I.C.T Desktop Pick and Place Machine Manual

Please read the operation manual carefully before using the machine!

Dongguan Intercontinental Technology Co., Ltd.

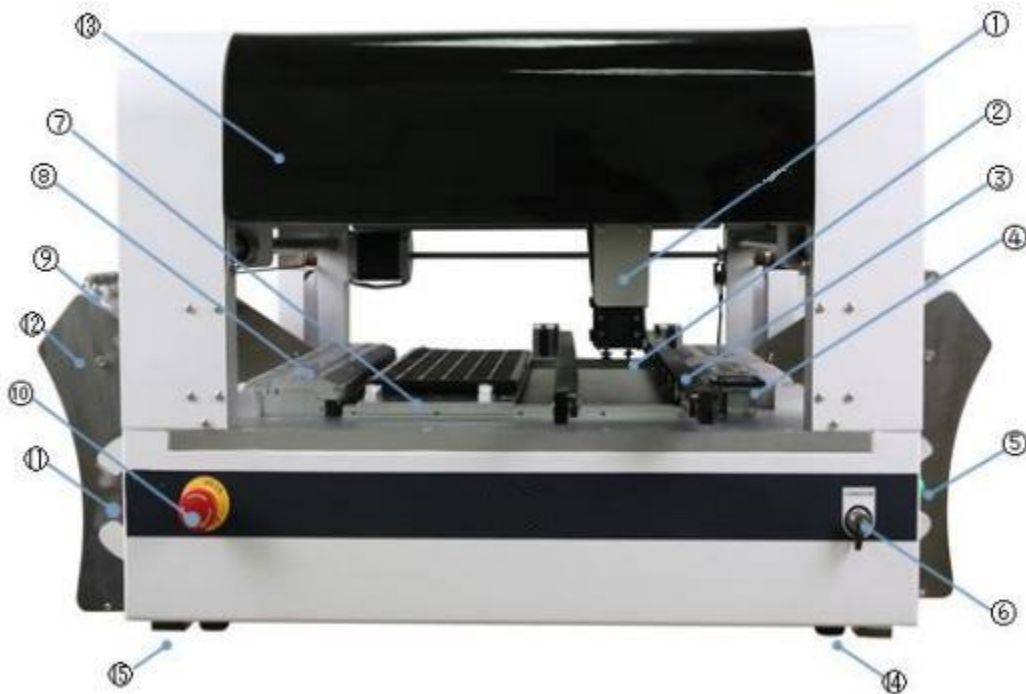Email: info@smt11.com /   etasmt@foxmail.com

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Youtube Subscribe "ETASMT"

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Catalog

Chapter 1 Structure of N6


Each part mentioned above can be disassembled and tested. Please find more details on P20.

①：Placement head (see P)
②: Nozzle (see P)
③：Rails (see P)
④：Vibration feeder
⑤：On/Off button
⑥：Conveyor port(see P)
⑦：Multi-hole positioning board(see P)
⑧：Feed box (see P)
⑨：Peel box (see P)
⑩：Emergency button
⑪：Power switch
⑫：Rack shelf (see P)
⑬：Acrylic cover
⑭：Foot Mounts
⑮：Fixed support

Procedure for making a programming file
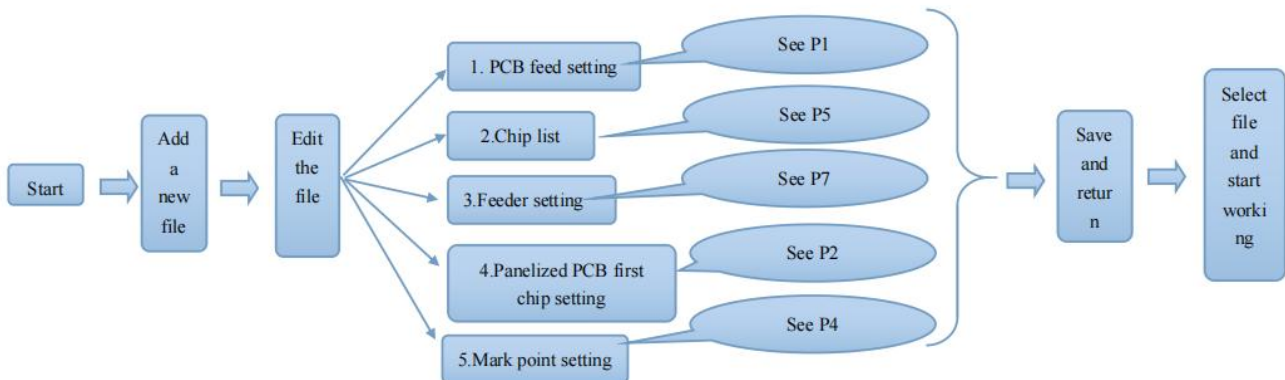
Note: The basic procedure of making a programming file for manual programming or direct PCB file is similar, but there are two different parts: chip list and mark point setting. Please find the detailed operation steps of the differences on relative page.
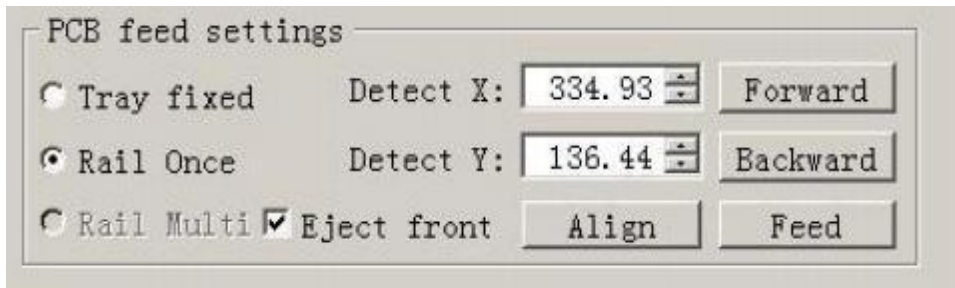
Edit on the Operation Interface

I. Edit on the Interface

See below Fig.: Edit Interface
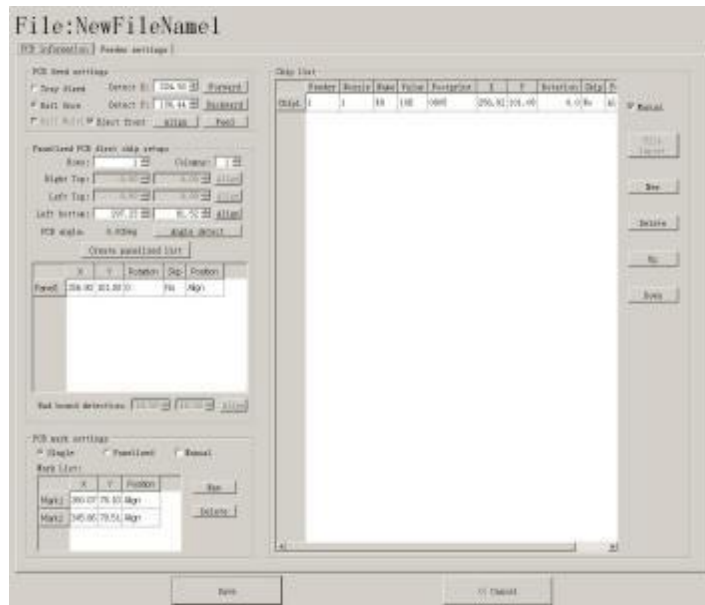
1.PCB Feeding Setting

Function:Used to confirm the feeding place,first edit item in manual program

Introduction of function keys:

(1) Tray Fixation:Once selected tray fixation,the setting items of board feeding will be closed.We only need use the positioning column to fix the board.

