

2016

# Charmhigh Automatic Chip Mounter (CHM-T48VB) Operating Manual



CHARMHIGH TECHNOLOGY LIMITED

Technology Versus Future-V1.0-2016

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# Catalogue

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## 1. Revision History

No.	Date	Description	Version
1	2016-06-01	Create document	V1.0

## 2. Install the Machine

- Open the packing cases, take out the SMT machine, placed it on a strong table;
- Check if the machine is in good condition, check the list of products, if you have any questions please contact us;
- Please read this manual carefully before use SMT machine;
- There's any problem in use, welcome to contact.

### 3. Product List

No.	Parts	Quantity	Remarks
1	SMT machine	1	-
2	nozzles	4	503,504,505,506
3	USB flash disk	1	8G
4	power cord	1	-

## **4. Hardware Requirements and Compatible Software**

### **4.1. Hardware Requirements**

All equipment are built-in, don't need other external devices.

### **4.2. Compatible Software**

Compatible with Protel99se, Altium Designer.

## 5. Notices

- (1) Keep the machine away from humidity and dust, otherwise may cause electric shock or fire;
- (2) Do not place the machine in the platform of instability or tilted, otherwise the vibration of the machine when working may lead to lower precision, even personal injury caused by overturned;
- (3) Don't disassembling machine, or may be led to the decrease of the accuracy or machine damage;
- (4) Don't use hand to touch the moving parts, otherwise it may damage the machine or cause personal injury;
- (5) New machine components containing volatile substances, it need to maintain good ventilation in the first few days using;
- (6) The power cord can only be used for the machine, otherwise may damage the other electrical appliances;
- (7) Ensure the power supply meet machine nominal requirements;
- (8) Ensure the power supply socket with good grounding;
- (9) Keep the machine away from flammable and explosive goods;
- (10) Place the nozzles and other small accessories in out of the reach of infants and young children;
- (11) Don't let the pull needle in the stretched state for a long time, or it could be damaged;
- (12) Don't put machine direct exposure to sunlight or bright light, otherwise may cause the machine precision reduce or damage to the machine.



## 6. Technical Parameters

model	CHM-T48VB
PCB area	10mm×10mm~355mm×355mm
X,Y axis stroke	510×460mm
Z axis stroke	15mm
number of nozzle	2
material stack number	ordinary material stack 58, IC material stack up to 14
visual support	dual cameras
Motor drive	Closed-loop servo high voltage drive system ( Ensure the accuracy of operation )
Z axis back position detection	Yes
Pull needle auto return	Yes
Leak detection method	Vacuum detection、 Visual inspection
LCD Screen	7 inch Industrial LCD screen
Board	Independent research and development of industrial computer motherboard
System	Embedded Linux system
need external air pump	no(built-in mute air pump)
need external PC	No need
power supply	220V(110V), 50Hz
power	250W
weight	65Kg
volume of packaging	0.41m <sup>3</sup>

## 7. Mechanical Structure

The figure below shows the machine structure as a whole.

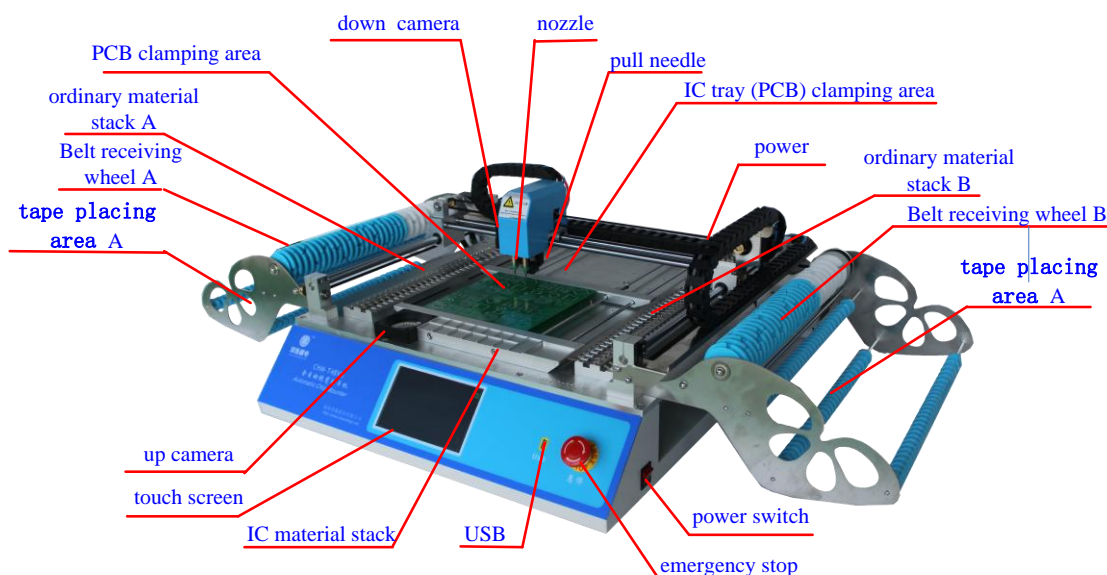


Figure.7-1

- (1) **Nozzle:** Support two nozzles, the nozzle 1 is on the left, nozzle 2 is on the right, used for absorbing materials;
- (2) **Pull needle:** Used for pulling tape, note, don't let the pull needle in the stretched state for a long time, or it could be damaged;
- (3) **Down camera:** Used for observing the material stack, PCB and components;
- (4) **Up camera:** Used for calibrating the components position, angle, so as to improve placement accuracy;
- (5) **IC tray (PCB) clamping area:** Used for fixing the IC tray or PCB;
- (6) **PCB clamping area:** Used for fixing PCB, let PCB close to left, top spring should be compacted;
- (7) **Ordinary material stack A/B:** Place tape packaging materials;
- (8) **Belt receiving wheel A/B:** Used for collecting film;
- (9) **Tape placing area A/B:** Used for placing tape;
- (10) **IC material stack:** Used for placing the larger IC;
- (11) **Touch screen:** Used for manipulating and control the machine;
- (12) **USB interface:** Used for connecting the USB storage device;
- (13) **Emergency stop switch:** Emergency stop after press down, machine normal

work when clockwise rotation and bounce;

- (14) **Power switch:** Note, open this button to boot, shutdown should first close the software through the touch screen, and then close the button.

## 8. Boot the Machine

Open the machine power switch, wait for the machine to self check and loading the operating system, when machine start complete, display screen as shown below.



Figure.8-1

- (1) **Alarm:** Used for viewing current alarm and cause;
- (2) **Run:** Used for loading working files and control the machine running etc.;
- (3) **Test:** Used for testing each function module respectively;
- (4) **Set:** Used for setting various parameters that machine work required;
- (5) **Log:** Used for viewing the record information;
- (6) **System Log:** Used for viewing the log of system;
- (7) **Files:** Used for managing and convert work file.

## 9. Run

The machine needs to select a work file to run, from the main screen, click on the run button to enter the screen as shown below, through this screen can manage work file.

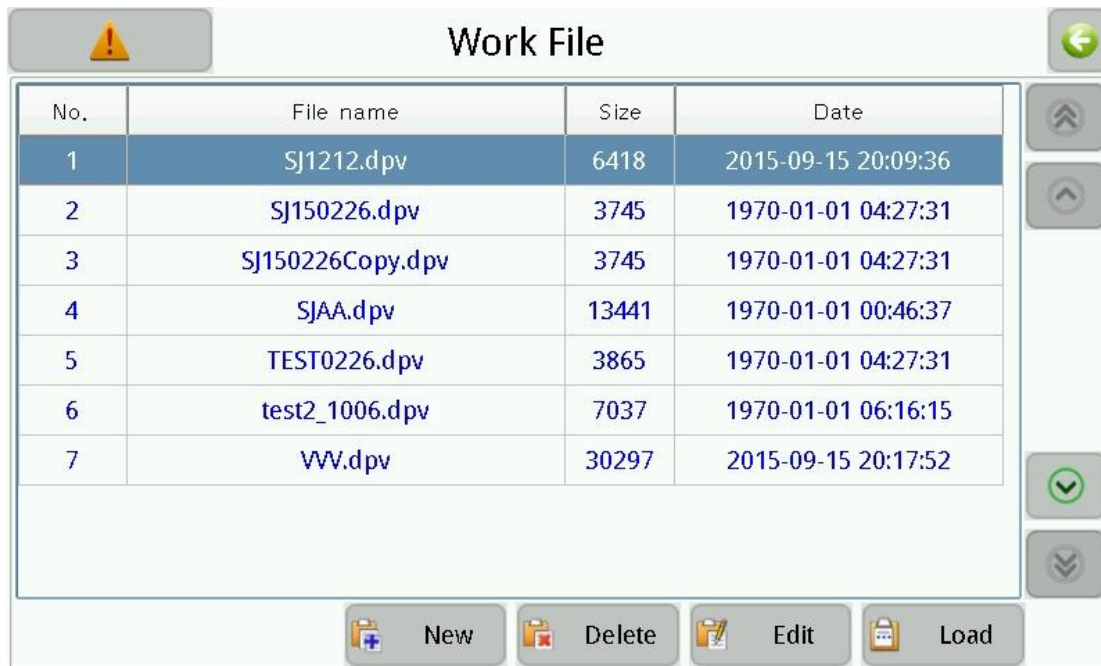


Figure.9-1

- (1) **Work file list:** The middle of the screen displays a list of existing work files in the system, click to select the work file, the upward double arrow on the right used for paging up, upward single arrow used for selecting previous line, downward arrow vice versa.
- (2) **New:** Create a new work file;
- (3) **Delete:** Delete the selected work file;
- (4) **Edit:** Edit the selected work file;
- (5) **Load:** Load the selected work file to run;
- (6) **Back:** Click left arrow button on the upper right corner of the screen to return to the previous level screen, other screen similarly.

### 9.1. Edit Work File

The work file editing screen shown as below, can edit component, material stack, batch, IC tray and PCB calibration respectively.

Work File EditSJ150226.dpv

Component		MStack	IC tray		Batch	PCB calibrate			
Com. ID	MHead	VStack	X	Y	Angle	Height	Speed	Designator	Comments
7	1	1	23.00	18.00	90.00	0.50	0	R6	R0402P1K
8	1	1	22.75	19.53	108...	0.50	0	R5	R0402P1K
9	1	1	22.03	20.92	126...	0.50	0	R4	R0402P1K
10	1	1	20.92	22.03	144...	0.50	0	R3	R0402P1K
11	1	1	19.53	22.75	162...	0.50	0	R2	R0402P1K
12	1	1	18.00	23.00	180...	0.50	0	R1	R0402P1K
13	1	1	16.44	22.75	-16...	0.50	0	R20	R0402P1K
14	1	1	15.06	22.03	-14...	0.50	0	R19	R0402P1K
15	1	1	13.91	20.92	-12...	0.50	0	R18	R0402P1K

Add    Insert    Delete    Edit    Save

Figure.9-2

## 9.1.1.Component

The screen as shown above, used for managing device in PCB.

- (1) **Component list:** Show all components contained in the selected work file, green indicates enables vision calibration, orange indicates disable vacuum testing, purple indicates enables vision calibration and disable vacuum testing, gray indicates skip the device;
- (2) **Add:** Add a component to the end of the list;
- (3) **Insert:** Insert a new component before the currently selected row;
- (4) **Delete:** Delete the selected component;
- (5) **Edit:** To edit the selected component, see below for details;
- (6) **Save:** If you edit the component in the list, the save button will flash, prompt the information changed and has not been saved yet, click to save and stop flash.

### 9.1.1.1. Edit

The popup screen as shown below, the top left of the screen displays the current component's line number (start from 0), the arrows on both sides, used for selecting a component before or after, also can click the middle button popup keyboard to input device line number directly.

Figure.9-3

- (1) **Comp. ID:** Set component ID number, component ID number can not repeat in the same work file;
- (2) **MStack:** Set the specified component's material stack, when specifying a new material stack, the material stack list in work file will automatically add a new similar material stack;
- (3) **Speed:** Set the component speed, set to 0 indicate use system speed, tips, reduce speed properly when mount IC can improve the accuracy, e.g. 50%;
- (4) **Height:** Set component height, smaller values represent lower height, and the nozzle down more; Note, in order to adapt the 1.6 mm height PCB board, the factory default height is 0.5 mm. Do some adjust for different thickness boards.
- (5) **Angle:** Set component rotation angle, counterclockwise is positive, clockwise is negative;
- (6) **Designator:** Component designate information, such as R1, R2, C1, U1 etc.;
- (7) **Comments:** Component annotation information, such as 0402,0805;
- (8) **MHead:** Select nozzle, e.g. nozzle 1;
- (9) **Coord. X:** Component coordinate X, generally do not need to modify if it is generated in work file;
- (10) **Coord. Y:** Component coordinate Y, generally do not need to modify if it is generated in work file;
- (11) **Skip comp.:** Check indicate not mount;
- (12) **Vacuum detect:** Check indicate not throw material due to vacuum insufficient,



note, no material detection still effective, i.e. if the current position is not get the material, it will do it one more time, if still failed then pull the tape one time and try two times, if pull tape two consecutive times (in 3 position, total try 6 times) all failed, then the machine alarm and stop, we suggest open this function when mount such as cylindrical component;

(13) **Enable vision:** Check indicate calibrate component with vision, note, enable vision can improve precision when mount IC;

(14) **Coord. set:** Setting component coordinate use down camera or nozzle, see details below.

### 9.1.1.2. Coordinate Setting

Screen shown as below.



