NeoDen®

NeoDen10

High Speed Pick and Place Machine

User Manual

NeoDen®

Model： **NeoDen10 High Speed Pick and Place Machine**

Version： **V1.0**

Catalog

1. Foreword

Sincerely thank you for choosing NeoDen SMT machine.NeoDen10 is designed and used according to the following purpose---pick and place electric components on PCB. Please do not use this machine for other purposes.

2. Precautions before using the machine

Notice to users:

Dear users, before the equipment starts working, please read the relevant information of this user manual carefully, so as not to cause equipment failure affecting the use or equipment lifespan reduction.

Remove the rust-proof protective film:

In order to prevent rust caused by environmental impact during transportation, we pasted a protective film in the following parts of the machine as protection (as shown in the figure below). This protective film needs to be manually removed before the machine is powered on. If there is any omission, it may cause hidden trouble in operation and damage.
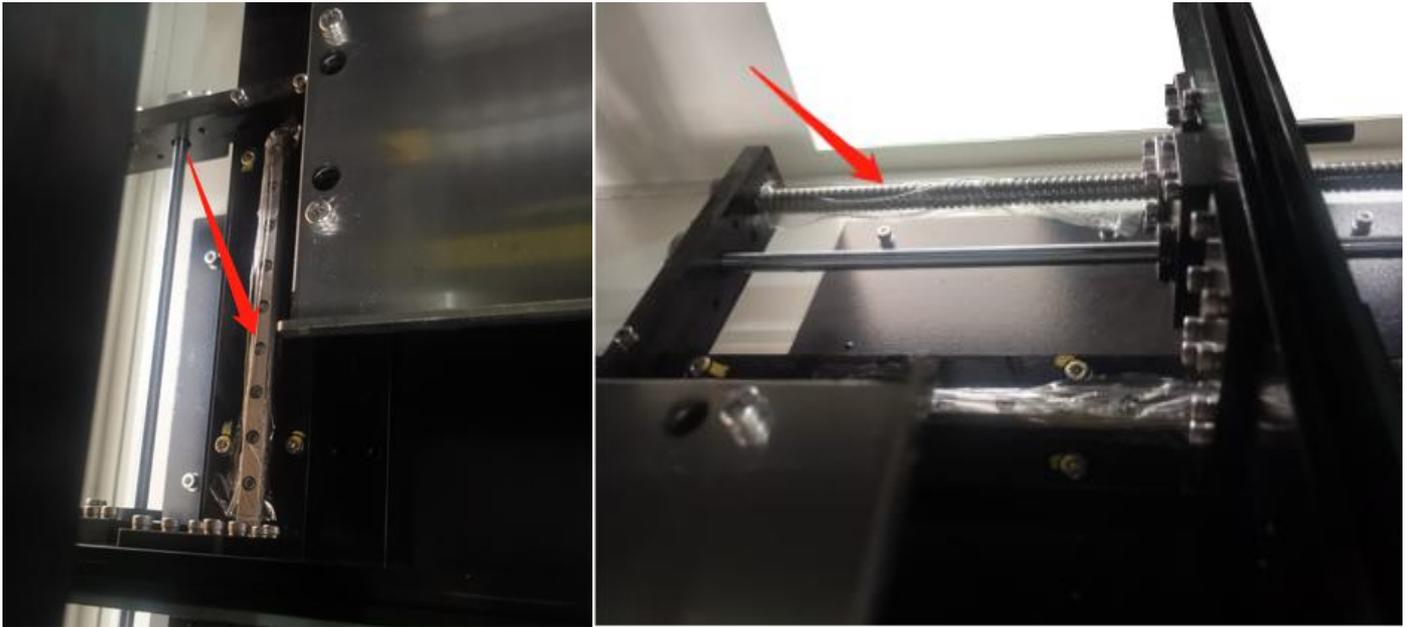
Figure A Anti-rust protective film

Figure B： **rail left and right drive ball screw;**

Figure C： **Y-axis left and right movement linear guide;**

Figure D： **rail left and right movement linear guide;**
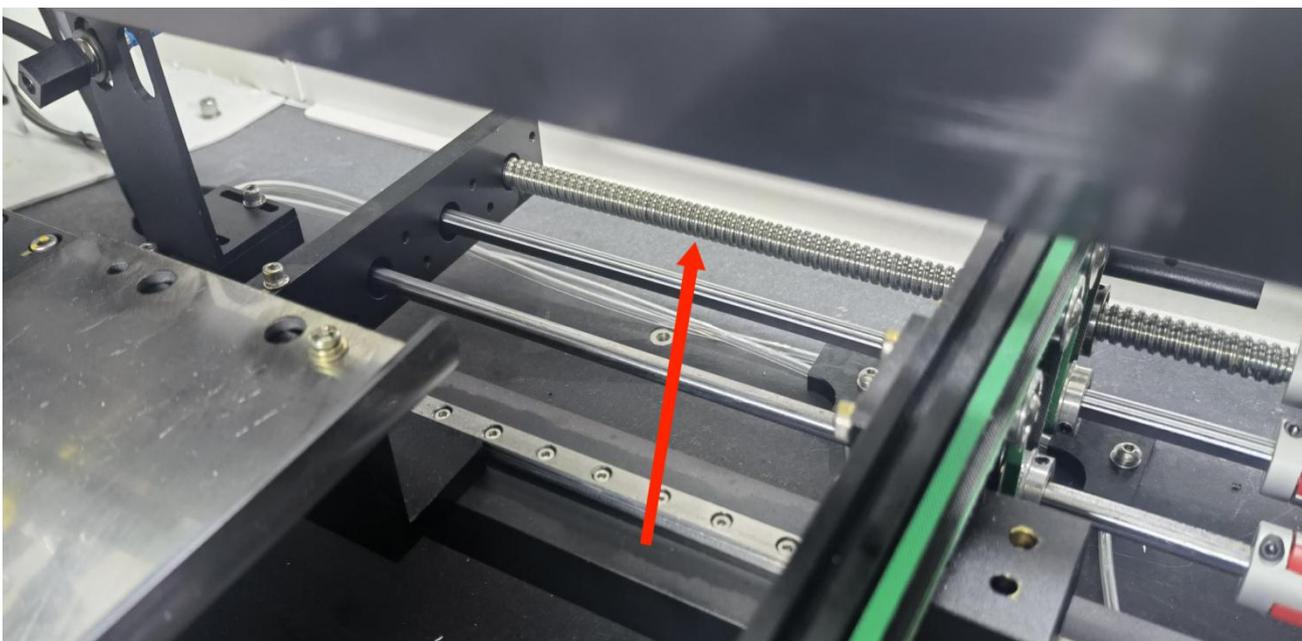
Figure B
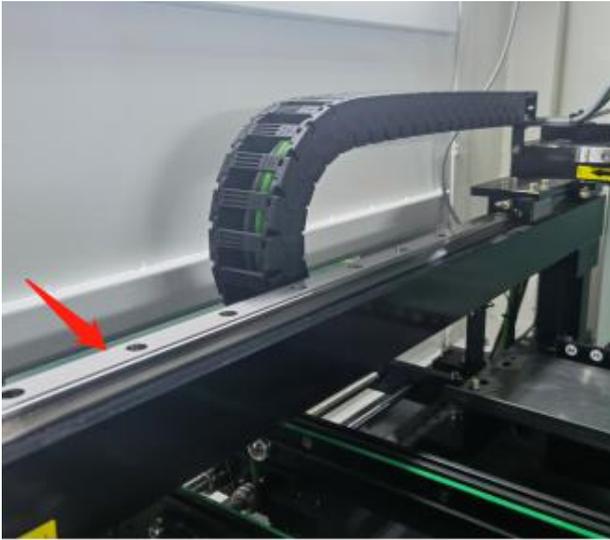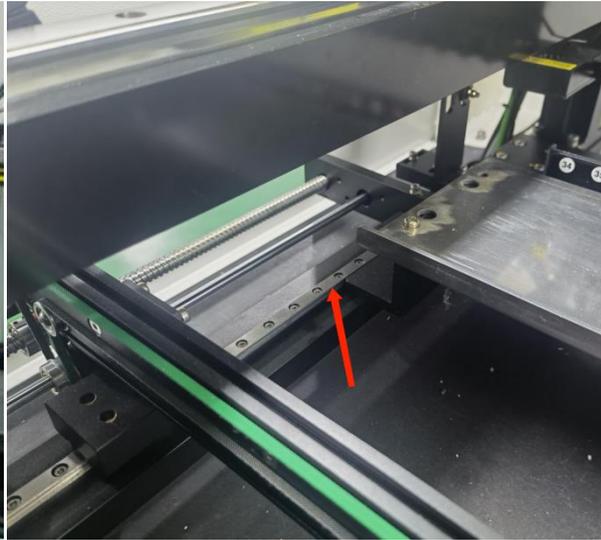
| Figure C | Figure D |

2.1 Important Notes

⚠️ **Warning of failure risk of camera identification, refer to figure 3 and figure 4: the following parts are forbidden to touch or strike.**

❶ front IC camera ❷ back IC camera ❸ left mark camera ❹ right mark camera

❺ left mark camera light source ❻ right mark camera light source

⚠️ **Warning of accuracy failure risk, refer to figure 4: the following parts are forbidden to touch or strike.**

❶ Back to zero point

For the risk of accuracy failure, refer to figure 4: when moving XY axis manually,pull or push should be performed at the moving force point.

Warning of electric shock risk, be sure to follow the requirements below:

❶ Connect to the input power supply that meets the requirements of the

machine, the electrical interface of the machine to the ground must be effectively

grounded.

❷ Any time you enter the case or repair the placement head, you need to shut

down the machine and cut off the power supply.

Warning of machine lifespan reduction risk, be sure to follow the requirements

below:

❶When installing the machine, the machine must be leveled;

❷Correct shutdown: first shut down the operating software and the system,

before turning off the main power switch.

figure 6- oil-water separator   figure 7-feeder pressure 0.55MP

the air supply shall not be less than 0.6MP

Note: when the pressure input is 0.6MPA, the air flow is 37L/min.It is recommended that users use a compressed air storage tank of no less than 70L.

2.2 Machine Structure of NeoDen10

figure 1-Ports and Appearance

(1) Warning Light (Triple Color)	(7) USB port
(2) Safety cover	(8) Pause button
(3) Front Feeder Slots 1-33 (Reference value)	(9) Mouse keyboard bracket
(4) Electric Feeder Port	(10) Power Switch
(5) Display	(11) Air source input
(6) Emergency Button	(12) Heavy load pedestal