(2) One-offrail feed:First need ensure there are rails for your machine,then select one-offrail feed,the setting items will be open corresponding.

Operation Step:First should adjust the width of the rail to ensure the PCB can move smoothly   Adjust the position of the board in rail via clicking items"Rail forward" and "Rail

backward".

② Click "Position Align" and into below interface(See fig.2),then adjust the position of

camera until to the limited place by clicking the image(See fig.3).Click "Save" item to save the setting,return to the main page to finish the setting.

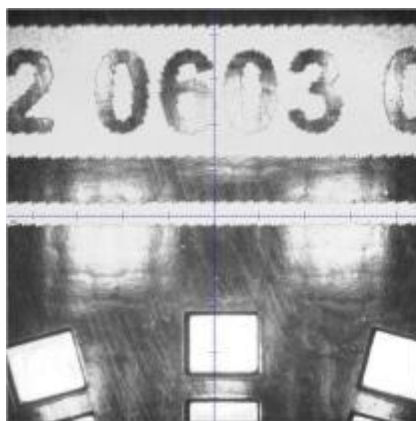Q   Fig.2   Fig.3
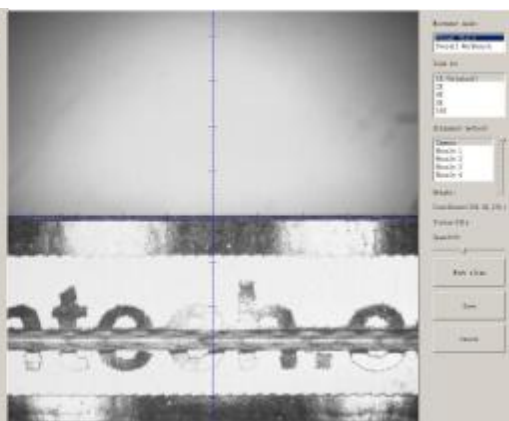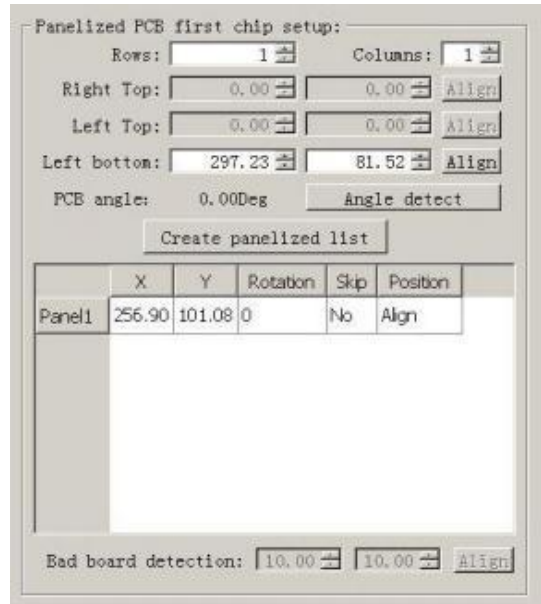
(3) Multiple rail feed:

(4) Eject PCB front-side:Once selected this item,the PCB will eject at front side when finish mounting.If don't select,the PCB will eject at back side.

2.Setting Panelized PCB & first chip

(manual is the same as automatic download)

Function: This is mainly to determine the first component on single or panelized PCB of manual programmed or imported file. The principle is to collect and calculate the data of each board's

relative spacing, in order to achieve the effect of the actual placing.

Operation introduction

(1) Single PCB: Only need to enter "1" in the row and column, some other useless function will   turn grey. The "left bottom" is functional, which means the first PCB.Then you can press "align" to go to the screen of vision and get the coordinate of first component, see image 2-2.
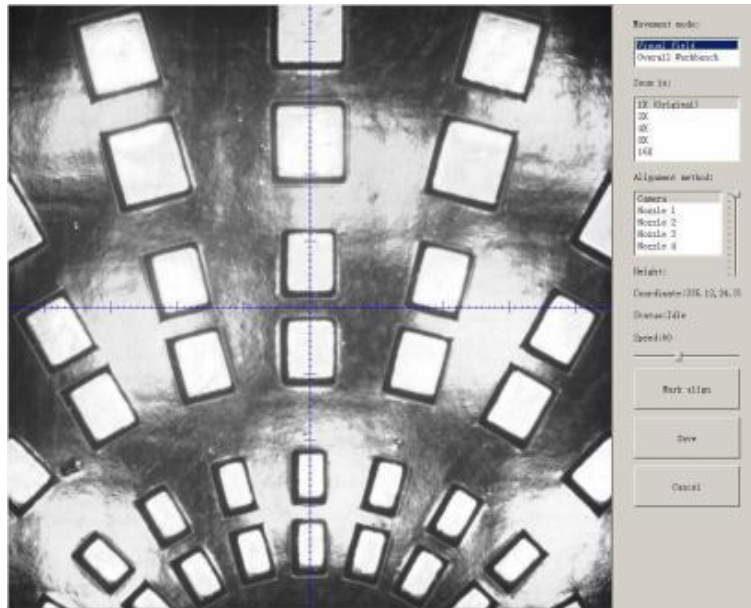
Fig.2-2

After saving the coordinate, the screen will automatically turn back to "PCB information" . Click "Create panelized list" to get the information of "Panel 1". Now we've finished setting of first

component of PCB.

(2) Panelized PCB: the sequence is same to single PCB, but please pay some attention to several points below.

① The row and column is determined by the positioning of PCB on working area. The direction along the rails is the column. Enter data in the row and column.

② About the data collection of "left bottom" , "left top" and "right top", we should take the "left bottom" as the basic, and then go to set "left top" and "right top". Once all the data is collected, the machine can calculate and process the information of panelized PCB. 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 programming file.

Press "align" find the left bottom panel which is nearest to the feeding position, after saving the data, it will return to the "PCB information" automatically.

. The data of "left top" is collected according to component (its position is same to that on "left bottom"). Press "align" find the left top panel which is furthest to the feeding position, after

saving the data, it will return to the "PCB information" automatically.

. The data of "right top" is collected according to component (its position is same to that on "left bottom"). Press "align" find the right top panel which is furthest to the feeding position, after saving the data, it will return to the "PCB information" automatically.

After setup, click "create panelized list", the data will be generated accordingly in the blank. PCB angle correction

Bad board detection
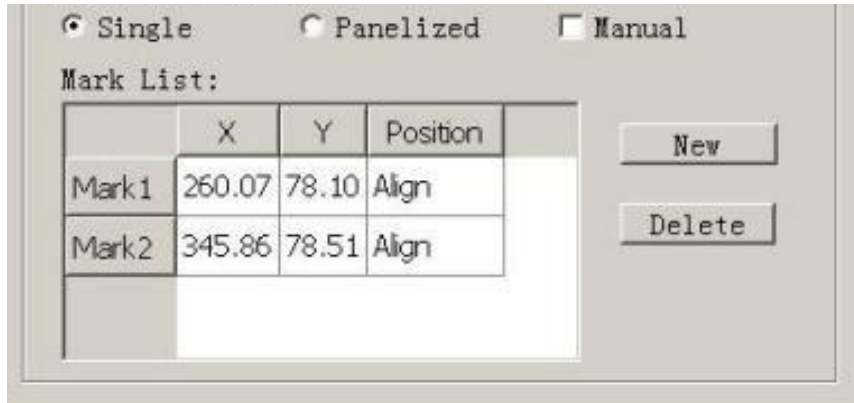
3. PCB mark point setting

Fig.3-1

Function: After completing setup of the mark points, with which the machine can locate the position of PCB and identify the set up mark points, so that the next step can be followed

Operation method:

(1) Mark point on single PCB: this mainly applies on single PCB or a whole board that consists of a few boards (take them as a single board).General we need to set 2-3 mark points.