Figure.9-4

- (1) **Coordinate:** Coordinate offset display in the upper left corner;
- (2) **MHeadVision:** Switchover coordinate set mode among nozzle and vision, the figure below shows the screen that set coordinate by nozzle, in this mode user need to check position by eye;



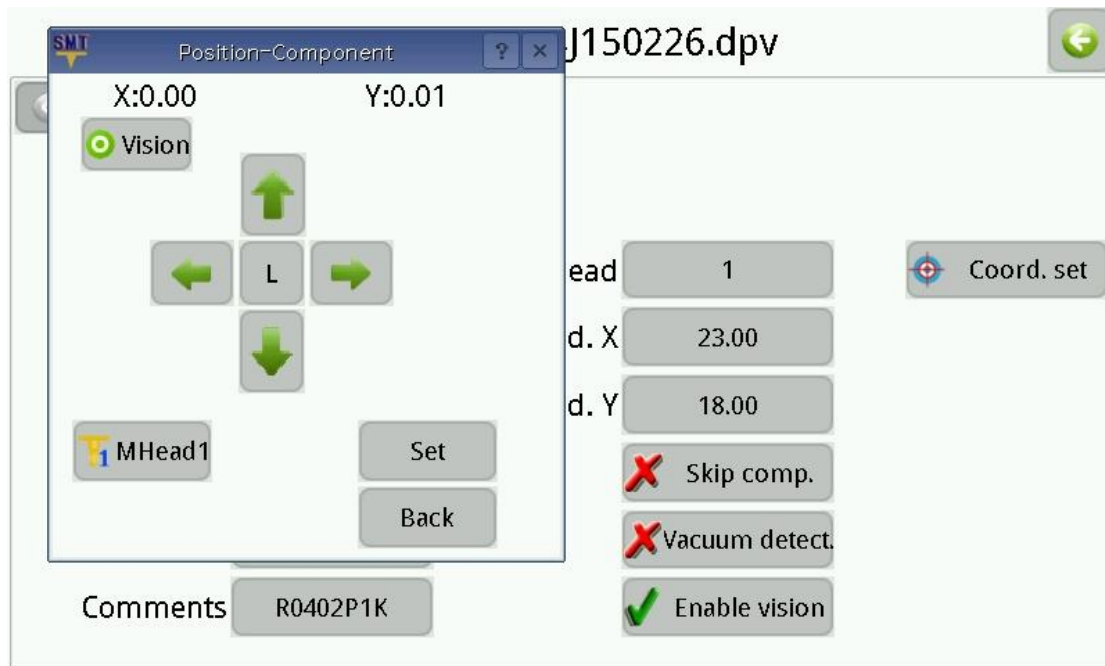


Figure.9-5

- (3) **Move:** In the left side of the window four arrows control the mount head moving in four directions respectively, movement speed can be changed by H/L button, L indicate low speed, H indicate high speed;
- (4) **Enlarge:** zoom up the image;
- (5) **Find Target:** Locating component position automatically, principle explains as follows, the algorithm search from the image center to around, the first searched close graph is deemed to be the target which is marked with a red rectangle. Note, the border of the target must be clear and closed, silk printing is found generally; capture target is just an auxiliary function, silk printing position is not always the right position of component since the deviation of process technology, user should set coordinate according to the position of footprint;
- (6) **Auto. center:** Move nozzle to the center of target if target was captured;
- (7) **MHead n(n is MHead number):** When use nozzle to positioning, click this button then specified nozzle press down, for the convenience of observation;
- (8) **Apply:** Click to apply changes.

## 9.1.2. Material Stack

Screen show as below, in this page can manage different kinds of component's place position.

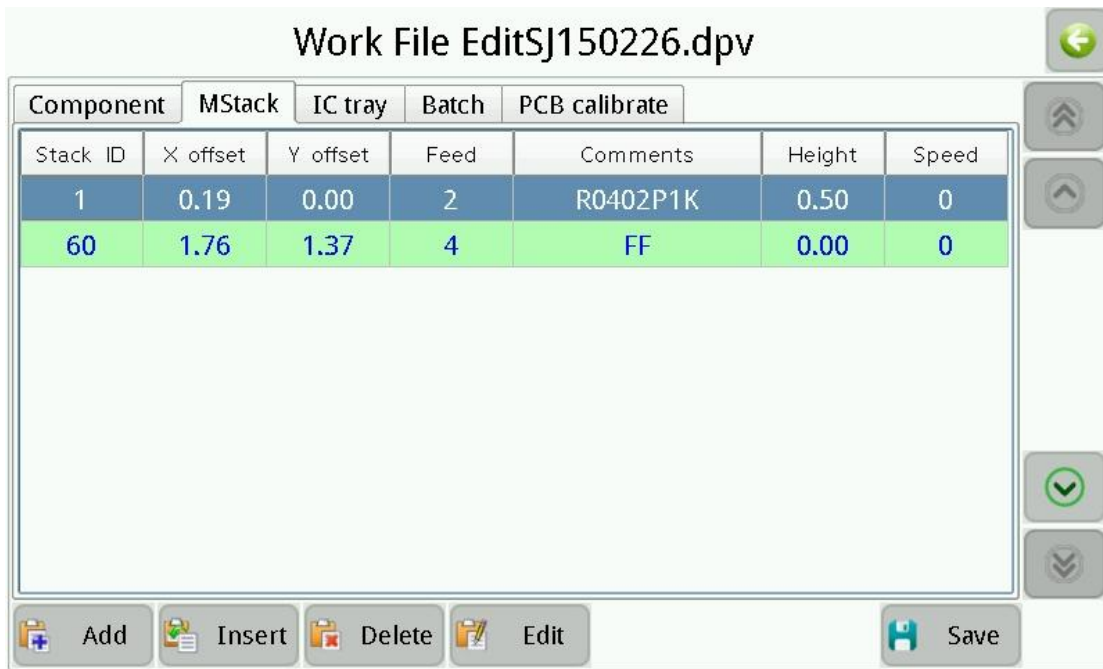


Figure.9-6

- (1) **Material stack list:** Display all material stack that the work file contained;
- (2) **Add:** Add a new one to the end of the list; tape packaged material use ID 1 to 29, bulk IC use ID 60 to 79, IC tray use ID 80 to 99(see details below);
- (3) **Insert:** Insert a new one to the position that before current selected material stack;
- (4) **Delete:** Delete selected material stack, note, all of components that use this material stack in the component list will be deleted too;
- (5) **Edit:** Edit selected material stack, screen show as below.



Figure.9-7

- a) **Stack ID:** Set current material stack ID, value can't repeat, all of components' ID that use this material stack in the component list will be changed too;
- b) **Feed:** The center distance between two successive components in the tape, unit is millimeter;
- c) **Ec size X\Y:** The size of components in this stack, unit is millimeter;
- d) **X\Y offset:** Material stack coordinate adjustment;
- e) **Height:** Functionally just like corresponding item in component edit, all of relevant component will be changed;
- f) **Speed:** Functionally just like corresponding item in component edit, all of relevant component will be changed;
- g) **Comments:** Set material stack comments;
- h) **Skip comp.:** Functionally just like corresponding item in component edit, all of relevant component will be changed;
- i) **Vacuum detect:** Functionally just like corresponding item in component edit, all of relevant component will be changed;
- j) **Enable vision:** Functionally just like corresponding item in component edit, all of relevant component will be changed;
- k) **Coord. set:** Functionally just like corresponding item in component edit, see figure below, there will appear a pull needle button in the top right corner of the window when set coordinate by nozzle, click it then machine will pull tape one time, in order to make the component in a certain place, then calibrating the feed place of material by camera or nozzle, see figure below, adjusting the tape let the red circle touches the blue line, the place of green rectangle is just the suggested feed place.

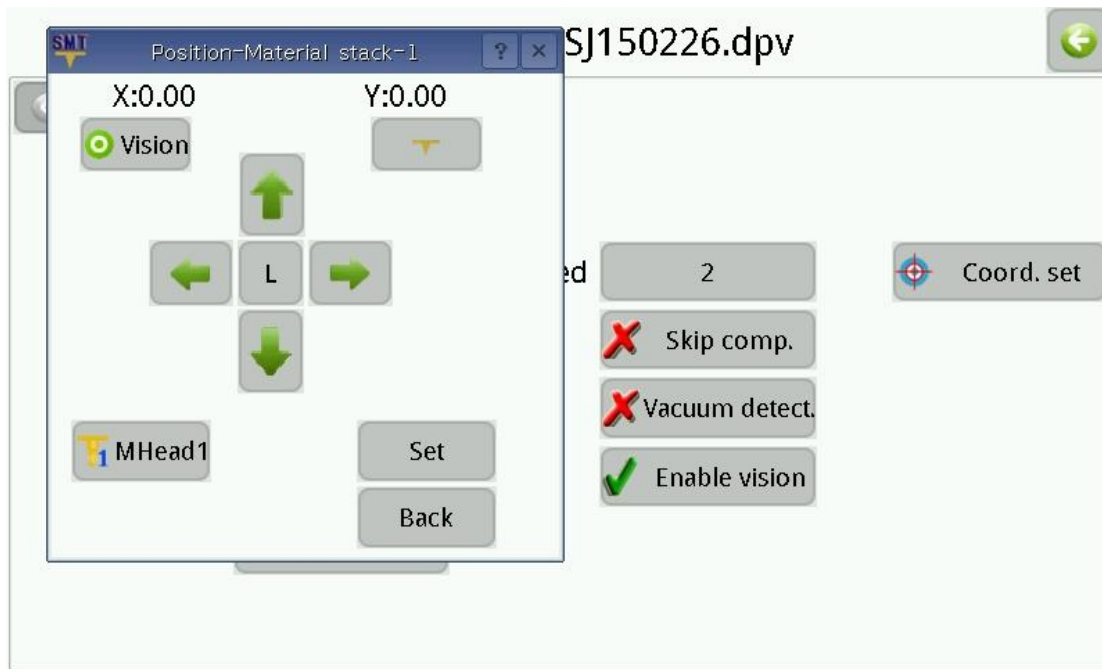


Figure.9-8

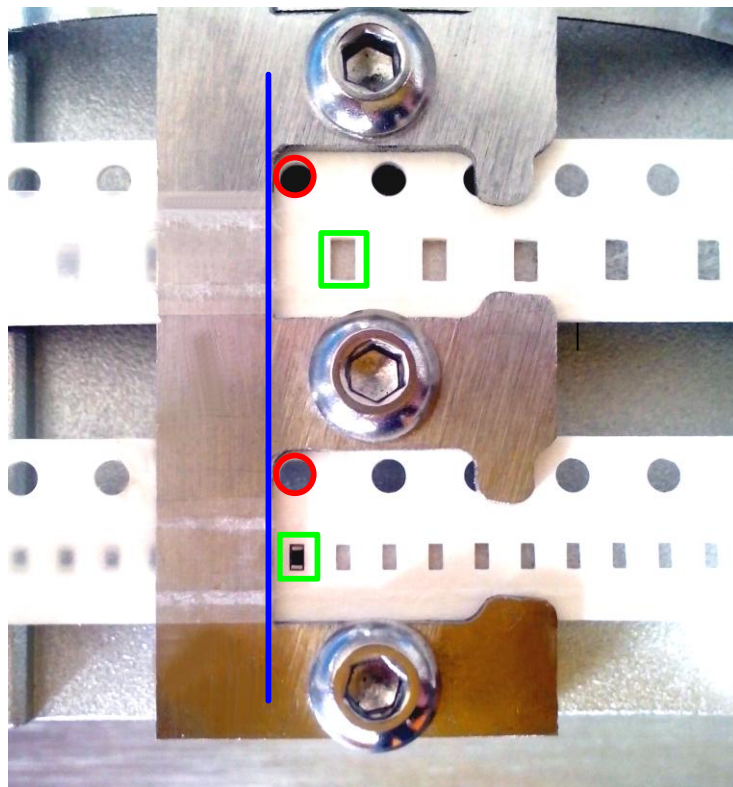


Figure.9-9

### 9.1.3.Batch

Batch is that splicing a number of same PCBs to mount together, but just need one

component list, it can be multiple same PCBs which have not been cut apart after manufacture, also can be some same PCBs spliced by user.

Note, PCBs' edge must parallel each other(same rotation angle)when place PCBs to the PCB clamp area.

Batch has two location types, the one is by coordinate, i.e. locating each PCBs' origin which set by user, the other one is by array, i.e. PCBs' coordinate is calculated by machine automatically while user set PCB's line and column count. array mode screen as show below.

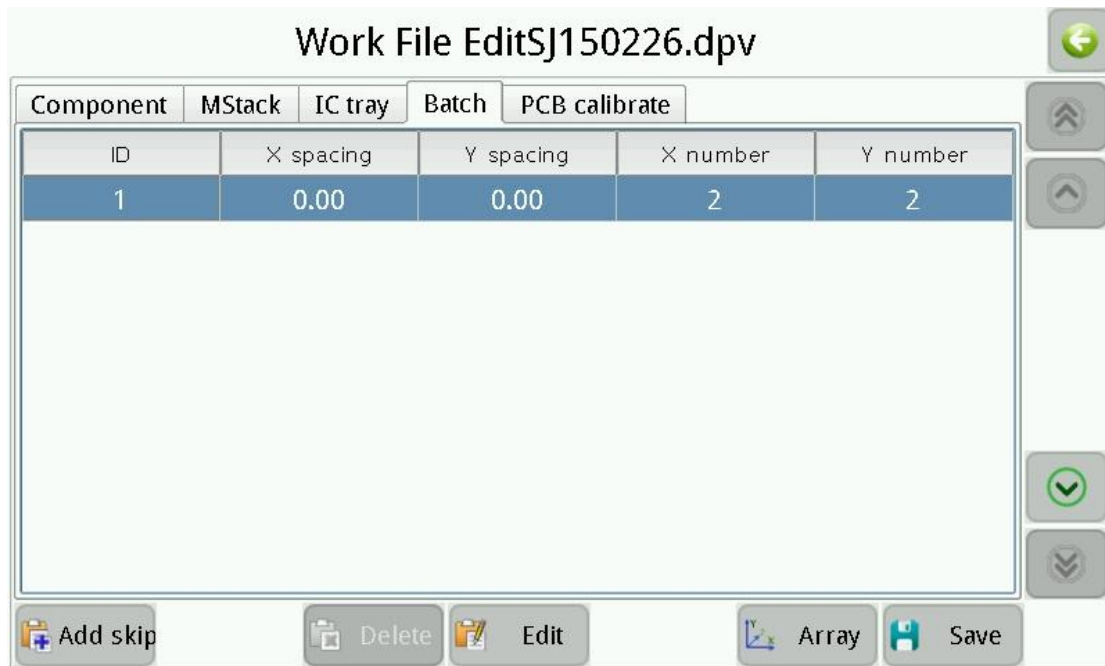


Figure.9-10

Batch list have one record at least, click "Add skip" button to add a skip record, i.e. do not mount added PCB when machine running, click "Edit" button popup window as show below.

