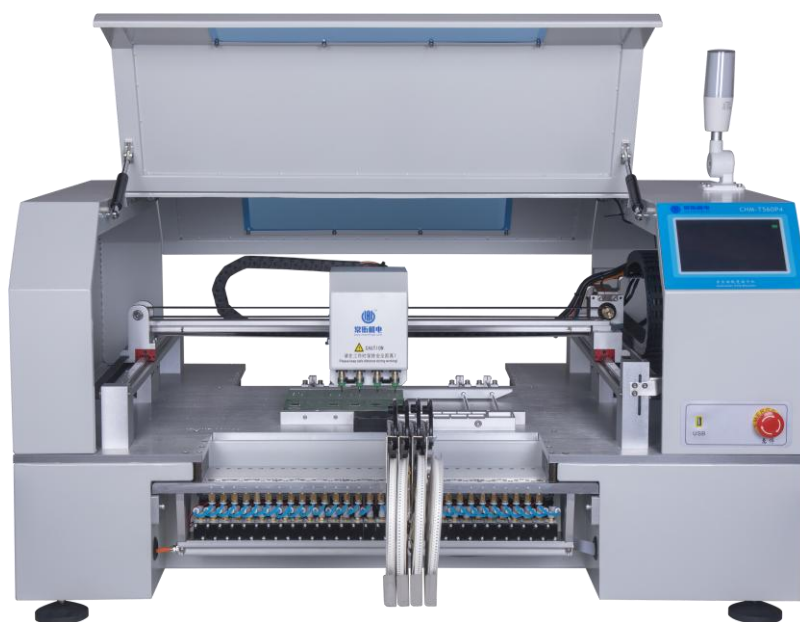


CHM-T530P4
CHM-T560P4

PICK AND PLACE MACHINE USER MANUAL



CONTENTS

1. SAFETY MATTERS	2
2. MAIN PARAMETERS.....	3
3. MACHINE INTRODUCTION	4
4. START	5
5. RUN	6
5.1. EDIT WORK FILE.....	6
5.1.1. <i>Component Edit</i>	7
5.1.2. <i>Material Stack Edit</i>	11
5.1.3. <i>IC Tray Edit</i>	12
5.1.4. <i>Panel Edit</i>	14
5.1.5. <i>PCB Calibrate</i>	15
5.2. RUN	17
6. TEST.....	19
7. SET	20
7.1. SYSTEM SET.....	21
7.2. VACUUM DETECTION SET	23
7.3. BACKUP AND RECOVERY	25
8. FILE MANAGE	26
8.1. GENERATE CSV FILE	26
8.1.1. BY ALTIUM DESIGNER	26
8.2. FILE CONVERT	28
8.2.1. CSV FILE	29
8.2.2. MATERIAL STACK STATION LIST	30
8.2.3. COMPONENTS LIST.....	31
8.2.4. BATCH	31
9. LOG LIST	33
10. SYSTEM LOG	34
11. MAINTENANCE	35
12. WARRANTY	36
13. CONTACT US	37

1. SAFETY MATTERS

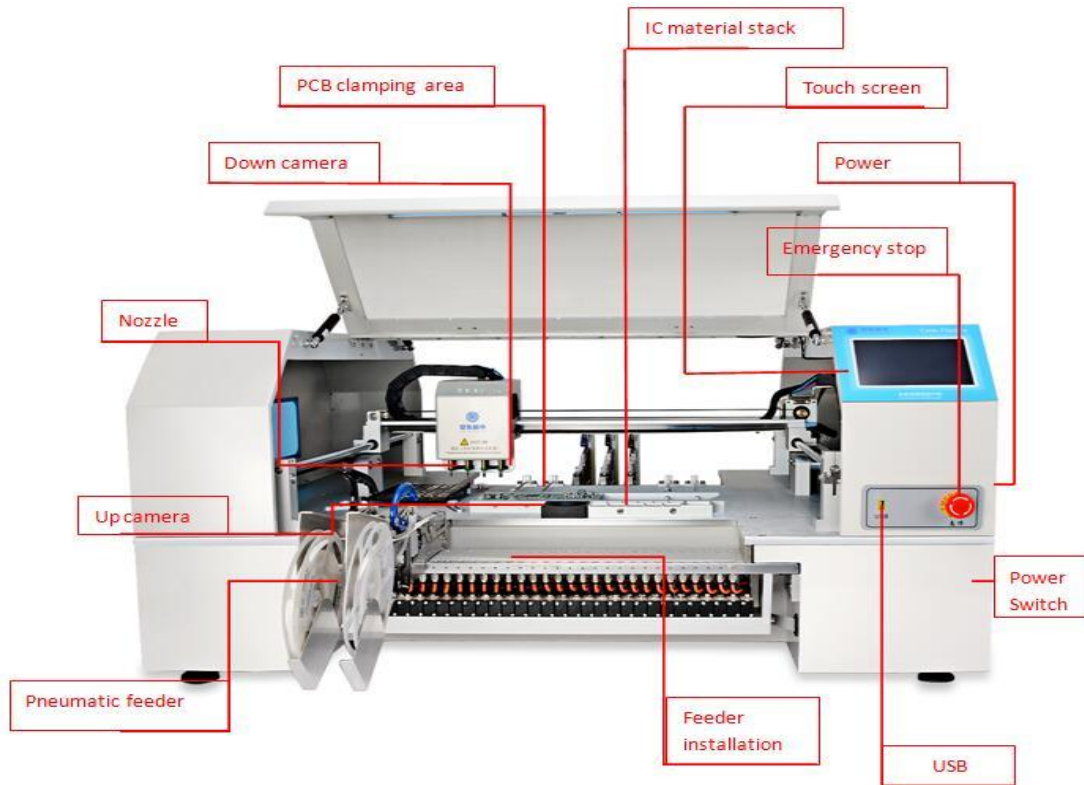
- (1) Stay away from dust and wet.
- (2) Stay away from inflammables and explosives.
- (3) Put machine on a stable platform, if not stable will lose of accuracy.
- (4) Keep it away from child.
- (5) Don't dismantling machine randomly, it will lose of accuracy or broke the machine.
- (6) Make sure power supply and air supply is standard and in good condition.
- (7) Make sure power supply connect earth well.
- (8) Don't touch machine during working.
- (9) Power cord only use for this machine.
- (10) Please read manual carefully before using.

2. MAIN PARAMETERS

Dimensions	1180mm(L)×870mm(W)×640mm(H)
Weight	140kg
Power Supply	AC220V (50Hz, single phase) / AC110V (60Hz, single phase); 400W
Air Supply	0.5MPa
Vacuum Generation	Built-in vacuum pump
Mounting Head Quantity	4
Mounting Speed	8000cph (optimal without vision detection); 5500cph (optimal with vision detection)
Control Accuracy	0.015mm
Component Type	0402/0603~5050/SOT/SOP/QFP/QFN/BGA, etc. (resistor/capacitor/diode/triode/LED/IC, etc.)
PCB Thickness	0.6mm~3.5mm
PCB Size	10mm(L)×10mm(W)~400mm(L)×290mm(W)
PCB Conveying	Manual operation
Nozzle Change	Manual operation
Control System	Built-in computer (embedded Linux operating system), 7-inch touch screen
Drive System	X&Y-axis driven by stepping motors in the way of closed-loop control; Z-axis capable of reset detection; all motors adopting flexible S-curve acceleration and deceleration
Transmission System	Synchronous belt + linear guide
Feeding System	60 Yamaha standard pneumatic/electric feeder stacks (also suitable for IC tray and stick feeder), 11 preset general IC stacks, worksurface custom IC trays supported
Vision System	Up-looking camera for component automatic calibration (component size applicable: 22mm×22mm); down-looking camera for PCB automatic calibration via Mark Point and component positioning

3. MACHINE INTRODUCTION

CHM-T560P4 machine structure as below:



PIC3-1

- (1) **Nozzles:** 4pcs, Far left NO.1 nozzle & Far right NO.4 nozzle.
- (2) **Down-looking camera:** help positioning and for mark point calibration.
- (3) **PCB clamping area**
- (4) **IC material stack:** put some loose-packed ICs
- (5) **Full Touch screen**
- (6) **Power:** Mains supply, fuse inside it
- (7) **Emergency button:** press it will emergency stop, switch to right it will pop out and back to normal working
- (8) **Power switch:** turn ON/OFF machine
- (9) **USB:** connect external USB flash
- (10) **Up-looking camera:** use for component positioning and angle calibration
- (11) **Feeder installation area**
- (12) **Pneumatic Feeder:** standard Yamaha feeder 8mm,12mm,16mm,24mm.

4. START

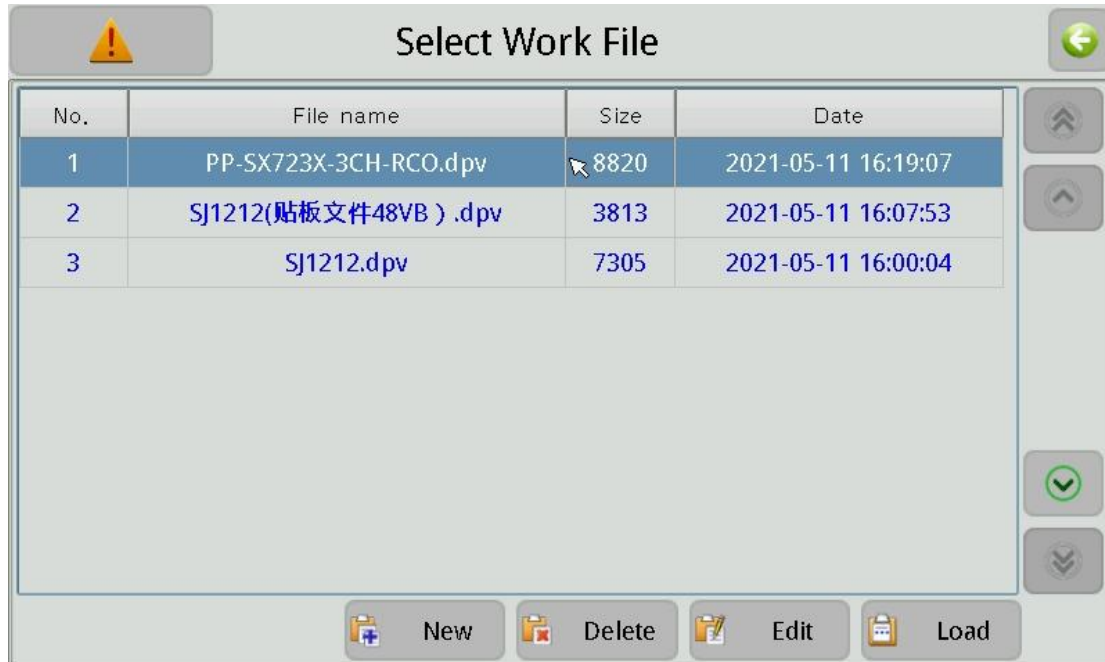
Power on, machine self-check and operation system start, below is home page. You can normal use it now.



