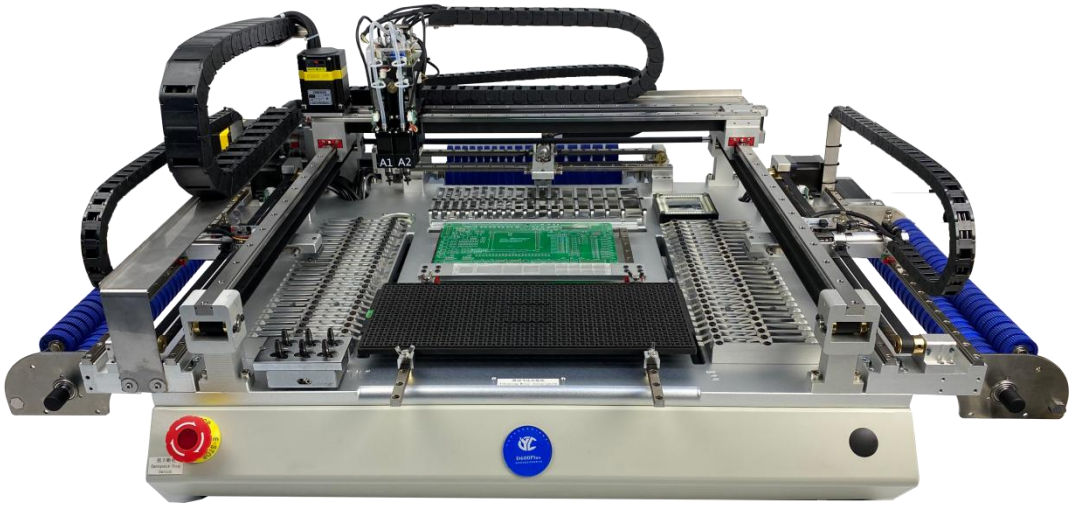
Automatic patch machine



This manual is applicable to: Q1, Q1S, Q2, Q2S, D600, D600S, D600Plus

Preface

Thank you for using this product. This operation manual provides the equipment parameters, operation instructions and other relevant information of the mounter. Be careful:

1、It is strictly prohibited to copy or copy part or all of the contents of this book without permission. (including software and programs).

2、The contents of this book are subject to change without prior notice.

3、We strive to be accurate in compiling the contents of this book. In case of any errors, omissions or suspicions, please contact the dealer or our company.

4、The company shall not be responsible for the results caused by incorrect operation, whether related to item (3) or not.Please understand.

Be careful: For safe use of the machine! The operators who actually use the mounter for maintenance and repair shall carefully read the following safety precautions before using the machine to avoid injury.

1、 Basic dos and don'ts

(1) The operation of the mounter is limited to the operator who has mastered the operation of the mounte;

(2) Do not use the mounter for other purposes. Otherwise, the company will not be responsible for the resulting liabilities;

(3) Do not modify the mounter. The company shall not be responsible for any accident caused by transformation;

(4) In order to prevent accidents caused by accidental startup of the mounter, please cut off the power supply before maintenance, repair and cleaning;

(5) When pulling out the power plug, hold the plug and pull it out, not the wire.

2、 Precautions during use

(1) Please take necessary safety measures during handling to prevent inversion and falling accidents during lifting and moving;

(2) Please keep the equipment used after opening;

(3) Please place the machine in a stable place during installation;

(4) To prevent personal accidents, please make sure that the cable is free of damage, falling off, relaxation, etc. before connecting the power supply;

(5) To prevent personal accidents, please confirm that the power supply has been safely grounded before connecting the power supply;

(6) In order to prevent accidents caused by unskilled operation, repair and commissioning operations shall be carried out by skilled technicians. When replacing parts, please use the genuine parts of the company. The company is not responsible for accidents caused by the use of non genuine parts;

(7) In order to prevent electric shock accidents caused by unskilled operation, please entrust personnel with professional electrical knowledge for electrical repair;

(8) To prevent personal accidents, please make sure that the screws and nuts are not

loose after repair, commissioning, parts replacement and other operations.

3、 Precautions for working environment

(1) To prevent accidents caused by incorrect operation, please avoid using in the following working environment;
(2) Do not use under the influence of noise sources (electromagnetic waves) such as high-frequency welding machines;
(3) Do not use when the power supply voltage exceeds ± 10% of the rated voltage;
(4) In case of thunder, please stop using and cut off the power supply.
(5) Avoid high humidity environment. Do not touch the guide rail by hand and add oil frequently to prevent rust.
(6) Ensure sufficient operating space to avoid high temperature.

- Quick start skills: the basic parameters and engineering routines in this manual have been completed before leaving the factory. After receiving the machine, the user first uses the routines attached to the original factory to install it, understand the software installation process, and test various functions of the machine hardware. Then refer to the quick start chapter to start from a material rack and a mounting list from simple to cumbersome, so as to achieve twice the result with half the effort。

Catalogue

1. Equipment introduction

1.1. Preface

- YC series chip mounter has small space, stable mounting and high precision. It is suitable for batch production, experimental development, sample trial production and school teaching in small and medium-sized enterprises. This machine is designed to meet the needs of small and medium-sized customers. It is a fast and accurate mounting machine, easy to operate, stable and affordable. With high cost performance, it is your best choice!

1.2. Characteristic

- Equipped with stepper servo motor to realize high-precision positioning and smooth low-speed operation;
- Q2S and D600P are equipped with full linear slide rails for stable and high-speed mounting, which is more stable and accurate;
- Simultaneous mounting of dual mounting heads enables rapid mounting of micro components and integrated IC components at the same time.
- The high-resolution Industrial 3 camera corrects the picking offset and improves the reliability of mounting;
- Double mark identification and positioning function, automatically correct the offset caused by irregular PCB and incorrect position;
- The patented Feida material supply system solves most of the problems in the market, such as using the machine head to drag the needle, inaccurate marking, more sticking and more deviation, and easy to get stuck;
- The patented mobile pneumatic Feida realizes the separation of patch and feeding, which makes the feeding more stable and the patch speed higher;
- Patented 6-bit suction nozzle library, realizing 2 × 6 automatic nozzle change to meet the mounting requirements of various parts;
- Maximum 22mm suction nozzle mounting stroke, specially for high parts;
- It can be configured with embedded industrial control PC and windows

system, with simple and convenient operation and stable performance;

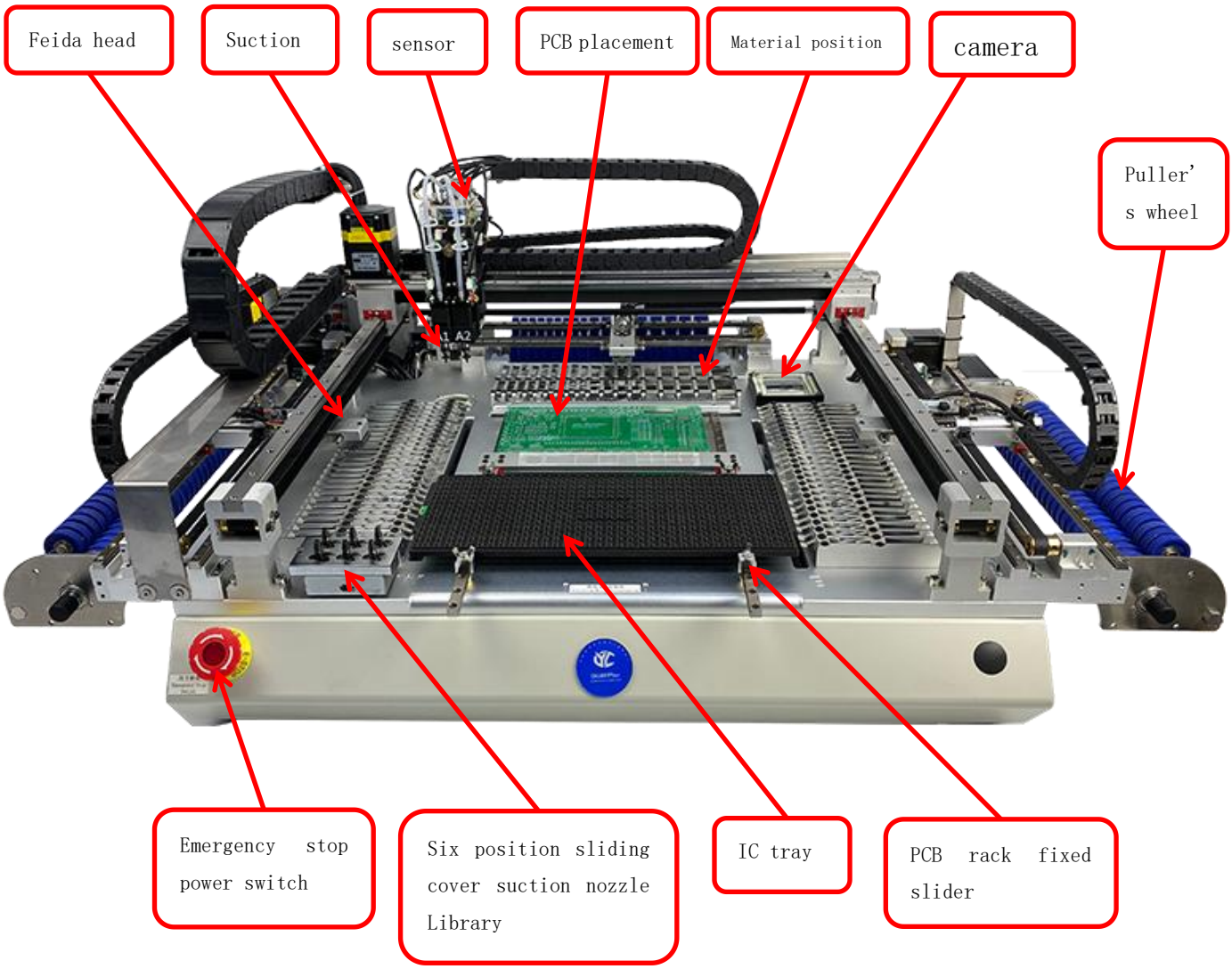
- Chinese and English control system interface, internationalization;
- The humanized control interface is easy to learn, understand and operate. It takes 1 hour to learn, 3 days to be familiar with and 7 days to be proficient;
- CSV coordinate file import editing and quick editing program supporting PCB source file conversion;
- Powerful open and upgradeable system, supporting customized automatic material stack, composite IC tray and vibrating Feida, meeting diversified needs;
- Samsung universal suction nozzle meets the mounting requirements of different packages;
- Various production modes are applicable to production, teaching, experiment and other purposes。

1.3. Model selection parameter table

具体参数对比

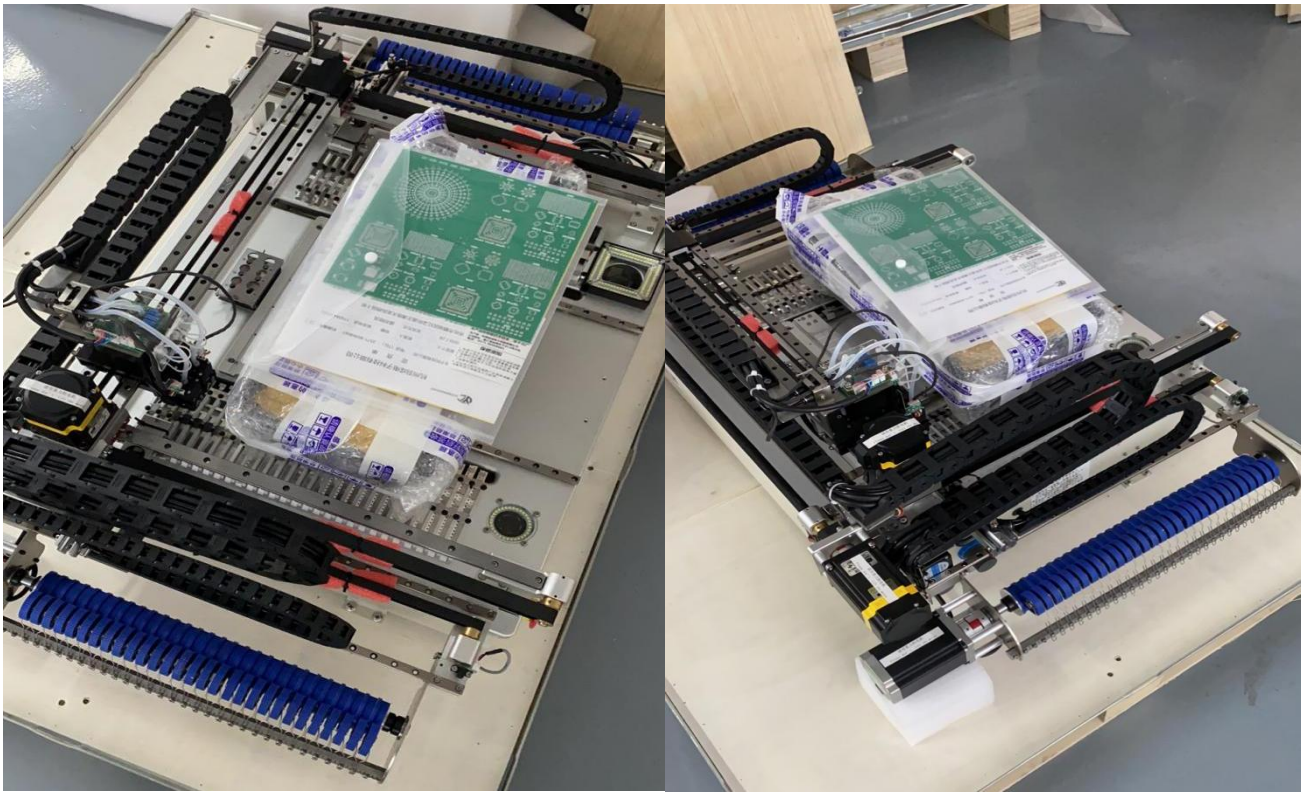
型号	YC-Q1	YC-Q2S	YC-D600 Plus
电源功率	220V (100v)~50HZ / 400w (锋值)		
电机/驱动	步进	步进伺服	步进伺服
设备尺寸	76×65×40CM	100×60×40CM	100×75×40CM
设备重量	60KG (出口木箱100*82*40cm)	75KG (出口木箱 110*82*50cm)	85KG (出口木箱 110*82*50cm)
封装类型	0402、0603、0805、 1206、CD12	0402、0603、0805、1206、CD12、BGA、 SOP、SSOP、QFN、高固态电容、大电感	
气源	1、外部供气（压缩空气0.5Mpa~0.7Mpa) 流量：单头工作13L/MIN、双头工作26L/MIN (真空内部自动转化) 2、气动送料耗气量0.04L/M，标配机器不含电脑、气泵。		
操作系统	微软Win7以上		
兼容文件格式	CSV、TXT、格式文件		
编程方式	支持在线、离线、Excel三种方式		
贴装头数量	2头	2×6(自动换6头)	
贴装精度	贴片精度0.03MM	贴片精度0.028MM	
贴装速度	阻容3500粒/h，全视觉贴片2500粒/h		
视觉相机	标配Mark相机+2视觉相机，共3个相机		
视觉系统	自主研发		
识别能力	MAX、17MM×17MM		
供料器位数	共33位标配 (可定制) 北面：8MM×28位 12MM×2位 16MM×2位 24MM×1位	共54位 (两面均可定制) 西面：8MM×29位 东面：8MM×18位、 12MM×4位、 16MM×2位、 24MM×1位	共68位(三面均可定制) 西面：8MM×25位 北面：24MM×1位、 16MM×4位、 12MM×4位、 8MM×9位 东面：8MM×25位
管装供料器	羽成专用5管管状供料器1位，尺寸：290×90×140MM (选配)		
供料方式	盘带：8MM、12MM、16MM、24MM。托盘，工位，以及特殊管装震动		
基板最大尺寸	620MM×440MM	620MM×540MM	680MM×550MM
最大PCB面积	370MM×260MM (和托盘共享面积)	240MM×350MM (和托盘共享面积)	240MM×350MM (和托盘共享面积)
最大行程	X480MM、Y320MM、 Z20MM	X430MM、Y450MM、 Z22MM	X430MM、Y430MM、 Z22MM
z轴最大高度行程	20MM	22MM	
传动主轴	同步轴+光轴	同步轴+直线导轨	
前置IC料位	10位		
前置托盘	1位标准托盘（可定制复合托盘）		
A轴旋转角度	360°		

1.4. Machine structure



1.5. Packaging and accessories

1.5.1. Packing



- check all parts of the machine for damage.
- check whether there are foreign matters around the machine.
- whether the table on which the machine is placed is stable.
- Remove the pearl cotton and black ties that fix the equipment.

1.5.2. D600Plus Configuration list

1	整机一台(包含北西东 3 组飞达)		11	黄油一只	
2	U 盘一个 (内有配套软件, 教程)		12	双面胶一张	
3	加密狗一个		13	内贸备件包（见附件 1）	
4	大号测试 PCB 板一块		14	8mm 气管 2 米 1 根	
5	USB 转接头一个		15	工具 1.5、2、2.5 内六角各 1 把	
6	视频采集卡一个		16	吸嘴 6 个（型号自选）	
7	电源插头线一根		17	25 位黑料盒两个（东，西面用）	
8	抛料盒一个		18	铝合金大料盘架一个（北面用）	
9	相机布一块		19	吸嘴库（已装在机器上）	
10	防尘罩一个			注意：6 个吸嘴在抛料盒中	

Shop accessories:

1	气泵		2	高精密丝印台		3	震动飞达	

1.5.3. Q2S Configuration list

1	整机一台(包含西东 2 组飞达)		11	黄油一只	
2	U 盘一个 (内有配套软件, 教程)		12	双面胶一张	
3	加密狗一个		13	内贸备件包（见附件 1）	
4	大号测试 PCB 板一块		14	8mm 气管 2 米 1 根	
5	USB 转接头一个		15	工具 1.5、2、2.5 内六角各 1 把	
6	视频采集卡一个		16	吸嘴 6 个（型号自选）	
7	电源插头线一根		17	25 位黑料盒两个（东，西面用）	
8	抛料盒一个		18	铝合金大料盘架一个（北面用）	
9	相机布一块		19	吸嘴库（已装在机器上）	
10	防尘罩一个			注意：6 个吸嘴在抛料盒中	

Shop accessories:

1	气泵		2	高精密丝印台		3	震动飞达	

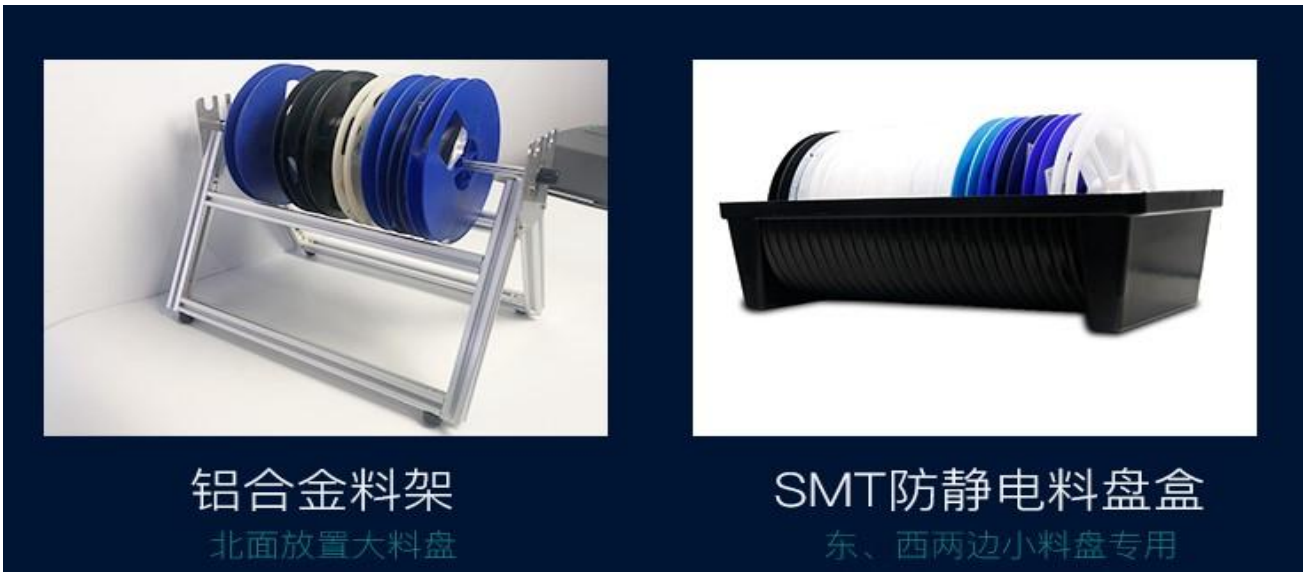
1.5.4. Q1 Configuration list

1	整机一台(包含北面 1 组飞达)		10	料盒一个	
2	U 盘一个(内有配套软件,教程)		11	黄油一只	
3	加密狗一个		12	双面胶一张	
4	大号测试 PCB 板一块		13	内贸备件包（见附件 1）	
5	USB 转接头一个		14	8mm 气管 2 米 1 根	
6	视频采集卡一个		15	工具 1.5、2、2.5 内六角各 1 把	
7	电源插头线一根		16	吸嘴 2 个（型号自选）	
8	抛料盒		17	铝合金三脚架	
9	相机布一块		18	防尘罩	

Shop accessories:

1	吸嘴库		2	气泵		3	高精密丝印台	
4	震动飞达							

1.5.5. Attached accessories



1.5.6. Selection of suction nozzle

型号	CN040	CN065	CN140
外径	Φ 0.75	Φ 1.20	Φ 2.20
内径	Φ 0.38	Φ 0.65	Φ 1.4
外形			

型号	CN220	CN400	CN750
外径	Φ 3.6	Φ 6.2	Φ 9.0
内径	Φ 2.2	Φ 4.0	Φ 7.5
外形			

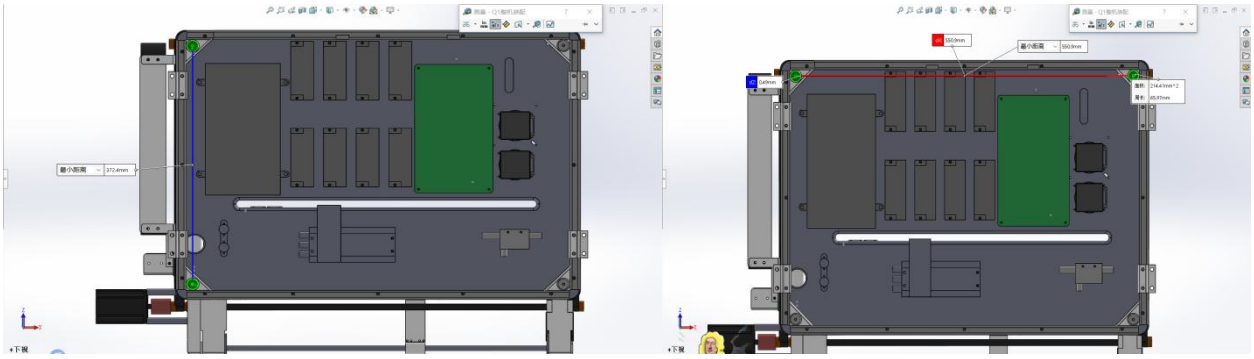
Note: the suction nozzle shall be selected according to the outer diameter of the suction nozzle. The diameter of the chip is a little larger than the outer diameter of the suction nozzle.

Cn040 is mainly used for 0402 and cn065, the most widely used, 0603, 0805, 1206, secondary pipe All three-stage tubes can be used.

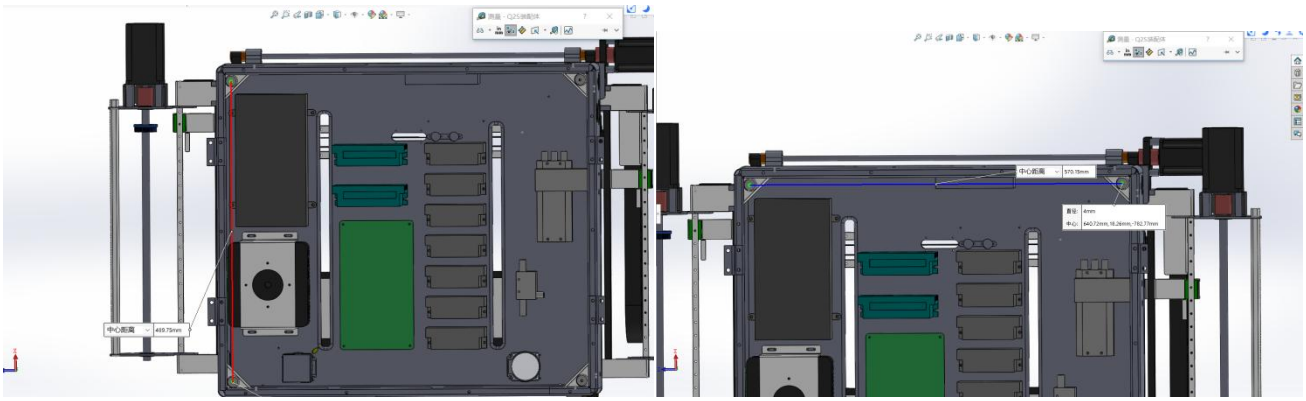
1.6.Placement of Mounter

1.6.1. Size

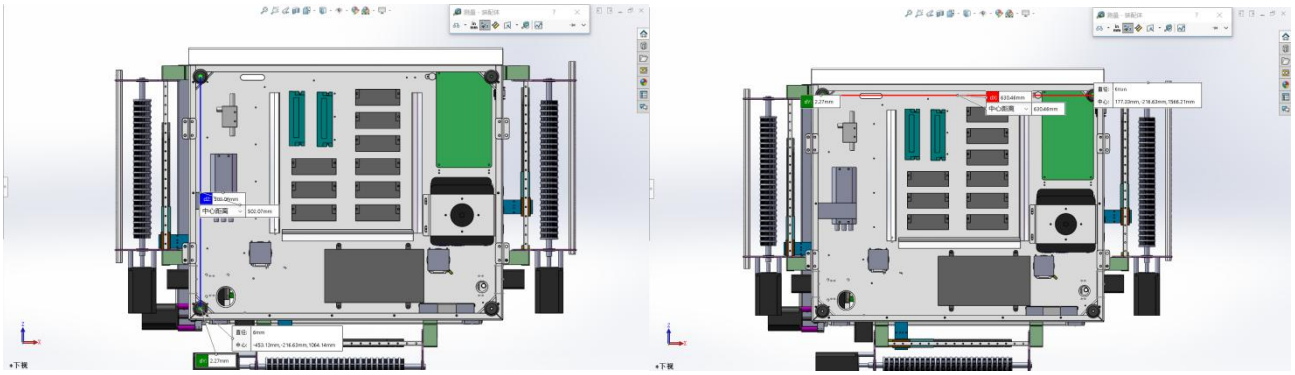
- Q1 Maximum outline length 630 and width 670mm
- Q1 Rubber pad center distance length 372.4mm width 550.9mm
- Q1Package fixing foot hole distance 24mm length 284mm width 611.35mm



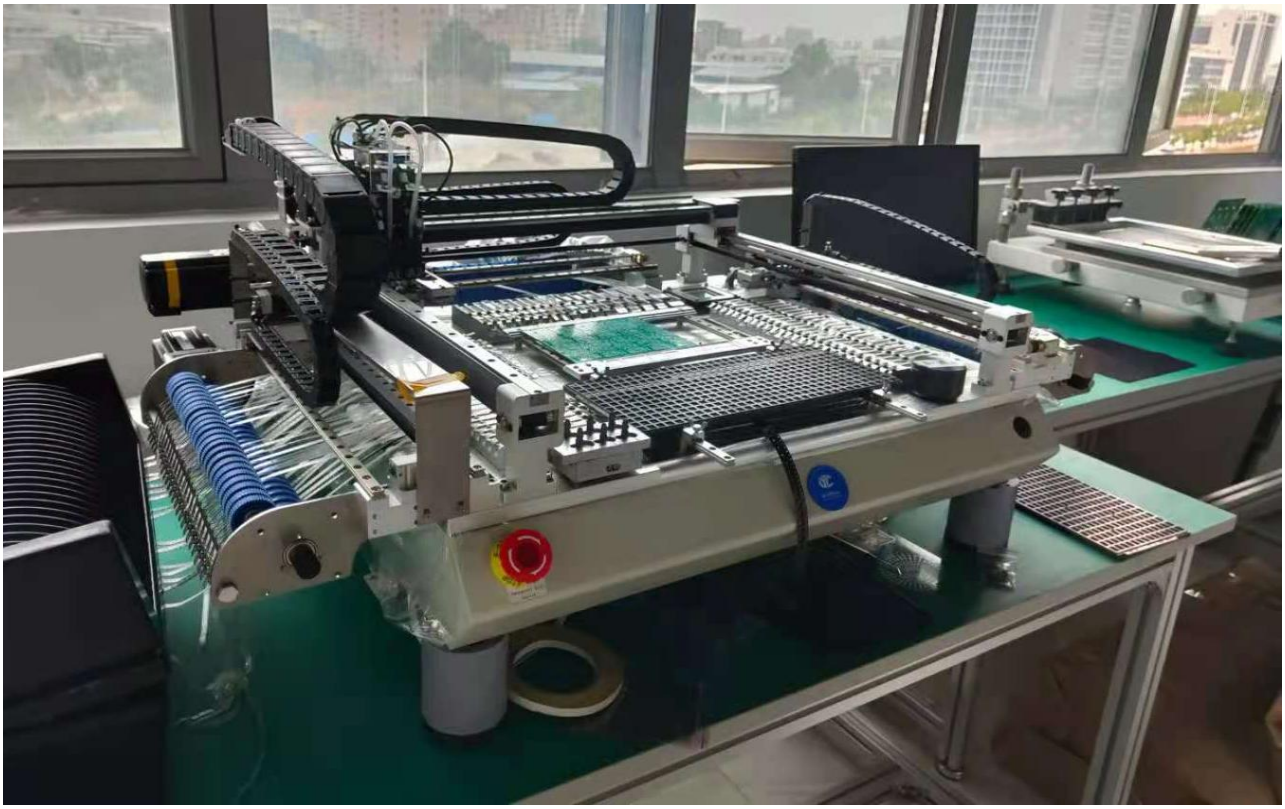
- Q2S Maximum outline length 600 width 970mm
- Q2S Rubber pad center distance length 489.75mm width 570.15mm
- Package fixing foot hole spacing 30mm length 290mm width 637.06mm



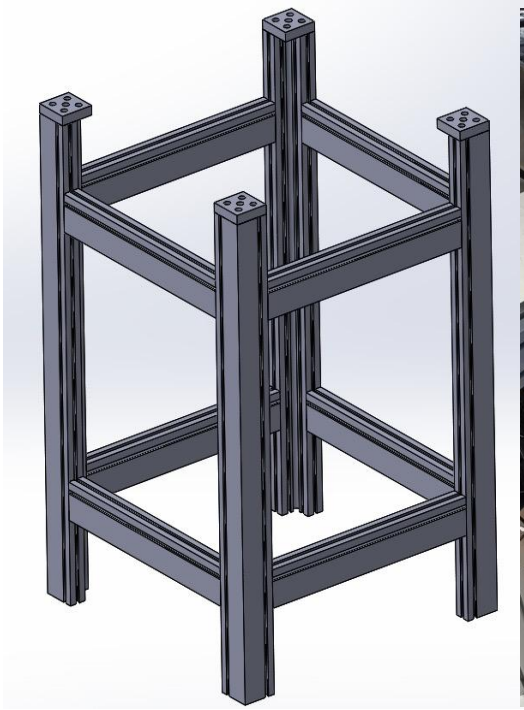
- D600Plus Maximum outline length 730 width 1000mm
- D600Plus Rubber pad center distance length 502.07mm width 630.46mm
- Package fixing foot hole spacing 30mm length 300mm width 690.06mm



1.6.2. Construction and placement scheme of desktop aluminum profile

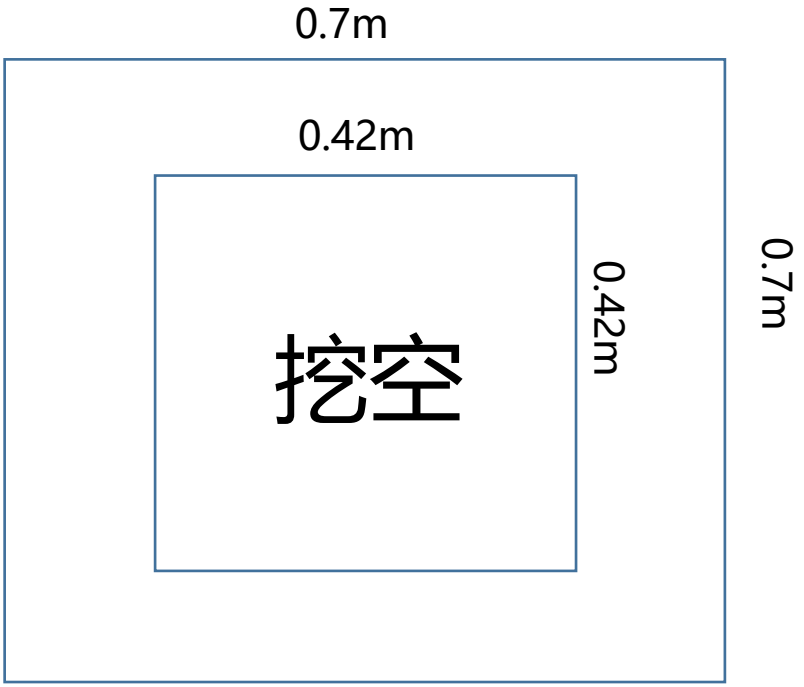


1.6.3. Construction and placement scheme of floor aluminum profile



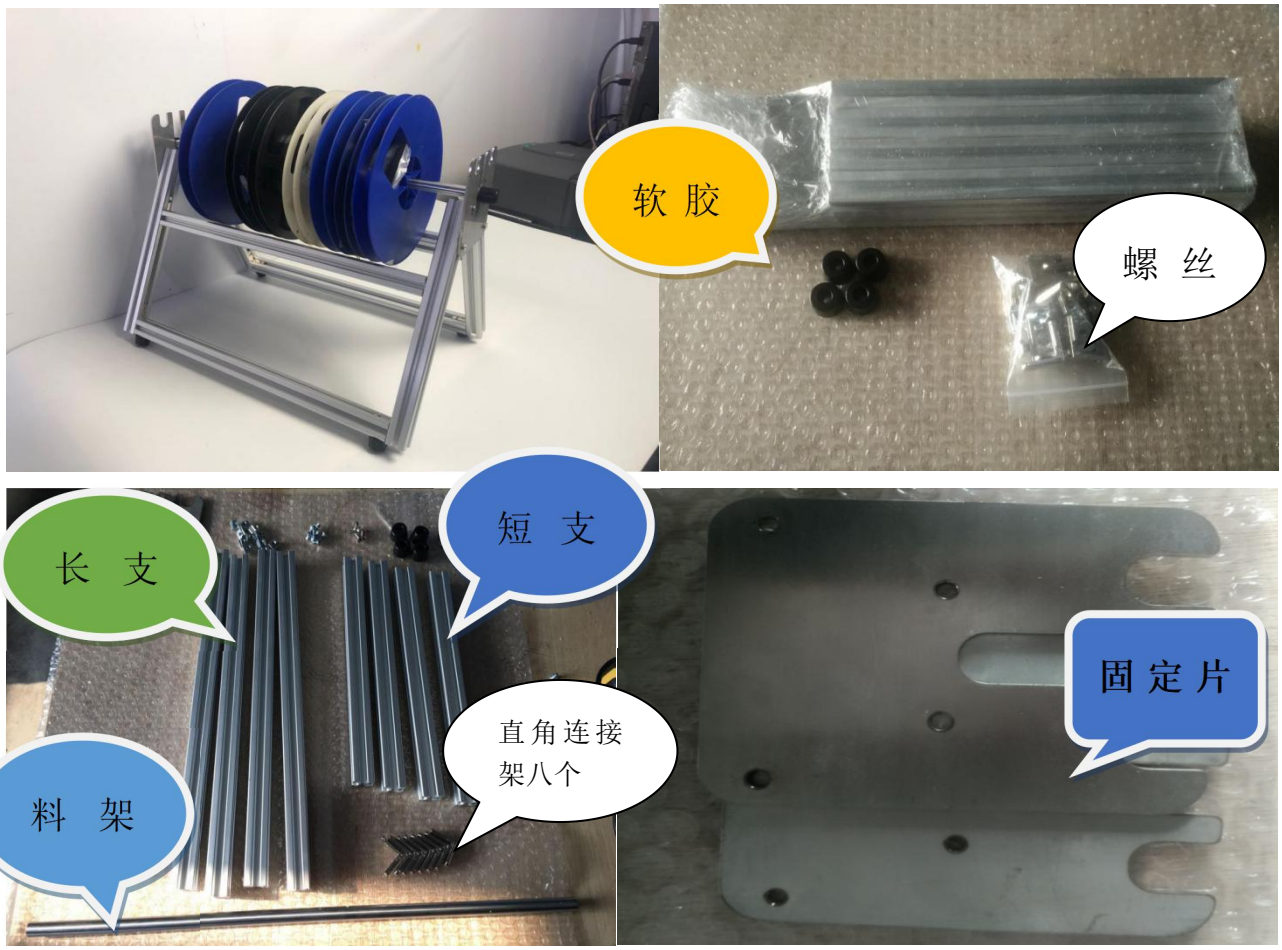
1.6.4. Table top hole digging placement scheme