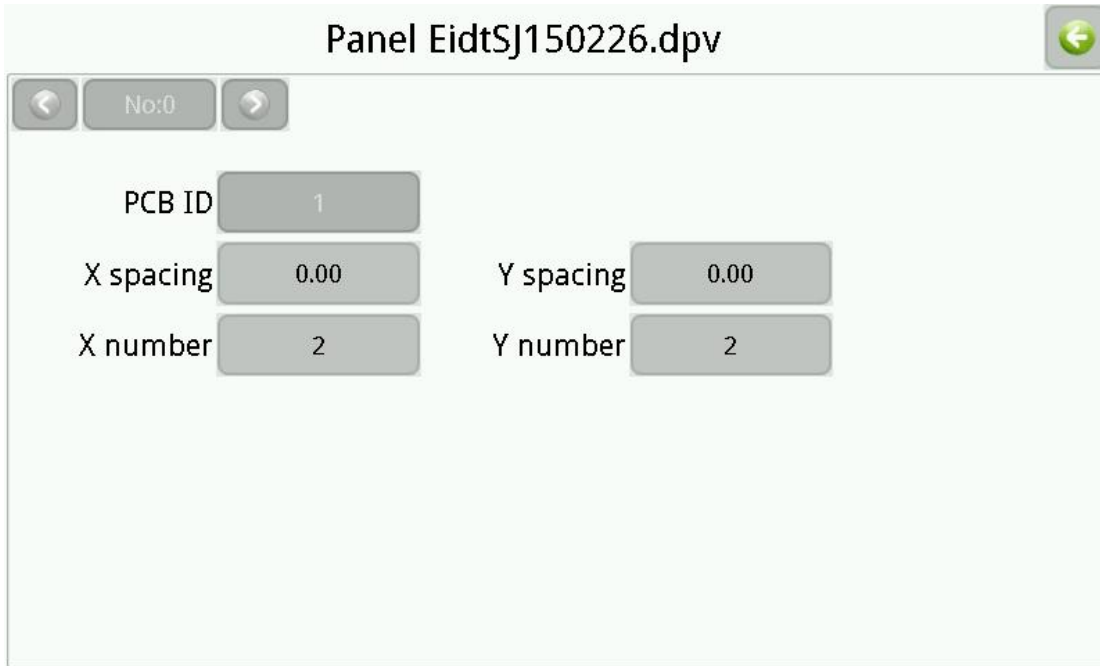


Figure.9-11

- (1) **PCB ID:** Can't modify while use array mode;
- (2) **X\Y spacing:** Two neighboring PCBs' X\Y coordinate spacing of origin;
- (3) **X\Y number:** Number of PCB in X\Y direction.

Coordinate mode screen as show below.

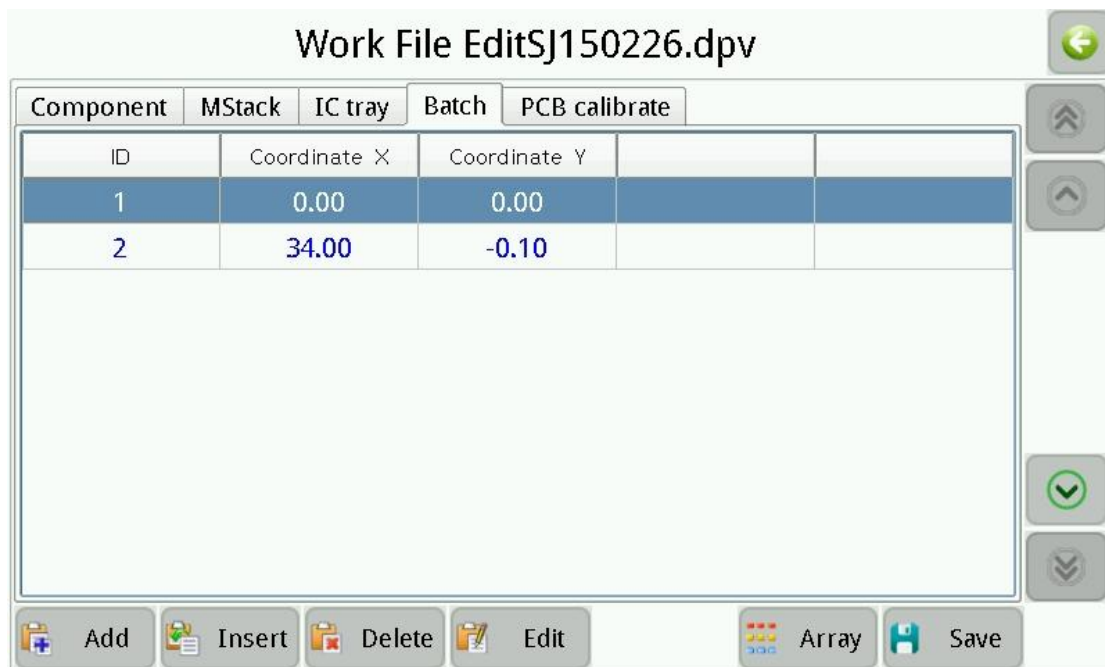


Figure.9-12

Note, while there have only one record in batch list that indicates batch is disabled, and the data is invalid. Each record preserve a origin point of PCB while there have several records, click "Edit" to modify the coordinate or set it via location directly.

### 9.1.4.IC Tray

IC tray is particular material stack, i.e. the same kind ICs are hold in IC tray clamp area as a array, machine pickup material to mount in sequence from left to right and down to up. Window as show below.

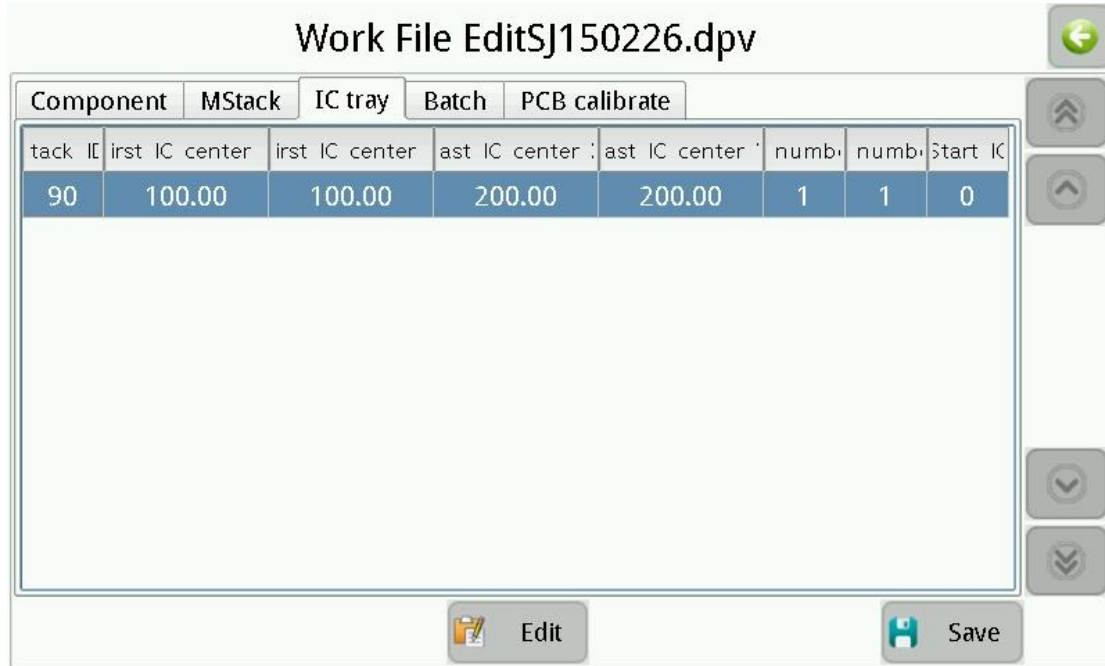


Figure.9-13

Material stack will be added to IC tray list automatically if material stack number is from 80 to 99 in material stack list, click “Edit” to popup window as show below.

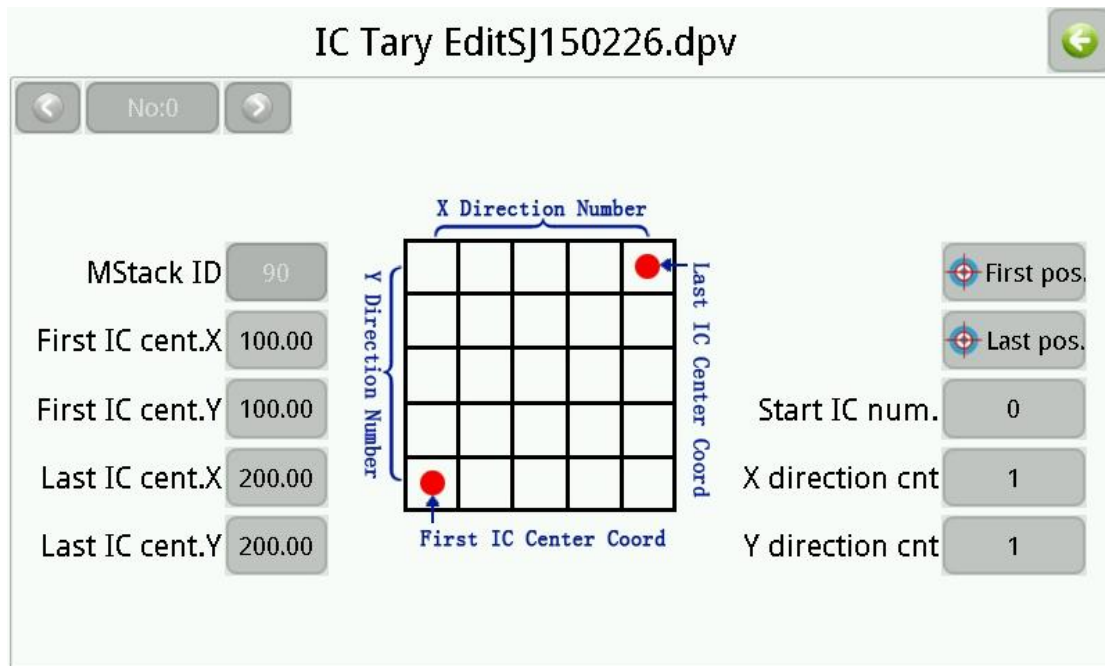


Figure.9-14



- (1) **First IC cent. X/Y:** IC center coordinate in the left bottom of IC array, it can input manually or determine by location;
- (2) **Last IC cent. X/Y:** IC center coordinate in the top right of IC array, it can input manually or determine by location;
- (3) **X/Y direction cnt: i.e. IC count in X/Y direction;**
- (4) **Start IC num.:** ICs are numbered(start from 0) from left to right and down to top, if the start IC number is set, ICs which number smaller than start IC number will be skipped.

Note, IC tray can not be put on the top of fix pillar, or pull needle may run into IC tray and be damaged due to height exceeding, the figure below shows the right.



Figure.9-15

## 9.1.5. PCB Calibration

In order to eliminate PCB position and angle of deviation, it is necessary to calibrate PCB before mount, screen as show below.



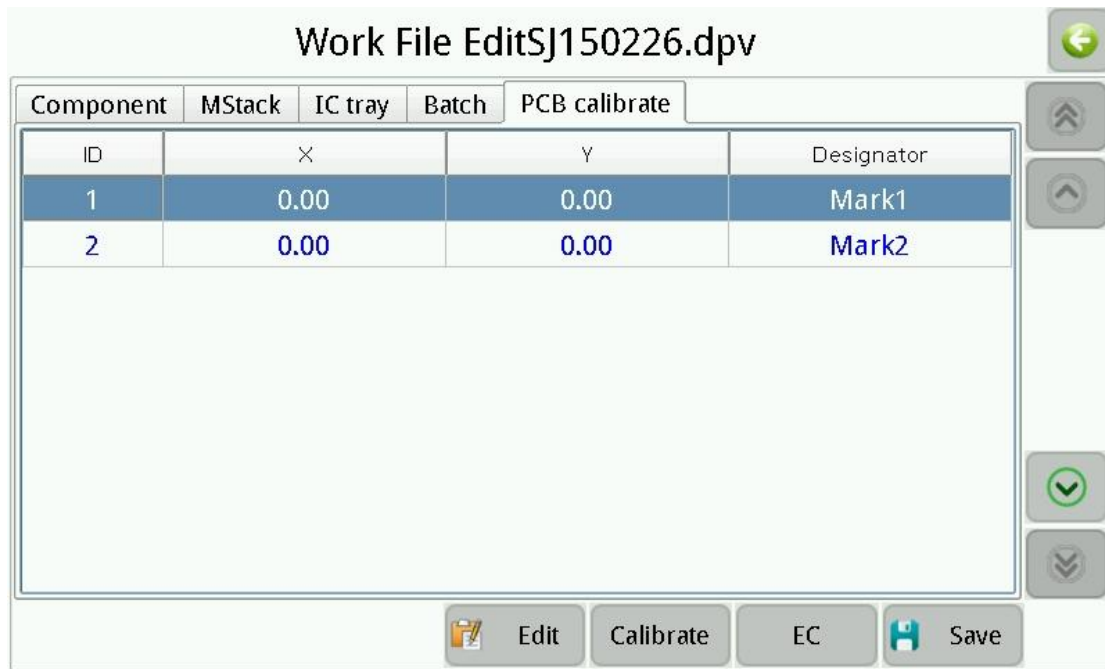


Figure.9-16

Depending on choice to calibration point, there are two PCB calibration type.

- **EC:** Machine select two component from PCB to calibrate automatically, its PCB coordinate is known, and do not need to input by user, the designation in the list of figure as show above, the number after character “P” indicates batch PCB ID, number after character “E” indicates component ID, and string after “:” is the designation of component;
- **MARK:** User select two specific point(MARK point) from PCB, input its PCB coordinate to calibrate manually, point in is recommended.

Note, if use array mode of batch, the choice of calibration point should be top left corner and bottom right corner of the whole PCB which consist of several same PCB.

Window as show below, click in sequence to locate actual position of calibration points.