- (1) **Alarm:** on the left-side up triangle corner, used to check alarm detail and history.
- (2) **Run:** Used to manage and run the working file.
- (3) **Test:** Used to test the machine's functions
- (4) **Set:** For machine settings
- (5) **Statistic:** Used to view statistics
- (6) **System log:** For the record information
- (7) **Files:** used to manage files and generating work

5. RUN

Home page --- Run, then you will see below image:

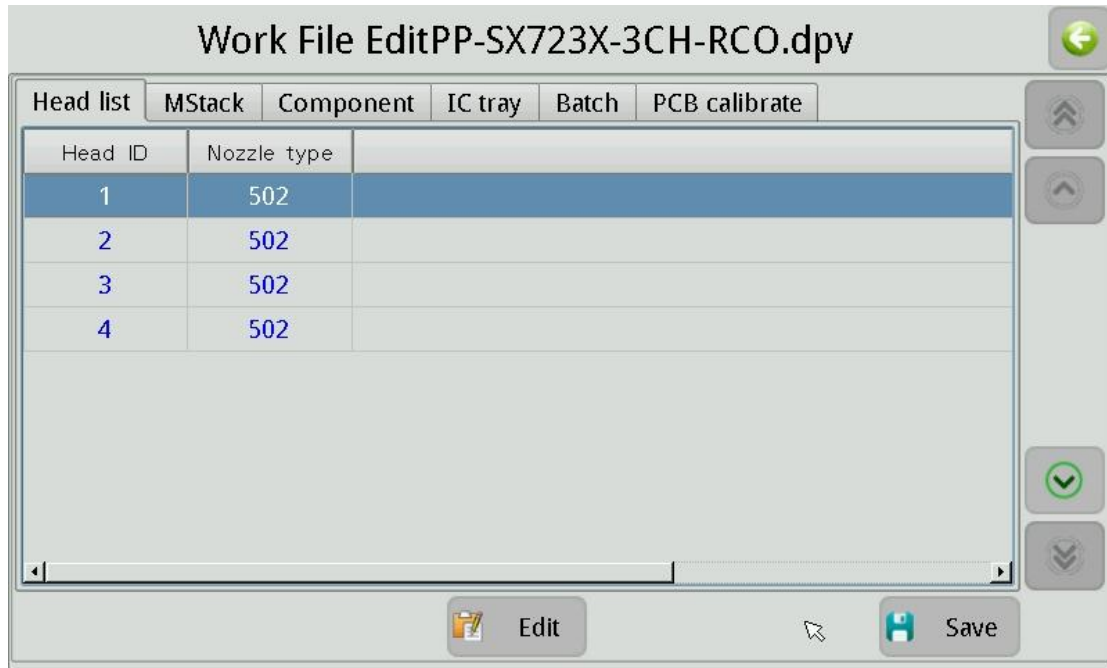


PIC5-1

- (1) **Work file:** current working file
- (2) **New:** create a new working file by yourself
- (3) **Delete:** delete work file
- (4) **Edit:** Edit the selected working file
- (5) **Load:** loading the selected working file and go to start running
- (6) **Back:** on the right-side up corner of the screen, used to back to last page.

5.1. EDIT WORK FILE

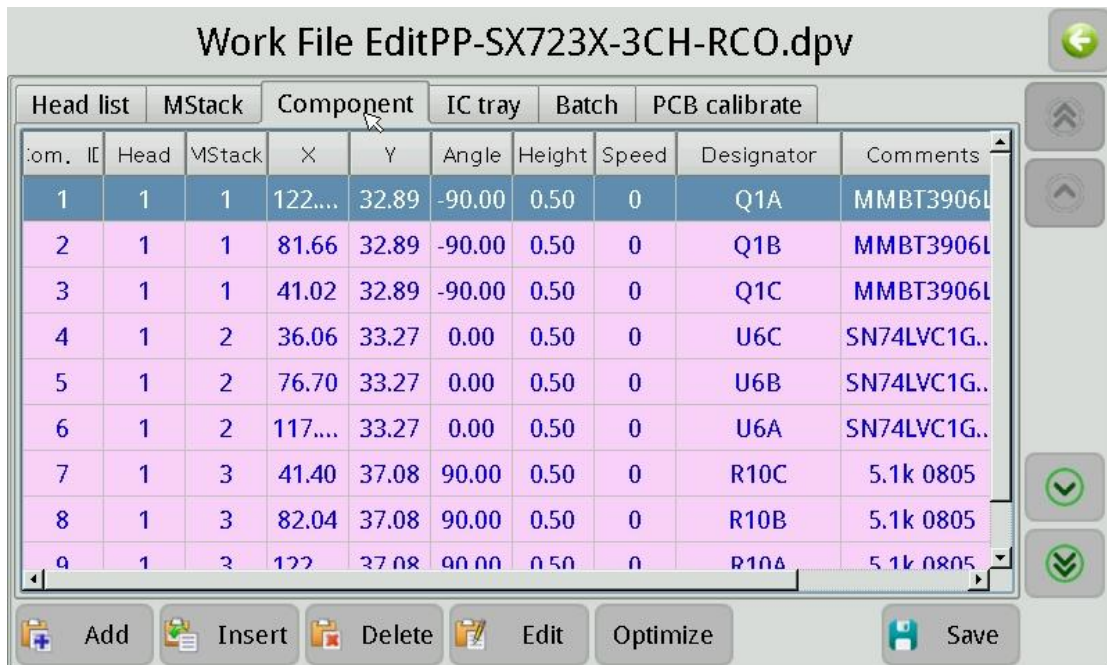
Below image is edit work file:



PIC5-2

5.1.1.

.....



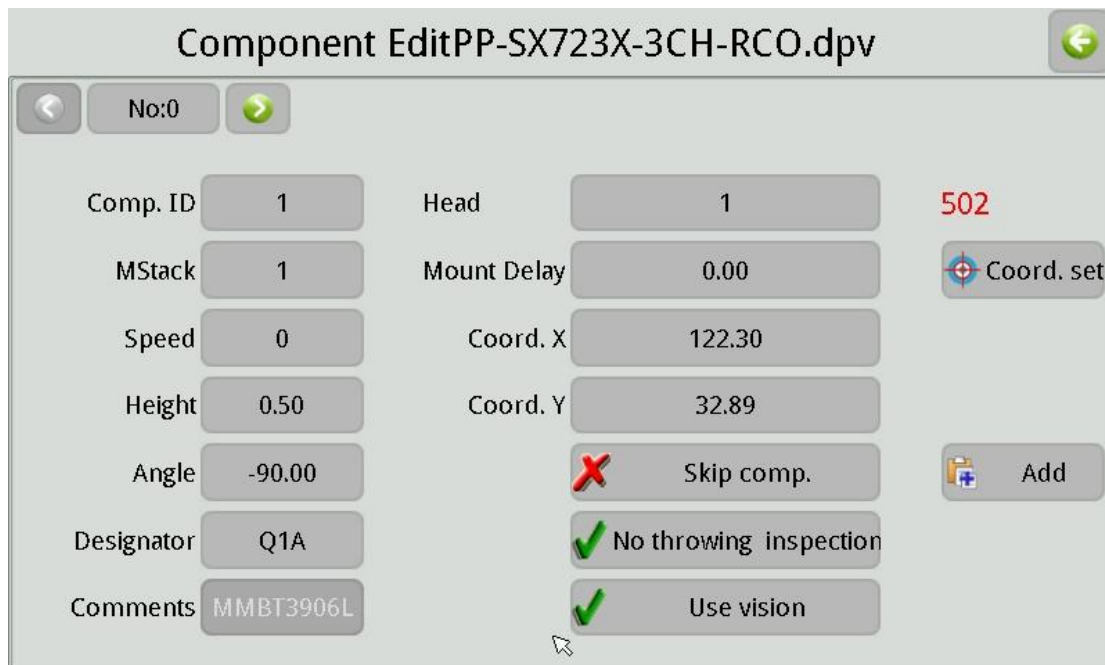
5.1.2. Component Edit

As above picture:

- (1) **Component list**
- (2) **Add** : add a new component on the end of the sheet
- (3) **Insert**: insert a new component before current component.
- (4) **Delete**: delete a component
- (5) **Edit**: edit the selected component
- (6) **Save**: after amend the component list you need to save, if not save in time, the save button will twinkle, then press the button and save, the twinkle end.

5.1.2.1. Edit Component

Below image:



Component EditPP-SX723X-3CH-RCO.dpv

No:0

Comp. ID: 1 Head: 1 502

MStack: 1 Mount Delay: 0.00 Coord. set

Speed: 0 Coord. X: 122.30

Height: 0.50 Coord. Y: 32.89

Angle: -90.00 Skip comp. Add




Designator: Q1A No throwing inspection

Comments: MMBT3906L Use vision

PIC5-3

- (1) **Component number**: on the left-side up corner (start from No.0). Press it you can select the component number.
- (2) **Comp. ID**: unique number, it won't have 2 same comp. ID in one work file.
M Stack: stack 1-30 is for feeder, stack 61-80 is for user-defined IC, stack 81-100 is for IC tray.
- (3) **Speed**: 0 is for machine's general max speed. (for mounting IC, you can lower down the speed a little such as 60-80, it will be more accuracy. [Note: machine speed better not under 50](#))
- (4) **Height**: it is used for component height setting. The value is small for height means the nozzle is more go down. (**Note: machine general height is 0.5mm,**

the general PCB thickness is 1.6mm, you can adjust the height according to the thickness of your PCB)

- (5) **Angle:** for rotate angle of component.
- (6) **Designator:** component identification information, such as R1, R2, C1, U1 etc.
- (7) **Comments:** component information, such as 0402, 0805 etc.
- (8) **M Head:** nozzle for this component
- (9) **Coordinate X:** usually work file generated from software no need to change the setting.
- (10) **Coordinate Y:** usually work file generated from software no need to change the setting.
- (11) **Skip comp:**  means not place this component
- (12) **Vacuum detect:**  means forbid throwing materials due to lack of vacuum.
(Note: if no component, this function also valid, for some flat surface component, we suggest enable this function (such as cylindrical led component 4148, it can prevent misunderstand throwing materials)
- (13) **Enable vision:**  means open vision positioning, if turn off, the speed will increase but accuracy will be lower.
- (14) **Coord. Set:** used for component coordinate by nozzle or down-looking camera.

5.1.2.2. Coordinate set

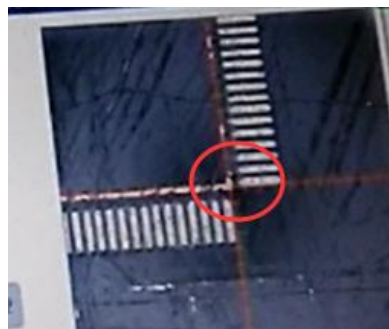


PIC5-4

- (1) **Coordinate:** X and Y's coordinate is relative coordinates, means the coordinate after movement comparing with previous coordinate.
- (2) **Vision:** press this button exchange nozzle positioning and vision positioning, we suggest use vision positioning, nozzle position not that accurate.
- (3) **Two point:** means diagonal positioning, left-up corner and right-down corner. We suggest use this function for some big ICs, pictures as below:



Left-up corner

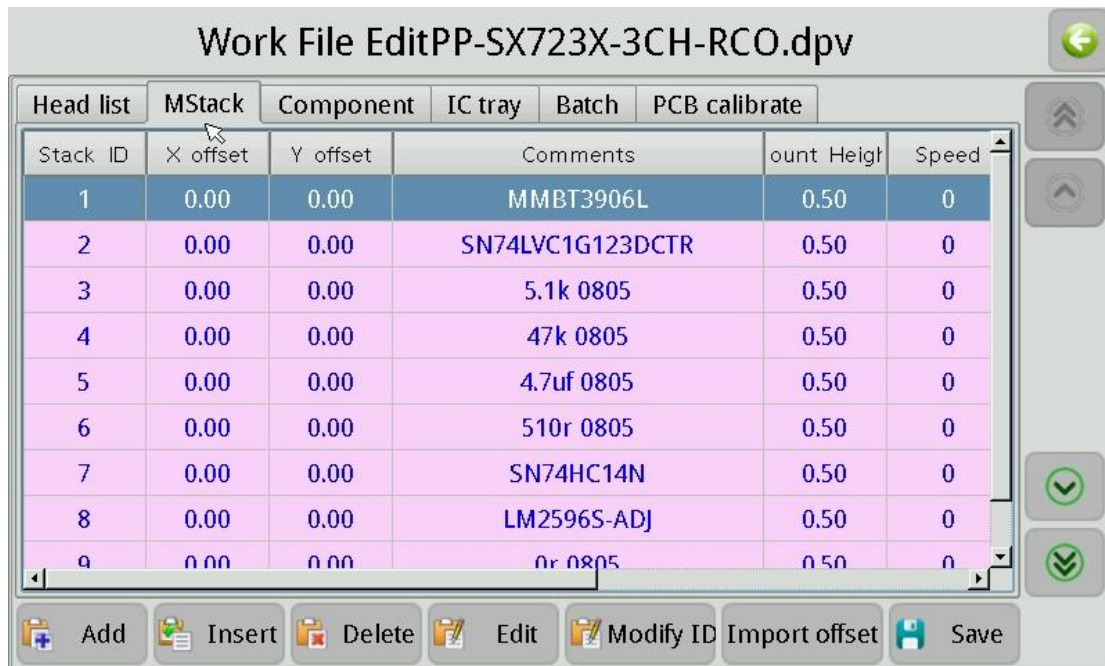


right-down corner

Note: use this way of positioning, don't view printing silk frame, silk printing not accurate, you need to view the bonding pad.