Recommended table size. Dimensions are for reference only. Top view of desktop: empty space and waste belt down position



1.6.5. Wooden table top placement scheme

1.7.Aluminum alloy rack assembly



- **Assembly procedure:**

- 1.Put in the right angle connecting frame: put two "right angle connecting frames" into each short support rod. Note: due to the different styles at both ends of the "right angle connecting frame", the short support bar must be placed in the same way as the right figure, and it can slide completely in the short support bar。

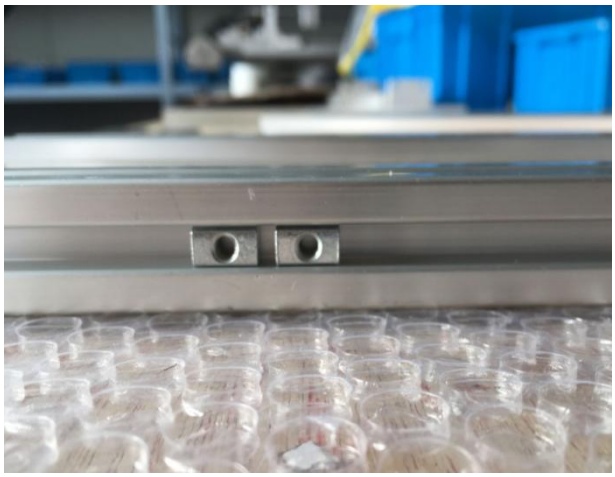
➢ 2.Placement of slider:

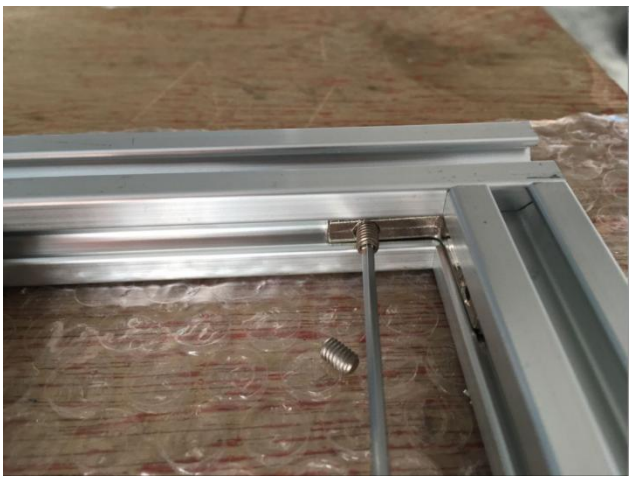
First put the slider into the bottom long bracket slot, as shown in the figure:

➢ 3. Connect "long support bar"

Connect the "right angle connection support" on the "short support bar" to the long support bar, as shown in the figure:

➢ 4.Fixed right angle connecting frame:

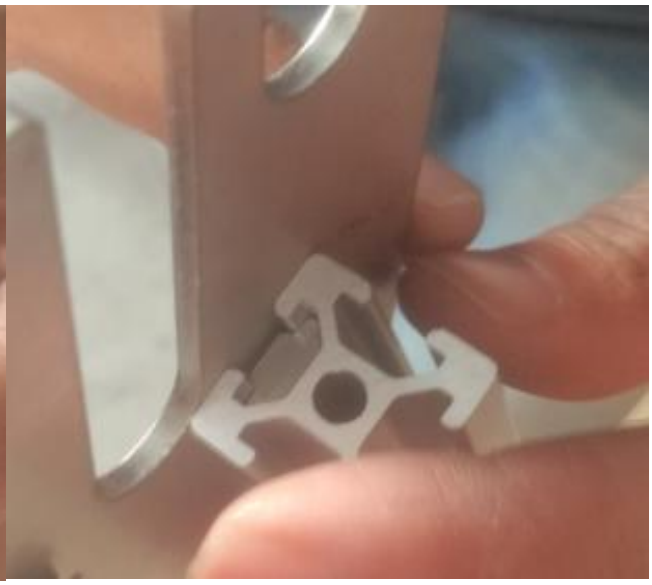




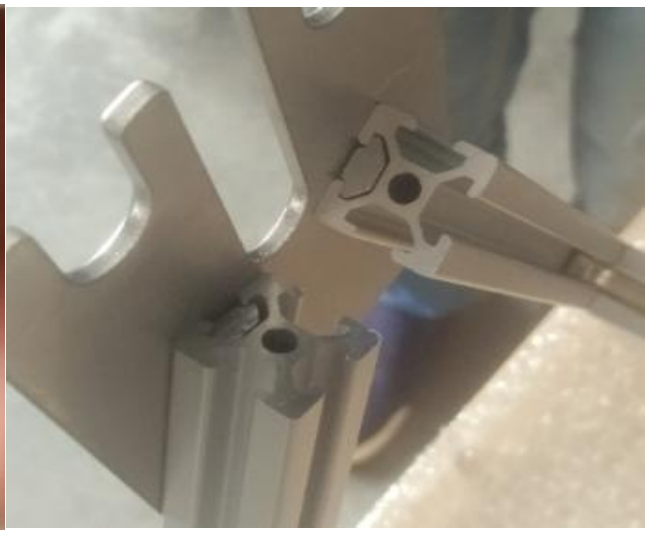
- 5. Completion drawing: assemble the bracket on the other side with the same operation

- 6. Assembly of fixing plate:

- It can also be assembled without fixing. Put the slider fixed on the fixed piece into the slot at one end of the assembled support。

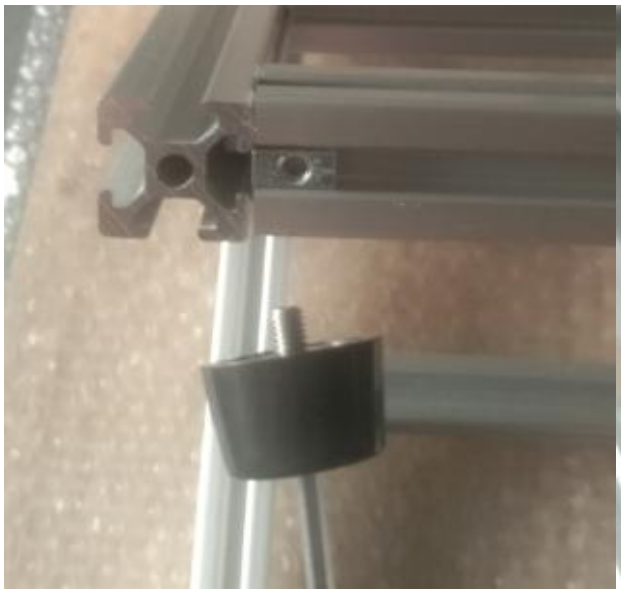
- The sliding plate on the other side of the fixed plate operates in the same way and is put into an assembled bracket:

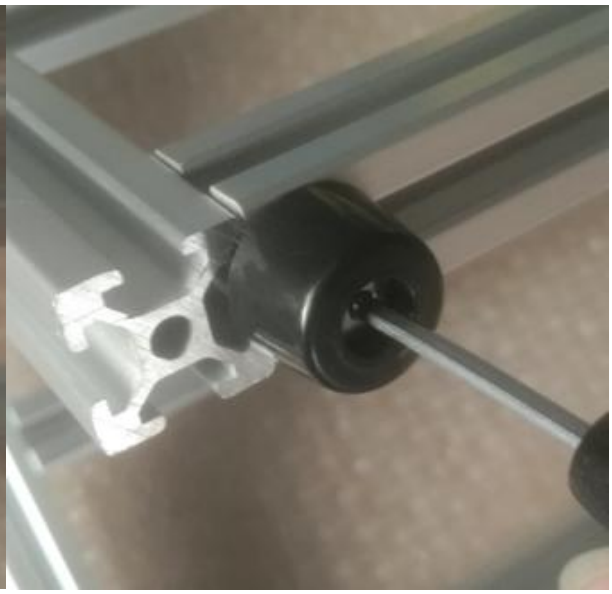



- The operation of the fixing plate on the other side is as follows:

➢ 7.Assembly of base:

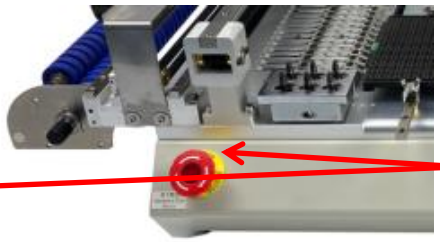
Move the slider that was initially placed in the bar slot of the bottom long support to both sides, and tighten the screws.





1.8.Power connection of the mounter

be careful! Please keep the power supply well grounded, otherwise electrostatic shock may occur.



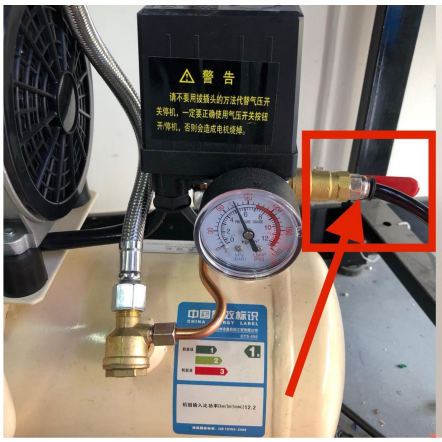
Rear main power switch of the mounter,The emergency stop power switch at the front of the mounter is turned on and the emergency stop button is on.

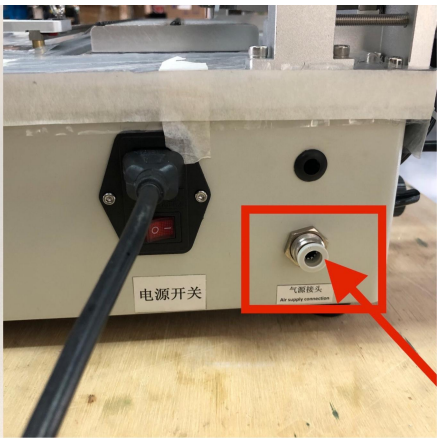
1.9. USB connection

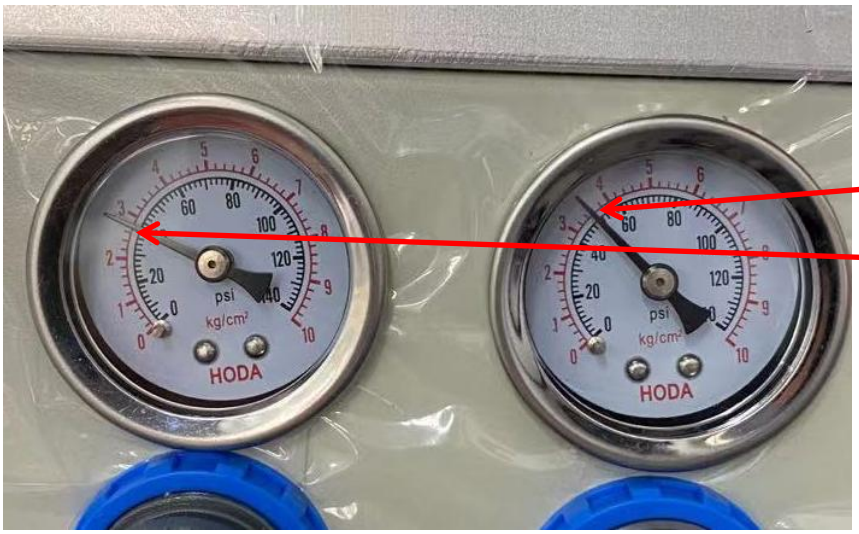
- Plug the USB dongle into the computer.
- Plug the USB acquisition card into the computer. The gray video cable is plugged into the yellow port of the acquisition card.
- Plug the computer into the USB communication converter.

Be careful! The above USB is a drive free device. If your system does not recognize it, you can use the drive wizard to download it automatically.

1.10. Air supply connection



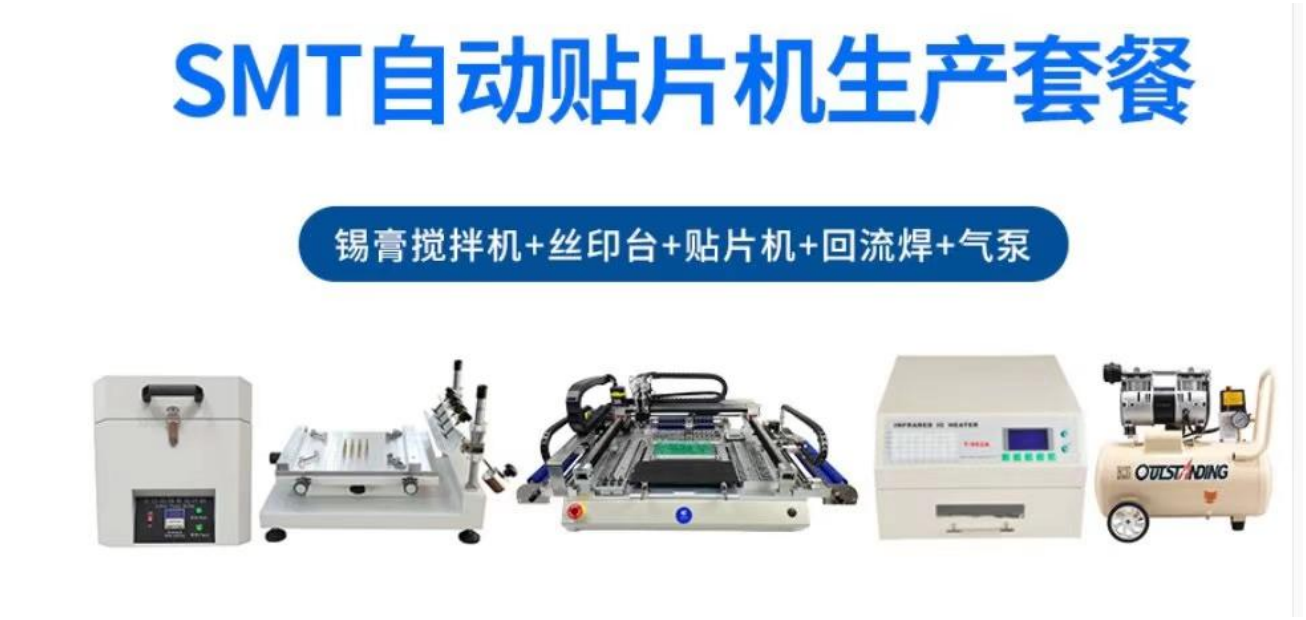




Connect the air source first, turn on the air pump switch, turn on the air pump valve when the air pump is full, and observe that the patch Feida barometer is at 2.8kpa and the vacuum barometer is 3.5kpa

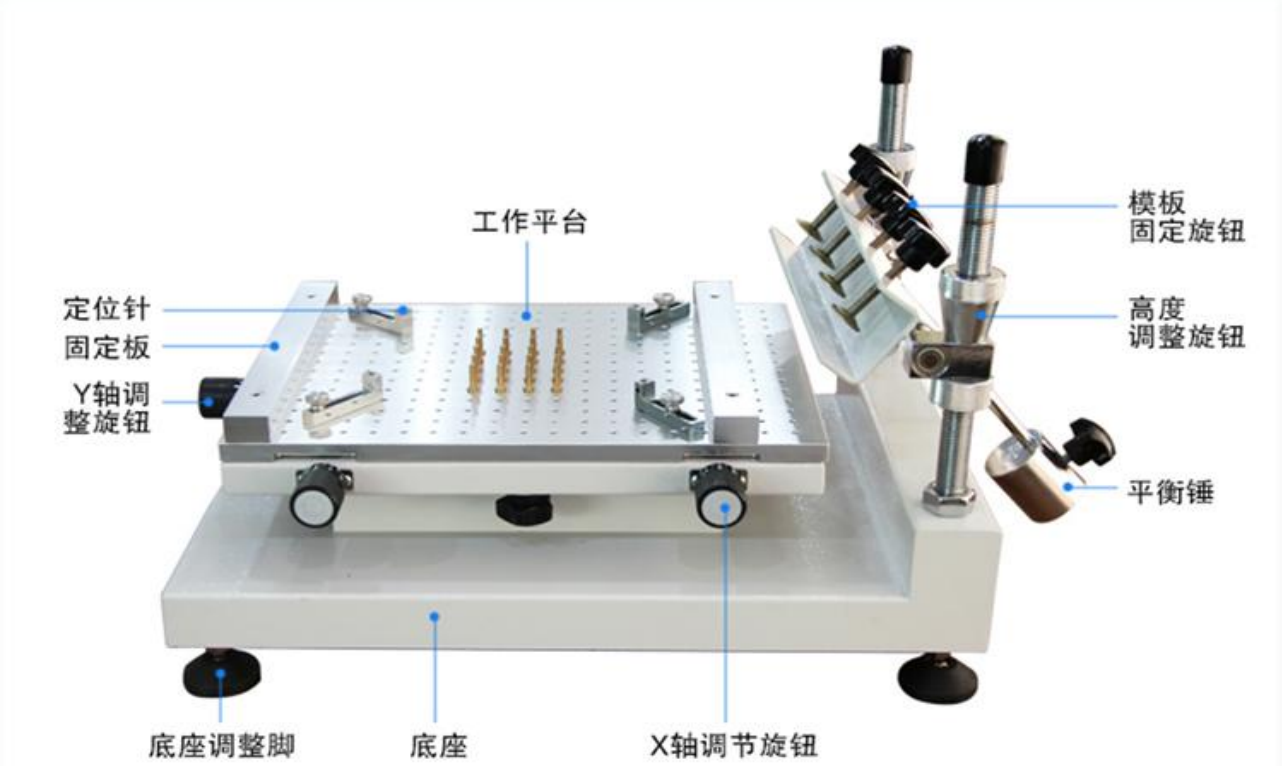
1.11. Installation of material belt

2. Supporting equipment



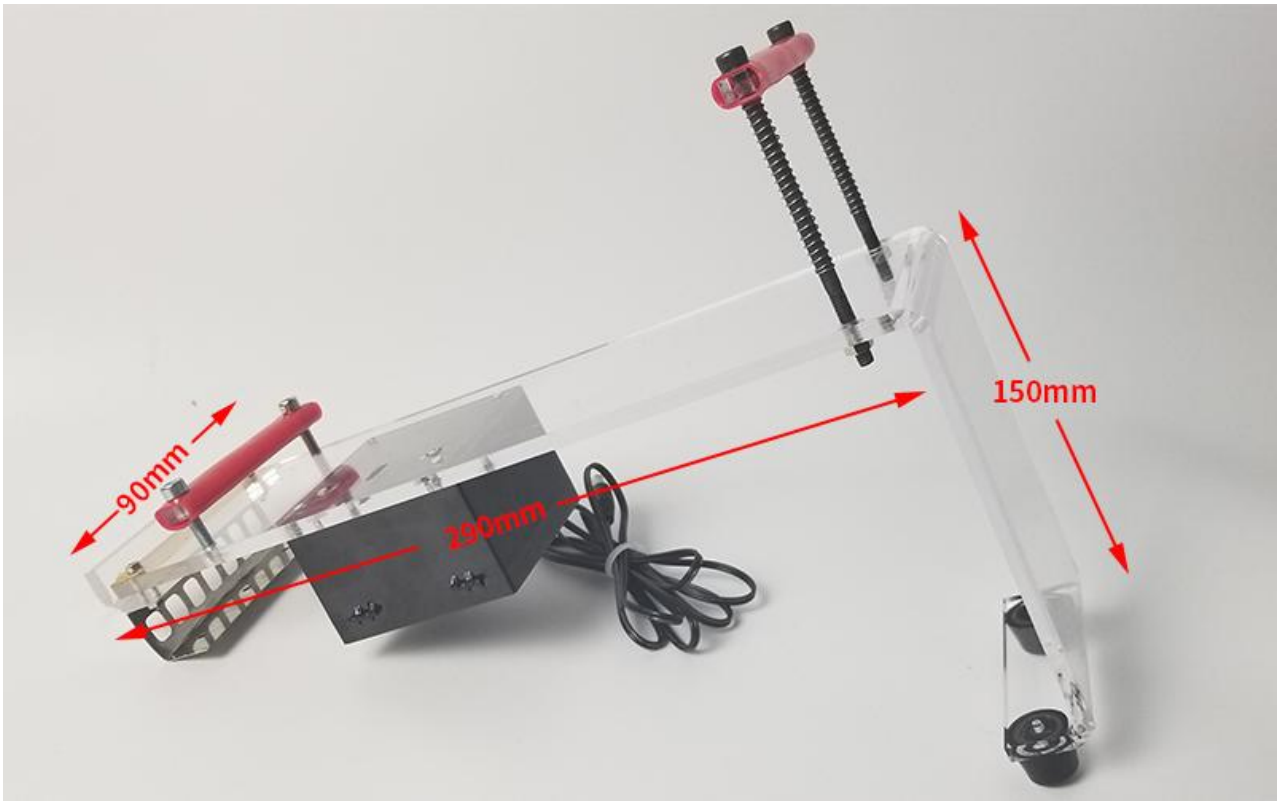
2.1. Screen printing table

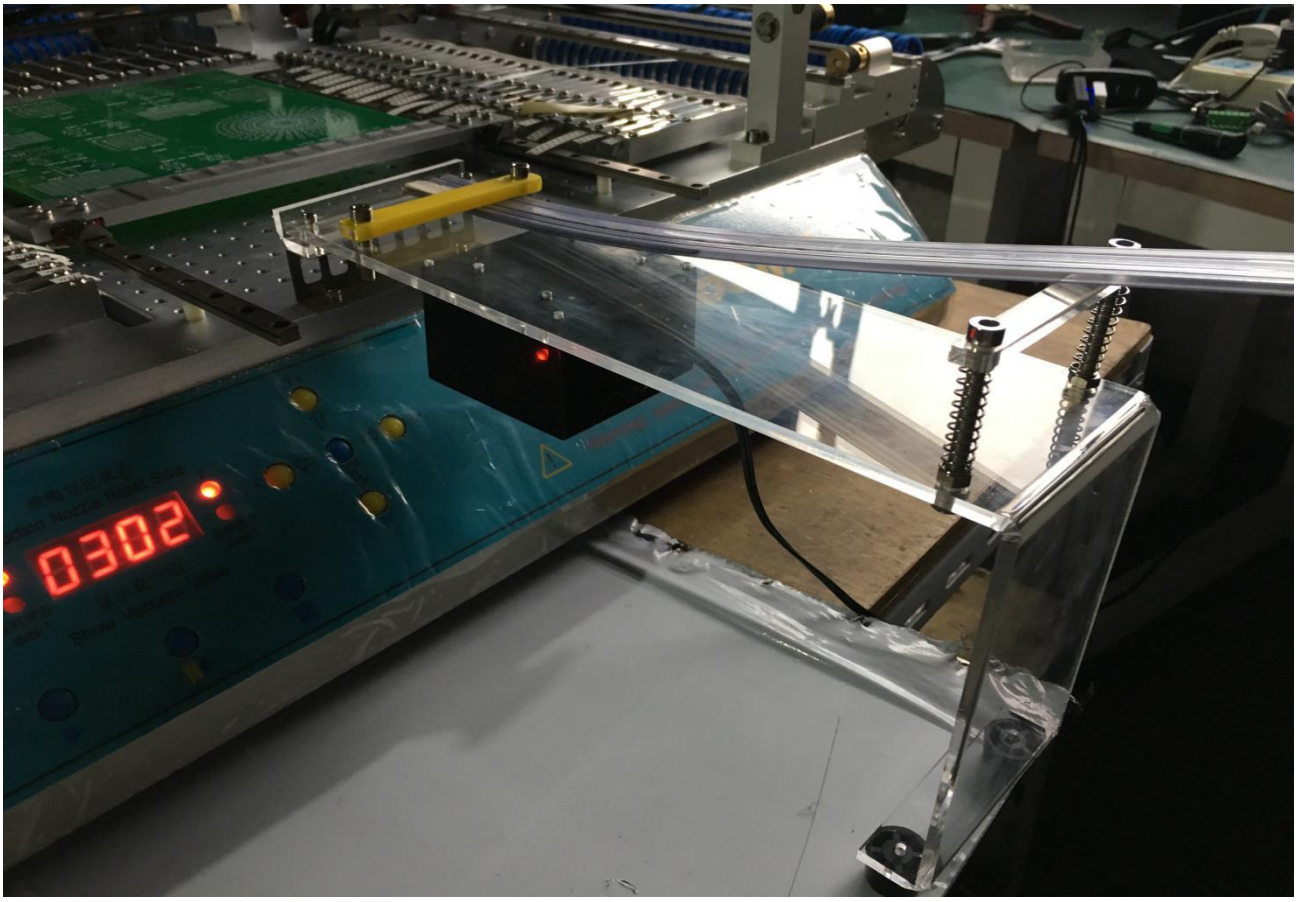
产品参数



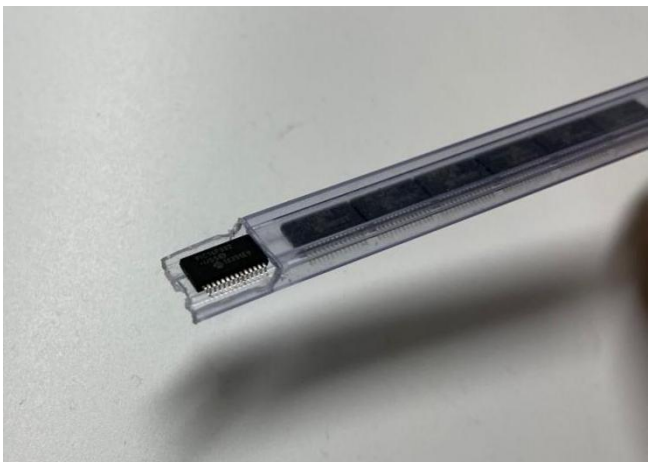
型　号	YC3040H	重　量	20KG
最大印刷尺寸	250mm*400	定位方式	外形或基准孔
印刷速度	人工控制	工作台尺寸	300*400(mm)
工作纵横调节度	10（mm）	最大网框尺寸	370*470(mm)
重 复 精 度	±0.01(mm)	印载物厚度	0-80(mm)
外形尺寸	540*380*390(mm)	印刷平台高度	190（mm）

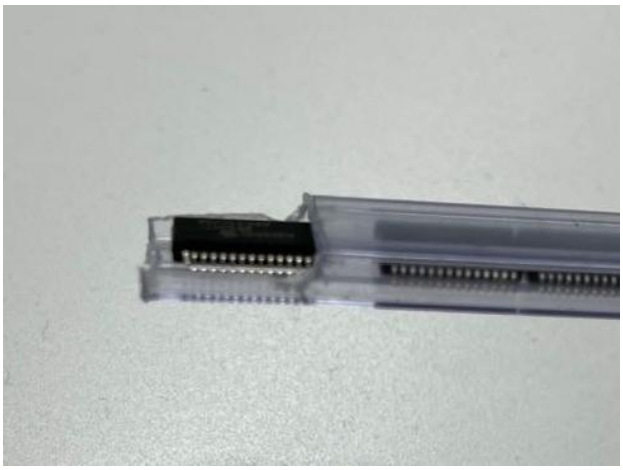
2.2. Stick feeder



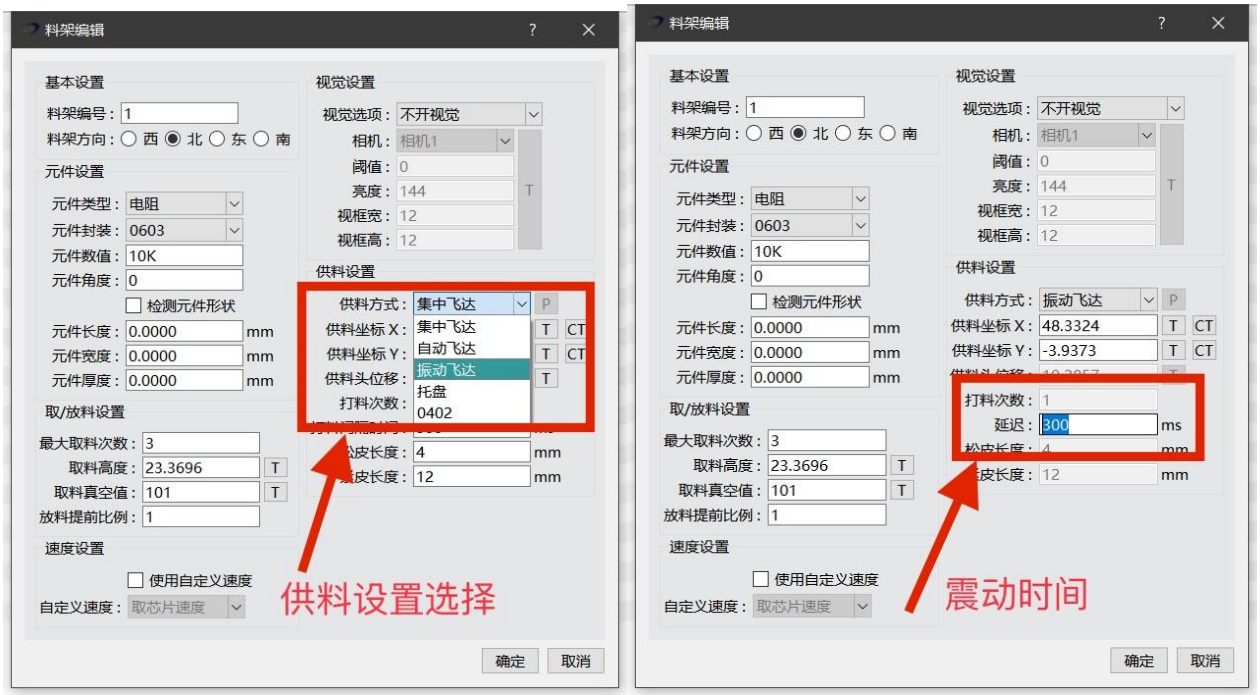


➢ Be careful! Cut the tubular shell as follows:

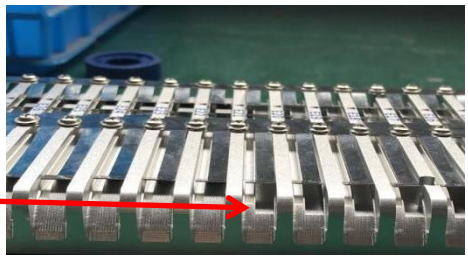




➢ After the vibration Feida is installed, open the material rack for editing, and select the material supply setting: vibration Feida, and set the vibration time.



2.2.1. Precautions for guide chute



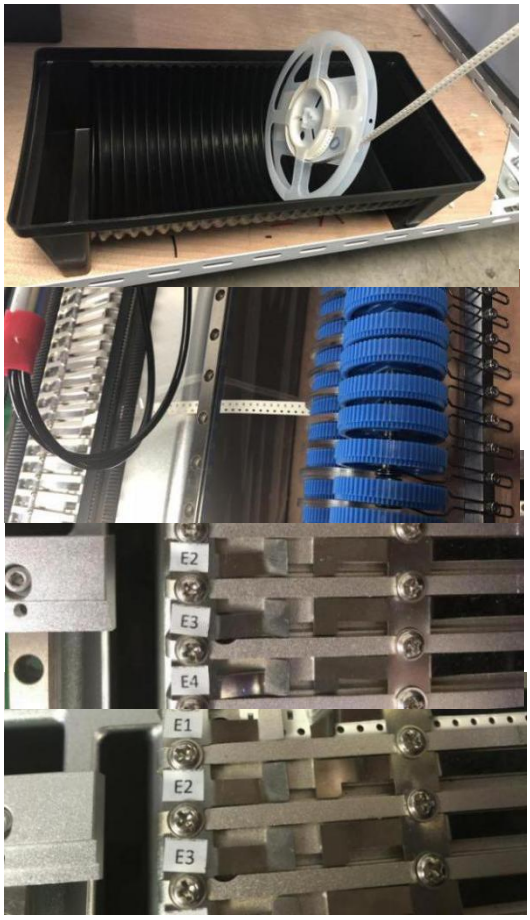
➢ The paper material belt can be strung on the material level of the corresponding width at will.

➢ Concave convex material strips, such as diode triodes, must be strung in concave grooves.

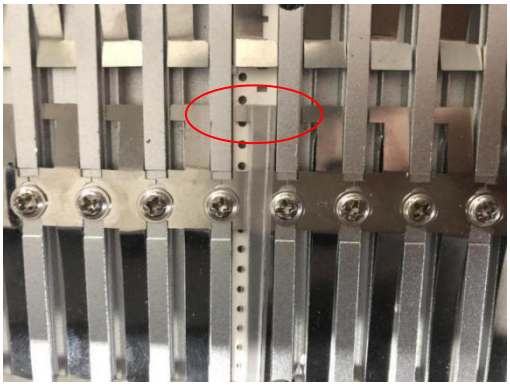
➢ The number of bits of the concave material trough shall be subject to the actual configuration of the model.

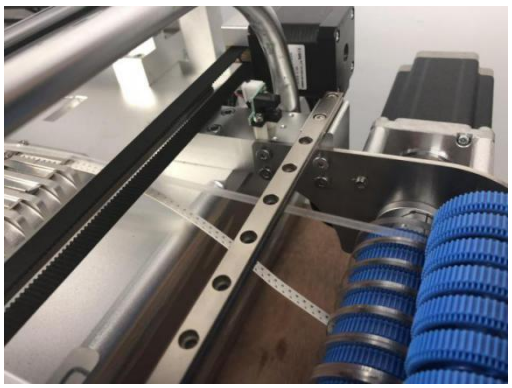
2.2.2. Material preparation: material tray box, material tray, tool preparation: tweezers, scissors

Installation steps:



- First place the tray in the tray box
- Take out one end of the material belt and pass it through the bottom of the machine puller.
- Thread into the corresponding chute, push the belt forward, and stop when it is about to reach the top.
- Tear off the tape film and pull it out from this position with tweezers.
- Hold the tape film and push the tape forward to the top. Push until the film is long enough Fold back from the top of the pressing spring (pay attention to the shape of the material film folded back to keep a certain inclination with the material belt, as shown in the figure) press and hold the pressing clip to loosen the pressing wheel, the material film passes through the pressing wheel, then release the pressing clip, let the material film press on the pressing wheel and the receiving wheel, and then tighten the material film.