2.3 Machine dimension
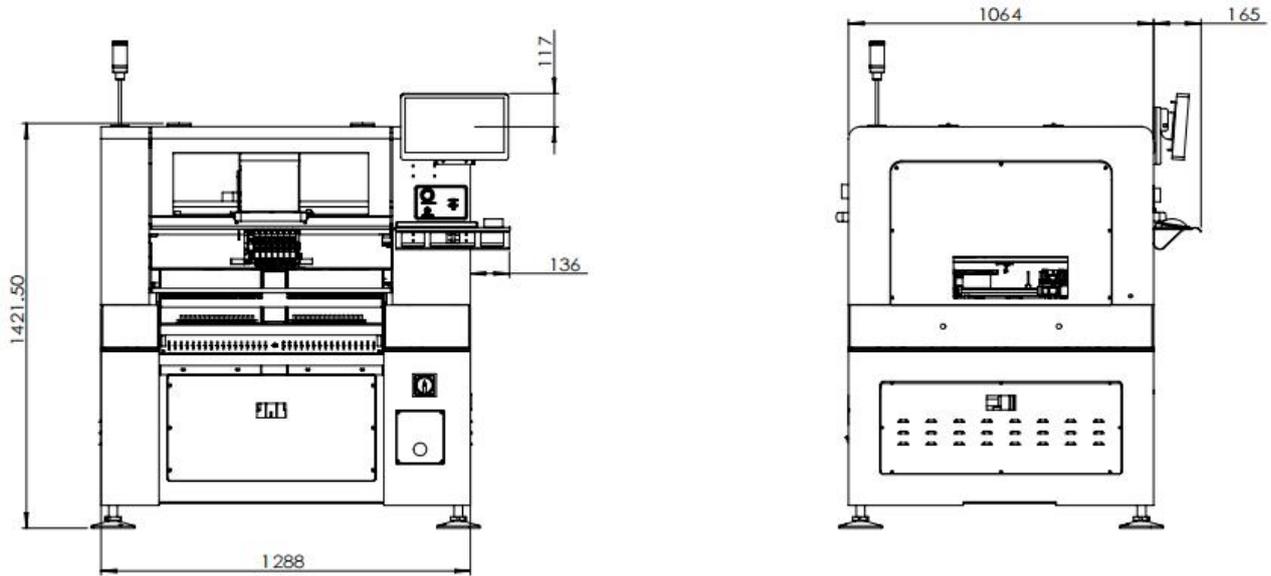
figure 2 –machine dimension

2.4 Working area structure

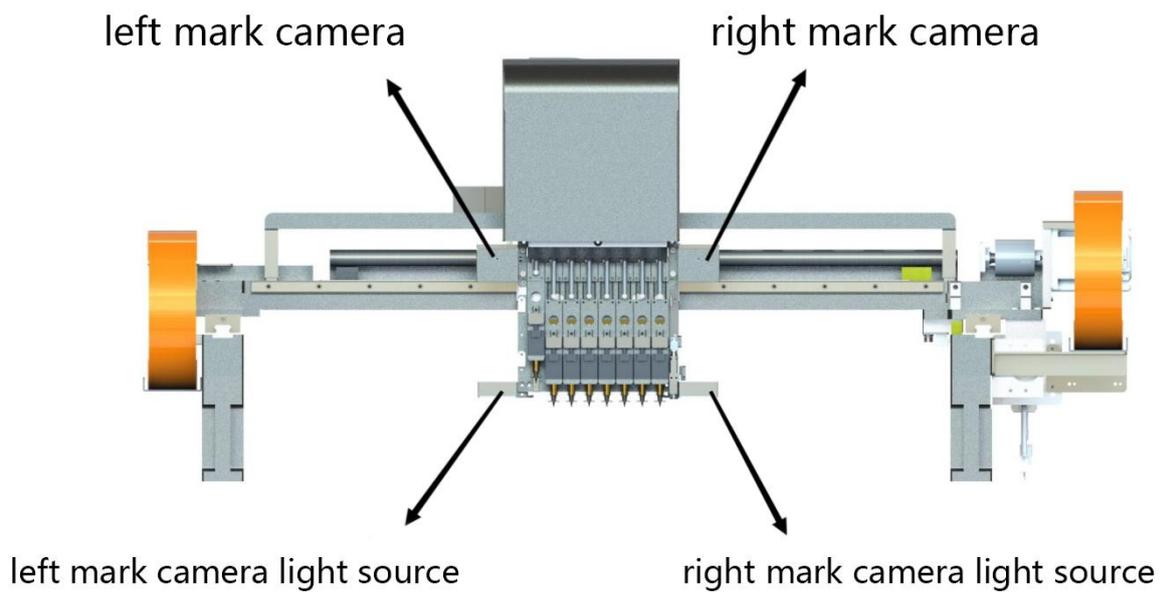left mark camera   right mark camera

left mark camera light source   right mark camera light source

figure 3- Main placement head camera

back IC camera

back to zero point

rail 1

front IC camera

rail 2

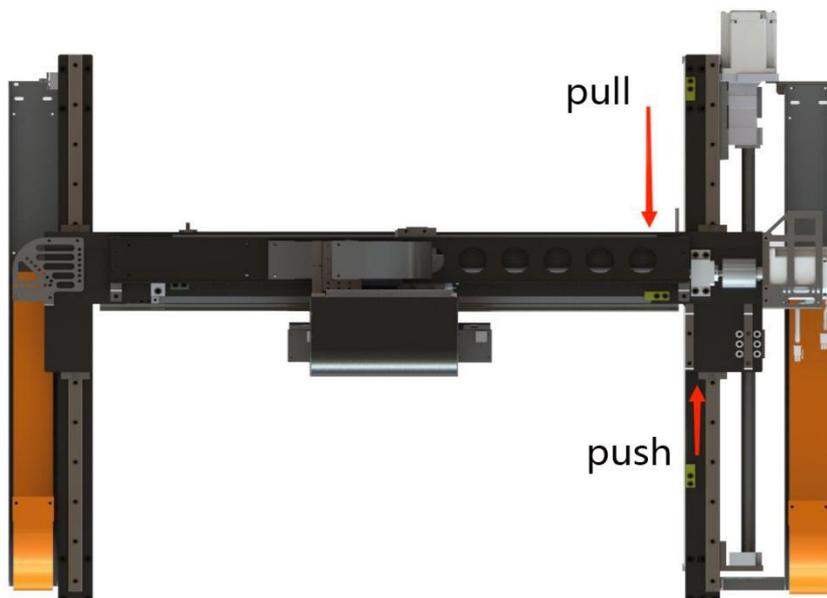automatic align point

rail 3
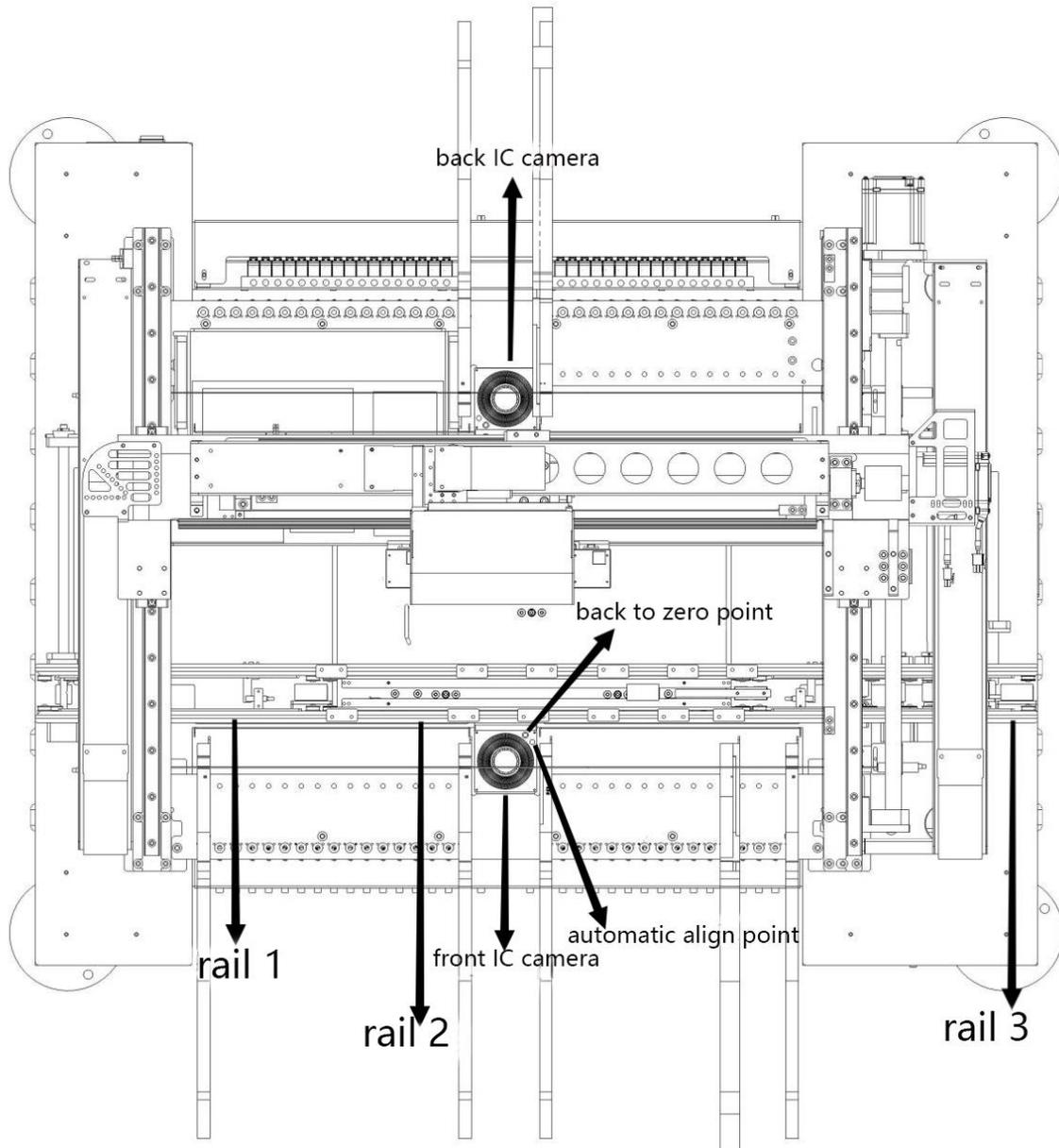
pull

push

figure 4-top view of main mounting area

figure 5-X axis beam（pull and push at the moving force point as above picture）

2.5 Operation flow chart

NO.	Flow chart	Note
1	**Start-up steps** **Preparation** ↓ **Power ON** ↓ **Automatic** ↓	1. The pick and place machine is a precision equipment. In the installation position of the machine, it is necessary to carry out horizontal correction before and after the equipment to prevent the uneven operation of the equipment from damaging the service life of the equipment; 2. Connect and fix the equipment interface before and after the equipment, and connect and fix the ground wire; 3. The access power must meet the requirements of power identification; 4. No less than 0.6mp air source input and adjust the pressure value to OK; 5. Check the safety of the working area of the mounting head; 6. The XY transmission parts are not fastened and interfered, and check that the emergency stop switch is in normal state;
2	**Power on page** ↓	Power on and turn the power switch clockwise;
3	**Program and Edit; Production** ↓　**Modify**	1,　1. When the self-test is carried out, the head indicator light of the mounting head and the light source of the IC camera will be on and flash briefly to indicate that the self-test is normal; 2,　XY initialization (origin reset) is normal, the software enters the file list interface, and no error report pops up;
4	**Mounting** Abnormal	After power on, directly enter the file list page;
5	**Shutdown steps**	See page 10 for the introduction of machine operation for details;
6	**Production Finished** ↓ **Exit** ↓	Suggestions on production process: 1. First component confirmation: confirm the component angle and polarity, component picking position and mounting position; 2. Start production after confirming solder paste printing and temperature setting;
7	**Software shut down** ↓	Production process;
8	**System shut down** ↓	After the production is finished, reset the origin and prepare to shut down;
9	**Power OFF**	Shut down the system via computer, then power off the machine.
10		Disconnect the electricity supply after the system being powered off.

11		Keep the machine clean, daily maintenance of the nozzles assures high utility.

2.6 Flow chart of making a programming file
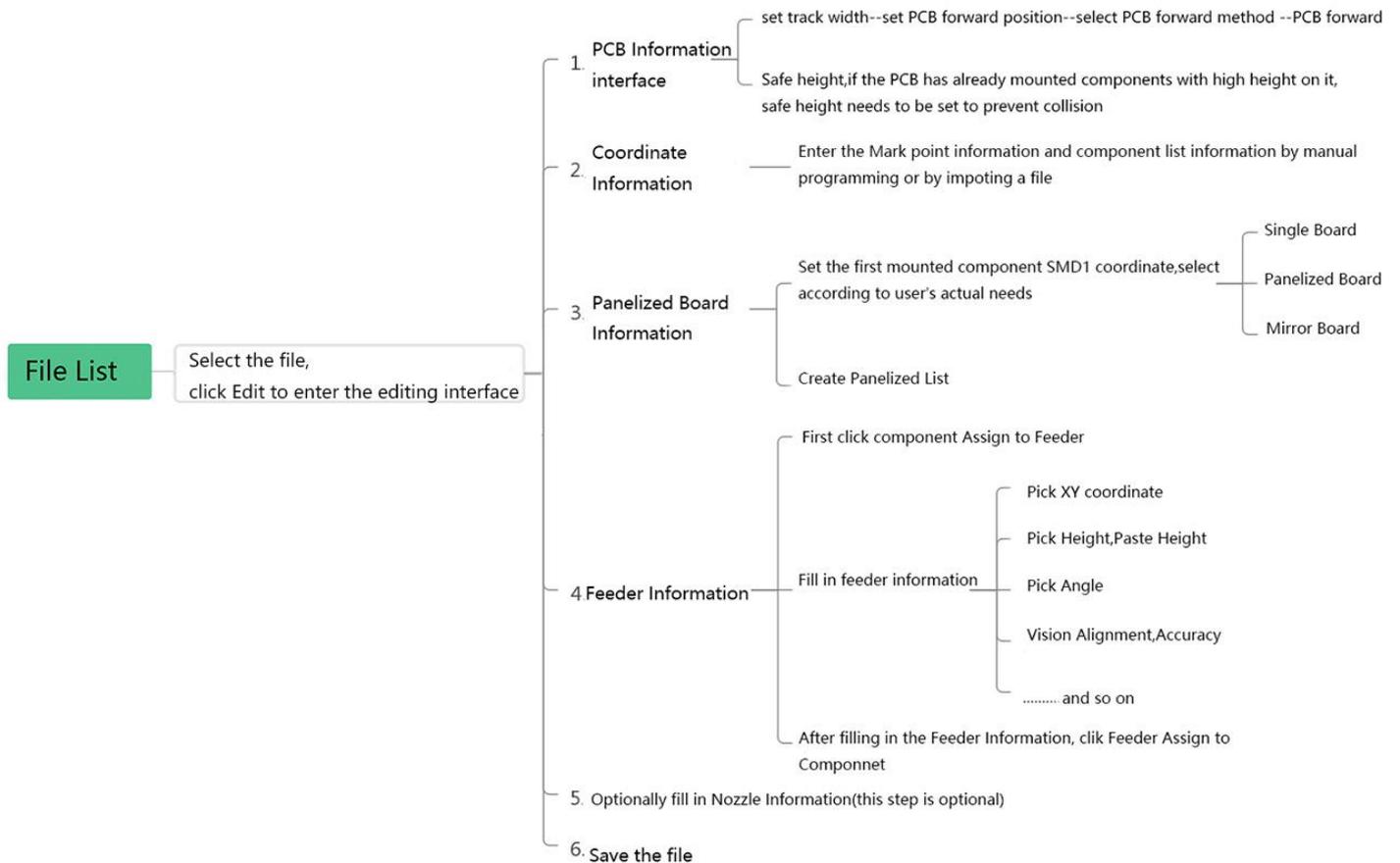
Note:

A. The basic procedure of making a programming file by manual programming or import coordinate file is similar, but there are two different parts: component list and fiducial setting.

B. Please find the detailed operation steps of the differences on relative page.

3. File List Introduction

(1) Excel Open：The Excel table of the file can be modified directly in the table for some routine operations, simplifying the programming operation.

(2) Edit: select a file and click Edit to enter the corresponding editing interface.

(3) Processing: after editing the file and checking the correctness, select the file and click mount button.

(4) Export file: After connecting an U disk, select the file and click Export, after the successful notice pops up, the export is finished.

(5) Import from U disk: for the files that have been edited offline, they can be directly imported from U disk for mounting. After connecting U disk, click Import from U disk, select the corresponding files in the new window, and click OK. When the imported files are showed in the file list, the operation is finished.

(6) Delete: select the corresponding file, click delete, a prompt window will pop up, and click Yes.

(7) Copy: select the corresponding file, click Copy, and the file list will generate a file of xxxcopy1. In order to prevent misoperation, a new file can be copied before operation.

(8) Add a new file: click Add to open the input window, input the file name, and click OK. At this time, when the file list interface displays new files, the operation is successful.

4. PCB Information Editing

In File List interface, select the file to edit,enter to PCB Information interface, as show in the figure:
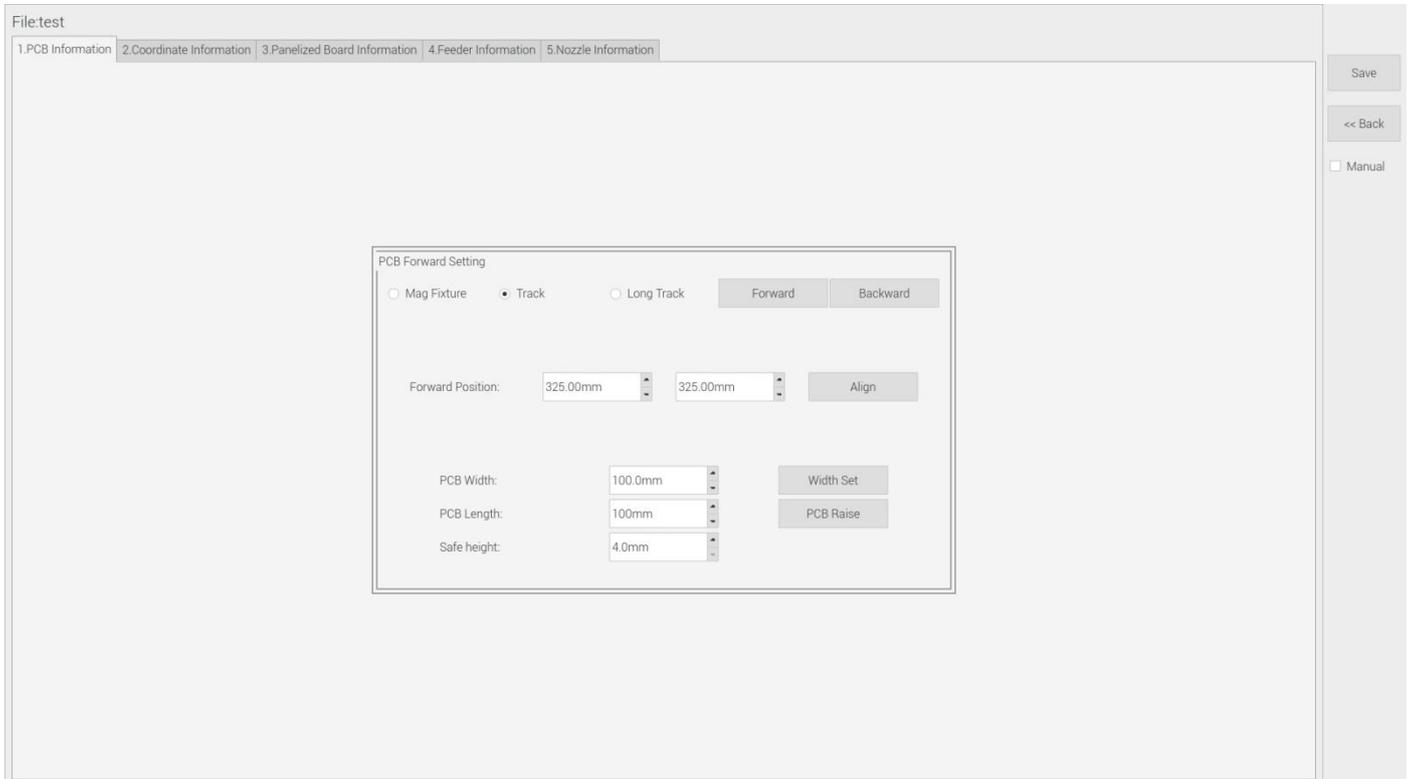
First, set the track width,adjust the track width according to the actual PCB width(usually actual PCB width plus 1mm),click Width Set,follow the prompt window to check whether back to zero condition are met.After back to zero, the track width will be adjusted.After placing the PCB on the track,gently push the PCB back and forth by hand to confirm that the PCB has a small gap of about 1mm in the track, so that the PCB can pass smoothly.

Secondly,set PCB Forward Position(note:Mag Fixture mode does not need to set Forward Position),click Align,select the Forward Position according to the image recognized by Mark camera,select the Alignment Method nozzle 1, click save and back,Forward Position is recorded ans saved.

4.1 PCB Forward Setting

There are three ways in PCB Forward Setting---Mag Fixture,Tracks,Long Tracks

（1）Mag fixture

Select tray to fix the board feeding mode, place the PCB to be installed in the proper position in the mounting area, and then click "top plate control" to fix the PCB.

（2）Tracks

Select the "Tracks"on PCB Feed Setting interface:

Tracks width setting:Set correct PCB width value until the PCB can move smoothly

PCB Feed Test:Put PCB to "Tracks Section 1",Click "forward", PCB will move to "Tracks section 2" and stop at the cylinder thimble position through the sensor,cylinder will raise the PCB, then thimble will go down, PCB feeding complete.

（3） Long Tracks

Select the "Long Tracks"on PCB Forward Setting interface, first enter the number of track segments(each segment corresponds to a file, the number of the file is corresponding to the number of the segment).Take 3-segment files as an example, for first file, the number of segment is input 1;for second file,the number of segment is input 2;for third file, the segment is input 3.
Secondly, set the board Forward Position. When editing long tracks file, only for first file, you need to set Forward Position,for second file and third file, you do not need to set Forward Position.Finally,click Forward,the track will transport PCB to the position of cylinder thimble. The blocking pin will block the PCB.The cylinder thimble will raise the PCB. The blocking pin will return. The board feeding is completed.

The operation method of long tracks placement is as following: (1)In the long track mode(placement of three sections), three separate files need to be edited.(2)the naming requirements are as follows:add an underscore after the second file name and the third file name(the underscore is English format)+the corresponding number of the file, there can not be any space in the file name, the file name is as follows:

When want to do mount of the finished working file,need choose the phase 1 file(e.g. long),then click mount.(the long tracks also support mount 2 phases,then only need create 2 working files).

Working Step description of Long tracks mode in mounting: The long tracks sends feed signal to the front conveyor, and feed PCB to cylinder thimble 1 position, cylinder will raise the PCB,then thimble 1 will go down,PCB feeding phase 1 is completed.After above placement is completed, the PCB in the waiting area is released, feed to cylinder thimble 2

position, cylinder will raise the PCB,then thimble 2 will go down,PCB feeding phase 2 is completed.After above placement is completed, the PCB in the waiting area is released, feed to cylinder thimble 3 position, cylinder will raise the PCB,then thimble 3 will go down,PCB feeding phase 3 is completed.

4.2 PCB Eject setting

After click "Eject"no matter under Mag fixture or Track mode,the thimble will go down in "track section 2",track section 2 and 3 begin to work and PCB will feed to back above the sensor position. If there's SMT conveyor connected and release signal to pnp machine,PCB will be automatically transit into SMT conveyor.

5. Panelized PCB Edit

5.1 Panelized PCB origin (SMD1 coordinate)

Function: This is mainly to determine the first component on single or panelized PCB of manual program or imported file. The principle is to collect and calculate the data of each board's relative spacing, in order to achieve the calculation of the real coordinate.

5.1.1 Single board:

Click "single board setting", you will see the "align" button of the SMD1 position that means the first component on the component setup. Click "align" to enter the vision align interface, we need find the first component that on the component list,generally we choose the center of the component, see figure
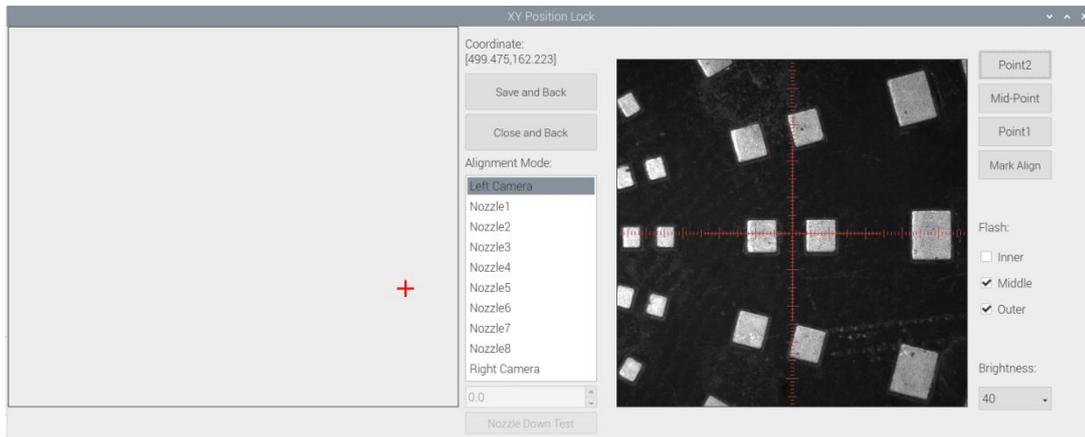
Click "Save and back", it will back to the previous interface, click "create panelized list" button, the data which on the panelized list will change.Can see the "SMD1 information"on the list and do double check via "align"button.

Notice: when you program under "Manual" mode, as we cannot assume the related PCB to be absolute 90° or 0°, we need to setting the "PCB angle" (angle deviation of PCB board compares to rails). To minimize the deviation, please select two points in parallel positions, machine can calculate the PCB angle automatically.