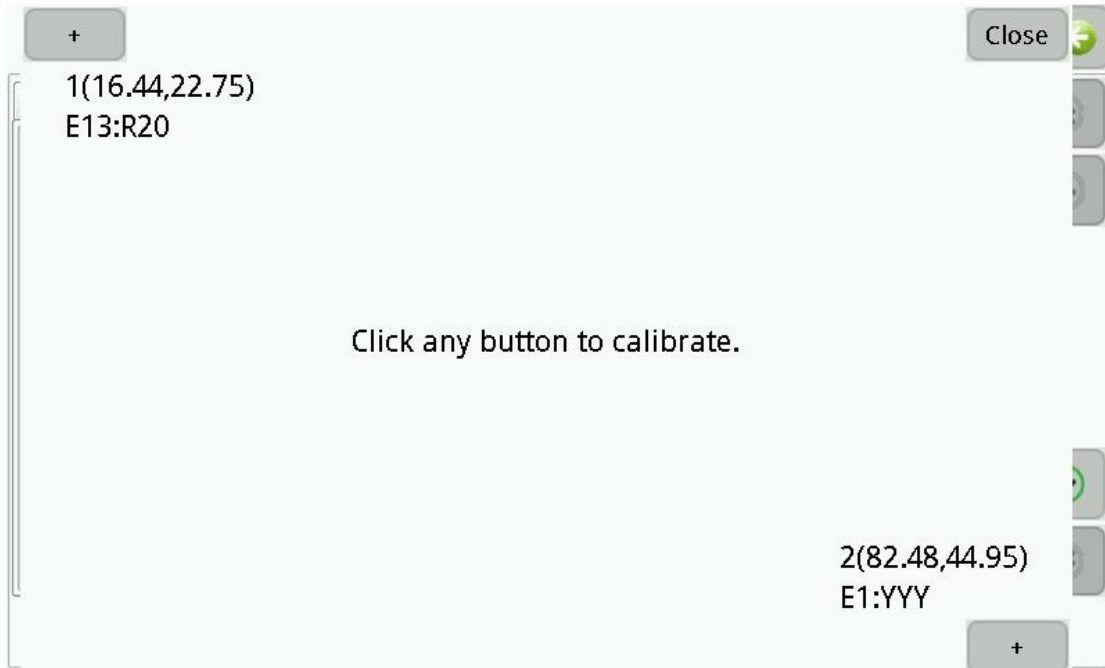


Figure.9-17

## 9.2. Load Work File

Screen as show below.

No.	MHeat	1Stac	X	Y	Angle	heigh	speed	Designator	ID
0	1	1	23	18	90	0.5	0	R6	7
1	1	1	22.75	19.53	108	0.5	0	R5	8
2	1	1	22.03	20.92	126	0.5	0	R4	9
3	1	1	20.92	22.03	144	0.5	0	R3	10
4	1	1	19.53	22.75	162	0.5	0	R2	11
5	1	1	18	23	180	0.5	0	R1	12
6	1	1	16.44	22.75	-162	0.5	0	R20	13
7	1	1	15.06	22.03	-144	0.5	0	R19	14
8	1	1	13.91	20.92	-126	0.5	0	R18	15
9	1	1	13.24	19.53	-108	0.5	0	R17	16

Figure.9-18

- (1) **Comp. ID:** Showing current component number/total number, click to set current component number which mount next;
- (2) **PCB ID:** Show current PCB number/total PCB number, click to set current PCB

number which mount next;

- (3) **Comp. cnt.:** Show total mounted component count this run time;
- (4) **Pcb cnt.:** Show total mounted PCB count;
- (5) **Ave. speed:** Show average mount speed, unit is chip per hour;
- (6) **Time cnt.:** run time of this time;
- (7) **Tray start IC:** Click to set the start IC's ID of IC tray; (below 'Time cnt.' Not viewing where hasn't tray information in file)
- (8) **Up camera:** The first button in the left bottom of screen, click to show image of up camera;
- (9) **Work light:** The second button in the left bottom of screen, click to switch work light;
- (10) **PCB calibration:** The third button in the left bottom of screen, click to calibrate PCB directly;
- (11) **Vacuum detection:** The fourth button in the left bottom of screen, click to open or close vacuum detection, note, if close vacuum detection here, machine will not detect lack of material, also will not discard material due to vacuum insufficient;
- (12) **Mount head homing:** The fifth button in the left bottom of screen, click to move mount head to the farthest location to origin;
- (13) **Step:** I.e. mount as step by step, in order to test;
- (14) **Run:** Run normally;
- (15) **Stop:** Stop mount.

## 10. Test

Used for testing modules of SMT machine respectively, window as show below.

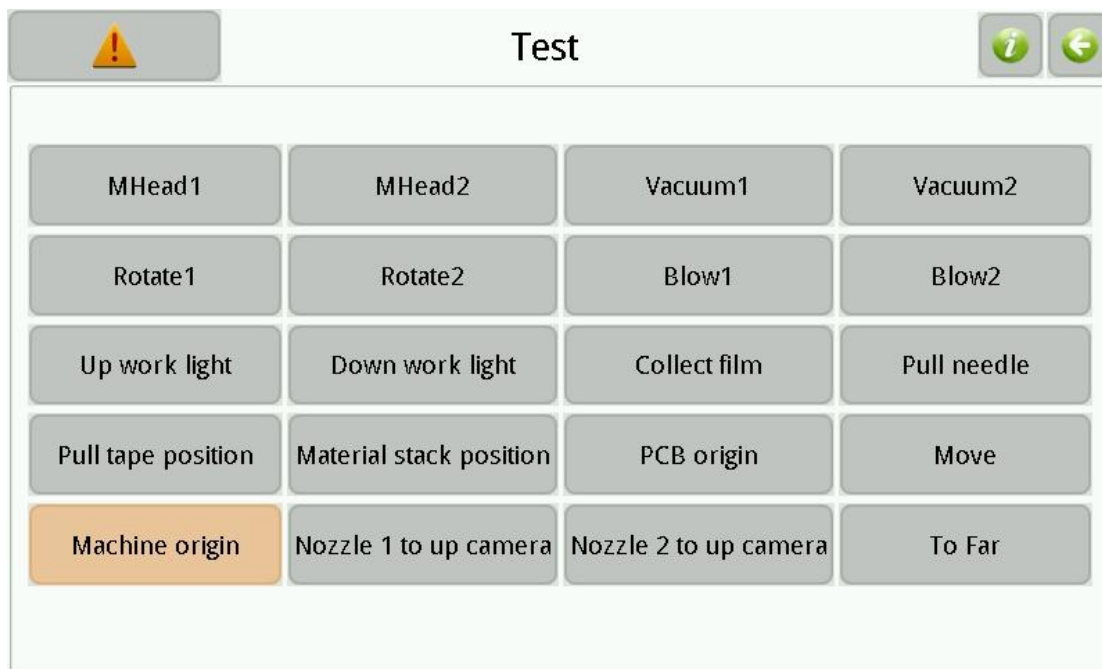


Figure.10-1

- (1) **Mhead 1\2:** Button down then nozzle press down, button up then nozzle up;
- (2) **Vacuum 1\2:** Click button to switch nozzle in suction;
- (3) **Rotate 1\2:** Button down then nozzle anticlockwise rotate 180°, button up then return back;
- (4) **Blow 1\2:** Click button to switch nozzle in blow;
- (5) **Up work light:** Click to open or close up camera work light;
- (6) **Down work light:** Click to open or close down camera work light;
- (7) **Collect film:** Click to collect film one time;
- (8) **Pull needle:** Button down then pull needle down, button up then pull needle up;
- (9) **Pull tape position:** Move pull needle to specified position of tape;
- (10) **Material stack position:** Move nozzle to specified position of material stack;
- (11) **PCB origin:** Move nozzle to PCB origin;
- (12) **Move:** Move mount head to certain position;
- (13) **Machine origin:** Click then mount head return to origin;
- (14) **Nozzle 1\2 to up camera:** Move nozzle 1\2 to position of up camera.
- (15) **To Far:** Move nozzle part to right top.

**Note:** Change of parameters in this window will not be saved, since it just used for testing if machine is working normally.

## 11. Set

Used for setting system parameters, screen as show below.

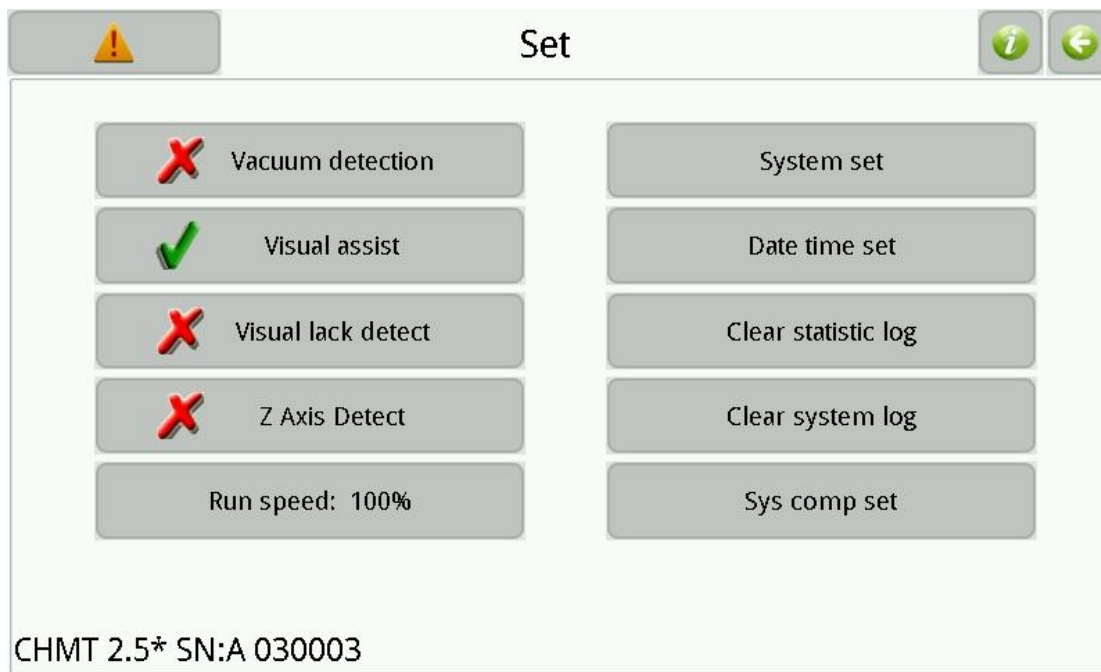


Figure.11-1

- (1) **Vacuum detection:** Click to open or close vacuum detection, note, if close vacuum detection here, machine will not detect lack of material, also will not discard material due to vacuum insufficient;
- (2) **Vision assist:** Click to open or close vision auxiliary, if closed then all of component are mounted without calibration by vision;
- (3) **Visual lack detect:** Click to open or close visual lack detect,if open, When the material is attached to the detection of the lack of material will be re drawn, many times to detect the lack of material, alarm and stops (if the visual detection error, can be closed this function);
- (4) **Z Axis detect:** Click to open or close Z axis detect,if open, The Z axis is found to be lost when the stick is attached, then the Z axis is automatically returned to the origin.. This feature can be avoided due to the high level of the device is not set up to cause the Z axis, damage to the device parts;
- (5) **Run Speed:** Setting entire running speed of machine;
- (6) **System set:** Setting advanced parameters, it's need code to enter;
- (7) **Date time set:** Setting system time;

- (8) **Clear statistic log:** Click to empty all of statistic logs.
- (9) **Clear system log:** Click to empty all of system logs.
- (10) **Sys comp set:** Set up when the device's overall offset compensation, angle compensation.

## 11.1. System Set

Screen as show below.

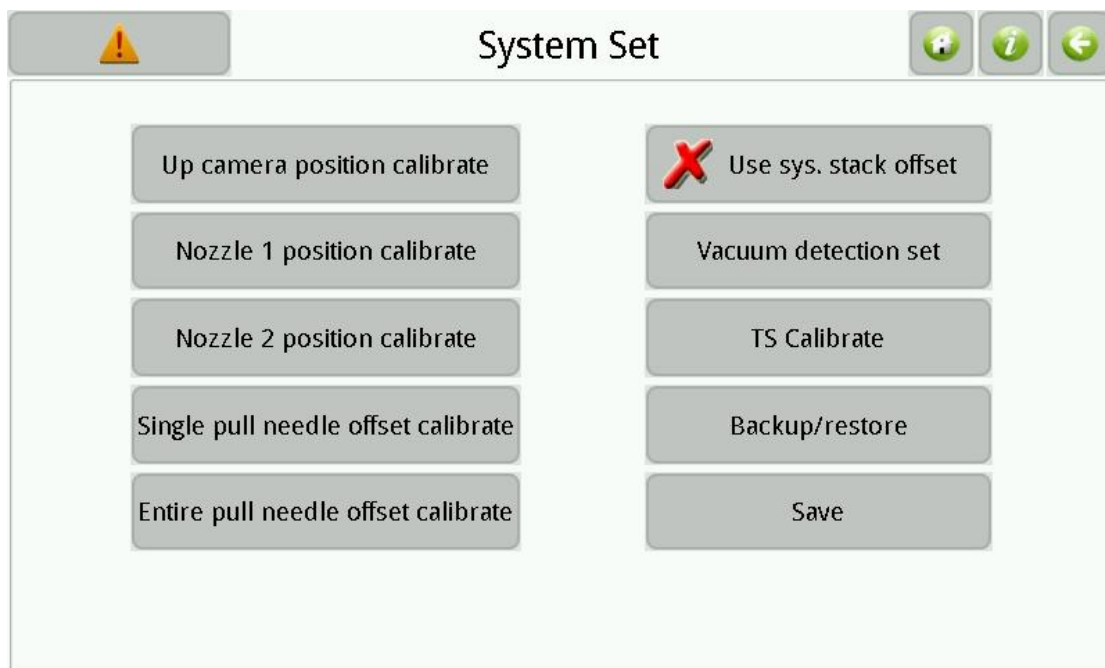


Figure.11-2

- (1) **Up camera position calibration:** Calibrating position of up camera, process is shown as below:
  - a) Click button then popup window as show below;