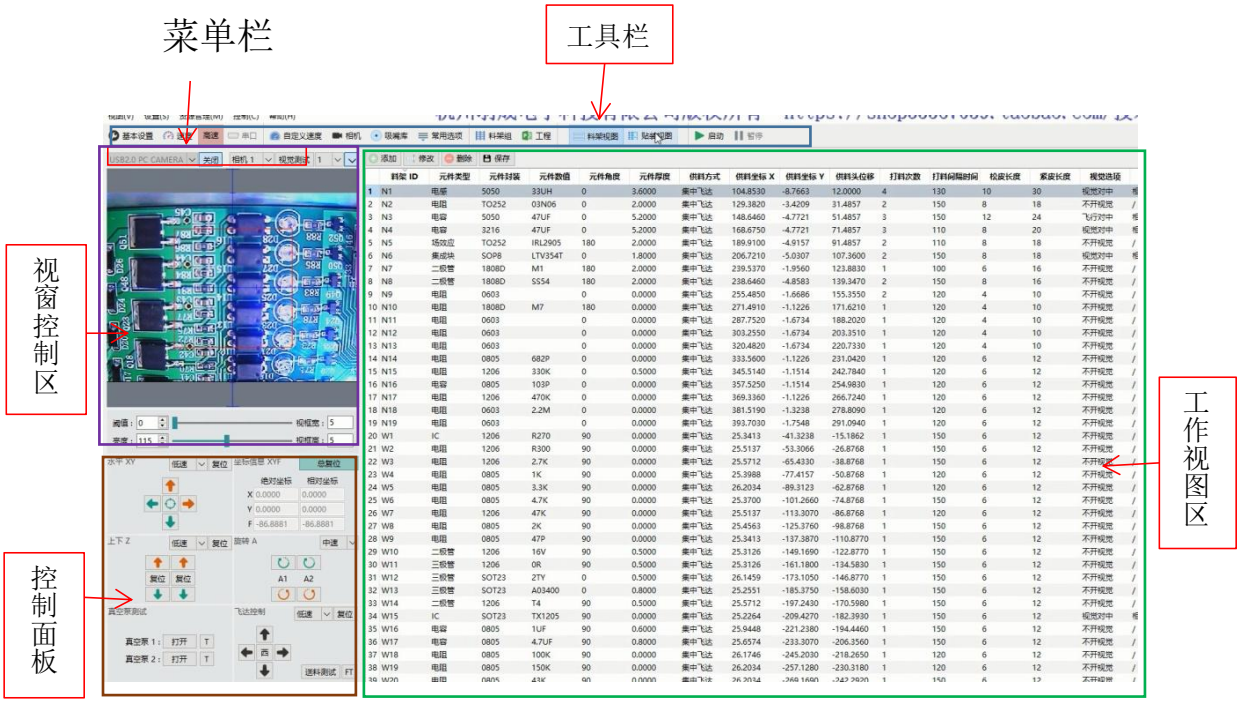
- For details, please refer to online disk > Mounter > video tutorial > quick start tutorial > 006 loading tape video. Click the link to see the details.

https://yunpan.360.cn/surl_yBrMdjFibID

3. Software introduction

3.1. Operation interface navigation

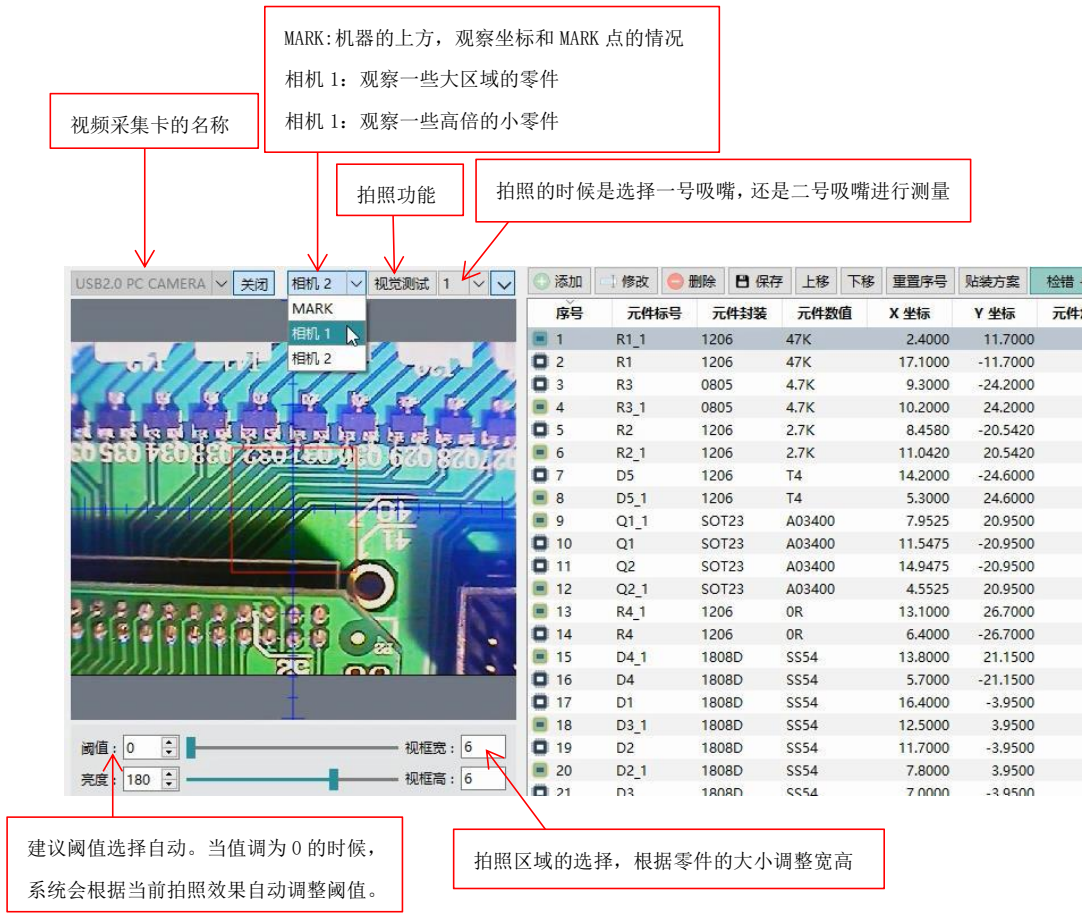
The software interface consists of menu bar, toolbar, control panel area, visual window control area and work view area



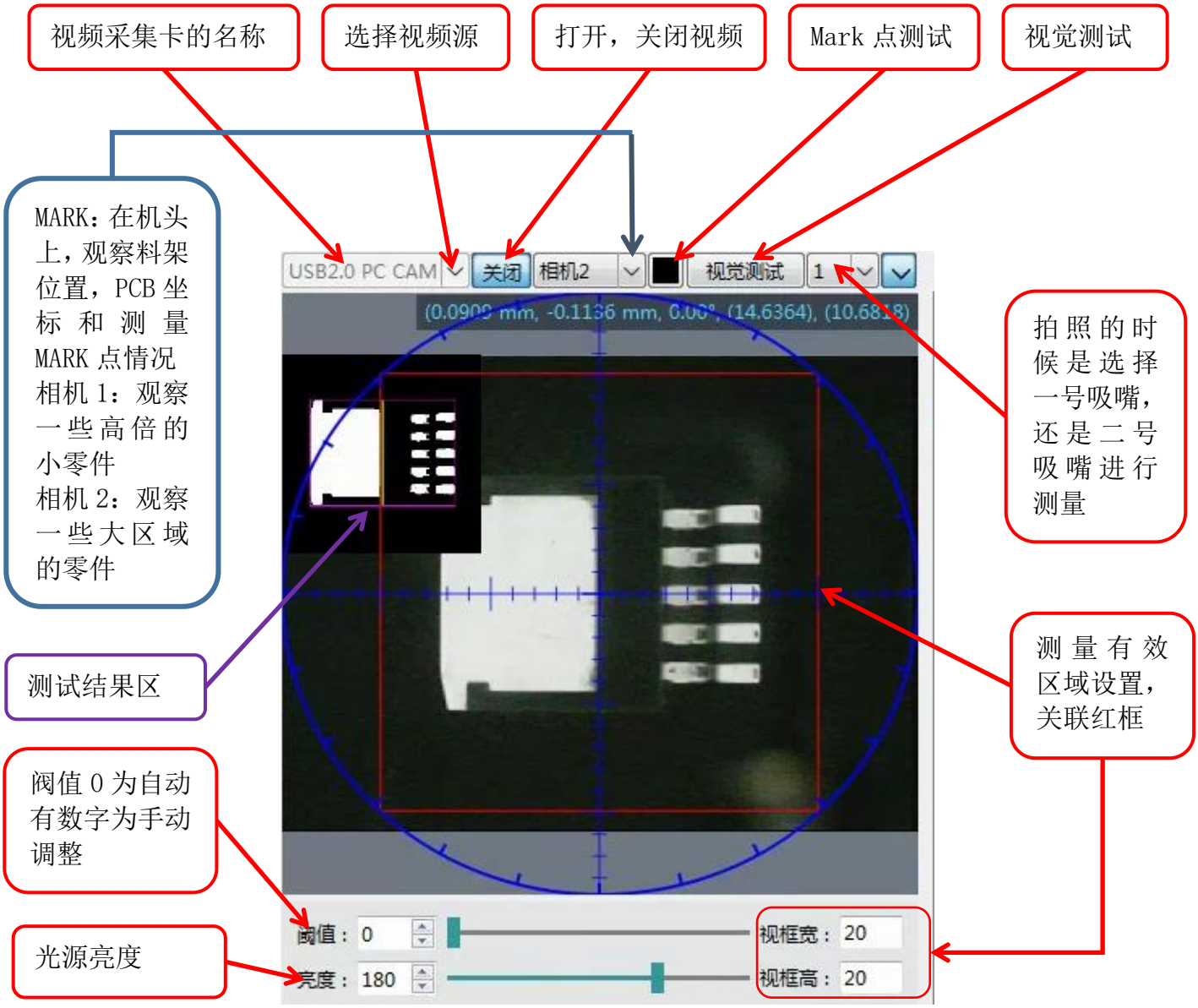
3.1.1. Menu bar

3.1.2. Toolbar

3.1.3. Visual frame



3.1.4. Detailed explanation of visual frame function

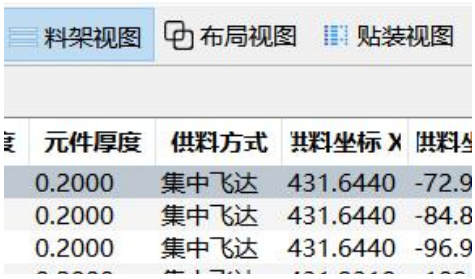


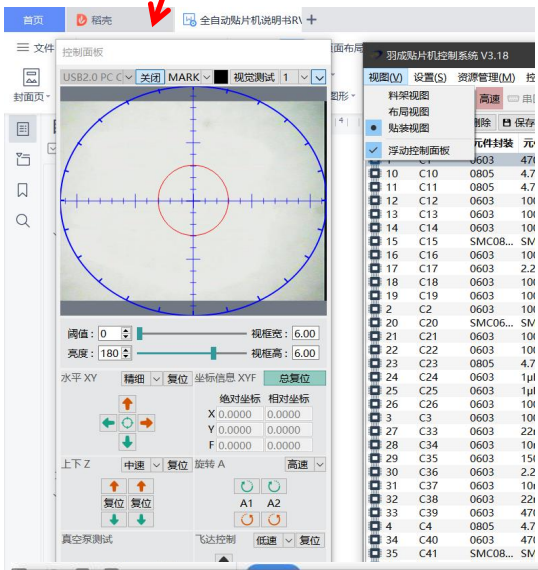
3.1.5. Machine control area

3.2. Menu bar / toolbar buttons

3.2.1. View menu

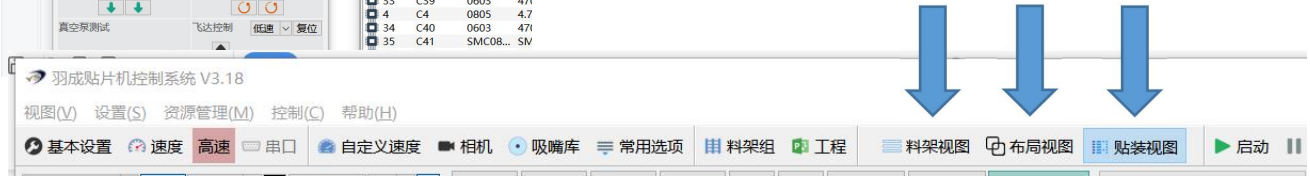
➢ Click different menus to switch the corresponding work view



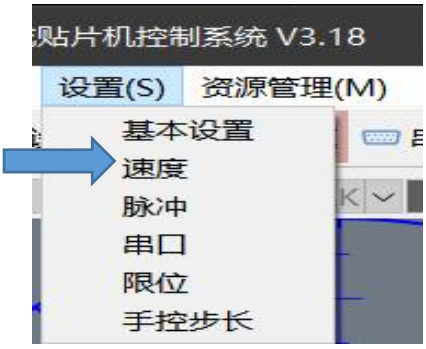


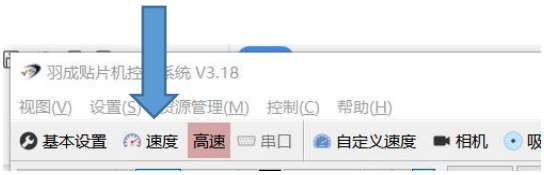
➢ The floating control panel can work independently, which is very convenient when setting up the machine。

➢ You can also open the corresponding work view in the toolbar shortcut button.



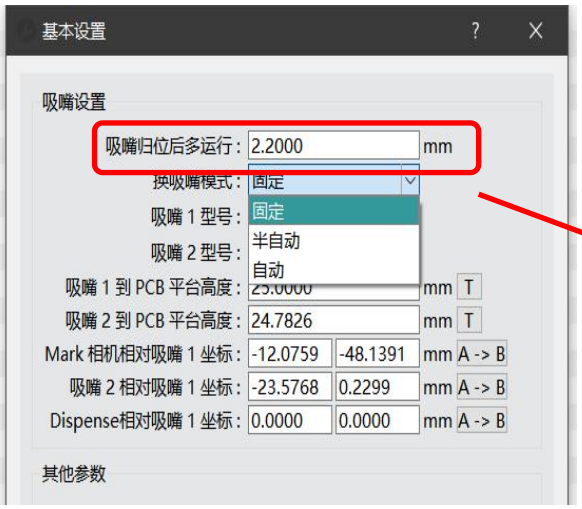
3.2.2. Setup menu

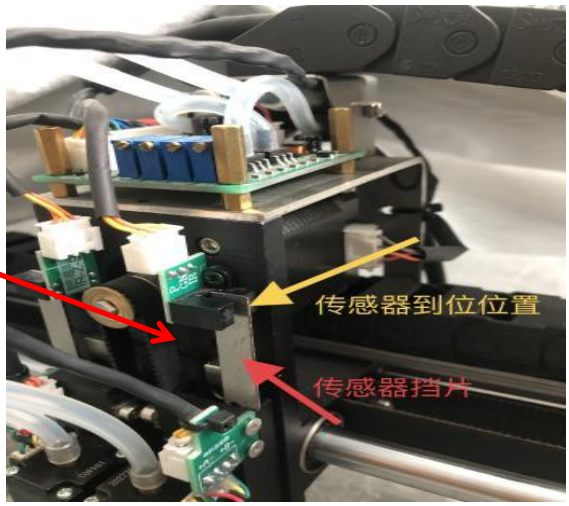




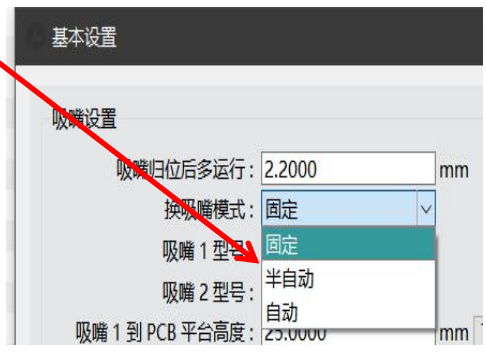
3.2.2.1. Basic settings > multiple operation after nozzle homing

- The additional running distance between the sensor blank and the middle position of the sensor is used to keep the two suction nozzles horizontal after being installed and reset





3.2.2.2. Basic settings> Change suction nozzle mode



- There are three modes for changing suction nozzle: fixed mode, semi-automatic mode and automatic mode.
- **Fixed mode:** the model with two suction nozzles fixed on the mounting head.
- <u>Note that if only two suction nozzles are used, it is recommended to use the fixed mode, which is more efficient.</u>
- **Semi automatic:** when the machine is not equipped with a nozzle library, but needs to use the "nozzle change mode", you need to manually change the nozzle.
- **Automatic:** the machine is equipped with a suction nozzle library, and the suction

nozzle is automatically changed during the mounting process (sliding cover type is selected).

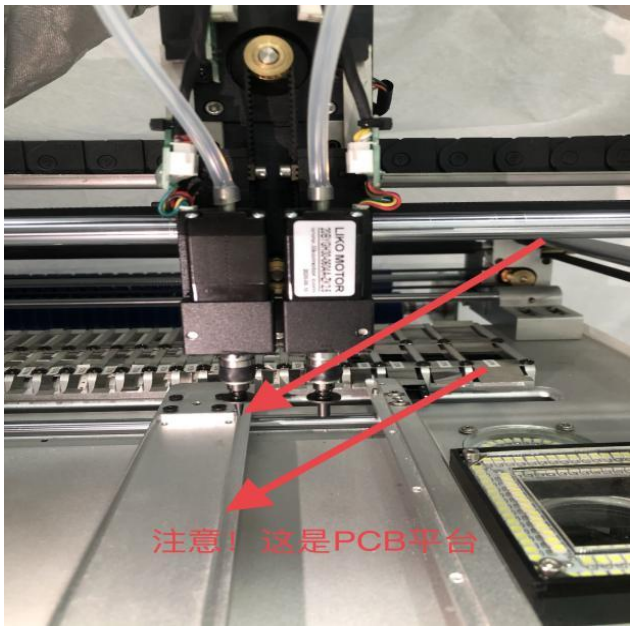
- **Prompt:** under the same nozzle model, click the (error detection + matching) button in the mounting view, and the form will be sorted automatically in 1.2.1.2

- **Tip:** under the same nozzle model, the forms in the mounting view will not be sorted automatically.

3.2.2.3. Basic settings > height from nozzle 1 to PCB platform (important data)

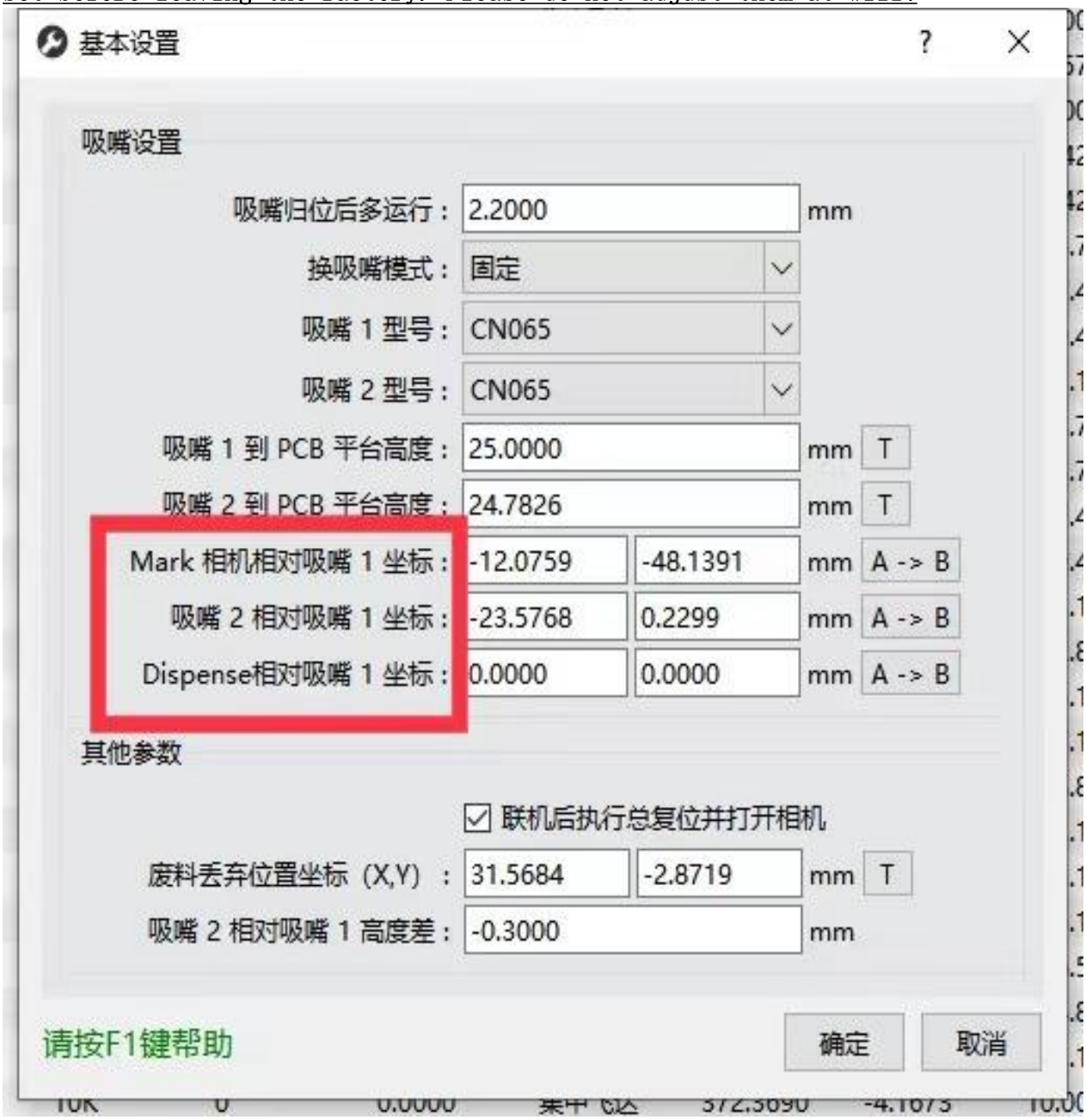
Note: the total mounting height of the suction nozzle is the height from the suction nozzle to the metal platform, not the PCB surface height. Set by the manufacturer,Please do not change it at will!

To change the mounting height, apply the formula:Height from suction nozzle to PCB platform -pcb thickness - component thickness = mounting height



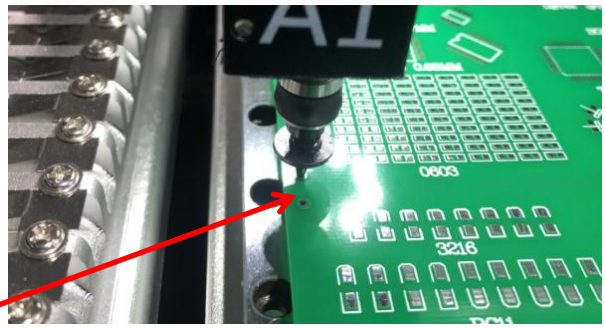
3.2.2.4. Basic settings > mark camera, coordinates of nozzle 2 relative to nozzle 1 (important data)

Note: all coordinates of the system are subject to suction nozzle 1, and the following three items are the relative relations of suction nozzle 1. The parameters have been set before leaving the factory. Please do not adjust them at will!



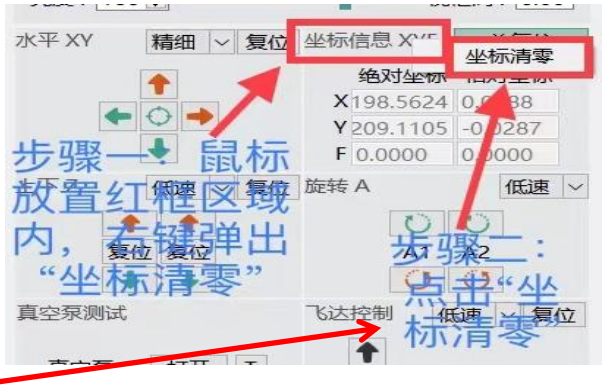
- ❖ If deviation is caused during operation, it can be readjusted.
- ❖ The coordinate method of mark camera relative to nozzle 1 is as follows。

- 1. After the total reset, manually set the suction nozzle 1 to the approximate position above a certain point on the PCB, and then lower the suction nozzle to this point. Adjust the horizontal XY speed gear to fine, and move the coordinates to align the suction nozzle with the points on the PCB.



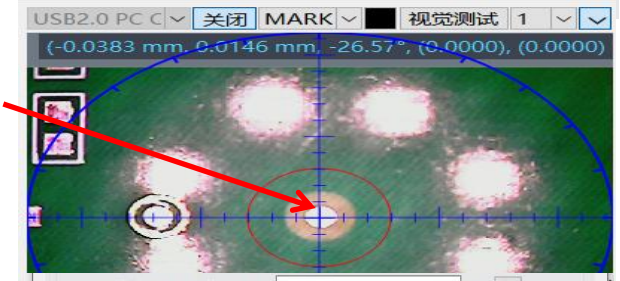
- Note: when the suction nozzle is in the descending state, only the fine gear is allowed to move.

- 2. Move the mouse to the control panel coordinate information and right-click to clear its coordinates.



- 3. Lower suction nozzle 1 reset.

- 4. Then move the mark camera to this point for alignment。



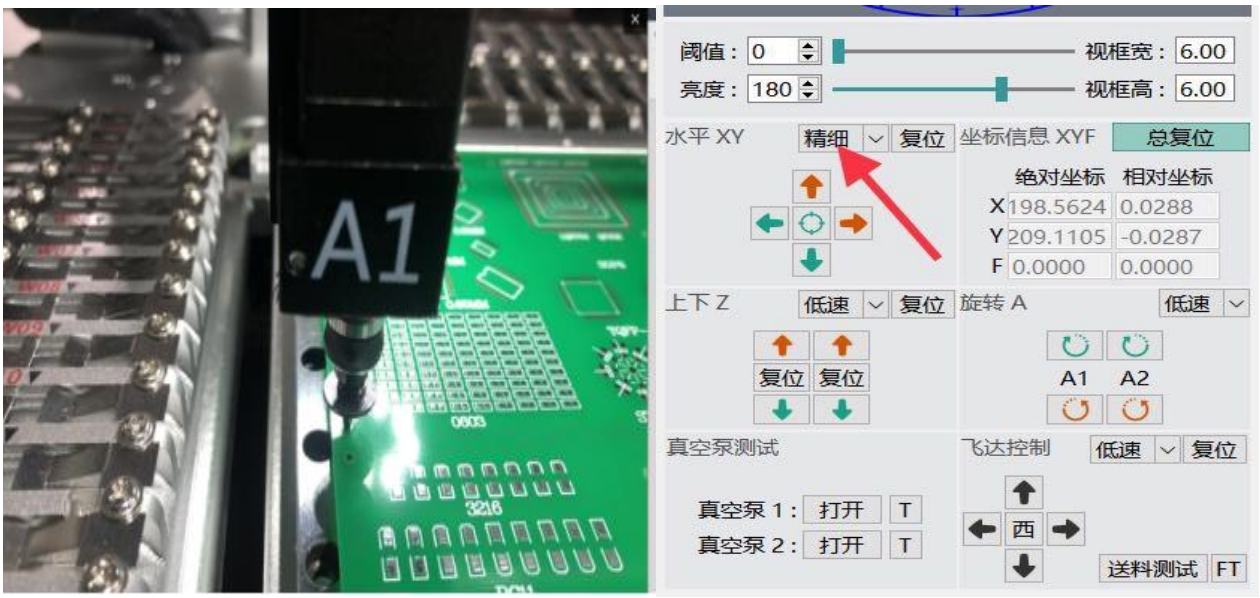
- 5. Click "A- > B" again in the basic setting to extract the coordinates.

3.2.2.5. Basic settings > relative coordinates from nozzle 2 to nozzle 1 (important data)

(1) After the total reset, manually set the suction nozzle 1 above a certain point on the PCB, and then lower the suction nozzle to this point.

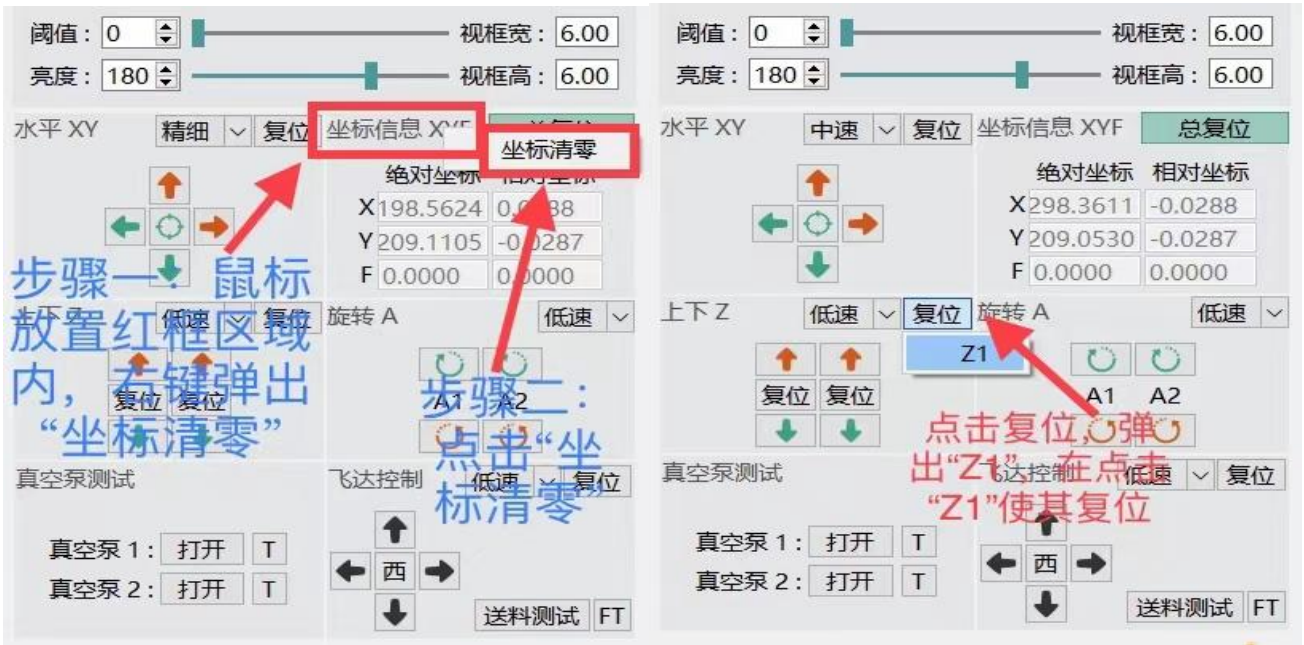
(2) Adjust the horizontal XY speed gear to fine, and move the coordinates to align the suction nozzle with the points on the PCB.

Note: when the suction nozzle is in the descending state, only the fine gear is allowed to move.



(3) Move the mouse to the coordinate information and right-click to clear its coordinates.

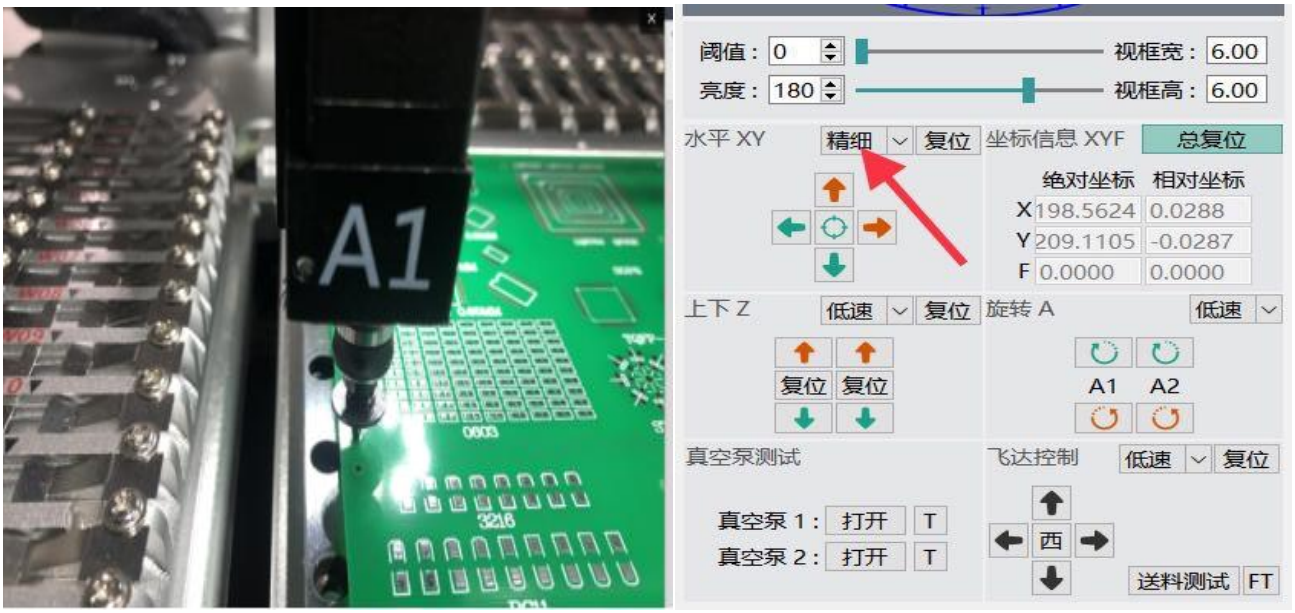
(4) Lowered suction nozzle 1 reset.



(5) Move the XY coordinate so that the suction nozzle 2 is above this point, and then lower the suction nozzle to this point.

(6) Adjust the horizontal XY speed gear to fine, and move the coordinates to align the suction nozzle 2 with the points on the PCB.

Note: when the suction nozzle is in the descending state, only the fine gear is allowed to move.



(7) The suction nozzle 2 to the camera 2 are shown in the figure. Click "A- > B" to extract.

3.2.2.6. Basic settings > relative relationship between dispensing head and nozzle 1

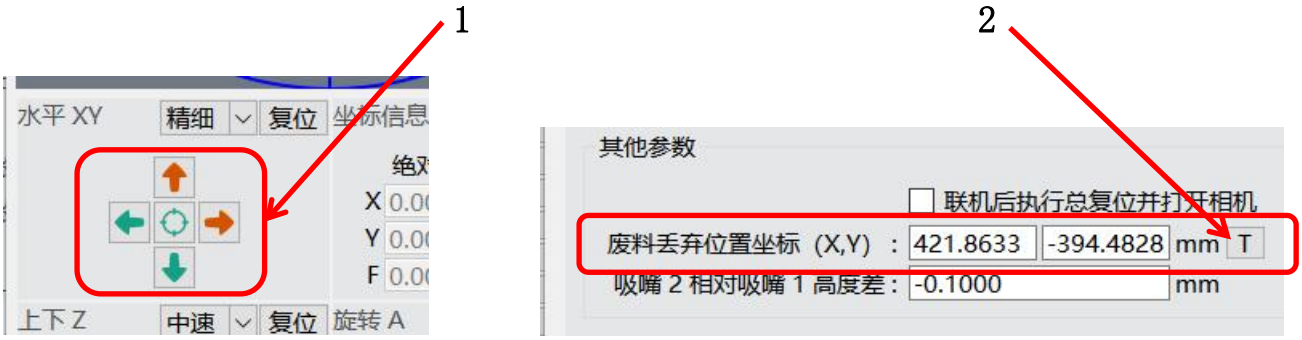
➢ Dispensing function needs to be customized

3.2.2.7. Basic settings > always reset and turn on the camera after connecting

- Enable this function to automatically reset and turn on the camera after successful online.