- (4) **Move:** "L" for low speed, "H" for high speed.
- (5) **Set:** press it for save position changes

5.1.3. Material Stack Edit



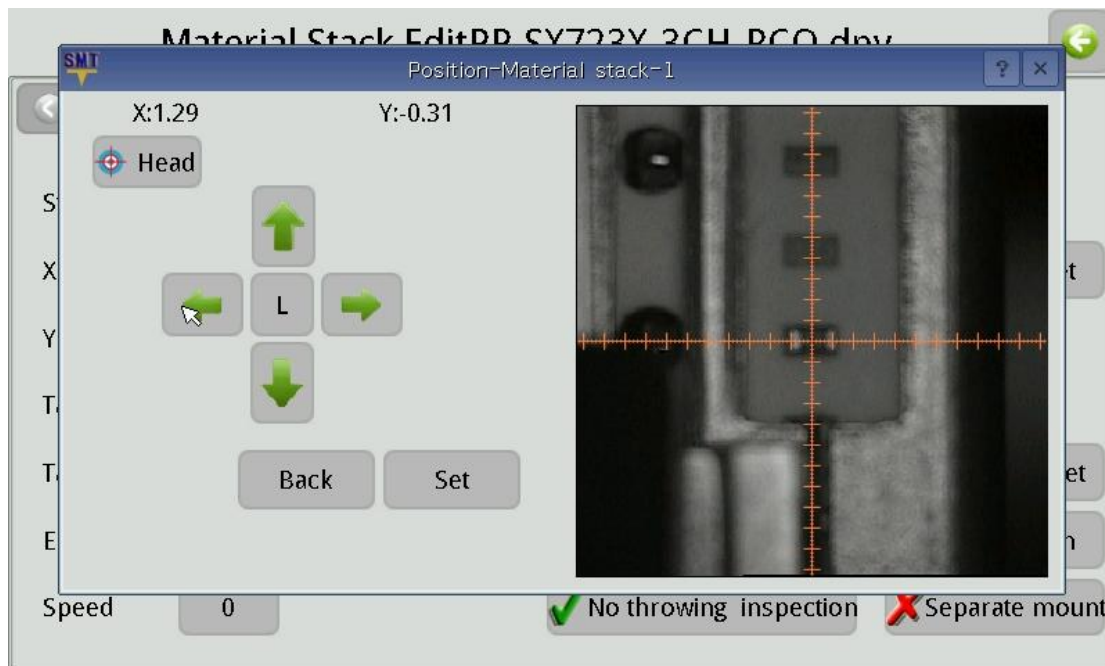
PIC5-5

- (1) **M Stack list**
- (2) **Add:** add a new stack at the end of stack list;
- (3) **Insert:** insert a new stack
- (4) **Delete:** delete the selected stack, note: delete this stack, the components will be delete as well.
- (5) **Edit:** edit selected stack, image as below:



PIC5-6

- a) **Stack ID:** 1-30 for feeder, 61-80 for user defined IC, 81-100 for IC tray. If edit the stack ID, all the component will be changed as well.
- b) **X/Y offset**
- c) **Height:** function the same as “component edit” as above.
- d) **Speed:** function the same as “component edit” as above.
- e) **Comments**
- f) **Ec size X/Y:** this setting used with vision calibrate, 0 means full screen search, otherwise it will search 2 times length of the side of the bigger component of X or Y. According to this setting, it can prevent wrong calibration due to light source interface around the camera.
- g) **Skip comp.** function the same as “component edit” as above.
- h) **Vacuum detect:** function the same as “component edit” as above.
- i) **Enable vision:** function the same as “component edit” as above.
- j) **Coord. set:** used to select the pick position, image as below:
(For feeder stack, the pick position must positioning the first feeder component, must show full part of this component.)

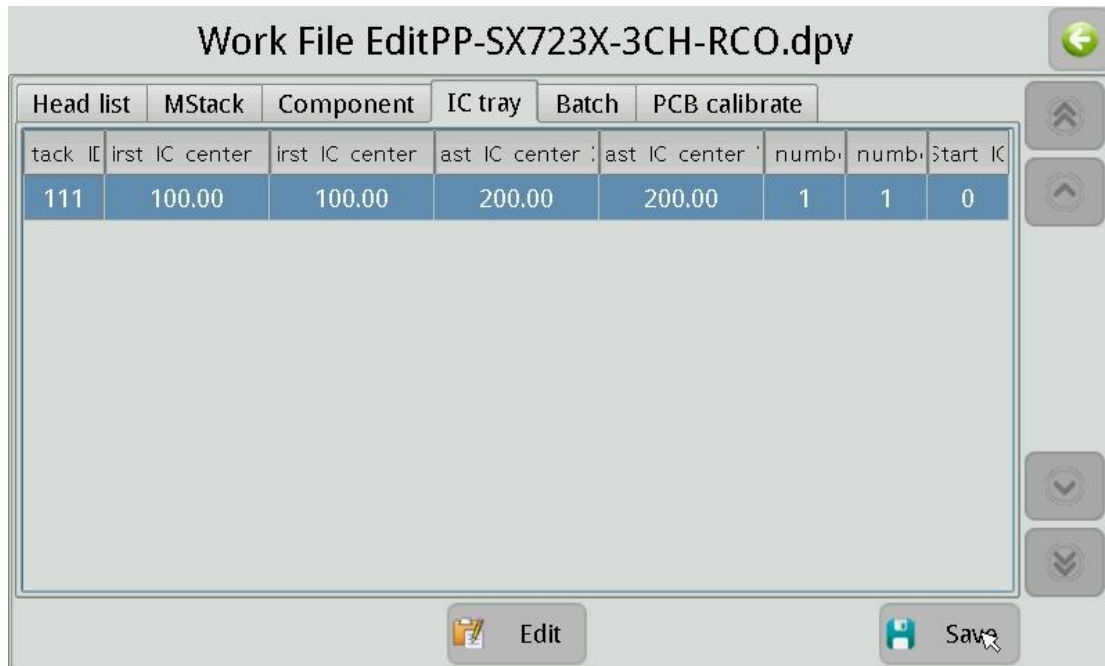


PIC5-7

5.1.4. IC Tray Edit

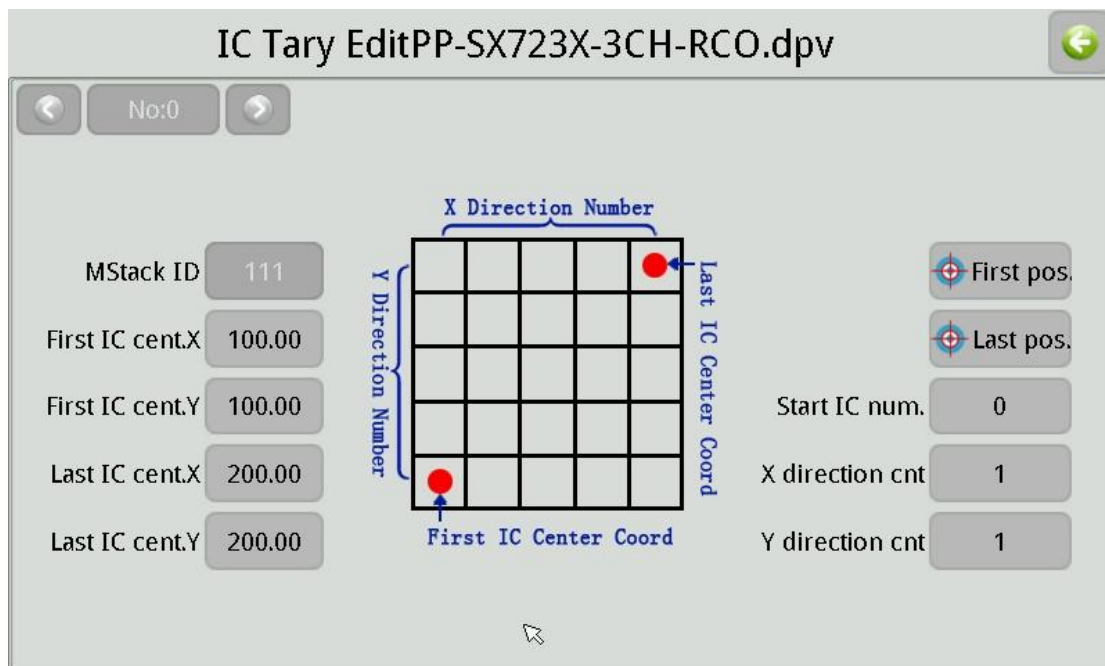
IC tray stack number from 81-100, IC tray fixed on the holding area, same type of IC

put inside the tray with array shape, machine will pick the IC from left to right, down to up.
IC tray edit image as below:



PIC5-8

The stack number is from 81 -100, IC tray edit image as below:



PIC5-9

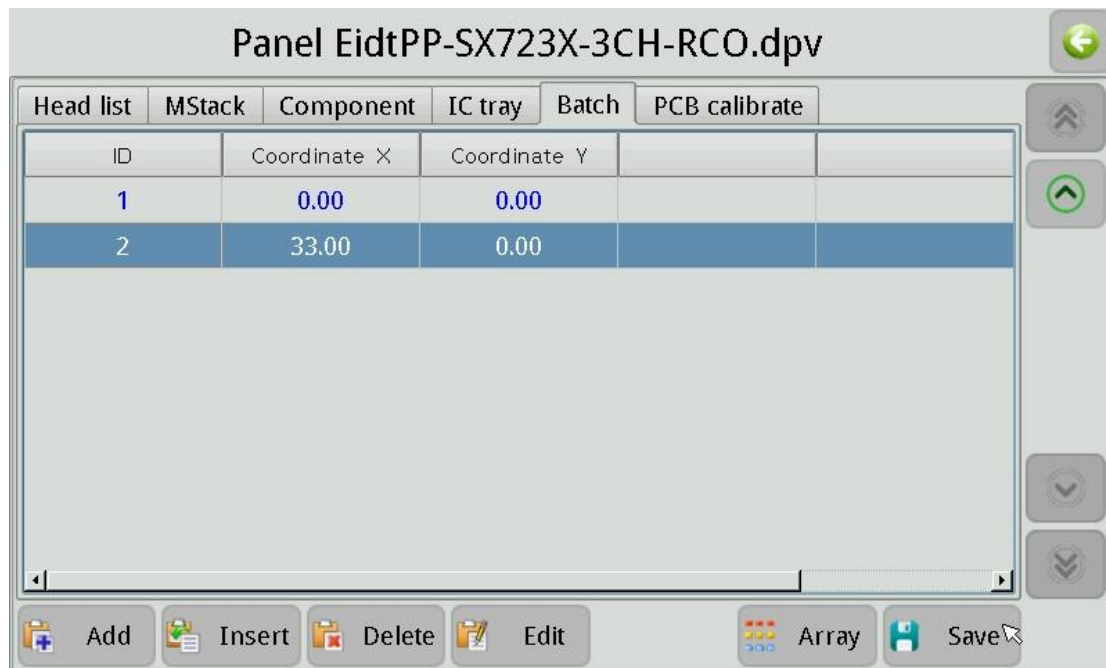
- (1) **First IC center coord. X/Y:** on the left-down side corner;
- (2) **Last IC center coord. X/Y:** on the right-up side corner;
- (3) **X/Y direction number:** The number of X/Y direction on IC
- (4) **Start IC number:** from number 0, IC number from left to right, up to down, when running, machine will start from your selected IC number.

