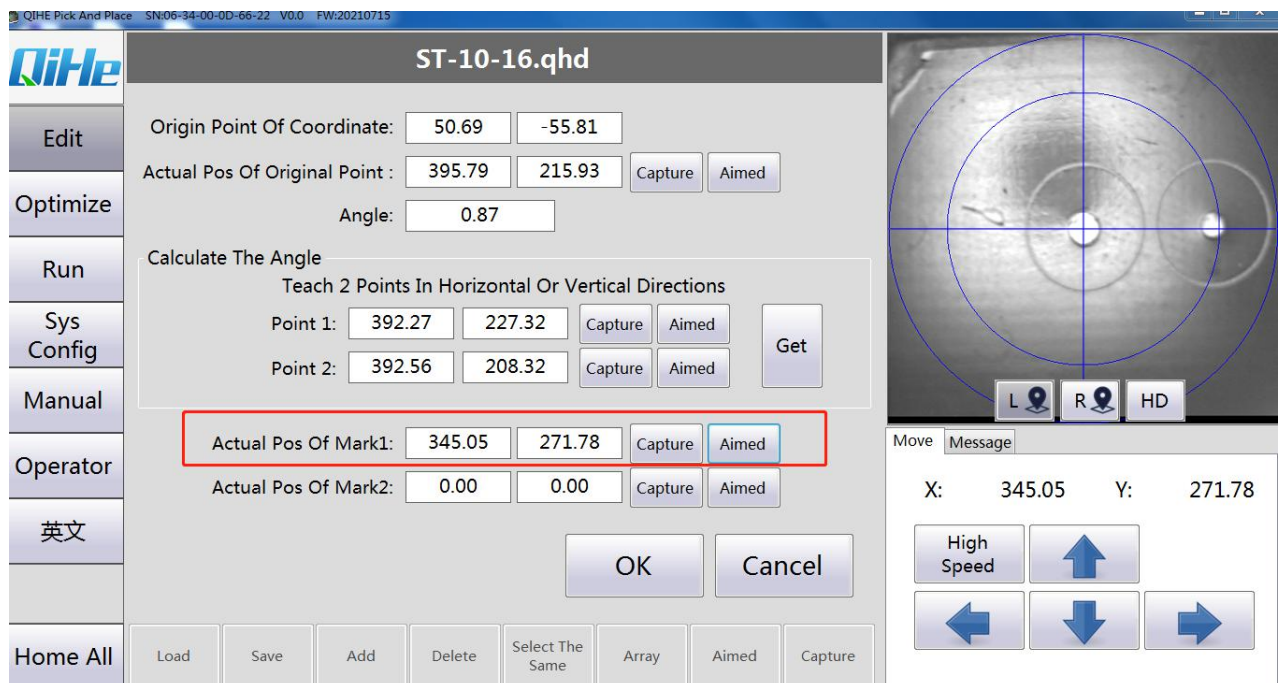
1 Select a component coordinate on the drawing to fill the base point in the drawing coordinate, and then move the downward-looking camera directly above to capture the actual position of the base point.

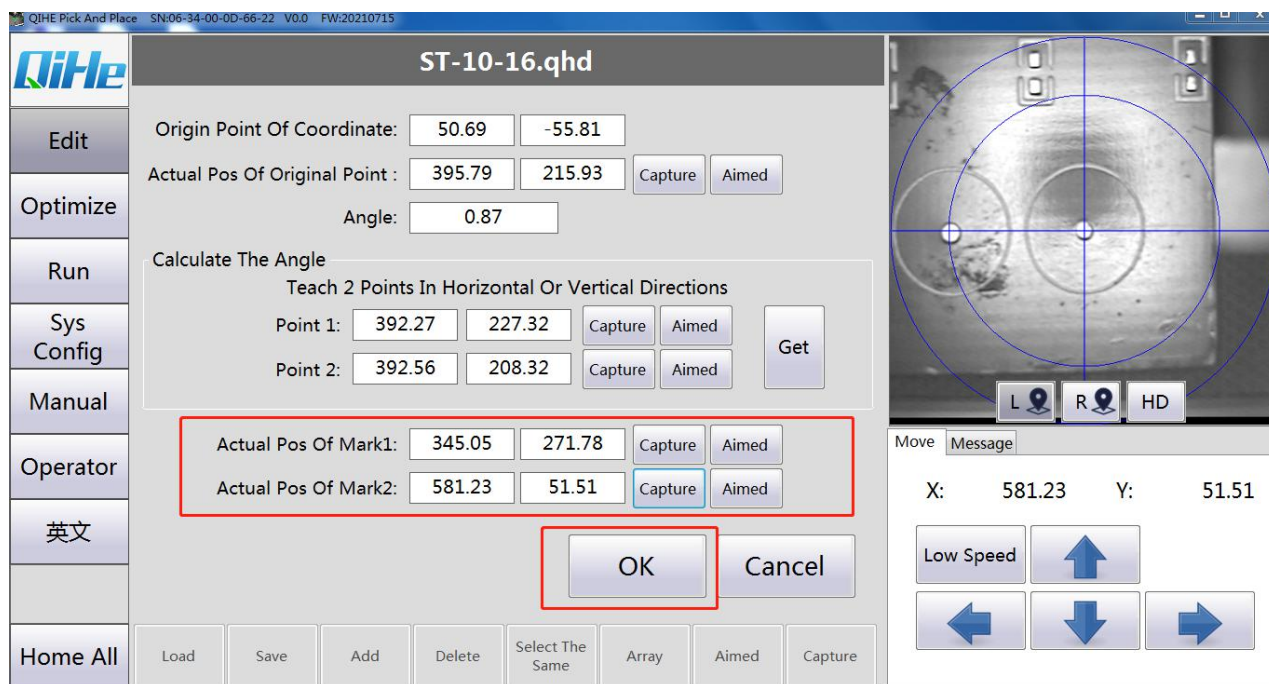


2 Angle measurement: select two far points in the horizontal or vertical direction of the board, grab the coordinates of the two points, and click to calculate.



3 After pointing the camera at the two mark points (preferably two diagonal ones) on the edge of the process, grab the coordinates of the two mark points respectively, and click OK after the capture.



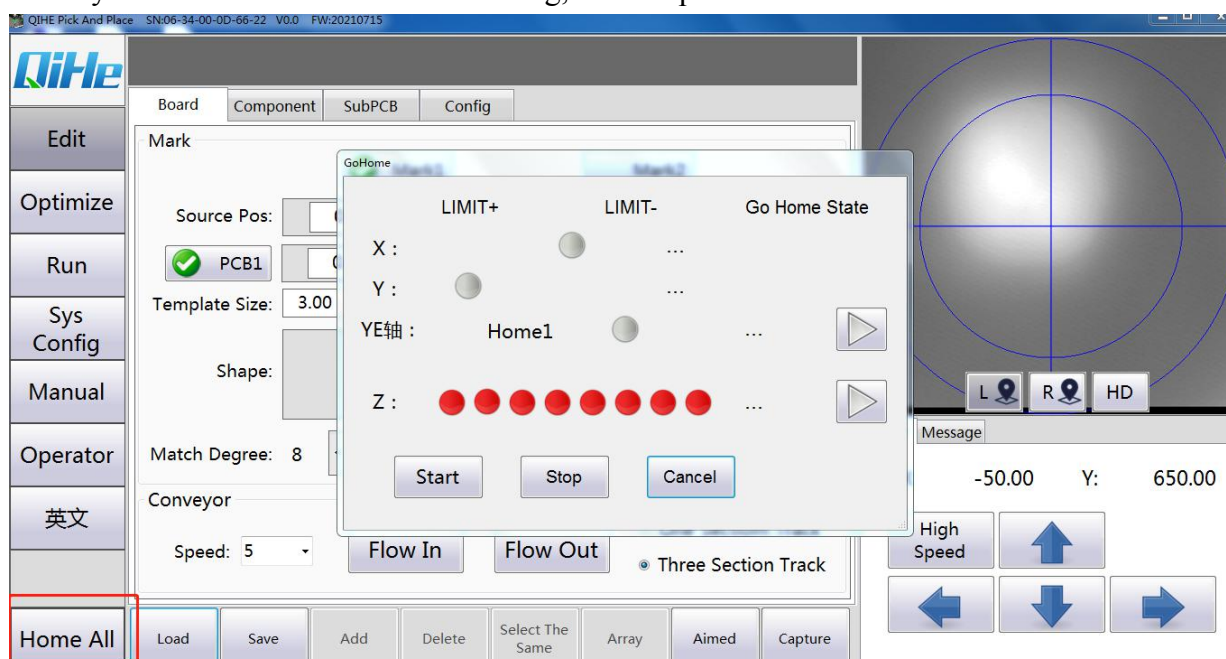


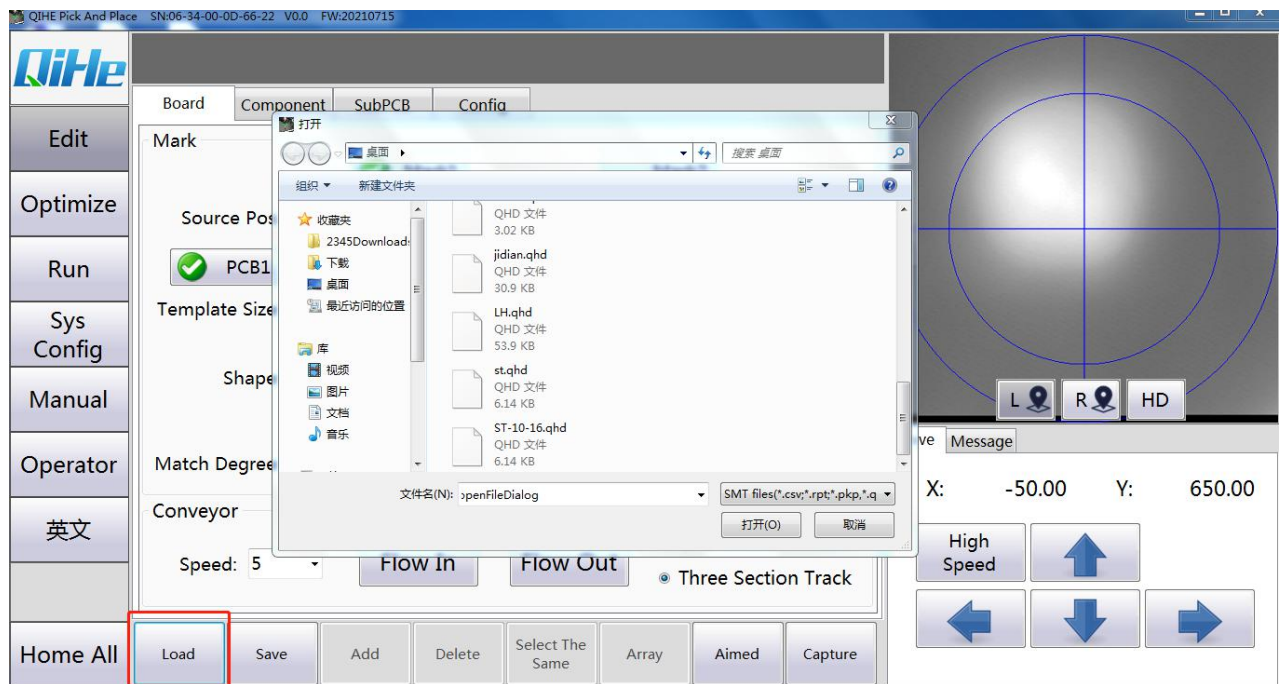
3.8.3 No PCB drawings, set the mark point.

1. Select two points at random (component pad or plug-in hole) and point the camera at the point to capture the actual coordinates and image template. Change the drawing coordinates to be the same as the actual coordinates. (The coordinate of the drawing will not be modified in the subsequent mounting process)

3.9 Steps

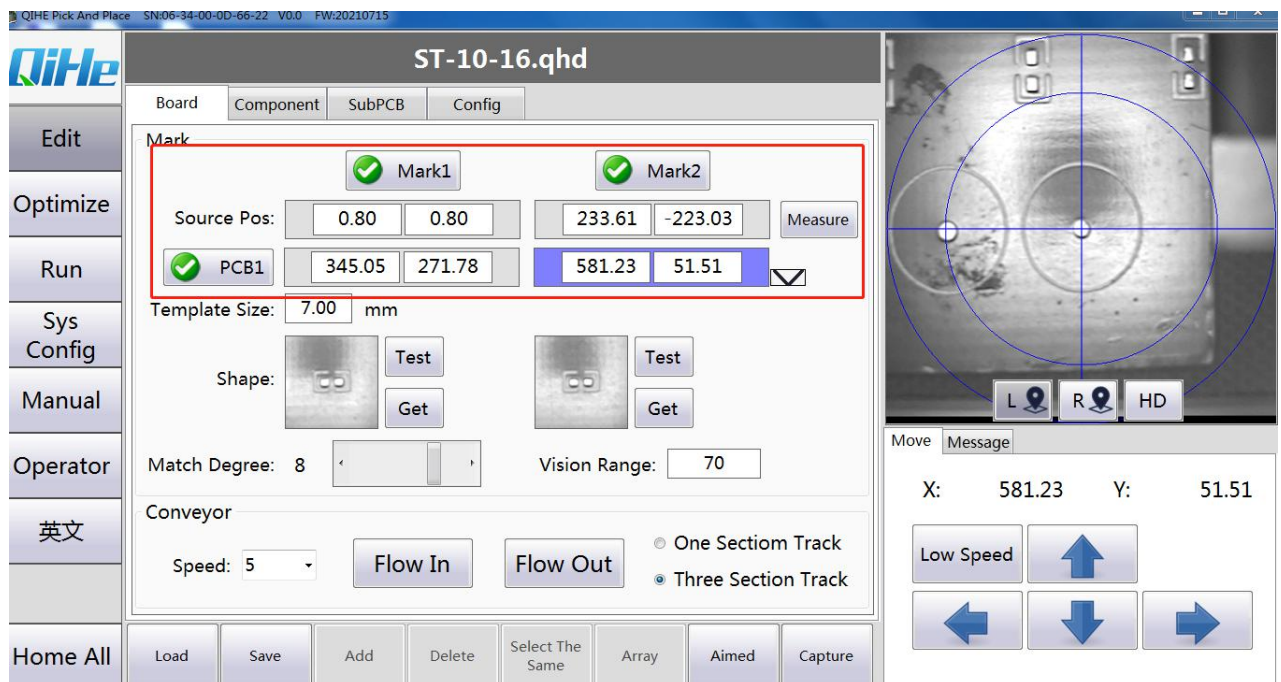
- 1 Turn on the computer and turn on the emergency stop button.
- 2 Open the software and click the origin position. If there is PCB drawing, the coordinate file is directly loaded. If there is no PCB drawing, the component coordinates are set first.