(2) Panelized PCB: this mainly applies on multiple PCB(we need to set mark points on each PCB)
(3) Manual alignment: if there is no mark point on PCB, you can use some positioning holes or some other referential points as subsidies to locate the PCB
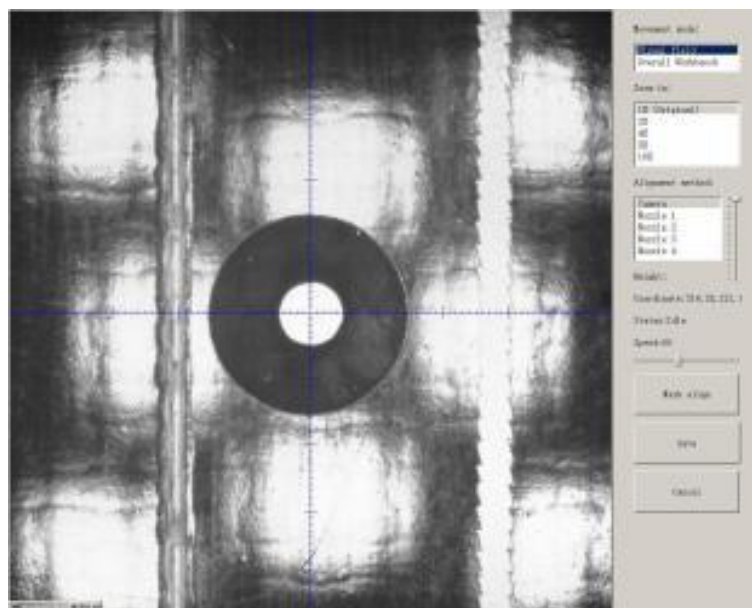

Fig.3-2

Import coordinate: according to the PCB schematic, we get the coordinate of mark and write down manually.

. Manual programming: when it's in Manual Programming status, the function "Alignment" of Mark will be effective. Click on it, the camera will go and collect the coordinate of mark

(see image 3-2), save it and go back. (Note: if the mark point is far away, please use Overall movement to find it)

. No mark exists: Generally we will choose a component that is far away from the first component as a mark, which will make placement effect better.

(4)   Add mark point: the function of adding mark point

Delete mark point: the function of deleting mark point can be used when there is needless mark point or error point.

4. Component list settings
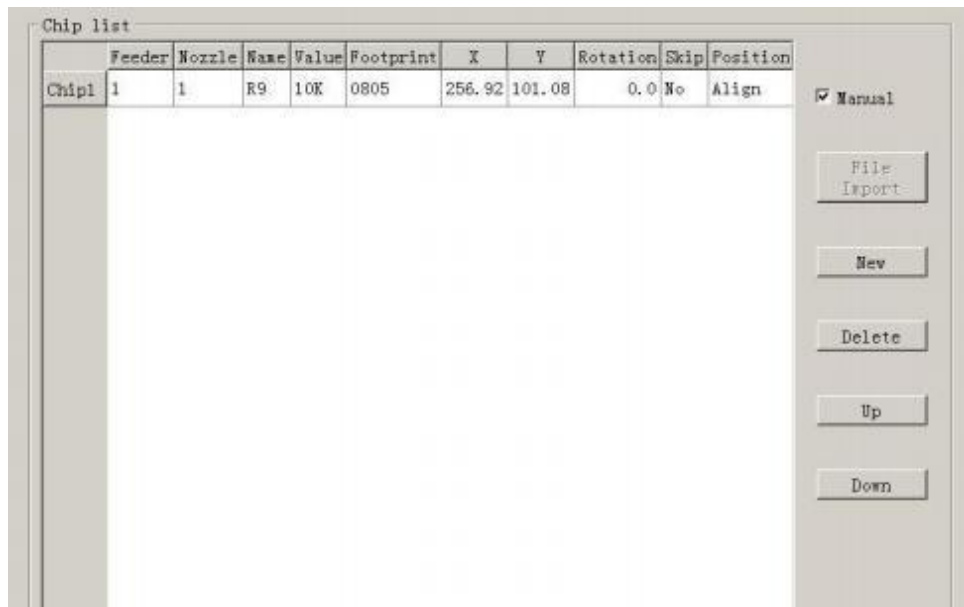
Function: to display the sequence, footprint and other information of components. There are two ways to add these information: manual programming and import mounting file.

Operation：

（1）Manual programming: firstly, check the box of manual programming. There is a sample line of the first component, please modify this line firstly.
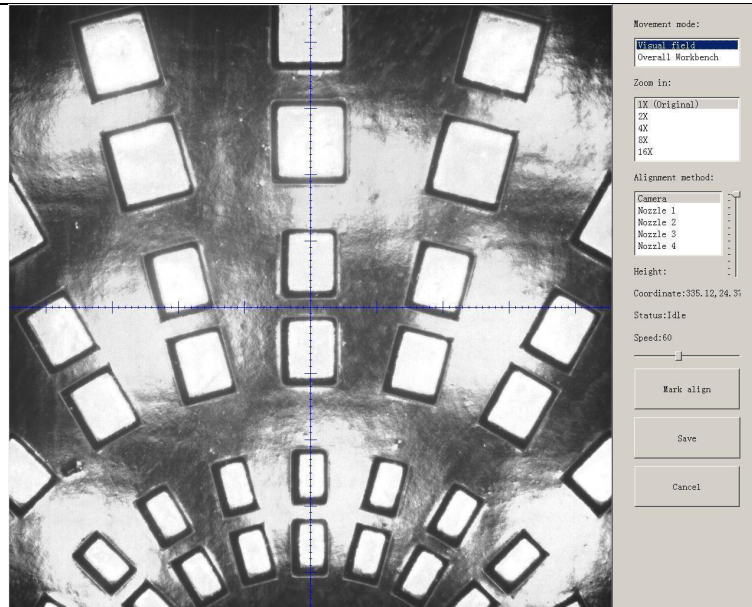
Fig. 4-1,

one component has been found

Find and confirm one component's coordinate by using the function of "Movement Mode"-Click to move (Visual field/Overall Workbench).Once clicked the "Save" item,the interface will automatic back to main page,then input the corresponding values(Designator refer to the location,Specification refer to the value of resistance,Footprint refer to the normal package info,I.e.0603,0805,1206,Etc.Angle value should be set according to the required direction on the PCB and polarity ,horizontal direction(0 or 180 degree),vertical direction(90 or -90 degree).the value should be integer.The first component have been completely created after set all above values.The next step is click "New"item and will popup one line(completely copy the previous line),then click "Align" to find and confirm second component(same operation as before)

(2) Import PCB BOM File

First generate the coordinates from PCB diagram and put the PCB file on the USB Flash Disk,then insert it to the machine(There are many kinds of PCB designer software,the only request is can generate the coordinates from them,file format(.csv)-support use Excel to edit