5.1.5. Panel Edit

Batch is very convenient for same multi PCBs, before mounting, machine need to know the position of each PCB, 2 ways of Batch: **Coord. or Array** positioning for PCB. Coord. positioning according to the origin point of each PCB, coord. way is complicated but more accurate; Array positioning need to know Line, the number of columns and spacing, then machine will calculate the origin point automatically.

5.1.5.1. Coord.(Coordinate)

Coordinate way image as below:

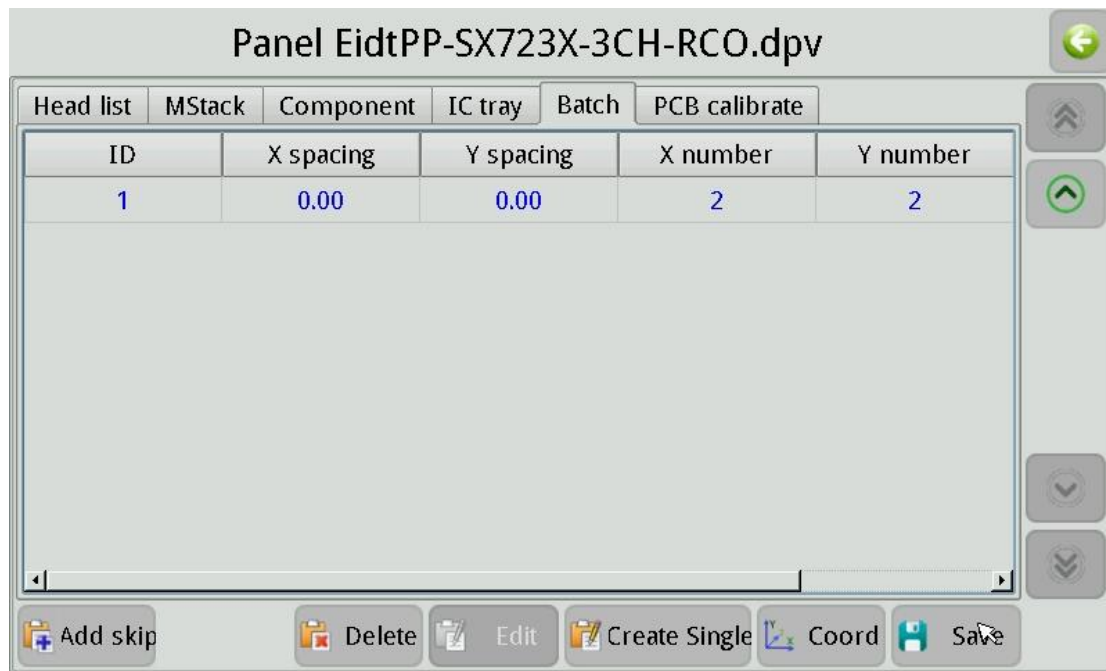


PIC5-10

Above picture, one line for one PCB, X and Y for origin point coordinate.

5.1.5.2. Array

Array way image as below:



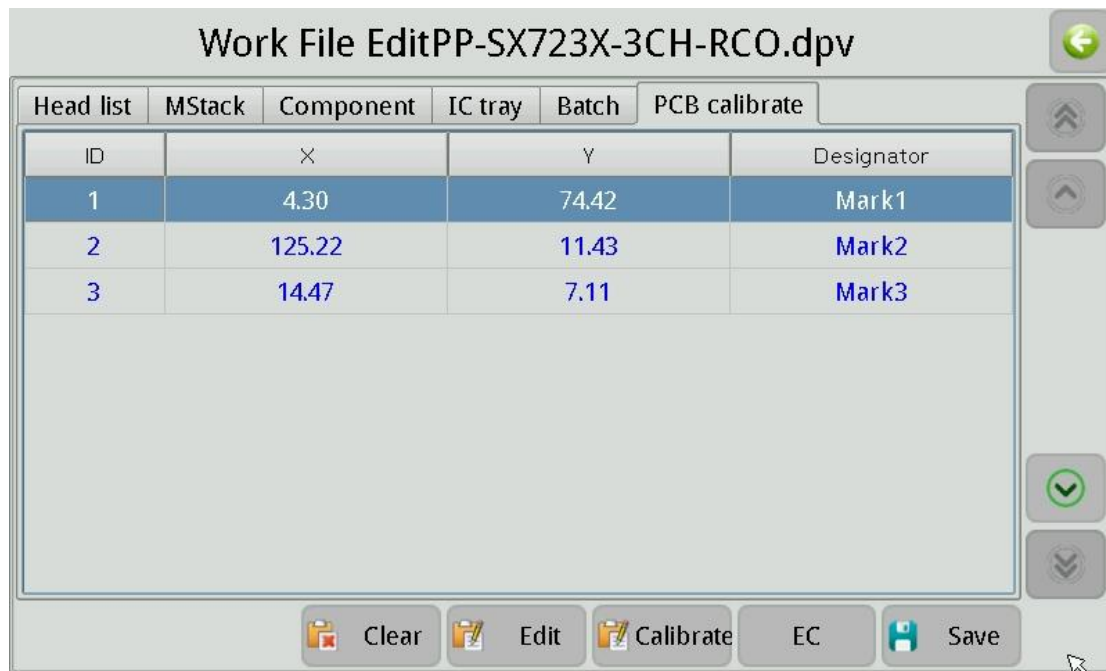
PIC5-11

“Add skip”, it can skip some PCB and not mounting this PCB.

“Create single” used to all the small PCB expand to one PCB, and save into a new work file. This function means you can adjust one single component in this new PCB. New work file will show “Single” at end for the name.

5.1.6. PCB Calibrate

Due to each PCB is different, it has some offset, in order to ensure the accuracy, you need to calibrate the actual position of the PCB and component. Image as below:



PIC5-12

Two ways of PCB calibrate:

- **Component coordinate:** the left-up corner component + the right-down corner component.
- **Mark point:** you can use 2 random points as Mark point, then enter its theoretical coordinates, then positioning its actual position, machine can calibrate automatically. (Note: 2 mark points need to be far apart, such as one in left-up corner and another in right-down corner.)

If you use mark point calibrate automatically, you need to edit a **model** for this 2 mark points, model image as below:



PIC5-13

5.2. RUN






After work file completion, now you can run this file!

Image as below:



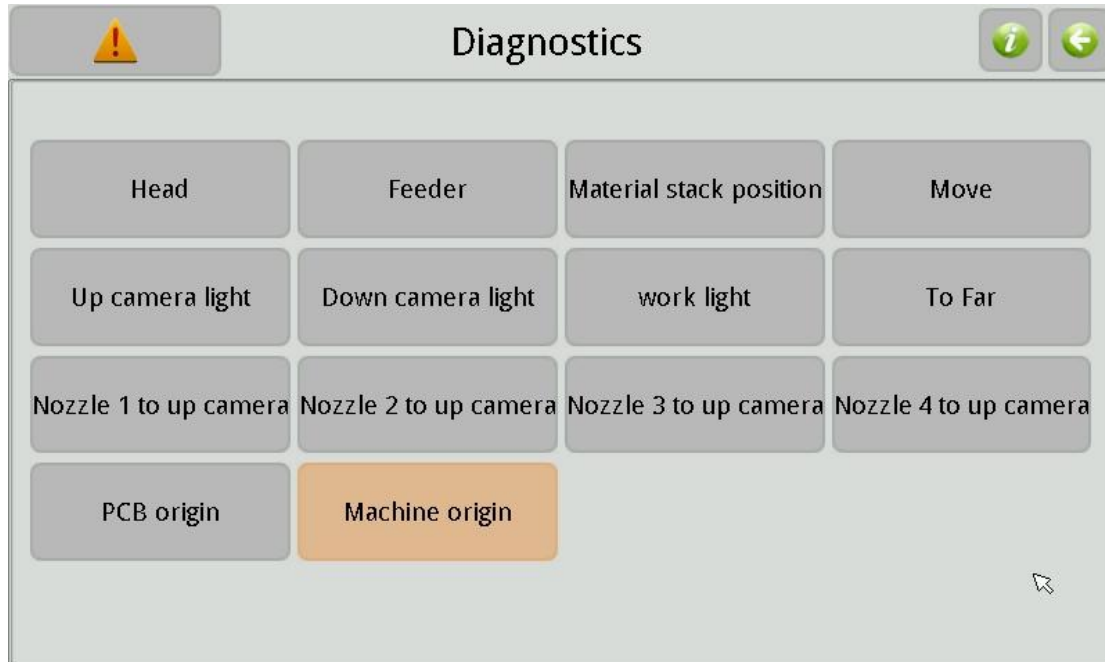
PIC5-14

- (1) **Comp. ID**
- (2) **PCB ID:** display current panel's quantity.
- (3) **Comp. cnt:** component count.