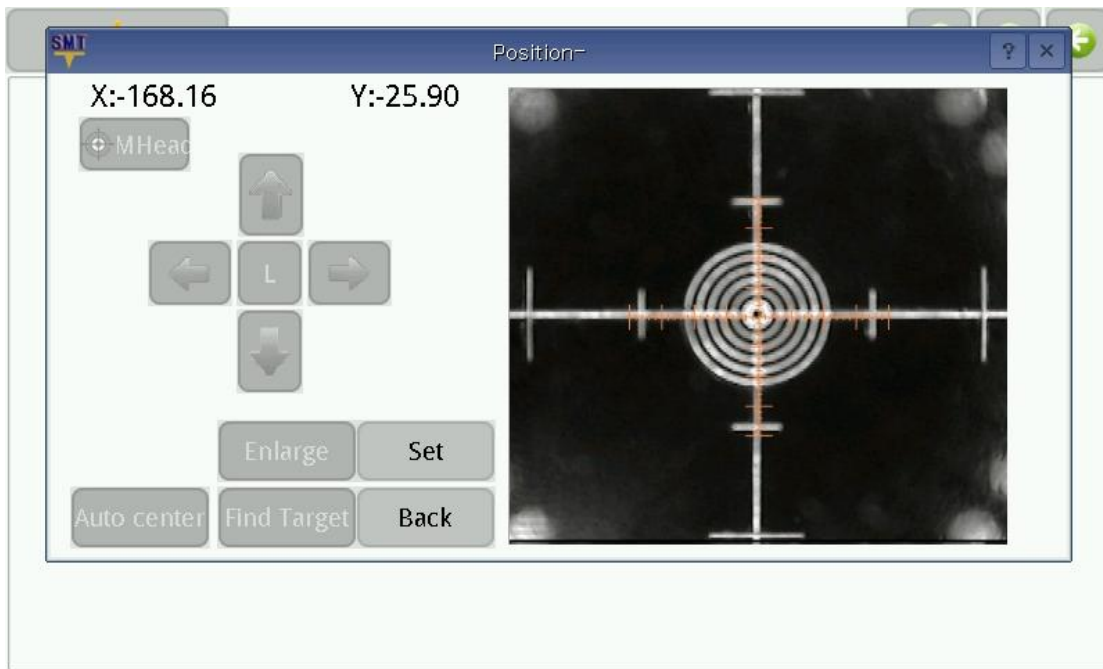


Figure.11-3

- b) Put the calibration board on up camera, adjust position of calibration board to centering the cross on screen, keep calibration board do not move, click "Set" to next, popup window as show below;



Figure.11-4

- c) Move position of down camera to centering the cross on screen, click "Set" to finish.
- (2) **Nozzle 1\2 position calibration:** Click button to popup window, move nozzle to the center of screen to calibrating, note, ensure that up camera position is



calibrated before do this calibration;

- (3) **Single pull needle offset calibration:** Click button and input material stack ID, adjust position of pull needle in popup window, see figure below, adjusting the tape let the red circle touches the blue line, the place of green circle is just the suggested pull needle position;

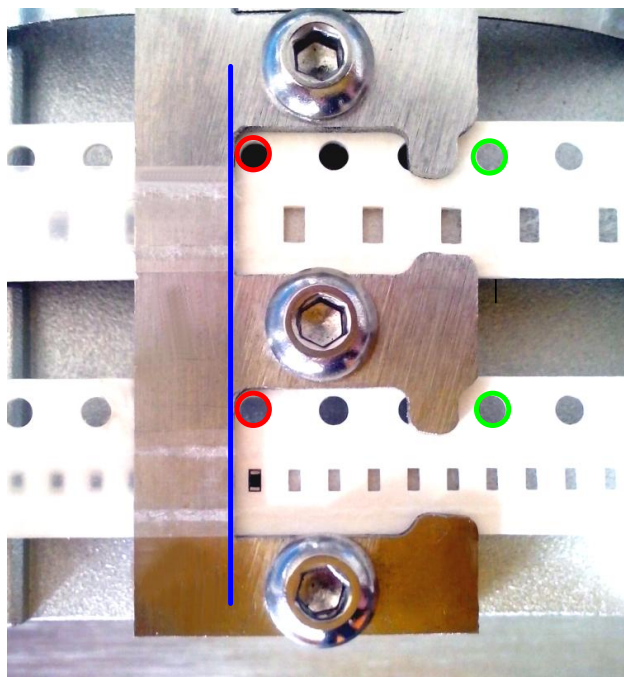


Figure.11-5

- (4) **Entire pull needle offset calibration:** Adjusting process is similar to above, but the result will affect position of pull needle for all of material stack, therefore it's appropriate for the situation that pull needle with entire deviation;
- (5) **Use sys. stack offset:** Click to open or close use system material stack offset, if use system offset then all of offset information in work file will kept in system, otherwise offset information in work file kept in itself.
- (6) **Vacuum detection set:** Used for viewing and setting parameters of vacuum pump;
- (7) **TS Calibrate:** Used for touch screen calibrate,system will restart after calibration.
- (8) **Backup/ Restore:** Backup and restore all of parameters in system set;
- (9) **Save:** Click to save updates of system set, note, if system parameters were modified without saving, then parameters that before modification will be restored when machine restart.

## 11.2. Vacuum Detection Set

Screen as show below.

Name	AP value	Vacuum value	Current press
MHead1	0	0	22.26
MHead2	0	0	23.35

Kindly reminder:the method of threshold adjust please refer to help text

MHead1	MHead2
Threshold1: 1.80	Threshold1: 1.80
Threshold2: 2.20	Threshold2: 2.20

Save

Figure.11-6

- (1) **Nozzle 1\2-suck:** Switch nozzle in blow;
- (2) **Nozzle 1\2-blow:** Switch nozzle in blow;
- (3) **Air pressure status list:** Note, ordinary pressure and vacuum value in list are valid only after sucking material at least one time when running, or it will display invariable 0; ordinary pressure is the pressure detected before sucking material; vacuum value is the absolute value of that pressure after sucking minus ordinary pressure, bigger value indicates better effect, effect is judged by partition the range of this value;
- (4) **MHead 1\2 threshold 1:** I.e. lower limit of vacuum value, no material is determined if vacuum value is below this value when running, and machine will retry, otherwise indicates material is sucked;
- (5) **Nozzle 1\2 threshold 2:** I.e. upper limit of vacuum value, bad material is determined if vacuum value is below this value when running, and material will be thrown away, otherwise indicates good suction and material will be mounted;

Note, threshold 1 must smaller than threshold 2, threshold 2 must smaller than detected vacuum value when suction OK, threshold 1 must greater than detected vacuum value when no material. Recommended values: threshold 1 must less than detected vacuum value when suck empty material; threshold 1 less 0.2 than threshold 2,

threshold 2 less 0.3 than detected vacuum value when suck normal material.

Prompt, machine will continue paste when machine don't suck any material and the detected vacuum value is more than threshold 2.

(6) **Save:** Save changes.

### 11.3. Backup/Restore

Screen as show below.

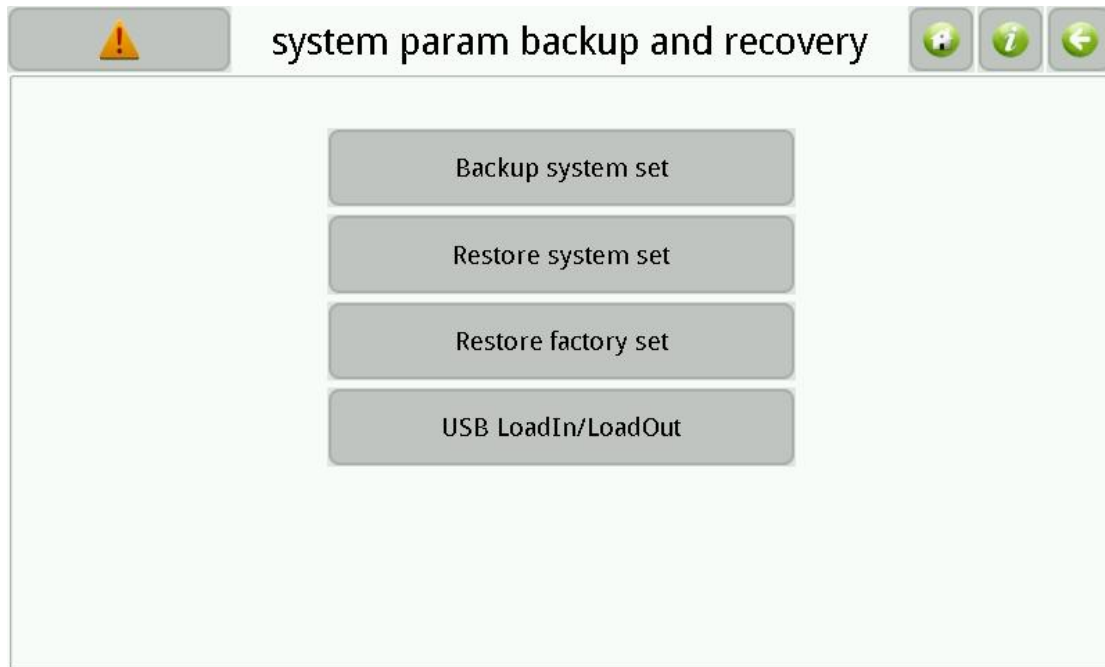


Figure.11-7

- (1) **Backup system set:** Backup all of system parameters;
- (2) **Restore system set:** Restore all of system parameters;
- (3) **Restore to factory set:** Restore all of system parameters to factory;
- (4) **USB LoadIn/LoadOut:** Screen as show below, button is enabled while USB storage device is connected, note, import parameters will not change system settings directly, only when do execution of restore system set.

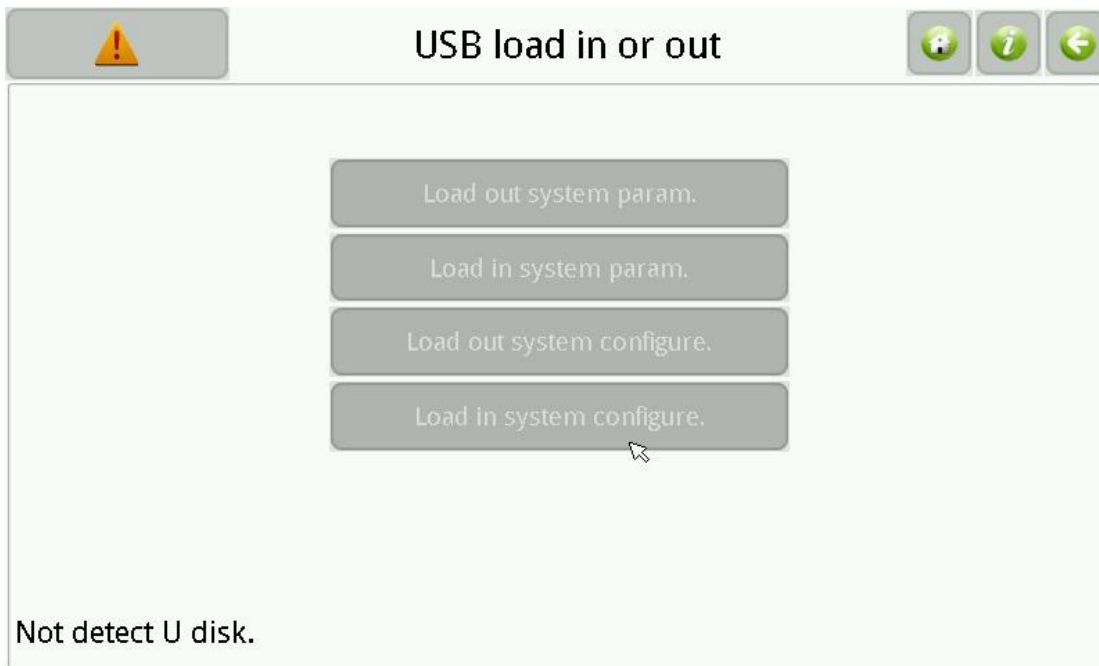


Figure.11-8

## 12. File

Used for managing work files and production files which generated by PCB software, screen as show below.

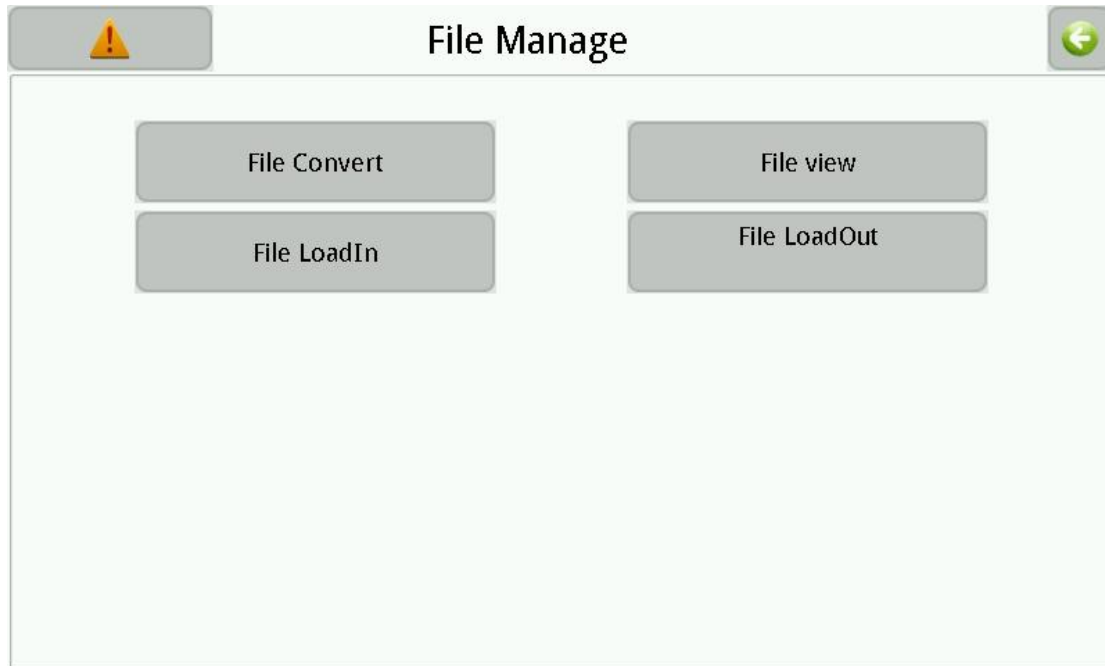


Figure.12-1

- (1) **File Convert:** In order to using CSV files generated by PCB software to work, a tool that convert CSV file to work file is required, see the usage of convert tool below;
- (2) **File view:** Browse all of CSV file and work file in system;
- (3) **File LoadIn\LoadOut:** LoadIn\LoadOut CSV file or work file, button valid when USB storage device is connected.