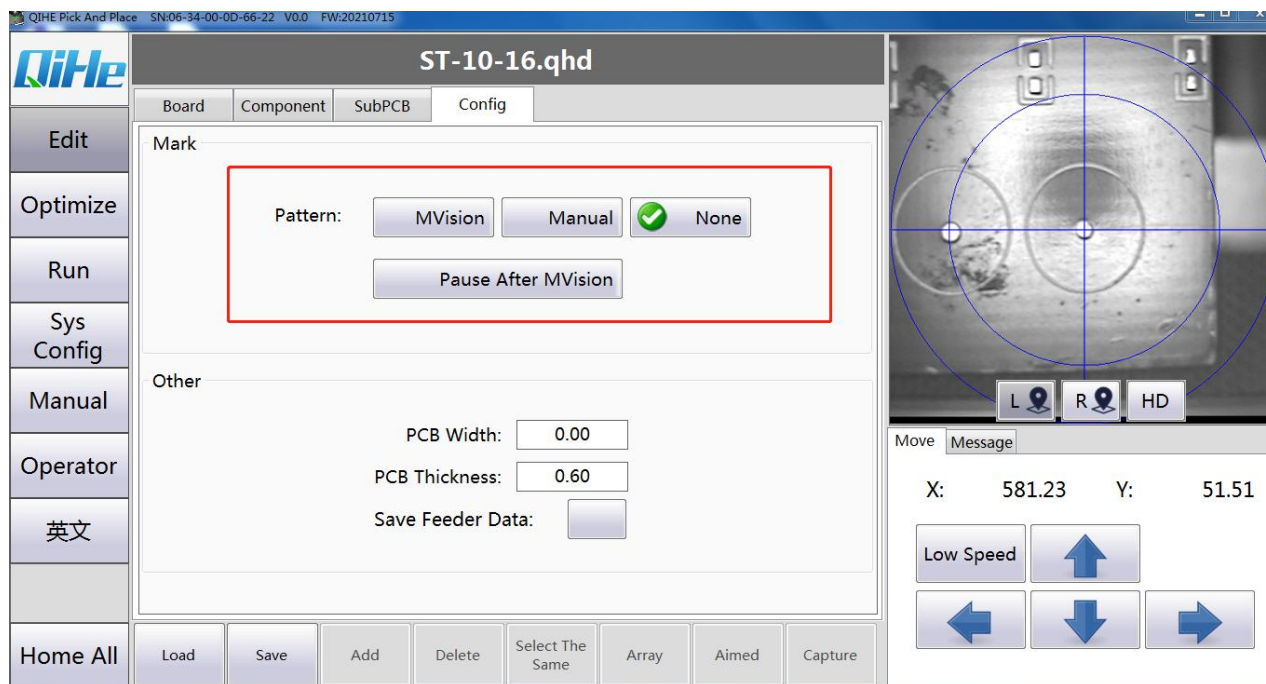




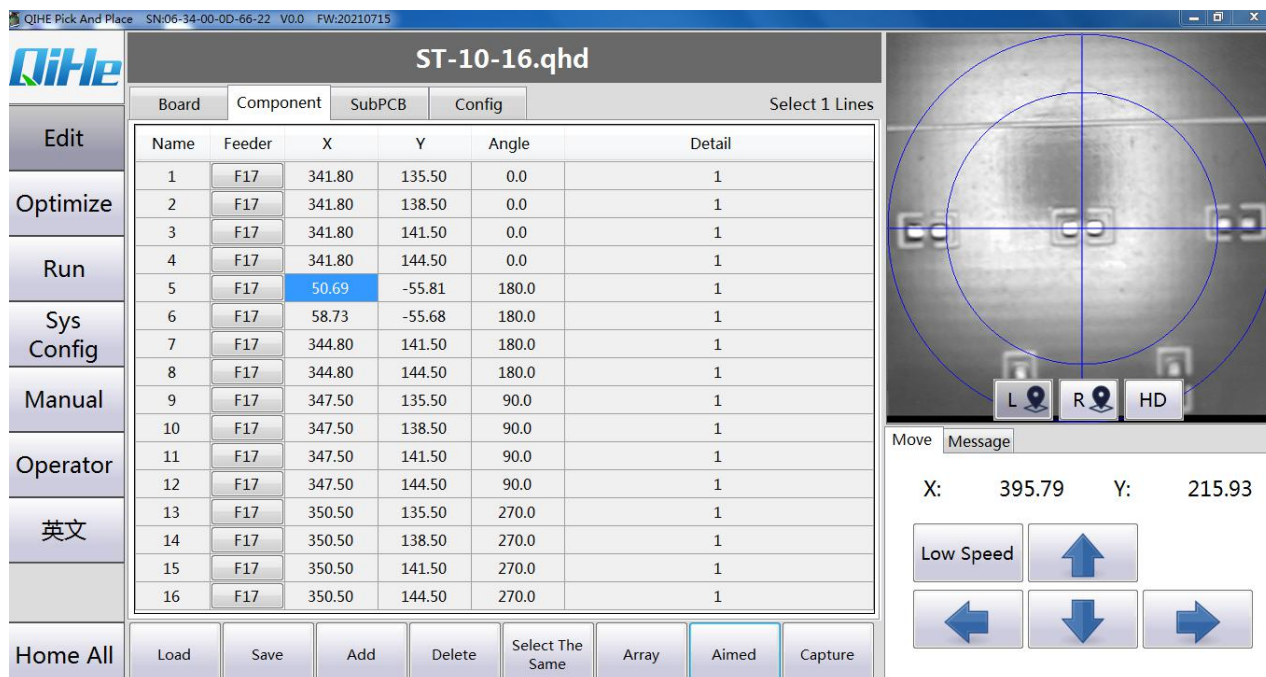
3 Set the mark point coordinates (set according to 3.8 mark points)

Reference point identification parameters can be selected according to their own situation (usually selected automatically)

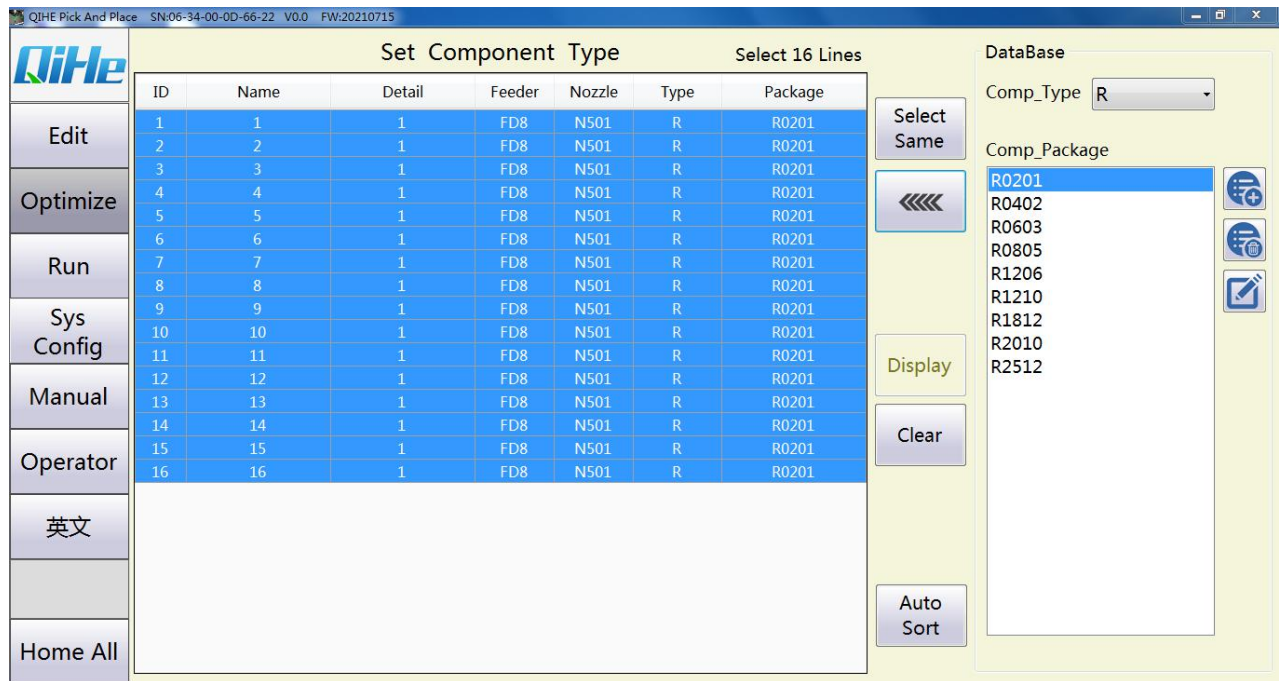




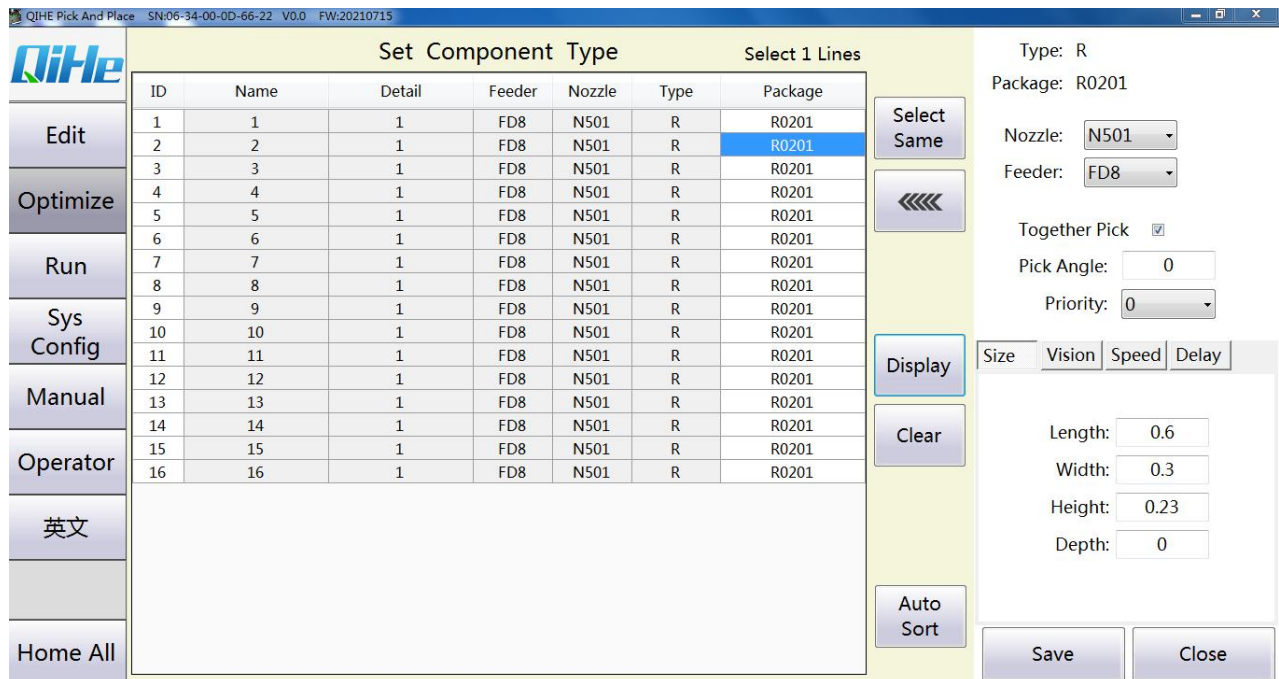
4 If the component position is not correct, usually the mark point is set incorrectly (the drawing coordinate is set incorrectly) or the drawing does not match the actual circuit board.



5 Click on Component Optimization to set each component. For example, select the component in package 0805 and click Select Same. Then pull down the component type, find R0805 in the resistor column, and click the button in the image.

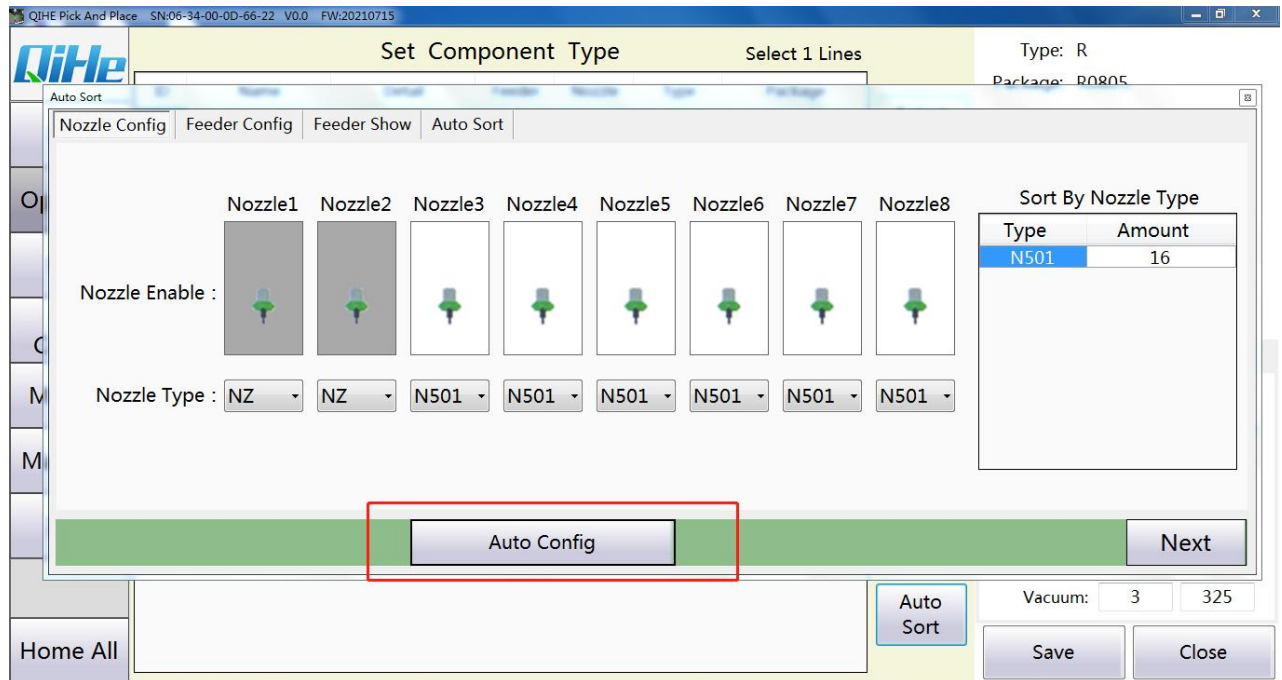


6 Select the device, in the display parameters, set parameters (commonly set parameters are identification mode, material inspection mode and paste delay, etc).

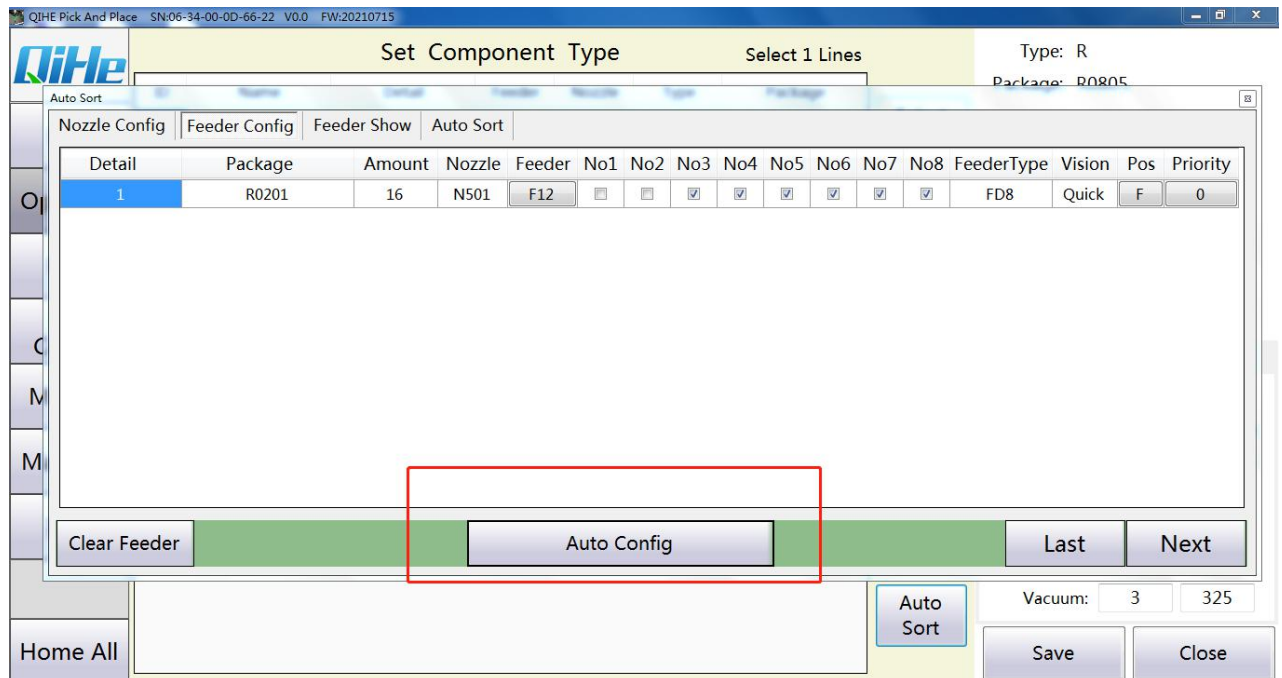


7 If there is no component you need to install in the component library, click New Component to set the length and width of the component, the identification method, the material inspection method, the type of suction nozzle and the type of the feeder.

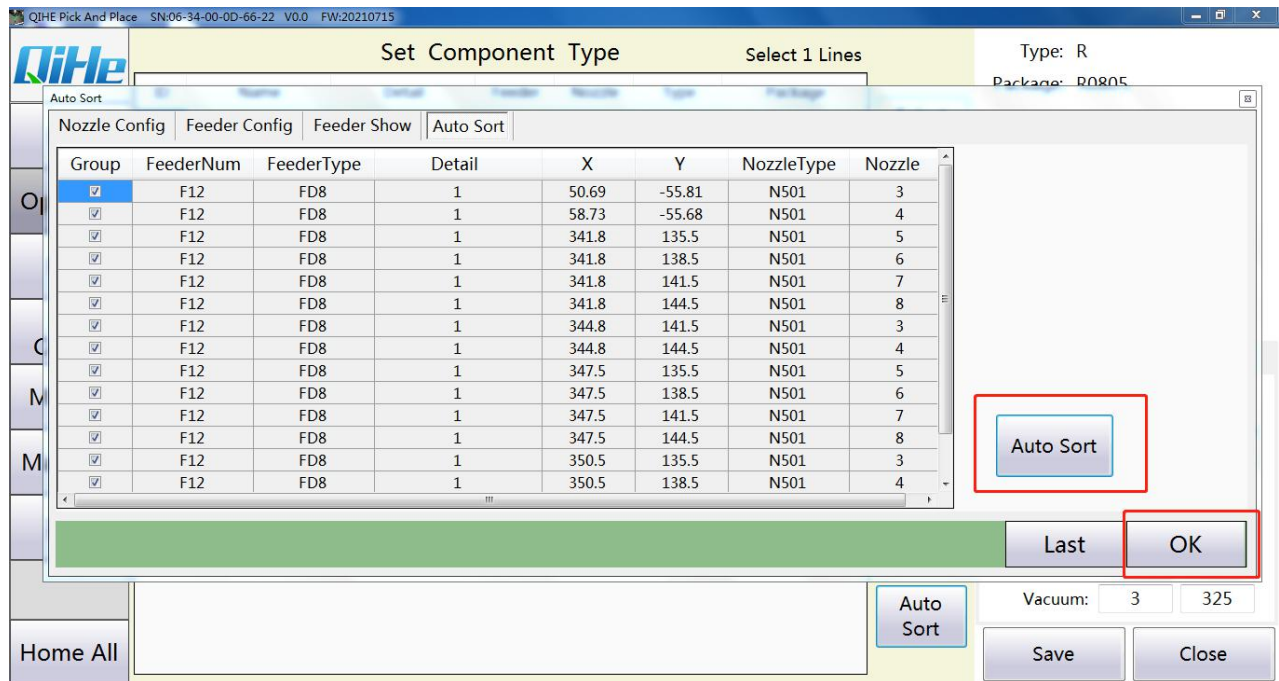
8 Click on mount optimization. The first step is to automatically allocate the nozzle and install the nozzle according to the location of the nozzle model as instructed by the system.



9 Step 2: Click to automatically assign the location of Feeder, and install the required locations of Feeder of various components according to the system prompts.