3.2.2.8. Basic settings > waste disposal position coordinates

- 1. Move the coordinate button to move the suction nozzle to the dumping position, and 2. Click T on the right of the waste dumping position coordinate

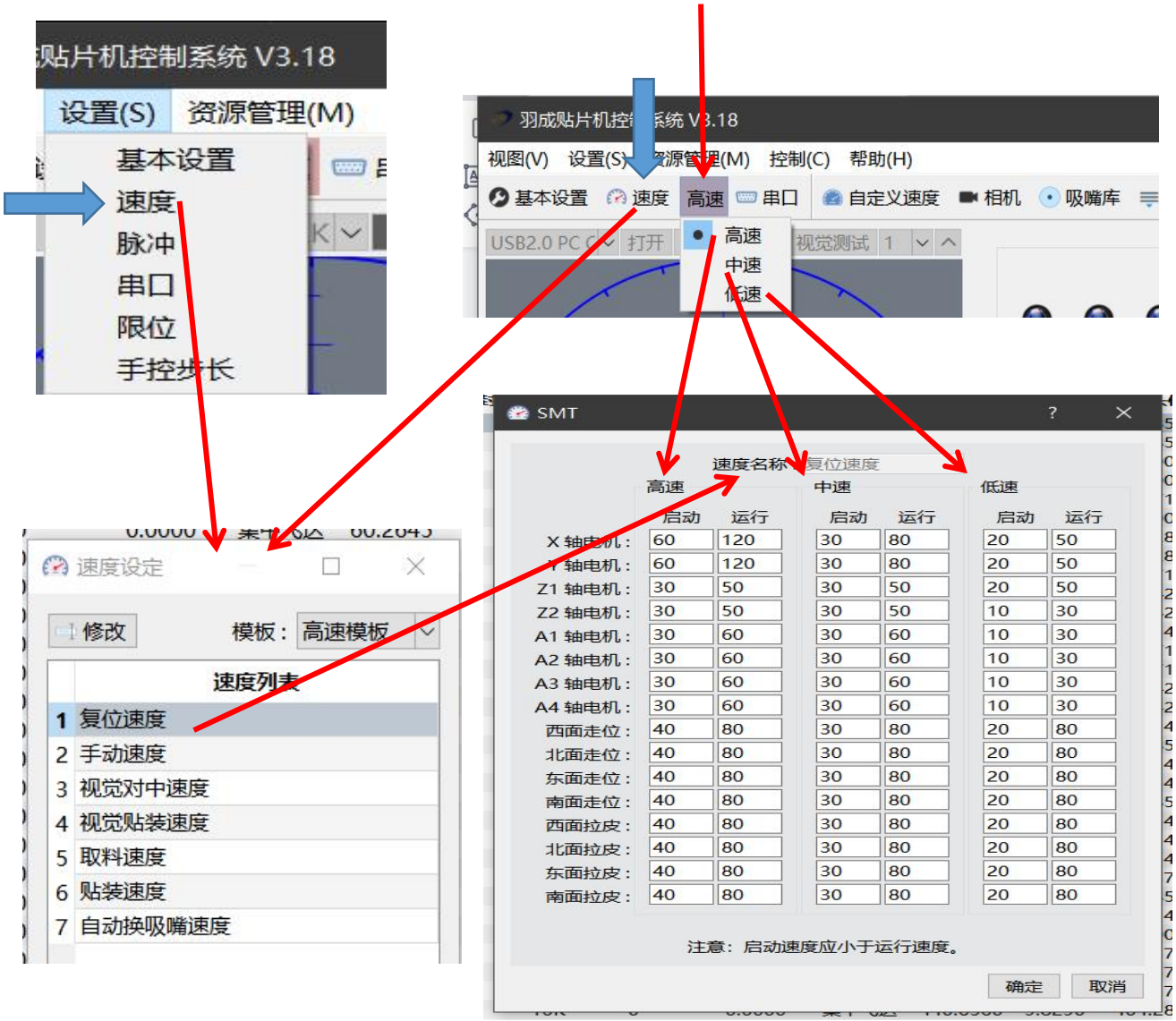


3.2.2.9. Basic settings > height difference between nozzle 2 and nozzle 1

- If the working height of suction nozzle 2 and suction nozzle 1 are not in the same plane, adjust this parameter.

3.2.2.10. Speed

- Click the speed button in the menu bar > speed setting dialog box or directly click on the toolbar.
- Third speed > what gear is set will enable the corresponding speed template.



- The speed is set as high, medium and low speed templates, and each motor has "start, run" operation parameters, "start" is the acceleration value, "run" is the highest speed operation value. Note: when the starting value is adjusted too high, the machine will vibrate. To achieve a very smooth effect, you can reduce the startup value. (the lower the start-up value, the smoother the movement of the machine).

Note: the "mounting speed" plays a very important role in the whole mounting process, and the value can be adjusted according to the machine operation.

★If the machine is not sure about the material and the paste is crooked. The z-axis

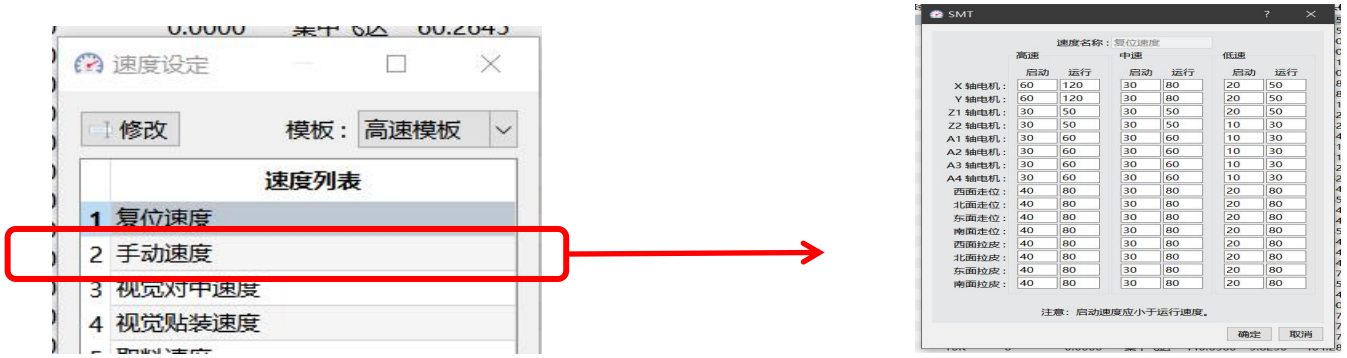
speed can be reduced or the low speed can be adopted. Many problems can be found through the slow action of Z-axis lowering.

3.2.2.11. Speed setting > Reset speed

➢ Speed parameter when performing reset

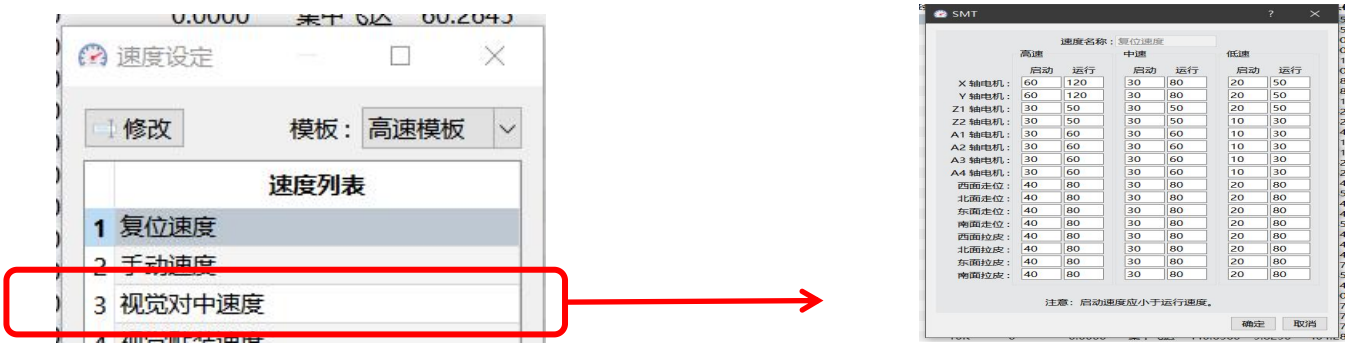
3.2.2.12. Speed setting > manual speed

➢ Speed parameters during manual control



3.2.2.13. Speed setting > visual alignment speed

➢ Speed parameter when using visual function



3.2.2.14. Speed setting > visual mount speed

➢ Speed parameter during automatic visual correction

3.2.2.15. Speed setting > reclaiming speed

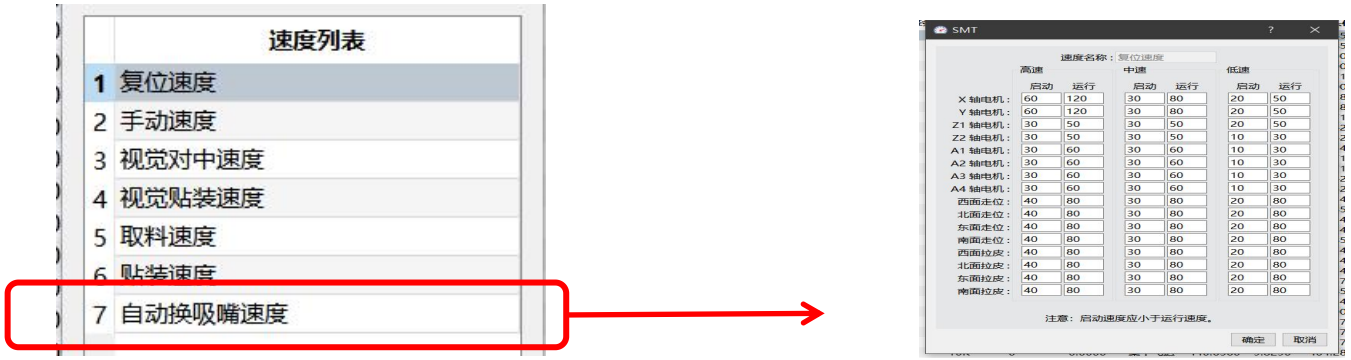
- Ellipsis

3.2.2.16. Speed setting > mounting speed

- Speed parameter during automatic mounting

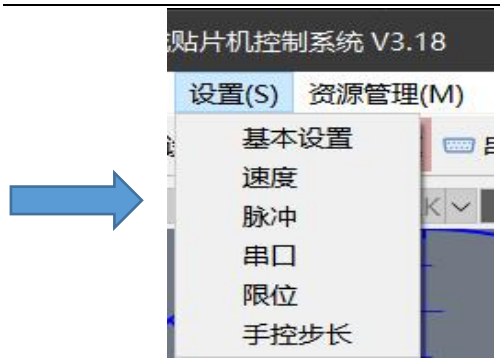
3.2.2.17. Speed setting > automatic nozzle change speed

- Speed parameters during automatic nozzle change



3.2.2.18. Pulse (important data)

Note: the pulse has an important relationship with the accuracy of the machine. The parameters have been set before leaving the factory. Please do not adjust them at will!



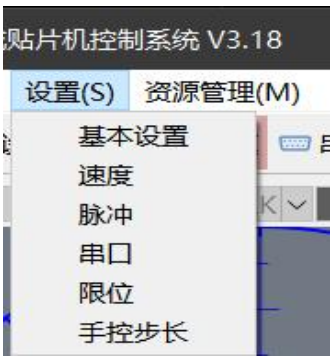
- Click Settings - pulse - pop up pulse settings
- The precision of x/y travel pulse is 0.025mm
- Axis Z: pulse accuracy is 0.022mm
- A1 and A2 axes: the angle accuracy is 0.1125°
- West, north, East and south travel: the pulse accuracy of the feeding motor is 0.028mm
- West, north, East and South pullers: the pulse accuracy of the motor on the puller is 0.025mm
- The pulse is the number of millimeters a pulse travels. It can be used to test a certain axis separately in the pulse calibration.

- Example: test whether the West rubber puller operates normally. Pulse verification (operation axis selection: West skin pulling test operation: 180 ~ 360 ° forward rotation or reverse rotation)

For details, please refer to the network disk > Mounter > video tutorial > quick start tutorial > 003 vertical y horizontal x consistency and pulse accuracy check and adjustment method video.

- Click to see details ⇨ https://yunpan.360.cn/surl_yBPye8XTDGm

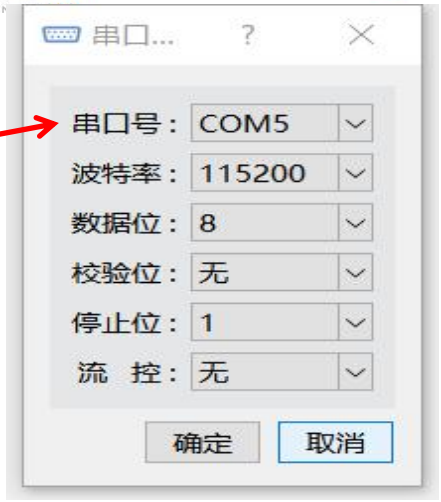
3.2.2.19. Serial port



- Note: when using online for the first time, the warning as shown in the pop-up. The computer port number used last time is inconsistent with the machine setting. The customer needs to reset the corresponding port number.

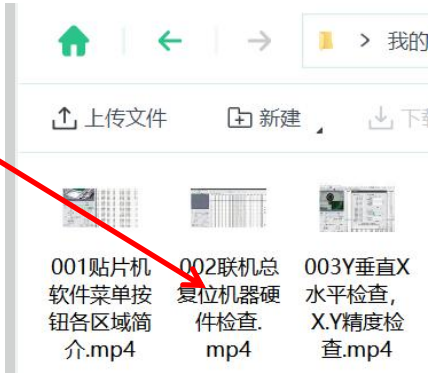
- First, find the computer assigned port number: open the computer control panel > device manager > communication port

- Serial port setting: first take the machine offline > Settings > serial port > serial port setting dialog box > select computer to assign serial port number



- Note: other options do not need to be set

- For details, please refer to network disk > Mounter > video tutorial > quick start tutorial >002 online total reset machine hardware check > 35S

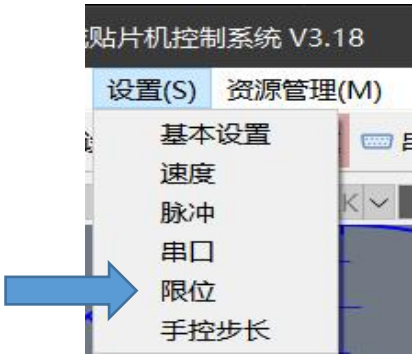


- Video introduction link

https://yunpan.360.cn/surl_yBPye8XTDGm

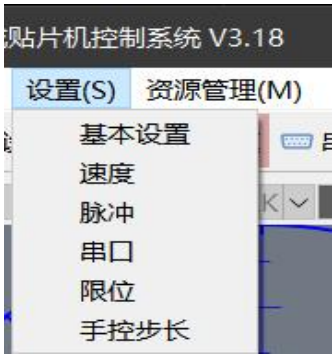
3.2.2.20. Limit

➢ Set the limit protection formation of each axis

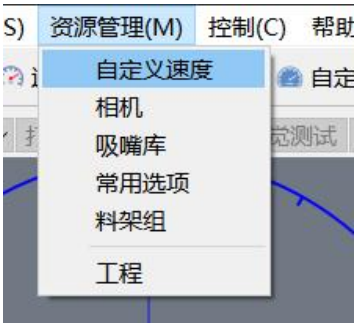


3.2.2.21. Manual step length

➢ Set the single travel length of each motor axis in manual control mode.

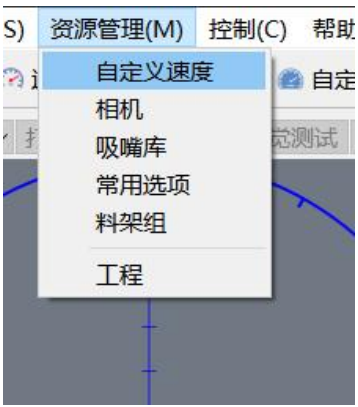


3.2.2.22. Explorer

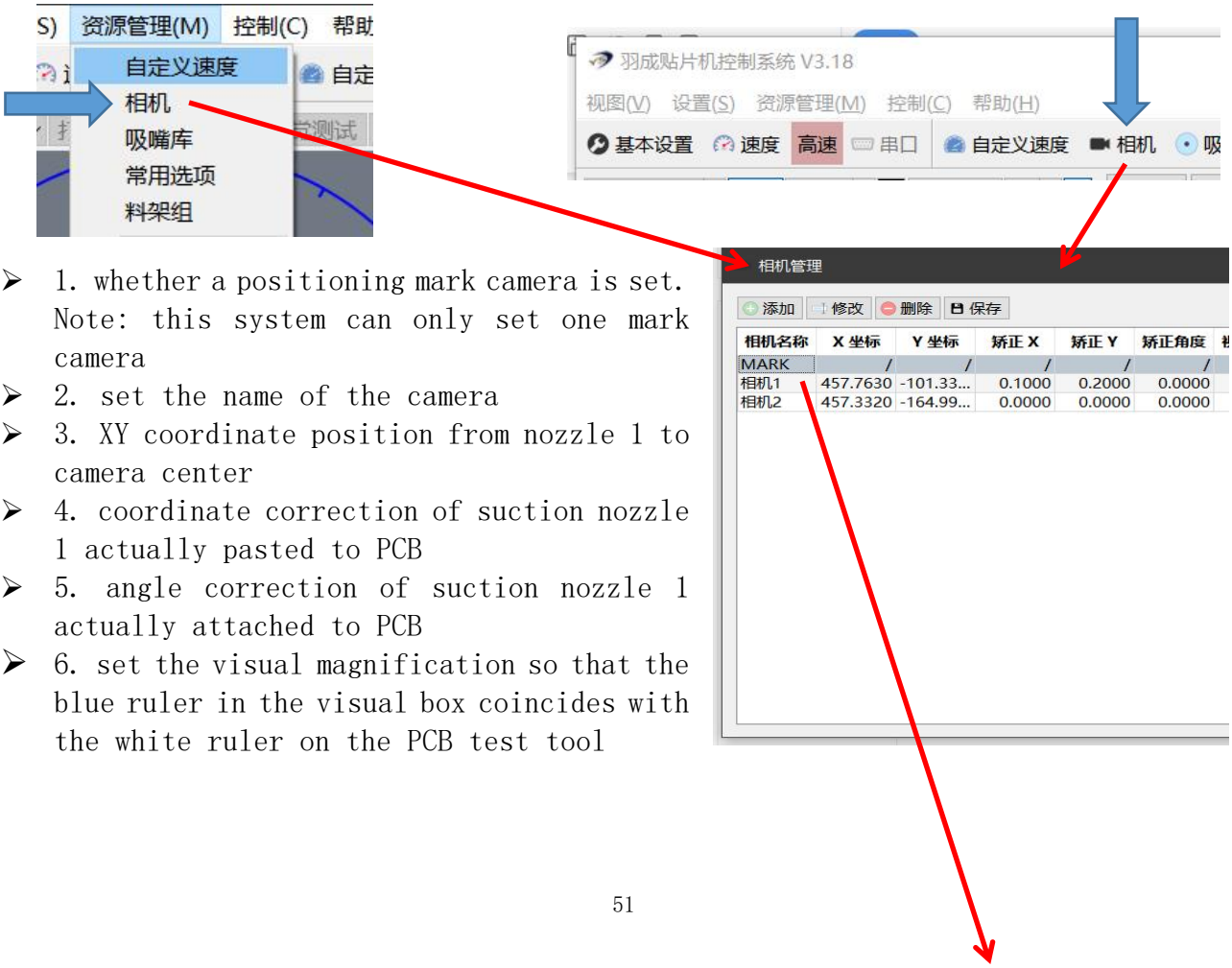


3.2.2.23. Customize speed > Customize speed Manager

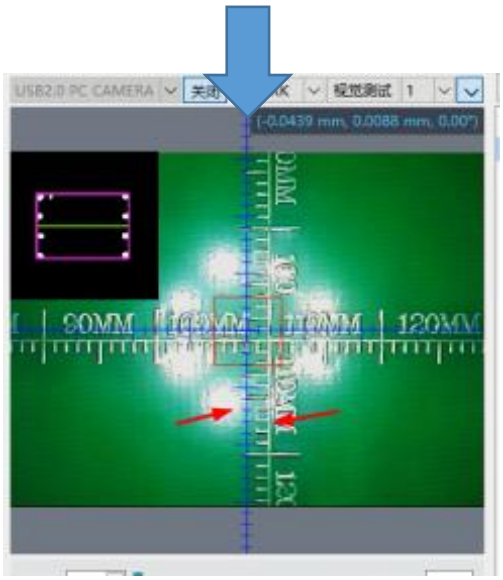
➢ When mounting special components, the customer can create a user-defined speed template and enable it separately in the material stack。

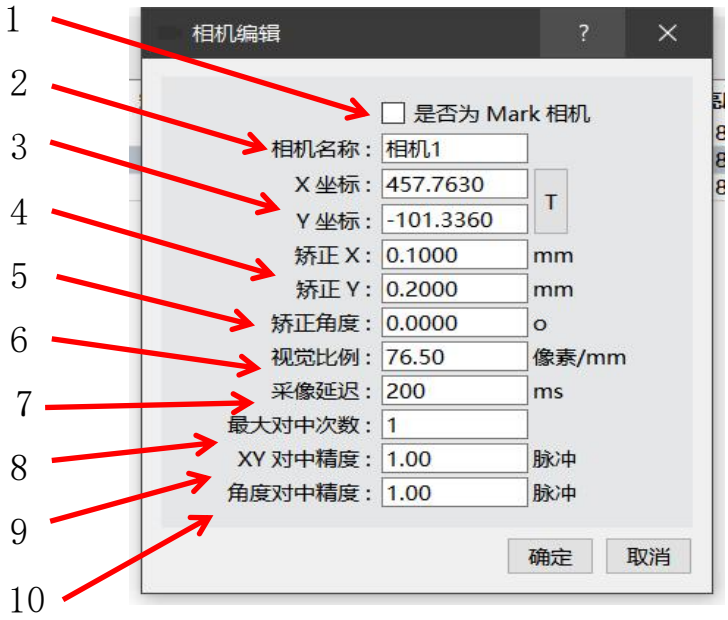


3.2.2.24. Cameras > camera management



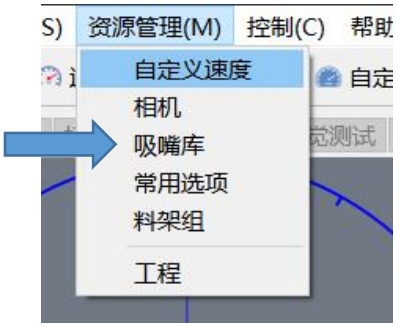
- 1. whether a positioning mark camera is set. Note: this system can only set one mark camera
- 2. set the name of the camera
- 3. XY coordinate position from nozzle 1 to camera center
- 4. coordinate correction of suction nozzle 1 actually pasted to PCB
- 5. angle correction of suction nozzle 1 actually attached to PCB
- 6. set the visual magnification so that the blue ruler in the visual box coincides with the white ruler on the PCB test tool

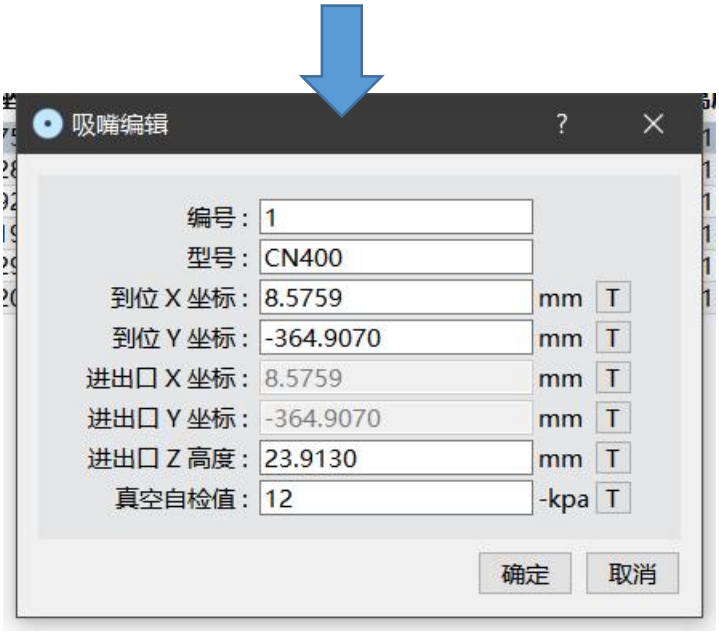




- 7. Image stabilization time when measuring components.
- 8. Measurement times of automatic visual alignment (if the set accuracy is not reached within the set times, throwing will be performed)
- 9. Set the precision of XY in automatic visual alignment (1 is the maximum precision), which needs to be used in conjunction with the maximum number of times.
- 10. the angle setting accuracy of automatic visual alignment (1 is the maximum accuracy) needs to be used in conjunction with the maximum number of times.

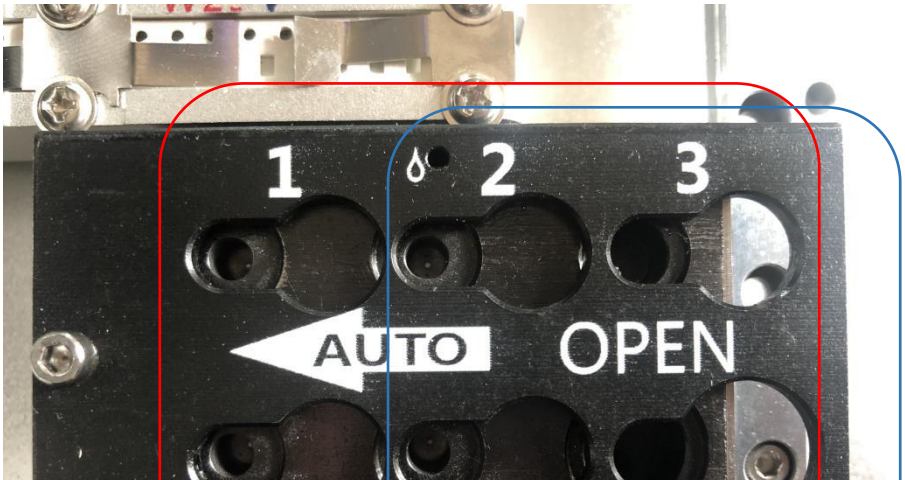
3.2.2.25. Suction nozzle Library > Editing of Suction nozzle Library





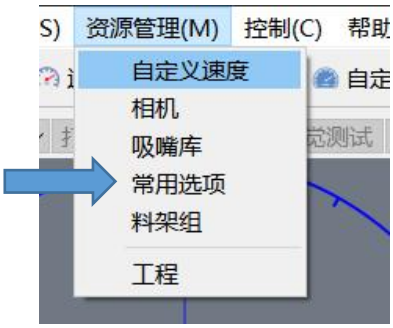
- 1. Number in order
- 2. Specify nozzle model
- 3. The X and Y coordinates of the suction nozzle of this model
- 4. Import and export X Y coordinates (default)
- 5. Z-axis height of suction nozzle descending
- 6. Vacuum self test value (default)

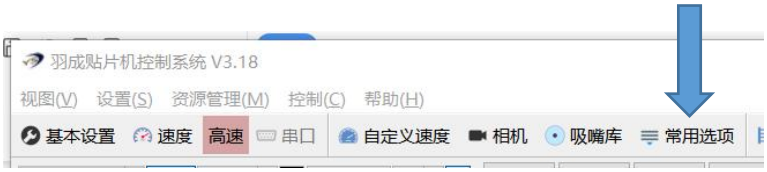
- As shown in the figure, this is the suction nozzle library on the machine. Six suction nozzles can be placed at the same time. Mark them with numbers.
- Note: 6 nozzles can be used for No. 1 mounting head. 2 mounting head, only 4 can be used（2、3、5、6）

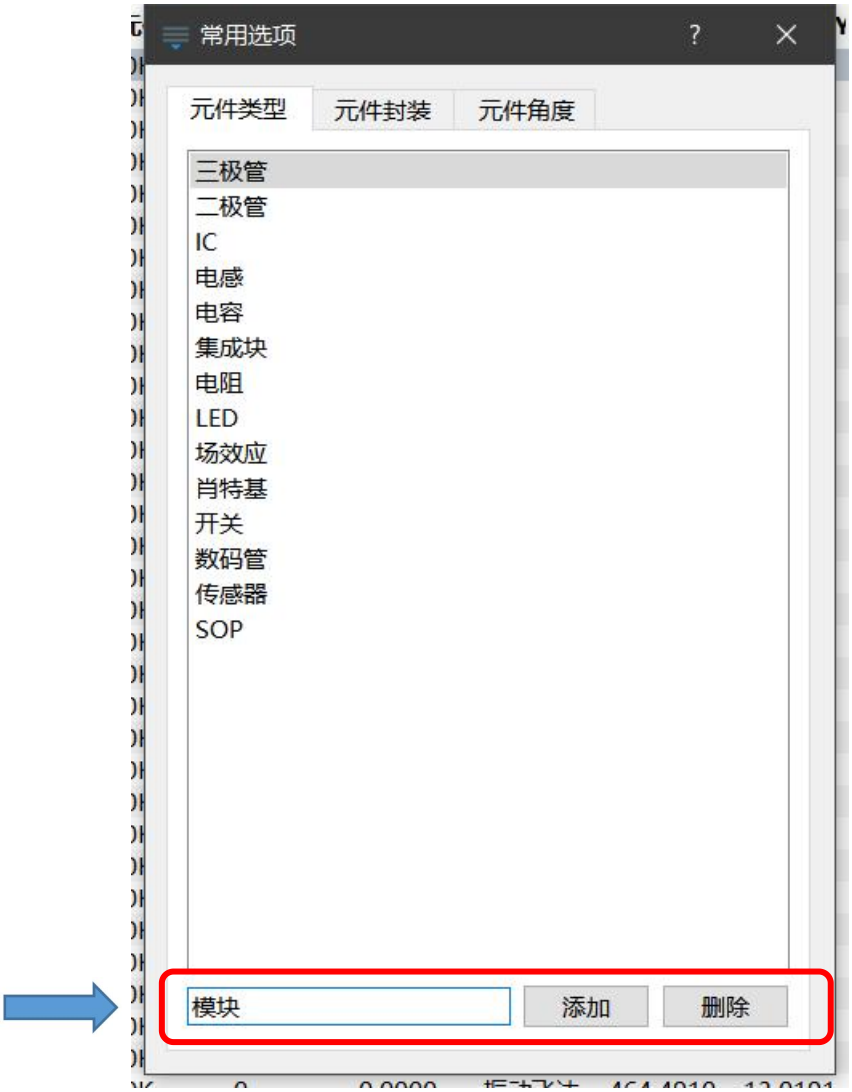


3.2.2.26. Common options

➢ Enter the name in the input box and click the Add button

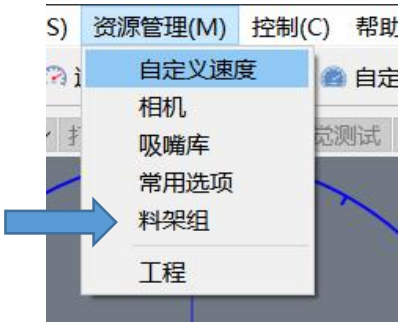


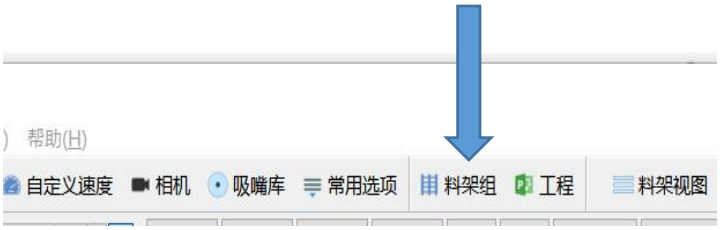




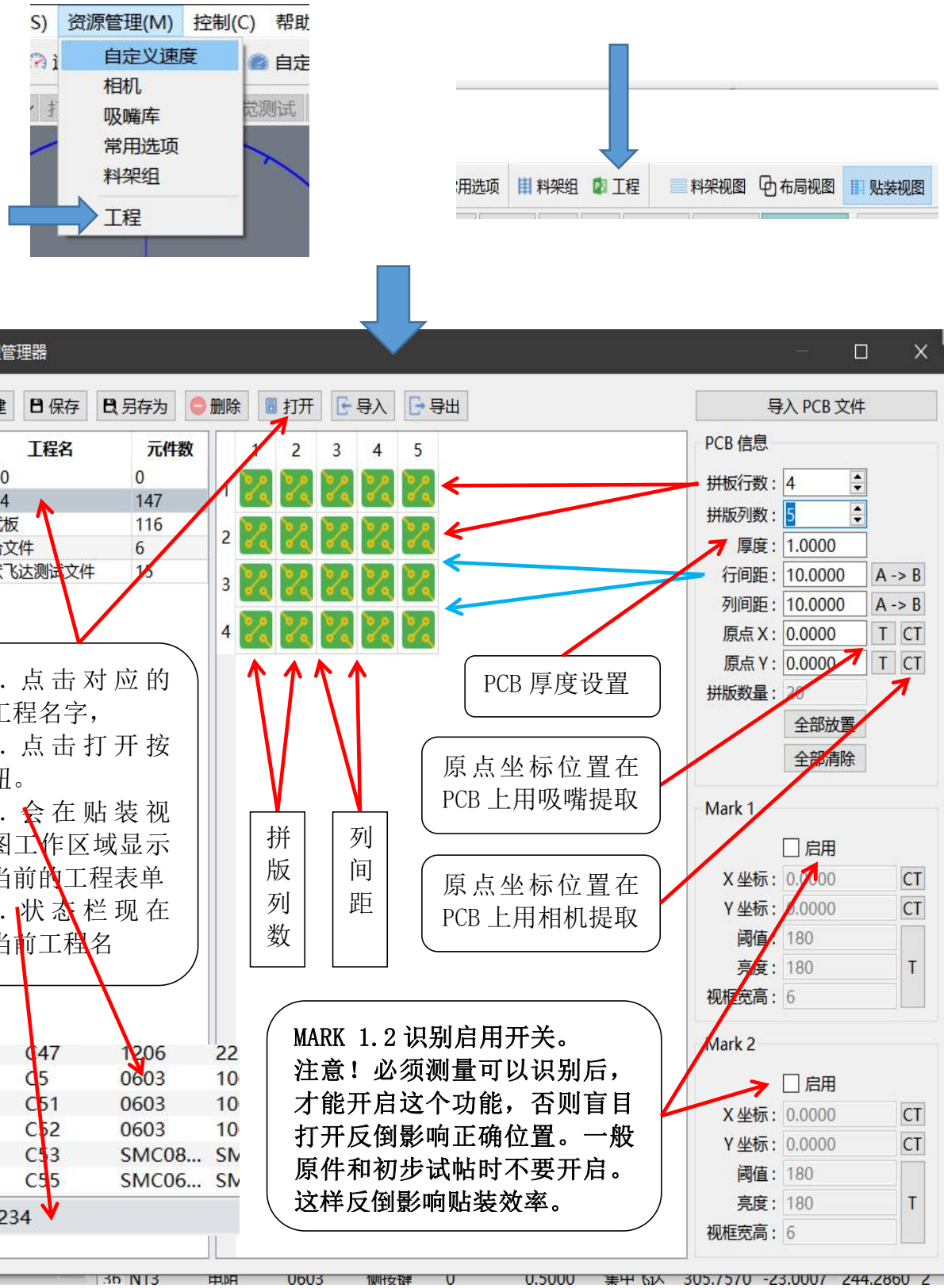
3.2.2.27. Material rack

➢ Enabled shelves will be displayed in the work area

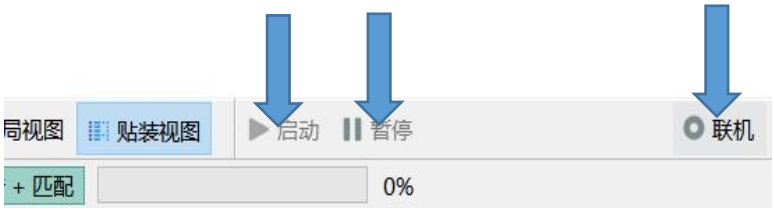




3.2.2.28. Engineering


资源管理(M)
控制(C)
自定义速度
相机
吸嘴库
常用选项
料架组
工程
料架视图
布局视图
贴装视图
工程管理器
新建
保存
另存为
删除
打开
导入
导出
导入 PCB 文件
工程名
元件数
1 0000 0
2 1234 147
3 测试板 116
4 磨合文件 6
5 管状飞达测试文件 15
PCB 信息
拼板行数：4
拼版列数：5
厚度：1.0000
行间距：10.0000
列间距：10.0000
原点 X：0.0000
原点 Y：0.0000
拼版数量：20
全部放置
全部清除
Mark 1
启用
X 坐标：0.0000
Y 坐标：0.0000
阈值：180
亮度：180
视框宽高：6
Mark 2
启用
X 坐标：0.0000
Y 坐标：0.0000
阈值：180
亮度：180
视框宽高：6
1. 点击对应的工程名字，
2. 点击打开按钮。
3. 会在贴装视图工作区域显示当前的工程表单
4. 状态栏现在当前工程名
PCB 厚度设置
原点坐标位置在 PCB 上用吸嘴提取
原点坐标位置在 PCB 上用相机提取
拼版列数
列间距
MARK 1.2 识别启用开关。
注意！必须测量可以识别后，才能开启这个功能，否则盲目打开反倒影响正确位置。一般原件和初步试帖时不要开启。这样反倒影响贴装效率。
工程：1234

3.2.2.29. Eontrol



3.2.2.30. Online

- Click the online button, the buzzer rings once, and the online button lights up. The online is successful.

3.2.2.31. Start-up

- Click mount, and the software will automatically mount according to the list order.