### 12.1. Generate CSV File

#### 12.1.1. By Altium Designer

- (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;

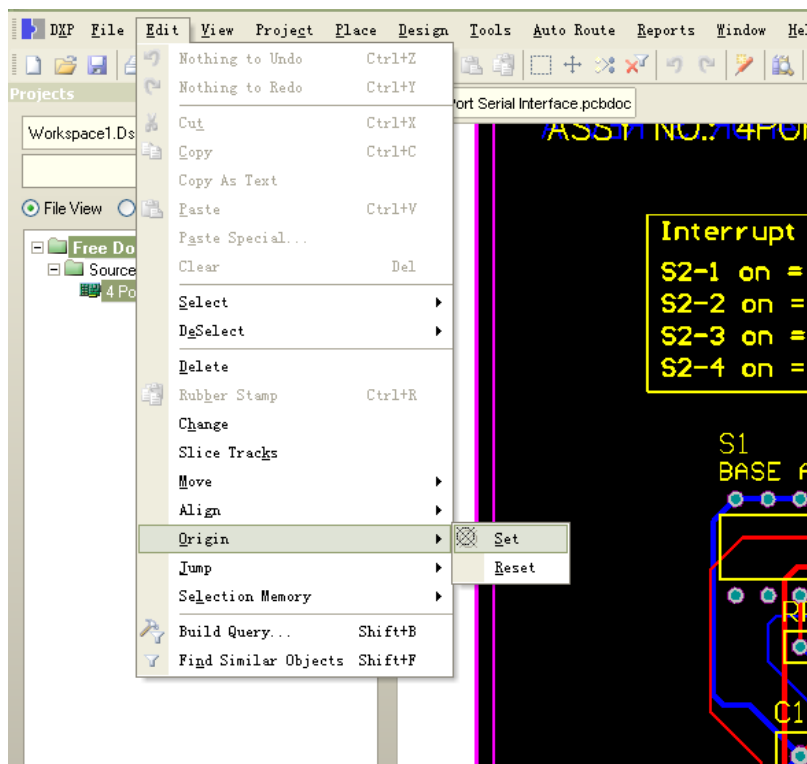


Figure.12-2

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

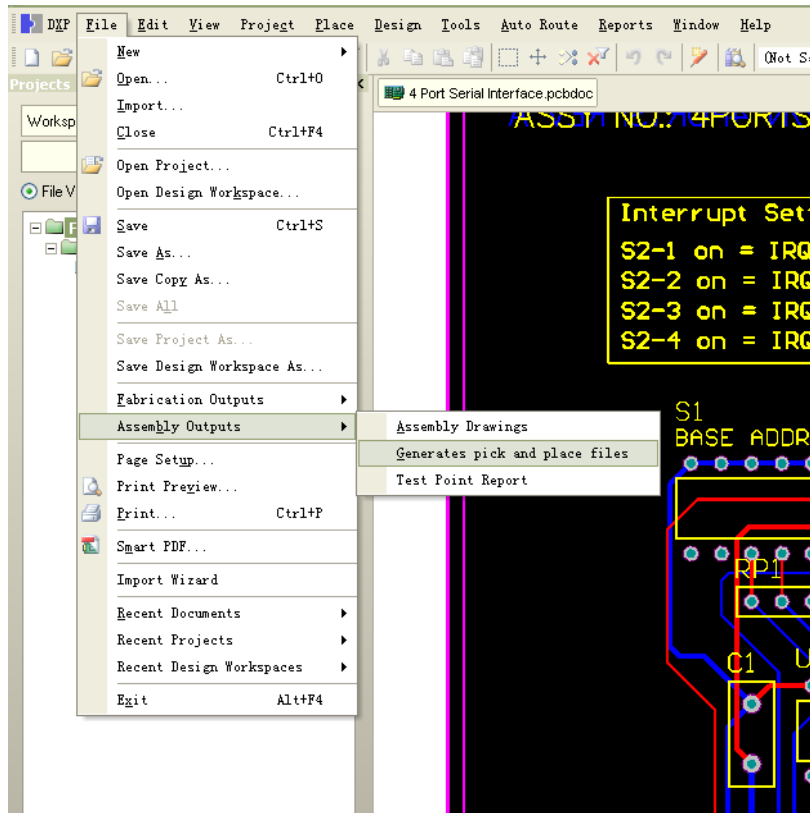


Figure.12-3

- (4) Figure as below, select “CSV” and “Metric” in popup dialog box, click “OK” to finish, generated CSV file can be found in same directory of PCB file.

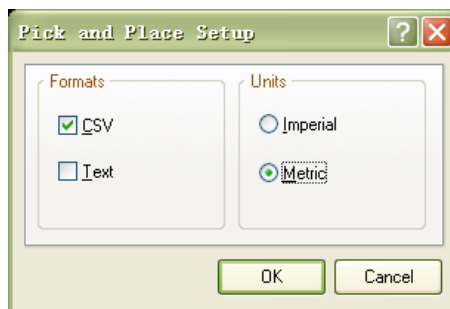


Figure.12-4

### 12.1.2. By Protel

- (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) Selecting “Edit”-“Origin”-“Set”in menu bar to setting PCB origin, 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;

(3) See figure below, select “File”-“CAM Manager” in menu bar;

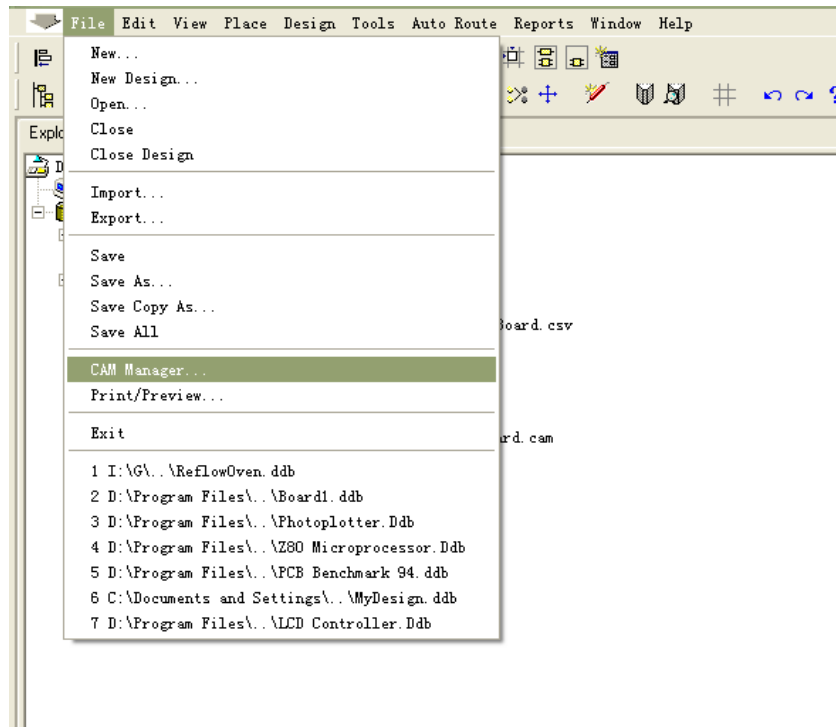


Figure.12-5

(4) See figure below, select “Pick Place” and then click “Next” in popup dialog box;

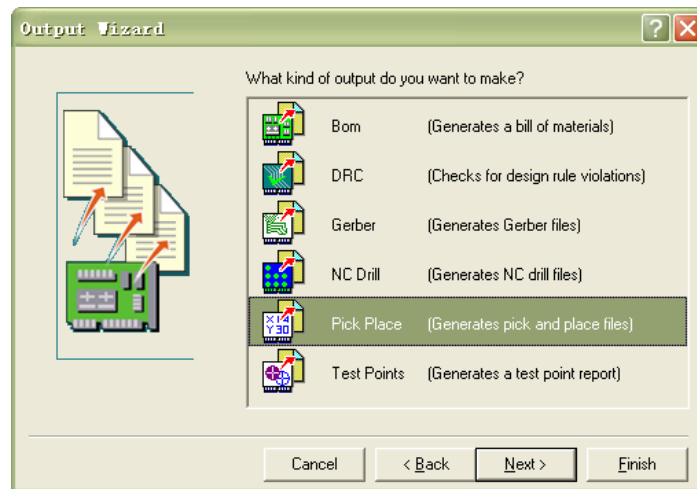


Figure.12-6

(5) See figure below, input file name, then click “Next”;



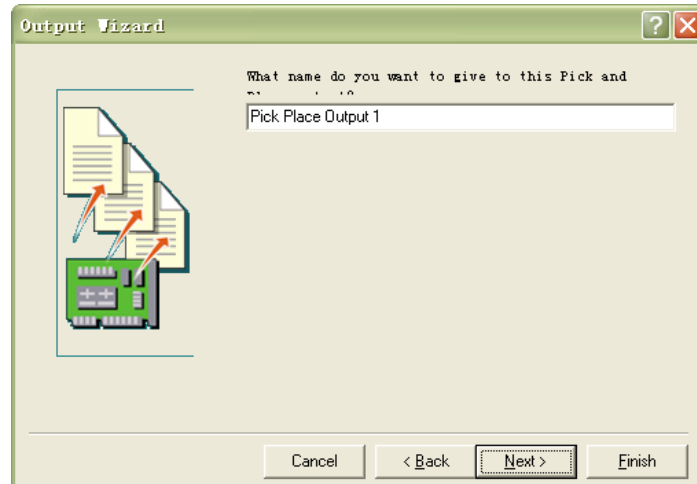


Figure.12-7

(6) See figure below, select “CSV” then click “Next”;

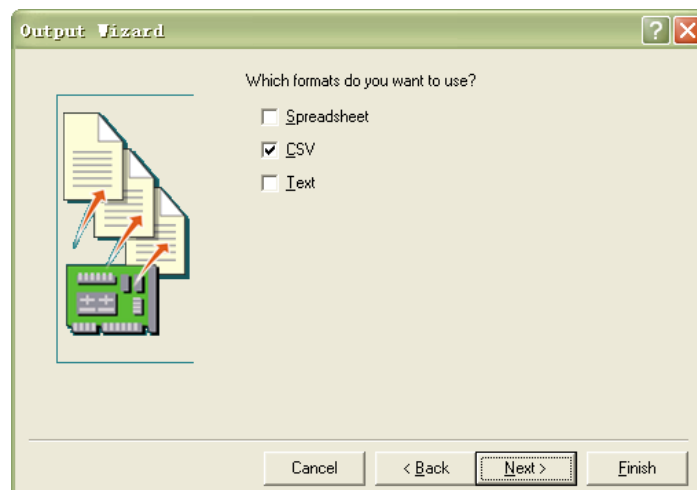


Figure.12-8

(7) See figure below, select “Metric” then click “Next”;

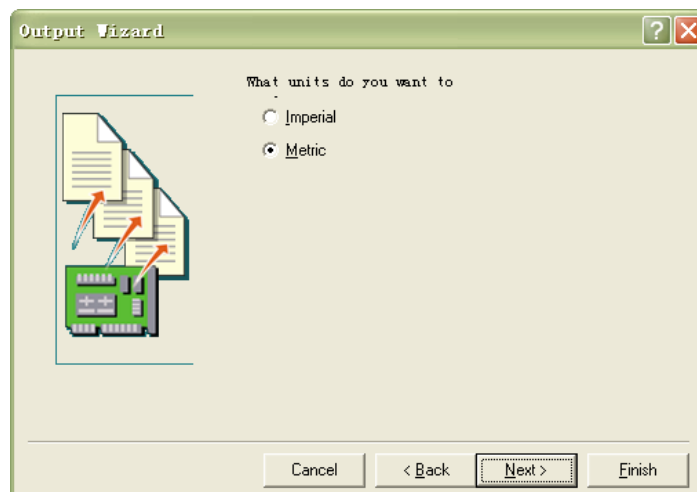


Figure.12-9

(8) See figure below, right click the file just generated in the list, select “Generate”

CAM Files” from popup menu;

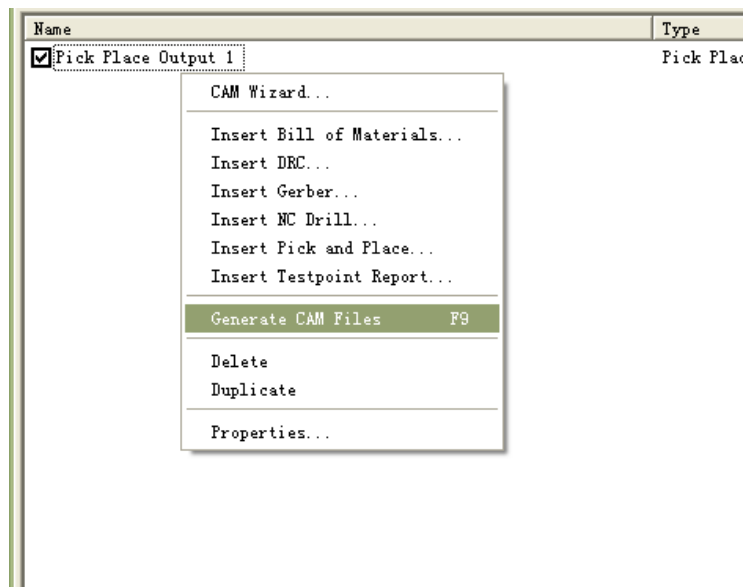


Figure.12-10

- (9) See figure below, right click the “CAM” folder just generated, select “Export” from popup menu to finish.