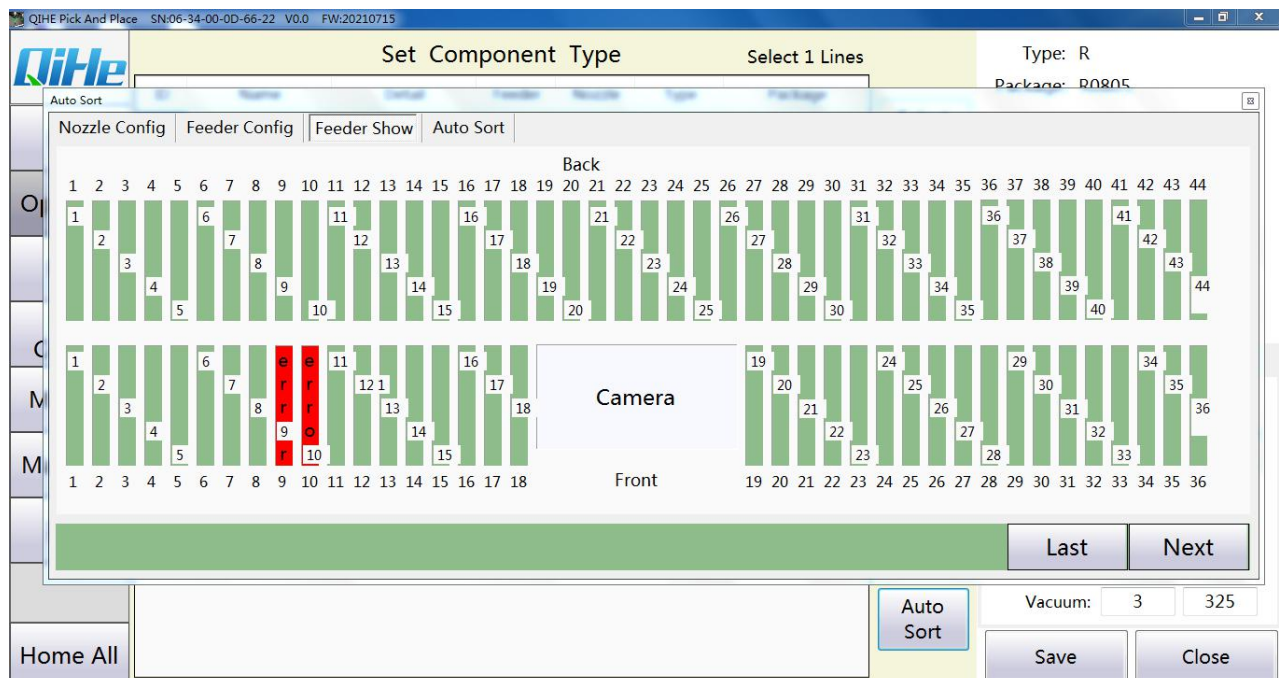


10 Step 3 Click Start Optimization. Complete the optimization of the mounting sequence.



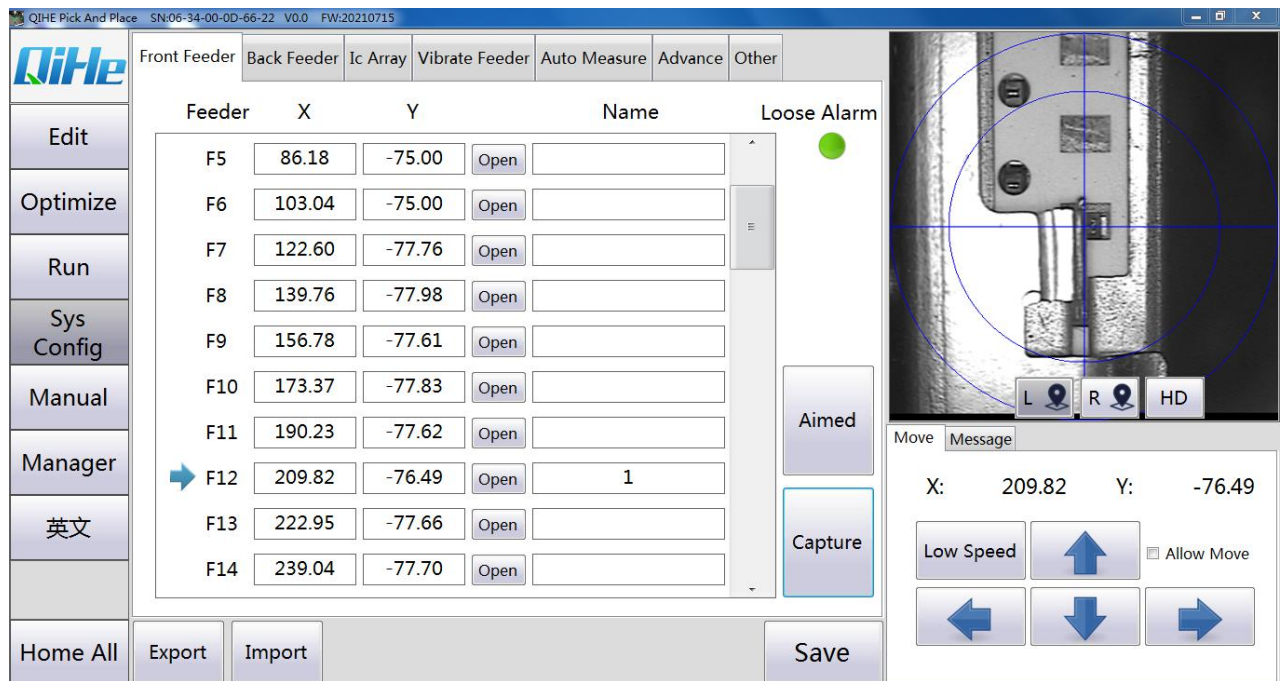
In this interface, double-click Feeder serial number, you can choose to disable or change the serial number Feeder. Red is disabled, green is used.

After disabling the suction nozzle, Feeder and sorting optimization need to be re-conducted.

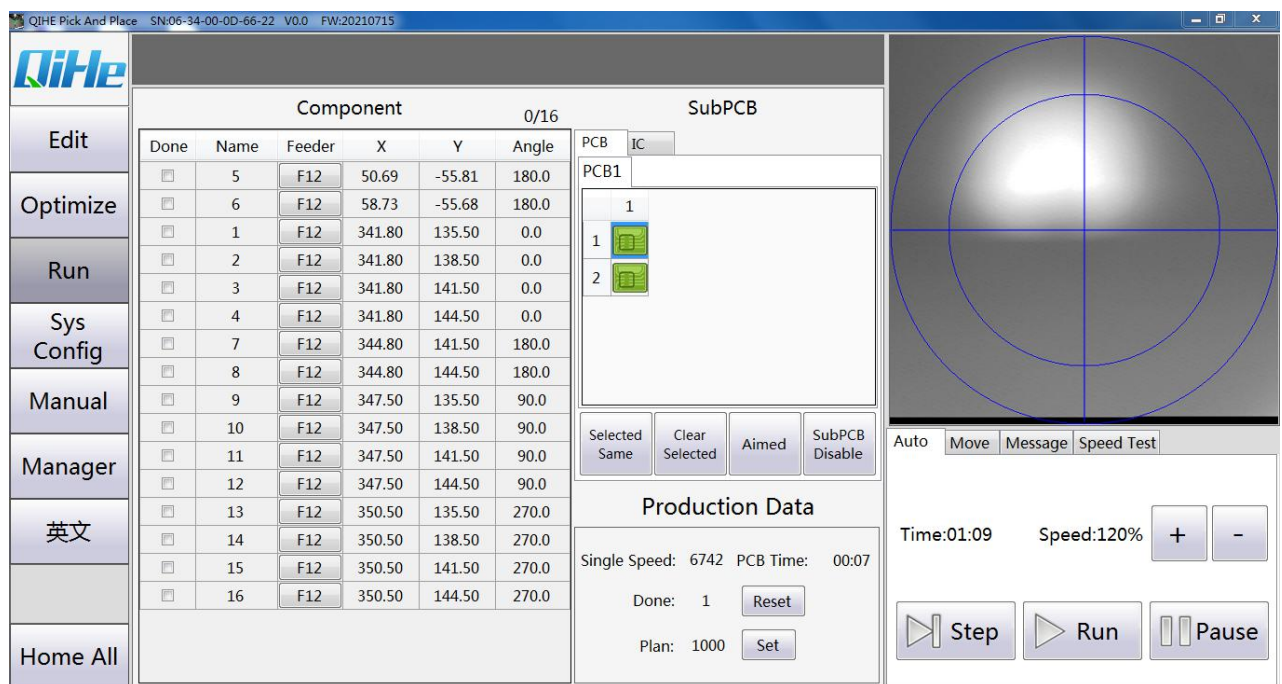


- After disabling the suction nozzle, Feeder and sorting optimization need to be re-conducted
The lower view center should be in the center of the component, click visual grab and click save.

FULL AUTOMATIC PICK AND PLACE MACHINE



12 Select the patch to run, and click Automatic to mount



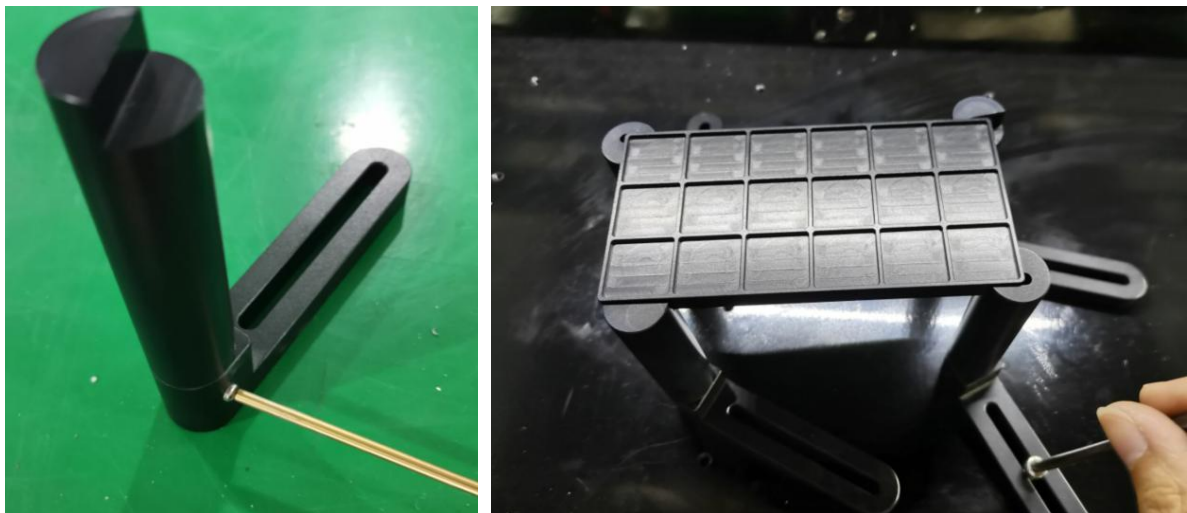
3.10 Feeder



If the component spacing and the feeder spacing are different, you can adjust the feeder spacing according to the prompts above the picture

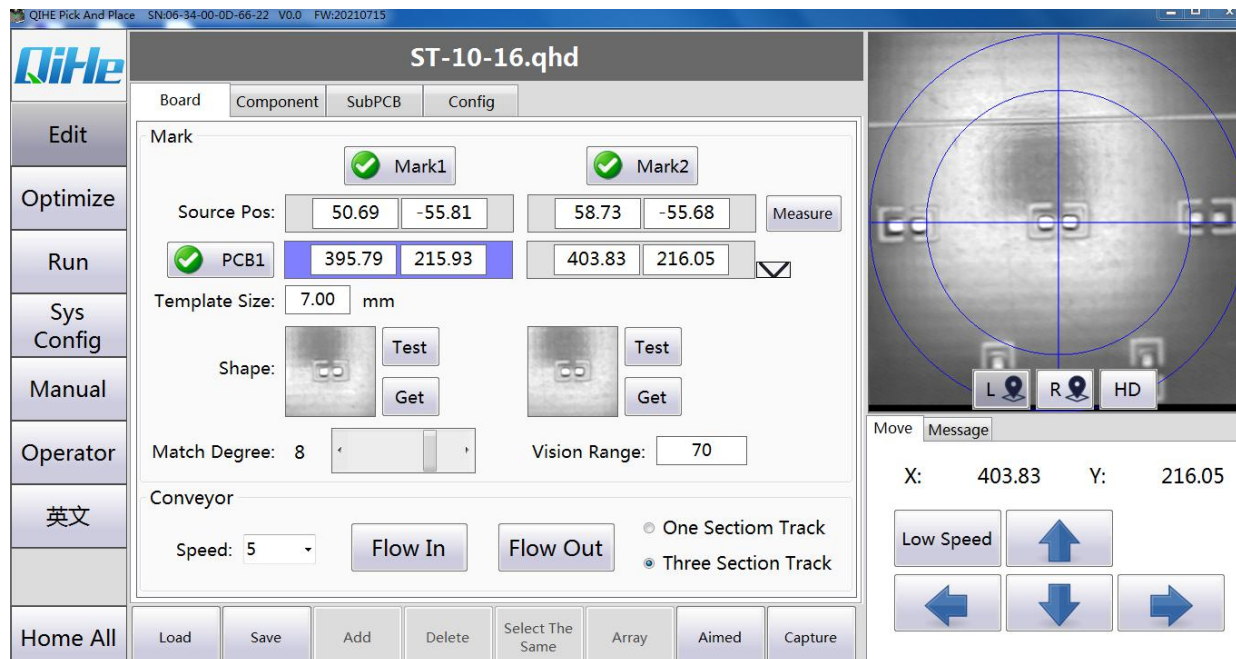
3.11 IC Tray

Adjust the pallet fixing seat according to the size of the pallet and fix the pallet fixing seat on the machine. When installing the retaining blocks, we recommend installing a right Angle fixing block and a straight fixing block to make full use of the pallet space (see below).



4 Introduction to upper computer software

4.1 Edit the file



Origin positioning: after each boot, the first step is to position the origin.

4.1.1 The base plate

Coordinate transformation:

Generally, two points on the opposite corner of PCB board are selected as reference points, namely Mark point.

Reference point setting: first locate the Mark point position in the PCB file as the drawing coordinate

Then capture the position of the corresponding Mark point with the down-view camera and set it as the actual coordinate

Note: set must be saved.

Template images: The user needs to move the camera to the center of each of the two mark points and click Grab. The image of the two mark points can be obtained.

Template size: Affects the size of the captured image.

Identification strength: 1-10, respectively. The smaller the value is, the lower the image matching degree is required.

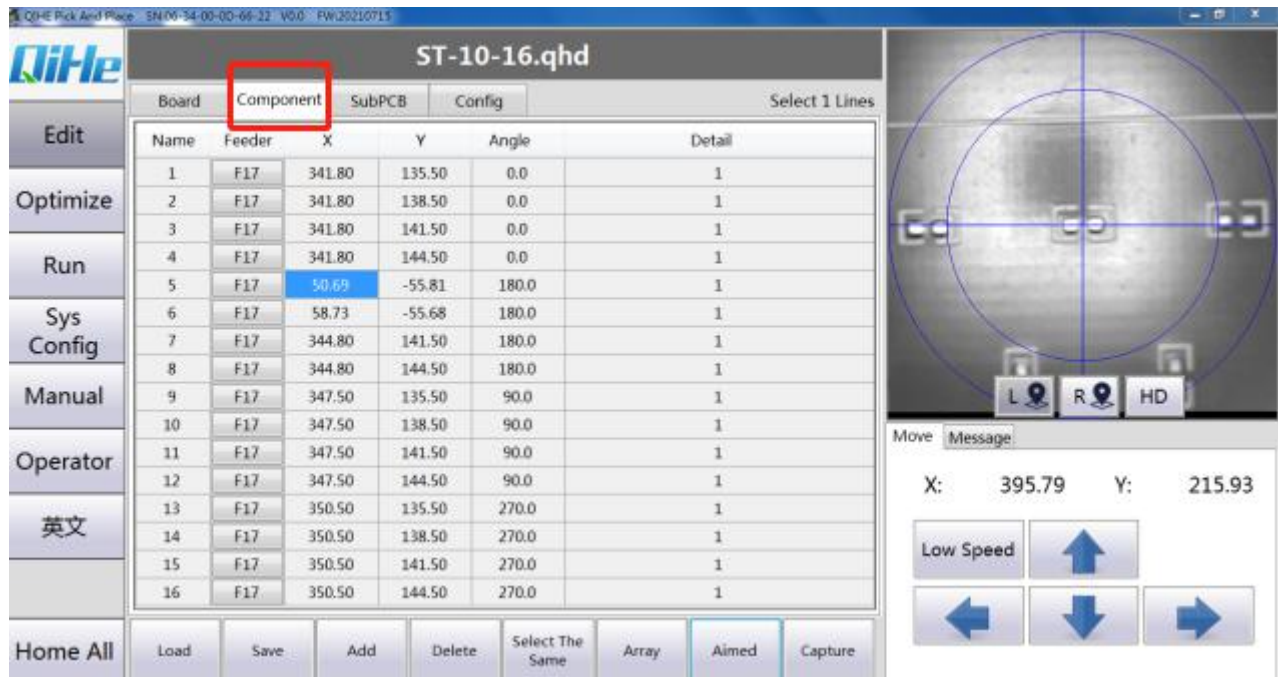
Note: It is possible that the recognition is not good after grasping, so it is necessary to change the template size and matching degree for correct recognition.

Pipeline control:

Inflow: Inflow into the circuit board to a specified location.

Outflow: Outflow the circuit board.