3.2.2.32. Suspend

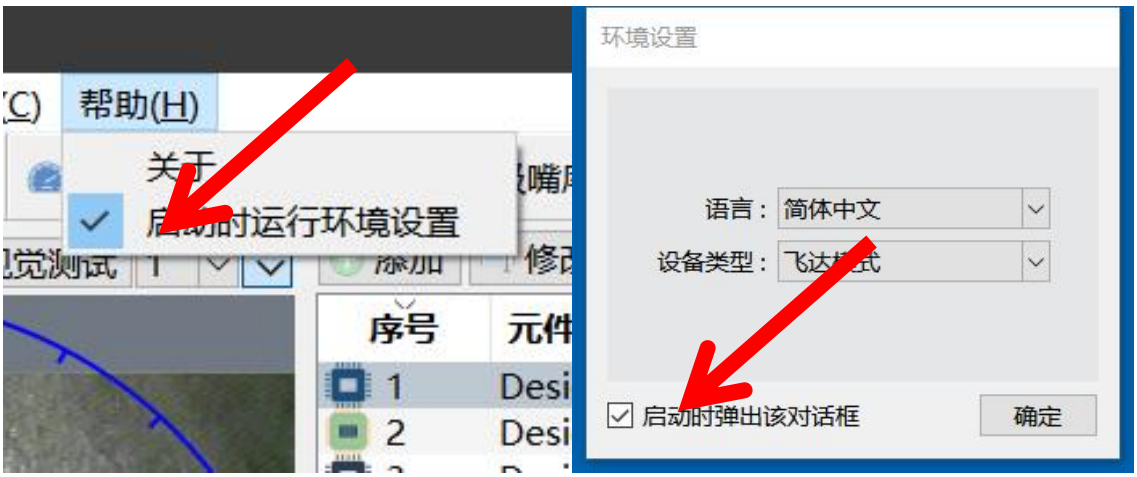
- Click the pause button to temporarily stop the mounting process.

3.2.2.33. Menu bar help

3.2.2.34. About version number

3.2.2.35. Running environment settings

- When the startup and running environment setting is checked, the environment setting will be prompted every time the software is started.
- When setting the startup and running environment is canceled: the environment setting is not prompted every time the software is started.



3.3. Workspace view

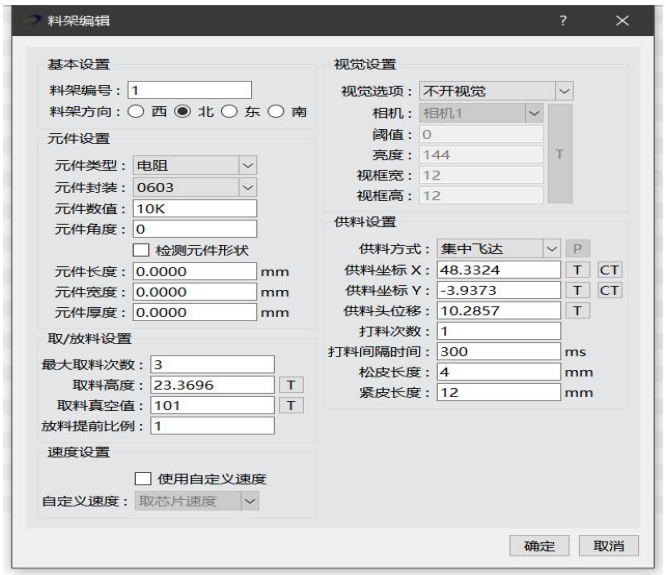
3.3.1. Material rack view

- Click View > material rack view in the menu bar. The work view area displays a list of material racks.
- You can also click the material rack View button on the toolbar to switch directly.

	料架 ID	元件类型	元件封装	元件数值	元件角度	元件厚度	供料方式	供料坐标 X	供料坐标 Y	供料头位移	打料次数
1	N1	电阻	0603	10K	0	0.0000	集中飞达	48.3324	-3.9373	10.2857	1
2	N2	电阻	0603	10K	0	0.0000	集中飞达	60.2645	-4.1385	22.2857	1
3	N3	电阻	0603	10K	0	0.0000	集中飞达	72.4842	-4.1960	34.0000	1
4	N4	电阻	0603	10K	0	0.0000	集中飞达	84.3013	-4.1098	46.0000	1
5	N5	电阻	0603	10K	0	0.0000	集中飞达	96.2047	-4.0810	58.5714	1
6	N6	电阻	0603	10K	0	0.0000	集中飞达	108.2520	-3.9948	70.0000	1
7	N7	电阻	0603	10K	0	0.0000	集中飞达	120.3850	-4.1960	81.4286	1
8	N8	电阻	0603	10K	0	0.0000	集中飞达	132.2020	-4.1098	93.4286	1
9	N9	电阻	0603	10K	0	0.0000	集中飞达	144.3360	-4.1385	105.7140	1
10	N10	电阻	0603	10K	0	0.0000	集中飞达	156.2390	-4.1385	117.4290	1
11	N11	电阻	0603	10K	0	0.2000	集中飞达	168.2580	-4.1960	129.4290	1
12	N12	电阻	0603	10K	0	0.0000	集中飞达	180.3620	-4.1673	141.1430	1

3.3.2. Material shelf editing

- Double click a row to edit in the material rack view to open the material rack edit dialog box



1. **Rack No:**

- Corresponding position number of each chute, attention! Material rack No. and material rack can be combined with direction, but cannot be repeated in the system.

2. **Material rack direction:**

- There are three directions on the machine: West, North and East (the south is reserved). After selecting the corresponding direction, the material rack ID will be automatically marked with W, N and E in English

3. **Element type:**

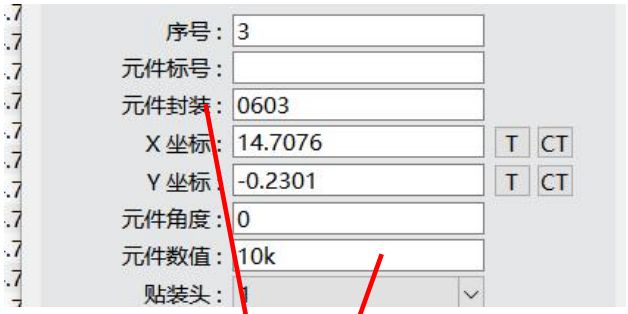
- It is a component category and is only used as a reference in the system.

4. **Encapsulation:**

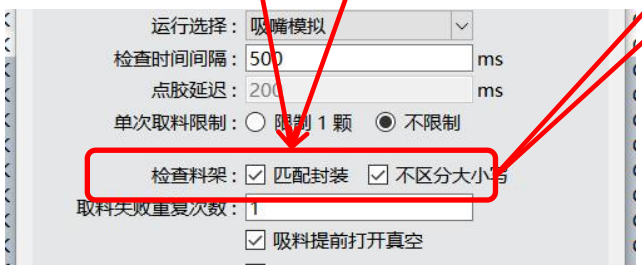
- Overall dimension of components, and component packaging is the key data.

5. **Component value:**

- Key parameters of components
- When the key parameters of components are established, the system will automatically match the component values to the material rack according to the mounting form and the packaging in the material rack.



- Set the auto match option in the mount scheme



6. **Component angle**

- Note: there are two component angles in the system: the component angle in the material rack and the component angle in the mounting view.
- The component angle in material rack editing is the material rack direction

compensation, not completely the mounting angle. Its function is to compensate the initial angle of components in the East and West material racks. In principle, the North material rack is 0 degrees, 90 degrees east and -90 degrees west.

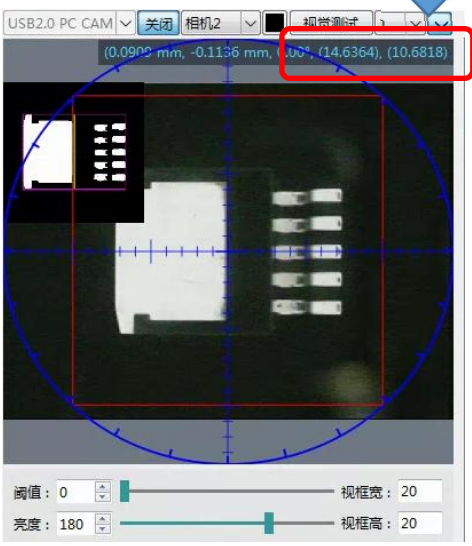
- The component angle edited by the material shelf can also be used as a batch modification function. After modification, all the component mounting angles of this material stack will change.
- The mounting angle relationship is: component angle in material rack + component angle in mounting view = mounting angle.

7. **Detection element shape**

- Note: shape detection is only enabled for components with length and width characteristics at any angle。
- Component length and width dimensions are required when enabled.

8. **Element length and element width:**

- If dimension measurement is enabled, the component length and width must be actually extracted! Methods take the components to the camera, click the visual test button, and fill in the measured component size.



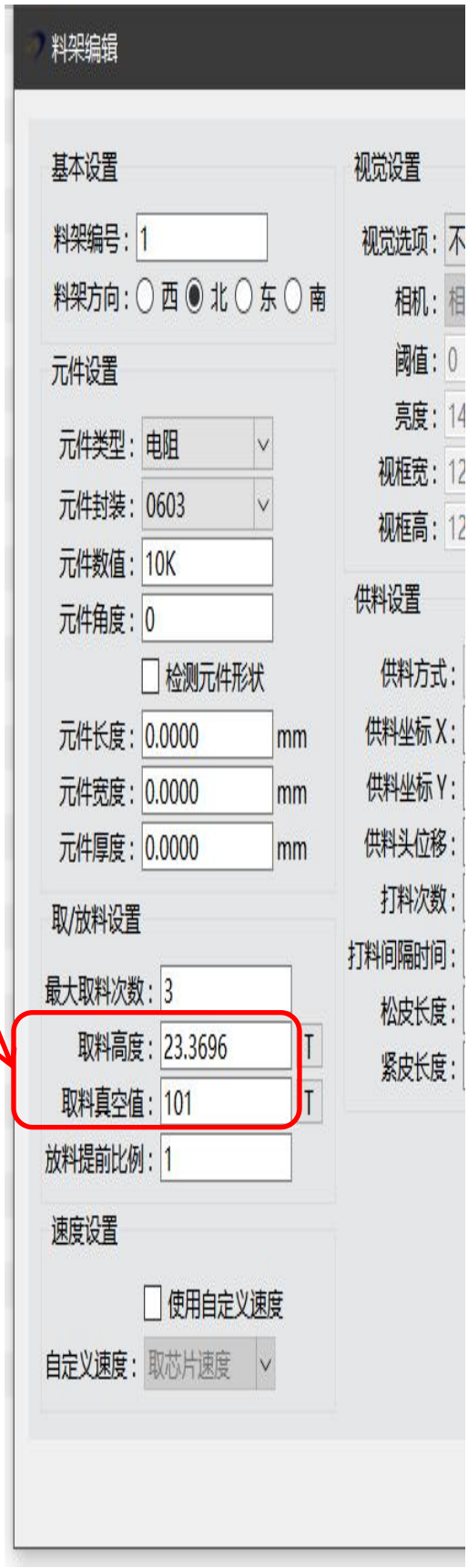
9. **Thickness of element**

- The height of components can affect the height from the suction nozzle to the PCB.
- There are two settings that affect the mounting height of the suction nozzle: total height from the suction nozzle to the PCB platform - PCB thickness - component thickness = mounting height

10. **Maximum number of component fetches:**

- Repeat times of components not taken from the suction nozzle, 1 recommended.

11. **Take material height:**



- Pick up height of suction nozzle on material belt.
- The height of each material rack can be set independently.
- **Technique: if the material shelves with the same height can directly copy the height data of the previous one。**

12. Take component vacuum value (important)

- If the vacuum value is lower than 100, it is a fixed detection value. Setting method: manually open the vacuum of a suction nozzle, record the no-load vacuum value without parts, and then manually put it on the suction nozzle to record the current part vacuum value, and then the part vacuum value - no-load vacuum value = take the middle value. Example: 30 without suction nozzle and parts, 50 with parts It is recommended to set 40 calculation formula: (50-30) /2+30=40
- Above 100 is the automatic detection value, which is used to set the automatic tracking floating difference. No matter how much the vacuum value is, it can be detected as long as there is a part difference. Example 101 - 100 = 1 is the highest sensitivity. As long as there is a change in vacuum value, the part can be detected. Of course, the anti-interference ability can also be improved according to the actual vacuum difference of the suction nozzle.

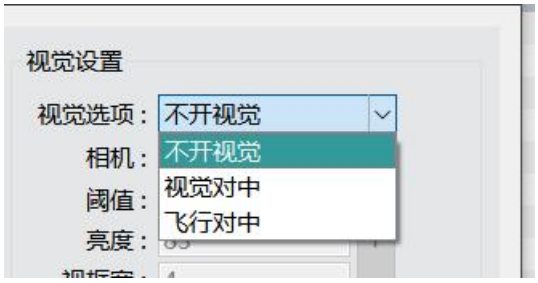
13. Advance ratio of discharging:

- The suction nozzle turns off the vacuum in advance during the process of placing the original, where is the% proportional value. For example, when 1 suction nozzle is set to 20mm high on the PCB, the vacuum is turned off in advance. Advance = 20mm x 1% = 0.2mm.

- <u>This function can avoid sucking tin slurry to block the suction nozzle. Observe in slow motion according to the site during setting.</u>
- <u>attention! The advance shall be properly set. Too much will cause the parts to throw materials halfway without touching the PCB resulting in inaccurate position.</u>
- Other customizations slow down when mounting special parts.
- User defined speed templates can be created by yourself.

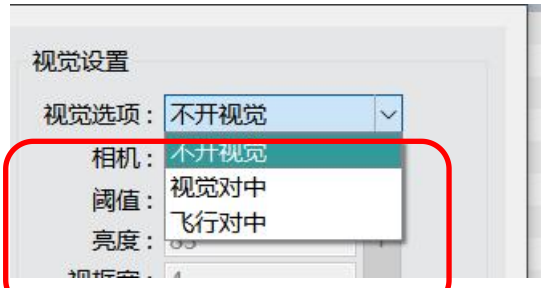
14. Settings > visual options

- There are three visual options, and each material rack can be selected independently.
- <u>attention!The flight alignment can only be used after the visual alignment debugging is normal.</u>



15. Camera

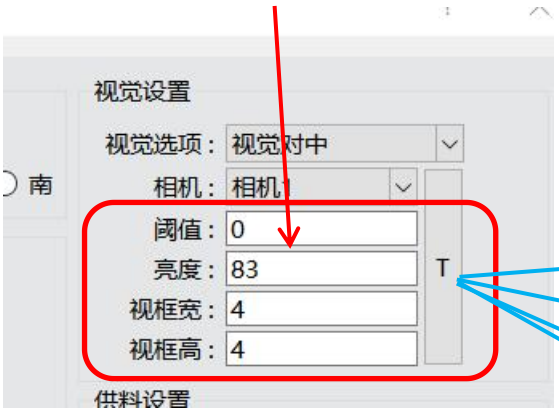
- There are 3 cameras for vision, 2 of which are

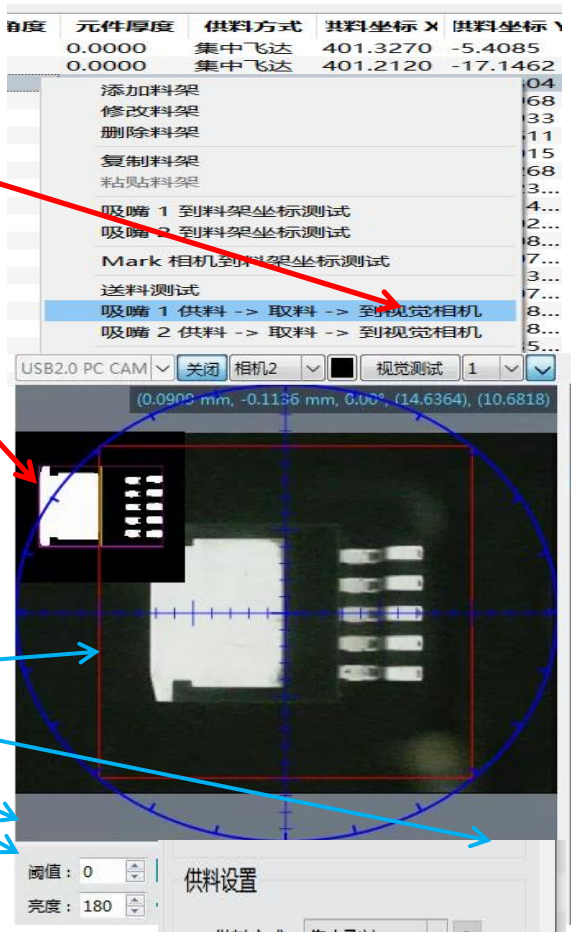


cameras for measuring large areas and small areas, which can be selected according to the size of parts.

16. Visual feature test

- First go to the material rack to take a part to the camera.
- Click visual test.
- observe whether the photographic result area is normally identified.
- after the recognition is normal, click the extract t button to save the visual measurement features.





17. Feeding mode

- The feeding method is selected here.

18. Feeding coordinates x, y

- The coordinate position of the suction nozzle to take material here, T is the suction nozzle coordinate extraction, and CT is the mark camera coordinate extraction.

19. Feed head displacement

- Feida moves to the position of the current material stack. T is coordinate extraction.

20. Punching times

- Set the punching times of Feida, for example, one piece of material accounts for one strip hole, and the bit distance is set to 1. One material occupies two material strips, and the hole spacing is set to 2.

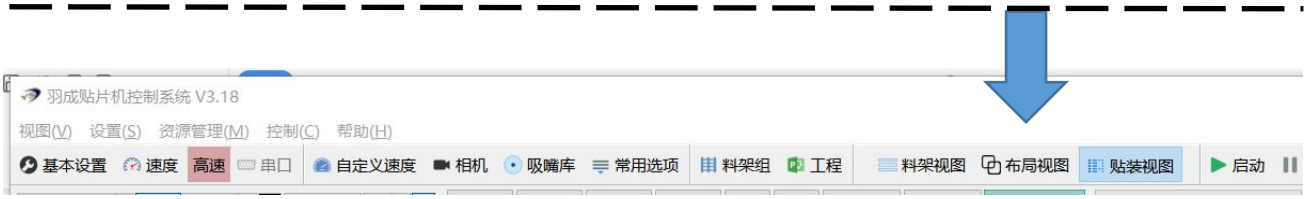
21. Time between materials

- Set the interval of Feida's marking. Recommended 300-400ms.

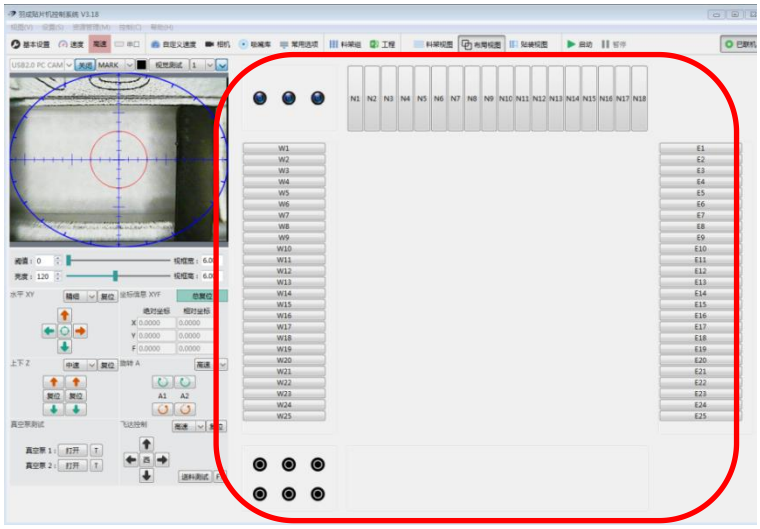
22. Loose skin length tight skin length

- The loose skin length is to loosen the material skin in advance when Feida hits the material to prevent the original from flying out. Recommended setting: 4mm for one shot and 8mm for two shots.
- The tight skin length is that Feida tightens the skin after punching, which is convenient for the suction nozzle to take materials. The recommended setting is more than 2-3 times that of loose skin, for example, 4mm for one-time feeding × 2.2 = 8.8MM.
- Note: these lengths are approximate and do not need to be precise.

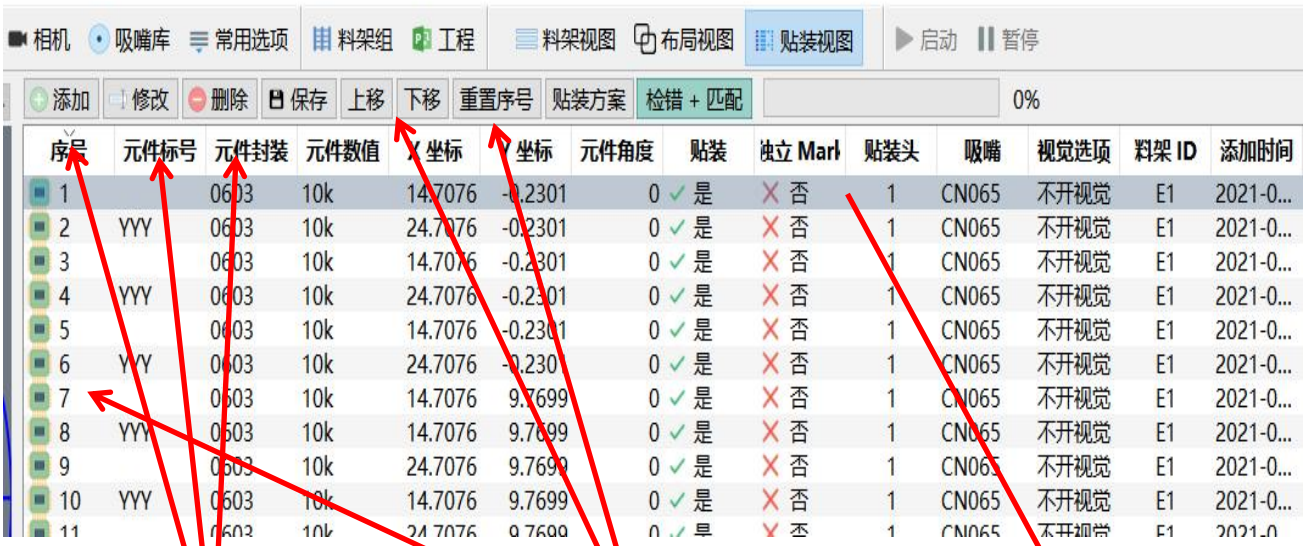
3.3.3. Rack layout view



- Click View > layout view in the menu bar, and the work view area displays the material rack layout list.
- You can also click the layout view button on the toolbar to switch directly.



3.3.4. Mount view



Sort by each item
1. click the small arrow above each item,
2. click once from small to large,
3. click from large to small to get different permutations and combinations.

Mount list serial number can be reset
1. click or select all to select the list to be moved.
2. click the order required by the move up and move down buttons.
3. click Reset serial number.

Move the mouse to the current list and right-click to pop up function options

1.1.1.1. Mount list > Function right click

1. Add a new part.
2. Modify part > original edit dialog box pops up.
3. Delete the part.
4. To copy a part, first select a list with the mouse, click Copy, and then click Paste.
5. Open the rack.
6. Coordinate test from nozzle to original (not commonly used).
7. Mark camera to original coordinate test.

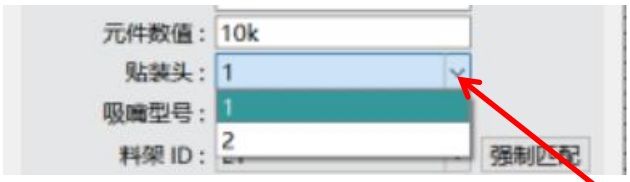
Note: Tt is required to use this verification coordinate during project commissioning, which is a

common function.

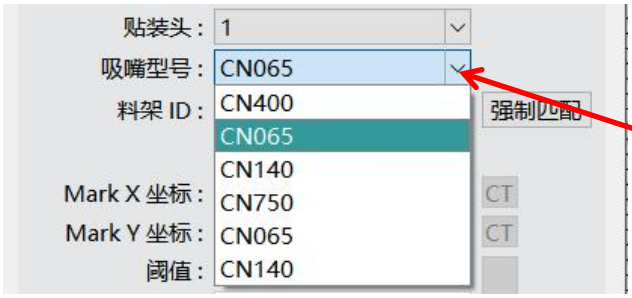
8. Mark camera to independent mark point test (not commonly used).
9. Move the mouse to the list to be pasted, right-click and click to paste the current.
10. Paste the following parts from the current list.
11. You can use this function to rotate the PCB coordinates of the original output.

3.3.5. Mount list > component edit dialog box

1. **Paste or not:** Click to tick √ to open, and not tick √ to cancel.
2. **SN:** The SN of the mounting list.
3. **Component label:** Represents the serial number of this component in PCB.
4. **Component package:** Represents the overall dimension of the component.
5. **XY coordinate:** The mounting position of the part center.
6. **Component angle:** The rotation angle of this part.
7. **Component value:** The parameter of this part.
8. **Mounting head:** Specifies which head to mount.

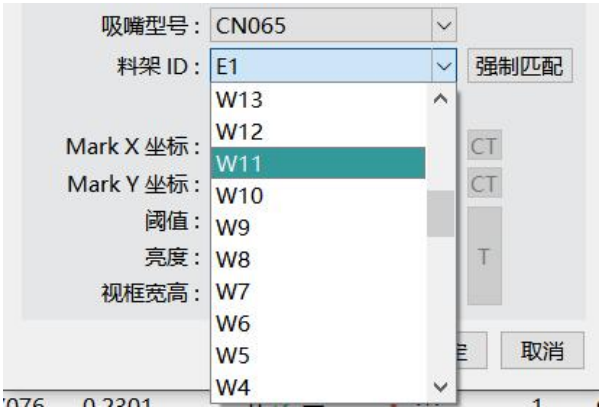


9. **Nozzle model:** Specify the nozzle model.



10. Rack ID: The rack number matched with this mounting form.
11. Forced matching: If you encounter the same original but different names, you can use forced matching to link material shelves. After matching, the encapsulated values in the form will be rewritten into rack parameters.

- Click the rack ID
- Select matching rack
- Click force match

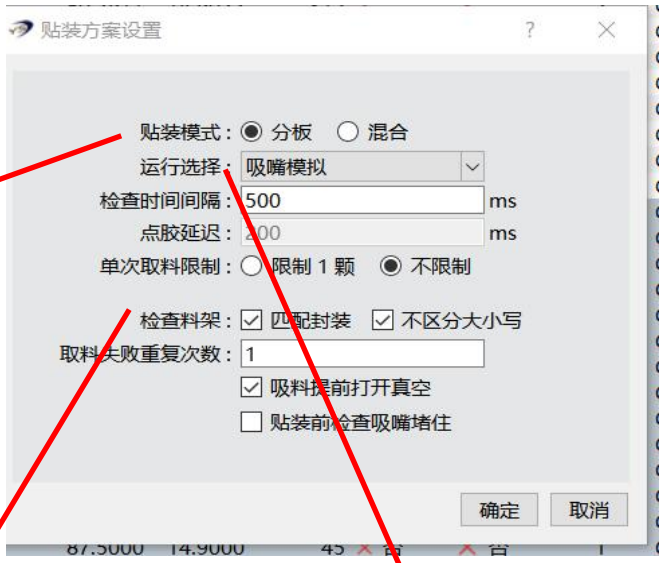


12. Independent Mark point (not recommended if not necessary).

3.3.6. Mounting scheme

1.Mounting mode

- Plate splitting pastes each piece of plate in the project manager separately.
- Mix all the pieces in the project manager into one PCB.



2.Run selection

- Mounting function selection

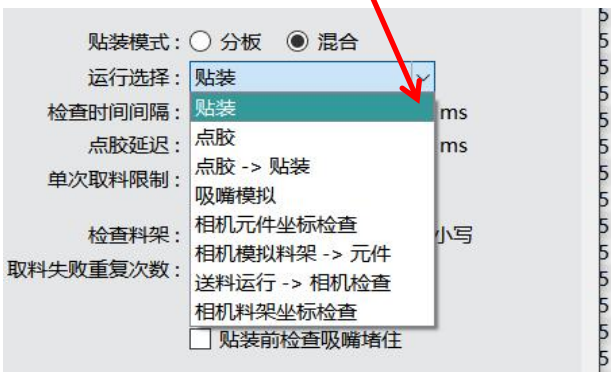
3.Inspection interval

- Time setting at each action interval

4.Glue dispensing delay

- The glue point function needs to be customized.

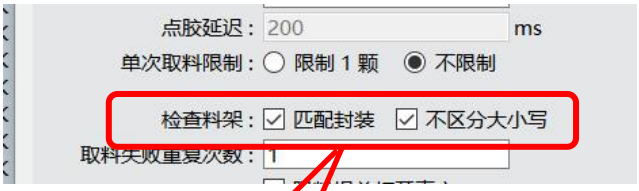
5.Single withdrawal limit



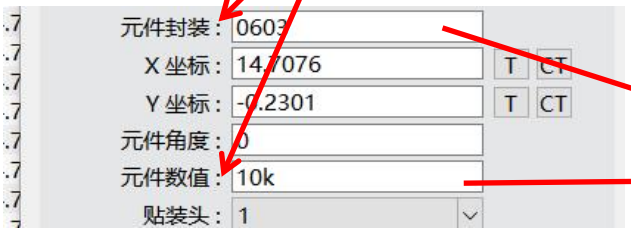
- Set to single head working mode

6.Check the material rack

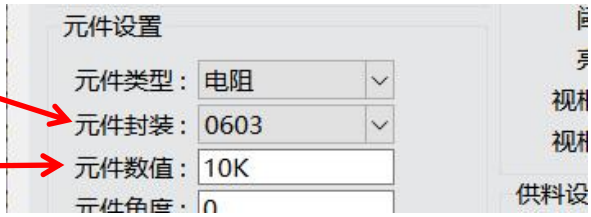
- Matching rules for mounting forms and racks.



- Paste form edit dialog box

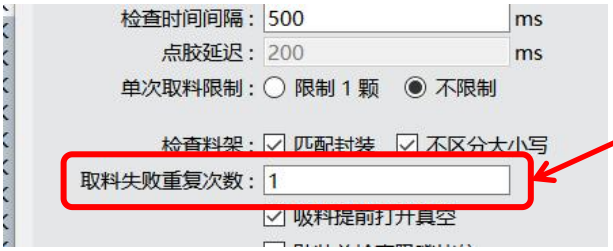


Rack setting dialog box



7.Repetition times of picking failure

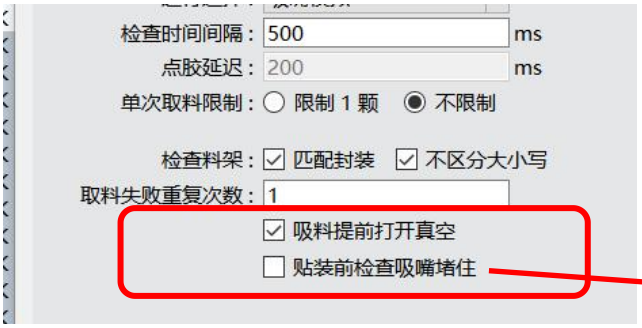
- Mount scheme dialog box



Shelf edit dialog box

8.Open the vacuum in advance and check that the suction nozzle is blocked

- Open the vacuum in advance before reclaiming to establish the vacuum faster. It is recommended to open it.
- Check whether the suction nozzle is blocked. Set the self-test value in the suction nozzle library manager. It is not recommended to enable it if necessary.



4. Visual correction

➢ The vision system can measure the deviation of the mounting elements and

automatically correct them to achieve accurate mounting.

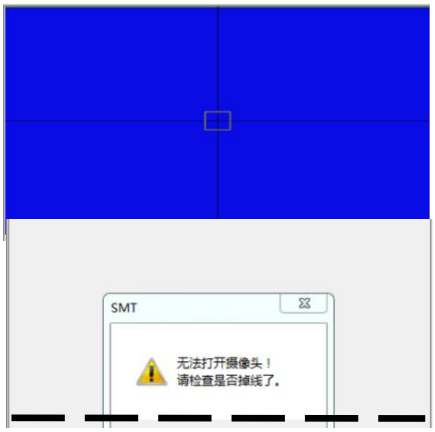
（if the acquisition card is not inserted or the contact is poor, the camera cannot be opened）

Camera ⟶ The camera Management dialog box pops up. There are three cameras in the system.

Mark camera: the camera on the machine head, observing the coordinates and parts of the PCB, and detecting the mark point of the PCB.

Camera 1: it is the first one on the left side of the machine to detect large parts. (only suction nozzle 1 can be used for mounting head, and suction nozzle 2 cannot pass through, limit).

Camera 2: the second high-power camera on the left of the machine to detect small parts. (suction nozzles 1 and 2 for mounting head are OK)



- Select video source:

Select the video source to open the camera, and in the window bar (the screen will turn blue)

Switch between mark camera, camera 1 and camera 2 when the screen turns blue

- If the acquisition card is not inserted or the contact is poor, the camera cannot be opened

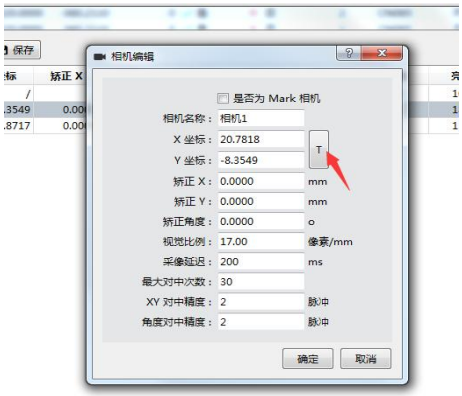
4.1. Several factors affecting camera vision

- XY coordinate extraction (debugging before delivery. No adjustment is required. However, if there is deviation, the adjustment method is as follows).

- First click "reset". As shown in Figure 3-4. ② "Coordinate test button", click "nozzle 1 to visual

camera 1″。

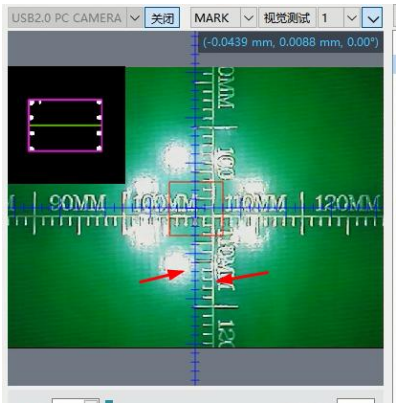
- It is found that the suction nozzle 1 deviates from the camera 1, press the key manually to move to the middle, and click ″t″ to extract the coordinates.

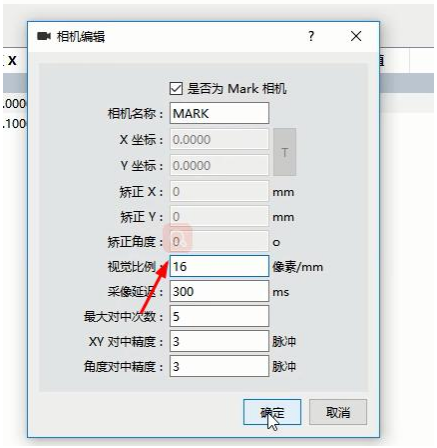


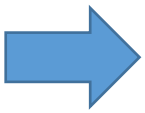
➢ Maximum alignment times, XY alignment accuracy, angle alignment

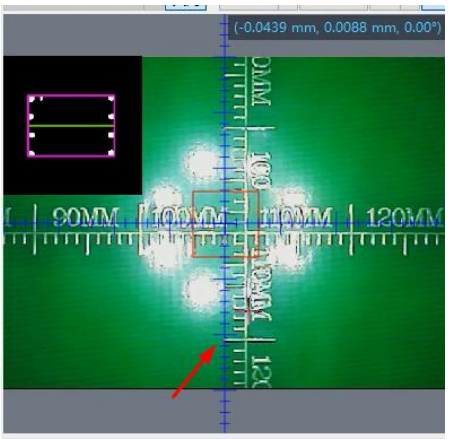
Maximum alignment times: align the chip within the specified frequency range (recommended value is 15-20). XY alignment times and angle alignment: the smaller the value, the higher the precision required. Visual alarms may occur (recommended values 3-5)

- **Visual scale:** the visual scale is the ratio between the real object and the camera 1 and 2.
- **Example:** through the visual scale of the mark camera, the blue scale in the figure coincides with the scale on the PCB
- Double click to open the ″mark″ camera in ″camera management″; Set the visual scale to ″16″
- It is found that the scale of the blue ruler will become larger, as shown in the figure. This means that the larger the visual scale value, the larger the scale scale.

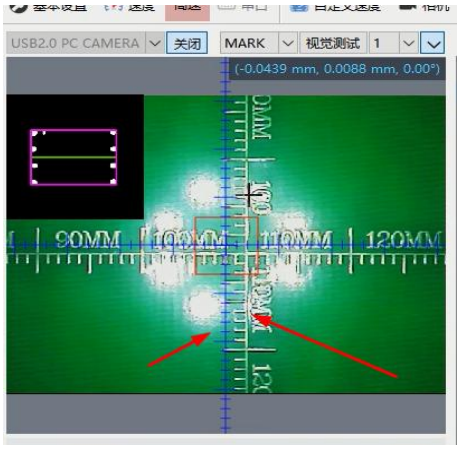








➢ By constantly adjusting the parameters, the scales of the two scales are completely coincident.