When you program under the mode of import coordinate file, no need to set this step. The default angle under this mode will be 0°

5.1.2 Panelized board
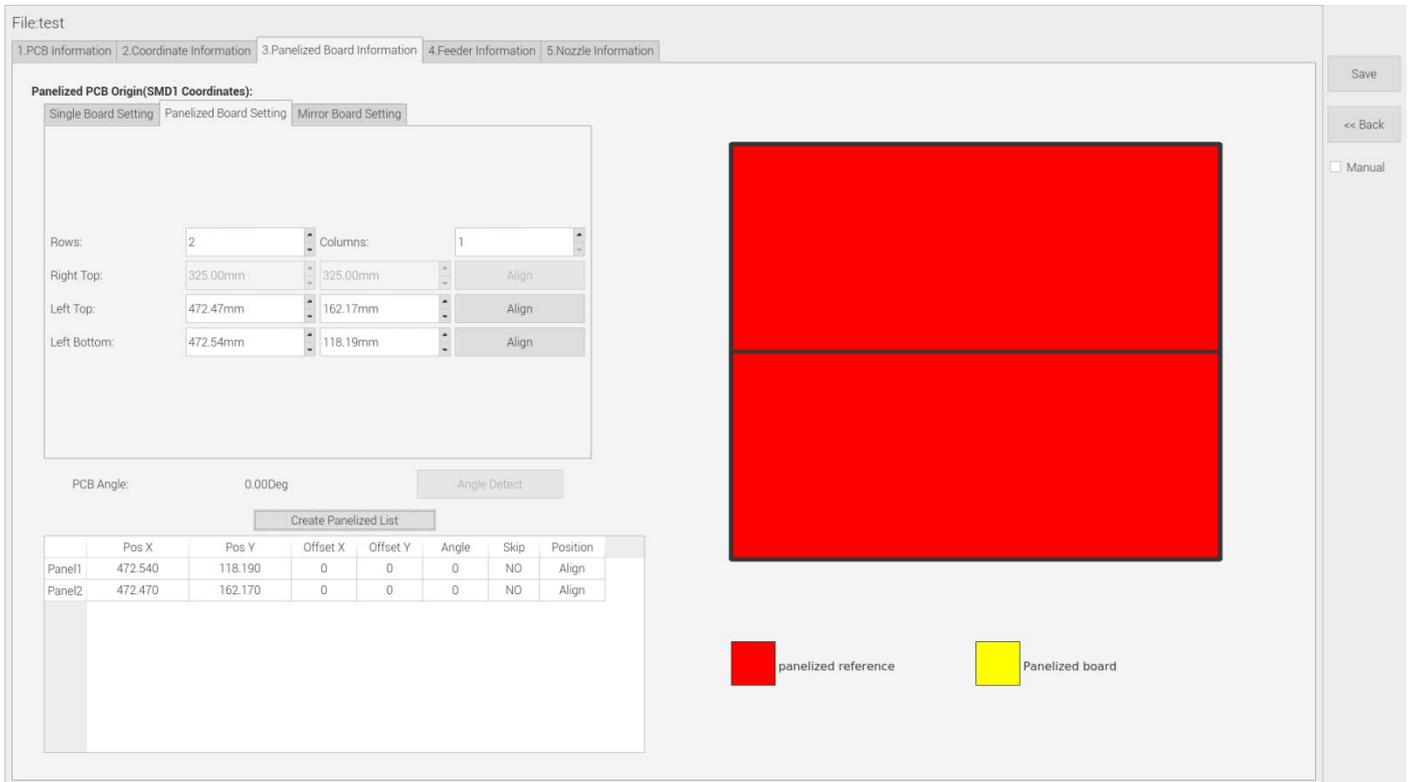
The steps of the panelized board programming are similar with the single board, but need pay some attention to several points below

(1)The row and column are determined by the positioning of PCB on working area. The direction along the rails is the column,
the direction perpendicular to the rail is row, then please enter data in the row and column.

(2)Please refer to the data collecting method of each position information as following:
●The data of "left bottom" is collected according to first component in the component list of programming file. Press "align" of left bottom, find the left bottom panel that is nearest to the left side and nearest to the feeding position, then find the first component which on the chip list of this panel, align the center of this component. After saving the data, it will return to the "PCB information" automatically.
●The data of "left top": on the alignment interface, find the left top panel that is nearest to the left side but farthest to the feeding position, then find the component same as the component that aligned on the "left bottom", align the center of this component. Click save and cancel, it will return to the "PCB information" automatically.
●The data of "right top": on the alignment interface, find the right top panel that is nearest to the right side but farthest to the feeding position, then find the same component as the component that aligned on the "left bottom", align the center of this component, click save and cancel, it will return to the "PCB information" automatically.

After setup, click "create panelized list", the panelized list will be generated accordingly in the blank. You can also double-confirm each position by clicking "Align".

5.1.3 Mirror board

The steps of the Mirror board programming are similar with the Panelized board, but need pay some attention to several points below

(1)Mirror board includes row panelized and column panelized
Row panelized: several same PCBs are arranged in horizontal direction, and the nearby rows are mirrored
Column panelized: several same PCBs are arranged in vertical direction, and the nearby columns are mirrored
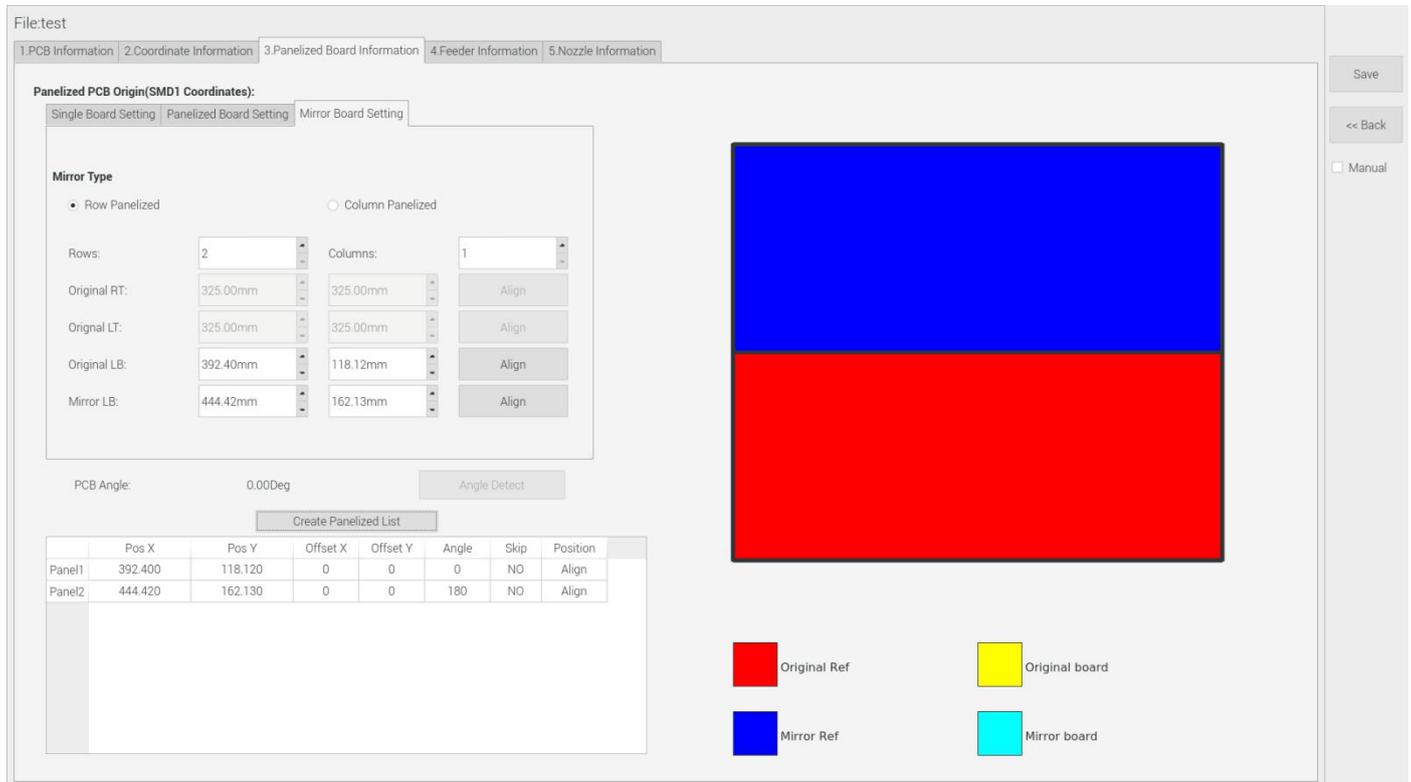
(2)Panelized Board Row and Column
The row and column are determined by the positioning of PCB on working area. The direction along the rails is the column, the direction perpendicular to the rail is row, then please enter data in the row and column.
  (3)   Please refer to the data collecting method of each position information as following:
After select the corresponding mirror board panelized method(column or row)and data of column&row, may occur the situation of the align interface turn gray and can't be edited,then no need do position align.
Based on actual mirror board data,right side is showing corresponding images and can find the first component on it.

●The data of "right top"on original board: on the alignment interface, find the right top panel that is nearest to the right side but farthest to the feeding position, then find the first component which on the chip list of this panel, align the center of this component, click save and cancel, it will return to the "PCB information" automatically.
●The data of "left top"on original board: on the alignment interface,find the left top panel,then find the component same as the component that aligned on the "right top",align the center of this component, click save and cancel, it will return to the

"PCB information" automatically.

●The data of "left bottom"on original board:on the alignment interface,find the left bottom panel,then find the component same as the component that aligned on the "right top", align the center of this component. After saving the data, it will return to the "PCB information" automatically.

●The data of "left bottom"on mirror board:on the alignment interface,find the left bottom panel,then find the component same as the component that aligned on the "right top", align the center of this component. After saving the data, it will return to the "PCB information" automatically.

After setup, click "create panelized list", the panelized list will be generated accordingly in the blank. You can also double-confirm each position by clicking "Align". Note:The angel difference between original and mirror board is 180 degree,original board is 0 degree,mirror is 180 degree.

●Skip: For the block component corresponding to the number entered in the panel number (edit box), if no placement operation will be performed, then select "Yes" in the drop-down list.

●Placement: For the block component corresponding to the number entered in the panel number (edit box), if perform placement operation, then select 'No' in the drop-down list.

●Recognition: Used for bad board detection. The current bad board detection function is still under development and cannot be used yet.

5.2 Introduction of Lock interface

Lock interface, as below fig.
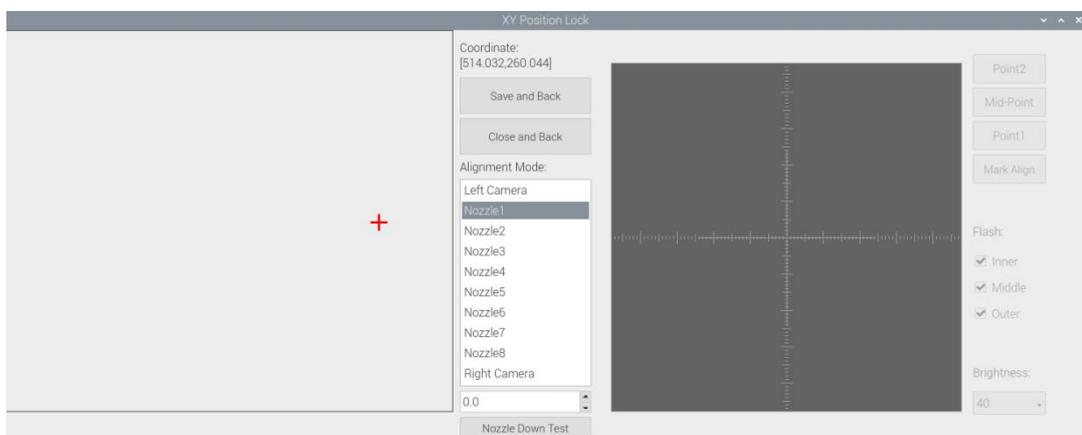
Save and back: After align the center of components,click "save and back"to save the date.

Close and Back: Refer to exit the current interface.

Align method：Include left mark camera,nozzle 1-8,right mark camera,choose the alignment method according to the actual situation,right side will show the real image by mark camera alignment.

Nozzle Down Test：

When mark cameras are selected as the alignment mode, this function is gray and inoperable.

When selecting nozzle 1-8, this interface turns black and can be operated. The user must first lock the position, enter a reasonable height value, and then click the nozzle down test button to measure whether the reclaiming height is reasonable.

(Note: when locking the interface to test the reclaiming height of feeder, feeder will not open automatically. You can select the material above the edge of the component to measure.)

Point 1, Point 2, Mid-point：This operation is used to select the center position of some components.

For example, select " left mark camera" as alignment mode. First select the center of the first pin of the lower left foot of the chip, click "point 1", then select the pin center of the upper right foot opposite to left 1, click "point 2", and then click the middle point. The machine will automatically calculate the center position of the chip.

Light source: outer ring,middle ring,Inner ring,Mark point generally select to use outer or inner ring,select corresponding light source according to PCB kind.

Brightness: Image recognize brightness can be adjusted on the drop-down list.

6. Coordinate information

6.1 PCB Mark setting

Function: After finishing mark setting, when the machine is working, the specific position and direction of PCB can confirm via setting mark. Only in this way the next step of mounting work can carry out.PCB mark setting interface see below fig.

File:test

| 1.PCB Information | 2.Coordinate Information | 3.Panelized Board Information | 4.Feeder Information | 5.Nozzle Information |

PCB Mark Setting
○ Panelized Mark Point   ● Single Mark Point

Mark Point Alignment
○ Manual Alignment   ● Auto Alignment

New   Delete

Save

<< Back

☐ Manual

	Pos X	Pos Y	Min	Max	Flash	Brightness	Range	Circle Degree	Mode	Camera
Mark1	4	4	0.8	1.2	Inner and middle	20	4	80	White Point	Left Camera
Mark2	38	40	0.8	1.2	Inner and middle	20	4	80	White Point	Left Camera

(1) Panelized mark point

It is mainly used for multiple identical PCB boards consistent of the whole board, when place every panel board, the machine will rescan small panel board's mark point.

(2) Single mark point

It is mainly used for a single PCB board and multiple identical PCB boards consistent of the whole board (Notice: coordinate programming is done as a single board)
Generally, need to select 2 or 3 mark points.

(3)Manual alignment:
If the fiducial point quality is poor and the recognition is not accurate, the reference position can be determined manually. If there is no fiducial point on the PCB, which can through some location holes and set up some special reference point manually to replace and confirm reference position. Note: Generally use SMD1 coordinate in chip list and the one that is relatively easy to find far away from SMD1 as fiducial points .In this way, the relative placement effect will be better during placement, the reference point is determined manually.

(4) Auto alignment
The machine will scan and align fiducial points automatically.

6.2 Mark Point information

Mark point Coordinate: Import the coordinate automatically status: the data collection of mark point, which through PCB circuit board to find mark point coordinate information directly, and input directly. Manual programming status:Select mark point on the list and click "align",enter the image capture page,and then find the center of the mark point via movement, click "Mark align" see below figure, and then click "Save and Back" to go back to main page.
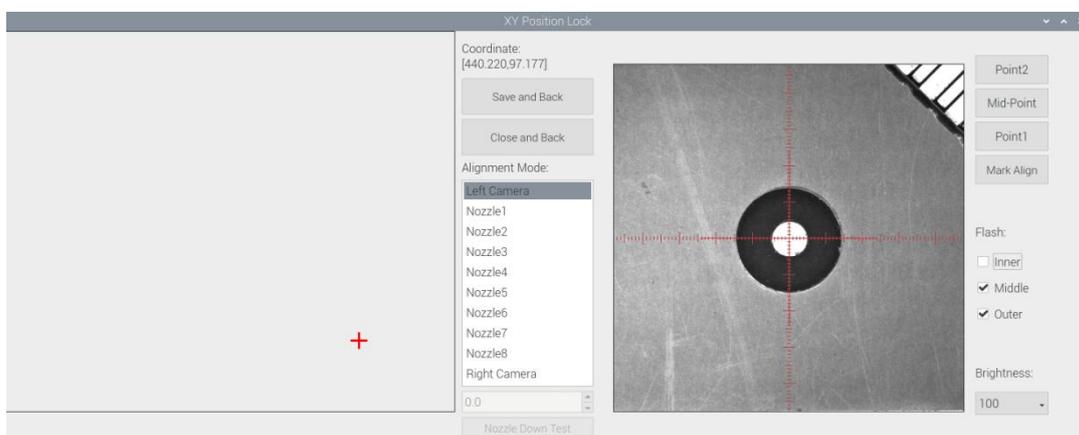
Min, max value：It means the size of mark point, it has a floated value, which can prevent recognizing mark point wrongly.

Flash：Light source divide into inner、middle、 outer、inner and middle、middle and outer, whole lights. The user can make adjustments according to fiducial point recognition situation.

Brightness：The user can adjust the brightness when align the fiducial point according to actual situation.

Range：If there are interference points near the Mark point, you can input a certain value and ensure identify the Mark point more accurately.

Circle Degree：Input reasonable circle degree value,can avoid interference from other points effectively。

Mode：Dividing into white point and black point, select black point mode if have hole and bright point,select white point mode if have bright point.

Camera：Support select left camera and right camera(user can select the camera for calibration according to the actual situation),also can select default setting camera. If user select camera that can't reach the position, the machine will use corresponding camera during work.

Mark point add and delete：Click "new" to add new fiducial point(base on mode of the latest fiducial point). Click "delete" to remove the selected fiducial point you want.

6.3 Component list setting

Function: display the information and mounting order of components. The components' quantity and mounting information can be added through manual programming or importing files , see below figure:

File:test

| 1.PCB Information | 2.Coordinate Information | 3.Panelized Board Information | 4.Feeder Information | 5.Nozzle Information |

PCB Mark Setting
○ Panelized Mark Point   ● Single Mark Point

Mark Point Alignment
○ Manual Alignment   ● Auto Alignment

[Save] [New] [Delete] [<< Back] [□ Manual]

	Pos X	Pos Y	Min	Max	Flash	Brightness	Range	Circle Degree	Mode	Camera
Mark1	4	4	0.8	1.2	Inner and middle	20	4	80	White Point	Left Camera
Mark2	38	40	0.8	1.2	Inner and middle	20	4	80	White Point	Left Camera

	Feeder	Comment	Footprint	Designator	Nozzle	Pos X	Pos Y	Angle	Place
Comp1	1	10k	0402	R1	1	325	325	0	✔
Comp2	1	10k	0402	R1	1	326	325	0	✔
Comp3	1	10k	0402	R1	1	326	325	0	✔

[Import Top Layer] [Import Bottom Layer] [Auto Programming] [New] [Delete] [Move Up] [Move Down] [Move to First] [Search designator] [To Current Position] [Position Correction] [Component division] [Batch Create]

6.3.1 Manual programming

(1)Select manual programming;

(2) The component information list displays multiple rows of sample components. First, modify the sample components: coordinate XY, click the position lock to enter the lock interface. According to the image presented by the Mark camera, find the corresponding component and confirm the center position coordinates, click save.

(3) Fill in the information of component: Stack refers to which stack No. the component located; Nozzle refers to which nozzle used to mounting the component; Specification refers to the component's value; Footprint refers to the common footprint name as 0402,0603,0805 etc; XY coordinate refers to the position of where the component is mounted, align the center position of component, it will display synchronously. Skip setting includes true or false, false means keep mounting, true means skip mounting this component. After finish all parameters' editing, the setting of first component information finish.

(4) Click 'New' to add one row on the component list. The information will exactly copy from last row. Click align to find the component's coordinate. Then click save then edit other information such as name, value, footprint and angle etc. Keep adding new component until the whole PCB finish. Please note that the stack and nozzle do not need to be edited manually. It can be set through feeder setting interface with 'Assign all sequentially' button to assign the information to component list

automatically.

6.3.2 Import the coordinate file

(1) Export the component coordinate information through computer by choosing metric system CSV format to the USB flash disk.