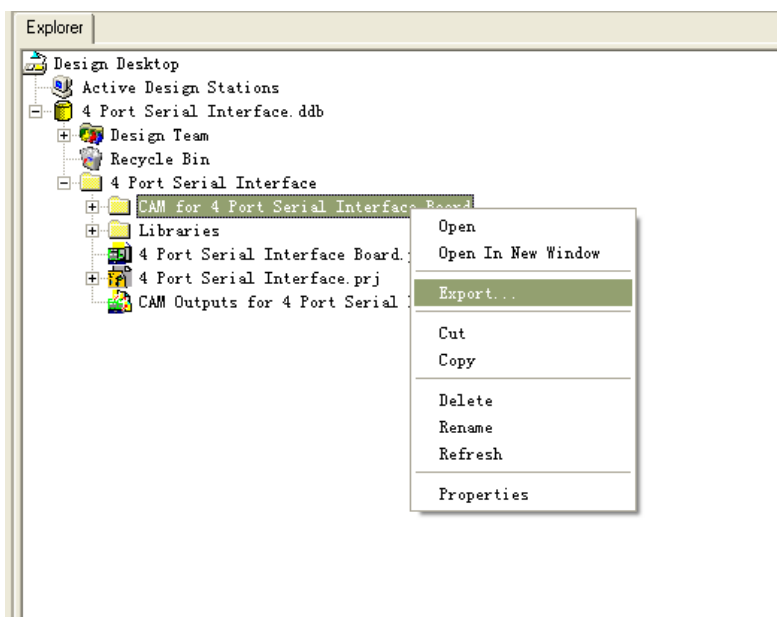


Figure.12-11

## 12.2. File Convert

Window as show below, all of imported CSV files in system are displayed in the list.



Figure.12-12

- 1、 **Open:** Open current select CSV file, Enter file convert page;
- 2、 **Delete:** Delete current select CSV file.

Open file to enter window as show below.

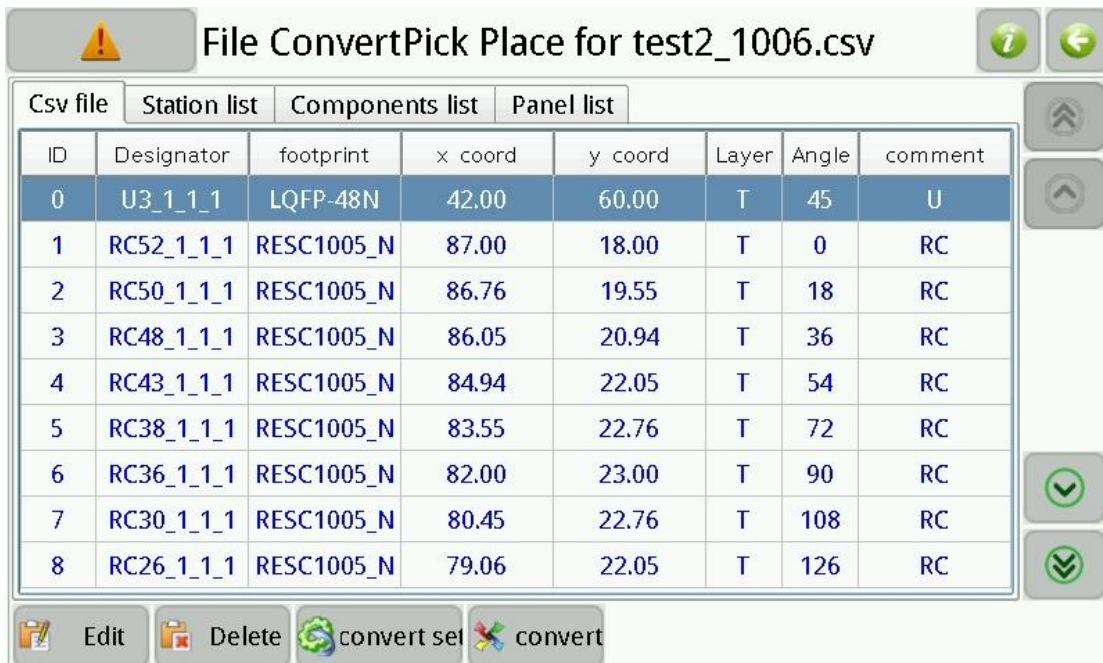


Figure.12-13

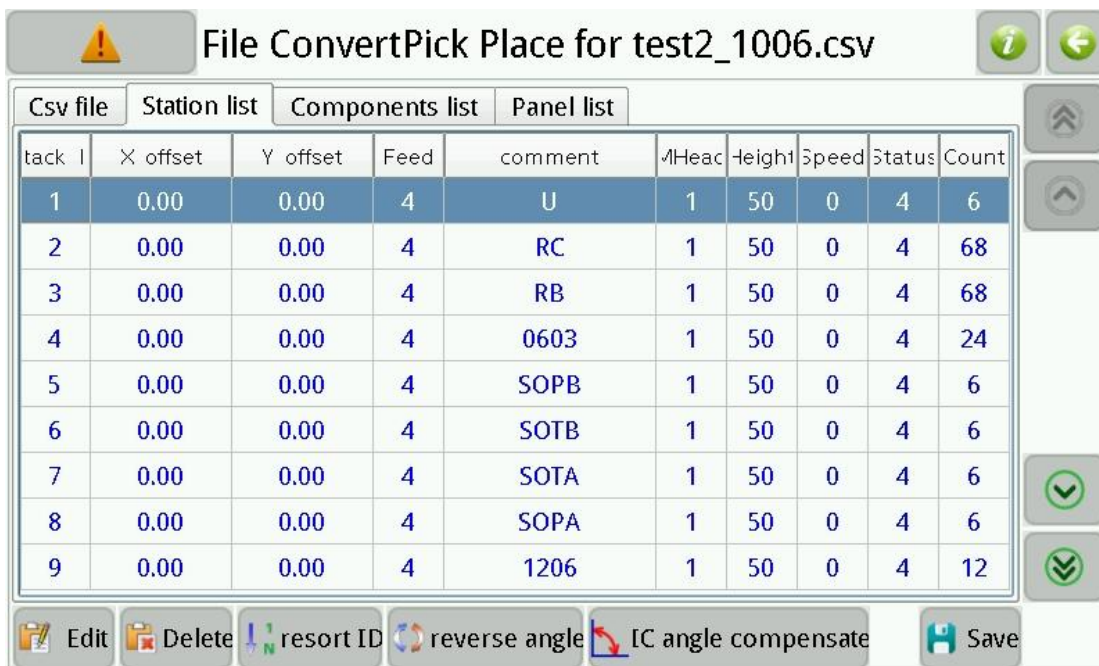
- (1) **Edit:** Edit information of selected csv item;
- (2) **Delete:** Delete information of selected csv item;
- (3) **Convert set:** Set the conditions for the conversion, select the top of the device,

the underlying device (whether the mirror);

- (4) **Convert:** Convert CSV file to work file;

## 12.2.1. Material Stack

Window as show below.



tack l	X offset	Y offset	Feed	comment	AlHeac	Height	Speed	Status	Count
1	0.00	0.00	4	U	1	50	0	4	6
2	0.00	0.00	4	RC	1	50	0	4	68
3	0.00	0.00	4	RB	1	50	0	4	68
4	0.00	0.00	4	0603	1	50	0	4	24
5	0.00	0.00	4	SOPB	1	50	0	4	6
6	0.00	0.00	4	SOTB	1	50	0	4	6
7	0.00	0.00	4	SOTA	1	50	0	4	6
8	0.00	0.00	4	SOPA	1	50	0	4	6
9	0.00	0.00	4	1206	1	50	0	4	12

Figure.12-14

- (1) **Station list:** Show all of material stack in work file;
- (2) **Edit:** Edit selected material stack, note, all of relevant components will be changed;
- (3) **Delete:** Delete selected material stack, note, all of relevant components will be deleted;
- (4) **Resort ID:** The material stack ID starting from 1 in ascending order;
- (5) **Reverse angle:** Invert selected material stack, i.e. rotate 180 degree, note, all of relevant components will be changed.
- (6) **IC Angle compensats:** Compensate IC, rotate 90 degree. Some component need angle compensats, e.g. SOPB, QFN, etc.
- (7) **Save:** Save converted work file.

## 12.2.2. Component

Window as show below.



Figure.12-15

- (1) **Components list:** Show all of component in work file;
- (2) **Edit:** Edit selected component;
- (3) **Delete:** Delete selected component;
- (4) **Resort ID:** The device number starting from 1 in ascending order;
- (5) **Use dual nozzle1:** Check indicates that take two component in one time by using two nozzle(same material stack), but component list must be sorted by material stack;
- (6) **Use dual nozzle2:** Check indicates that take two component in one time by using two nozzle(difference material stack);
- (7) **Save:** Save converted work file.

### 12.2.3. Batch

Window as show below.

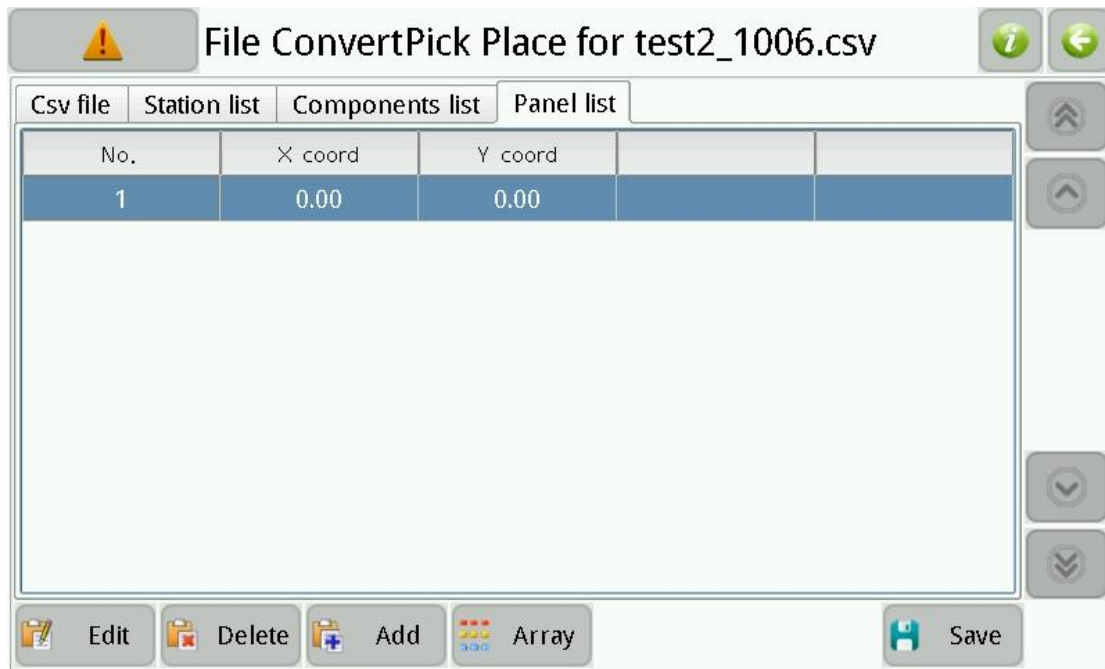


Figure.12-16

- (1) **Edit:** Edit coordinate information, or edit X\Y interval and count of PCB;
- (2) **Delete:** Delete selected coordinate;
- (3) **Add:** Add a new origin coordinate of PCB;
- (4) **Array\Coordinate:** Switching that manage batch by array or by coordinate;
- (5) **Save:** Save converted work file.



### 13. Log

Window as show below.

Load time	End time	Work file(B)	Comp. cnt	PCB cnt.
2014-10-28 15:35:03	2014-10-28 15:35:35	test2_1006copy.dpv	8	0
2014-10-29 11:26:46	2014-10-29 11:27:34	test2_1006copy.dpv	19	0
2014-10-31 11:00:13	2014-10-31 11:01:39	111.dpv	0	0
2014-10-31 11:02:47	2014-10-31 11:03:06	test2_1008.dpv	0	0
2014-10-31 11:07:43	2014-10-31 11:07:51	test_1023.dpv	0	0
2014-10-31 11:07:54	2014-10-31 11:08:21	test2_1008.dpv	0	0
2014-10-31 13:54:12	2014-10-31 13:54:32	test_1023.dpv	0	0
2014-10-31 14:14:30	2014-10-31 14:14:49	test2_1008.dpv	0	0
2014-11-02 11:00:17	2014-11-02 11:00:26	test2_1006.dpv	0	0

Figure.13-1

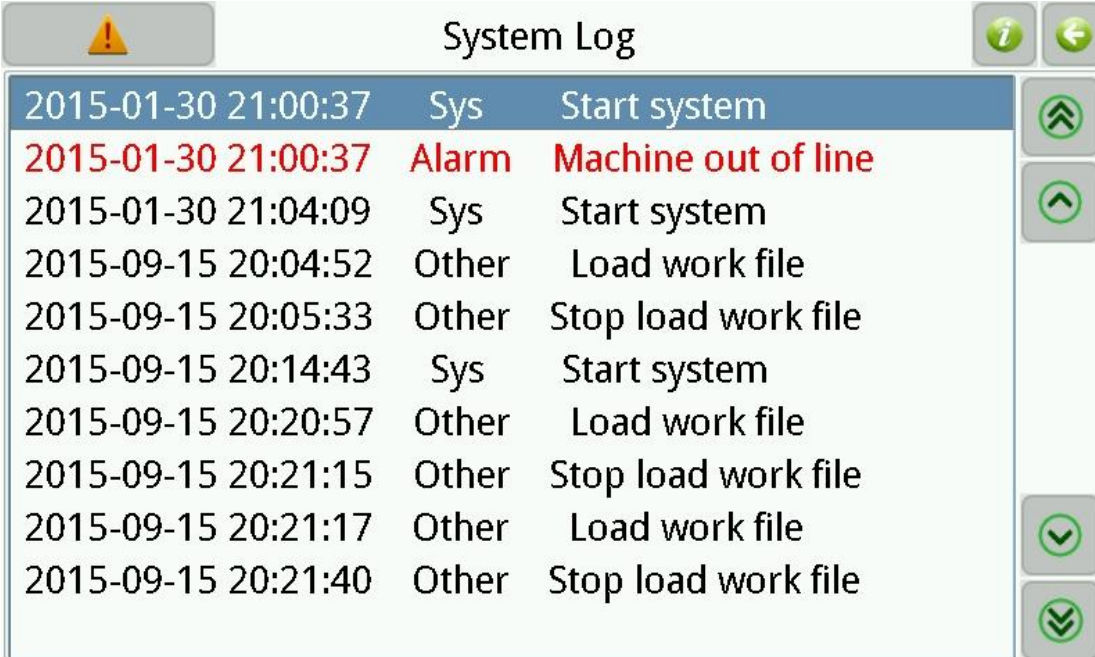
- (1) **Log list:** Each line records information of one running time;
- (2) **Sum.:** Show mount count of each material stack in table.