Remove tick mark before the item"Manual Program"and then click "Import PCB BOM File",will popup one small dialog,select the required PCB file and then click "Save"item,all data will be automatic imported to Chip List .(Turn to the "Feeder configuration"interface to do next operation).See fig.4-2
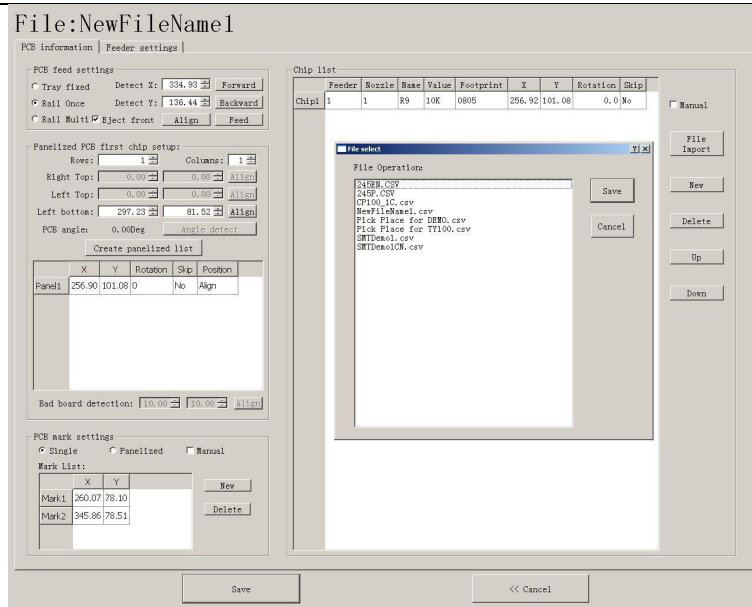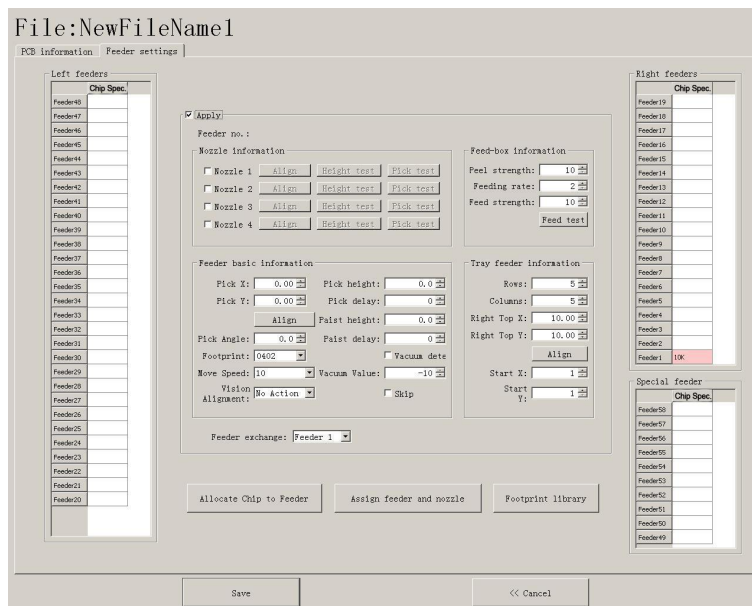
Fig.4-2

5. Feeder configuration

Functions:All components' configurations will be set here for every working file,I.e.(Nozzle selection,Feeder selection,Pick up position,Correction setting and other parameters)

(1) Feeders Arrangement:Left Feeders(Feeder20-48),Right Feeders(Feeder1-19),Special Feeders(Feeder49-58).Above feeders'setting is under the ideal situation.According to the Required Tape's width from customers,the quantities maybe be cut down.For example,if there are a lot of components' information under the "Chip List"item,choose the feeder number and you will find the drop-down symbol,will display all components'specifications by click it.Select one specification and one less in drop-down list,can do same operation in every feeder.

(2) Feeder Configuration:Select one feeder,tick the item"Apply",all configurations will be unlocked for this feeder,then can do amendment.Total have five items:Nozzle information,Feed-box information,Feeder basic information,Tray feeder information,Feeder exchange.One item will be always locked for Feed-box information and Tray feeder information according to the differences of components.Operation sequence: Feed-box information(Tray feeder information)—Feeder basic information—Nozzle information—Feeder exchange(used if placed wrong tape).

Feed-box information setting

```
┌─ Feed-box information ──────────┐
│                                 │
│  Peel strength:    [    10 ▲▼]  │
│                                 │
│   Feeding rate:    [     2 ▲▼]  │
│                                 │
│   Feed strength:   [    10 ▲▼]  │
│                                 │
│                    [ Feed test ] │
│                                 │
└─────────────────────────────────┘
```
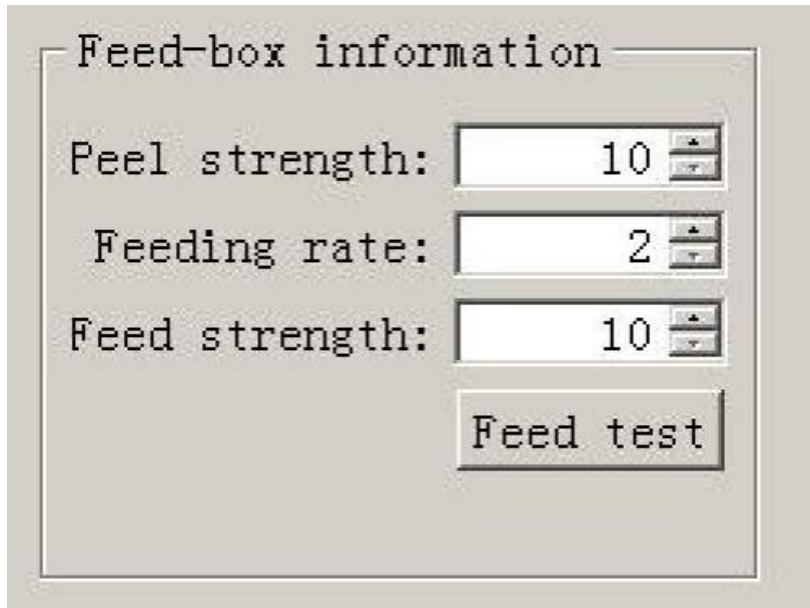
Function:Adjust the value for feed and peel box
Peel Strength:Support do adjustment according to different components' required strength,default value 100
Feed rate:Adjust the feed & peel distance by changing the value
Feed strength:Adjust the feed strength by changing the value,default value 60
Feed test:After finishing above steps,can click this item to test the feed status

Tray feeder information
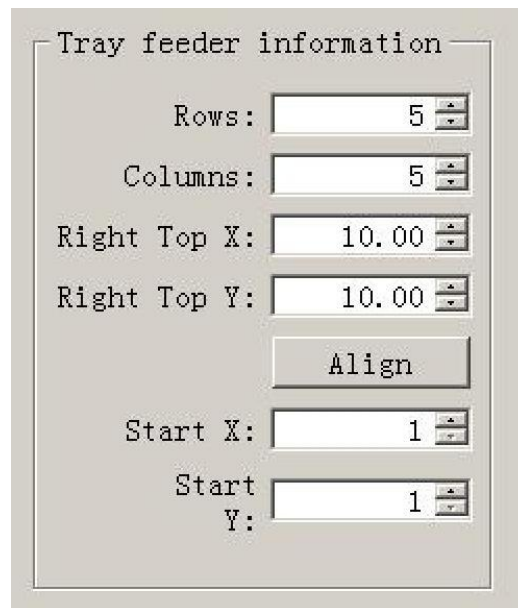
Function:Use to set the components' information from tray and tube packages,complete picking up operation for special feeders by changing the values