(2) Plug the USB into the machine, do not choose the manual programming, import the processing file by clicking related layer file import button. The right side click 'file import top layer' and the reverse side click 'file import bottom layer' . It will pop up a selecting window, choose the processing file and click save, the information will be imported to the list.
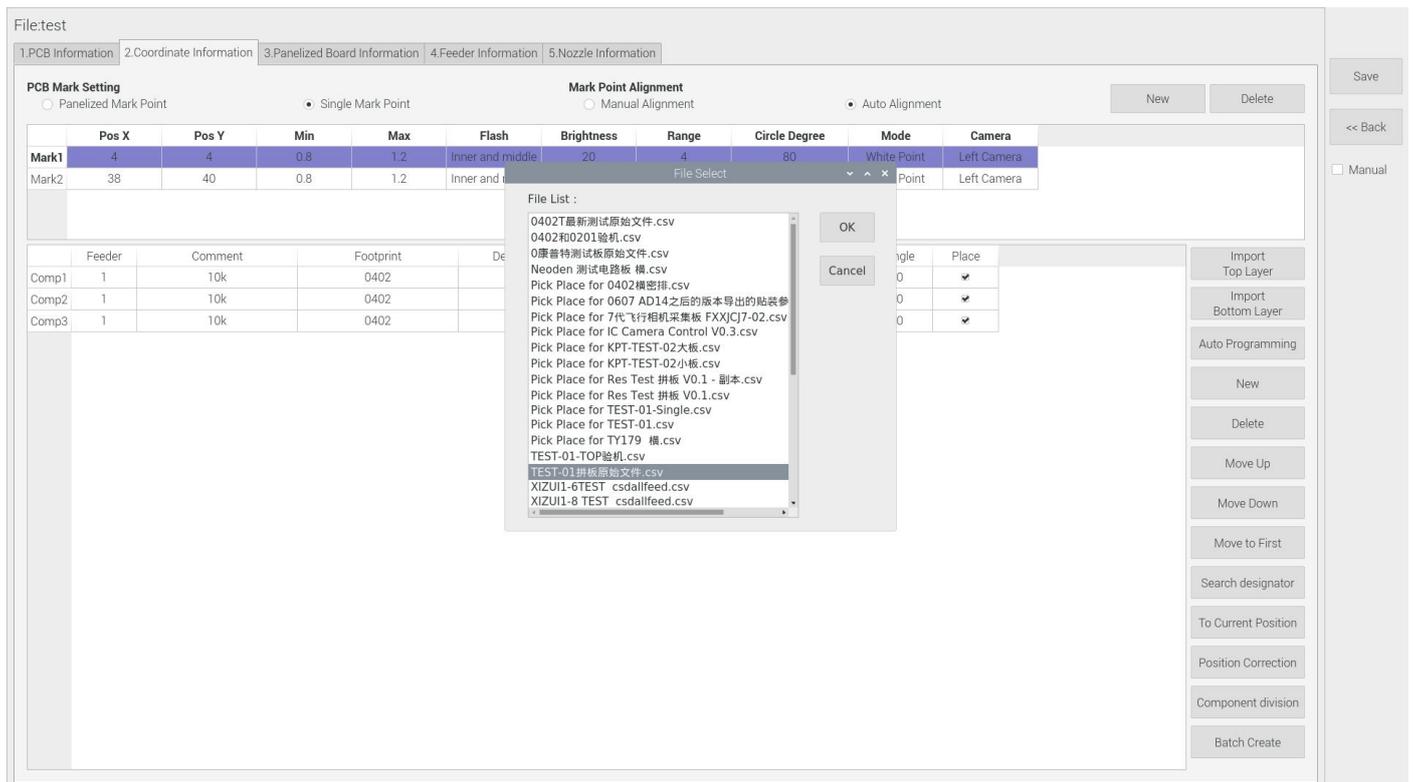
(3) Addition of component: Click 'New' , the component list will copy one row from the adjacent row, then modify the component information. Delete component: Select the wrong component row, click delete to remove the component.

(4) Movement of component

When editing, sometimes we need to do a slightly adjustment for the edited file, we have three ways of movement:

● Move up: to move the selected component upward

● Move down: to move the selected component downward

● Move to head position: To move the selected component to the first row. Please notice the first row component must be the same as the first component to place on the PCB.

（5）Search designator：it's convenient for users to find the specific components, click the seek footprint, and input footprint name in new window, click "OK" and finish.

（6）Convert to current machine coordinate

Message!

Please confirm the PCB in correct position!Press<Yes>,Mark points,Chip position and angle will be converted to current position!

No   Yes
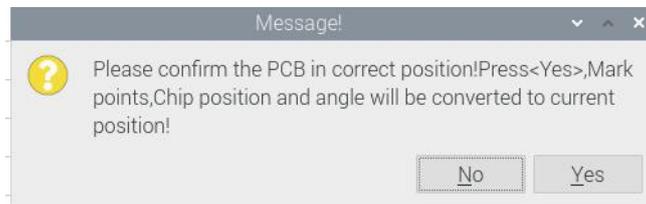
After finish all editing operation, click convert to current position. It will pop up the above dialogue, click yes, the machine will recognize the fiducials automatically and convert all component coordinate to machine coordinate. After convert successfully, it will pop up a dialogue, click align to check if the components' position are still correct.
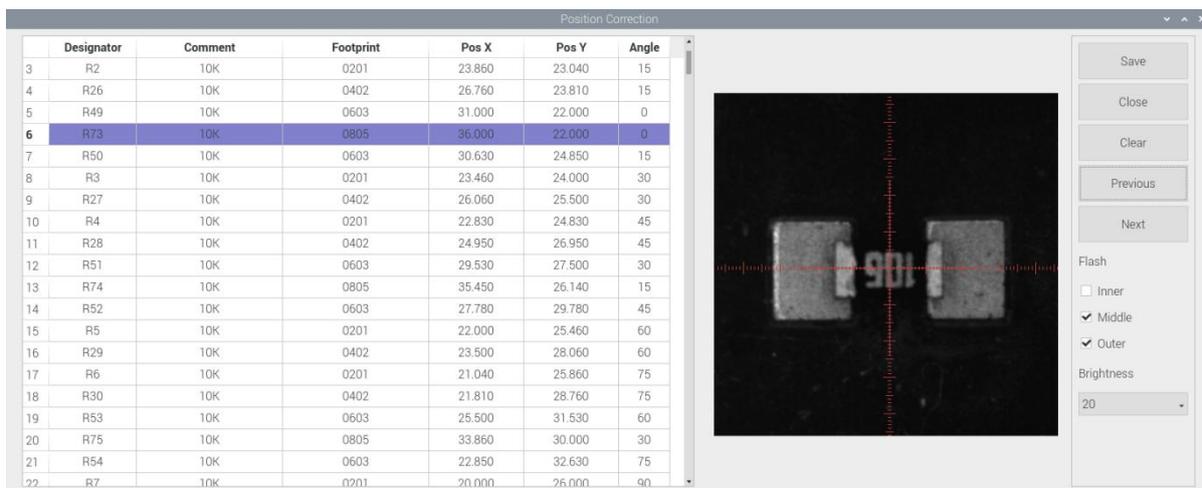
（7）Position correction

After first mounting, if there is a deviation(deviations are regular and relatively consistent), please click position correction to enter the new vision page. Click the left mouse button to align the center of the placed component; Click the right mouse button to align the center of pad. Then correct next one until finish all component and save. The machine will remember the position after correction. It will fix it automatically at the second placement

Position Correction

	Designator	Comment	Footprint	Pos X	Pos Y	Angle
3	R2	10K	0201	23.860	23.040	15
4	R26	10K	0402	26.760	23.810	15
5	R49	10K	0603	31.000	22.000	0
6	R73	10K	0805	36.000	22.000	0
7	R50	10K	0603	30.630	24.850	15
8	R3	10K	0201	23.460	24.000	30
9	R27	10K	0402	26.060	25.500	30
10	R4	10K	0201	22.830	24.830	45
11	R28	10K	0402	24.950	26.950	45
12	R51	10K	0603	29.530	27.500	30
13	R74	10K	0805	35.450	26.140	15
14	R52	10K	0603	27.780	29.780	45
15	R5	10K	0201	22.000	25.460	60
16	R29	10K	0402	23.500	28.060	60
17	R6	10K	0201	21.040	25.860	75
18	R30	10K	0402	21.810	28.760	75
19	R53	10K	0603	25.500	31.530	60
20	R75	10K	0805	33.860	30.000	30
21	R54	10K	0603	22.850	32.630	75
22	R7	10K	0201	20.000	26.000	90

Save
Close
Clear
Previous
Next
Flash
☐ Inner
☑ Middle
☑ Outer
Brightness
20

(8)Component division: divide one kind of component multiply, input footprint, comment, qty etc. according to the prompt dialog box. After division, the divided ones will be marked with [xx] in comment column (such as the comment of 104, it will show as 104[1], 104[2], 104[3])
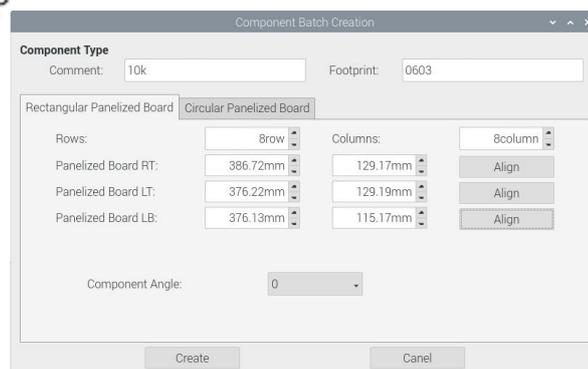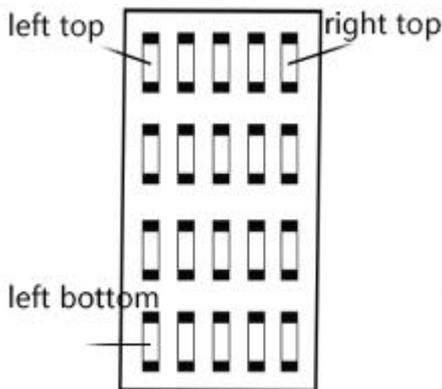
(9) Batch create components

Some circuit boards are relatively regular and easy in real editing situation. For this type of circuit board, we can generate coordinate in batch , the interface as shown in figure:
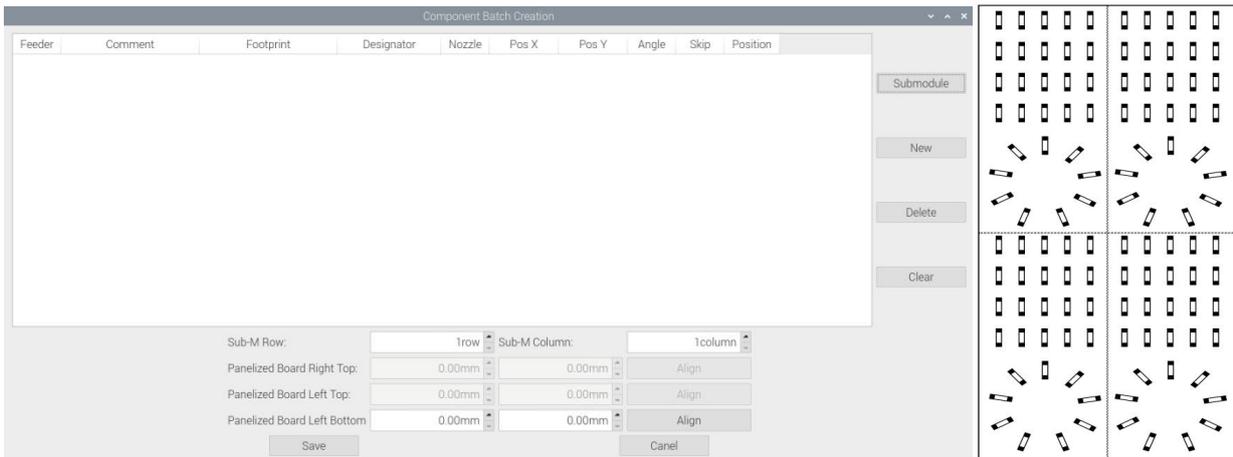
For example: we can see the above picture which has a rectangular block and a circular block to form a small panel. We call such panel as submodule. We can generate the whole panel board through creating a submodule. Two ways to generate submodules: rectangle and circle. ·

1) The way to generate rectangle panel: Click: "submodule", below dialogue will pop up. Please fill in specification and footprint of component. We can see the panel has four rows and five columns. Fill in 4 rows and 5 columns in the dialogue, and align the three components(right top, left top, left bottom). The component degree will be based on actual situation. Click "create", the machine will generate all the coordinate automatically.

2) The way to generate circle panel

- When the quantity of component is even: Click: "batch create", below dialogue will pop up. Please fill in specification and footprint of component. Choose circle panel, the component number is 24 in the example, the angle is 0. Since the quantity of component is even number, we only need to find two symmetry components to align, Start point and Component point 2. After that, click create, the 24 components coordinate will be generate Automatically
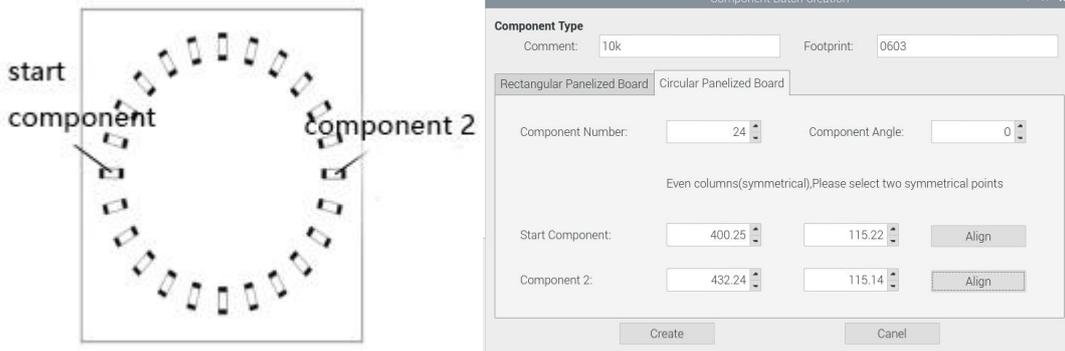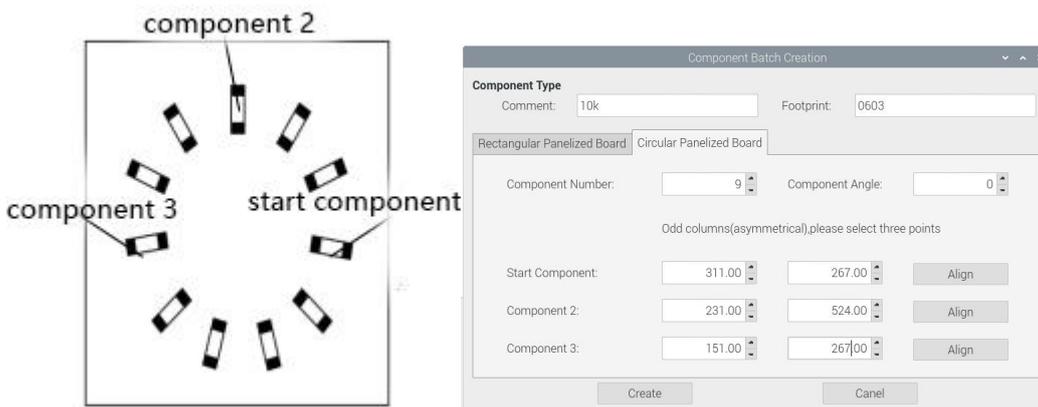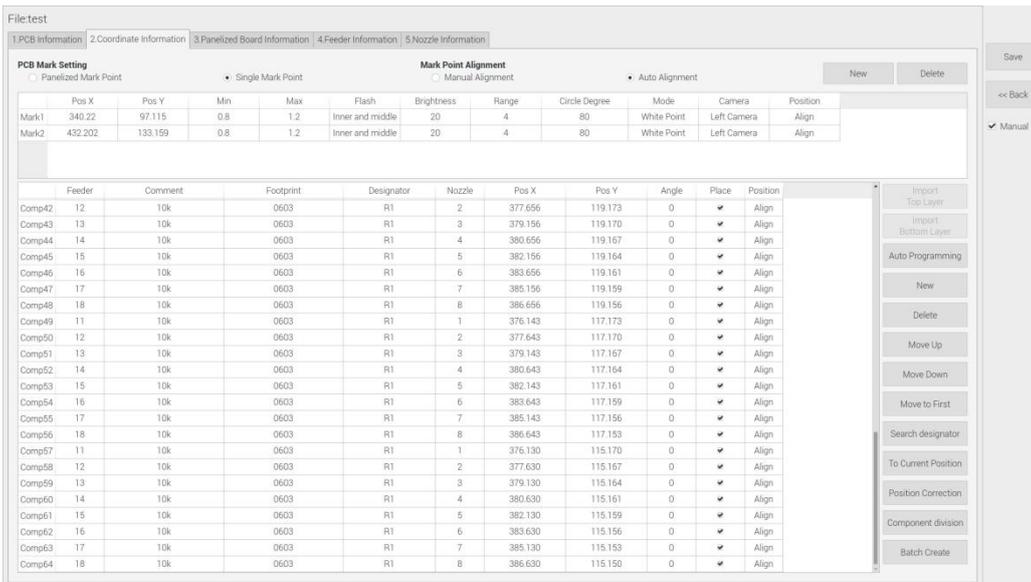
图（2.1.3.2-6）

● When the quantity of component is odd: the component type will be the same. We can see that the panel has 9 components , as the quantity number is odd, we need to find 3 components that are in isosceles triangle, and then align the coordinates of those three points in turn. Click 'create' to generate 9 components' coordinate in circle panel.

All components setting on this files list, like: nozzle selecting, stack setting, the location of pick components, adjustment setting, and others components' setting need to be finished here.