4. 1. 2 Components



Number: device class and serial number of similar devices

Stack: The corresponding Fida serial number of the device

X, Y, Angle: Select the corresponding position and modify the coordinates and angles by yourself

Description: that is, you load the file to indicate

Load files: Load CSV files exported by Protel, DXP, Altium Designer, PANDS, Candes, Proteus, etc

Save files: Save files that have been modified during the process of running or debugging

Add: Add device location

Delete: Deletes the device location

Select the same: select the same location, device, or all devices of the same flight

Device identification: identify the size of the component to be attached

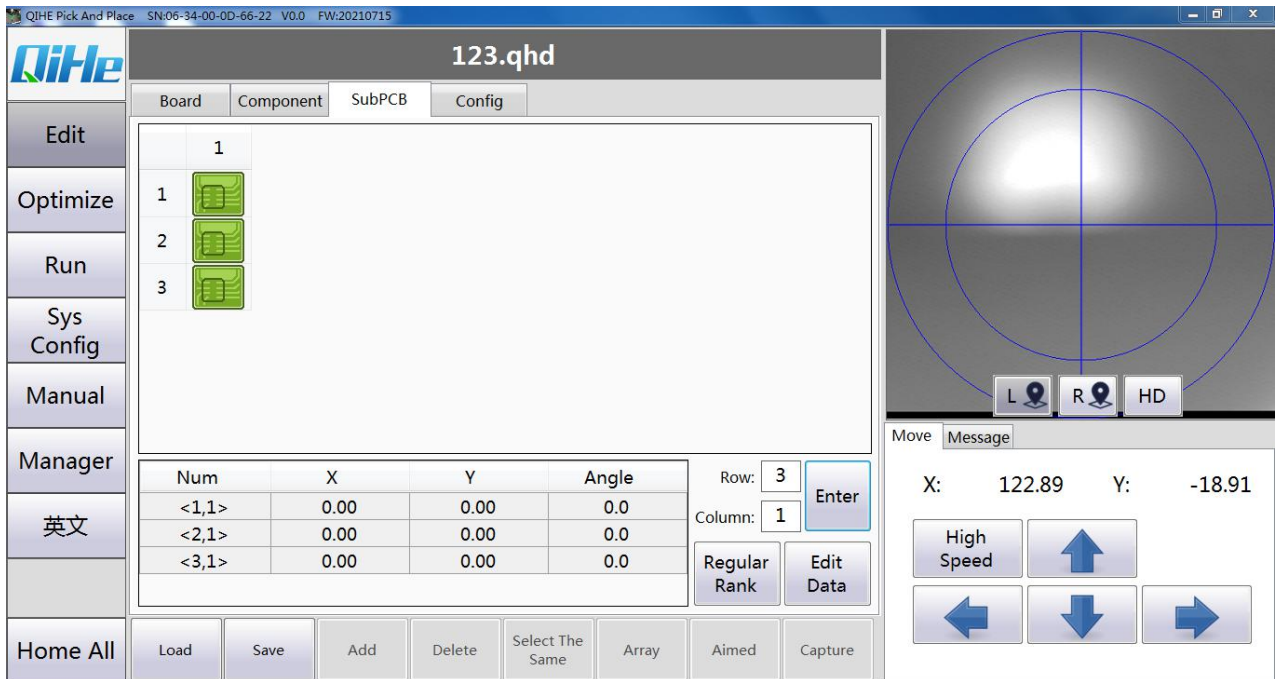
Generate Array: Quick editing of components with a regular arrangement

Camera positioning: locate the corresponding device position with the downview camera

Grab coordinates: Sets the current coordinate to the device position

Note: Be sure to save when you have modified it

4. 1. 3 The makeup



Generate Array: Fill in the number of rows and rows that need a jigsaw

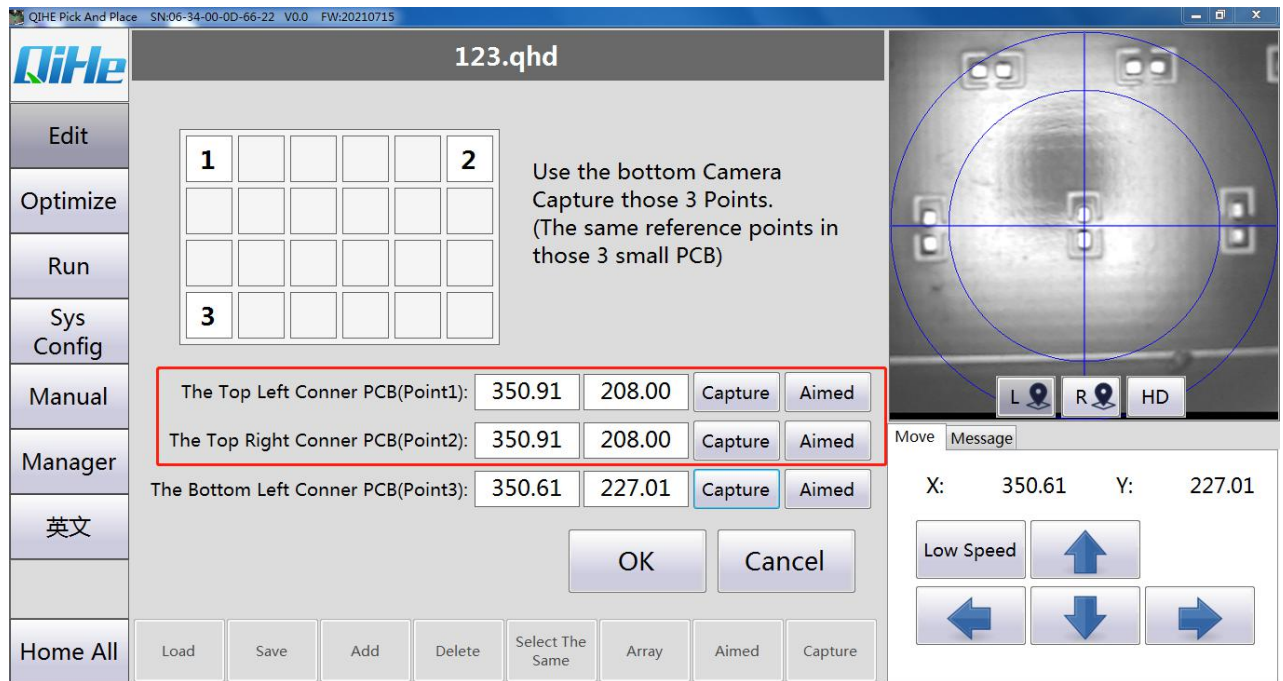
Regular arrangement: Standard points for Benchmark # 1 subboard: Grabbing to find a point on the board where the mark point is set.

Standard point for subboard # 2: Grab the most distant board in the X direction of the board on which the mark point is set to find the same point as standard point # 1.

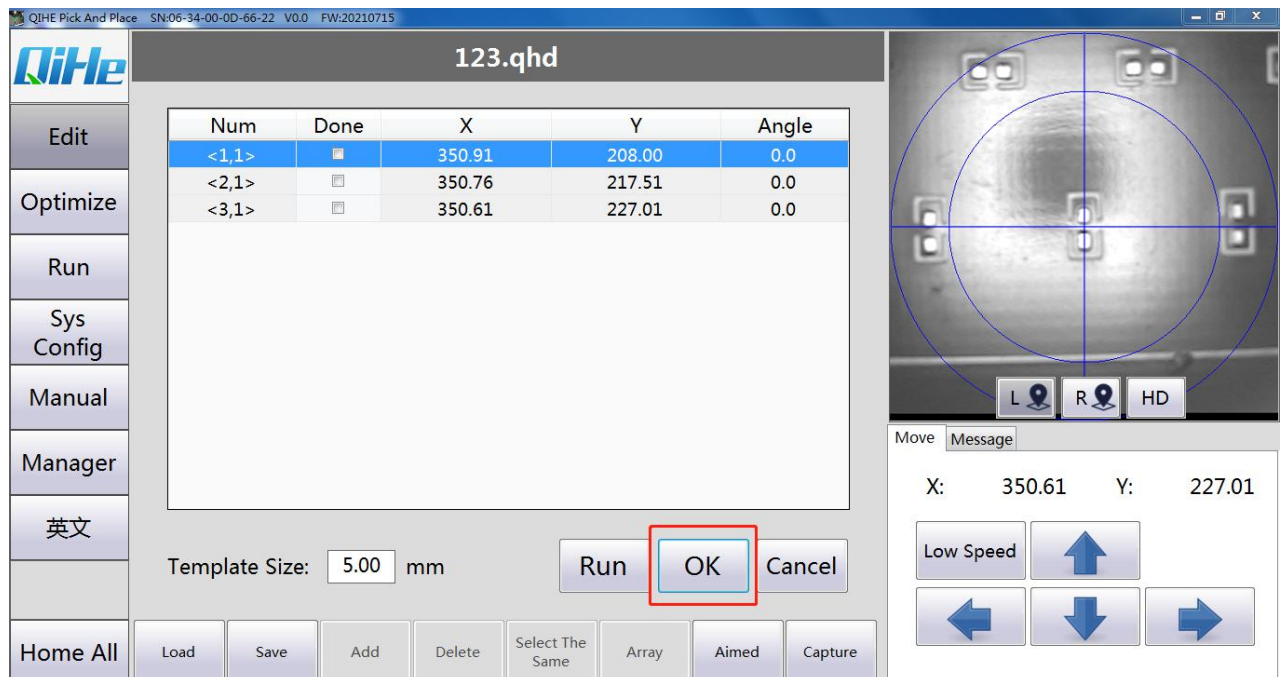
Standard point for subboard # 3: Grab to find the same point as standard point # 1 on the board at the farthest end of the Y direction of the board on which the mark point is set.

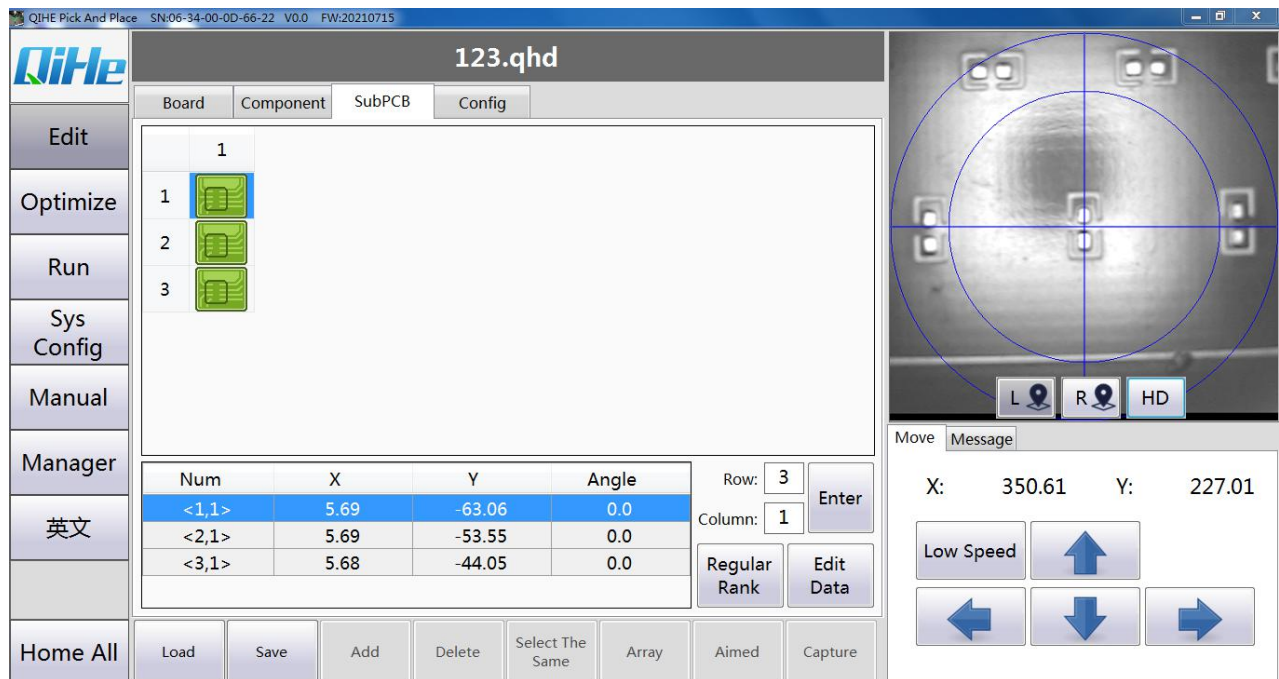
Edit data: Locate the reference point of each circuit board

For example, we are now a triplex with rows of 3 and columns of 1. After generating the array, we arrange it regularly

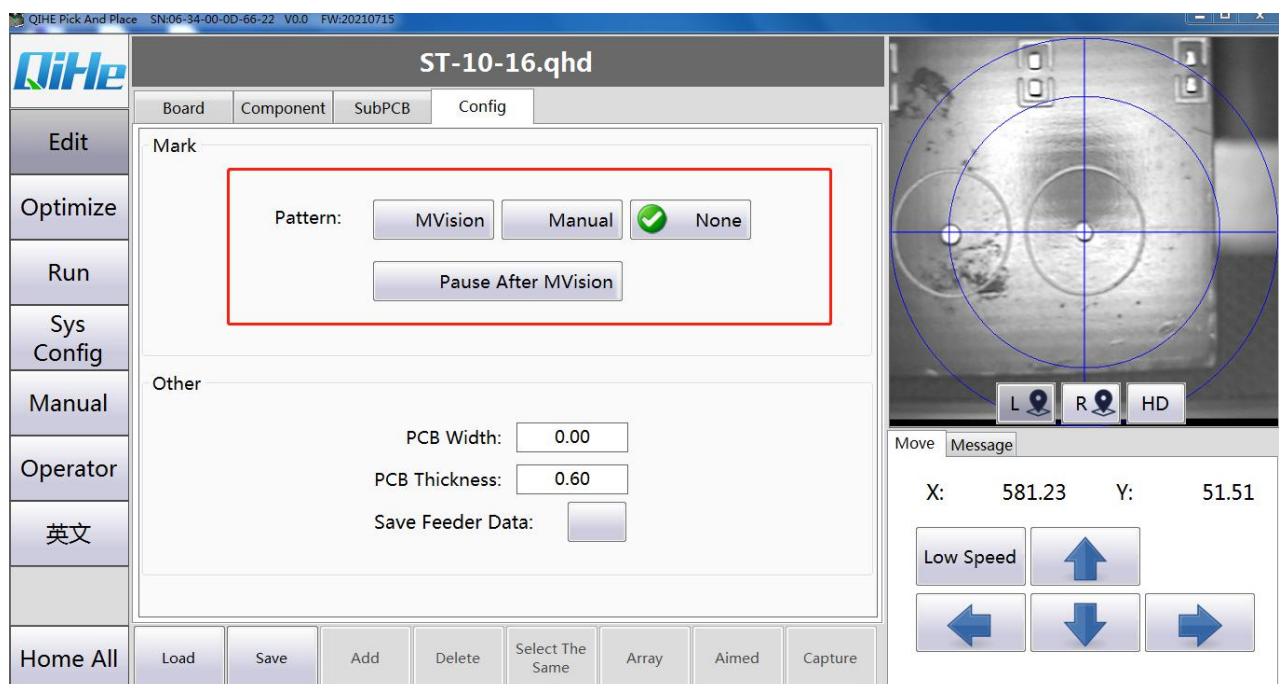


Note: Even if there is no jigsaw board in X direction, the coordinate should be captured, and the coordinate should be the same as that of No. 1 board. Similarly, if there is no jigsaw board in Y direction, the coordinate should be captured and the coordinate should be the same as No. 1





4.1.4 Parameters



Reference point identification parameters:

Recognize patterns:

Automatic recognition: the down looking camera automatically corrects the error so that the center alignment of the camera is aligned with the center position of the mark point.

Manual identification: manually operate the lower view camera to run above the mark

point, manually correct the error, so that the center of the camera alignment to the center of the mark point

Do not identify: on the mounting accuracy is not high, high efficiency requirements, you can choose this mode.

Pause confirmation after automatic recognition: in the automatic recognition mode under the ticking condition, after a mark point is identified, it will pause and wait for the manual to confirm whether the mark point is correctly identified or not, and then proceed to the next step of identification manually.