- (4) **PCB cnt:** PCB count.
- (5) **Ave. speed:** average speed, cph.
- (6) **Time cnt:** time count.
- (7) **Tray start:** set the start number for IC tray
- (8)  **Up-looking camera:** press it will show the component by up-looking camera
- (9)  **Working lamp**
- (10)  **PCB calibrate**
- (11)  **Vacuum detect:** if you turn off vacuum detect, machine will not detection of pick failure;
- (12)  **Head to the farthest place:** press it the head will move to the farthest place away from origin point (means the home position).
- (13) **Step:** single step;
- (14) **Run**
- (15) **Stop:** end working

6. TEST

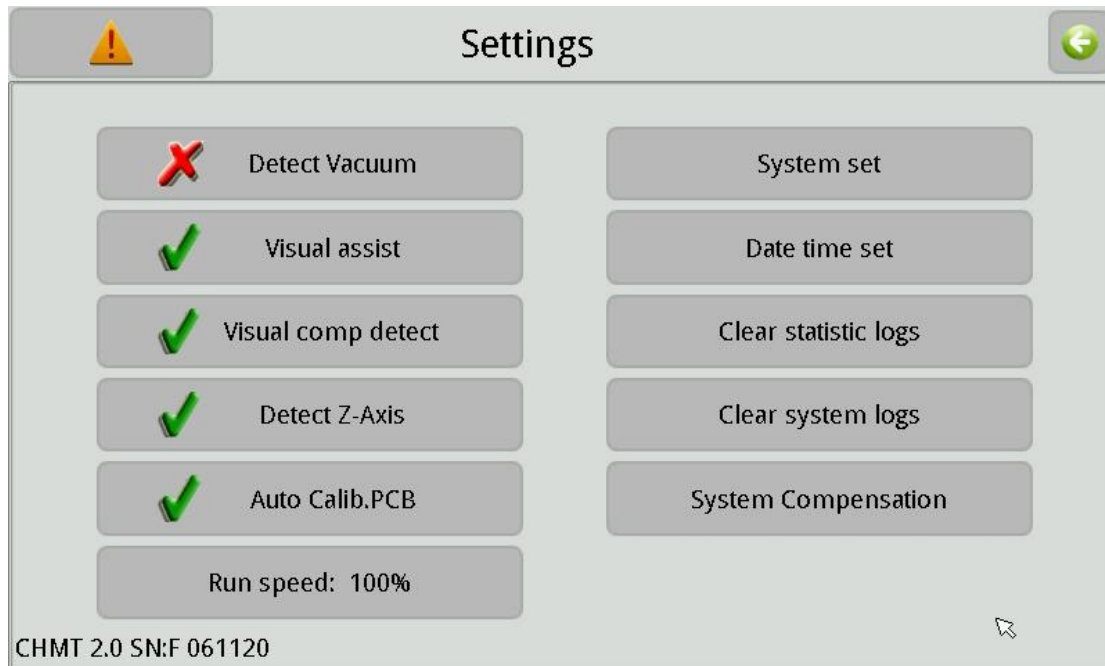
Test used to test if each function in normal condition, you can't edit in this page:



PIC6-1

- (1) **M Head 1/2**
- (2) **Vacuum 1/2**
- (3) **Rotate 1/2:** press it rotate 180 degree;
- (4) **Blow 1/2**
- (5) **Up work light**
- (6) **Down work light**
- (7) **Work light**
- (8) **Material stack position:** press it to selected pick position
- (9) **PCB origin:** head moves to PCB origin
- (10) **Move:** move the head position randomly
- (11) **Feeder:** test feeder's Feeding function
- (12) **Nozzle 1 to up camera:** move nozzle 1/2 to up-looking camera
- (13) **To far:** nozzle back to the farthest place of origin point
- (14) **Machine origin:** press it and back to origin

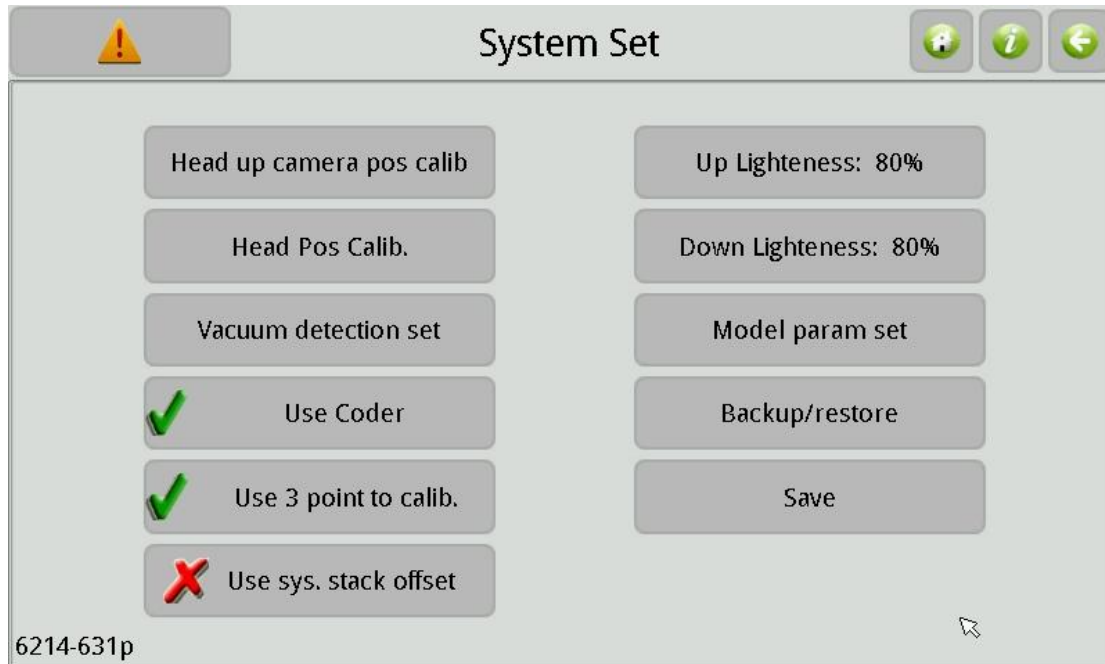
7. SET



PIC7-1

- (16) **Vacuum detection:** if you turn off vacuum detection, machine will not detection of pick failure, and also not throwing materials.
- (1) **Visual assist:** close it will have no vision function
- (2) **Visual lack detect:** if you turn on this function, system will pick again when it detects lack of materials. If detect many lack of material many times, machine will alarm and stop working.
- (3) **Z Axis detect:** if you turn on this function, if Z axis lose step when mounting, Z axis will back to origin automatically. Turn on this function will help to prevent Z axis due to incorrect setting of component height.
- (4) **Auto Calib. PCB:** if you turn on this function, machine will doing PCB calibrate automatically by down-looking camera before running.
- (5) **Run speed:** used to set the general speed of machine.
- (6) **System set:** setting up the system advanced parameter, need to enter code “123456”, if machine work fine, then no need to amend the setting.
- (7) **Date time set**
- (8) **Clear statistic log**
- (9) **Clear system log**
- (10) **System comp. set:** used to set component entire offset and angle compensation.

7.1. SYSTEM SET

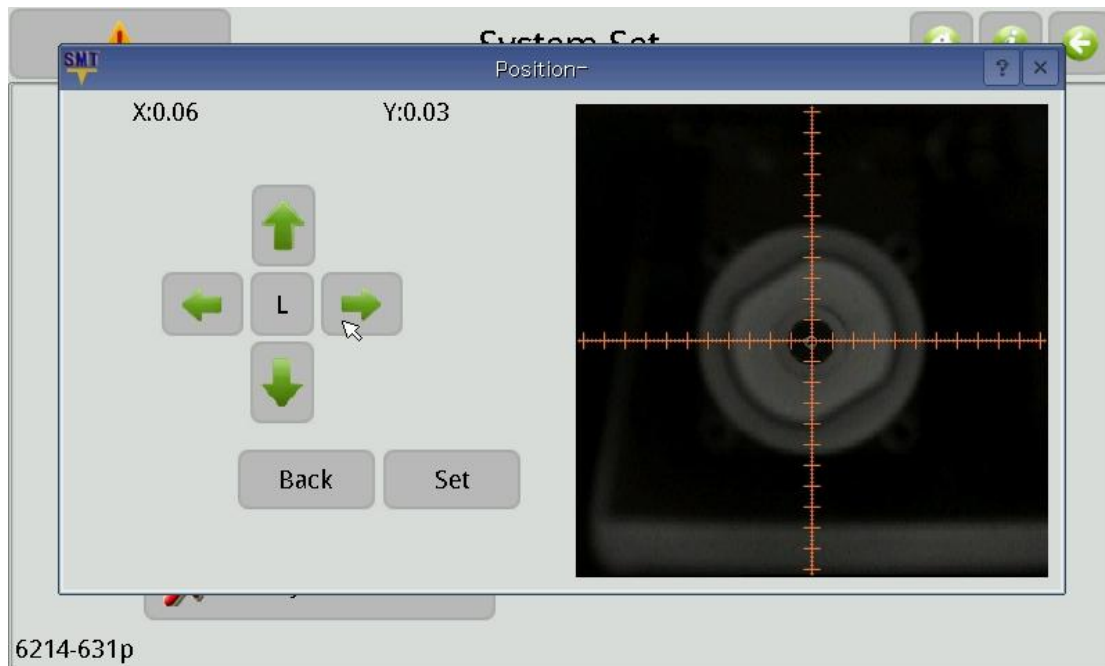


PIC7-2

- (1) **Up camera position calibrate:** when you start you new machine for the first time, you need to calibrate the up camera, it is very important for mounting accuracy.

Steps as below:

- a) Press it machine open up-looking camera and image as below:



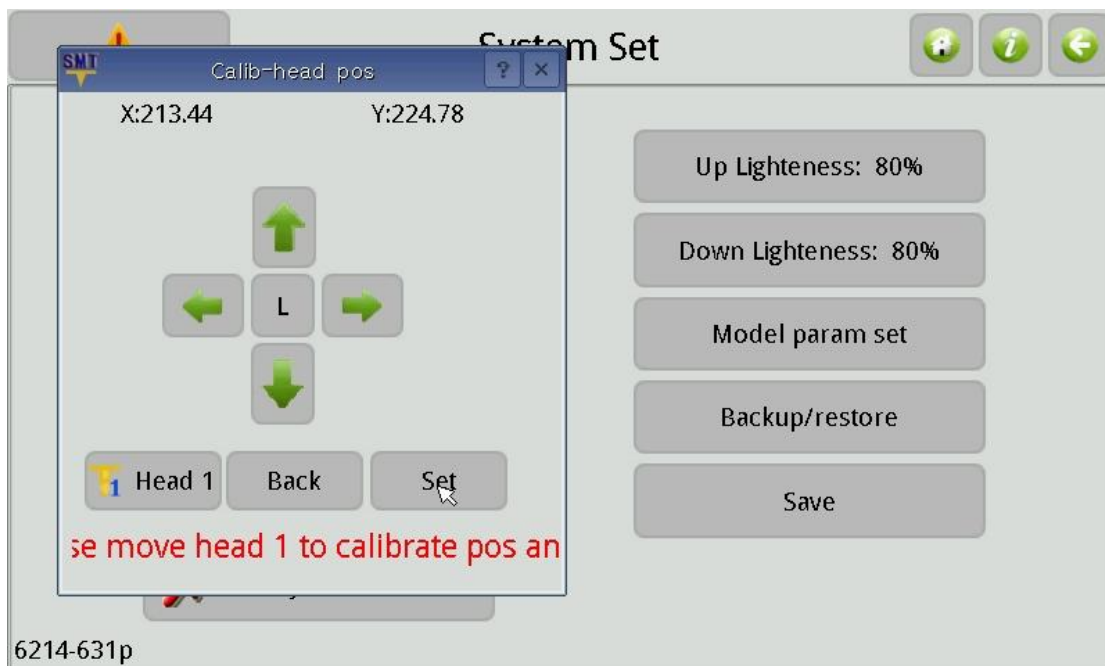
PIC7-3

- b) Put the black board on the up-looking round camera-----adjust the board's

position----- make the two center points matching -----press set go to next step-----machine change to down-looking camera automatically-----next display will show as below:

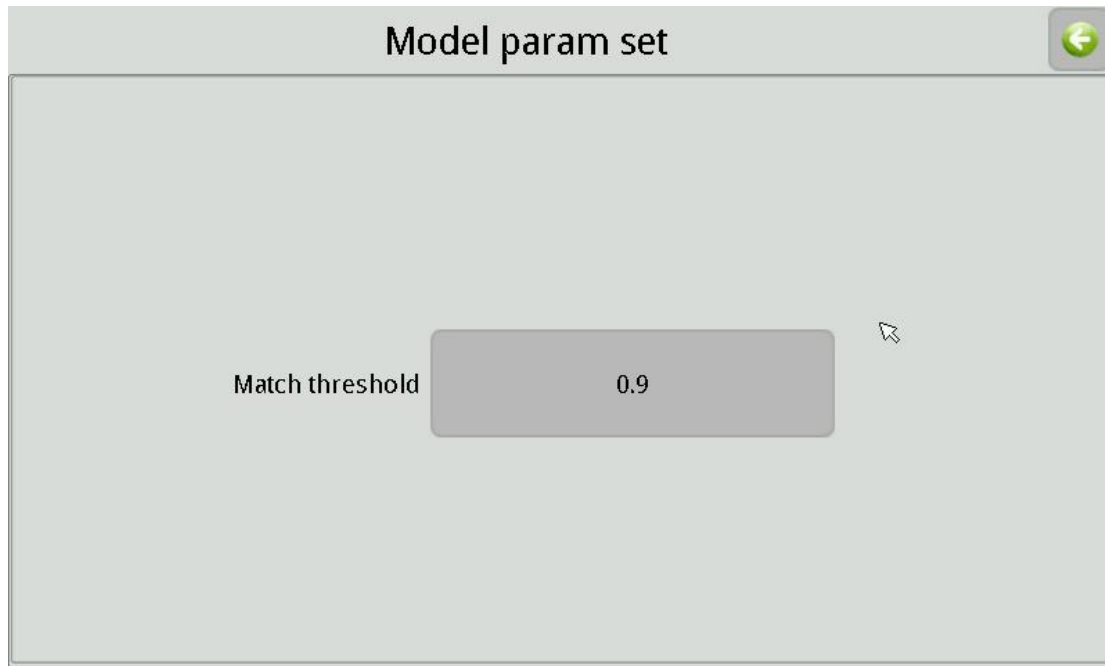


PIC7-4



- c) Press arrow to move the head -----make the down-looking camera match the black board cross check ----- press set ----- calibrate done.
- (2) **Nozzle2 position calibrate:** after set well the nozzle1 position, then set the nozzle2. Aim at the center of the cross.
- (3) **Vacuum detection set:** (please refer below page 24 for detail)

- (4) **Use system stack offset:** if turn on this function, stack offset will be saved in system, different work files all use one same offset. If turn off this function, stack offset will be saved in work file (not system), different work files have different offset information. **(Usually we suggest turn off this function)**
- (5) **Model parameter set:** press it goes to image as below, it is the setting for Mark2 point auto positioning function. “Model size” is the size of the model, usually you can set as 50-100. “Match area size” is the range of searching target, bigger size, longer searching time. When match area size is smaller than “Match threshold”, machine will not detect the mark point, so auto calibrate mark point failure.

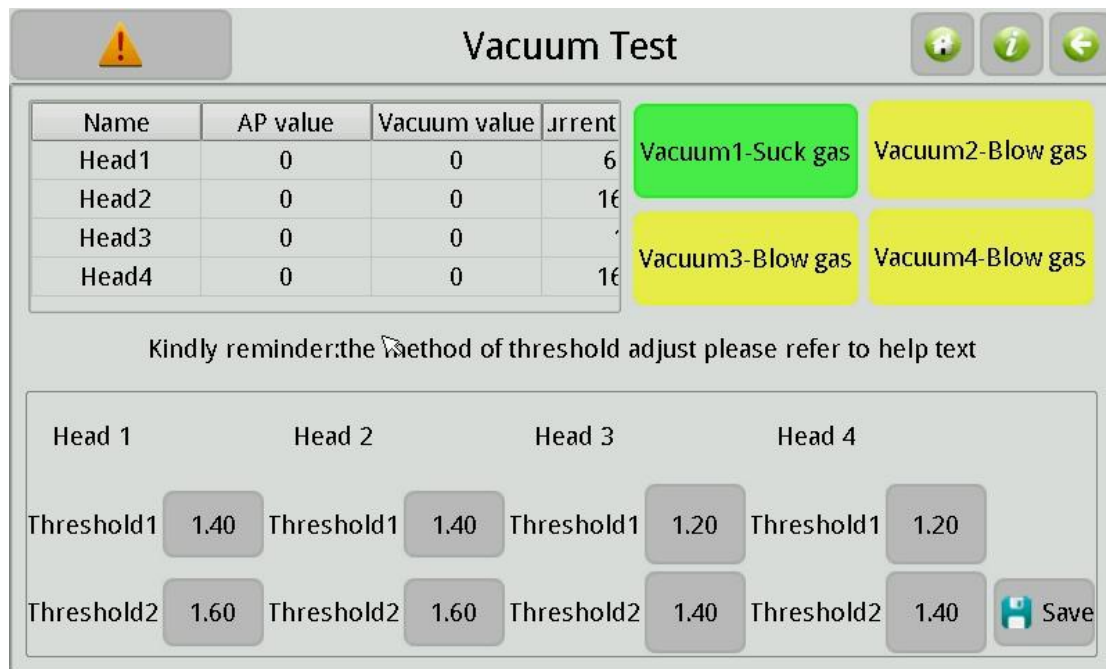


PIC7-5

- (6) **TS calibrate (touch screen calibrate):** after calibration, the system will restart.
- (7) **Backup/restore**
- (8) **Save:** used to save all system setting. Note: if just changed the setting but not saved, then the setting only valid one time, next time after start machine, the setting will back to the previous setting.

7.2. VACUUM DETECTION SET

Image as below:



PIC7-6

(1) **Vacuum1-Suck gas**

Vacuum1-Suck gas: nozzle 1/2 change to suck gas condition, you can use your finger to block the nozzle tip, then you can see

Current press
24.89
23.28

the changing current pressure. So that you can check if the vacuum pump in good condition.

(2) **Vacuum2-Blow gas**

Vacuum2-Blow gas: change to nozzle1/2 to Blow gas condition.

Name	AP value	Vacuum value	Current press
MHead1	0	0	24.89
MHead2	0	0	23.28

(3)

Value sheet: AP value means Atmospheric pressure value, it means nozzle not suck any component. Vacuum value means the value after suck the component minus the AP value, bigger vacuum value, better mounting effect. Note: AP value and vacuum value will display after 1 time normal suction, otherwise the value is 0.

(4) **M head 1/2 threshold 1:** when machine suck component, if detect current vacuum value **smaller** than threshold value1, then machine will judge nozzle not suck the component and it will suck again the component. If vacuum value **bigger** than threshold value1, then continue judge threshold value2.

(5) **M head 1/2 threshold 2:** when machine suck component, if detect current vacuum value smaller threshold value2 (and also bigger than threshold

value1), then machine will detect suction bad, and machine will throw material then suck again. Or else that means suction good, machine will continue mounting.

Note: threshold value1 MUST bigger than the vacuum value when machine at no suction condition; threshold value1 MUST be less than threshold value2. We suggest threshold value1 less than threshold value2 about **0.2**; threshold value2 MUST less than the **current vacuum value** about **0.3**. (Note: Current vacuum value get from 1-3 times good suction)

7.3. BACKUP AND RECOVERY

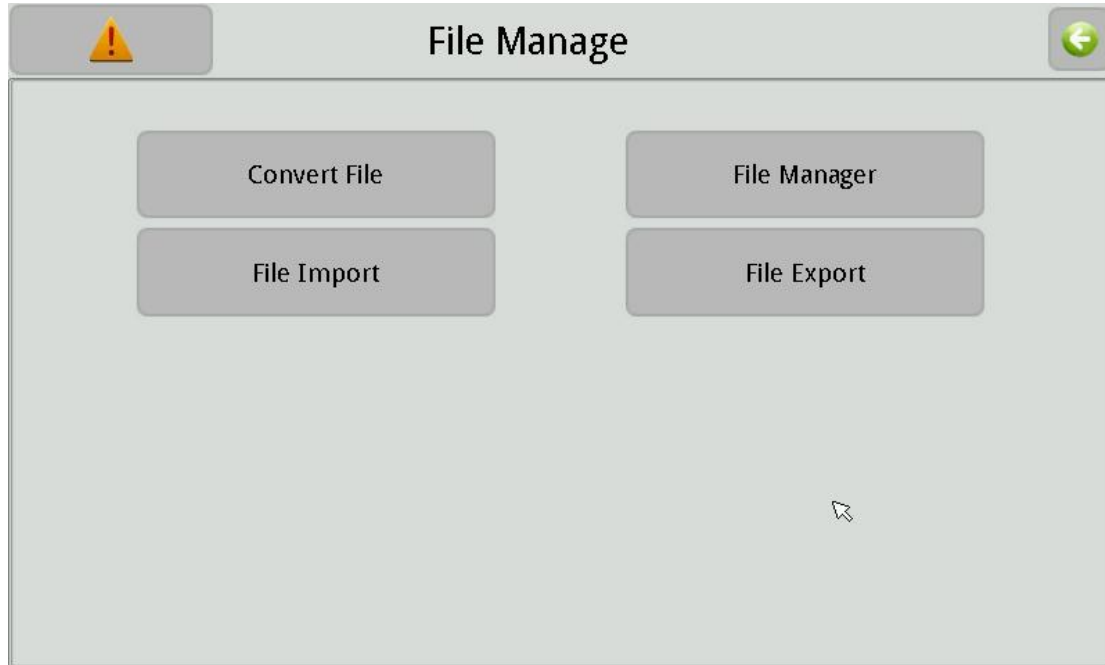


PIC7-7

- (1) **Backup system set:** backup all the current parameters of system.
- (2) **Restore system set:** restore previous backup parameters, machine will restart after restore.
- (3) **Restore factory set:** restore all the system parameters to factory setting.
- (4) **USB Load In / Load Out:** Load in all the parameters from USB or load out all the parameters into USB. **Note:** Just load in the parameters will not change the system parameters, you need to Backup System Set after load in the system parameters, then the system parameters will be valid in machine.

8. FILE MANAGE

Manage the CSV file which generate from PCB software, and also the work file.



PIC8-1

- (1) **File convert:** Machine can not directly use the CSV file from PCB software. You need to [convert the CSV file to DPV file](#) which machine can be recognize.
- (2) **File view:** check all the current CSV file and DPV file in system.
- (3) **File Load In / Load Out:** Insert USB flash and load in or load out the CSV or DPV file.