	Feeder	Comment	Footprint	Designator	Nozzle	Pos X	Pos Y	Angle	Skip	Position
Comp1	11	10k	0603	R1	1	376.220	129.190	0	□	Align
Comp2	12	10k	0603	R1	2	377.720	129.187	0	□	Align
Comp3	13	10k	0603	R1	3	379.220	129.184	0	□	Align
Comp4	14	10k	0603	R1	4	380.720	129.181	0	□	Align
Comp5	15	10k	0603	R1	5	382.220	129.179	0	□	Align
Comp6	16	10k	0603	R1	6	383.720	129.176	0	□	Align
Comp7	17	10k	0603	R1	7	385.220	129.173	0	□	Align
Comp8	18	10k	0603	R1	8	386.720	129.170	0	□	Align
Comp9	11	10k	0603	R1	1	376.207	127.187	0	□	Align
Comp10	12	10k	0603	R1	2	377.707	127.184	0	□	Align
Comp11	13	10k	0603	R1	3	379.207	127.181	0	□	Align
Comp12	14	10k	0603	R1	4	380.707	127.179	0	□	Align
Comp13	15	10k	0603	R1	5	382.207	127.176	0	□	Align

Submodule

New

Delete

Clear

Sub-M Row:	1row	Sub-M Column:	1column
Panelized Board Right Top:	0.00mm	0.00mm	Align
Panelized Board Left Top:	0.00mm	0.00mm	Align
Panelized Board Left Bottom	0.00mm	0.00mm	Align

Save   Canel

Click save, it will generate related component list as below:

（10） Auto programming: After import the coordinate file into component list (or manually programmed the coordinate file), click "Auto programming", it will turn to the related interface:

① The first interface is"1/5 place order edit", it is component list information, you can directly click "Next"
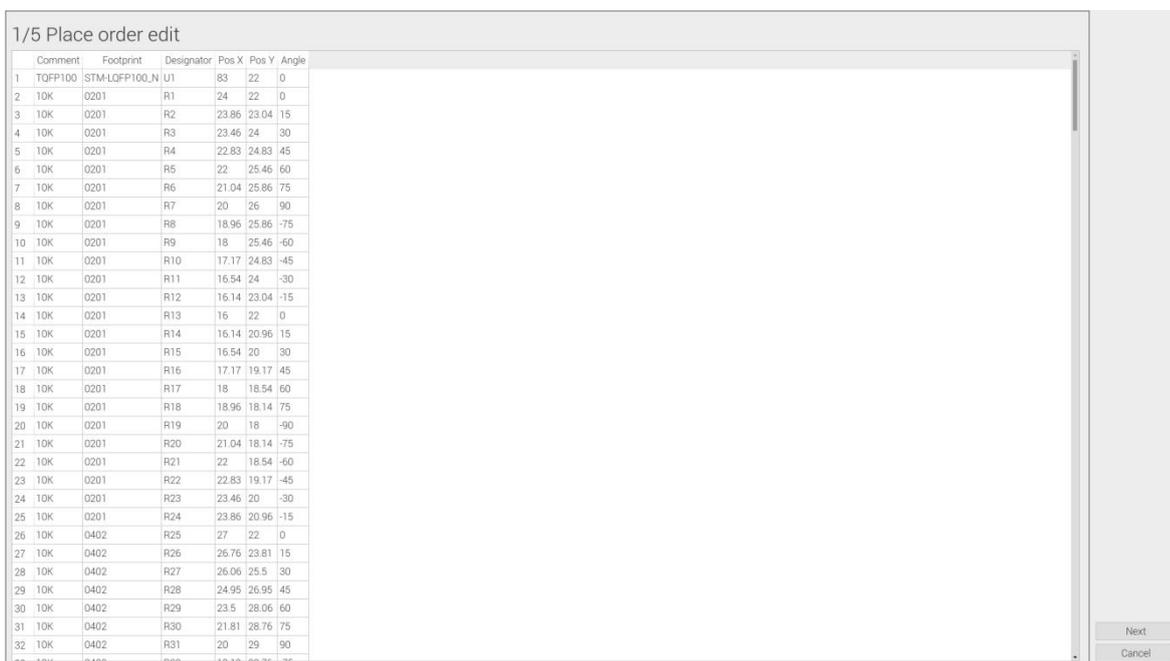
② The second interface is "2/5 New footprint edit". Left part is the footprint library (includes component L/ W/ T, nozzle type, feeder type etc.); Middle part is footprint alias library (for the same footprint, different engineers have their own naming conventions, so we call it "footprint alias library"); Right part is new footprint list (if there's new footprint which not in the left footprint library, it will be showed in this area)

Footprint library

#	Footprint	Length (mm)	Width (mm)	Thick (mm)	Nozzle Type	Speed (%)	Pick delay (ms)	Place delay (ms)	Accuracy	Capture type	Brightness	Feeder Type
1	01005[0402]R	0.4	0.2	0.13	CN030	100	20	20	High Speed	Fly Calib	80	Feeder 8mm
2	0201[0603]R	0.6	0.3	0.23	CN040	100	20	20	High Speed	Fly Calib	80	Feeder 8mm
3	0402[1005]R	1	0.5	0.35	CN040	100	20	20	High Speed	Fly Calib	80	Feeder 8mm
4	0603[1608]R	1.6	0.8	0.45	CN065	100	0	0	High Speed	Fly Calib	80	Feeder 8mm
5	0805[2012]R	2	1.27	0.55	CN065	100	0	0	High Speed	Fly Calib	80	Feeder 8mm
6	1206[3216]R	3.2	1.6	0.55	CN065	100	0	0	High Speed	Fly Calib	80	Feeder 8mm
7	1210[3225]R	3.2	2.5	0.55	CN065	100	0	0	High Speed	Fly Calib	80	Feeder 8mm
8	1812[4632]R	4.6	3.2	0.55	CN140	100	0	0	High Speed	Fly Calib	80	Feeder 12mm
9	2010R	5	2.5	0.55	CN140	100	0	0	High Speed	Fly Calib	80	Feeder 12mm
10	2512R	6.35	3.2	0.55	CN140	100	0	0	High Speed	Fly Calib	80	Feeder 12mm
11	01005[0402]C	0.4	0.2	0.2	CN030	100	20	20	High Speed	Fly Calib	80	Feeder 8mm
12	0201[0603]C	0.6	0.3	0.3	CN040	100	20	20	High Speed	Fly Calib	80	Feeder 8mm
13	0402[1005]C	1	0.5	0.5	CN040	100	20	20	High Speed	Fly Calib	80	Feeder 8mm
14	0603[1608]C	1.6	0.8	0.8	CN065	100	0	0	High Speed	Fly Calib	80	Feeder 8mm
15	0805[2012]C	2	1.27	1.27	CN065	100	0	0	High Speed	Fly Calib	80	Feeder 8mm
16	1206[3216]C	3.2	1.6	1.6	CN140	100	20	20	High Speed	Fly Calib	80	Feeder 8mm
17	1210[3225]C	3.2	2.5	2.5	CN140	100	20	20	High Speed	Fly Calib	80	Feeder 8mm
18	1812[4632]C	4.6	3.2	3.2	CN140	100	20	20	High Speed	Fly Calib	80	Feeder 12mm
19	2010C	5	2.5	2.5	CN140	100	20	20	High Speed	Fly Calib	80	Feeder 12mm
20	2512C	6.35	3.2	3.2	CN140	100	20	20	High Speed	Fly Calib	80	Feeder 12mm
21	A-3216	3.2	1.2	1.6	CN140	100	20	20	High Speed	Fly Calib	80	Feeder 8mm
22	B-3528	3.5	2.2	1.9	CN140	100	20	20	High Speed	Fly Calib	80	Feeder 8mm
23	C-6032	6	2.2	2.5	CN140	100	20	20	High Speed	Fly Calib	80	Feeder 12mm
24	D-7343	7.3	2.4	2.8	CN140	100	20	20	High Speed	Fly Calib	80	Feeder 12mm
25	DO-213AA	3.5	1.6	1.6	CN140	100	20	20	High Speed	Fly Calib	80	Feeder 8mm
26	DO-213AB	5	2.5	2.5	CN140	100	20	20	High Speed	Fly Calib	80	Feeder 12mm
27	DO-214	5.74	1.52	2.5	CN140	100	20	20	High Speed	Fly Calib	80	Feeder 12mm
28	DO-214AA(SMB)	5.5	2.1	2.5	CN140	100	20	20	High Speed	Fly Calib	80	Feeder 12mm
29	DO-214AB(SMC)	8	3.25	2.6	CN140	100	20	20	High Speed	Fly Calib	80	Feeder 16mm

Footprint alias library

#	Footprint	Alias
1	01005[0402]R	01005
2	0201[0603]R	0201
3	0201[0603]R	201
4	0402[1005]R	0402
5	0402[1005]R	402
6	0603[1608]R	0603
7	0603[1608]R	0603R
8	0603[1608]R	0603_LED
9	0603[1608]C	0603C
10	0603[1608]R	603
11	0805[2012]R	0805
12	0805[2012]R	0805D
13	0805[2012]R	805
14	1206[3216]R	1206
15	1206[3216]R	3216[1206]
16	1210[3225]R	1210
17	1812[4632]R	1812
18	SOT-23	SOT23A
19	SOT-23	SOT23B
20	DO-214AC(SMA)	SMA
21	TQFP-100(e=0.5)	LQFP100_N
22	TQFP-100(e=0.5)	STM-LQFP1...

New footprint list

#	Footprint
1	STM-LQFP144_N
2	STM-LQFP176_N

New footprint | Delete footprint | New alias | Delete alias | Rename | <<Add to footprint library | << Add to alias library | Next | Cancel

Detailed operations below:

How to add these new footprint information to the footprint library? Three options for your selection:

（1）Click "New footprint", it will show a demo footprint line in the "Footprint library", please manually type into the new footprint (showed on the right part in "New footprint list" area) information into it, then click any blank place, you'll find the related information will disappear in the right part "New footprint", that means it has been successfully added into Footprint library now.

（2）Select a new footprint from the right part "New footprint list", click "Add to footprint library", then manually fulfill its related information will be ok

(3) If there's similar footprint in left side, please select one new footprint (from the right side "New footprint list") and then select a similar footprint in the left side "Footprint library", then click "Add to footprint library", you'll find a new similar demo footprint showed, just modify its information will be ok.

(4) If the new footprint belongs to the type of footprint alias, please select the new footprint (from the right side "New footprint list ") and then select a similar footprint in the left side "Footprint library", then click "Add to alias library".

Before click "Next", please must make sure all the new footprints in the "New footprint list" are added into the library (or alias library)

2/5 New footprint edit

Footprint library

	Footprint	Length (mm)	Width (mm)	Thick (mm)	Nozzle Type	Speed (%)	Pick delay (ms)	Place delay (ms)	Accuracy	Capture type	Brightness	Feeder Type
83	QFN-20(e=0.65)	6	6	0.9	CN140	100	30	30	High Accuracy	Fly Calib	80	IC tray
84	QFN-S-28	6	6	0.9	CN140	100	30	30	High Accuracy	Fly Calib	80	IC tray
85	QFN-40	6	6	0.9	CN400	100	30	30	High Accuracy	Fly Calib	80	IC tray
86	QFN-44	8	8	0.9	CN400	100	30	30	High Accuracy	Fly Calib	80	IC tray
87	QFN-64	9	9	0.9	CN400	100	30	30	High Accuracy	Fly Calib	80	IC tray
88	UQFN-28	4	4	0.5	CN400	100	30	30	High Accuracy	Fly Calib	80	IC tray
89	MSOP-8	2.26	4.9	1.1	CN140	100	20	20	High Speed	Fly Calib	80	Feeder 12mm
90	MSOP-10	2.24	4.9	1.1	CN140	100	20	20	High Speed	Fly Calib	80	Feeder 12mm
91	QSOP-16	4.7	5.99	1.75	CN140	100	20	20	High Speed	Fly Calib	80	Feeder 12mm
92	SSOP-20	6.15	7.8	2	CN140	100	20	20	High Speed	Fly Calib	80	Feeder 16mm
93	SSOP-24	7.45	7.8	2	CN140	100	20	20	High Speed	Fly Calib	80	Feeder 16mm
94	SSOP-28	8.75	7.8	2	CN140	100	20	20	High Speed	Fly Calib	80	Feeder 16mm
95	TSSOP-8	2.195	6.4	1.2	CN140	100	20	20	High Speed	Fly Calib	80	Feeder 12mm
96	TSSOP-14	4.145	6.4	1.2	CN140	100	20	20	High Speed	Fly Calib	80	Feeder 12mm
97	TSSOP-16	4.795	6.4	1.2	CN140	100	20	20	High Speed	Fly Calib	80	Feeder 12mm
98	TSSOP-20	6.095	6.4	1.2	CN140	100	20	20	High Speed	Fly Calib	80	Feeder 12mm
99	TSOP-28	20	7.7	1.14	CN400	60	20	20	High Accuracy	IC Calib	80	Feeder 24mm
100	VSOP-28	13.4	7.35	1.14	CN400	60	20	20	High Accuracy	IC Calib	80	Feeder 24mm
101	LQFP-32	9	9	1.6	CN400	40	30	30	High Accuracy	IC Calib	80	IC tray
102	MQFP-44	13.2	13.2	2.45	CN400	40	30	30	High Accuracy	IC Calib	80	IC tray
103	MQFP-64	17.2	17.2	3.15	CN400	40	30	30	High Accuracy	IC Calib	80	IC tray
104	TQFP-32	9	9	1.2	CN400	40	30	30	High Accuracy	IC Calib	80	IC tray
105	TQFP-44	12	12	1.2	CN750	40	30	30	High Accuracy	IC Calib	80	IC tray
106												IC tray
107	TQFP-64(e=0.8)	16	16	1.2	CN750	40	30	30	High Accuracy	IC Calib	80	IC tray
108	TQFP-80(e=0.5)	14	14	1.25	CN750	40	30	30	High Accuracy	IC Calib	80	IC tray
109	TQFP-80(e=0.65)	16	16	1.2	CN750	40	30	30	High Accuracy	IC Calib	80	IC tray
110	TQFP-100(e=0.4)	14	14	1.2	CN750	40	30	30	High Accuracy	IC Calib	80	IC tray
111	TQFP-100(e=0.5)	16	16	1.2	CN750	40	30	30	High Accuracy	IC Calib	80	IC tray

Footprint alias library / New footprint list

	Footprint	Alias		Footprint
1	01005[0402]R	01005	1	HDR1X4
3	0201[0603]R	201	3	SW_DIP-1
4	0402[1005]R	0402		
5	0402[1005]R	402		
6	0603[1608]R	0603		
7	0603[1608]R	0603R		
8	0603[1608]R	0603_LED		
9	0603[1608]C	0603C		
10	0603[1608]R	603		
11	0805[2012]R	0805		
12	0805[2012]R	0805D		
13	0805[2012]R	805		
14	1206[3216]R	1206		
15	1206[3216]R	3216[1206]		
16	1210[3225]R	1210		
17	1812[4632]R	1812		
18	SOT-23	SOT23A		
19	SOT-23	SOT23B		
20	DO-214AC(SMA)	SMA		
21	TQFP-100(e=0.5)	LQFP100_N		
22	TQFP-100(e=0.5)	STM-LQFP1		

| New footprint | New alias | Rename | Next |
| Delete footprint | Delete alias | <<Add to footprint library | Cancel |

(1)select a footprint from New footprint list

(2)select a similar footprint from footprint library

(3)click Add to footprint library or Add to alias library

③   After click "Next", it will turn to the third interface "3/5 nozzle assign edit". Left part will show which type of nozzle be used, also will count the times it was used. Right part will be the assignment against nozzle count times. If you wanna adjust it, please directly double-click the nozzle type and fill into the one you need.   If any nozzle head is not available to use, please directly set the related nozzle type as blank, then click "Next".

④

3/5 nozzle assign edit

Nozzle usage count

	Nozzle type	Usage count
1	CN040	176
2	CN065	112
3	CN750	3

Nozzle assignment

nozzle position	Nozzle Type
1	CN040
2	CN040
3	CN040
4	CN040
5	CN065
6	CN065
7	CN065
8	CN750

Next
Cancel

⑤   The fourth is "placement list placement sequence edit",   it is showed the optimized placement sequence, please directly click "Next"

4/5 placement list placement sequence edit

	Comment	Footprint	Designator	Nozzle	Pos X	Pos Y	Angle
1	10K	0201	R1	1	24	22	0
2	10K	0402	R25	2	27	22	0
3	10K	0201	R2	3	23.86	23.04	15
4	10K	0402	R26	4	26.76	23.81	15
5	10K	0603	R49	5	31	22	0
6	10K	0805	R73	6	36	22	0
7	10K	0603	R50	7	30.63	24.85	15
8	10K	0201	R3	1	23.46	24	30
9	10K	0402	R27	2	26.06	25.5	30
10	10K	0201	R4	3	22.83	24.83	45
11	10K	0402	R28	4	24.95	26.95	45
12	10K	0603	R51	5	29.53	27.5	30
13	10K	0805	R74	6	35.45	26.14	15
14	10K	0603	R52	7	27.78	29.78	45
15	10K	0201	R5	1	22	25.46	60
16	10K	0402	R29	2	23.5	28.06	60
17	10K	0201	R6	3	21.04	25.86	75
18	10K	0402	R30	4	21.81	28.76	75
19	10K	0603	R53	5	25.5	31.53	60
20	10K	0805	R75	6	33.86	30	30
21	10K	0603	R54	7	22.85	32.63	75
22	10K	0201	R7	1	20	26	90
23	10K	0402	R31	2	20	29	90
24	10K	0201	R8	3	18.96	25.86	-75
25	10K	0402	R32	4	18.19	28.76	-75
26	10K	0603	R55	5	20	33	90
27	10K	0805	R76	6	31.31	33.31	45
28	10K	0603	R56	7	17.15	32.63	-75
29	10K	0201	R9	1	18	25.46	-60
30	10K	0402	R33	2	16.5	28.06	-60
31	10K	0201	R10	3	17.17	24.83	-45
32	10K	0402	R34	4	15.05	26.95	-45

Next
Cancel

⑥ The final is "feeder stack edit", it will show components were assigned to which stack position and what kinds of nozzle be used etc., please directly click "OK" to finish the automatic programming.

5/5 feeder stack edit

Stack	Component	Nozzle Type	Usage count
1			
2			
3			
4			
5			
6			
7	0201/10K	CN040	88
8	0402/10K	CN040	88
9			
10	0805/10K	CN065	24
11	0603/10K	CN065	88
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			
33			

OK
Cancel

⑦ After that, you'll find the information (placement sequence, nozzle assignment) in component list changed.

7. Feeder setting

All components' setting on this files list, like: nozzle selecting, stack setting, the location of pick components, adjustment setting, and others components' setting need to be finished here. We can see that No.1-33 stack on bottom line, No.34-66 stack on top line, No. 67-76 feeders are the tray stack.
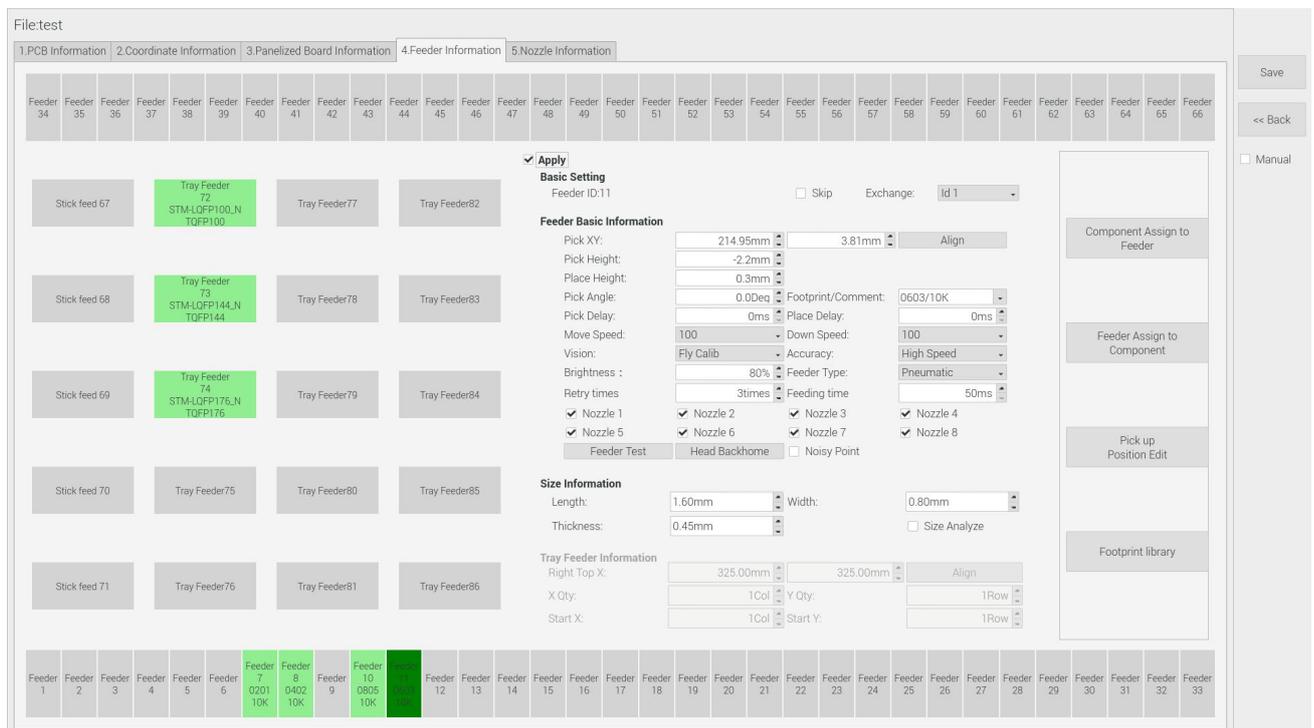
7.1 Function of feeder setting interface

（1）**Assign all sequentially**: After complete component information setting, click 'Assign all sequentially', the setting information will be assigned to each feeder automatically.