Note: For patch accuracy, it is recommended to identify the mark point

The other parameters:

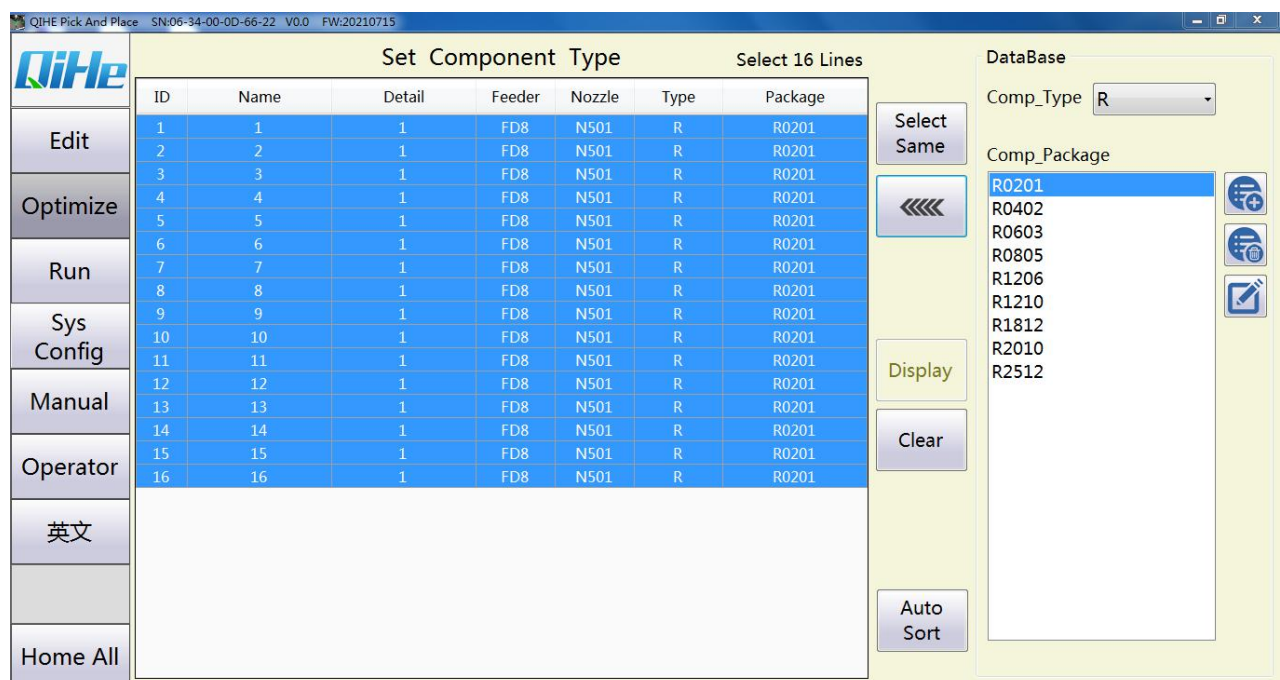
PCB thickness: generally do not need to modify

Stack speed: when applied to the Z axis, the stack speed increases or decreases, affecting the Z-axis mounting speed of the material modification stack device, and XY remains unchanged.

When it acts on the XYZ axis, the stack speed increases or decreases, affecting the loading speed of the XYZ axis of the material modification stack device.

Save stack location data: it is recommended to check and save together with the file

4.2 Element optimization



Select Same: Select other elements with the same selected information.



:Assigns the selected component type to the component on the left.

Display parameters: Displays the parameters of the selected element.

Clear Settings: Clears the element type of the selected element number.

Mount optimization: enter mount optimization.

Component type: Select the type of component that you want to mount.



:Add a new symbol type.



:Deletes the selected component type.



:Edit the component information for the selected component type.

4. 2. 1 Display parameters (size)

ID	Name	Detail	Feeder	Nozzle	Type	Package
1	1	1	FD8	N501	R	R0201
2	2	1	FD8	N501	R	R0201
3	3	1	FD8	N501	R	R0201
4	4	1	FD8	N501	R	R0201
5	5	1	FD8	N501	R	R0201
6	6	1	FD8	N501	R	R0201
7	7	1	FD8	N501	R	R0201
8	8	1	FD8	N501	R	R0201
9	9	1	FD8	N501	R	R0201
10	10	1	FD8	N501	R	R0201
11	11	1	FD8	N501	R	R0201
12	12	1	FD8	N501	R	R0201
13	13	1	FD8	N501	R	R0201
14	14	1	FD8	N501	R	R0201
15	15	1	FD8	N501	R	R0201
16	16	1	FD8	N501	R	R0201

Type: R
 Package: R0201
 Nozzle: N501
 Feeder: FD8
 Together Pick ☒
 Pick Angle: 0
 Priority: 0
 Size: Length: 0.6, Width: 0.3, Height: 0.23, Depth: 0
 Save Close

Length: The length of the component.

Width: The length of the component.

Height: Height of the component.

Depth: The depth of the component.

4.2.2 Display parameters (visual)

QIHE Pick And Place SN:06-34-00-0D-66-22 V0.0 FW:20210715

Set Component Type Select 1 Lines

ID	Name	Detail	Feeder	Nozzle	Type	Package
1	1	1	FD8	N501	R	R0201
2	2	1	FD8	N501	R	R0201
3	3	1	FD8	N501	R	R0201
4	4	1	FD8	N501	R	R0201
5	5	1	FD8	N501	R	R0201
6	6	1	FD8	N501	R	R0201
7	7	1	FD8	N501	R	R0201
8	8	1	FD8	N501	R	R0201
9	9	1	FD8	N501	R	R0201
10	10	1	FD8	N501	R	R0201
11	11	1	FD8	N501	R	R0201
12	12	1	FD8	N501	R	R0201
13	13	1	FD8	N501	R	R0201
14	14	1	FD8	N501	R	R0201
15	15	1	FD8	N501	R	R0201
16	16	1	FD8	N501	R	R0201

Parameters:

Type: R
 Package: R0201
 Nozzle: N501
 Feeder: FD8
 Together Pick: ☒
 Pick Angle: 0
 Priority: 0

Display Parameters:

Size | Vision | Speed | Delay
 Type: Quick
 Range: 100 (0~100)
 Threshold: 100 (0~200)
 CheckType: Vision
 DiscardTime: 3
 MaxError: 20 %
 Vacuum: 3 325

Buttons: Select Same, Display, Clear, Auto Sort, Save, Close

Sidebar: Edit, Optimize, Run, Sys Config, Manual, Operator, 英文, Home All

Pattern recognition: choose a visual way.

Identification Range: Select the size of the range that can identify the device.

Identification threshold: Select the minimum value that can identify the device.

Inspection mode: select the way to inspect the device.

Number of resuction: Select the number of refetching allowed.

Identification error: select the allowable error range.

4. 2. 3 Display parameters (speed)

QIHE Pick And Place SN:06-34-00-0D-66-22 V0.0 FW:20210715

QIHE

Set Component Type **Select 1 Lines**

ID	Name	Detail	Feeder	Nozzle	Type	Package
1	1	1	FD8	N501	R	R0201
2	2	1	FD8	N501	R	R0201
3	3	1	FD8	N501	R	R0201
4	4	1	FD8	N501	R	R0201
5	5	1	FD8	N501	R	R0201
6	6	1	FD8	N501	R	R0201
7	7	1	FD8	N501	R	R0201
8	8	1	FD8	N501	R	R0201
9	9	1	FD8	N501	R	R0201
10	10	1	FD8	N501	R	R0201
11	11	1	FD8	N501	R	R0201
12	12	1	FD8	N501	R	R0201
13	13	1	FD8	N501	R	R0201
14	14	1	FD8	N501	R	R0201
15	15	1	FD8	N501	R	R0201
16	16	1	FD8	N501	R	R0201

Edit **Optimize** **Run** **Sys Config** **Manual** **Operator** **英文** **Home All**

Select Same **Display** **Clear** **Auto Sort**

Type: R
Package: R0201
Nozzle: N501
Feeder: FD8
Together Pick ☒
Pick Angle: 0
Priority: 0

Size Vision Speed Delay
XY: 100
PickDown: 100
PickUp: 100
PlaceDown: 100
PlaceUp: 100

Save **Close**

XY: Select the movement speed.

Receiving drop: Select the rate of drop when taking the material.

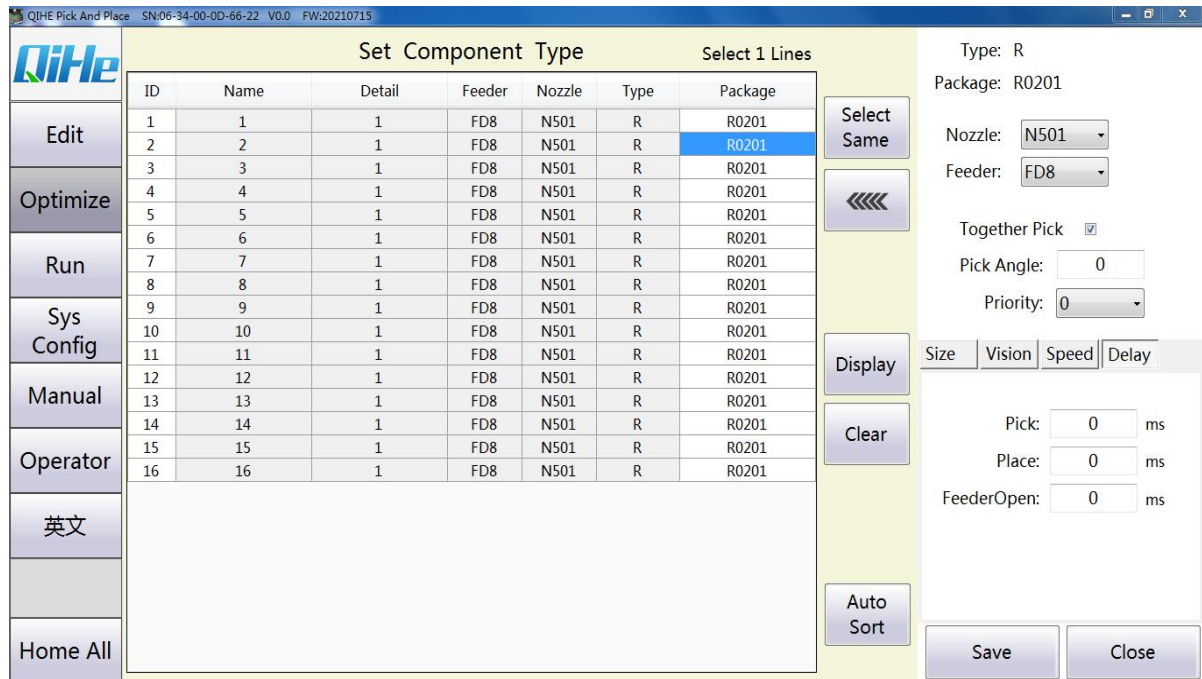
Receiving rise: select the rate of rise when taking material.

Plaster drop: the rate of drop when selecting the plaster.

Paste rise: the rise rate when selecting paste.

Angle Rotation: Select the speed of the Angle rotation.

4. 2. 4 Display parameters (delay)

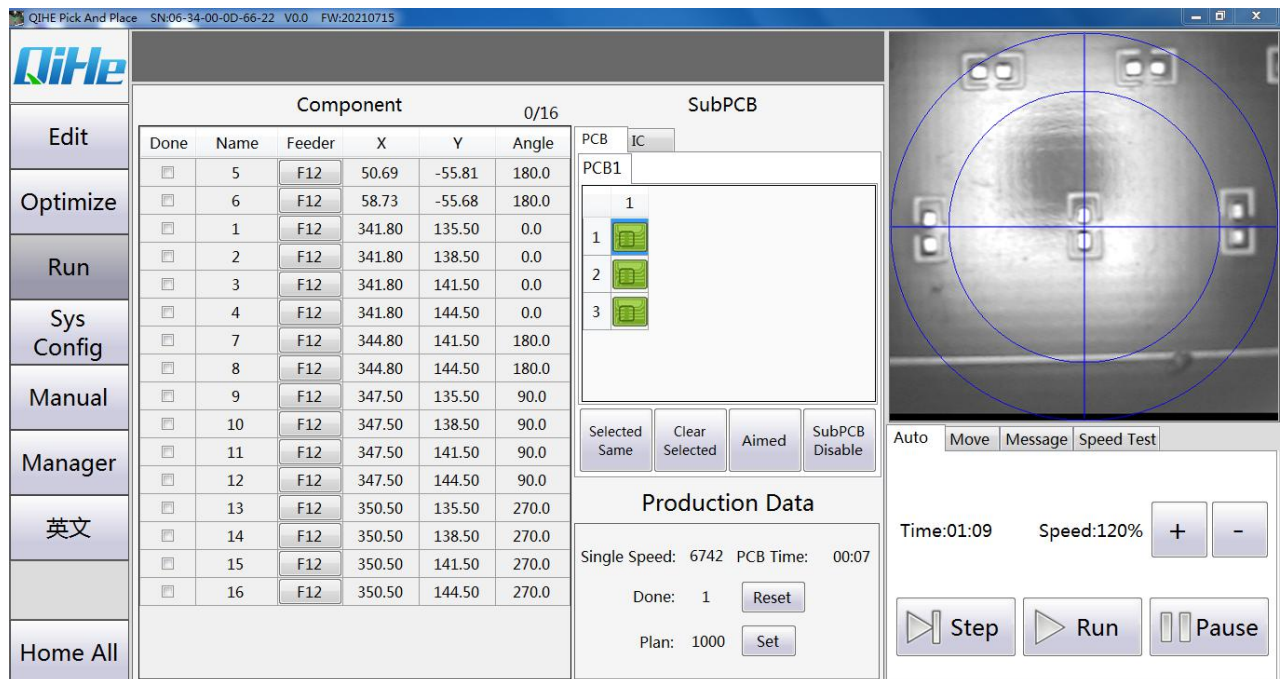


Receiving: Select the delay time of material taking.

Feeding: Select the delay time of feeding.

Feeder Open: Select the delay time when Feeder opens.

4.3 Run the patch:



Select the same: select the same location, device, or all devices of the same flight

Clear Check: Clear the selected device location

Camera positioning: Move to the current device coordinate position

Puzzle board springboard: Jump over the current board

Running:

Single step: single step operation

Automatic: Start stop

Pause: The pause continues

Time: Displays the time of mount

Speed: adjust the speed of the whole machine 0%-120%

Mounting head movement:

Pointing mode: Move at a slower speed

Continuous mode: Move at a higher speed

QIHE Pick And Place SN:06-34-00-0D-66-22 V0.0 FW:20210715

Component 0/16

Done	Name	Feeder	X	Y	Angle
<input type="checkbox"/>	5	F12	50.69	-55.81	180.0
<input type="checkbox"/>	6	F12	58.73	-55.68	180.0
<input type="checkbox"/>	1	F12	341.80	135.50	0.0
<input type="checkbox"/>	2	F12	341.80	138.50	0.0
<input type="checkbox"/>	3	F12	341.80	141.50	0.0
<input type="checkbox"/>	4	F12	341.80	144.50	0.0
<input type="checkbox"/>	7	F12	344.80	141.50	180.0
<input type="checkbox"/>	8	F12	344.80	144.50	180.0
<input type="checkbox"/>	9	F12	347.50	135.50	90.0
<input type="checkbox"/>	10	F12	347.50	138.50	90.0
<input type="checkbox"/>	11	F12	347.50	141.50	90.0
<input type="checkbox"/>	12	F12	347.50	144.50	90.0
<input type="checkbox"/>	13	F12	350.50	135.50	270.0
<input type="checkbox"/>	14	F12	350.50	138.50	270.0
<input type="checkbox"/>	15	F12	350.50	141.50	270.0
<input type="checkbox"/>	16	F12	350.50	144.50	270.0

SubPCB

PCB IC

PCB1

1

2

Selected Same Clear Selected Aimed SubPCB Disable

Production Data

Single Speed: 6742 PCB Time: 00:07

Done: 1

Plan: 1000

Auto	Move	Message	Speed Test
X	122.89	Y	-18.91
Z1	0.00	A1	Pick1 50
Z2	0.00	A2	Pick2 50
Z3	0.00	A3	Pick3 50
Z4	0.00	A4	Pick4 50
Z5	0.00	A5	Pick5 50
Z6	0.00	A6	Pick6 50
Z7	0.00	A7	Pick7 50
Z8	0.00	A8	Pick8 50

Paste header information:

X,Y: Displays the current coordinate information

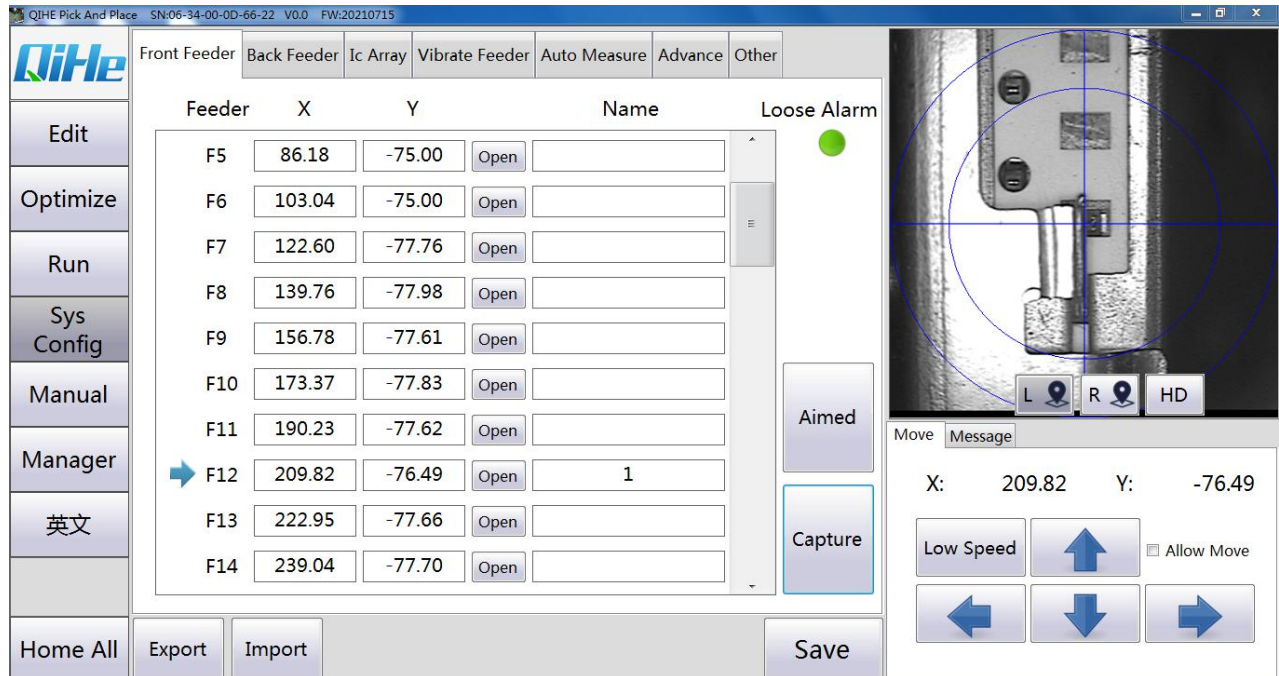
Z axis: shows the current drop height of suction nozzle