Feeder basic information
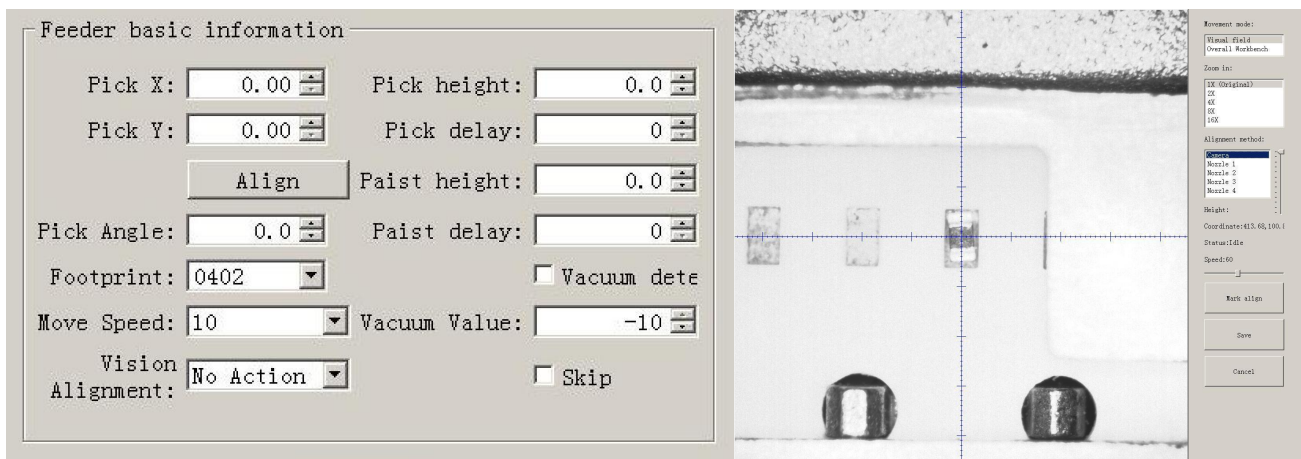

Fig.5-1   Fig.5-2

1 Pick position X/Y:First have to lock the position of component on the feeder(See fig.5-2),once saved the modification, the XY date will automatically change to the ones after alignment.
2 Pickup Angle:The initial default angle is 90 degrees, support to do modifying the value in order to change the mounting angels for wholly feeder if needed.
3 Footprint:Select corresponding footprint,when use the function"Vision Alignment", will refer to the values in date base.
4 Placement speed:Control the placement speed for the feeder by adjust the speed values.

5 Vision Alignment:Choose corresponding alignment method under this item.

6 Pick height:Control the pick height by dragging the sideward slider.

Placement height:Set the value according to the component's actual thickness.
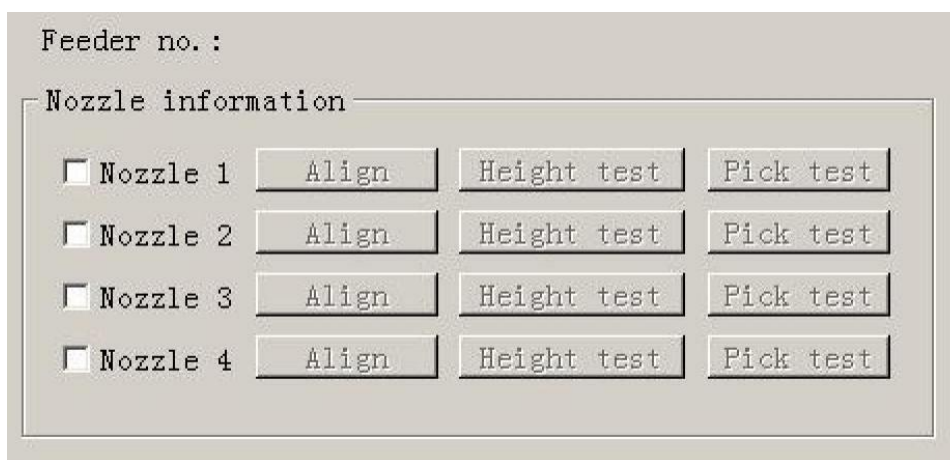
7 Placement/Pick delay:set a little value or 0 both ok.

8 Total have two detection methods,Vacuum Detection and Vision Detection.

Vacuum Detection:Once set one vacuum value which help judge if qualified or not before placement.Once the actual vacuum won't reach this range,the machine will drop away this components and re-pick one.

9 Pet-name ruby chose this material after skip pasted on the station all the material will be skipped, generally will not choose.

Skip:Once select this item,will skip all placement for this feeder.

6. Nozzle Information

```
Feeder no.:
┌─ Nozzle information ─────────────────────────────┐
│                                                  │
│   ☐ Nozzle 1   [ Align ]  [ Height test ]  [ Pick test ]   │
│                                                  │
│   ☐ Nozzle 2   [ Align ]  [ Height test ]  [ Pick test ]   │
│                                                  │
│   ☐ Nozzle 3   [ Align ]  [ Height test ]  [ Pick test ]   │
│                                                  │
│   ☐ Nozzle 4   [ Align ]  [ Height test ]  [ Pick test ]   │
│                                                  │
└──────────────────────────────────────────────────┘
```

Function:Select corresponding nozzles(one or more than one all acceptable)according to the components and the nozzle have set on the machine,then the machine will automatic assign to each feeder in order to meet the requirements pf single head work or multi heads working together.Also have detect functions on this item.

Position Align:The nozzle will align to the component's upside on corresponding feeders when click this item

Height Test:After clicking this item,the nozzle will go down and check whether the pick height is ok. Support do adjustment of pick height on feeder information item if needed.

Pick test:After clicking this item,the corresponding nozzle will pick one component and check whether pick position is ok. Support do adjustment of pick position on feeder information item if needed.

After finish setting of all above feeders information,then click "assign feeder and nozzle to Chip list",then chip list will automatic to be changed correspondingly.

Chapter 2 File Mounting
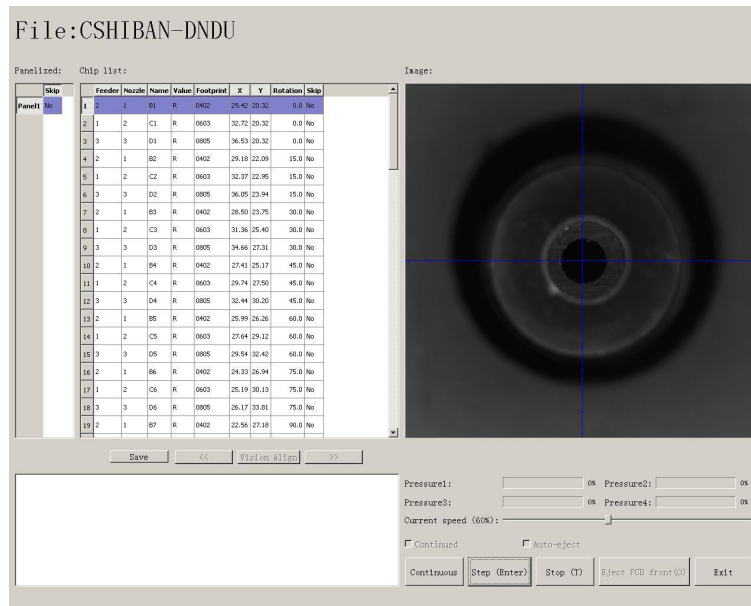
1.Method to mount one file:

First select one file, click"mount", then you will enter into one mounting page, above picture is an example of one file in mounting.