（2）**Assign feeder and nozzle**: After complete stack information and nozzle setting, click 'Assign feeder and nozzle', all information will update to the component list automatically.

(3) **Batch processing pick up position and height**: Press this button, it will show below：
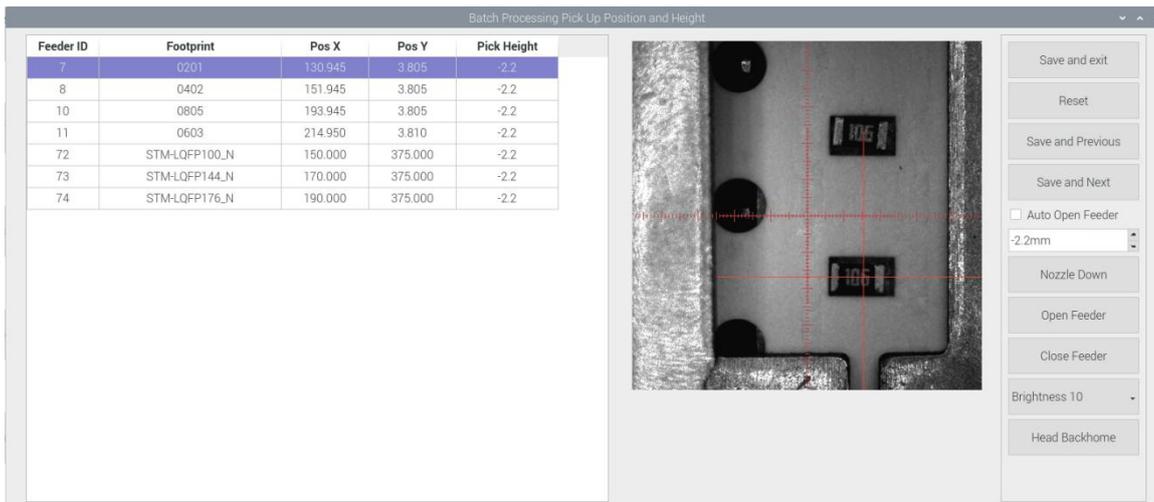
Batch processing pick up position and height: please select one stack to start setting (default start from the first assigned stack), at the same time, a real-time image will be showed as right side. Please set the red cross to the component center (generally if the feeder is in off condition, red cross will be at the edge of feeder's tape cover), click "save and next" until all be set well and there will be beep sound as a warning, then click "save and exit"to finish it. After that, you can select any feeder's pick position as a test. While setting the pick position, the function of "Feeder open"/ "Feeder close" can help setting the cross position more conveniently.

（4）Footprint library: The component's information is saved in the footprint library,including name, length, width, height, edge, pitch etc. Please note the detailed information for the IC is necessary. Press "Add" button to add a new footprint into the library; For footprints not required, please directly select them and press "Delete" button to move them. Save the setting before exit

7.2 Feeder Setting

Select one feeder, tick "Apply", then its related info can be edited such as feeder exchange, feeder, nozzle, IC tray feeder etc. The setting sequence for them should be: Feeder (or IC tray feeder)→ Feeder basic information→ Nozzle. P. S.: 1) For feeders 1-66, the IC tray feeder is in disabled condition. 2) Feeder exchange depends on application condition, if the tape reel was installed on wrong feeder, you can directly use feeder exchange to solve it.

（1）**IC tray feeder info**

It is used to set tray package component's pick position.

Right top XY: it refers to align the farthest component on the tray (generally take the component at right top as the final one on the tray, and take the component at left bottom position as the first one)

X qty: it refers to how many components in X direction

Y qty: it refers to how many components in Y direction

Start X, Start Y: It refers to the first IC in X/Y direction if the tray is in full package; If some ICs have been used and some tray slots are empty, please directly set the exact position as actual situation, start X will be the location of its actual column and start Y will be its actual location of row.

(2) Feeder basic info: see figure（4.2.1）

Skip: once selected, all components in this feeder will be skipped.

Feeder exchange: this function can be used if any reel tape was installed at wrong or inappropriate position. Select the feeder/ IC tray feeder you need to exchange, then the related feeder info will be synchronized to the swapped feeder/ IC tray feeder.

Pick XY: Align the first component position in the feeder as fig.4.2.2, which is Mark camera align the component central position, then click "save and back", the well-saved position's X/Y coordinates will be automatically show up as fig. 4.2.1 (P.S.: pick position can be set one by one or be set by the scale setting, scale setting is more convenient).
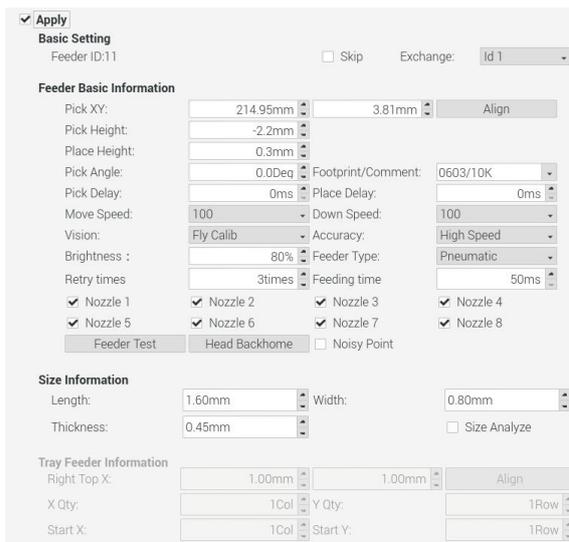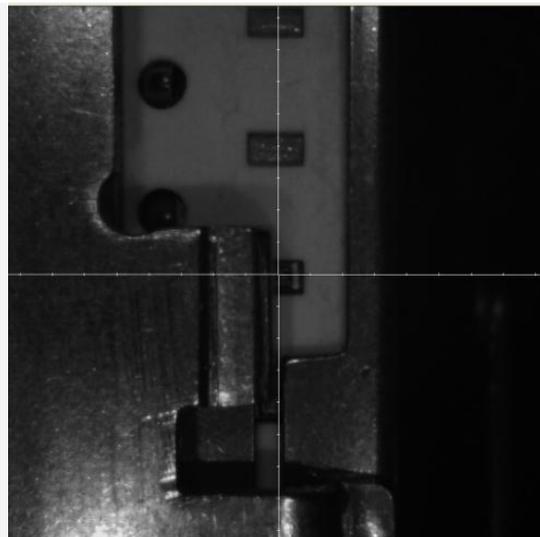
Pic（4.2.1）　　　　　　　　　Pic（4.2.2）

- **Initial angle:** default is 0°, if any special need, you can modify this angle to change the component's placement direction. Special attention for some chips with direction requirement, such as LED red/green, diode, IC etc.

- **Footprint/ Value:** Component footprint/ value. Footprint refers to the footprint name like 0603, 0805, 1206 etc., Value refers to component data like 10K, 75Ω etc

- **Pick Height：** the height between nozzle and taps&reel's surface on feeder.

How to check pick height: Go to the Batch processing pick up position and height interface,enter the thickness of the component, click nozzle down (if the feeder is closed,after click nozzle down, the feeder will open),then manually check if the nozzle could reach the component.Adjustment can be applied according to the test.

Go to XY movement interface, select Nozzle #1-#8, please lock the position and enter a pick height before clicking Pick test to check if the pick height is appropriate. P.S.when you doing pick test in the interface of Batch processing pick up position and height, the feeder won't open automatically,please   select the upper component to do pick height test.

- **Pick delay:** For special components like large IC and large capacitor, it's better to set some long time on the pick delay to make sure nozzle can pick up them stably.

   Place delay: For special components like large IC and large capacitor, it's better to set some long time on the place delay to make sure nozzle can still suck the component stably during the movement to place on the board.

   Move speed: It is used to control the head movement speed, generally just keep default will be ok. It is need be changed slower while doing some pick test.

   Down speed: It is used to control the nozzle head Z-axis downward speed (Special notice: for lead pitch distance< 0.5mm, please set this to a lower speed).

   Vision: Against component to choose applicable vision method.

For resistor/ capacitor--- please select Flying calibration.

For component which doesn't require higher precision but higher speed,you can select No action.

For IC, you can select IC correction or big IC correction according to different IC sizes. The difference is that IC correction is one shot recognition; big IC correction is separately taking photos for IC's four corners. So, if the IC size more than 35mm, please directly select big IC correction method.

- **Accuracy:** Generally normal resistor/ capacitor is default as high speed mode, do not need to modify it; For IC, please select high accuracy mode.

- **Brightness:** it refers to the brightness of component recognition (after be picked up) in assembly procedure. The same footprint's brightness varies in different machines, so we can't provide a recommended brightness.During setup, please use size measurement function to adjust the brightness until the components are well recognized.

- **Feeder type**: there are pneumatic and electric feeders.

- **Retry time**：for those expensive components,you can set less retry time to avoid wasting.

- **Feeding time:** add feeding time for these components can't be fed in right position during default feeding time.

- **Nozzle:** You can select one or several nozzles for the same feeder according to actual demand, once selected, they'll be automatically assigned to each feeder. Notice: for feeders near four corners, some nozzles can't reach the edge feeders,and the nozzle selection is limited. If you're not sure which nozzle could reach the feeder, please click "Feeder Test " button under the nozzle selection part. It will pop out below, you can test which nozzle is available to pick up component from this selected feeder. Details for each button:
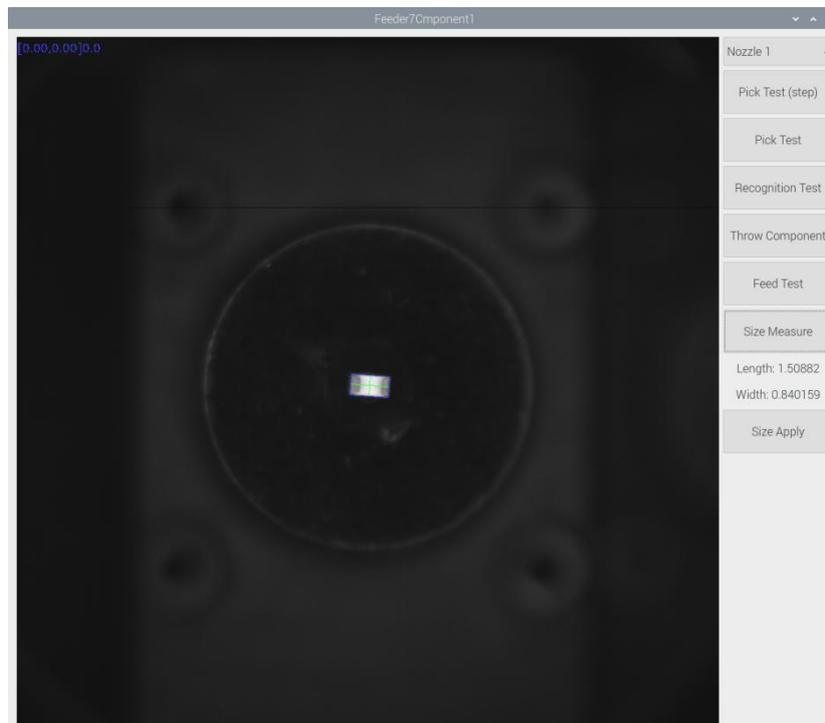
- **Nozzle**：**Select the nozzle you want to test**

- **Step Pick Test**: click Step button after nozzles are selected→ the nozzle moves to the feeder→feeder cover opens → the nozzle moves downwards to pick up component →photograph→ throw component. This could help the user to check if the pick position or the pick height is correct. If pick fails, then please adjust parameters in feeder basic information.

- **Pick Test**: after select the nozzle, click to do pick test, the head will move to feeder position and finish the pick up step without any pause.

- **Recognition Test**: After clicking Pick test, the component will be picked up. Then click Recognition test to check if the component can be recognized correctly with the selected recognize method. If the component is not well recognized , adjustment can be applied to solve the issue。

- **Feed Test**: feeding component, this is used to test if the feeder could feed components smoothly.

- **Size Measurement**：after setting up the pickup position, pick height and nozzle, click Size Measurement, the machine will measure the length and width of component according to the recognized photo, if the dimension is correct, click to save the the data.

- **Size Information**：After entering the length and width, the component will be identified by laser camera. For those tall components,please enter the thickness. Size Recognize function is optional, once it's ticked, if the components aren't within size offset tolerance, machine will throw the component and retry.

After finishing above settings, click Component Assign to Feeder, then these changes will be applied into Component List. Click to save it.

8. Nozzle Information

This interface will record which kind nozzle be installed on each nozzle head.

9. Assembly Interface

Choose the programmed file, click "Mount", it will go into assembly interface as below:

(1) Left part is detailed chip list, and following the highlight blue will get a real-time assembly situation; On right top is the current assembly speed, you can drag the scroll bar to change it and the max is 100%;

(2) Throw and Rate will make a statistics for threw components and you can also check each feeder's component pick failure rate then get which kind of component is easily pick failure, find solution to solve it.

(3) Log will show some information like rate of throw component , current average speed and how many pieces components have been assembled under the current file.

(4) Choose different placement method

● Standard placement:feeder list,chip list are already been ticked,just need click Start

● Place selected components: select the component which want to be placed in the placement list, check Mount, then select the component which want to start , click Start

File:test Count1 — 2. select the component — 3. click Start — 1. select Place selected components

● Place selected feeder:Tick feeder,click Start

File:test Count1 — 2. select feeders — 3. click Start — 1. select Place selected feeders

（5）View:After finish assembly work, users can select the corresponding components in the chip list, click View, photo 1 display the mounting situation of this component

（6）The bottom side 8 display windows are real-time feedback for component recognition

（7）Right side buttons introduction:

Start: Machine starts the current file's assembly procedure.

Step: operation for each single assembly procedure.

Stop: Stop current assembly work.

Exit: once mounting work finished, please directly click this button and back to home interface.

File Edit: In the process of mounting, if nozzle can't pick the component l for many times or big offset, Click Stop, analyze the related reason, and then click the File Edit , edit file without exiting the mounting interface, after finish modification,click Save and back to mounting interface

Config: press this button, a detailed configuration will pop out as below
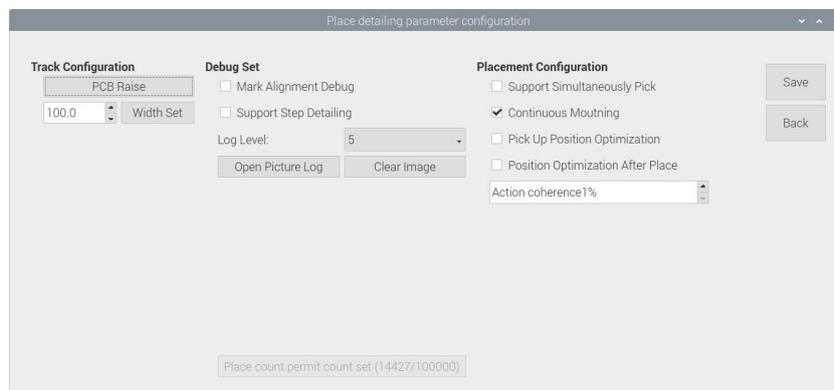
Config interface introduction:
Tracks configuration: PCB Raise and Width Set are totally same as PCB Information interface.

Debug Set: details can be showed once you select the related item.

（1）Support step detailing: once selected, every time you click "Step", the machine will only execute one command. **This is strongly recommended for the first assembly procedure.**

（2）Open picture log: press this button, the file for stocking recognition photos will be opened from which recognition details can be checked

Placement configuration:

(1) Support simultaneously pick: once selected, the nozzle head with same pick height can be downward to pick components at the same time, it will greatly improve placement speed (**It is recommended for component size bigger than 0603**).

(2) Rail continuous mounting: this is for PCB continuously feeding to realize automatic operation.

(3) Pick up position optimization: once selected this function, nozzle head can automatically optimize the pick position (**It is recommended only for small components**).

(4) Position optimization after placement: If this function be selected in the first time, the position will be auto optimized in future placement.