Axis A: Display the current rotation Angle of suction nozzle

Negative pressure: Represents the current suction nozzle pressure value

4.4 System parameters:

4.4.1 Front Feeder



Feeder: The corresponding Feeder

X, Y: The coordinates of the corresponding X and Y are captured with the down viewing camera

Open: Open the corresponding solenoid valve

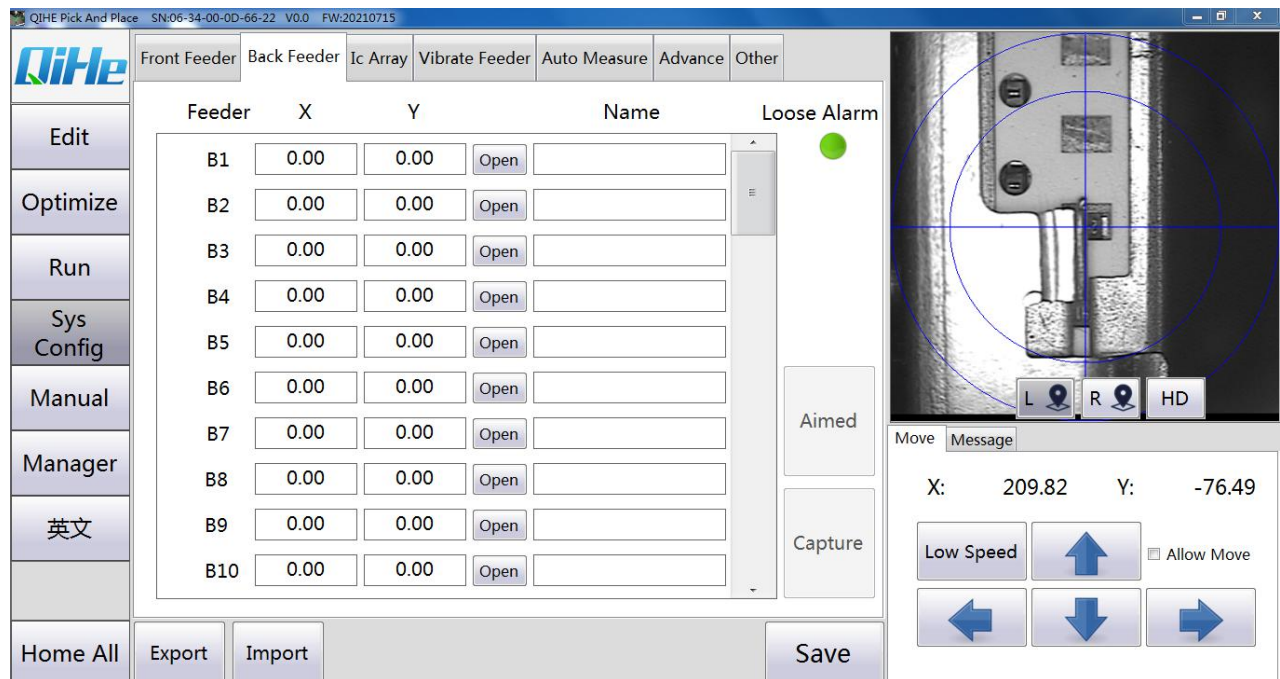
Visual positioning: Locates to the current coordinate

Grab coordinates: Sets the current coordinates

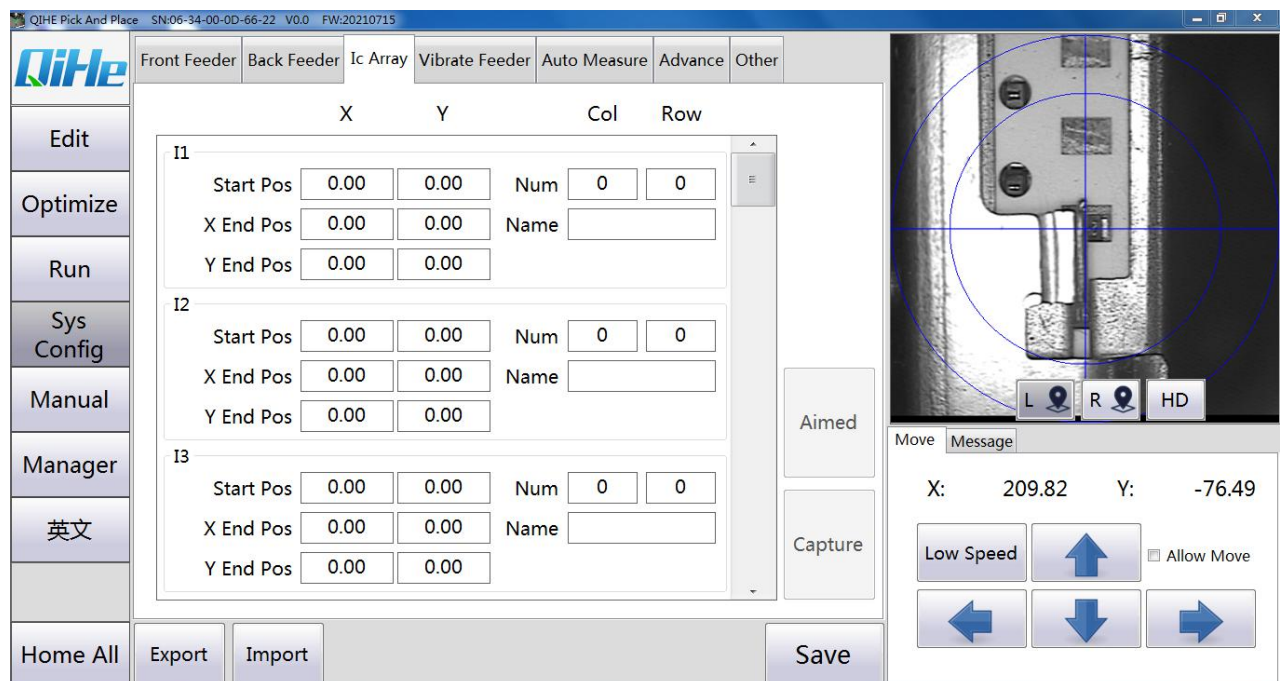
Name: Edit the material of feeder fang

4. 4. 2 Back Feeder

The operation is the same as that of the front row



4. 4. 3 The tray



Starting point: The location of the first chip

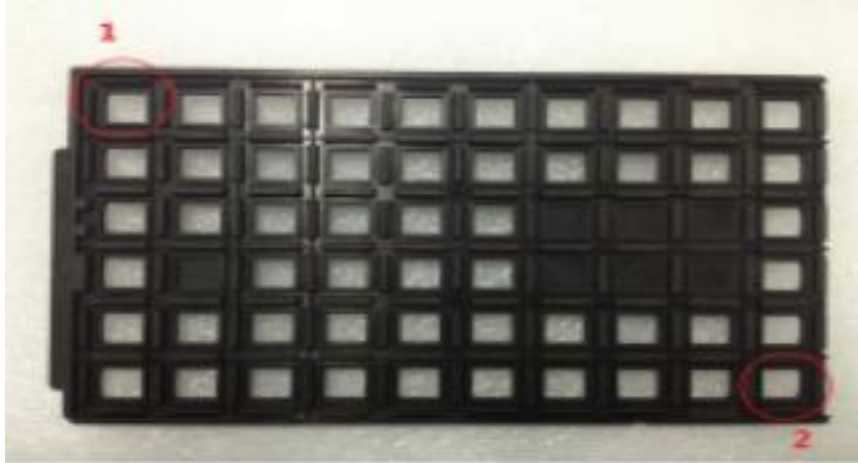
X terminal: The position of the farthest end of the first chip in the X direction.

Y terminal: The position of the chip at the farthest end of the Y direction from the first chip.

Array: number of X directions, number of Y directions

Visual positioning: Move to the current position

Grab coordinates: Grab the current position



(Modify the image, and also modify the second step below)

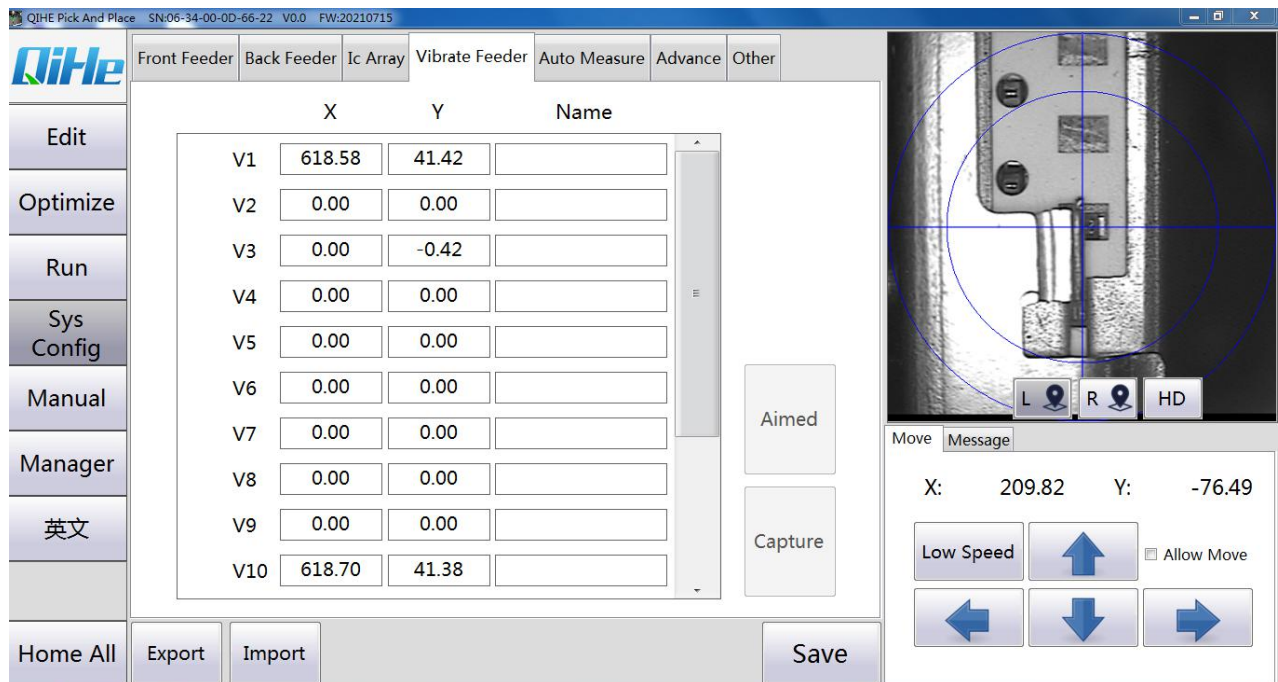
The first step is to run it manually. Move the suction nozzle to the top of the first IC. On the computer, move the cursor to the flat tray 1, the starting point position, and then click Set Current to automatically generate the starting point coordinates.

The second step is to move the suction nozzle to the top of the last IC. On the computer, move the cursor to the end point of the flat tray 1. Then click "Set Current" to automatically generate the end point coordinates.

Step 3: Array the line. Enter "10" and "6" to indicate that there are 10 chips in the X direction and 6 chips in the Y direction (according to the actual situation, if there are several chips in the X direction, just write a few and a few in the Y direction, just write a few). Finally, click OK to complete the coordinate setting of this chip.

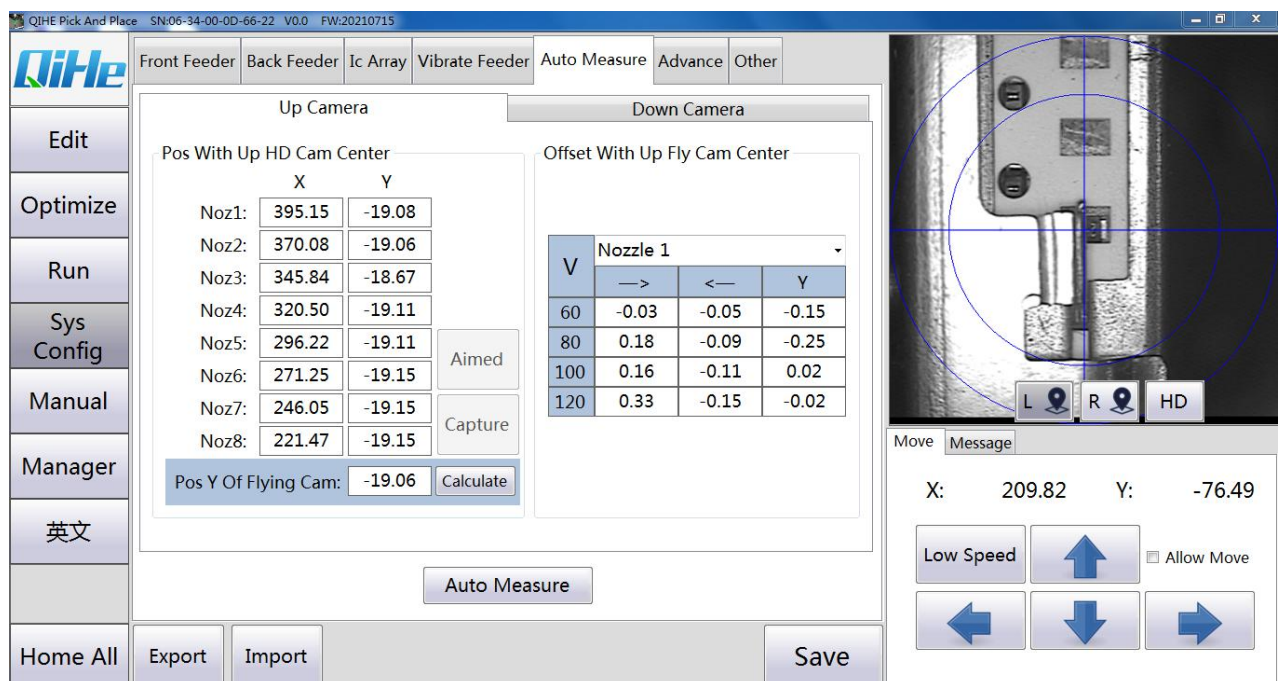
When actually mounting, select the material stack, select "material tray 1", and the system will go to the corresponding position to absorb the chip.

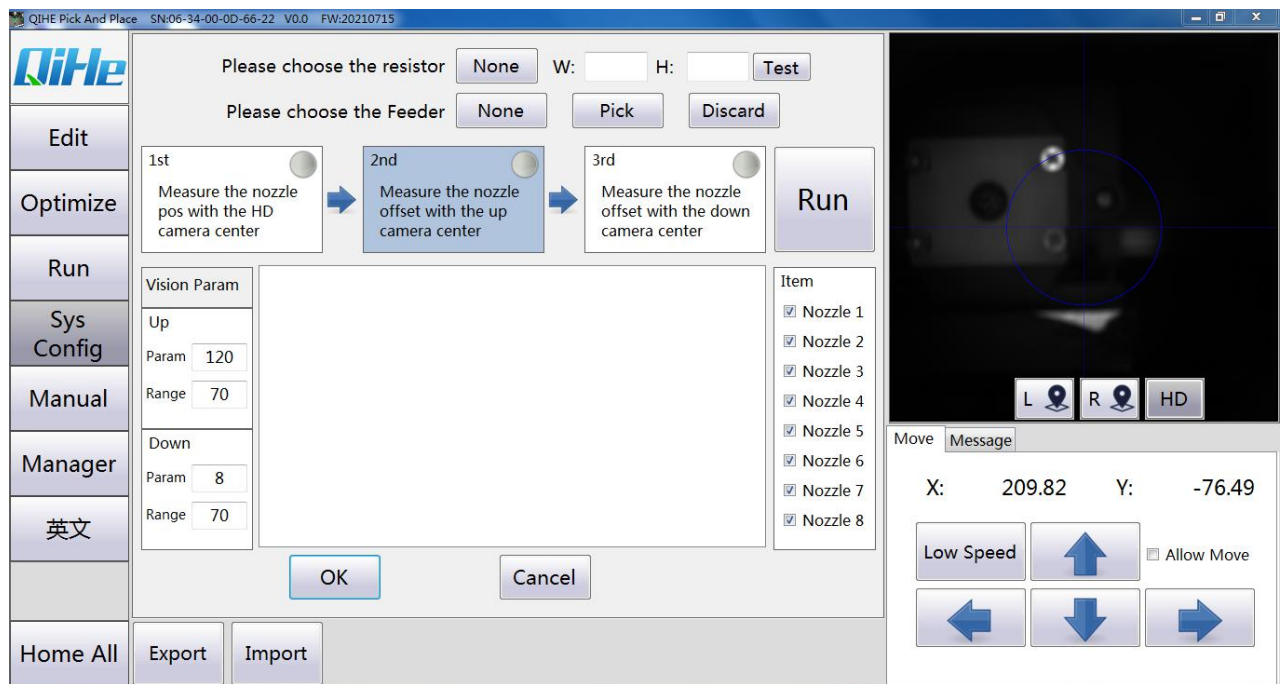
4. 4. 4 Vibration tray



The camera moves to the desired tray position, grabs the coordinates, and edits them

4. 4. 5 Camera parameter





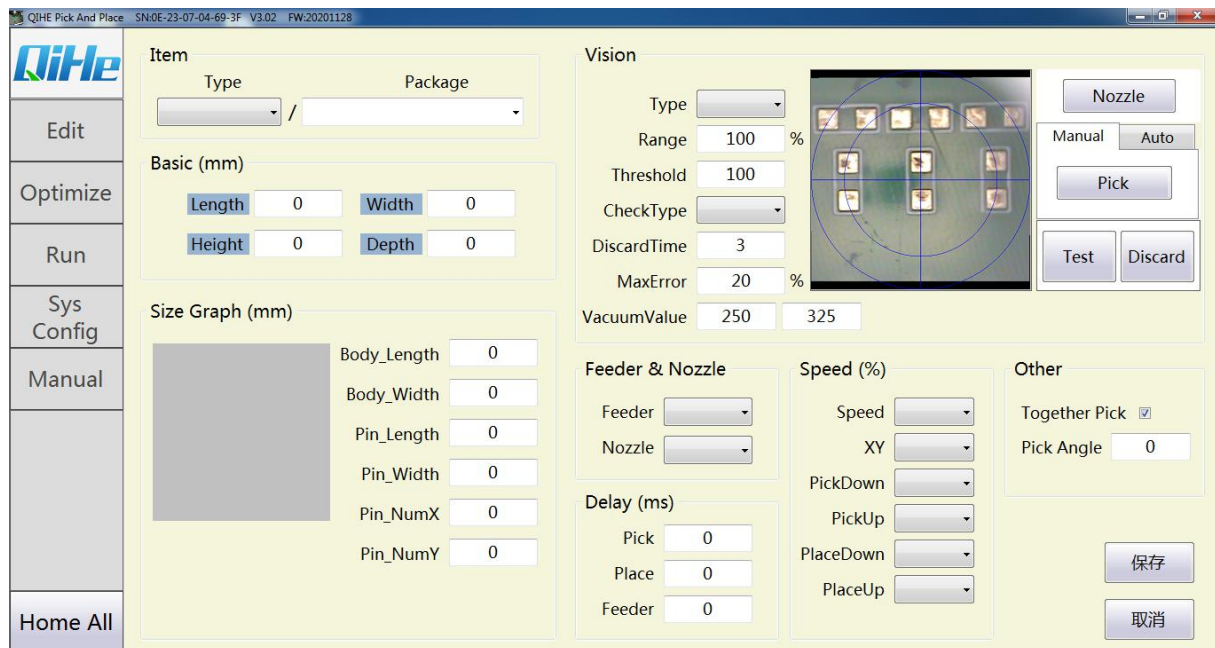
HD-camera and Dawn camera:

Component Threshold: Adjust when there is a problem with visual component identification so that the green box is just outside the component. If the box is too large, increase the component threshold. If the box is too small, reduce the component threshold.