(1) On the top-left corner shows mounting process, chip list---by the variation of blue line, you can track process of mounting constantly.

(2) On the bottom-left corner shows some feedback during mounting process.

(3) One the top-right corner shows the status of picking and picking alignment

(4) On the bottom-right corner shows some control information

　　Air pressure of 4 nozzles

　　Placement speed, can be changed by manual during mounting

　　Non-stop mount,this is used in one-stop smt production line, add conveyors in front and behind,

　　Auto-eject PCB once finished, when select this option, after finished mounting task, PCB will eject its working area automatically

　　Another control information,Continuous/Step/Pause/Eject PCB front-side manually/Stop

Continuous, The machine will obey its order and work constantly

Step, The machine will work one single step

Pause, The machine will stop its work instantly

Eject PCB front-side manually, In order to catch the PCB, after PCB assembly, click this option, PCB will eject from its feeding position. Kindly notice: After pause the machine then you can carry out this order.
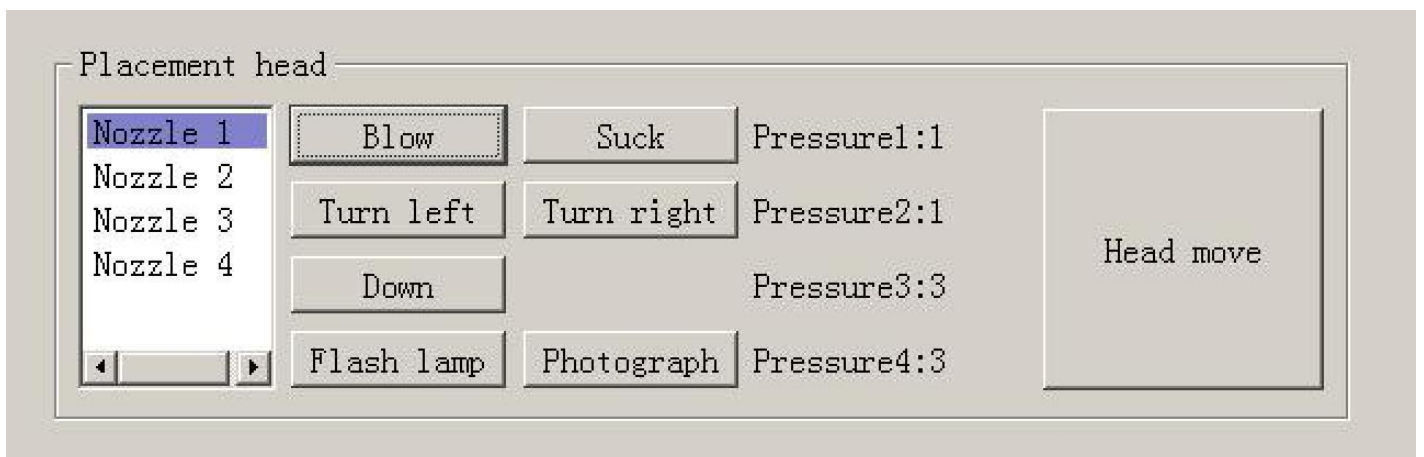
Stop, before click this option, you need to click "pause" first

Chapter 3 Manual Test
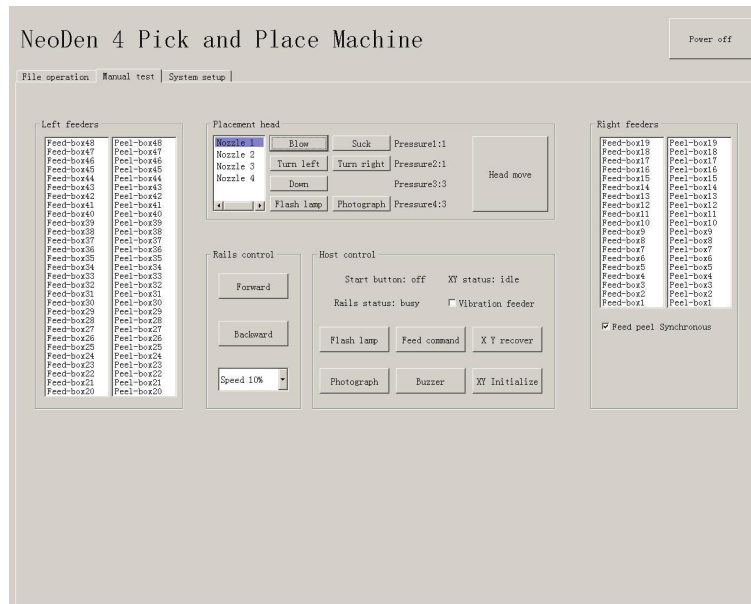
Function: Used for testing the basic functions, connection between software and hardware is the mainly function, details about testing as below:

1. Placement head

Choose nozzle 1, nozzle 2, nozzle 3, nozzle 4 to test separately

Blow, after click this option, air will blow-off from selected nozzle

Suck, after click this option, suction action will appear from selected nozzle

Turn left& Turn right, selected nozzles will turn

Down, after click this option, selected nozzle will descend slowly
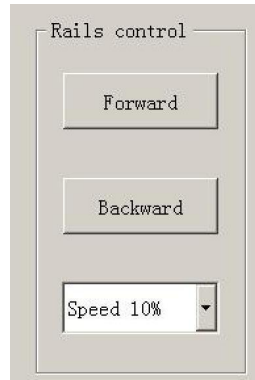
Down Looking Camera light, after click this option, Led light besides the camera will turn on

Down Looking Camera Photograph, after click this option will take a picture

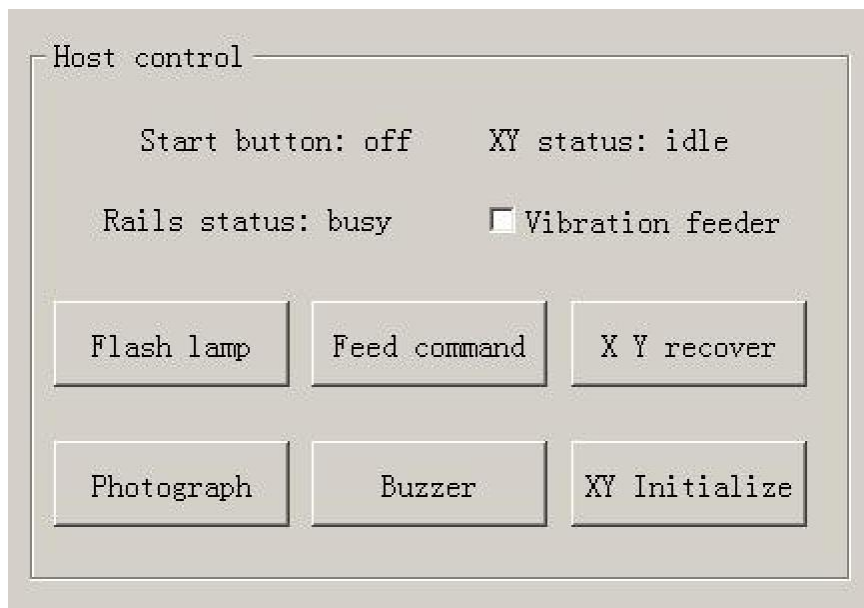Air pressure 1, 2, 3, 4,Based on the testing of nozzles, you can see pressure value of each nozzle.