10. System Setup

> Warning: this part aims at machine's global parameter settings, any modified parameter will influence all working files, when modify this part please

If any revision is required, we suggest you contact our engineer to get detailed instruction first. (P.S. All parameters were set up before shipping, usually no adjustment is required.) This section will provide a brief introduction for all parameters, to get detailed adjustment instruction, please contact our technical

NeoDen10 — System Setup

Feeder Position Config:

	Pos X	Pos Y	Align	Test
Feeder1	4.945	3.805	Align	Test
Feeder2	25.945	3.805	Align	Test
Feeder3	46.945	3.805	Align	Test
Feeder4	67.945	3.805	Align	Test
Feeder5	88.945	3.805	Align	Test
Feeder6	109.945	3.805	Align	Test
Feeder7	130.945	3.805	Align	Test
Feeder8	151.945	3.805	Align	Test
Feeder9	172.945	3.805	Align	Test
Feeder10	193.945	3.805	Align	Test
Feeder11	214.945	3.805	Align	Test
Feeder12	235.945	3.805	Align	Test
Feeder13	256.945	3.805	Align	Test
Feeder14	277.945	3.805	Align	Test
Feeder15	298.945	3.805	Align	Test
Feeder16	319.945	3.805	Align	Test
Feeder17	340.945	3.805	Align	Test
Feeder18	446.176	4.104	Align	Test
Feeder19	467.176	4.104	Align	Test
Feeder20	488.176	4.104	Align	Test
Feeder21	509.176	4.104	Align	Test
Feeder22	530.176	4.104	Align	Test
Feeder23	551.176	4.104	Align	Test
Feeder24	572.176	4.104	Align	Test
Feeder25	593.176	4.104	Align	Test
Feeder26	614.176	4.104	Align	Test
Feeder27	635.176	4.104	Align	Test
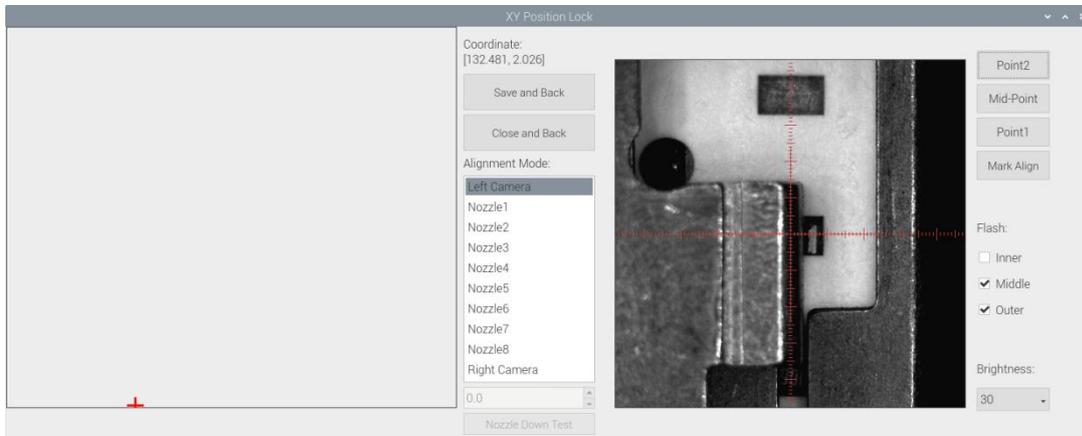
Component Position Config:

	X	Y	Position
Left Mark Camera Relative	438.125	25.055	Align
Right Mark Camera Relative	200.096	23.835	Align
Nozzle1 front IC Central	393.719	23.695	Align
Nozzle2 front IC Central	372.845	23.530	Align
Nozzle3 front IC Central	351.817	23.557	Align
Nozzle4 front IC Central	330.894	23.642	Align
Nozzle5 front IC Central	309.873	23.731	Align
Nozzle6 front IC Central	288.712	23.667	Align
Nozzle7 front IC Central	267.635	23.769	Align
Nozzle8 front IC Central	246.817	23.712	Align
Nozzle1 Back IC Central	392.312	490.692	Align
Trash Box Position	448.000	350.000	Align
Placement Head Rest	308.000	325.000	Align
Exchange Nozzle	596.000	10.000	Align
Pcb load pos	425.995	109.981	Align

Auto calibration
XY Linear Encoder Initialize
Mounting Head Linear Encoder Initialize
Nozzle Height Set Zero

Basic Configuration:

	Value
Default Working Speed	60
Mark Camera Brightness	40
IC Camera Brightness	60
Left Mark Camera Initial Angle	0.00
Right Mark Camera Initial Angle	0.00
Front IC Camera Initial Angle	0.03
Back IC Camera Initial Angle	-0.47
IC Background Brightness	0
Track Feeding PCB Duration(s)	5
PCB Track Delay(ms)	200
Track speed (percent)	100
Open Cover to Cut Off Motors	0
Pressure Zero Offset	0.0
Pressure Gain Correction	1.0
Speed Expand Mode	0

Config Save
Administrator Login
Change Password
Chinese

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Right buttons functions:

Config save: to click Save after changing the parameter

Administrator login: to prevent any misoperation, this interface will be inactive and greys out. To make it inactive, Administrator needs to login.

Change password: before Administration login in, this function is not visible.

If the password needs to be changed, please login and click Change password. A window will pop out, enter the original password. Then follow steps to enter the new password. A successful window will pop out when it's finished.

Version: the current software version will be displayed below.

When any software upgrade is required, please copy the upgrade file into the subdirectory of U disk, click "software upgrade" to load it. Then follow instructions to upgrade it.

English: this machine supports Chinese and English. To convert it into English, a password is required.

10.1 Feeder Position Config

This interface is used to setup pick offset and test feeding for each feeder.

The left column refers to feeder No., Pick X and Pick Y refer to the coordinates of pick offset. After "click to align", this interface will be displayed. Align the center of component (edge of tablet), then save it.

10.2 Component Positions Setup

|	X	Y	Position
Left Mark Camera Relative	438.125	25.055	Align
Right Mark Camera Relative	200.096	23.835	Align
Nozzle1 front IC Central	393.719	23.695	Align
Nozzle2 front IC Central	372.845	23.530	Align
Nozzle3 front IC Central	351.817	23.557	Align
Nozzle4 front IC Central	330.894	23.642	Align
Nozzle5 front IC Central	309.873	23.731	Align
Nozzle6 front IC Central	288.712	23.667	Align
Nozzle7 front IC Central	267.635	23.769	Align
Nozzle8 front IC Central	246.817	23.712	Align
Nozzle1 Back IC Central	392.312	490.692	Align
Trash Box Position	448.000	350.000	Align
Placement Head Rest	308.000	325.000	Align
Exchange Nozzle	596.000	10.000	Align
Pcb load pos	425.995	109.981	Align

Auto calibration
XY Linear Encoder Initialize
Mounting Head Linear Encoder Initialize
Nozzle Height Set Zero

（Note:Password is required to activate the items to avoid misoperation, please contact technical engineer before calibrating.）

1. Fiducial Camera Relative Position
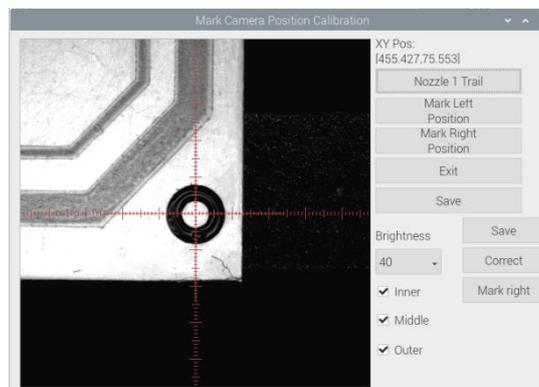
● Put a piece of label paper on the side of the track and dip the nozzle 1 into the printing paste or ink.

Go to the Manual Test interface, click "XY Move" , use the reference camera find the location of the label paper(find the location of the label on the track surface), for align way ,choose "nozzle 1", and then click "close and back". Go to the System Setup interface, after administrator login, "click to align" on Fiducial Camera Relative Position. A prompt window will pop up, "If continue to leave trace at current position?" After clicking "Yes" to enter this interface (see Figure), then click "Nozzle 1 Trail", the nozzle will move downwards and rotate until get a round mark. Follow the same steps to get the trail of Nozzle #8 , then check the offset between the round mark and the red crosshair, if it's within 0.1mm, the trail is

done.

P.S. If the offset is overly beyond 0.1mm, please kindly contact NeoDen support team.

2. function introduction:

Mark Left Position: to use the left camera align the round mark

Mark Right Position: to use the right camera align the round mark

Exit: exit without operation

Save: save the date after operation

Brightness: the brightness of mark camera can be adjusted accordingly.

（**Note: the other three functions: memory position, correction position, right Mark calibration.   These functions are currently under development.**）

3. Nozzle and IC Camera central position

● Nozzle 1 front IC camera Central Position: click to align, nozzle 1 will move to front IC camera and take photos. Once the photo is displayed, to align the central position of nozzle with white crosshair and save the data.(P.S. Once setup the Nozzle 1 front IC Central Position, nozzle 2-8 central position will be changed based on nozzle 1.) Apply the same operation for remaining nozzle 2 to nozzle 8.

● Nozzle 1 back IC camera Central Position: click to align, nozzle 1 will move to back IC camera and take photos. Once the photo is displayed, to align the central position of nozzle with red crosshair and save the data.
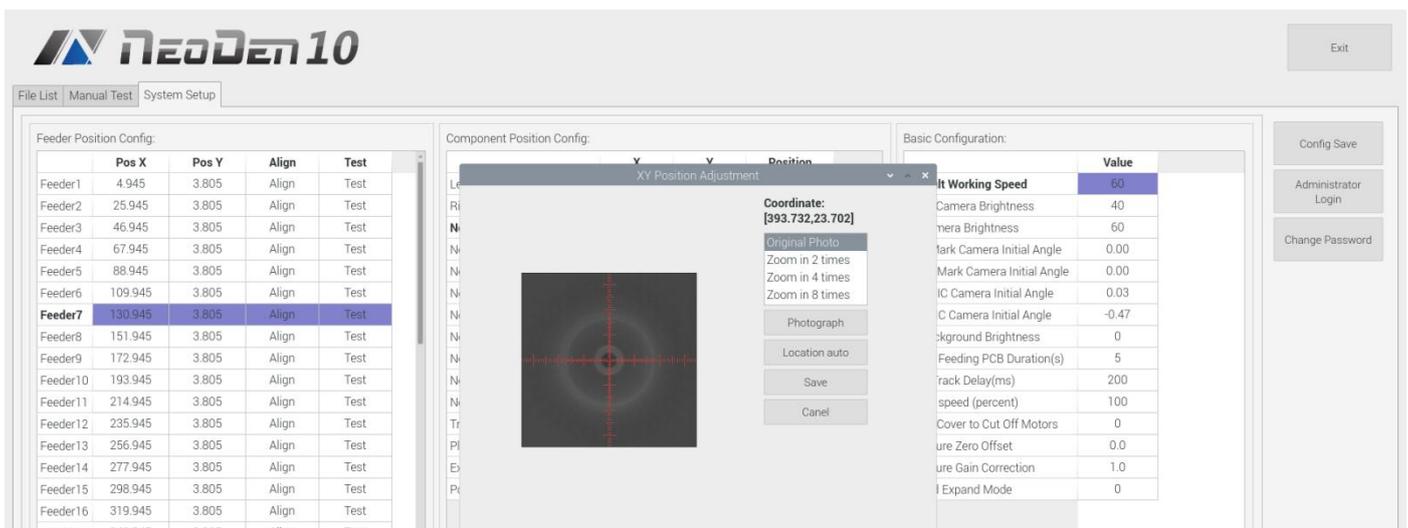
4. **Trash Box Position:** after Administration Login, click to align the position of trash box accordingly.

5. **Placement Head Reset Position:** after Administration Login, click to align the position of Placement Head Reset accordingly.

6. **Exchange Nozzle Position:** after Administration Login, click to align the position of exchanging nozzles accordingly.
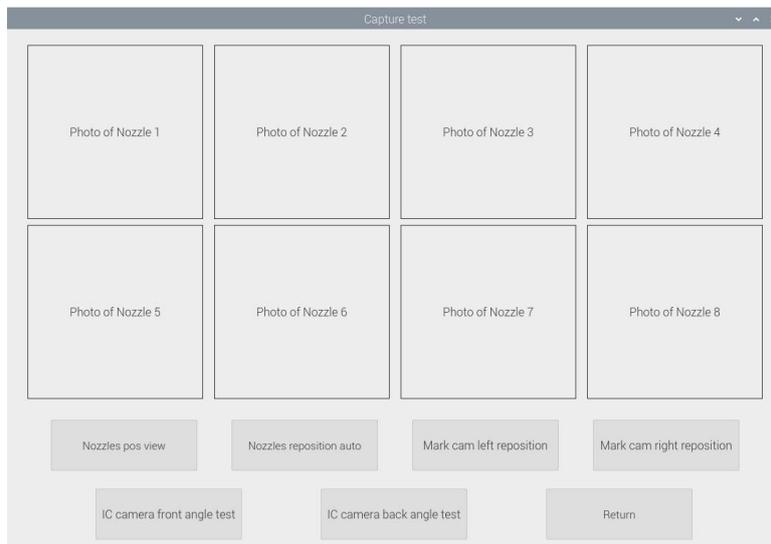
7. Automatic calibration

Nozzle Position View: View the position of nozzles 1-8 in the center of the front IC camera. Click this button then 1-8 nozzles automatically perform actions and are displayed in this screen.

Automatic nozzle positioning: The new version of the device enables automatic positioning of the nozzle with the front IC camera.

Left and right Mark camera positioning: this function is currently under development.

Front and Back IC camera angle: the camera may have angle when the device is installed, this function can automatically measure the angle of front and back IC camera to improve the placement accuracy. Click this button, nozzle 1 take mark point and action, click return, the data of automatic measurement will be synchronized to the initial angle of front and rear IC camera in the right base configuration

Automatic calibration interface

8. XY Linear Encoder Initialize

Warning: This function is required to initialize when the magnetic grid is newly installed or has mechanical changes, this operation should be operated with caution, there is a risk that the equipment cannot be used, it is recommended that changes be made under the guidance of the manufacturer's engineers!

9. Mounting Head Linear Encoder Initialize

> **Warning: This function is required to initialize after the height zero calibration of the placement head, this operation should be operated with caution, there is a risk that the equipment cannot be used, it is recommended that changes be made under the guidance of the manufacturer's engineers!**

10. Nozzle Height Set Zero

> **Warning: This function is necessary for zero calibration of the nozzle height (very important) after new installation or re-measurement of the upper and lower motors or upper and lower conveyor synchronous belts, otherwise an accident will occur by hitting the nozzle. This operation should be done with caution, there is a risk of rendering the equipment unusable and it is recommended that changes be made**

10.3 Basic Configuration

Basic Configuration:	Value
Default Working Speed	60
Mark Camera Brightness	40
IC Camera Brightness	60
Left Mark Camera Initial Angle	0.00
Right Mark Camera Initial Angle	0.00
Front IC Camera Initial Angle	0.03
Back IC Camera Initial Angle	-0.47
IC Background Brightness	0
Track Feeding PCB Duration(s)	5
PCB Track Delay(ms)	200
Track speed (percent)	100
Open Cover to Cut Off Motors	0
Pressure Zero Offset	0.0
Pressure Gain Correction	1.0
Speed Expand Mode	0

Buttons: Exit, Config Save, Administrator Login, Change Password, Chinese

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Default placement speed: The placement speed of the processing interface adopts the default speed configured by the system

Fiducial camera brightness and IC camera brightness: the default value of camera brightness when factory setting： the

default brightness of Mark camera is 30, the default brightness of IC camera is 40, can be adjusted according to the actual situation

Fiducial camera initial angle and IC camera initial angle.

⚠️ **Warning: both data are set up before shipping, no extra adjustment is required. There is a risk to lead to malfunctional condition, please kindly contact technical engineer before operation.**

Rails Feeding Time: the time it costs to feed a PCB from conveyor to Rail #1 when the machine is in continuous production.

Safety cover：When the parameter value is 1, the machine is in single-step mode to prevent any body damage when the cover is opened during picking and placement.

When the parameter value is 0, the placement speed will drop to 20% when the cover is opened during picking and placement.

11. Manual Test

Before run programming file, perform a manual test to debug whether the machine can work properly.

(1) Feeder No.1-No.66: after loading tape reel on feeder, click the feeder to test its feeding function.

(2) Alarm light: click it to test if the light could work correctly, the color should change from red, green to yellow by sequence.

(3) Buzzer: click it to test if it works

(4) XY initialize: click to have XY back to zero

(5) XY Move: click this button to enter vision interface, the movement mode are optional, use the crosshair to move the head.

(6) Front IC Camera, Back IC Camera: click to test the photograph function.

(7) Right Fiducial Camera, Left Fiducial recognition Camera: click to test the photograph function.

(8) Head initialize: head initialization can be executed before mounting

(9) Nozzle Height Calib: click to calibrate 8 nozzles' initial heights

Step 1 Make sure the nozzle is installed, click "Nozzle Height Calib"

Step 2 Lock nozzle position above the rail (after selecting the position, for the alignment method you select the nozzle 1 and save the position), select nozzle 1, and click on the keyboard to rise and fall button, to ensure that the nozzle just pressed to the surface of rail, after the adjustment is complete, click save.

Calibrate other nozzles' height in same way.

(10) Head Home back: click to move the head back to original left top position

(11) Nozzle Replace: click to replace nozzles, the head will move to its position for easier replacement.

(12) Head Nozzle: click to test rotation, suction, blow and moving down functions of nozzle NO.1-NO.8.

(13) Width Initialize: initialize the width of rails back to zero.

(14) Width Set: after the initialization of rails width, enter the expected width, click Width Set, the rails be widened accordingly.

12. First trial and test

12.1 Program first dry run

Usually we would suggest you to have a dry run (no components are loaded) before production test. After it goes smoothly,

you can start to produce few boards.

12.2 First production test

1 Make a programming file

2 Test the file to pick and place components.

12.3 Component Inspection

Inspection items

① Check if the specification, direction, polarity of components is aligned with what they should be.

② Whether the components are damaged or the pins are distorted.

③ Whether the component is off beyond allowance.

The inspection methods vary from the equipment that you have.

Except visual inspection, all of amplifier, microscope, online or offline AOI equipment can be applied if the pitch of IC is quite small to check.

Inspection standards

Please follow SOP to do inspection or any other general standards (IPC Standard and SJ / T10670-1995 SMT General

Technical Requirements).

Adjust the programming file according to the placement effect after the first production test.

1. If there is any issue of specification, direction and polarity, please follow process file to amend.

If the components are off, please adjust the file by following two methods.

● If the placement effects of all components are off in the same direction, it would be the

fiducial issues. Please resolve this issue by adjusting the coordinate of fiducials according to its value

of deviation. If the fiducials are normal, you can click the position align of the component list, the machine will carry

out the identification of Mark point first, then click the left mouse button to select the center position of the component

which has been mounted, click the right mouse button to select the center position of the PCB board component, click

the next one until it is finished and save. The machine will record the corrected position and mount again.

● If there are several components off beyond allowance，an offset can be estimated and the placement coordinate value

of the component can be corrected directly in the component list, or you could adjust their coordinates on working file

with down-looking camera

2. If there are couple of issues occur during test, some other points need to be considered：

● Frequent pickup failure. Some suggestions are listed below

① The pick height is inappropriate, please revise the value after an inspection or a pick-test；

② The pick offset needs an adjustment, it should be aligned with the center of component reel slot rather than that of

component；

③ Due to peel strength or installation issue of wasted film, the film on tape won't be peeled completely

④ The nozzle was blocked and need cleaning；

⑤ The nozzle is damaged or has a crack, which might cause air leakage；

⑥ The size issue of nozzle is inappropriate, which would cause air leakage or insufficient suction；

⑦ Insufficient air pressure or blockage of the air circuit, check whether the air circuit is leaking.

3. Frequently throwing components. Some suggestions are listed below：

① Incorrect image processing, images should be retaken；

② The pins are distorted；

③ The size or shape isn't aligned with that in "Footprint library''

④ The size of nozzle is inappropriate or insufficient suction；

⑤ The nozzle has solder paste or rubbish cause air leakage；

⑥ The nozzle is damaged or cracked cause air leakage.

12.4 Continuous SMT production

Follow the SOP to start production

Notes:

Do not touch the surface of board to avoid damaging the printed solder paste.

● When the error message occurs, please check out and solve it a.s.a.p.

- Once reloading the component during production, pay attention to the model, specification, polarity and direction of components.