Recognition range: affects the effective recognition range of the camera. The default value is 100 and the maximum value is 200. The size of the blue circle is the effective recognition range.

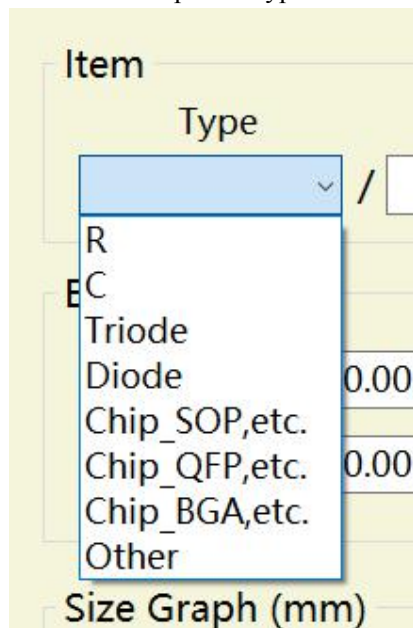


4. 4. 6 Component library main interface



1.Components directory

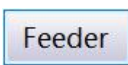

Select the component type and enter the package name of the component that you want to add or modify




2.Visual detection function

1、 Select the suction nozzle: click the button to select the suction nozzle used for testing

Manual feeding: click the button  After the suction is turned on, manually place the tested element on the suction nozzle

Automatic feeding: click the button  Select the stack where the component is located and click the button , Automatic suction element.

2、 Visual detection: click the button  , Automatically moves over the camera for visual detection

3.1The parameters "Recognition Range" and "Recognition Threshold" can be modified to adjust the visual recognition of the current component

Range	<input type="text" value="100"/>	%
Threshold	<input type="text" value="100"/>	

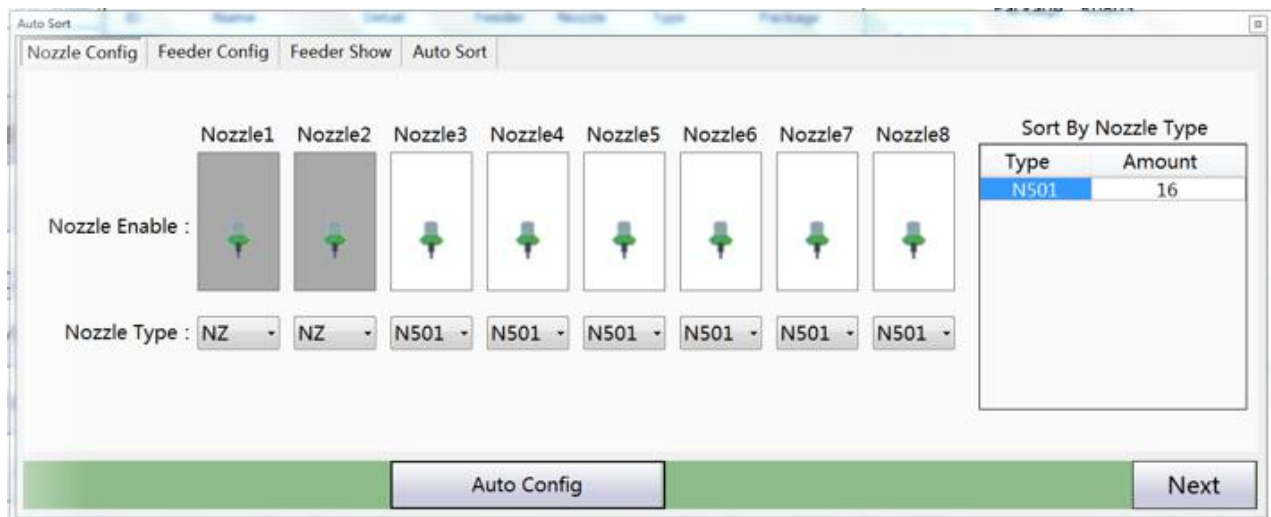
3.2According to the visual inspection, the component size (length/width) can be obtained.

Length	<input type="text" value="0"/>	Width	<input type="text" value="0"/>
--------	--------------------------------	-------	--------------------------------

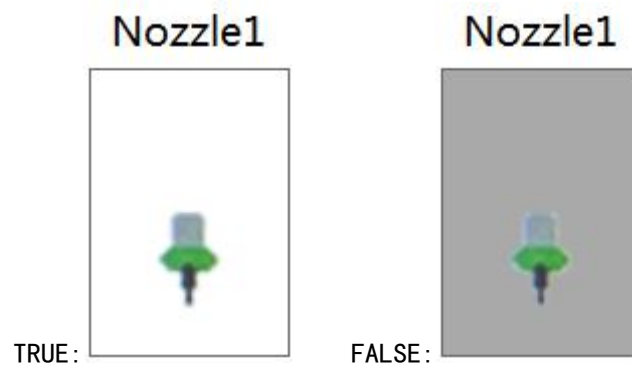
3、 Material discard: click the button  , Discarding the element

4. 4. 7 Placing optimization

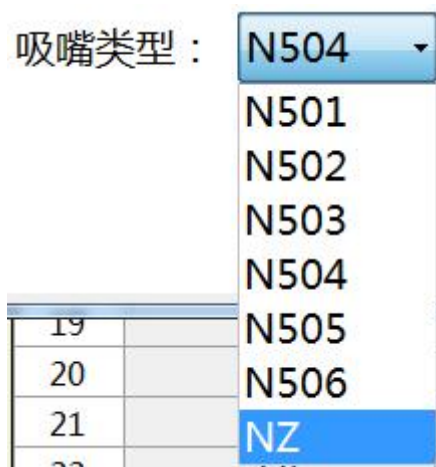
1 Suction nozzle configuration



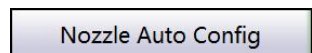
1、Enable suction nozzle: Double click the sample diagram of suction nozzle to switch the enabling state of suction nozzle



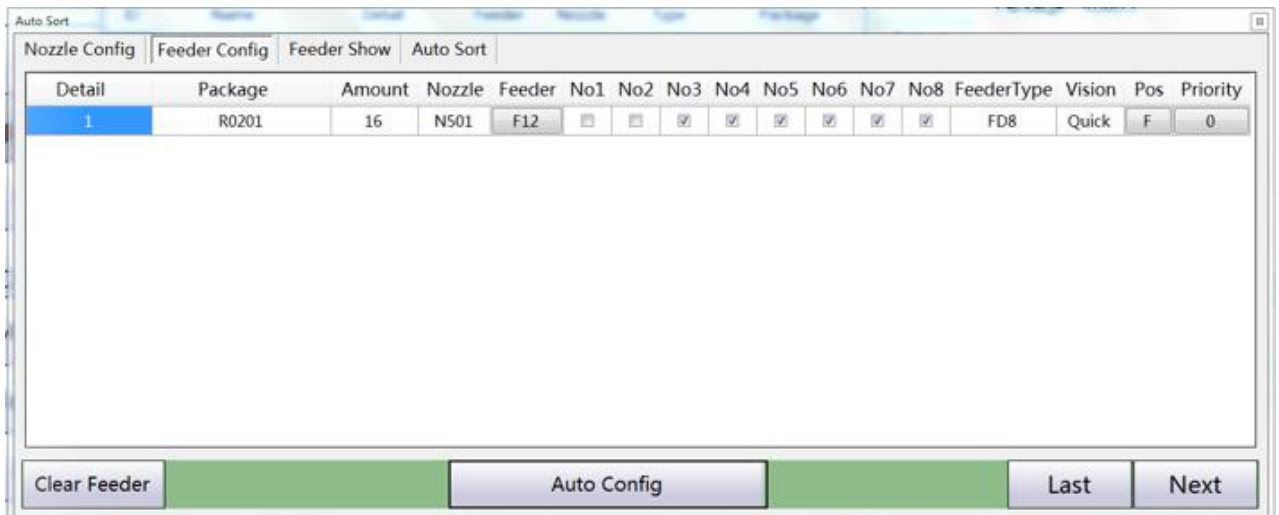
2、Nozzle type: select the appropriate nozzles from the drop-down box (" NZ "means not to use the nozzles, and the nozzles are set to FALSE)



3、Injector configuration: manually select or click the button
Automatically generate



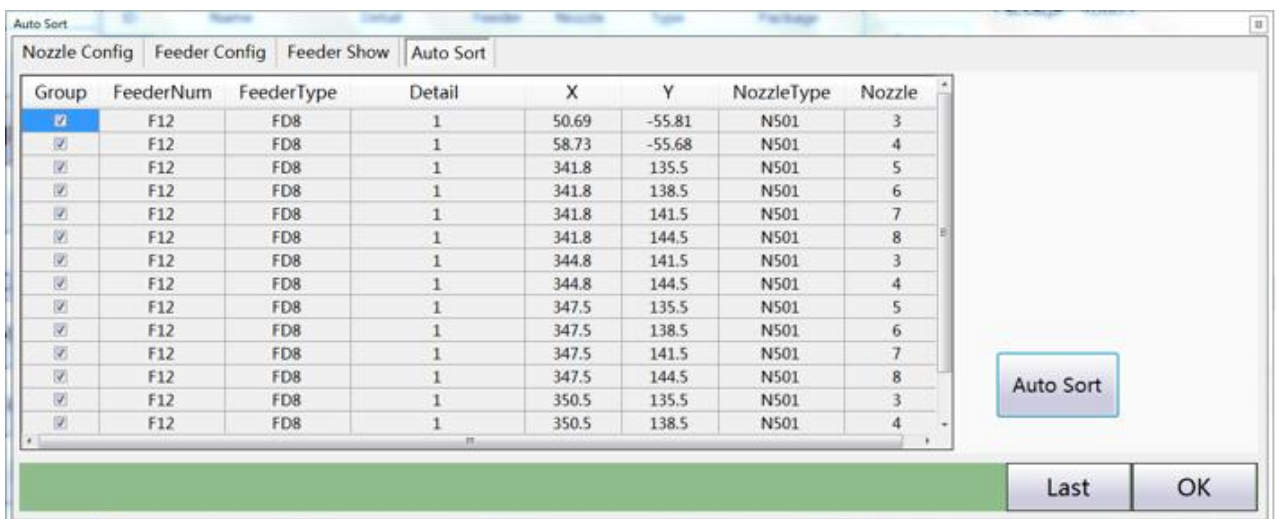
2 Feeder configuration



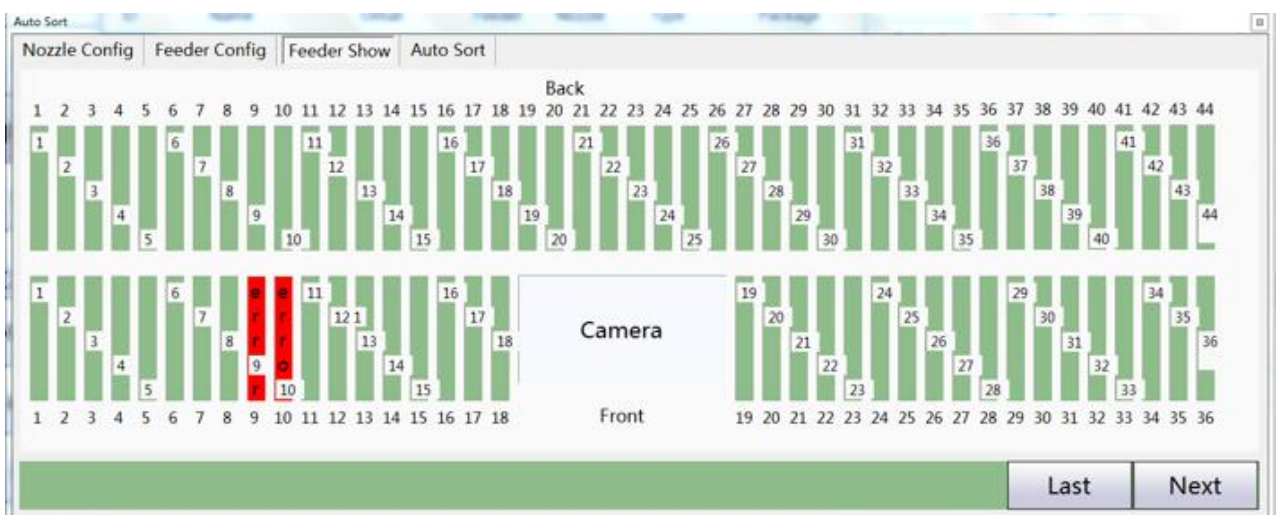
1、Click the button in the column of the material stack number to manually select the material stack number

2、Click the button on the right "Automatically assign flight location" for automatic assignment