4.2. Visual test: key factors box size and brightness

➢ The threshold does not need to be changed. The default value is "0". 0 is the automatic threshold value, which will be automatically adjusted according to the environment.

When the chip passes through the visual patch. It must be ensured that it is completely corrected when the vision is over. Otherwise the chip will stick askew.

Frame size: the height and width of the visual frame refers to an outer frame surrounding the components.

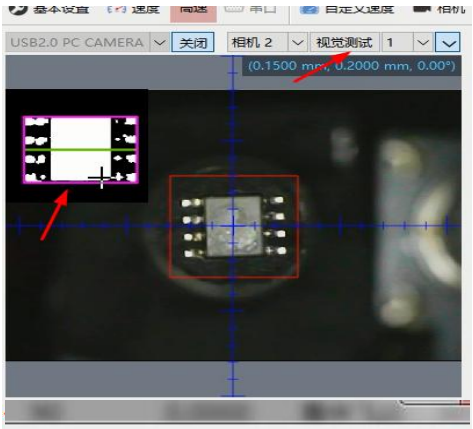
(the view frame of the large chip should be larger to prevent it from running outside the frame when turning the angle of the visual chip.)

Brightness: camera brightness plays an important role in visual testing.

➢ Example: ① take a piece of material from the suction nozzle 1 to the camera. As shown in the figure ("view of material rack" suction nozzle 1 feeding - > reclaiming - > visual camera)

➢ Adjust according to "view frame size" and "Brightness"。

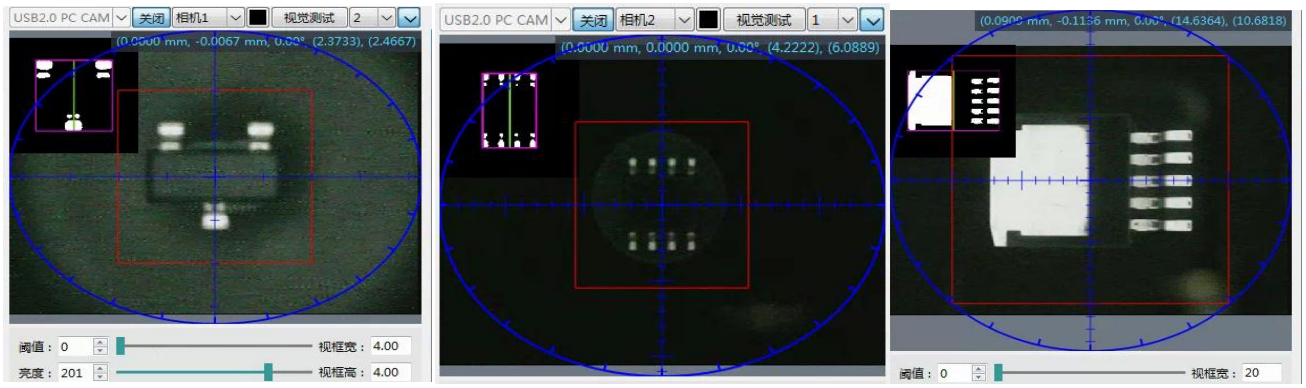
➢ Click the "visual test" button. As shown in the figure, the vision is successful.



Click "rack view" and double-click to open the rack.

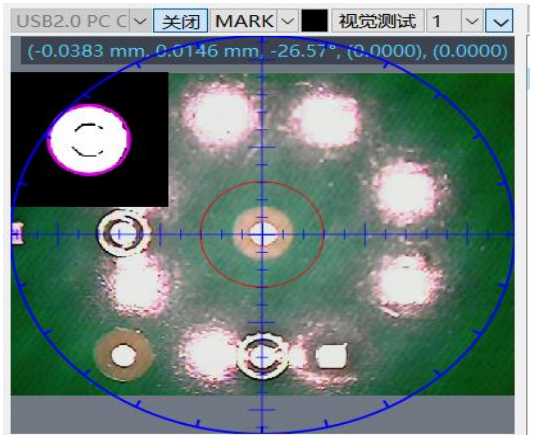
Extract in visual options t. Remember, do not fill in manually. After the original is successfully visually tested, click extract. Be careful! The material on each chute needs to be visually tested separately. (suction nozzle feeding - > reclaiming - > visual camera)

➢ Visual brightness and red box are examples of the importance of visual correctness.



➢ The importance of visual brightness and red boxes, examples of visual errors.

➢ Importance of visual brightness and red box, visual example of mark camera.



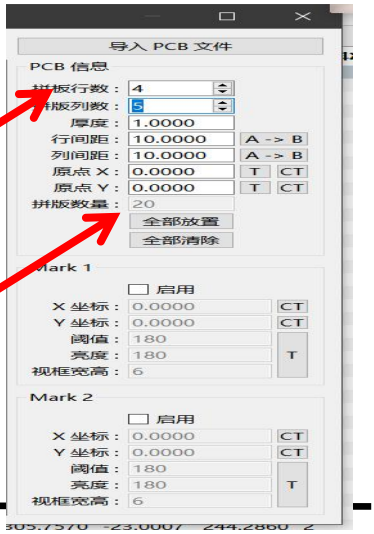
4.3. Workspace view mark camera

Mark camera is used to identify mark points and observe rack coordinates and PCB coordinates. Mark point is the position recognition measurement point of PCB applied to automatic Mounter in circuit board design. Select the corresponding camera switch to display the current image.

be careful! PCB origin and mark point are set in the project manager.

PCB origin: it is the basic coordinate relationship (very important) of all elements on the PCB. Mark point: it is an optical measurement point used to correct the deviation of PCB placed on the machine. It is an auxiliary function of fine adjustment (unnecessary opening).

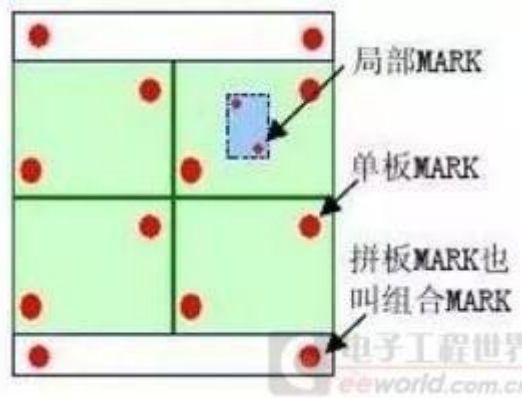
When creating a new project, first press the PCB origin to mount correctly, and then turn on the mark function.



4.4. Mark point

➢ Mark point classification

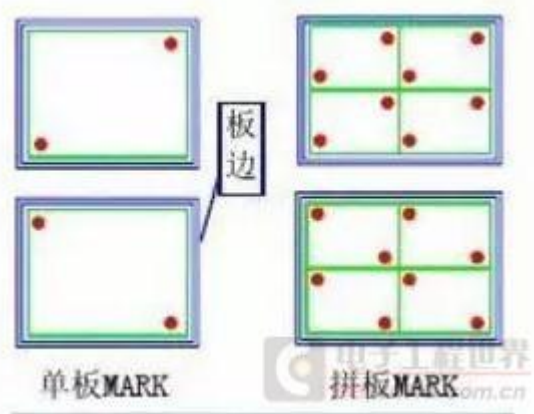
1. Single board mark, which is required when mounting a single PCB, is on the PCB;
2. Panel mark, which is usually used at the edge of the process, is required for assembling the panel PCB;
3. local mark is used to improve the precision of mounting some components, such as QFP, BGA, etc.



➢ Mark point design specification

All SMT incoming boards must have mark points, and the relevant specs of mark points are as follows:

1. Shape: requires mark points to be marked as solid circles.

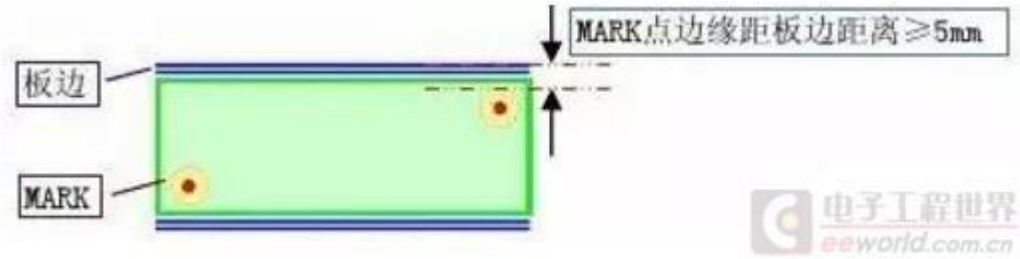


2. composition: a complete mark point includes: mark points / feature points and open areas.

3、Location: mark points are located at the relative position of the diagonal of the circuit board and separated as far as possible, preferably at the longest diagonal position. Therefore, mark points must appear in pairs. See the following figure for details:

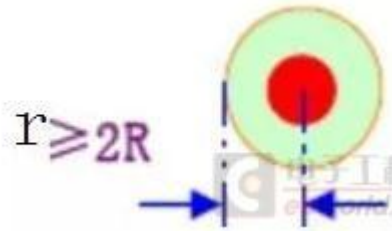
4、Size: the minimum diameter of mark point is generally 1.0mm, and the maximum diameter is generally 3.0mm.

5、Edge distance: the distance between the mark point and the edge of the printed board must be ≥ 5.0mm (the minimum distance required for the machine to clamp the PCB), and must be in the PCB rather than at the board edge, and meet the minimum mark point clearance requirements. Note: the distance refers to the edge distance, not the mark point as the center.



6、Requirements for clearance

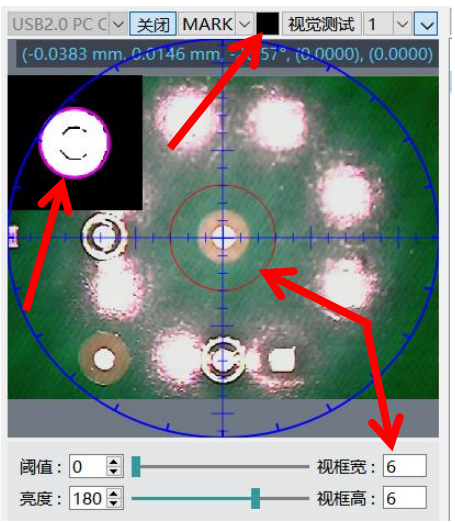
Around mark point mark, there must be an open area without other circuit features or marks. The circle radius of the open area R ≥ 2R, R is the radius of the mark point, and when R reaches 3R, the machine recognition effect is better. In general, it is to make a small circular pad with a large window.



4.5. Enable mark

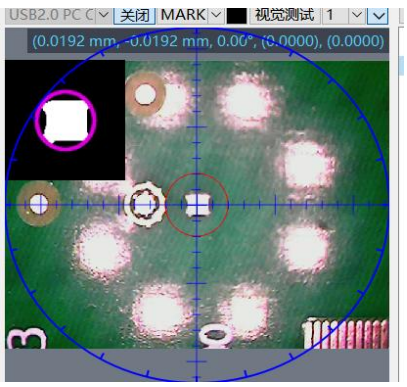
Be careful! Before enabling, check whether the mark point is normally available, because mark will automatically modify the basic relationship of PCB origin coordinates, and the wrong mark setting will affect the correct mounting (do not turn on this function blindly).

- Step 1: Manually move the mark camera to the mark point 1 position, and set the effective area of the red view frame, which is about 1.2-2 times the size of the mark point.
- Step 2: Click the mark black box test button to observe the photographing results. If the brightness is not adjusted to achieve the desired photographing results. Pay attention! Good



photographic results are the key to accurate and stable measurement.

- **Step 3:** Open the project manager, enable mark1> click CT button > extract mark coordinates x and y. Then click t to extract the current mark feature.
- **Step 4:** If two mark points are enabled for measurement, repeat the above steps to set Mark2, and then click the Save button in the project manager.
- <u>Be careful! If the effective area of the red view frame is set too high, the measurement will fail because of the super area. The following figure is an example of an error.</u>

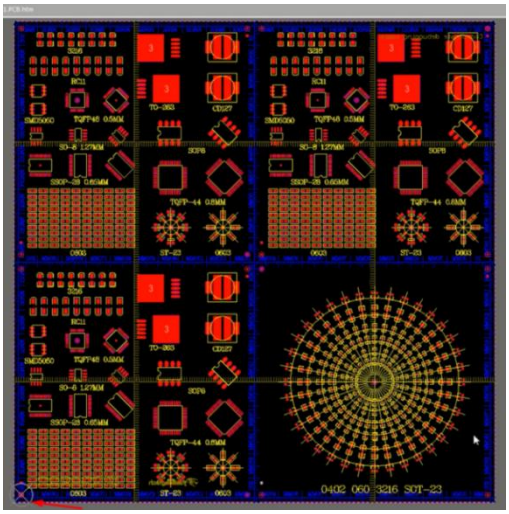


5. How to obtain PCB coordinates

➢ Take Altium designer AD15 software as an example

For the version above AD15, refer to section 8.1 of Chapter VIII.

Coordinate files are exported from PCB and can be divided into txt and CSV documents.

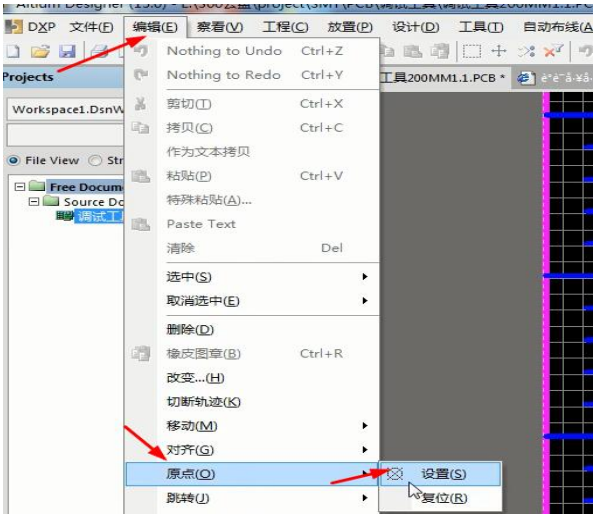


5.1. Export PCB coordinates

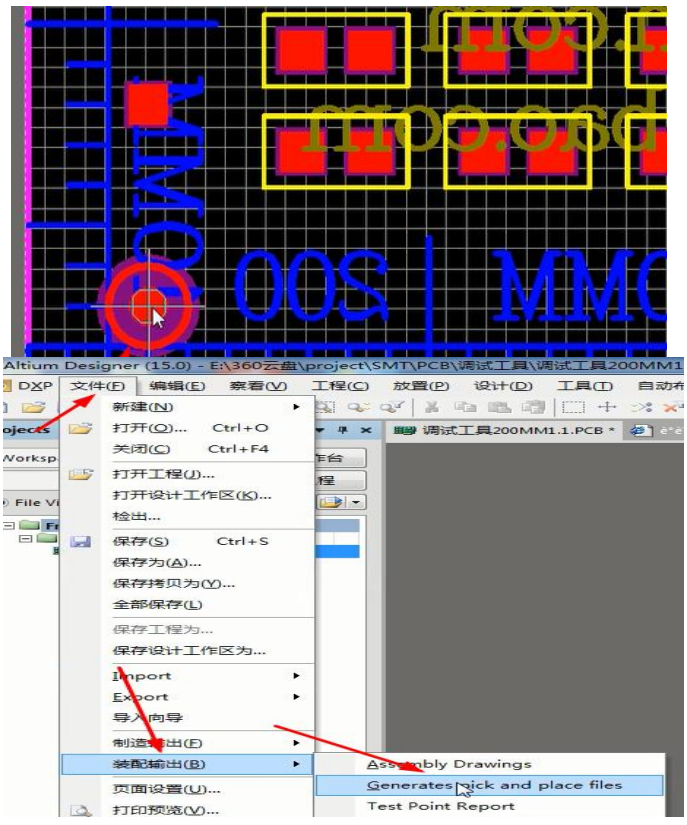
➢ Open a PCB file

➢ Click Edit → Origin → Set up

For any point in the PCB, all parts will output coordinates with this point as the zero point.



➢ Move the mouse to the position where you want to place the origin, and it will automatically snap the alignment.

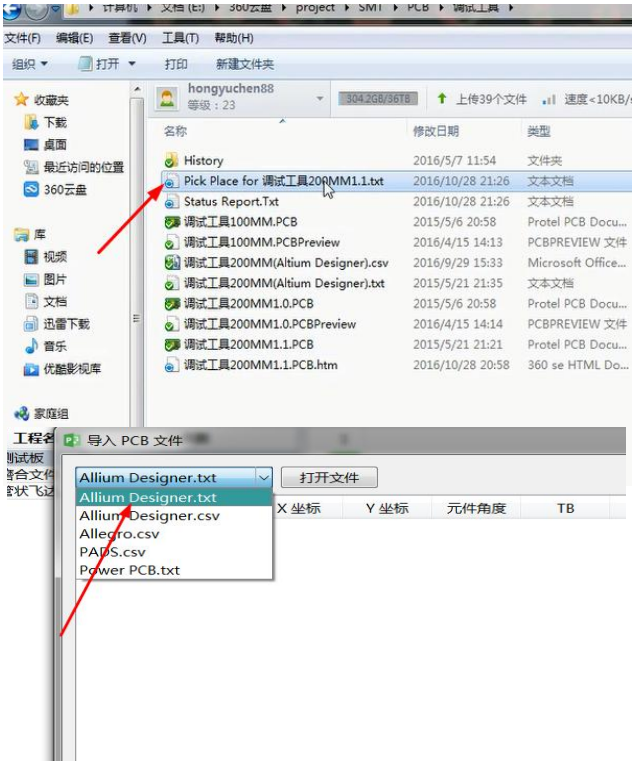


➢ Output mounting coordinates:

File> Assembly output> Generates pick and files

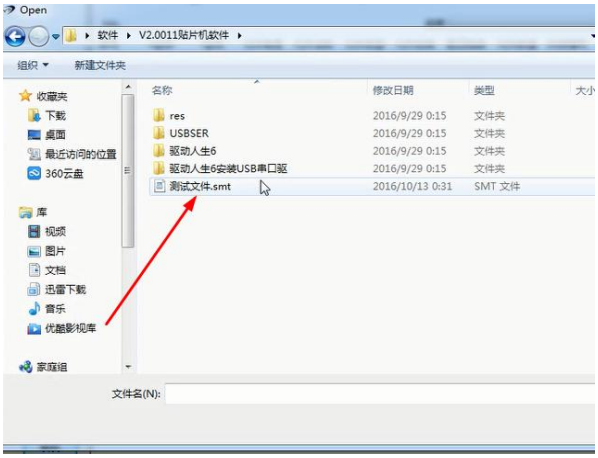
- Pop up setting dialog box: text, metric

- The coordinates will be output, and the output location will be opened in the folder you open. Then copy the file to the desktop for use.



- Open the "project" shortcut button in the mounter software, click the "import PCB file" pop-up window, and the file to be imported now. Note: you can select the suffix corresponding to the file suffix of the imported PCB file.

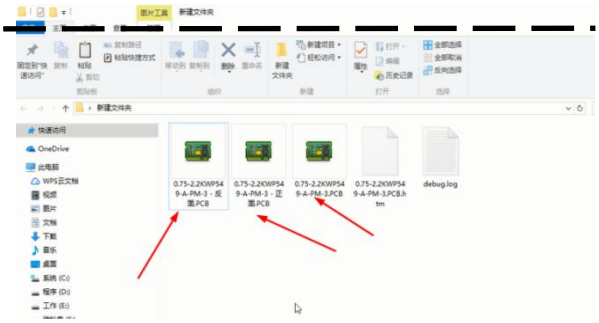
- Then find the file and open it



- Note: if the version of AD15 is above, please refer to 8.1 in Chapter VIII

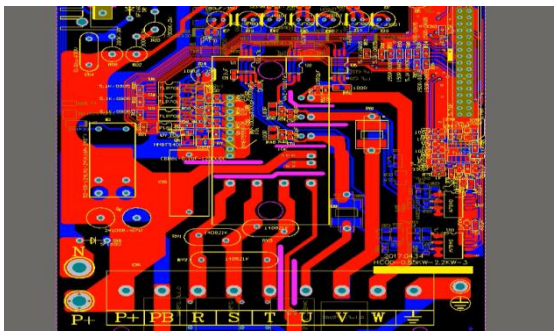
5.2. Method of outputting mounting files with Altium designer software for double sided PCB process

5.2.1. Output front PCB coordinate file

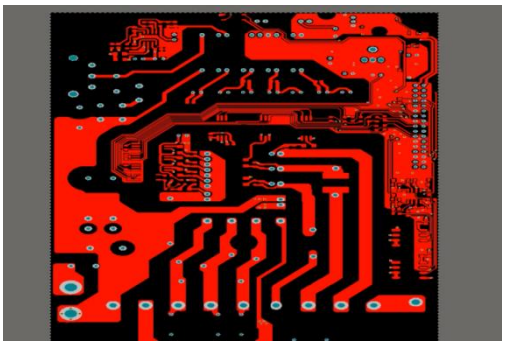


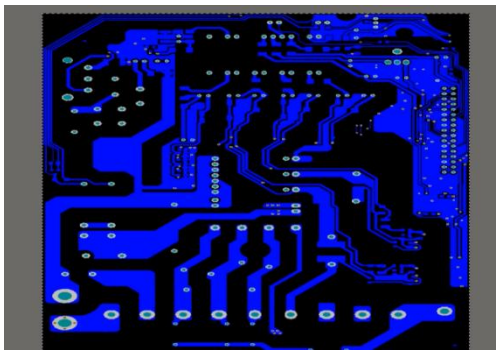
- Locate the PCB file and make two copies, named "front" and "back"

- First, open the "front" as shown in the figure. At this time, the PCB is transparent It is inconvenient to see both the front and back.

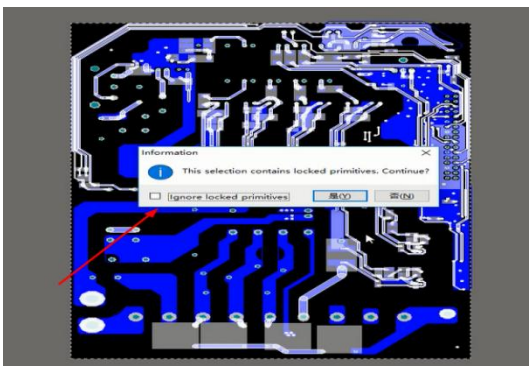


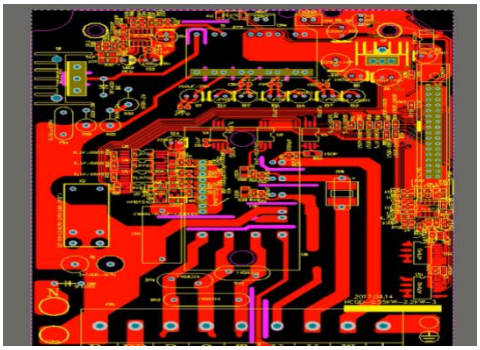
- Shortcut key "shift+s" switches to single layer mode



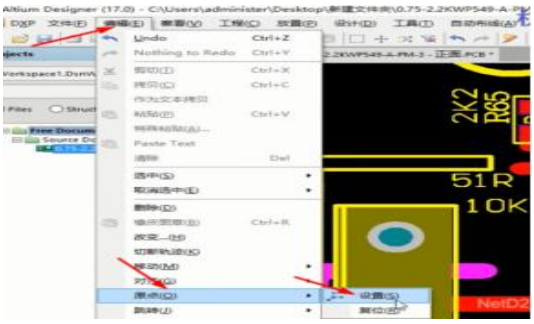


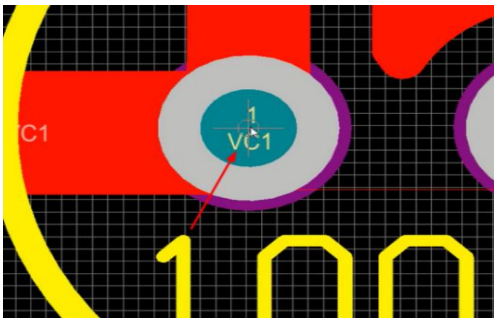
- Delete "reverse". Select all "reverse" and press the shortcut key "delete". Switch "front" and the shortcut key "shift+s" to switch the transparent mode.



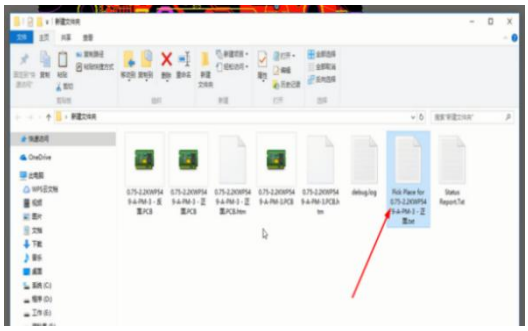


➢ Set the origin for PCB. The origin is set at any corner around the PCB or on the pad.



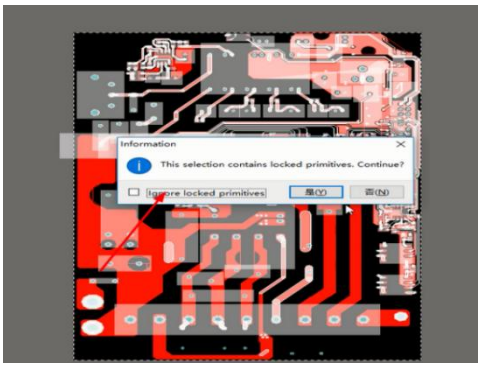


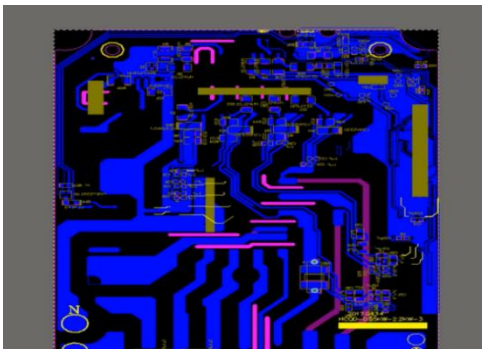
➢ Output coordinates (as shown in the figure, "front" coordinates are output).



5.2.2. Input PCB coordinate file on the reverse side

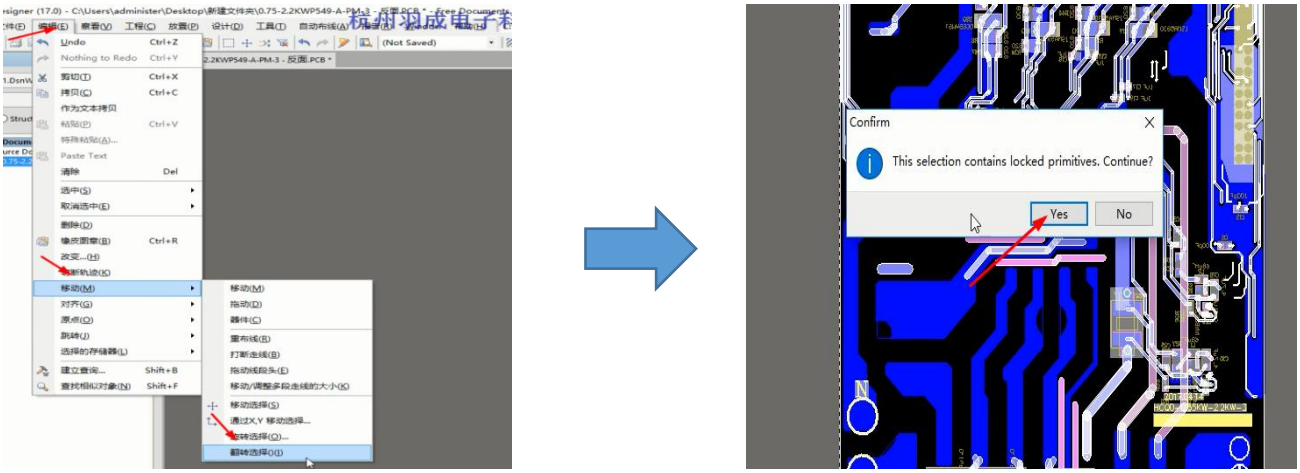
Coordinate output of "reverse side". Open the "reverse side" of the PCB, press the shortcut key "shift+s" to enter the single-layer mode, select all the "front side", press the shortcut key "delete", and delete the "front side", as shown in the figure; Toggle "reverse" mode shortcut key "shift+s" toggle transparent mode



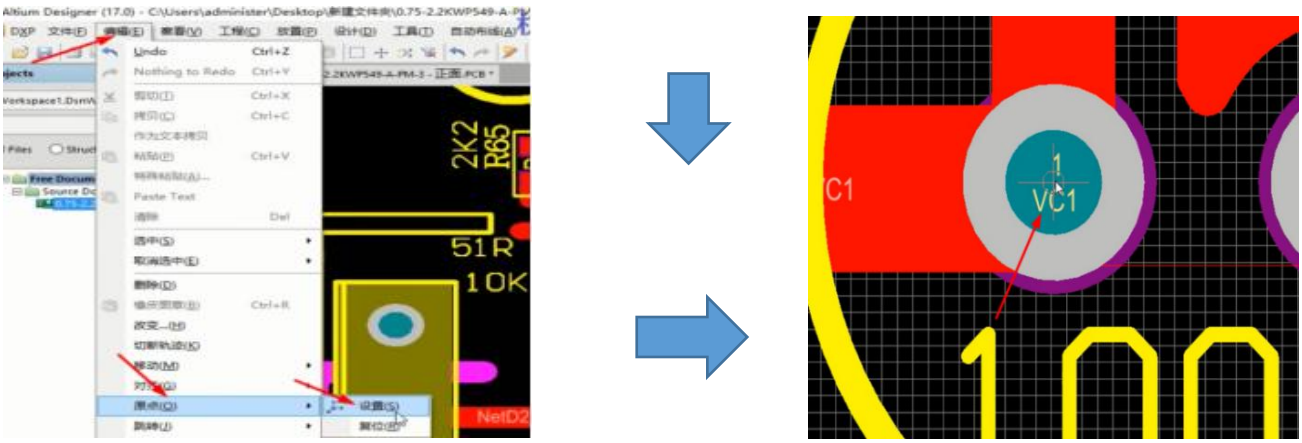


➢ "Reverse" because you want to paste it in reverse, you must have a "mirror direction" option.

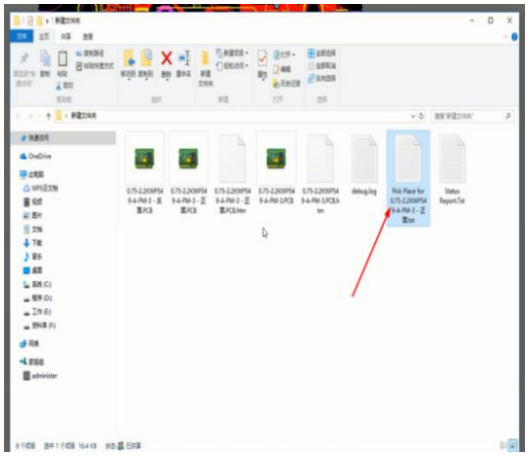
➢ Select all PCB "reverse", edit - move - reverse selection.



➢ Set the origin for PCB. The origin is set at any corner around the PCB or on the pad.



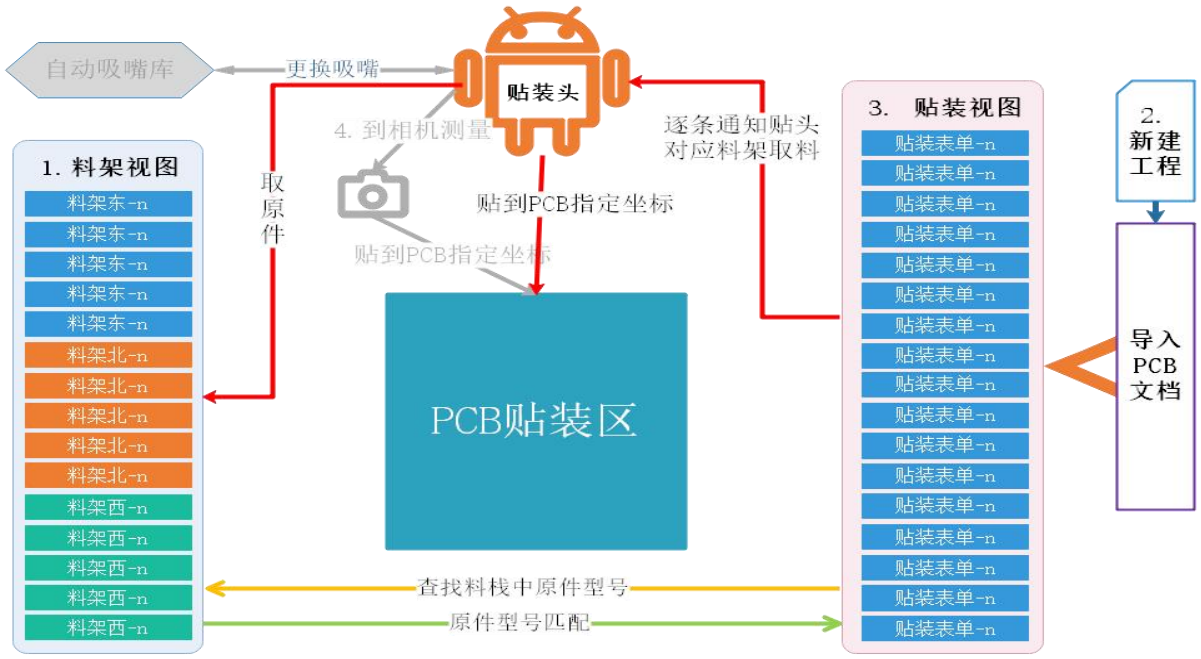
➢ Output coordinates (as shown in the figure, "reverse" coordinates are output)



6. Operational Processes (Building a Project)

6.1. Set up the map

贴片机软件设置引导图



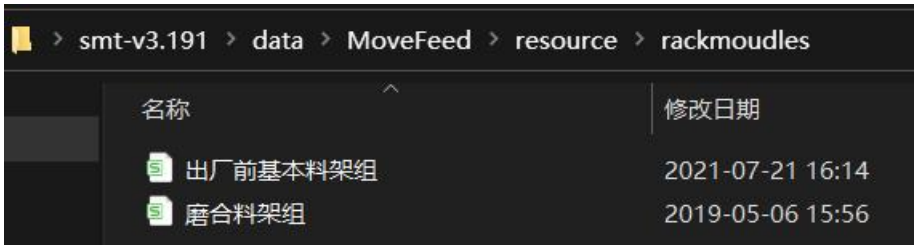
- **Relationship among rack view, mounting head, automatic nozzle library, camera, PCB mounting area and mounting view.**

1. **View of material rack:** coordinate positions and parameters of components on each material rack, and cruise Feida is equipped to eject materials. be careful! The data set by the customer will be saved in the software rack independently. It can be understood visually as an independent warehouse, so different material rack groups establish n independent warehouses of different styles.
2. **PCB mounting area:** mount the original to the designated position of PCB. It can be understood visually as the receiving address.
3. **Mounting head:** take materials according to the instructions of mounting view and paste them on PCB coordinates. Can be understood visually as express delivery man.
4. **Automatic nozzle Library:** it has built-in 6 sizes of nozzles that can be automatically changed, which can be visually understood as the delivery of goods by couriers using small motorcycles or large trucks.
5. **Camera:** measure and correct the component picking deviation caused by the gap in the material belt packaging.
6. **Mount view:** a mount form pastes a part in a drawing view. be careful! The customer setting data will be saved independently in the software project, which can visually understand your multiple shopping orders, and the system will notify the express delivery in order.

6.2. Material Rack Group

1、The system has finished the data of rack group at the factory and can be modified and used directly according to requirements.

2、If you need to add new rack groups, you can copy the rack groups, then modify the name to use, folder path:



3、Custom add rack group, refer to Chapter 3.3.1.1. Material Rack Editor.