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	0	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+	8	0	0	0	0	0	0	0	0	0
90+	0	0	0	0	0	0	0	0	0	0

Figure.13-2

## 14. System Log

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



System Log			
2015-01-30 21:00:37	Sys	Start system	
2015-01-30 21:00:37	Alarm	Machine out of line	
2015-01-30 21:04:09	Sys	Start system	
2015-09-15 20:04:52	Other	Load work file	
2015-09-15 20:05:33	Other	Stop load work file	
2015-09-15 20:14:43	Sys	Start system	
2015-09-15 20:20:57	Other	Load work file	
2015-09-15 20:21:15	Other	Stop load work file	
2015-09-15 20:21:17	Other	Load work file	
2015-09-15 20:21:40	Other	Stop load work file	

Figure.14-1

## 15. Quick Start

- (1) **Create work file:** By two ways:
  - a) Export CSV file by PCB software, and then convert it to work file, refer to section "File";
  - b) Build work file manually, refer to section "Run"- "Edit Work File".
- (2) **Edit work file:** Modify work file according to your needs, refer to section "Run"- "Edit Work File";
- (3) **Place material:** Place material in corresponding material stack according to work file, note some points below when placing:
  - a) See figure below, material disk is fixed by three points, and the tape goes across under bearing;



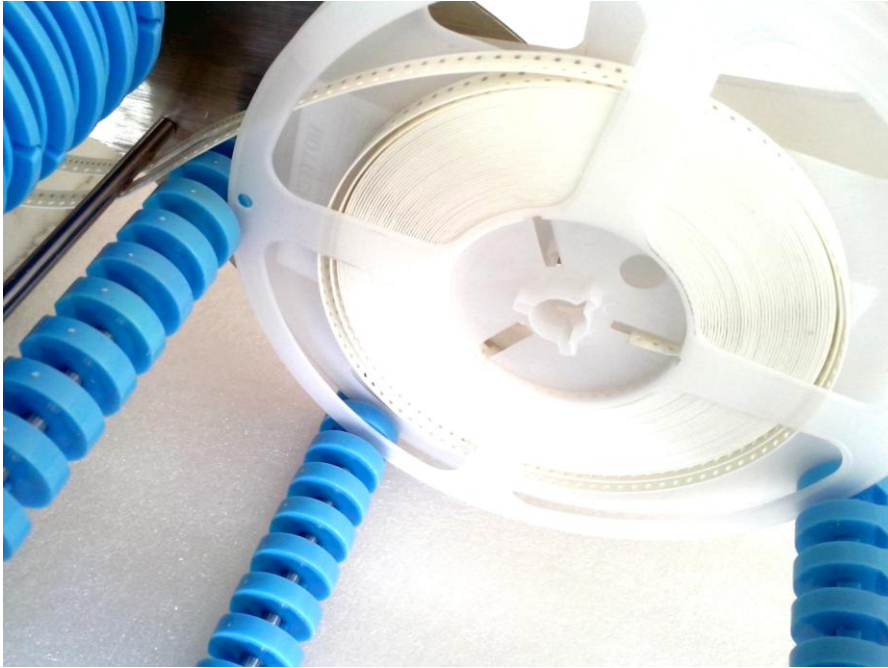


Figure.15-1

- b) See figure below, the tape goes across material stack and lead to underside of machine, note that align the round hole of tape to the edge of batten when placing, refer to section “Run”;

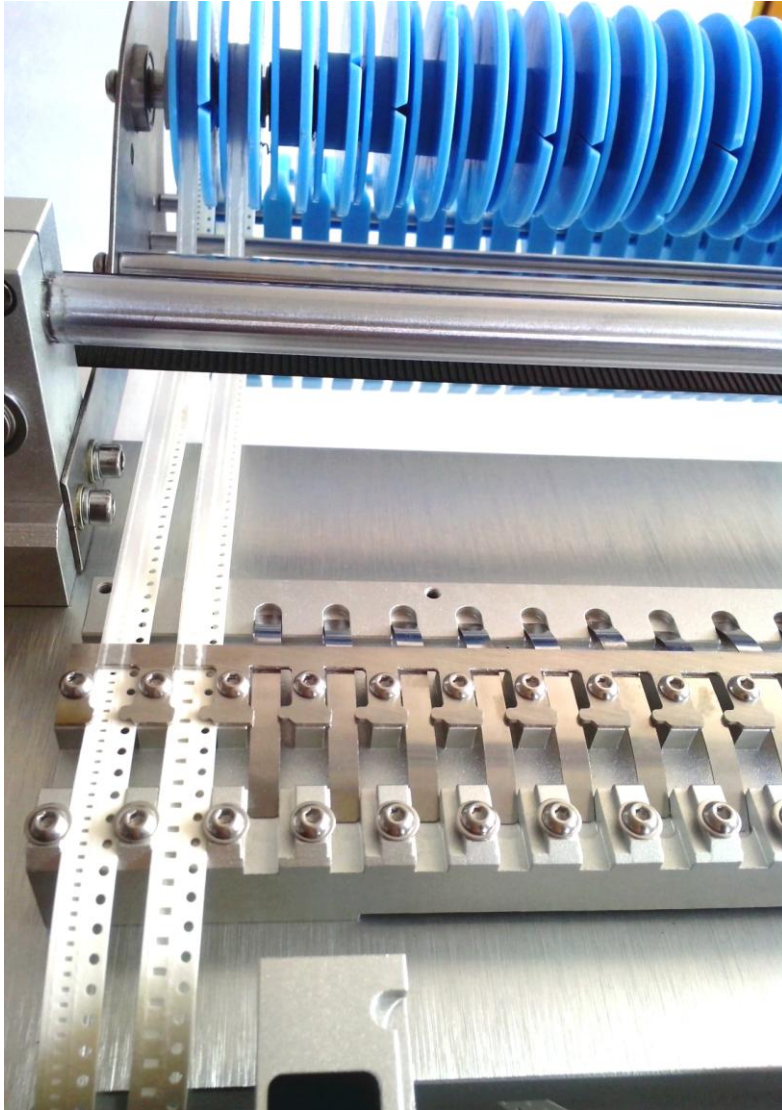


Figure.15-2

- c) See figure below, the film on tape goes across under bearing, and wound on belt receiving wheel;

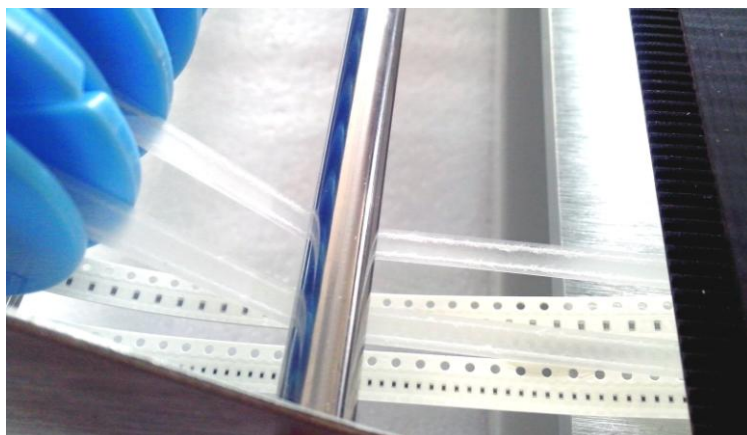


Figure.15-3

- d) The height of IC tray should not be exceeded, refer to section “Run”.

- (4) **Place PCB:** Place PCB with solder paste to PCB clamp area;
- (5) **Install nozzle:** Different model of nozzles are introduced below:
  - a) 502 is suitable for mounting footprint of 0402;
  - b) 503 is suitable for mounting footprint of 0603;
  - c) 504 is suitable for mounting footprint of 0805,1206,SOT23, etc.;
  - d) 505 is suitable for mounting footprint of SOP8,SOP14, etc.;
  - e) 506 is suitable for mounting footprint of QFN,TQFP, etc.;



Figure.15-4

- (6) **Edit material stack:** Calibrate position of material stack, refer to section “Run”-“Material Stack” for details;

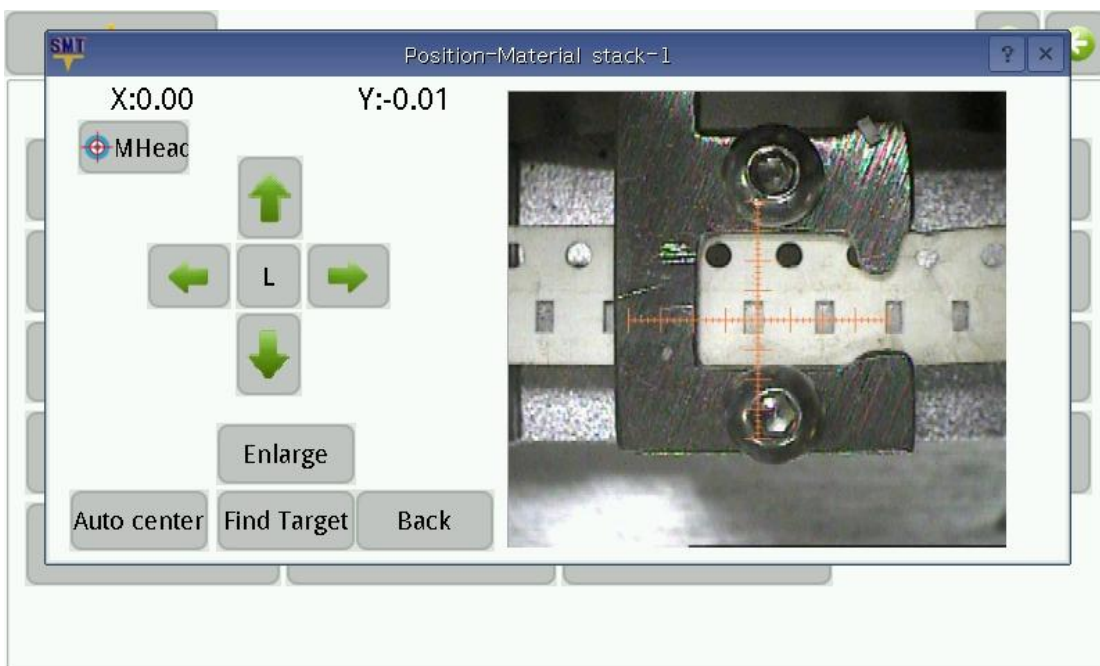


Figure.15-5

- (7) **PCB Calibration:** E.g. calibrating PCB by components, see figure below, refer to section “Run”-“Edit Work File”-“PCB Calibration” for details;





Figure.15-6

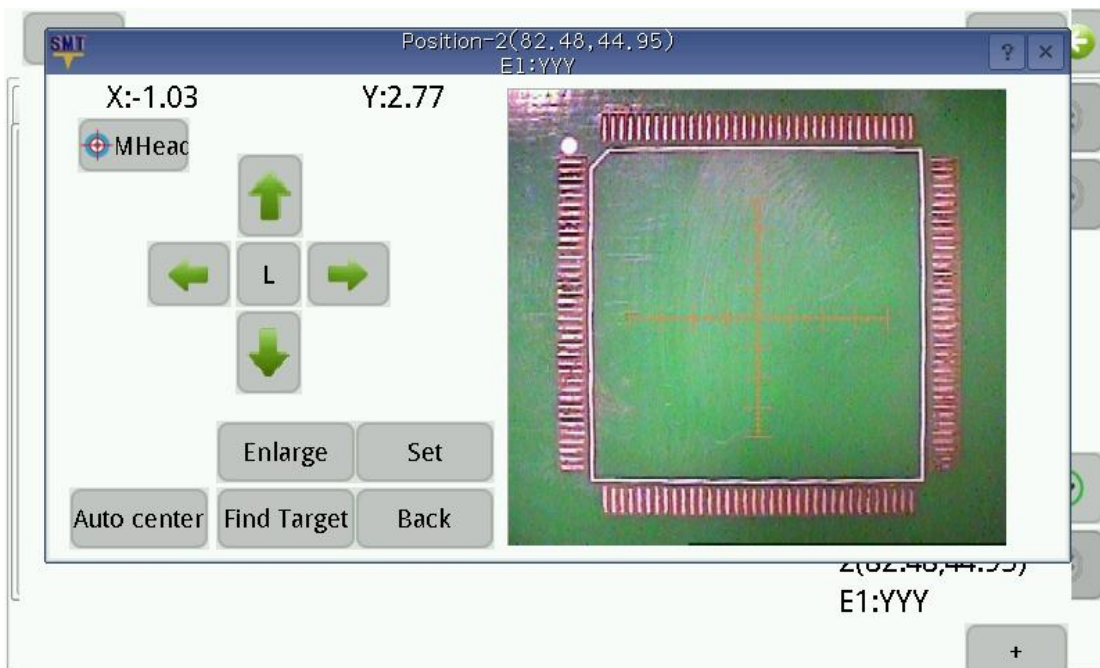


Figure.15-7

- (8) **Running step by step:** Running step by step in running window, check if each module is working normal, if not, adjusting relevant parts according to this manual until all of trouble are cleared;
- (9) **Running:** Notice if machine is alarming and material feeding is normal when running, if there are any abnormal occurred then pause running immediately until all of trouble are cleared.

## 16. Maintenance

- Clearing machine clean after using, close software before switch off power;
- According to condition of using, smear some grease to bearings regularly;
- Cover machine if unused for a long time.

## 17. Warranty

- Warranty range: SMT machine itself;
- Warranty period: 12 months;
- If there are problems in using, please contact us promptly, and do not 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 break 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 beyond specification;
  - Crash or improper placing when using;
  - Using environment that do not fit for specification;
  - Wrong power supply;
  - Earthquake, fire, lightning or accident beyond control.