Head move, after click this option, you will enter into"head move"page, click to move
(Overall Workbench) you can test to move in a wide range.

2. Rail control

Function, test rail PCB feeding,forward PCB feeding, backward PCB feeding and feeding speed

3. Hose control

Function, test each function key
    Start button status, on the left side of machine, it has one start button, press this button the status will change
    Vibration feeder, after select this option, vibration tray will vibrate
   Up looking camera light, after click the light will turn on
    Up Looking Camera Photograph, after click this option will take a picture
    Send PCB feeding command, after click this option, PCB will feed forward
    Buzzer，after click this option some sound will appear
    X Y step out recover&X Y Initialize, after click this, machine will recover to its original position and coordinates in system will initialize.

4. Feeder test
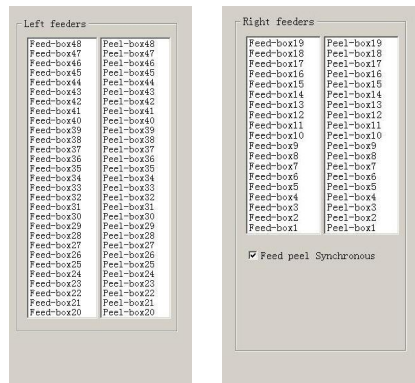
Function, test each feeder's matching and feed box & peel box's function. First, select" Feed-box and peel-box linkage", then test function of feed box and peel box.

(1) click any feeder randomly, feed box and peel box will appear corresponding actions

Chapter 4 Factory settings

Function, this part arm at machine' global parameter settings, any modified parameter will influence all mounting files, when modify this part please consider seriously. Especially the last page system settings, we suggest after using a period of time or under the guidance of our engineers then change its parameter.(Notice, before our machines leave factory, all parameter already be set and no need to change). This user manual just introduce all setting functions briefly, more details about parameter modification please refer to comments from our engineers.
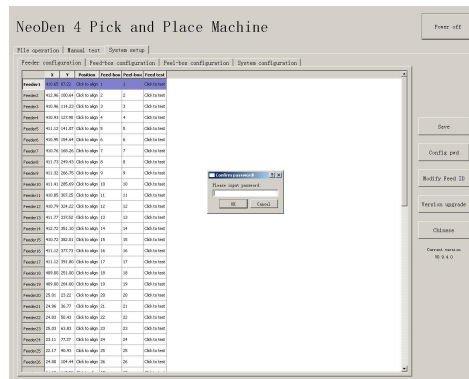
As pic show, function description of button on right side

Save configuration: click it for saving after modify the parameters

Modify password: click it, put into the password, then finish change the fourth page which is also the System interface.
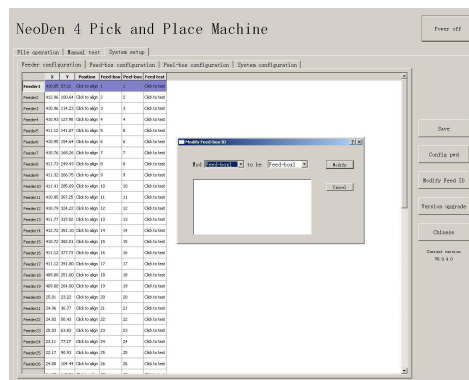

Set up feeder ID: click and show as pic above. This is for modifying of feed-box ID. Feed-box is different from peel-box, feed-box ID is saved in feed-box itself . E.g.: Feeder of feed-box 1, it will be identified feed-box 1 no matter which port matched. So we will mark it. New feed-box default ID are all No.50, it need you to change them here by yourselves.

Version upgrade: After receiving our new version file, you can upload it with clicking "version upgrade" to finish.

ENGLISH：Change to the English version.

1. Feeder configuration
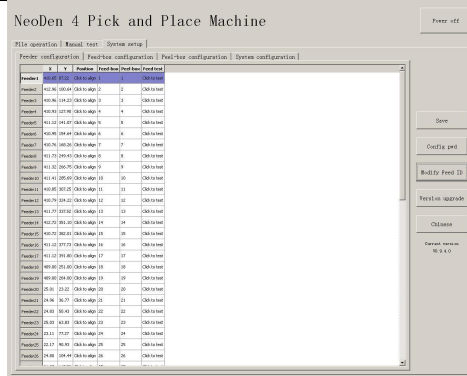
As figure show: parameters setting for all feeders.

First list on left side is feeder No.

X,Y parameters is setting the feeder's pick position.

Click button of "click of align" in the list of "position", then go into interface as below,
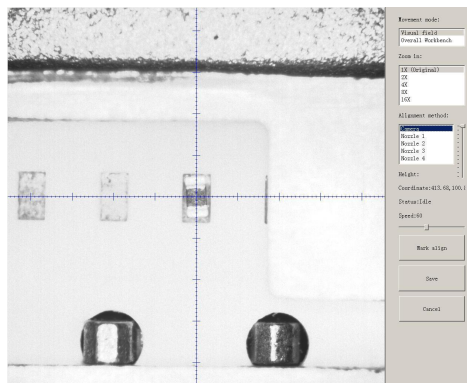

Save after setting well the pick position of the feeder. Same way as in the file.

"Feed-box" setting

It is used to set the feed-box ID. E.g., if you insert the feed-box 2 in the port 1, then it need to set the feed-box ID to be 2

"Peel Box"setting

"Peel box" is different from "Feed box",the ID for peel box is corresponding to the port.For example,no matter which "Peel box" you connect,the ID always be No.1.

Above setting can help set the serial number of the stack in power supply port on the machine, See below fig.
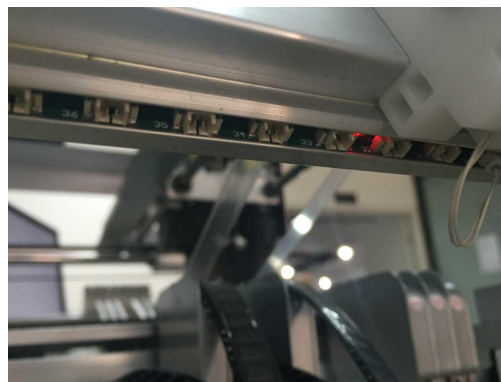
For example,the default port ID for Stack 33 is 33,if the port 33 is broken and want to change to port 34,can set in this item

"Feed test"

Once clicked this item,then the machine will start Feed test,feed one component and help check whether the feed is normal

2. Feed setting
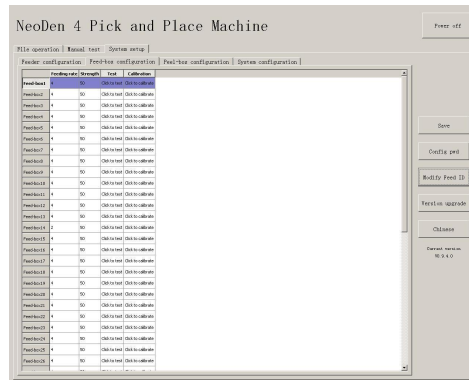
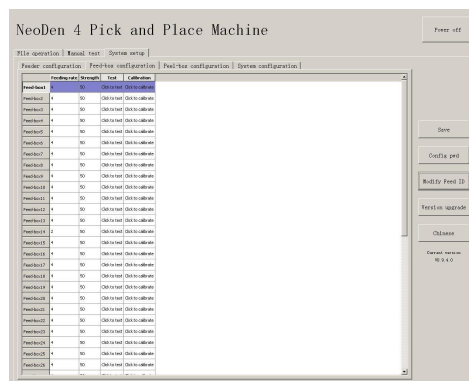Function:Used to setting values for all stacks

Feed rate:The distance between two components,default value 4mm,for 0402,should set 2mm.