6.3. Feeding belt

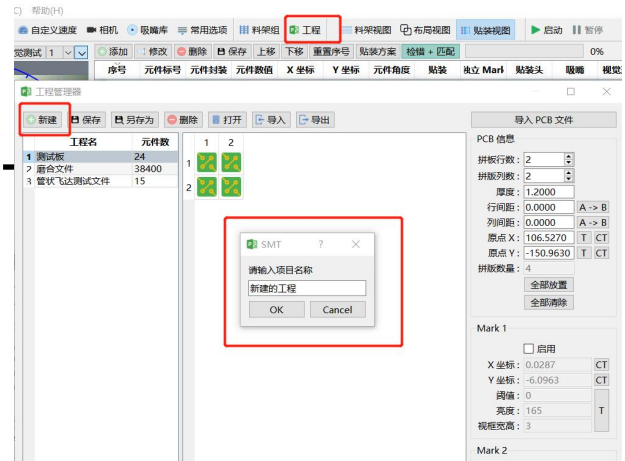
1、Place the tray in the tray box

2、Take out one end of the material belt and pass through the bottom of the machine puller

3、Insert into the corresponding material groove, push the material belt forward, stop when it is about to be pushed to the top, tear off the film covering of the material belt, and pull out the film of the material belt with tweezers

4、Hold the tape film and push the tape forward to the top. Push until the film is long enough. Fold back from the top of the pressing reed (pay attention to the shape of the material film folded back, and keep a certain inclination with the material belt), press and hold the pressing clip to loosen the pressing wheel, the material film passes through the pressing wheel, then release the pressing clip, let the material film press on the pressing wheel and the receiving wheel, and then tighten the material film.

6.4. Build project

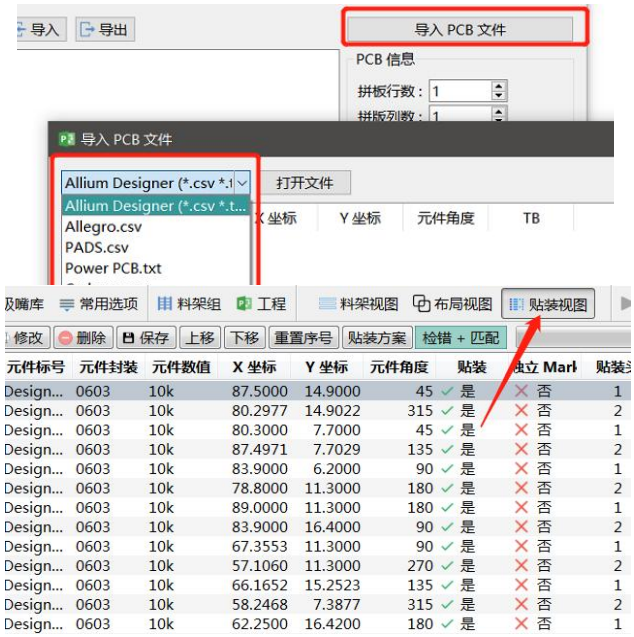


1. Click the "project" button to pop up the

"project manager" dialog box, click the "new" button, enter the project name, and click "OK".

2. Select the name of the new project, click the "open" button to enable this project, and the mount view list is empty at this time.

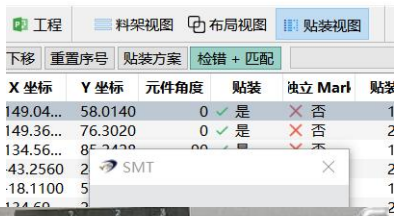
3. Click the "import PCB file" button, select the PCB coordinate document in the corresponding format, click the "open file" button, and select the file to be imported. After importing, the dialog box displays the contents of the coordinate file, and click the "OK" button.



4. At this time, the dialog box "check the number of failed components of the rack" pops up. Ignore it and click the "save" button.

5. Click the "Mount view" button to enter the mount interface.

6. Click the "check + match" button. If a warning pops up, it indicates that the component model in the rack is not retrieved in the mounting list, and the matching material model needs to be modified or forcibly matched.



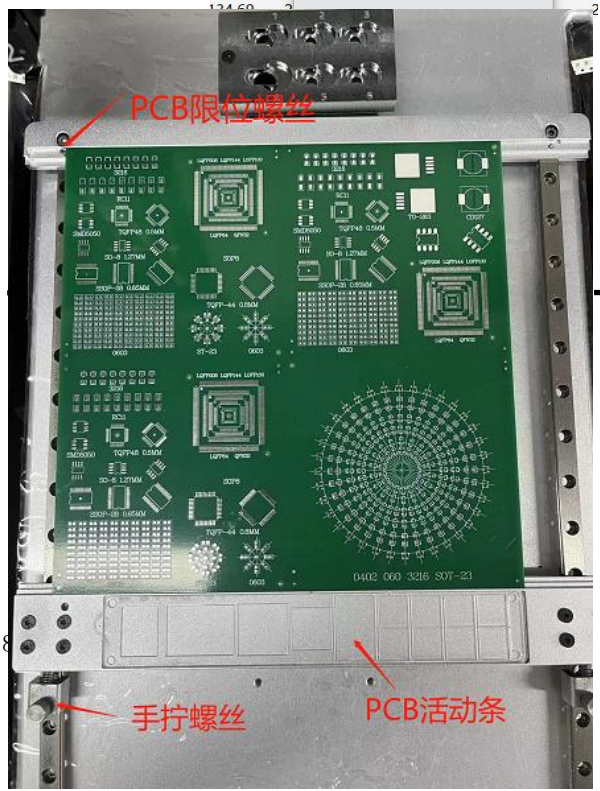
7. To modify the material model, refer to 3.3.1.1 in Chapter III Shelf editing

8. For forced matching, refer to 3.3.3.2 in Chapter 3 Paste list > original edit dialog box

6.5. PCB loading

1. Loosen the hand screw.

2. Adjust the position of PCB movable bar.



3. Place the PCB in the card slot, close to the PBC limit screw in the upper left corner, adjust the PCB movable bar to block the PCB, and lock the screw.

6.6. Specify origin

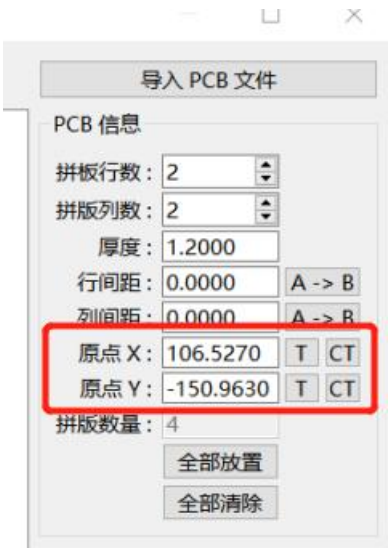
1. Total reset

2. Move the XY axis to move the mark camera to the origin position specified in the PCB coordinate document

3. Open the engineering dialog box and click the "CT" button behind "origin X" and "origin Y"

4. Save origin coordinates

5. After the general reset, click the coordinate center button on the control panel, and mark the camera to the coordinate origin for testing to check whether the origin coordinates are set correctly



6.7. Component editing

1. Click "mounting view", switch to the mounting list interface, and click "error detection + matching", the mounting list will automatically match the batch rack number according to the model and package

2. If the required model cannot be retrieved, the dialog box "failed to check the rack components" will pop up. You can modify the rack parameters or force matching until the matching is completed

3. Click the options at the top of the mounting list to automatically arrange and

optimize the mounting sequence. You can also optimize the mounting sequence by clicking, selecting all, selecting blocks, dragging and selecting batches, moving up and down, and setting the nozzle model

6.8. Production mounting

1. General reset of machine

2. Click "start" to start mounting

3. Right click a component in the mount list to "Mount current" or "mount from current position"

7. Maintenance and warranty

7.1. Equipment maintenance (important, must see)

1. Note: check that there are no sundries on the transfer track and within the moving range of the mounting head.

2. Note: it is forbidden to touch each shaft guide rail by hand, and oil it frequently to prevent rust. A small tube of lubricating oil is attached.

3. Regularly check whether the screws on each shaft are loose and tighten them.

4. Regularly check whether each linear bearing moves flexibly and has abnormal noise.

5. After startup, check whether the vacuum system of the test equipment has obvious

air leakage sound and whether the air pressure meets the standard.

6. Check whether the camera lens fixed on the mounter is free of sundries and clean.

7. Check whether the suction nozzle terminal is deformed due to impact, and confirm that there is no debris blockage inside the nozzle terminal.

8. Clean the scattered parts on the equipment, especially on the chute, so as not to affect the installation.

9. Cover with dust cover when not in use to prevent dust.

7.2.Daily use matters

1. Do not touch the PCB surface with your hands when taking the PCB.

2. Pay attention to the model, specification, polarity and direction of components when adding components during the installation process.

3. During the installation process, pay attention to whether the waste materials in the chute are piled up too high at any time, and clean them up.

4. After the first piece is successfully installed, it should be tested first, and then it can be installed in batches after passing the test.

7.3. About warranty

The warranty period of this machine is 12 months from the date of purchase. During the warranty period, if it is not a man-made fault, we will repair it free of charge. If it is a man-made fault or exceeds the warranty period, we will charge appropriate maintenance fees as appropriate.

★ cylinder, suction nozzle, solenoid valve and filter cotton are consumable products and are not within the scope of warranty.

The numbers on the material trough, suction nozzle library and mounting head are labels. If the numbers fall, it is not a quality problem.

7.4.Consumable suction nozzle

型号	CN040	CN065	CN140
外径	Φ 0.75	Φ 1.20	Φ 2.20
内径	Φ 0.38	Φ 0.65	Φ 1.4
外形			

型号	CN220	CN400	CN750
外径	Φ 3.6	Φ 6.2	Φ 9.0
内径	Φ 2.2	Φ 4.0	Φ 7.5
外形			

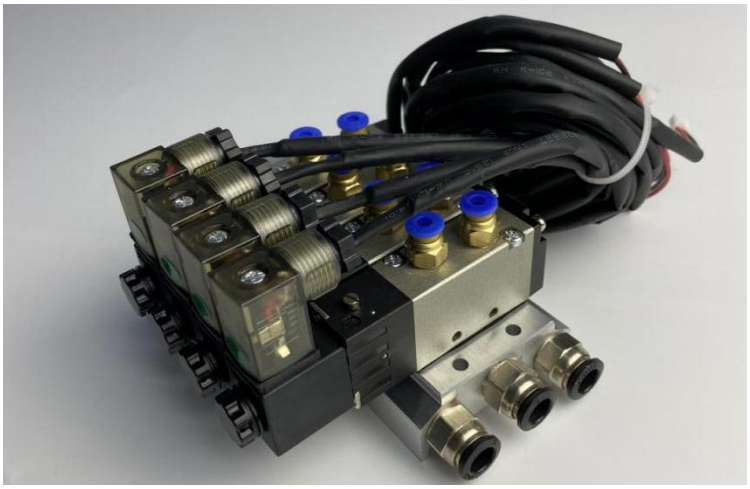
Note: the selection of suction nozzle depends on the outer diameter of suction nozzle. The diameter of the chip is a little larger than the outer diameter of the suction nozzle.

Cn040 is mainly used for 0402

Cn065 is the most widely used, including 0603, 0805, 1206, secondary pipe and tertiary pipe.

7.5.Consumable cylinder

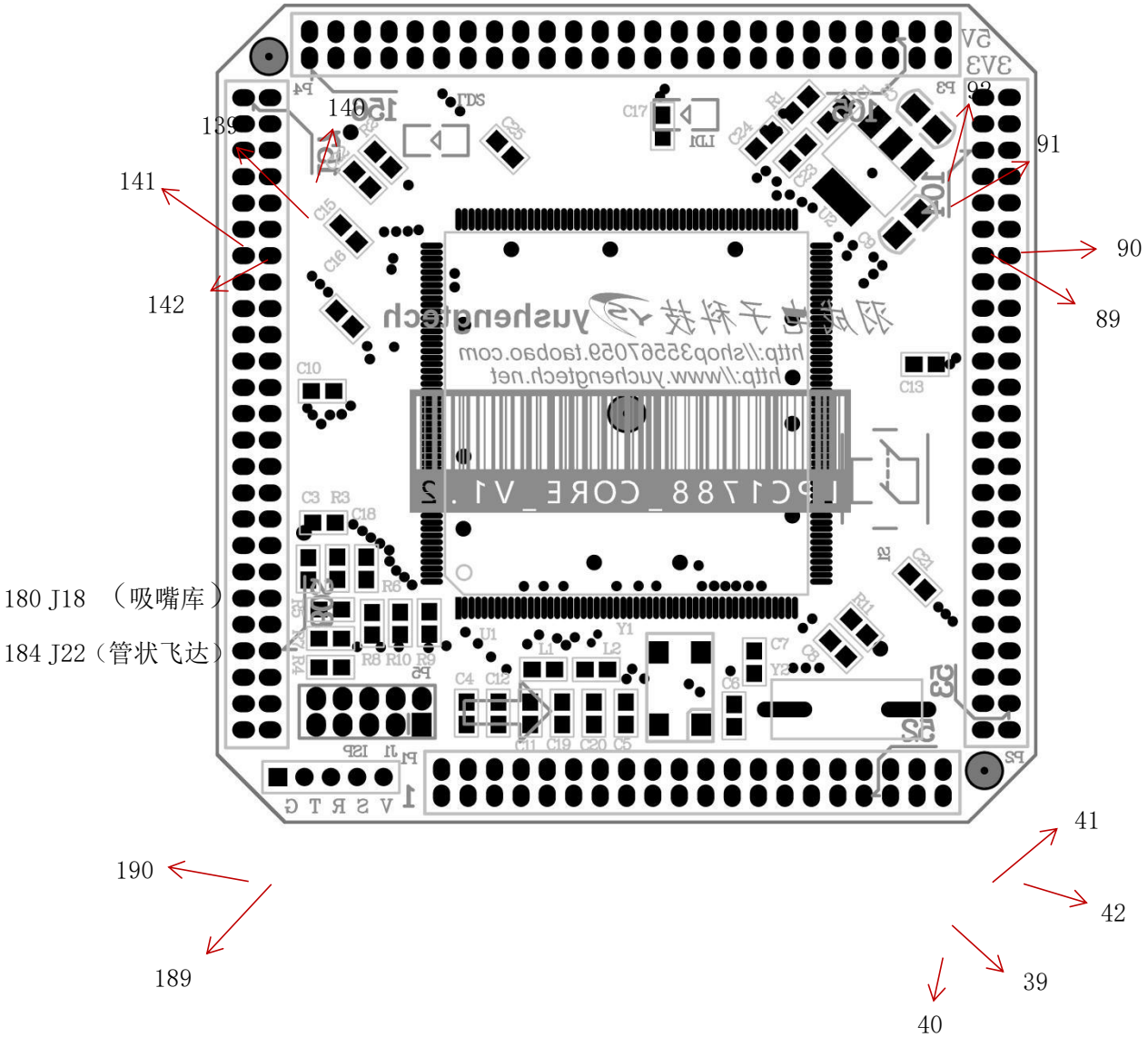
7.6.Consumable solenoid valve



7.7. Consumables filter cotton

7.8. Core board port function

串口	视频	光源	电磁阀	复位传感器
116 RXD	124 V1	129 PWM1	132 J32（真空 1）	95 X1 IR
118 TXD	126 V3	127 PWM2	133 J30（真空 2）	97 Y1 IR
	130 V3	125 PWM2	134 J29（送料西）	101 F1 IR
			135 J27 （送料北）	102 F2 IR
			137 J25（送料东）	103 F3 IR



注：CP=脉冲　　CW=方向　　阿拉伯数字为 PCB 上对应的端子号

X 轴	Y 轴	真空	吸嘴 1	吸嘴 2	Z 轴	送料西	送料北	送料东
4 X CP	6 Y CP	9 真空②	12 A1 CP	13 A2 CP	15 Z CP	17 F1 CP	22 F2 CP	23 F3 CP
5 X CW	7 Y CW	11 真空①	14 A1 CW	16 A2 CP	18 Z CW	19 F1 CW	24 F2 CW	26 F3 CW

拉皮西	拉皮北	拉皮东	复位检测
27 L1 CP	32 L2 CP	25 L3 CP	29 Z2 IR
30 L1 CW	34 L2 CW	26 L3 CW	31 Z1 IR

7.9.Main board terminal location diagram

感器端子 J1（从左到右 ⇨ 1 负极，X 信号，Y 信号，3 电源 5V），J16 （从左到右 1 信号，2 负极，3 电源 ）

J1 传感器 X Y 轴 J16 移动飞达西轴传感器 J11 移动飞达北轴传感器 J12 移动飞达西轴传感器

- **机头信号线**

J47 从左到右 ⇨ 1 电源 12V， 2 MARK 相机光源， 3 MARK 相机视频输出， 4 吸嘴 1 复位传感器，
5 吸嘴 2 复位传感器， 6 吸嘴 1 真空信号， 7 吸嘴 2 真空信号， 8 负极

- **相机光源端子**

J21 光源 1 J24 光源 2 （从上到下 ⇩ 1 电源，2 负极 ）

- **视频端子**

J26 视频输出端子（ 从上到下 ⇩ 1 视频，2 负极 ）
J28 相机 1 端子 ，J31 相机 2 端子 （ 从上到下 ⇩ 1 视频输入， 2 负极 ， 3 电源 12V ）

- **电机驱动端子** （ 从上到下 ⇩ 1 方向，2 电源 5V ，脉冲 ）

J45 拉皮电机北 J38 拉皮电机西 39 拉皮电机东 J40 移动飞达电机东 J40 移动飞达电机北 J42 移动飞达电机西 J43 电机 Z1
J44 吸嘴电机 A2 J3 吸嘴电机 A1 J36 电机 Y J37 电机 X J7 电机 Z2 J8 吸嘴电机 A4 J9 吸嘴电机 A3 J33 点胶开始输出
J46 点胶完成输入

- **电源端子**

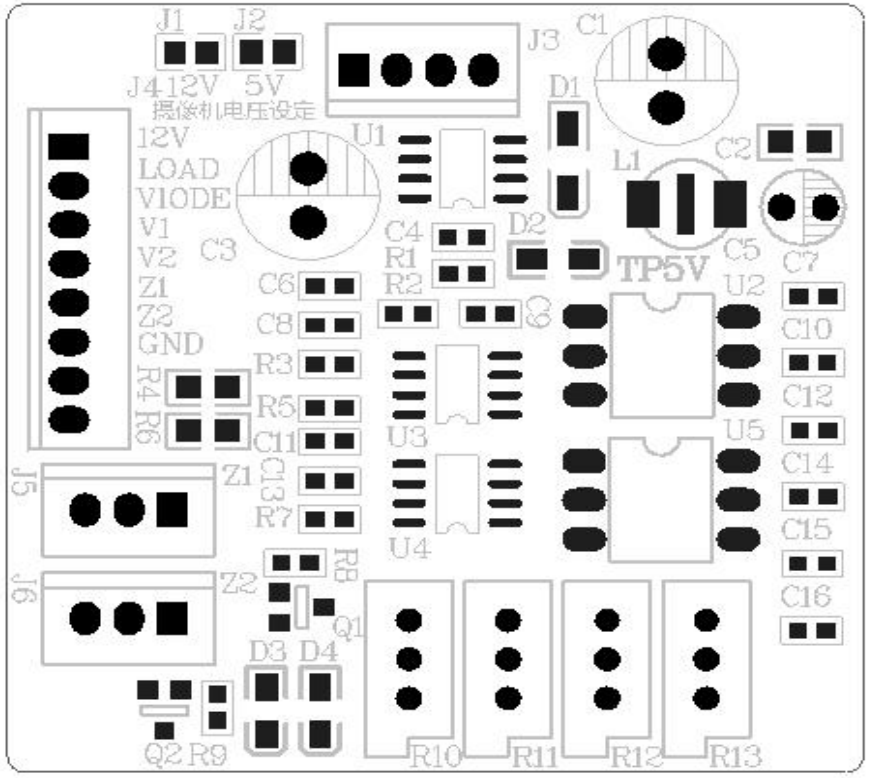
J13 电源输入（ 从上到下 ⇩ 1 电源 40V ， 2 负极 ）

➢ 电磁阀端子

J25 送料东　J27 送料北　J29 送料西　J30 真空 2　J32 真空 1　J18 吸嘴库　J20 手动确认功能知识灯　J22 管状飞达

➢ 按键面板端子

J28 到控制面板



➢ 机头信号线 （从上到下⇩）

J4 1 电源 12V 2 MARK 相机光源 3 MARK 相机输出 4 吸嘴 1 真空信号 5 吸空信号
6 吸嘴 1 复感器 7 吸嘴 1 复位传感器 8 负极

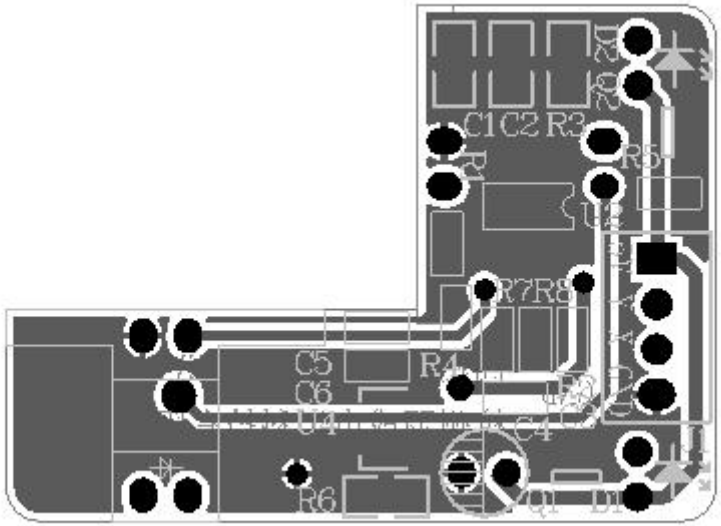
➢ 传感器端子（从左到右⇨1 信号，2 负极，3 电源）

J5 A1 传感器 J6 A2 传感器

➢ 视频端子 （从左到右⇨）

J3 1 MARK 相机光源 2 电源 5V 3 负极 4 MARK 相机视频输出

XY sensor location map

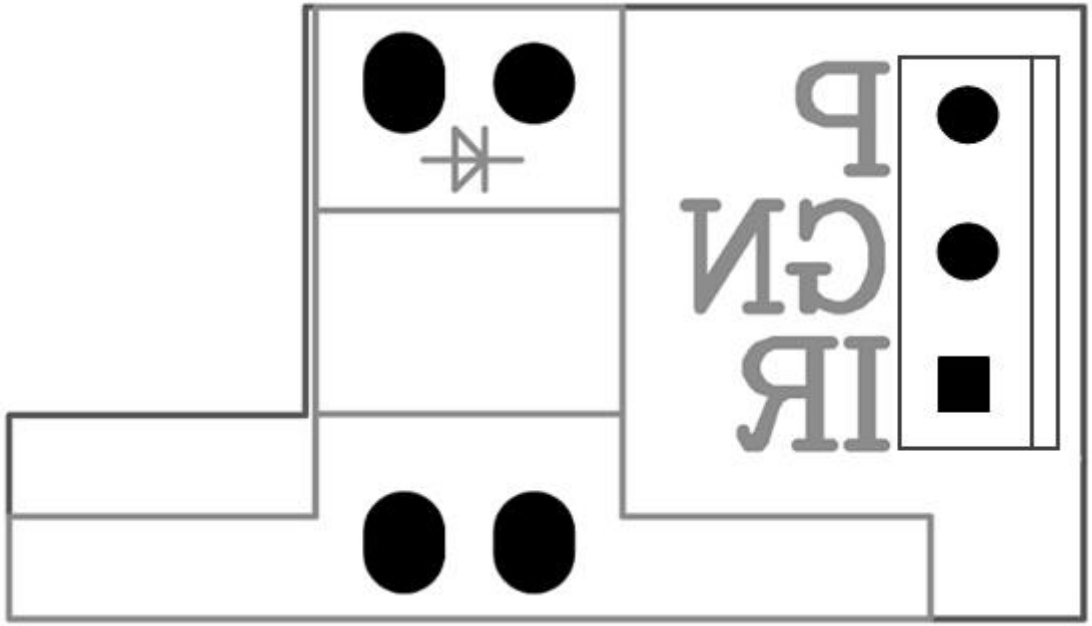


When the sensor is not turned off : 1. P 5V 2.X 0V 3.Y 0V 4.GND 0V
When the sensor is turned off : 1. P 5V 2.X 3.3V 3.Y 3.3V 4.GND 0V

➢ X、Y 传感器端子 （从上到下 ⇩）

1 传感器电源 5V	2 Y 传感器信号	3 X 传感器信号	4 传感器电源负极 GND

Sensor location diagram of version b

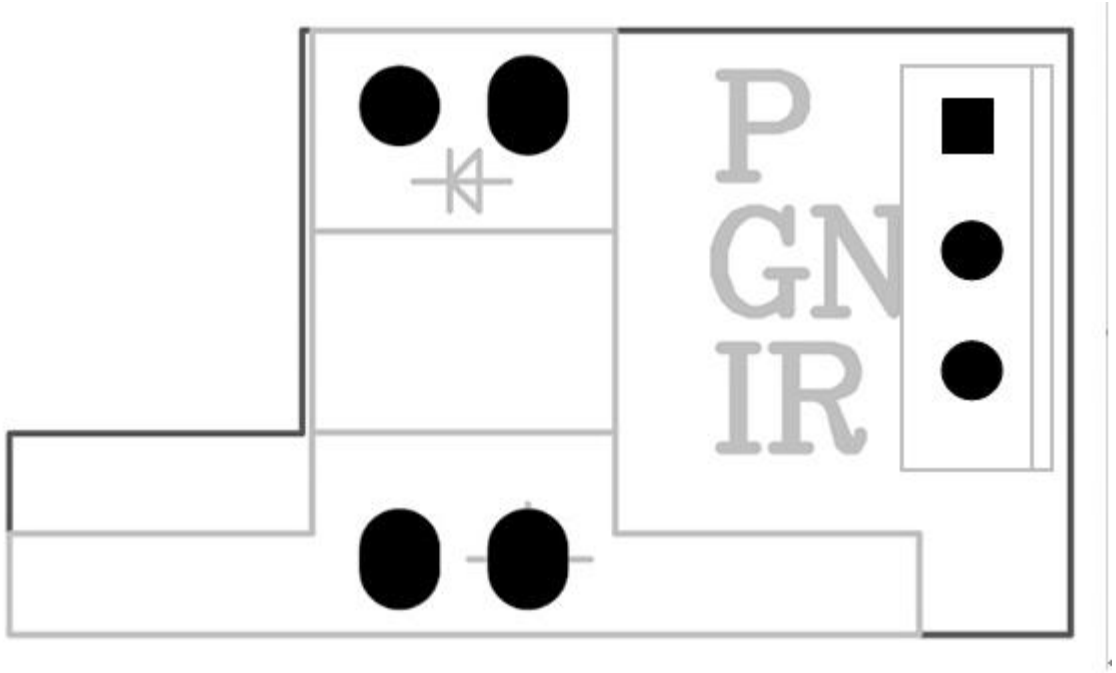


When the sensor is not turned off : P->GND=1.0V IR->GND=0.4V
When the sensor is turned off : P->GND=1.0V IR->GND=3.3V

➢ 传感器端子（从上到下⇩）

1 电源	2 负极	3 信号

Sensor location map of version a



When the sensor is not turned off : P->GND=1.0V IR->GND=0.4V
When the sensor is turned off : P->GND=1.0V IR->GND=3.3V

➢ 传感器端子 （从上到下 ⇩）

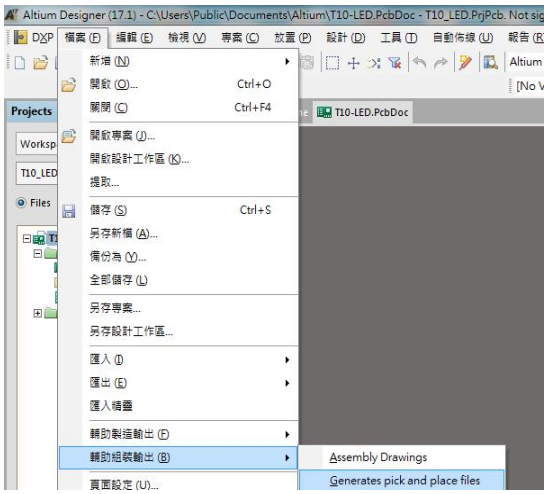
1 电源	2 负极	3

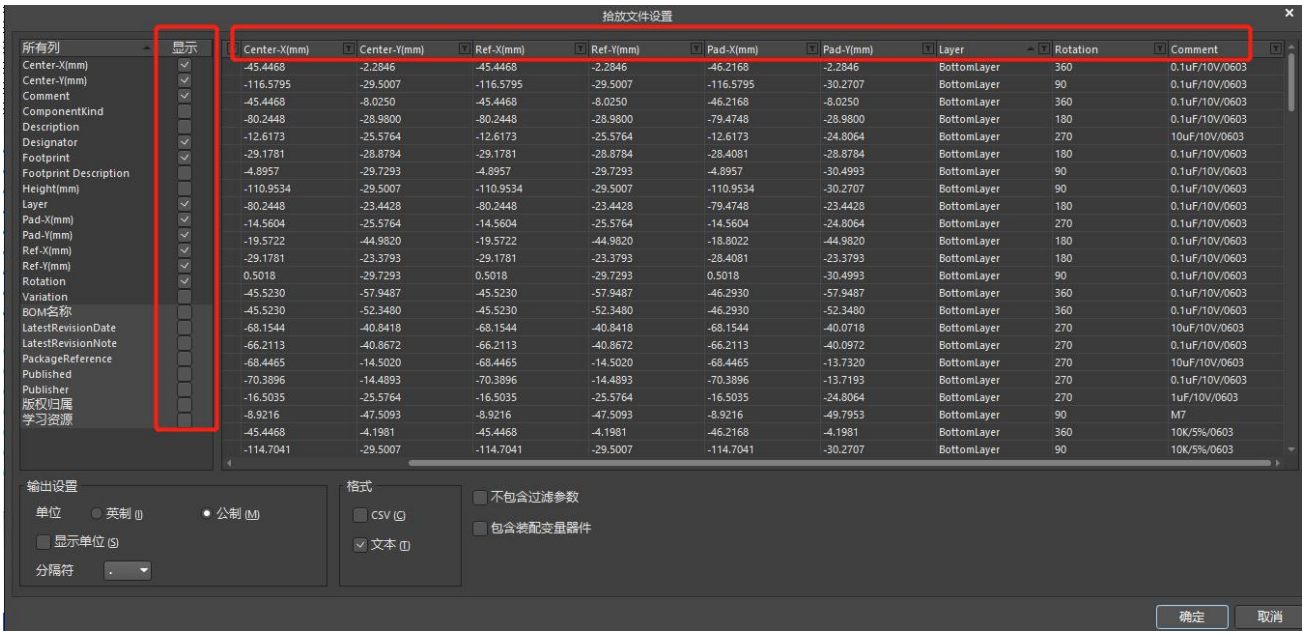
8. Common problem handling methods

8.1. The imported coordinate files of Altium designer of higher version are few or cannot be imported

1. The drawing software version of guide coordinates is too high. (versions below ad17 are recommended),

2. If it is a higher version, the customer can export the coordinate document according to the method of the following options.





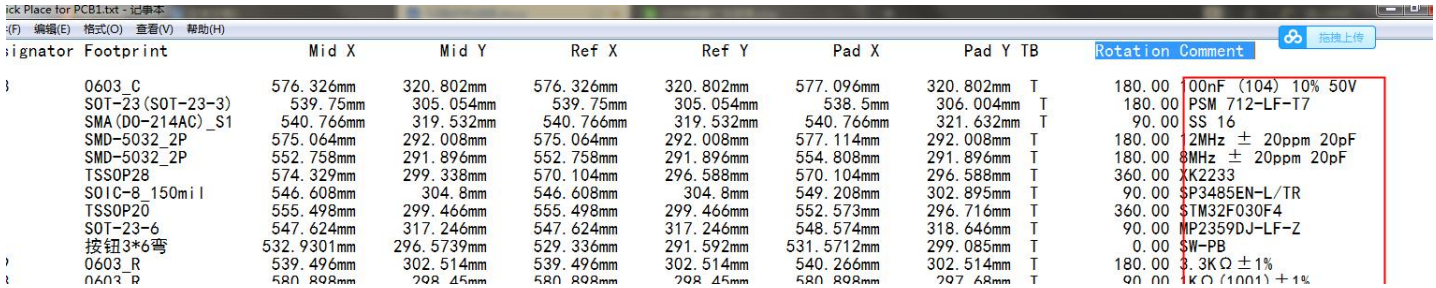
3. Example of outputting TXT coordinate document

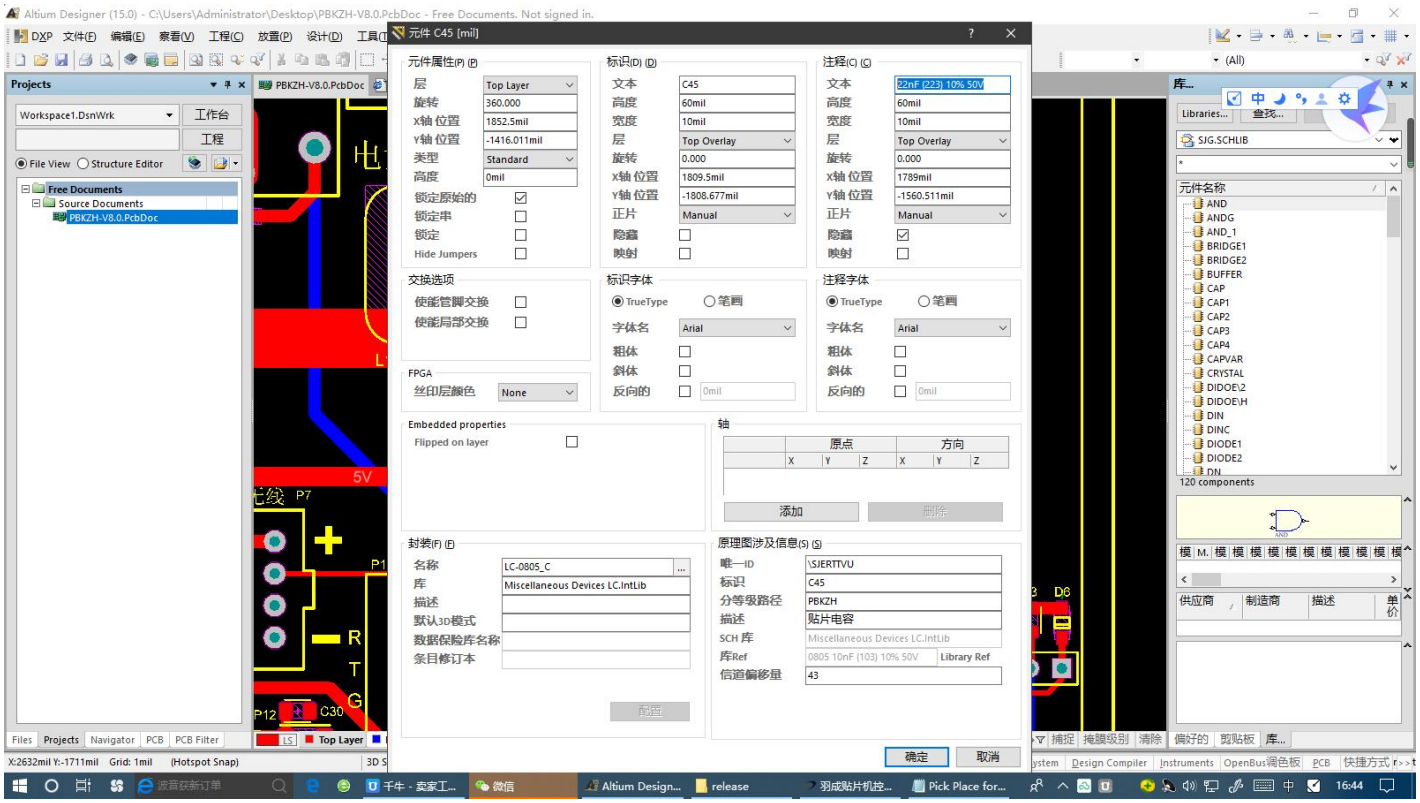
Units used: mm

Designator	Footprint	Center-X(mm)	Center-Y(mm)	Ref-X(mm)	Ref-Y(mm)	Pad-X(mm)	Pad-Y(mm)	Layer	Rotation	Comment
RP1	R_0805_L	10.8076	29.3782	10.8077	29.3781	10.8076	30.3282	DrillDrawing	270	5
Q2	SOT-23	4.2670	24.6771	5.2195	25.6931	5.2195	25.6931	DrillDrawing	180	BC846B
Q1	SOT-23	10.1903	24.6771	11.1428	25.6931	11.1428	25.6931	DrillDrawing	180	BC846
R8	R_0603_L	7.9888	33.4038	7.9888	33.4038	7.9888	32.6268	DrillDrawing	90	1K
R7	R_0603_L	6.1943	33.4147	6.1943	33.4147	6.1943	34.1917	DrillDrawing	270	180K

4、Found a few pieces

Solution: open the txt file exported from the engineering software. Check whether there is a space between the values in the column of rotation comment. Delete if any. (delete directly in txt document or in engineering software)





8.2.Can the software import Gerber files?