- Clear the reject box timely to avoid wasted materials stacked too high to damage the mount head

13. Structure and maintenance instruction

13.1 Feeder Brief Introduction
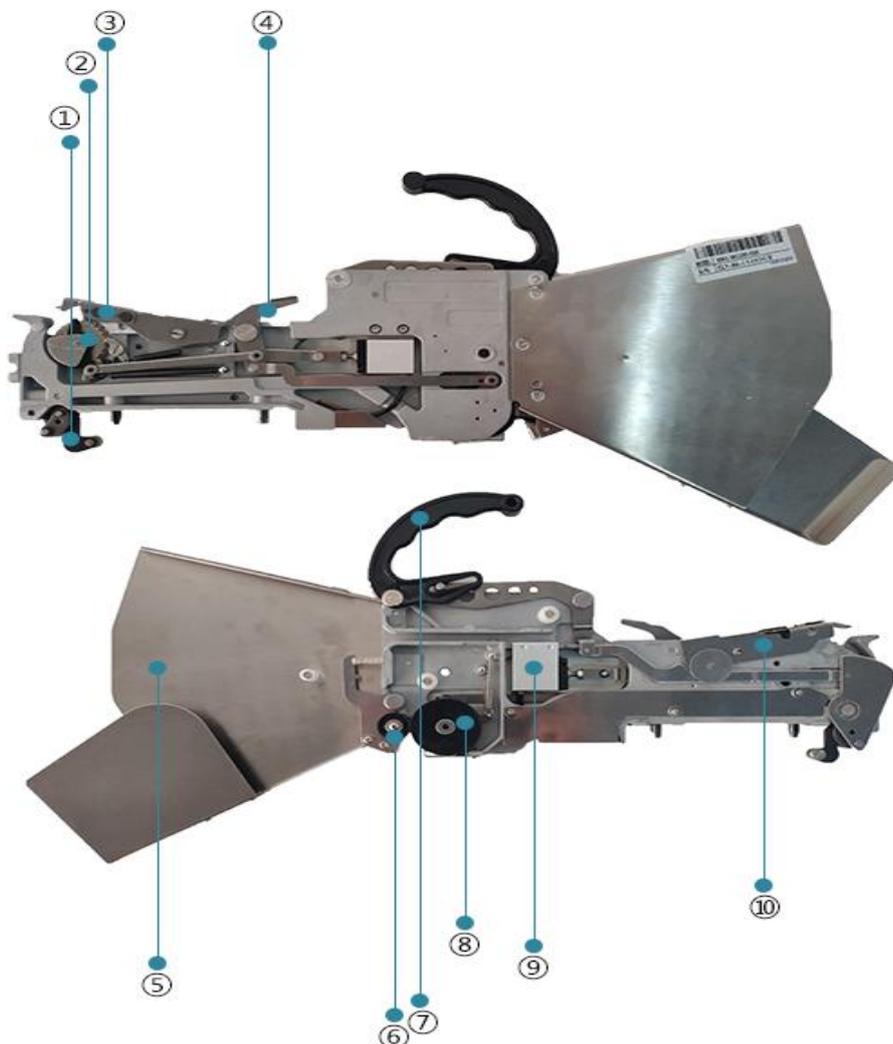
(1)Front fixed buckle　　　　（6）Single-track wheel

(2)Material-sendingwheel gear　（7）Hand Shank

(3)Press material cover　　　　（8）Tape coiling wheel

(4)Locking Claw　　　　　　　（9）Cylinder

(5)Tail board　　　　　　　　（10）Snap joint cover

13.2 Installing tape and reel components

figure 1　　　　　　　　　　　　　　　　　　figure 2

1. Making the feeder in open status to wait for installing the tape reel ①Lift up the feeder fixing handle；②Press the material-sending handle with left hand ③meanwhile press the lamellule at right side of the feeder with your right hand；④loosen the material-sending handle, ensure the proper wrapped (see figure 1) then loosen the lamellule.

2. Installing the tape and reel components: setting the reel on reel storage at the back side of the feeder, pull out approximately 10cm length tape, separate the film and tape, then put into transfer storage (see figure 1).The tape should be closely matched with the gear, and the film should pass through the upper denomination groove (see figure 2) through two white guide wheels and then be sandwiched between two gears.

figure 3

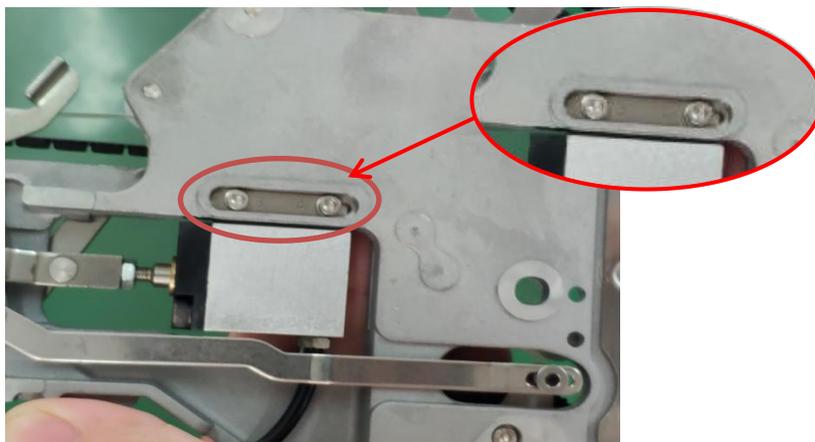3. Finish installing tape and reel components （see figure 3）

figure 4

The feeding rate can be adjusted by moving the adjustment steel piece. For 12mm, 16mm width feeder, the feeding rate could be adjusted to 12 or 16mm by flipping the steel piece (the distance between material belt holes is 4mm). (see figure 4)

13.3 Incorrect installation Samples：

1. Incorrect setting of reel in reel storage (see figure 5)
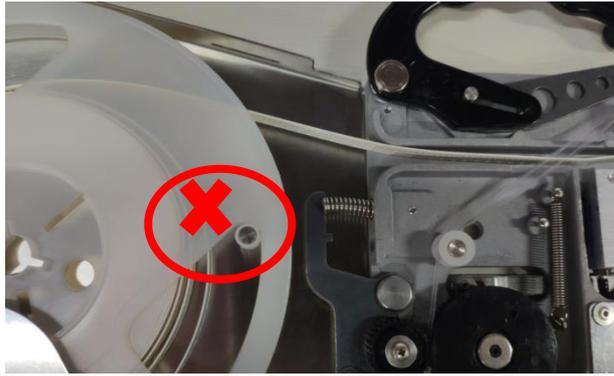
Figure 5

2. The film is twisted, not tight enough, or the film is not between the white guide wheel and the black gear
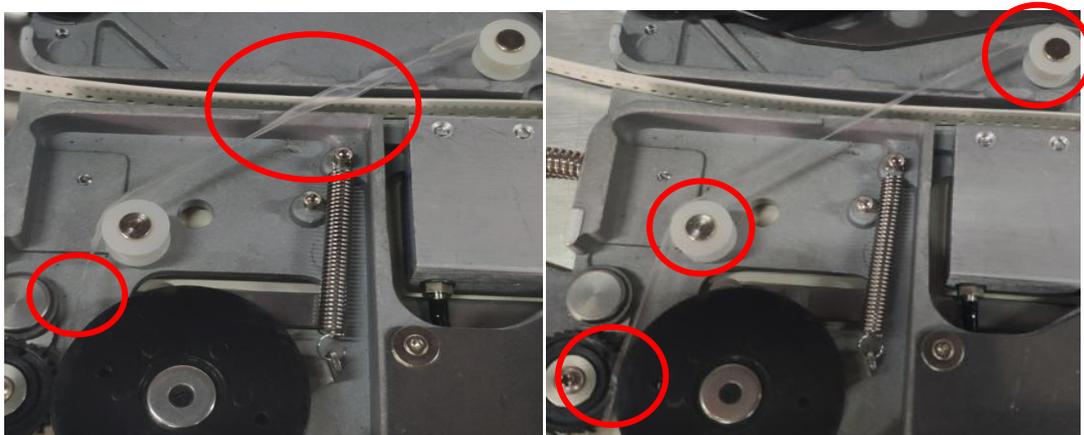
3. Cautions: Strictly refer to the instruction manual to use the feeder, and non-standard operation is strictly forbidden

送料器固定架
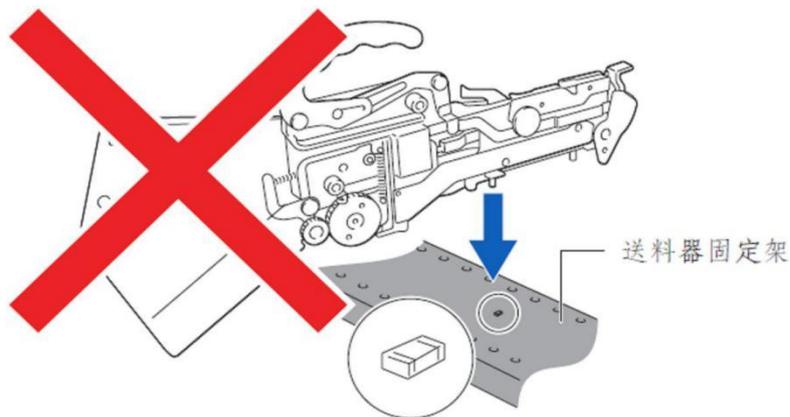
Warning: when installing the feeder, if feel the hand press is not strong, or loose match in place, then it is forbidden to operate. Otherwise will cause feeder floating in the operation and collision problem. In case of this situation, please contact the after-sales department of our company
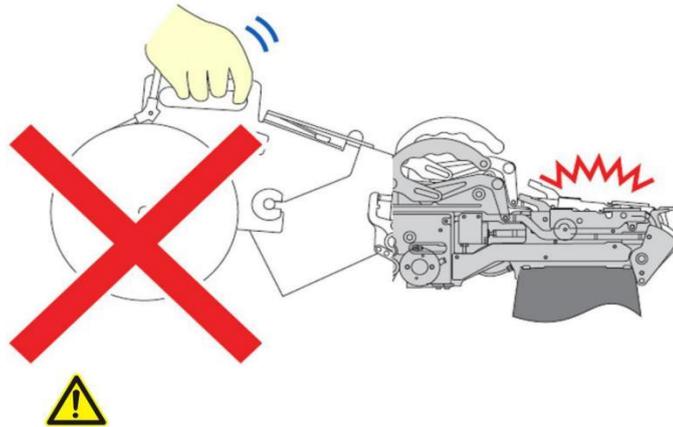
Warning: when installing the feeder on the equipment, make sure there is no foreign matter on
the feeder fixed plate, and make the bottom surface of the feeder fully fit with the fixed plate. The handle is the main way
to lock the feeder, so pls pay attention to protect this part. (**Note:** Don't move the feeder while the equipment is running,
or it may cause collision problem.)

13.3.1 Nozzle

In order to ensure the placement accuracy，please select nozzles according to the shape and size of components
Table 1-1 Nozzle

Type	Regular	Regular	Regular	Regular	Regular	Regular	Regular	Regular
Model	CN030	CN040	CN065	CN100	CN140	CN220	CN400	CN750
Illustration								
External Diameter	0.6mm	0.8mm	1.0mm	1.8MM	2.0mm	3.6mm	5.0mm	9.0mm
Inner Diameter	0.3mm	0.4mm	0.7mm	1.0MM	1.4mm	2.2mm	4mm	7.5mm

Type	Special	Special	Special	Special	Special	Special	Special custom
Model	YX01	YX02	YX03	YX04	YX05	YX06	-
Illustration							
Shape							

Table 1-2 size comparison of Nozzles

Maintenance

Model	Recommendation （Imperial system)
CN030	0201
CN040	0402 （optimal)
CN065	0402、0603 etc.
CN100	0805、diode、1206、1210 etc.
CN140	1206、1210、1812、2010、SOT23、5050, etc.
CN220	SOP series ICs、SOT89、SOT223、SOT252, etc.
CN400	ICs from 5 to 12mm
CN750	ICs bigger than 12mm
YX01	3528serices Soft bead
YX02	High power lamp beads
YX03	Chips and BGA from 11mm to 17mm BGA
YX04	Chips and BGA bigger than 17mm
YX05	4148 circular diode
YX06	3535 ball shape LED(Spherical height 1.4mm,overall height 1.9mm)

14.1 Take effective measures to reduce /avoid malfunction

14.1.1 Reinforce daily maintenance

P&P machine is that high-accuracy device which requires a clean working environment with constant temperature and humidity, so it's necessary to have a routine maintenance.

14.1.2 Requirements for operator

- Operator should get a basic operator training, which should cover fully all the skills and knowledge needed to safely operate the type of pick and place machine.
- Operating strictly against equipment's instruction. Don't use machine with problems. Stop the machine once malfunction appears and contact with the after-sales service staff, restart to work after problem solved.
- Operator should be concentrated,

Observation-- to see whether there is abnormal situation, such as peel-box doesn't work, plastic tape is broken etc.

Listening-- whether have strange sound, such as noise from placement head, sound of loss component, strange noise of conveyor etc.

Handwork-- solve some small problems in time, such as install feeder, correction placement position etc. If the main machine body or circuit problem, please consult after-sales staff. Formulate measures to reduce/ avoid big problem.

14.1.3 Formulate the measures to reduce/avoid big problem

The most easily appeared problem during work are placement wrong components and placement misaligned. Supply below measures for ref.

① It needs to check whether the components package is matched with related feeder. If not, please correct them.

② As to tape reel feeder, when ran out of one reel, operator must check whether newly changed tape reel is correct or not.

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④ Operator must check the first finished PCB of each file. If any problem, please find solutions such as revise program to solve it.

⑤ To check the placement position misaligned or not, component loss problem in regular work. Find reason in time and solve it.

⑥ Set pre-welding detection station (manual or AOI)

In sum, P&P machine's running speed and placement accuracy still has limit. Peoples work is important to run machine on its proper role. So, it's necessary to comply with effective measures to keep machine normal work, its placement quality and efficiency.

14.2 Maintenance

Arrange regular inspection and maintenance system.

14.2.1 Daily Inspection

	Items
Items check before power on	①Temperature& Moisture: Temperature 20℃～26℃, humidity 45~70% ②Indoor environment: Air clean without aggregate air. ③No clutters within the placement area and keep rails clean. ④No spots on cameras and keep lens clean. ⑤No obstacles around the head nozzles ⑥Checking if nozzles are dirty, distorted; If so, please clean or change the nozzle. ⑦Checking if feeders are correctly installed in stacks and confirm no clutters on stack. ⑧Checking the connection of air connector and air hose ⑨Checking air pressure.
Items check after power on	①Checking if the monitor display normally after system start up. ②Checking if emergency button can work normally or not. ③Checking if placement head can move back to the origin. ④Checking if there's abnormal noise while placement head move. ⑤Checking all nozzles vacuum pressure. ⑥Checking if PCB moving on rails smoothly or not; Sensor workable or not. ⑦Checking if the board has been well fixed by magnetic bar and pins.

14.2.2 Monthly Inspection

Items	Detailed Inspection
X/Y axis	Make sure no abnormal noise while placement head moving.
X/Y motor	Make sure X/Y motors no overheating.
Nozzle	Checking if all nozzles are good without bend and nozzle surface is horizontal
Air hose	Checking the connection between air hose and machine, keep sure the hose in good situation without wearing or air leaking.
Step motor	Checking if any dirty on step motor, synchronous belt, Synchronous wheel. Make sure the Z-axis motor can up, down and rotate smoothly.
Z-axis motor	Checking if the placement head can go up and down smoothly. Use your finger to push the

	nozzle to check if it moves smoothly. Let each nozzle head up and down beyond the normal range.
Vacuum pressure	Checking all nozzles' vacuum pressure. If abnormal, please clean nozzles.
Positive pressure	Checking if the positive pressure normal.
Optical axis	Checking whether it is covered dusk. Please keep it clean and lubricated
Operation button	Checking each button to make sure they are well-worked
Connector	Checking if well-connected the air hose and air connector.
PCB clamp block	check their wear pattern

14.3 Related issues during solder paste printing process

14.3.1 Stencil Printing Technology

Screen printing technology refer to using ready-made stencil, directly connect to the printer in a certain way, make the solder paste evenly flow on the stencil and then leak into the mesh through the holes. When getting the stencil away, solder paste had been covered to the printed circuit board solder graphics, then finish the solder paste printing on the PCB.

14.3.2 Inspecting of solder paste printing

Printing process is one of the key working procedures to ensure the quality of surface mounting. According to the statistics, under the premise of guaranteed quality about components and PCB, correctly PCB design, 70% of the surface quality problem caused during printing process. In order to ensure the quality of SMT assembly, it is necessary to strictly control the quality of the solder paste printing.

The amount of solder paste printing requirements are as follows:

- The using amount of solder paste should be uniform, good consistency. Solder paste graphics should be clear, try to avoid adhesion between adjacent graphics. Solder paste graphics and solder graphics should be consistent.
- In general, keep unit area amount of solder paste about 0.8 mg/mm². For fine pitch components, should be 0.5 mg/mm² (using stencil thickness and hole size to control in the actual operation).
- Printed on the substrate of solder paste compared with required value, a certain deviation is permissible, the covering area of the solder paste on each solder pad should be more than 75%.
- Should be no seriously collapsing problem and edges neatly after solder paste had been printed, the dislocation shouldn't be larger than 0.2 mm, for solder pad of fine pitch components, dislocation shouldn't be larger than 0.1MM, pollution by solder paste is not permitted to the PCB.

Inspection by 2~5 times magnifier or 3~20 times microscope.

14.3.3 The defects of solder paste printing, reasons and solutions

Excellent printing graphics should be uniform in both vertical and horizontal direction, full, clean all round, solder paste fill solder pad. Using above such printing graphics device, after reflow soldering, will get good welding effect then.

Problem	Reason	Issue	Solution
Solder paste graphics dislocation	Holes on the stencil not good match with solder pad; No enough precision of the Printing machine	easily cause bridge connection	Adjust the stencil position; Adjust the printing machine
Solder paste graphics have icicles and dents	Scraper pressure is too large; Rubber scraper hardness is not enough; Holes are too big in the stencil	Solder paste required volume is not enough, easy to appear faulty soldering; solder joint strength is not enough.	Adjust the printing pressure; Use metal scraper; Improved holes designing in the stencil.
Too much solder paste	Holes are too big in the stencil; The gap is too big between stencil and PCB	easily cause bridge connection	Check the holes size in stencil; Adjust the parameters of printing, especially the gap between PCB and stencil
Graphic uneven (have breakpoints)	Holes' wall are not smoothness enough; not wipe residual solder paste in using for many times; Solder paste's thixotropy is bad	Easy cause no enough solder paste, lead to the problem such as faulty soldering.	Wipe the stencil
Contamination of the graphics	Not wipe residual solder paste in stencil after using for many times; Poor quality of solder paste; Shake problem when getting the stencil way	easily cause bridge connection	Wipe and clean stencil; replace solder paste; adjust the machine

Dear users, the above is NeoDen10 operation instructions, if you have any questions, feel free to contact us, we will be happy to serve you.

Thanks again for supporting NeoDen Tech.

Zhejiang NeoDen Technology Co., Ltd