Strength Setting：Motor torque of feed for the stack(Normally no need to change).

Test:The machine will do feed test separate after clicking this item,peel box won't work during above test

Alignment:Click peel box,the motor idling several rings to do the initial position of the calibration. Used if there are problems during peel operation,then can click this item to repair. Normally no need to click.

3. Peel Configuration


Function:Peel configuration as above figure show,used to set the values for all peel boxes

Feed rate:Similar meaning in Feed box part,mean length of rotation each time

Strength:Torque setting of Peel motor(Plastic tape will be difficult strip away in the case of being affected with damp, can adjust bigger values of motor torque here)

Test:The machine will do peel test separate after clicking this item,feed box won't work during above test

4. System setting
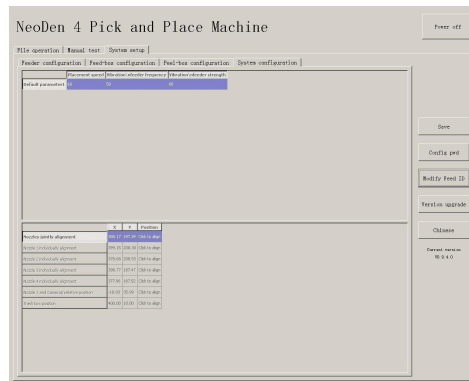
Function: it is mainly for correction the position of suction nozzle.(Notice: In case change by mistake,we have locked it by password. It can be changed by clicking the button of Password change and then insert password. Strongly recommend operating it under our engineer's guidance).

(1) Default parameters 1 setting:

Default speed: placement head movement speed under overall situation, priority is not as fast as speed set in stacks.

Vibration feeder frequency: setting the frequency of vibration feeder. Discharge state will be more stable if frequency high.

Vibration feeder strength: it depends on the component, if component too small and strength set high it will shake out the component easily, of course if strength small, the discharging speed will be slower.

(2) Nozzle Jointly Alignment setting:

Click test button and go into interface below:
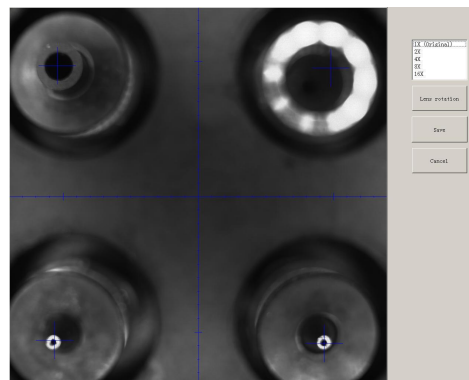
Click the central point among four nozzles under the shot can set the central point.

Another way is press CTRL button then click the mouse to make each nozzle to identify their own central point in the four quadrants.

(Notice: Please click the LENS ROTATION before setting the suction nozzle, then PnP machine will collect nozzle's 360 degree rotation photos to synthesize. After that, press CTRL button to set each nozzle's identification of central point.

Save it after finishing the setting.

(3) Correct nozzle 1~nozzle 4 separately.

Click test and go into interface below:
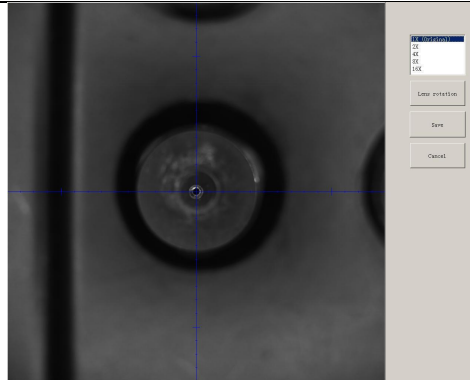
Operation steps: 1.click the button of LENS ROTATION to let machine take photos of nozzle's 360 degree rotation . 2.click the central point of nozzle 3. Click the save button.

Relative position of nozzle 1 and camera: it is for the synchronism of nozzle and camera, setting it when placement position do not matched with the camera position.

Click setting then go into interface below:
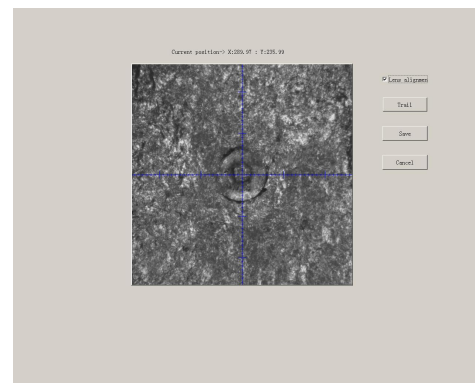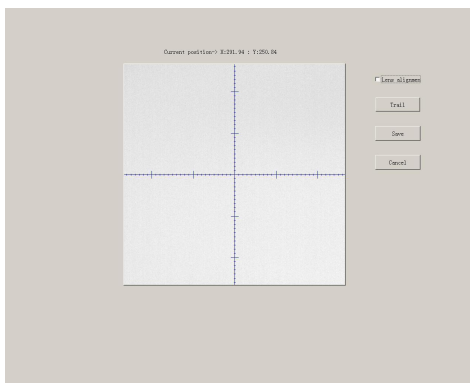
Move the nozzle to any place of PCB board, put one piece of carbon paper, then click REMAINS(MARK), placement head will rotate and leave a dot, after that click the button of Focus that dot and save,it will be done (show as photo above).

Trash box position: setting the position of dropping component, it depends

Company Profile

I.C.T, a long-standing electronic equipment industry platform, has been continuously contributing to the global customer base in the field of electronics manufacturing since 1999. I.C.T company has excellent technical team and service team in surface mount technology (SMT), plug-in assembly (DIP), functional test (TEST), etc. in home appliances (Such as TV, refrigerator, air conditioner, washing machine), new energy (LED, Solar, new energy vehicles, automotive electronics, medical equipment, semiconductors, power electronics and other fields have many successful experiences. Our products cover SMT equipment (smt line, stencil printer, SPI, pick and place machine, AOI, reflow oven, handling equipment), DIP equipment (plug-in line, wave soldering machine, assembly line, belt line), test equipment, packaging equipment, etc. .

Through the deepening of I.C.T's globalization strategy, we have helped more than 200 customers around the world to complete the entire industry chain from program design, production and construction, service training, etc. Our team and products have covered more than 150 countries all around the world and area.

While exporting I.C.T's nearly 30 years of technical experience to global customers, we continue to improve our R&D capabilities and production capabilities. Through investment and equity acquisitions, I.C.T has more than 15 member companies in China, forming a supply chain for the entire industry chain system.

In 2018, We helped clients plan to build more than 35 production workshops and train more than 100 technicians. In the next five years, our goal is to continue to focus on the electronics manufacturing industry, to provide more than 200 customers worldwide, and to provide more professional and active technical support for customers' manufacturing.