8.1. GENERATE CSV FILE

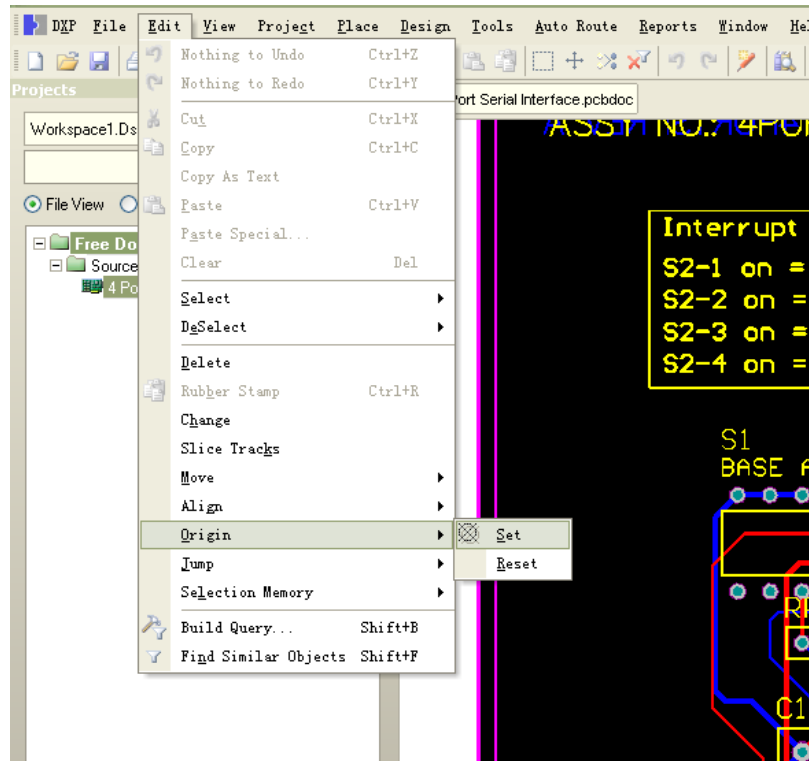
Running this pnp machine, one way is you can create new file manually, another way is simple, generate the CSV file from your PCB design software, and then load the CSV file into machine convert to DPV file to run. **Note: the CSV file must have coordinates, then machine can recognize it.**

8.1.1. By Altium Designer

Steps for generate CSV file from Altium Designer software:

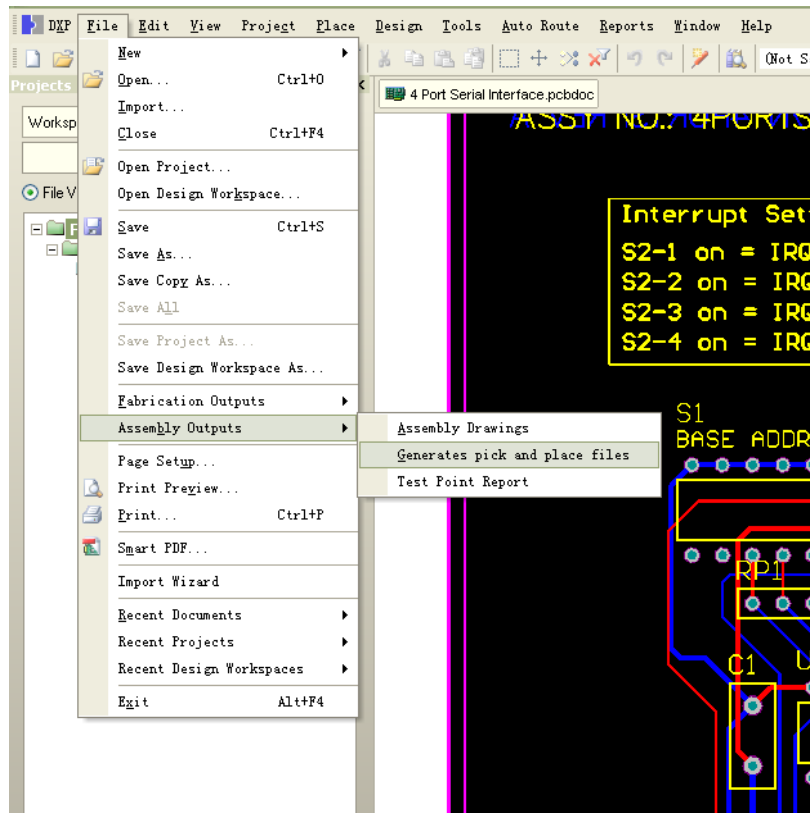
- (1) Open existing PCB file, note: same component must have same designator, otherwise one component may occupies more than one material stack, since convert tool identifies different material stack by designator of component;

- (2) Set PCB origin, figure as below, note, for top layer setting origin in left bottom corner of PCB, for bottom layer setting origin in bottom right corner of PCB and check mirror image option when converting;



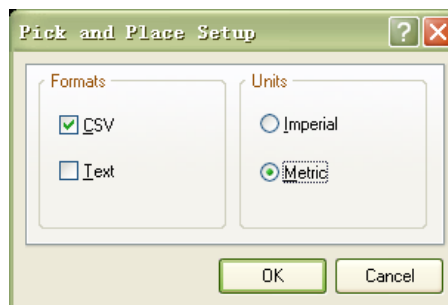
PIC8-2

- (3) Image as below, select “File”-“Assembly Output”-“Generates pick and place for files” in menu bar;



PIC8-3

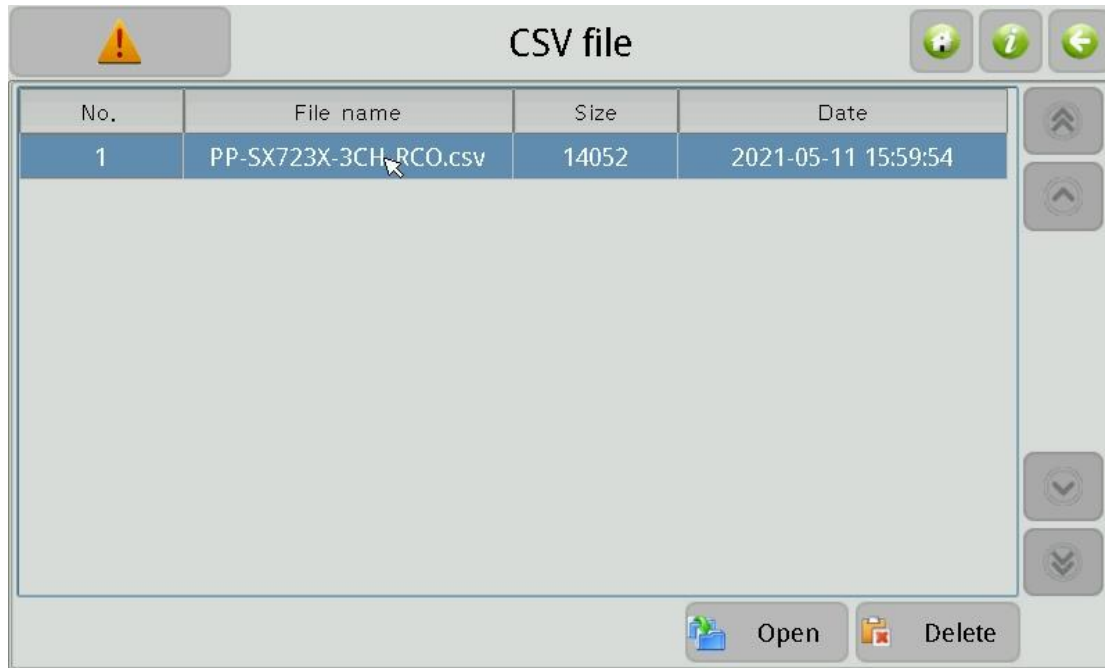
(4) Image as below, select “CSV” and “Metric” in popup dialog box, click “OK” to finish.



PIC8-4

8.2. FILE CONVERT

After generate the CSV file, all of generated CSV files in system are displayed in the list, then convert it to DPV file, picture as below:



PIC8-5

- (1) **Open:** select the CSV to convert;
- (2) **Delete:** delete selected CSV file.

8.2.1. CSV File

After selected one CSV file, display as below, all the components information included.



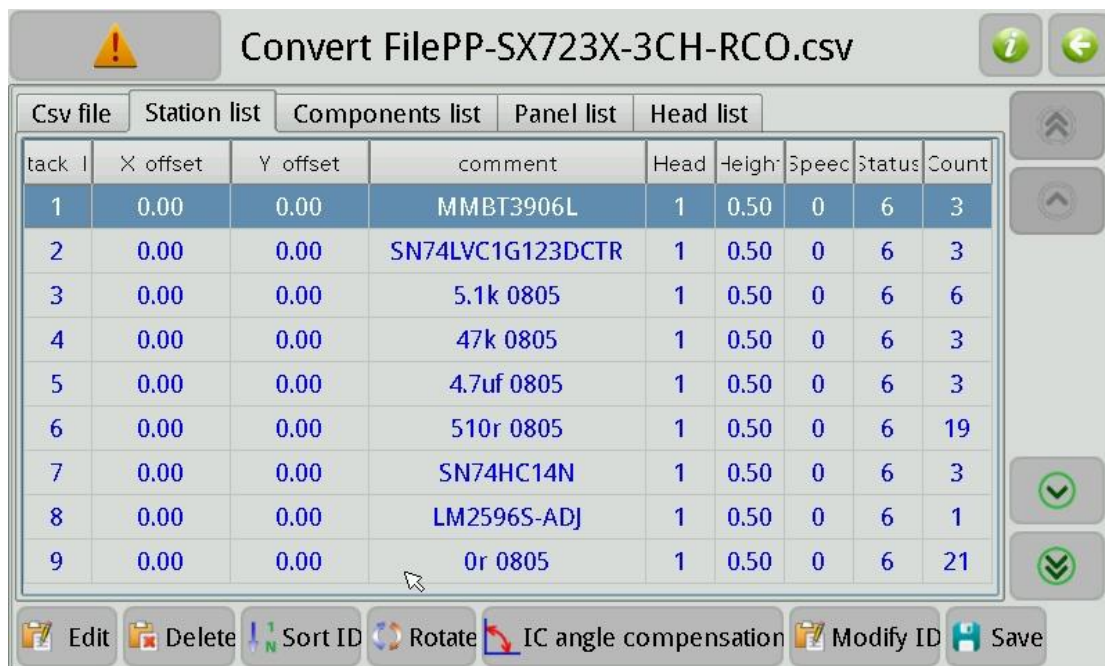
PIC8-6

- (1) **Edit:** edit information of selected component;

- (2) **Delete:** delete selected component;
- (3) **Convert set:** Set convert to the [top of the device](#) or the [underlying device](#), (the underlying device can set whether mirror or not.)
- (4) **Convert:** Convert CSV file to DPV work file,

8.2.2. Material Stack Station List

Image as below, stack was generated according to the comment of the CSV file. The same comment of components will use the same stack number. Therefore, how many different comments, then how many stacks.