3 The final optimization

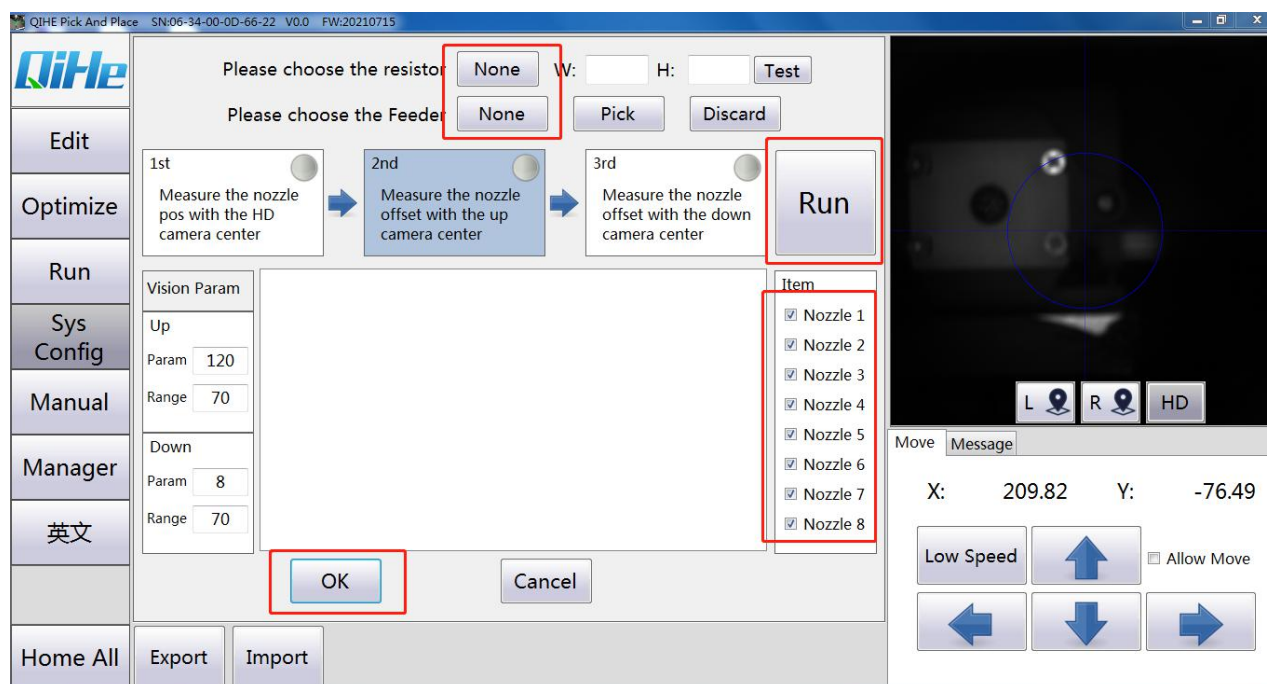


4 Fly location display



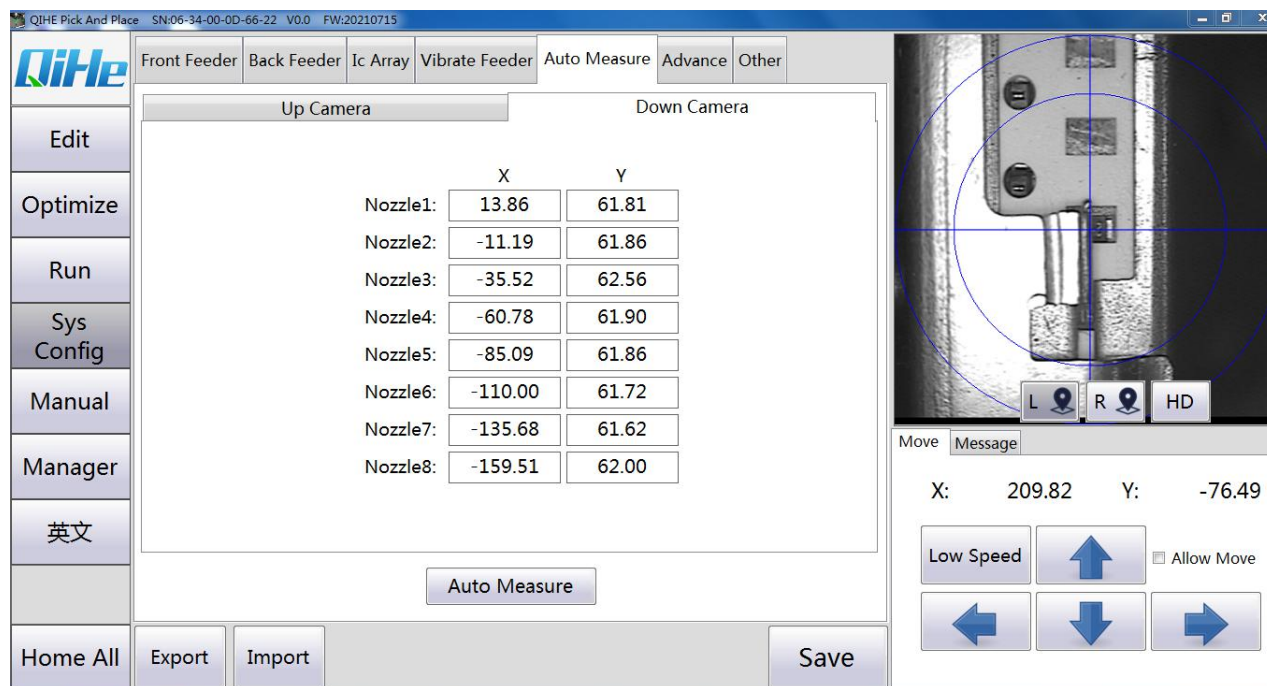
Double click on the Fit position to switch the Fit Enable state (True: green False: red)

4.4.8 Automatic measurement



Automatic measurement:

Select the corresponding Feeder to take the material, and then click Automatic and then click Next (generally test with 0805 or 1206 resistance).

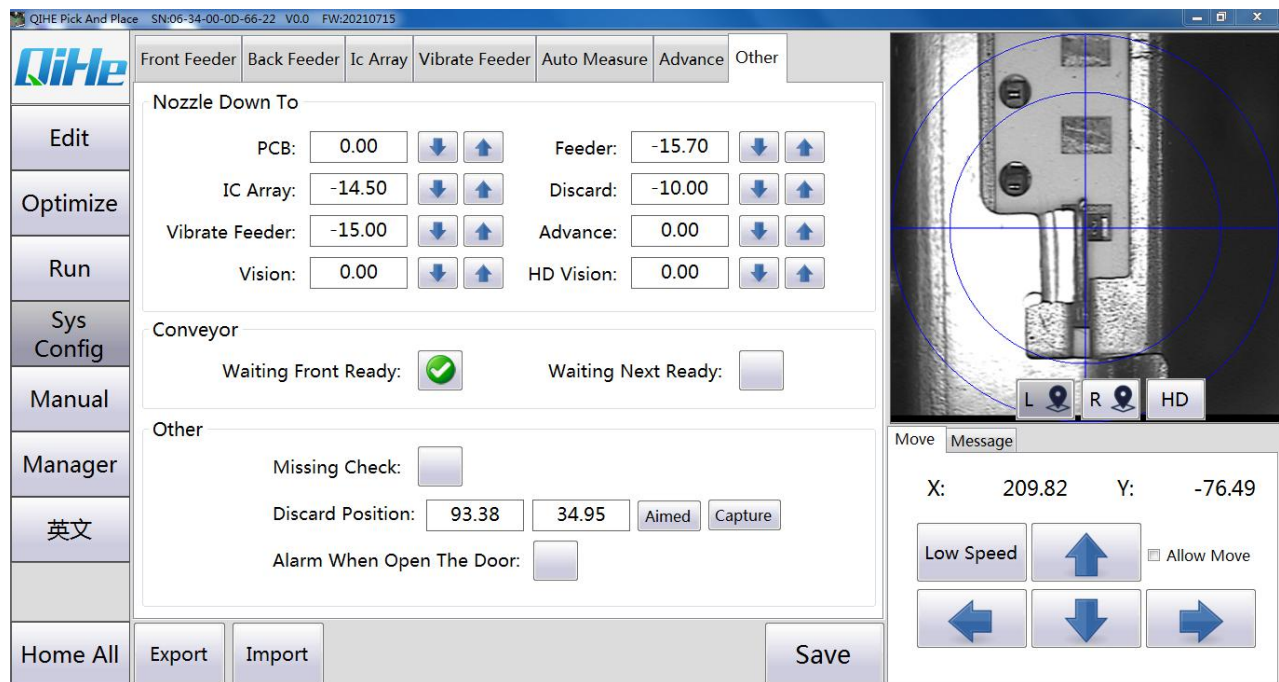


The offset of the suction nozzle from the center of the down looking camera:

Adjustments are made according to the mounting results of each component. For example, use the suction nozzle 1 mount element after the camera is aligned. If the component is located to the

right of the center of the camera cross, reduce the nozzles 1 and down-looking camera center X-axis parameters. And vice versa. If the component is located above the center of the camera cross, reduce the nozzles 1 and the Y-axis parameters of the down looking camera center. (This process is automatically measured to obtain two parameters: the offset between the nozzle and the center of the high-speed camera and the coordinates of the center of the nozzle with excessive clarity camera)

4.4.9 Other parameters:



The suction nozzle drops height:

PCB plate :The suction nozzle is lowered to PCB level

Flat tray:The suction nozzle is lowered to the height of the tray

Vibration tray:The suction nozzle is lowered to the height of the vibrating tray

The material stack:The suction nozzle descended to the height of the Feeder

Discard:The suction nozzle is lowered to the height of the discard position.

Advance:The height of the suction nozzle is lowered in advance. In order to increase the speed, it is generally not modified

High speed camera:The suction nozzle drops to the height of the high speed camera.

High definition camera:The suction nozzle is lowered to the height of the HD camera.

Pipeline parameter:

Wait for the front stage to arrive signal:Wait for the signal from the connecting station ahead

Wait for the post stage to arrive signal:Wait for the signal from the terminal behind

Other parameter:

Lack of material inspection:When components are not picked up, the machine can detect them

and pick them up again

The concrete coordinates: This coordinate is set by the customer

Open the protective cover when mounting and alarm: The recommendation has always been selected to prevent injuries caused by the manual opening of the machine

4.4.10 Manufacturer of parameters

The screenshot displays the QIHE Pick And Place software interface. The top menu bar includes options like Front Feeder, Back Feeder, Ic Array, Vibrate Feeder, Auto Measure, Advance, and Other. A left sidebar contains buttons for Edit, Optimize, Run, Sys Config, Manual, Manager, and 英文. The main area is filled with numerous input fields for parameters such as Home Pos X, Home Offset Z, Soft Limit X+, Scale Of X, Up Camera Distance/Pixel X, Down Camera Distance/Pixel X, Down Matrix Distance/Pixel XY, Right Down Camera Offset X, Scale of Air Sensor, and Scale of Air Sensor. A 'Capture' button and a 'Down Matrix Open' checkbox are also present. On the right, a camera view shows a mechanical component with a blue crosshair. Below the camera view, there are 'Move' and 'Message' tabs, and a set of directional arrows (Up, Down, Left, Right) with a 'Low Speed' button and an 'Allow Move' checkbox. The bottom of the interface has 'Home All', 'Export', 'Import', and 'Save' buttons.

Origin coordinate X: the registration point of the machine, which generally does not need to be modified

Origin calibration Z: modify the descending height of the Z axis to ensure that the descending height of the Z axis is consistent

Soft Limit X: The maximum distance the machine can run. Generally, no modification is required

Soft limit Z: The maximum height that the suction nozzle is allowed to descend.

Scale X: there is a deviation between the moving distance of the machine and the actual moving distance, which needs to be adjusted

Up view HD Camera Displacement/Pixel: Generally no modification is required

Up view height camera displacement/pixel: generally no modification is required

Down view Camera Displacement/Pixel: Generally no modification is required

High speed camera recognition before and after delay: after vision wait time and after vision wait time

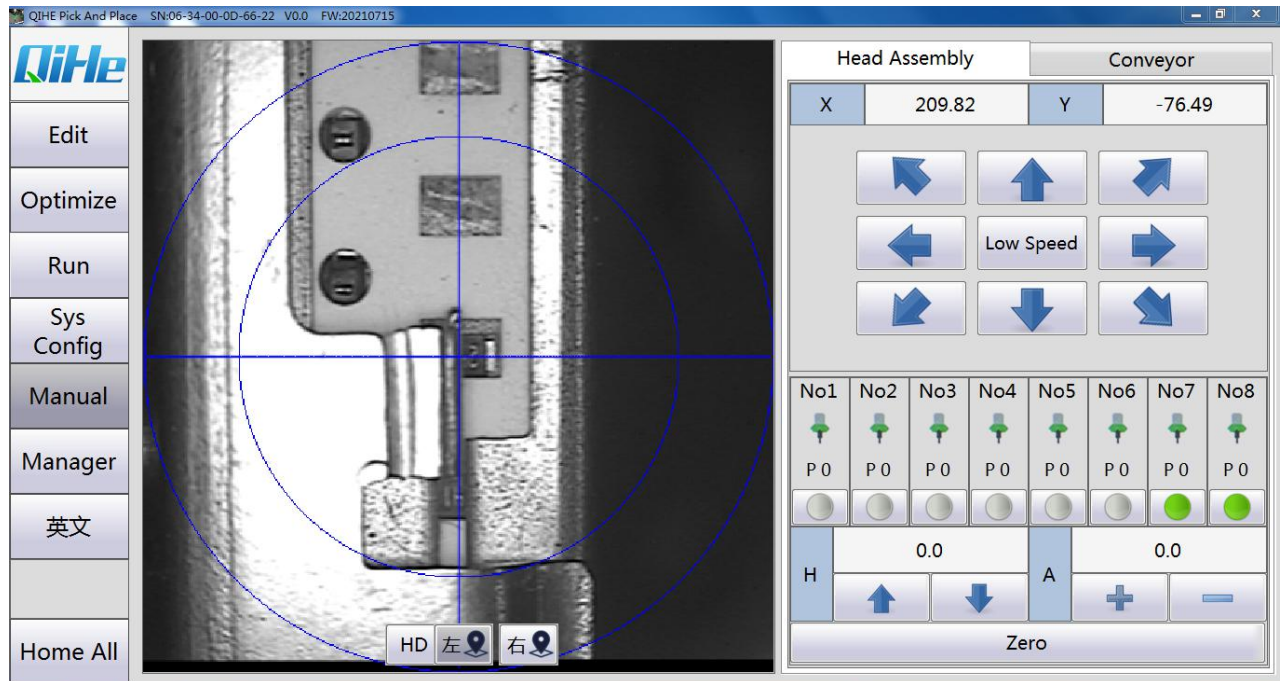
Delay before and after HD camera recognition: over vision wait time and over vision wait time

Pressure sensor magnification: when the pressure test is opened, the six nozzle pressure is

different, open the six negative pressure, with the hand blocked six nozzles, test

(Manufacturer parameters are generally not modified)

4.5 Manual debugging

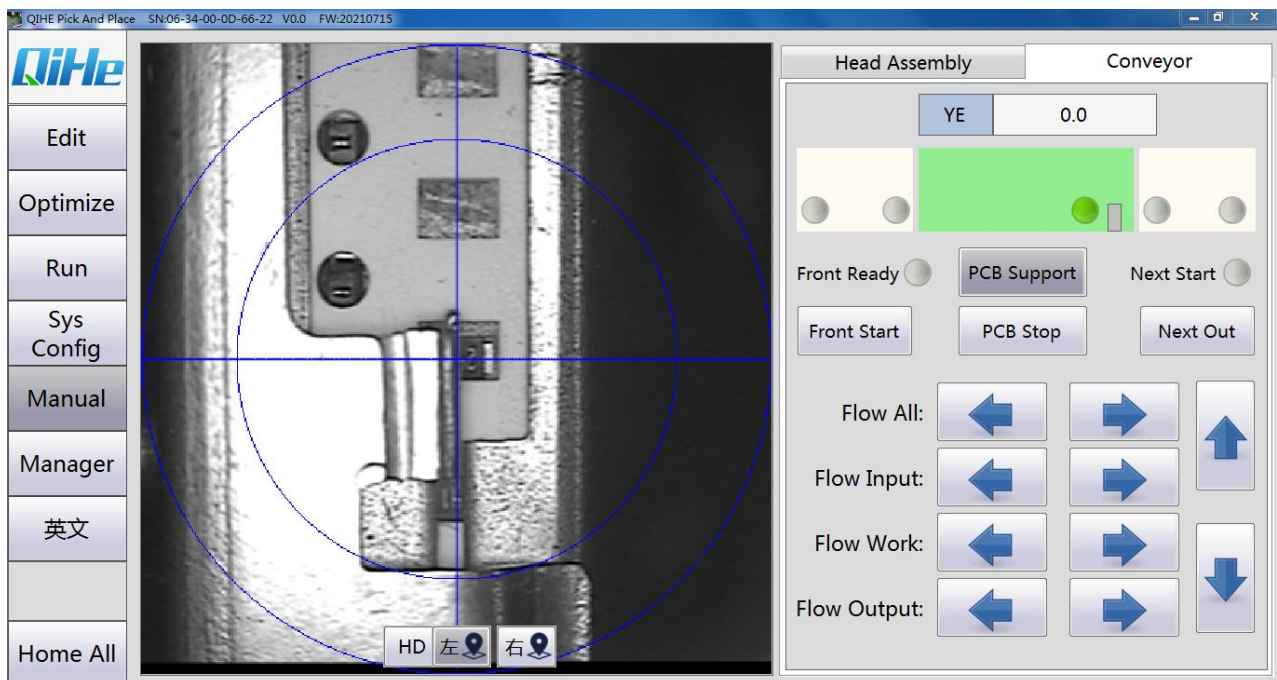


Attach the head piece:

The main test is whether the function of Z axis and A axis is normal

When sticking to the chip, you can zoom in to see if the chip is accurate

When you turn on the negative pressure, the pressure will appear when you cover it with your hand.



Pipeline unit:

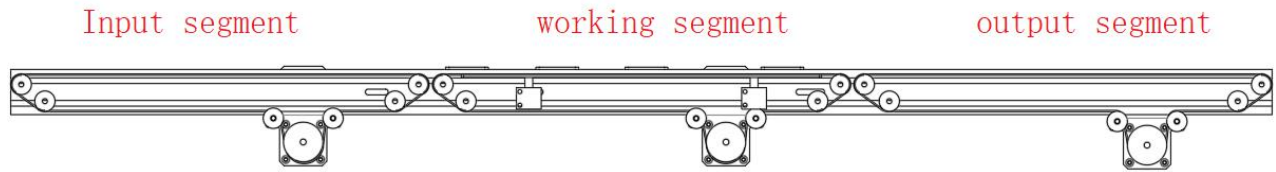
Front stage in place: when there is a board on the input terminal, the display is green, indicating that the front stage is in place.

Backstage startup: if there is no board on the output terminal interface, it is shown in green, indicating that the backstage can be started.

Inflow PCB (key) : Signals the front connector to let the circuit board flow in

Outflow PCB (key) : to signal the back connector to let the circuit board out

PCB jacking rod: lifting and lowering the PCB



Inflow start, Inflow overflow, PCB in place, Outflow start and Outflow overflow: the signal light will light when there is a circuit board on it

Line movement: control the movement of each discontinuous line epithelium

5 Preventive maintenance

5.1 Routine maintenance

- 1、 Check the suction nozzle mouth has no deformation due to impact, and confirm that there is no sundry blockage inside the suction nozzle.
- 2、 Check the camera lens for dust or debris, and clean it with a cotton swab or cloth if necessary.
- 3、 Check whether there are any left components or other sundries on the material stack, and clean it if necessary.
- 4、 Check whether the rolling wheel is loose and whether the positioning shaft is loose.
- 5、 Visually check the machine and feed rack for foreign bodies. If there are foreign bodies, dispose of them in time. Use brush to dispose of foreign bodies.

5.2 Periodic maintenance

- 1、 Check the lubricating grease of XY shaft slide rail for hardening and residual adhesion. Some use a rag to remove the old grease, plus a new grease.
- 2、 Check whether the XY axis synchronous belt is loose, and tighten it if necessary.
- 3、 Remove dust on the optical shaft of PCB clamping seat, and apply anti-rust oil if necessary.