The screenshot shows a software window titled "Convert FilePP-SX723X-3CH-RCO.csv". It features a tabbed interface with "Station list" selected. Below the tabs is a table with the following data:

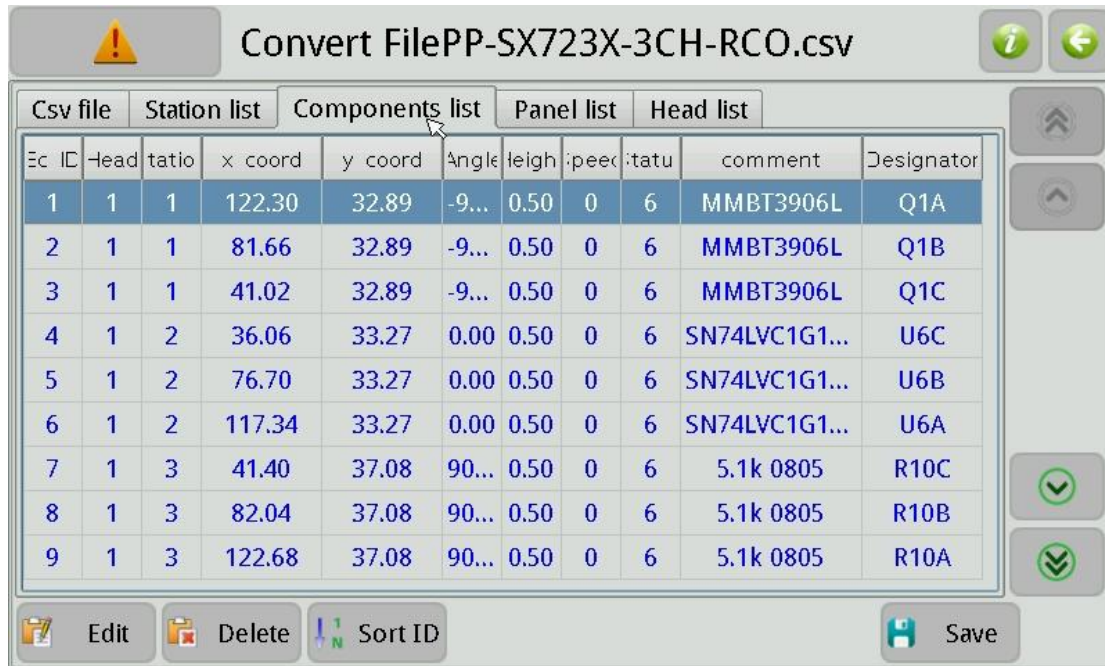
tack	X offset	Y offset	comment	Head	Heigh	Speed	Status	Count
1	0.00	0.00	MMBT3906L	1	0.50	0	6	3
2	0.00	0.00	SN74LVC1G123DCTR	1	0.50	0	6	3
3	0.00	0.00	5.1k 0805	1	0.50	0	6	6
4	0.00	0.00	47k 0805	1	0.50	0	6	3
5	0.00	0.00	4.7uf 0805	1	0.50	0	6	3
6	0.00	0.00	510r 0805	1	0.50	0	6	19
7	0.00	0.00	SN74HC14N	1	0.50	0	6	3
8	0.00	0.00	LM2596S-ADJ	1	0.50	0	6	1
9	0.00	0.00	0r 0805	1	0.50	0	6	21

Below the table is a toolbar with icons for Edit, Delete, Sort ID, Rotate, IC angle compensation, Modify ID, and Save.

PIC8-7

- (1) **Edit:** Edit selected material stack. (Note: all of relevant components will be changed if amend this stack);
- (2) **Delete:** Delete the selected material stack. (Note: all of relevant components will be delete if delete this stack);
- (3) **Resort ID:** The material stack ID starting from 1 in ascending order;
- (4) **Reverse angle:** Use this function will make the selected stack of components will rotate 180 degree, all of relevant components will be changed. Some stack with diode will need to use this function.
- (5) **IC Angle compensate:** Compensate IC, rotate 90 degree. Some component need angle compensate, e.g. SOPB, QFN, etc.

8.2.3. Components List



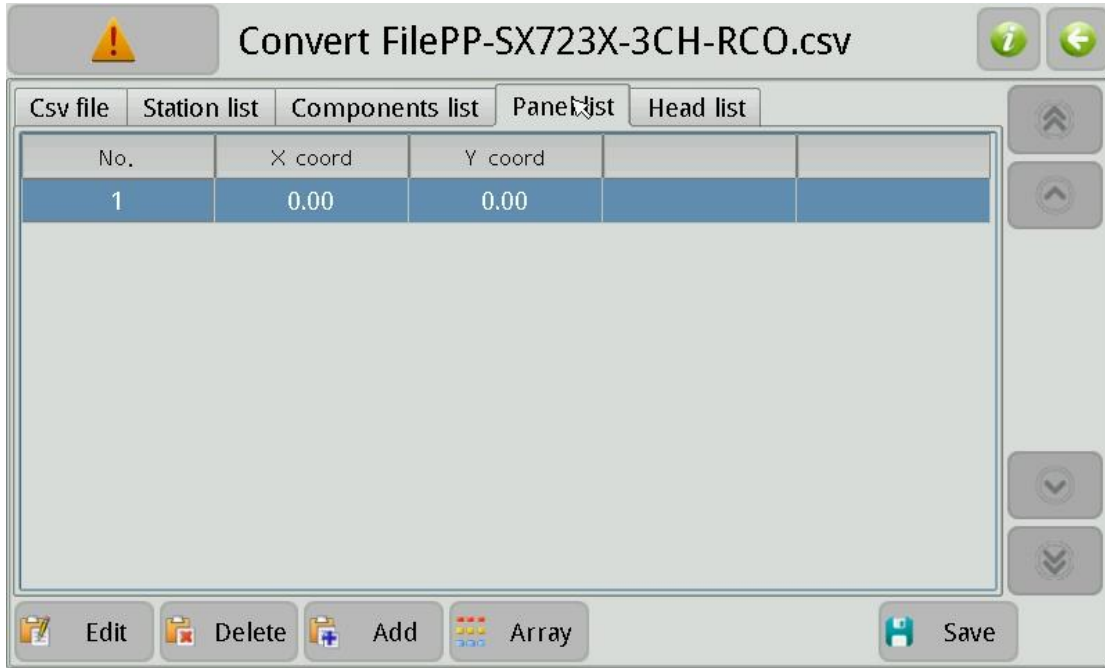
Ec ID	Head	Ratio	x coord	y coord	Angle	Height	Speed	Status	comment	Designator
1	1	1	122.30	32.89	-9...	0.50	0	6	MMBT3906L	Q1A
2	1	1	81.66	32.89	-9...	0.50	0	6	MMBT3906L	Q1B
3	1	1	41.02	32.89	-9...	0.50	0	6	MMBT3906L	Q1C
4	1	2	36.06	33.27	0.00	0.50	0	6	SN74LVC1G1...	U6C
5	1	2	76.70	33.27	0.00	0.50	0	6	SN74LVC1G1...	U6B
6	1	2	117.34	33.27	0.00	0.50	0	6	SN74LVC1G1...	U6A
7	1	3	41.40	37.08	90...	0.50	0	6	5.1k 0805	R10C
8	1	3	82.04	37.08	90...	0.50	0	6	5.1k 0805	R10B
9	1	3	122.68	37.08	90...	0.50	0	6	5.1k 0805	R10A

PIC8-8

- (1) **Edit:** Edit selected component;
- (2) **Delete:** Delete selected component;
- (3) **Resort ID:** The device number starting from 1 in ascending order;
- (4) **Use dual nozzle1:** Use nozzle1 and nozzle2 pick component in same material stack. NOTE: All components must 1,2,1,2... in order.
- (5) **Use dual nozzle2:** Means nozzle1 take component of stack1 and nozzle2 take component of stack2, then placing to two components. (It only can used to near by stacks)

8.2.4. Batch

Batch means same small PCBs joint together into a big PCB, please turn to page 14 for 6.1.4 to know the detail function. Panel list image as below:



PIC8-9

8.2.5. XXX



9. LOG LIST

Log list as below, it records all the history of mounting.

Load time	End time	Work file(B)	Comp. cnt	PCB cnt.
2016-01-19 10:41:10	2016-01-19 10:44:17	FFFFFFFFFFFFCop...	24	1
2016-01-19 10:46:26	2016-01-19 10:46:38	SJnew2?504???.dpv	0	0
2016-01-19 10:46:42	2016-01-19 10:47:51	FFFFFFFFFFFFCop...	7	0
2016-01-19 10:47:53	2016-01-19 10:48:29	FFFFFFFFFFFF.dpv	0	0
2016-01-19 10:49:25	2016-01-19 11:03:08	FFFFFFFFFFFF.dpv	24	1
2016-01-19 11:05:18	2016-01-19 11:05:31	FFFFFFFFFFFF.dpv	6	0
2016-01-19 11:05:35	2016-01-19 11:05:38	FFFFFFFFFFFFCop...	0	0
2016-01-19 11:05:59	2016-01-19 11:07:03	FFFFFFFFFFFFCop...	23	1
2016-01-19 11:08:24	2016-01-19 11:10:25	FFFFFFFFFFFFCop...	25	1

PIC9-1

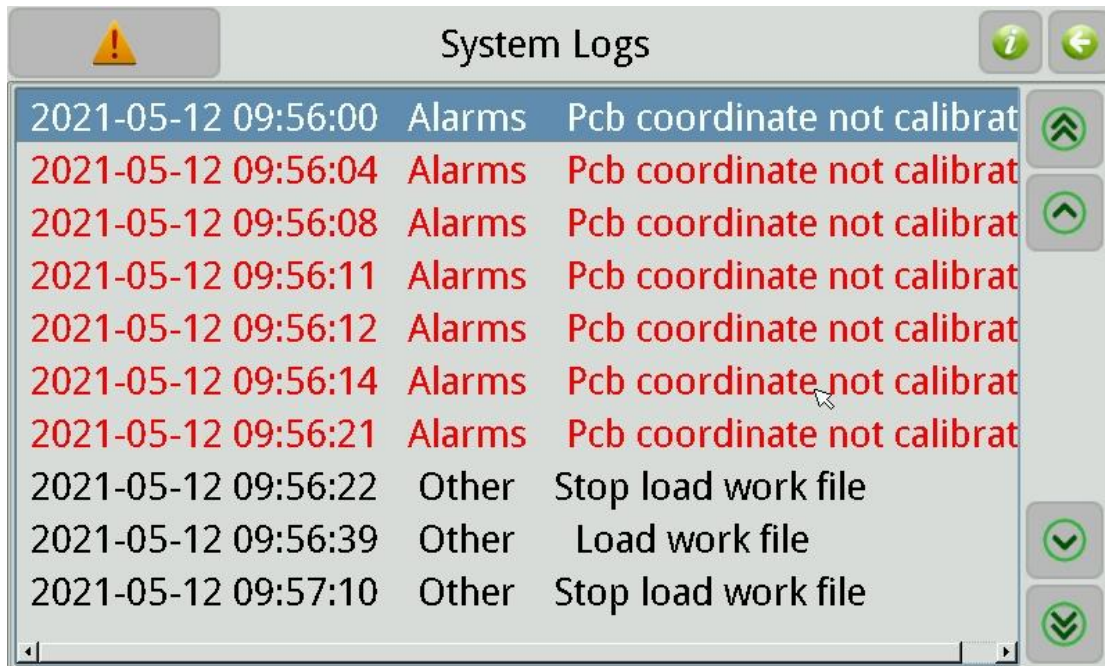
- (1) **Log list:** Each line records information of one running time;
- (2) **Record:** image as below, displays the detail running information:

Stack II	0	1	2	3	4	5	6	7	8	9
0+	0	0	0	0	0	0	0	0	0	0
10+	0	0	0	0	24	0	0	0	0	0
20+	0	0	0	0	0	0	0	0	0	0
60+	0	0	0	0	0	0	0	0	0	0
70+	0	0	0	0	0	0	0	0	0	0
80+	0	0	0	0	0	0	0	0	0	0
90+	0	0	0	0	0	0	0	0	0	0

PIC9-2

10. SYSTEM LOG

System log used to view all kinds of records generated by the system, image as show below.



PIC11-1

11. MAINTENANCE

1. Close power switch and air source after working done, clearing the machine.
2. Add some grease to the bearings regularly according to actual condition, make sure machine working in smooth condition.

12. WARRANTY

- Warranty range: SMT machine itself;
- Warranty period: 12 months;
- If there are problems in using, please contact us promptly, don't repair by yourself to avoid damage to machine, or will lose your warranty;
- If accessories are breakdown, we will send a new one to you after receiving the broken one;
- During warranty period, freight of send back to us is paid by user, freight of send to user is paid by us;
- Problems caused by below, we provide paid repair during warranty period:
 - Faulty operation, disassembly without permission;
 - Using environment that do not fit for specification;
 - Wrong power supply;
 - Earthquake, fire, lightning or accident beyond control.

13. CONTACT US

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