1. Gerber file is a computer software, which is a document format collection of PCB industry software to describe PCB (circuit layer, solder mask layer, character layer, etc.) images and drilling and milling data. It is a standard format for image conversion in PCB industry. It can be understood that Gerber is a layer file for PCB factories, because there is no original coordinate information, which is different from the SMT industry format, and it cannot be used directly.

2. You can check the network disk -> file -> Method of exporting component coordinates in Gerber file.

Note: the document is downloaded by Baidu and needs to be verified by the customer.

Or Baidu search uses other manual conversion methods to obtain coordinate information.

8.3."Request timeout" found when the software is online

Resolvent:

1、Check the "device manager" port number of the computer and select the corresponding serial port number in the "SMT" software.

2、If you find that the "device manager" has a port number displayed, but there is a yellow flag.
You need to download a driver。

(there is a small CD in the yellow bag of USB converter. Select the "USB serial driver" folder in the small CD to install it)

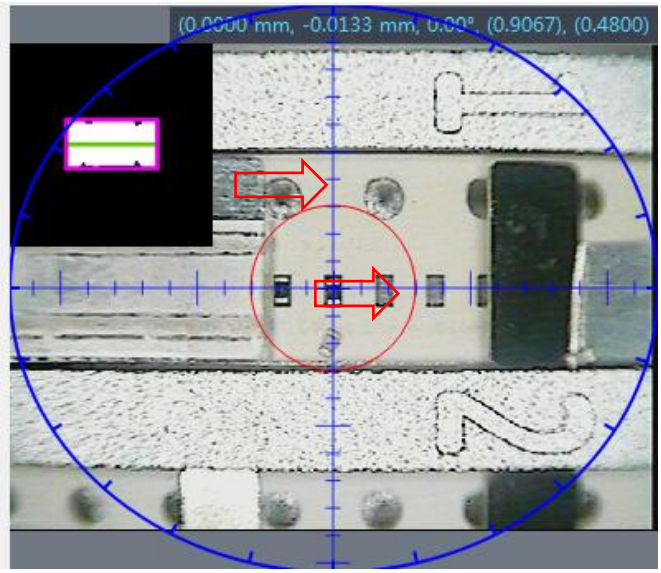
3、Win10 system has no port display. It may be hidden.
"Device manager" click "view". You can also download one.
Install in the "USB serial driver" folder on the compact disc.

8.4. Why does Feida feed two pieces at a time when pasting "0402"

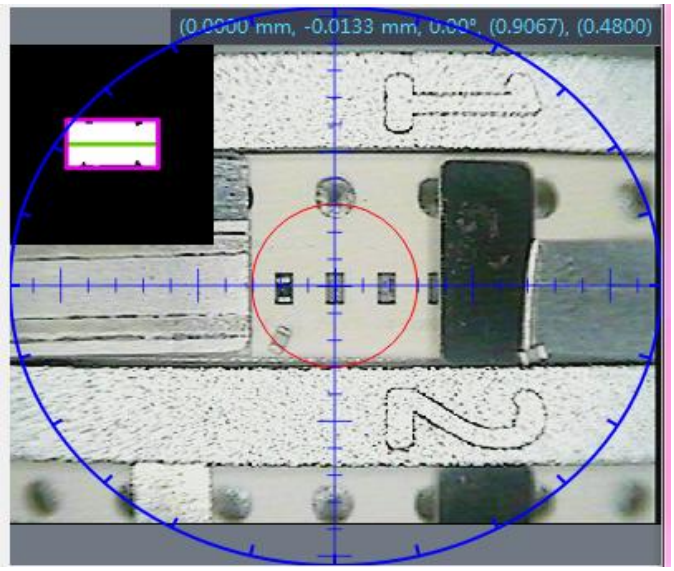
Solution: the normal Feida feeding is 4mm at a time. Because "0402" is relatively small, it is necessary to set "feeding method" as "0402" in the rack view separately.

8.5. When pasting "0402" with No. 2 header, the coordinate is out of limit

Move the steel sheet drawing and picking coordinates forward by one level respectively, and the Feida punching position remains unchanged.



Before



After

8.6. Feida deviated when feeding

Phenomenon	Reason	Terms of settlement
Feida feeding left-right deviation	Feida feeding coordinate offset	Re extract feed head coordinates
Feida feeding up and down	Tightness of rack screws	Adjust the tightness of the rack screws

8.7. The suction nozzle cannot take the material

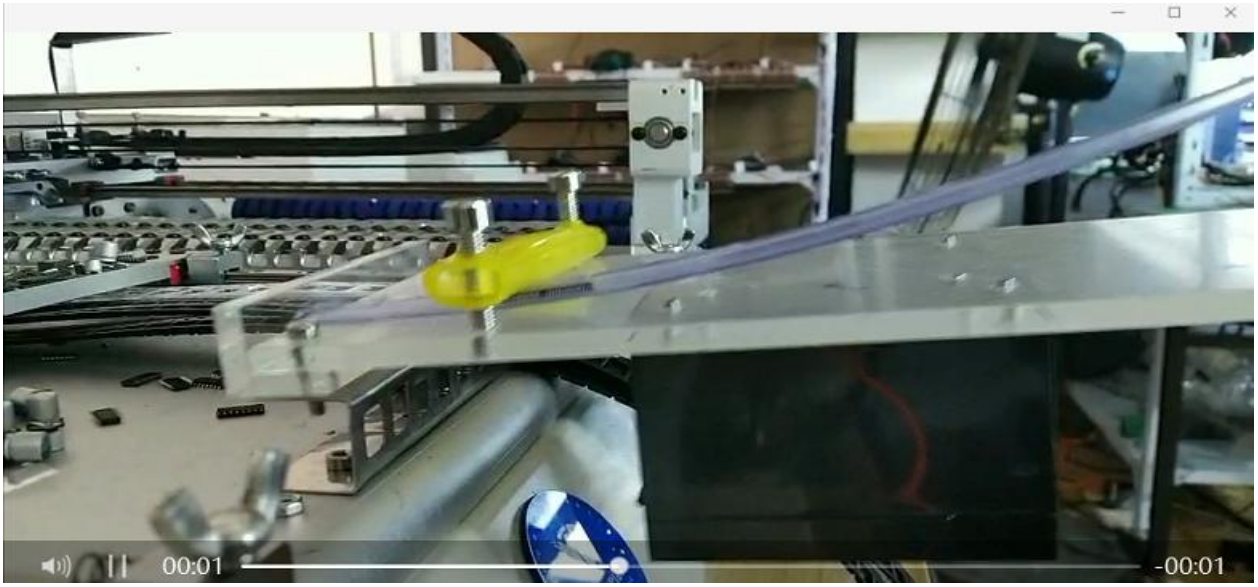
Reason	Verification method	Terms of settlement
Picking coordinate deviation	Mark camera to rack coordinate test	Re extract the feeding coordinates
Insufficient reclaiming height	Z-axis speed decreases. Look at the slow action of suction nozzle to reclaim	Reclaim height
The suction nozzle does not match the component	Is the outer diameter of the suction nozzle smaller than the diameter of the element	Use a suction nozzle that matches the component

8.8. Throwing material

Reason	Verification method	Terms of settlement
The suction nozzle does not match the component	Is the outer diameter of the suction nozzle smaller than the diameter of the element	Use a suction nozzle that matches the component
Vacuum value not reached	Open the "vacuum pump" in the software and block the suction nozzle by hand Look at the vacuum value on the panel (the value is above 35)	Check whether there is air leakage in the corresponding air circuit
Steel sealing ring is short of oil	The machine needs oiling and maintenance every half month	Add butter

8.9. Vibration Feida material doesn't go

- New materials need to be added and pushed forward by gravity



8.10. Visual error

Reason	Verification method	Terms of settlement
Visual camera is not selected right	Suction nozzle 1 can select camera 1 and 2 Suction nozzle 2 can only be used with camera 2	Select the corresponding camera

8.11. Z-axis fault

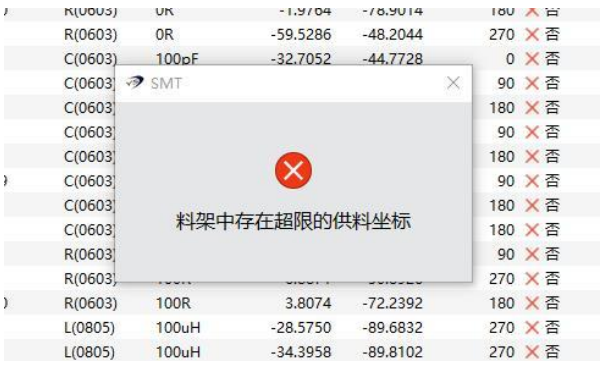
Reason	Verification method	Terms of settlement
Suction nozzle reclaiming height is too high	"Z-axis speed decreases" look at the slow action of suction nozzle to reclaim	Re extract (the suction nozzle must be reset when extracting)
Thickness of parts not filled	Thickness of components in rack view	Fill in component thickness
The height from suction nozzle to PCB platform is too high	"Z-axis speed decrease" to see the slow action of suction nozzle descending	Re extract the suction nozzle to the height of PCB platform

8.12. Z coordinate out of limit

Solution: (1) the coordinate extraction method is wrong

Reason	Resolvent
There is no z-axis reset when extracting the picking coordinates	Re extract coordinates
Suction nozzles 1 and 2 are not reset at the reclaiming height	Re extract coordinates
When extracting the North picking coordinate, the front one is not extracted	Re extract coordinates

(2) The warning of "over limit feeding coordinates" pops up. Or "Transfinite feed head displacement"



Solution: we should form the habit of looking at the overall material rack view. The overall comparison will find many problems.。

供料坐标 X	供料坐标 Y	供料头位移
368.4530	-35.3626	-18.8571
368.5390	-47.1885	-30.8571
368.5390	-59.3300	-42.5714
367.9360	-71.3281	-54.5714
368.4810	-83.2974	-66.2857
368.3380	-95.3529	-78.2857
368.2800	-107.5230	-90.0000
368.4530	-119.2920	-102.0000
368.1650	-131.2030	-114.0000
368.1370	-143.2020	-126.0000

As shown in the left figure: the (feeding coordinate x) in the East is a positive number, and the value changes. It's not too big. (feeding coordinate y) is a negative number, and the value will become smaller. (feed head displacement) is a negative number, and the value will become smaller and smaller.

106.6800	-9.6730	20.0000
125.9300	-9.6730	39.7143
144.0310	-9.6730	55.4286
160.1210	-9.6730	71.4286
176.2100	-9.6730	87.4286
192.0130	-9.6730	103.1430
208.1020	-9.6730	118.8570
224.4790	-9.6730	135.1430
240.5690	-9.6730	150.8570
255.7970	-9.6730	166.8570
272.1730	-9.6730	182.8570
287.9760	-9.6730	198.5710
302.1400	-4.5064	210.2860
314.1220	-4.2194	222.2860
325.9010	-4.2194	234.2860

As shown in the left figure: the (feeding coordinate x) in the north is a positive number, and the value will increase bigger and bigger. (feeding coordinate y) is negative, and the value change is not very large (feeding coordinate y). (Head displacement) is a positive number, and the value will become larger and larger.

32.1792	-51.8671	-27.4000
32.1505	-63.7504	-39.6857
32.2367	-75.6623	-51.0857
32.4091	-87.7752	-63.9429
32.1792	-99.7445	-74.5429
32.2367	-111.8000	-87.1143
32.4091	-123.7120	-99.1143
32.2367	-135.9680	-111.3710
32.2942	-147.6510	-122.8000
32.4953	-159.5910	-134.8290
32.4378	-171.5610	-146.2570
32.3229	-183.6160	-158.5430
32.5240	-195.6430	-170.5140
32.6102	-207.6410	-182.2290

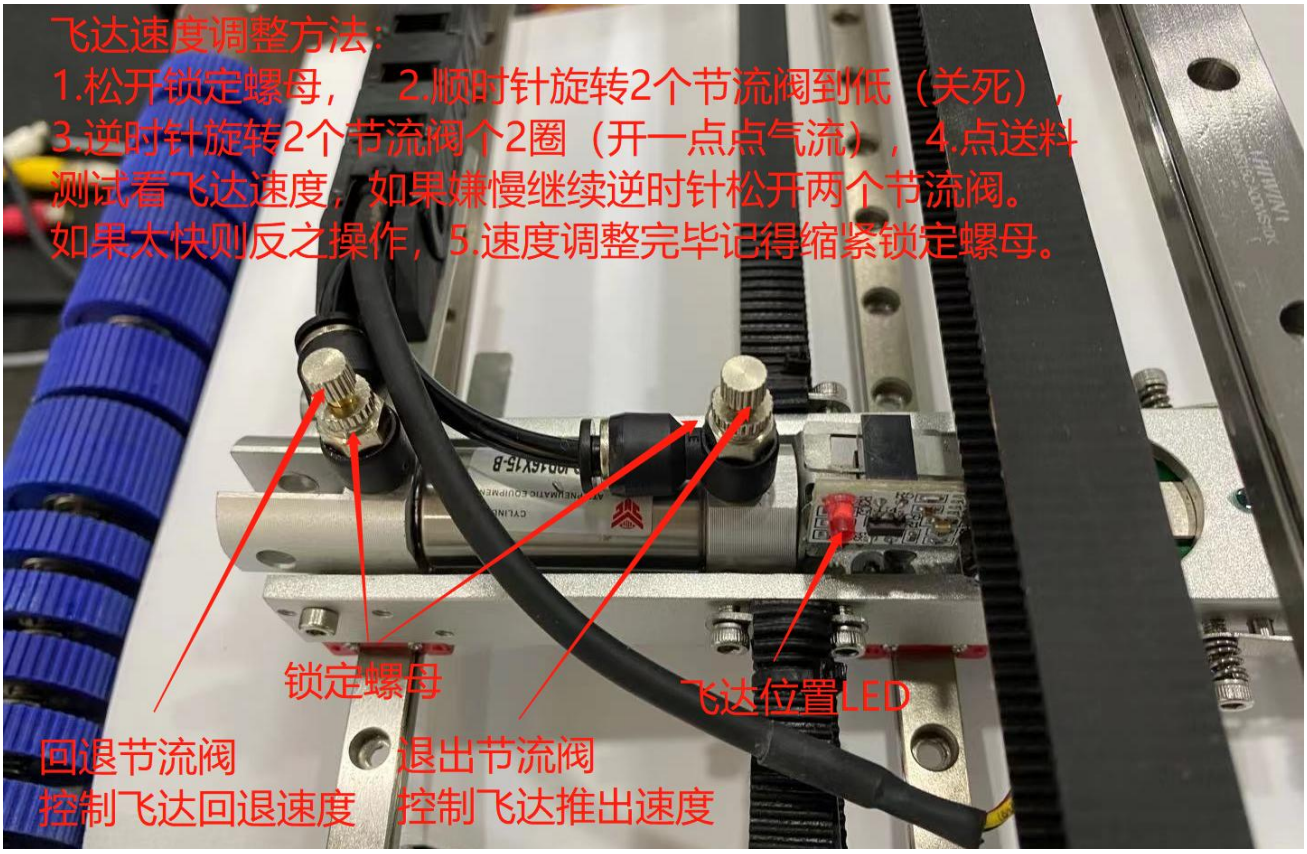
As shown in the left figure: the (feeding coordinate x) in the west is positive, and the value does not change much. (feeding coordinate y) is a negative number, and the value will become smaller. (feed head displacement) is a negative number, and the value will become smaller and smaller.

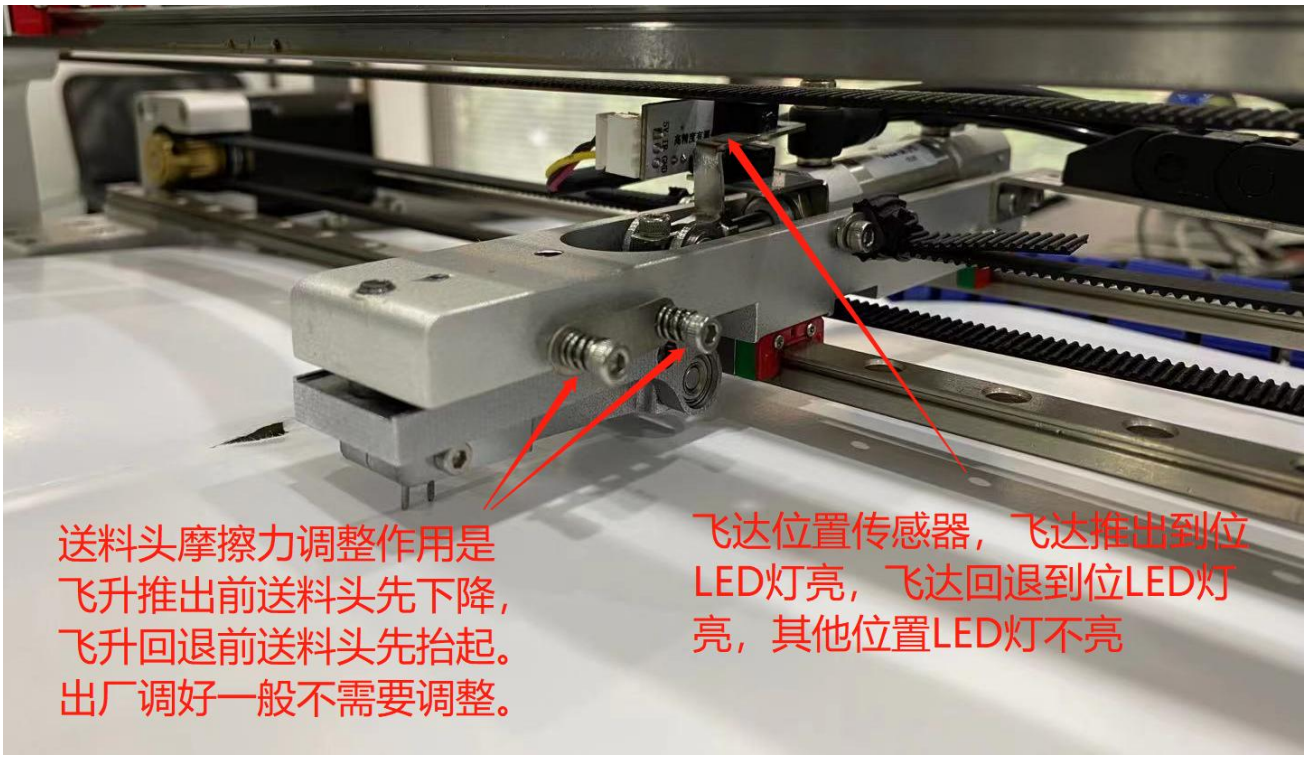
8.13. Mounting components will deviate

Phenomenon	Reason	Resolvent
Overall mounting offset	The origin is offset	Re extract origin
	Uneven PCB board clamping	Recalibrate the installation position of PCB board
	Mounting speed is too fast	Reduce mounting speed
Incorrect mounting of certain components	Suction nozzle is not concentric	Check and replace the suction nozzle
	Feida feeding has deviation	Re extract the displacement coordinates of the feeding head
	Picking coordinate offset	Re extract picking coordinates
	Suction nozzle to PCB board drops too much	Re extract the coordinates from the suction nozzle to the PCB board
	The vision is not corrected well	Recalibrate vision
Incorrect mounting angle	Abnormal rotation of suction nozzle	Check whether the suction nozzle motor terminal is loose
	Suction nozzle mismatch	Replace the matching suction nozzle
	Component angle is wrong	Modify component angle again

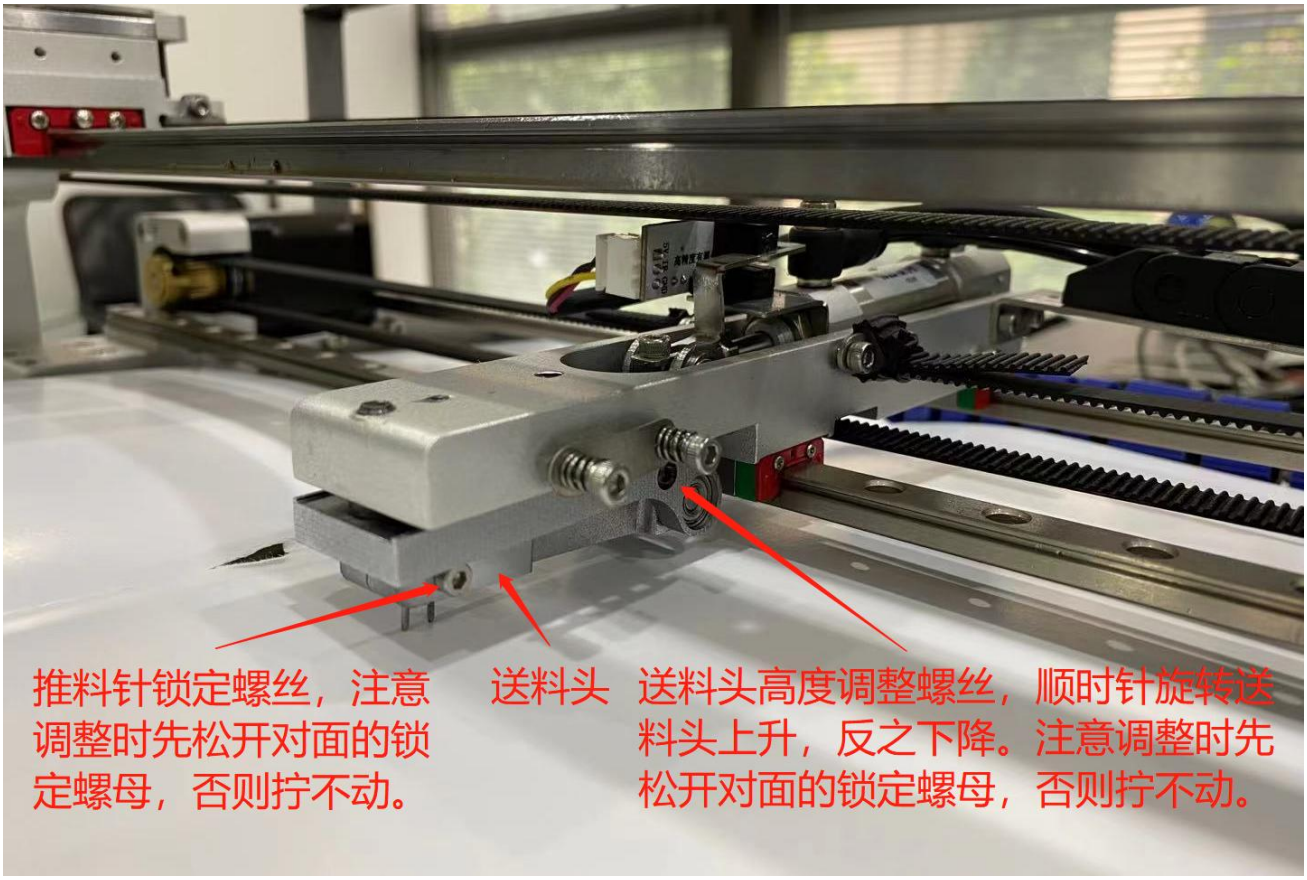
8.14. Introduction and adjustment method of Feida structure

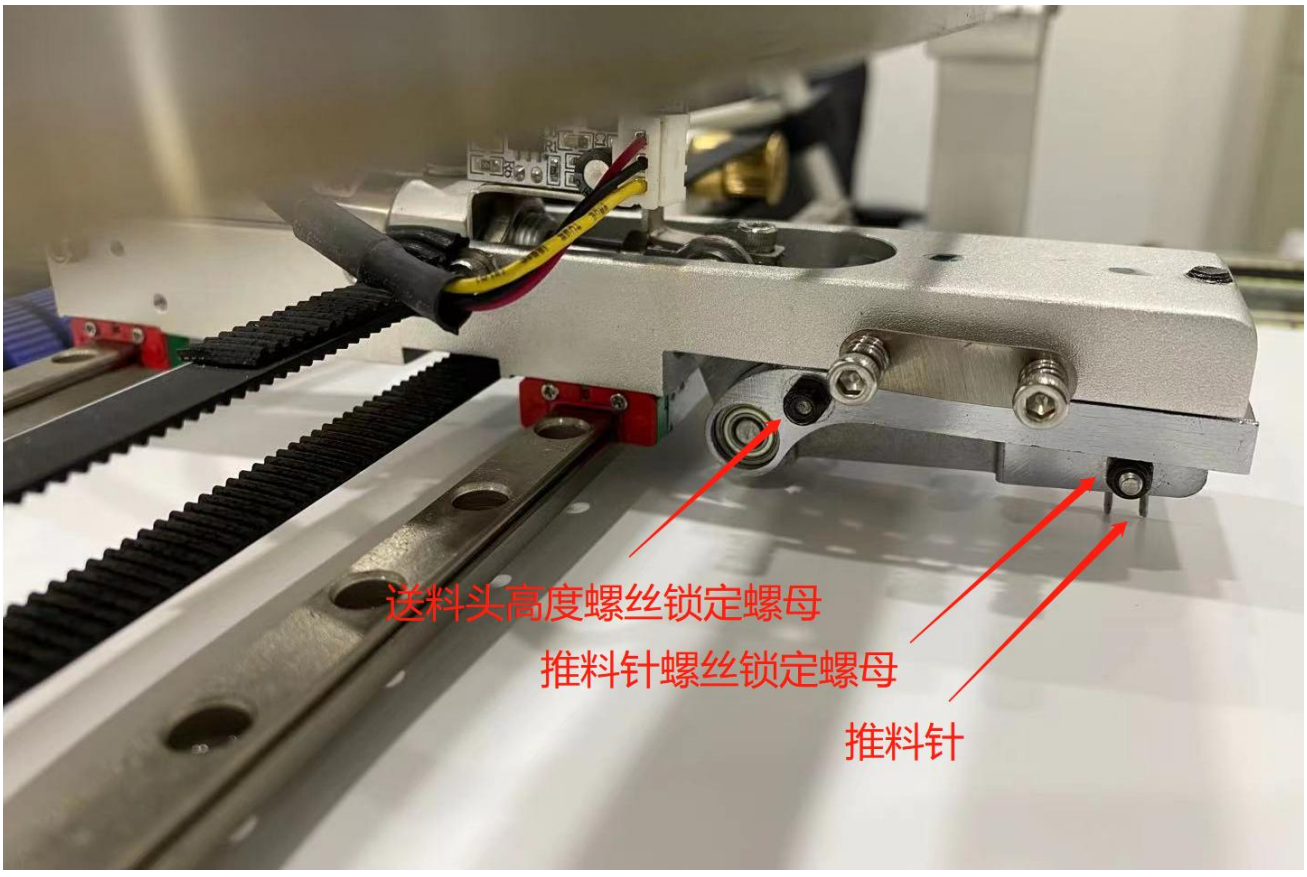
1. Introduction of Feida structure and adjustment method of Feida speed





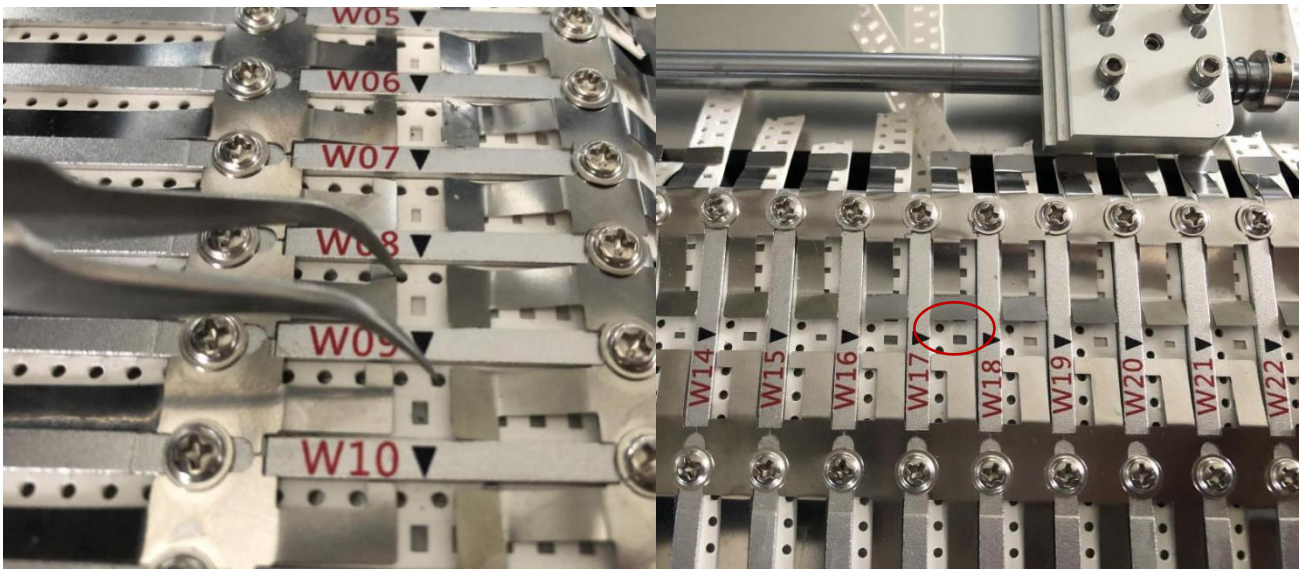
2.Height adjustment method of Feida head and feeding needle





8.15. Groove smoothness adjustment method

1. Use a crochet to pull the material belt back and forth to check whether it is smooth in the material trough. If there is resistance, adjust the arc of the baffle.



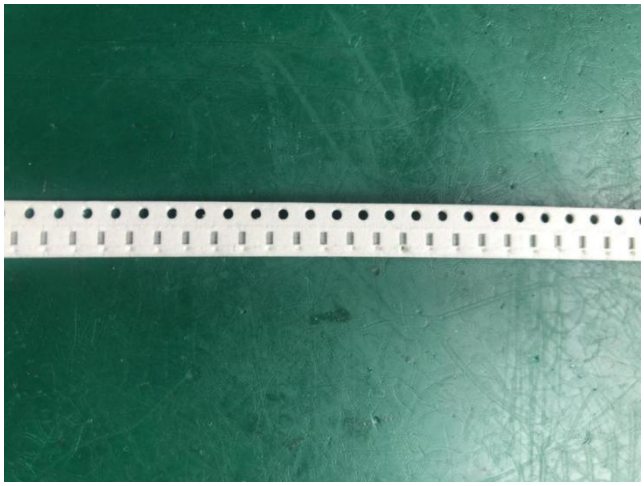
2. Adjust the tightness of the four screws of the Feida head. The function is to adjust the friction of Feida. Note that this adjustment generally does not need to move.

8.16. Feida needle cannot enter the hole

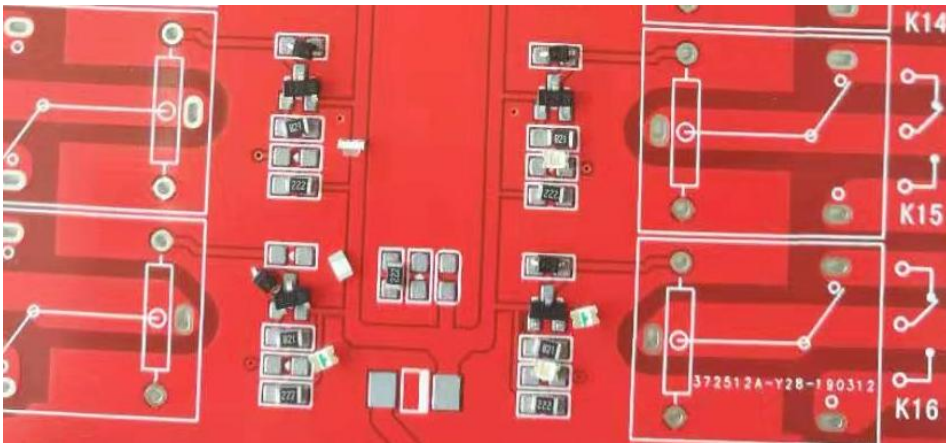
There are two cases:

1. When the Feida needle is feeding, the belt is evenly punched on the left and right sides of the feeding hole.

2. The Feida needle is evenly punched on the upper and lower sides of the material hole.



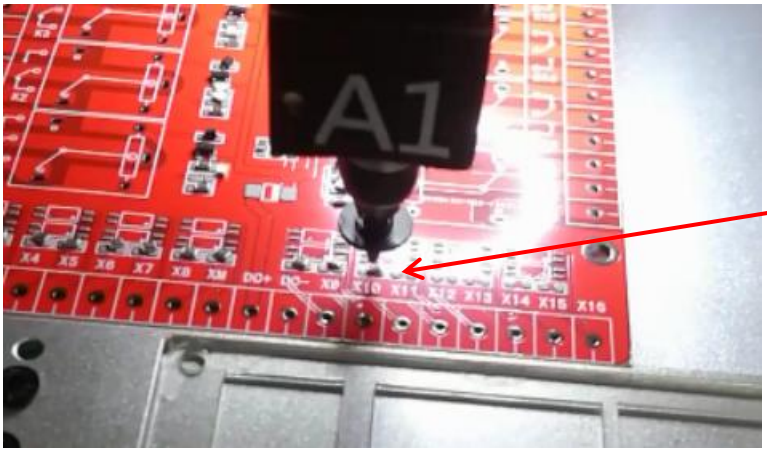
8.17. The patch is crooked and irregular



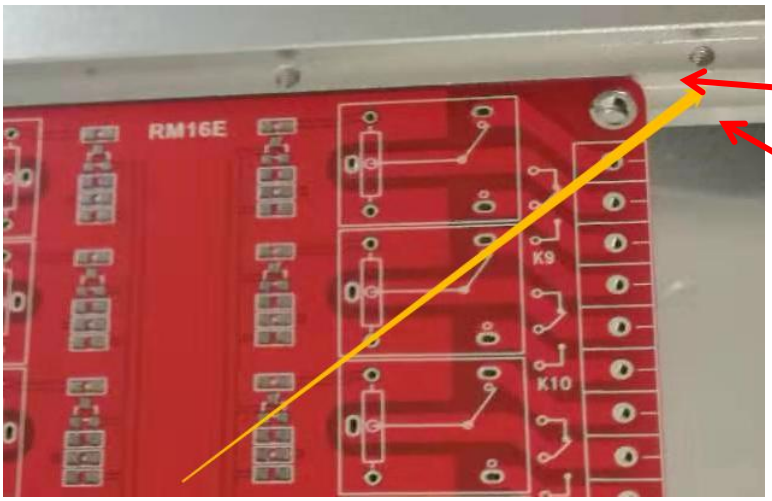
There are the following reasons for this:

1. During reclaiming, the falling height of the suction nozzle is not enough, and it does not touch the reclaiming parts, and the reclaiming parts are reversed.

2. During mounting, the falling height of the suction nozzle is not enough, the parts do not touch the PCB pad, and the materials are discarded across the space.



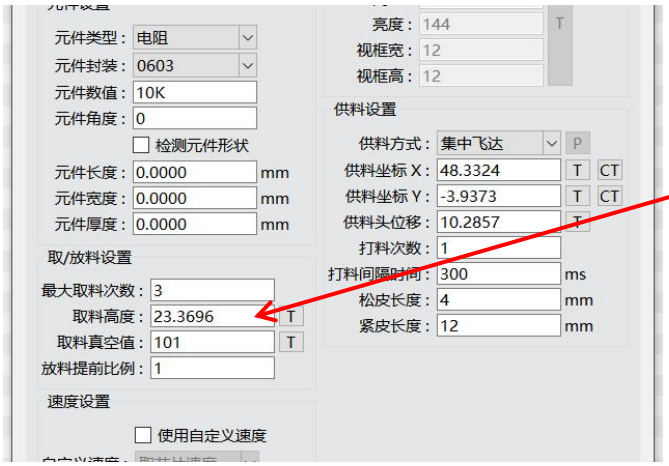
Insufficient total mounting height
Thickness of rack elements Engineering PCB thickness.
Will affect the mounting descent height
The judgment method is based on the slight compression of the suction nozzle spring



Correct PCB placement layer

Wrong PCB placement layer

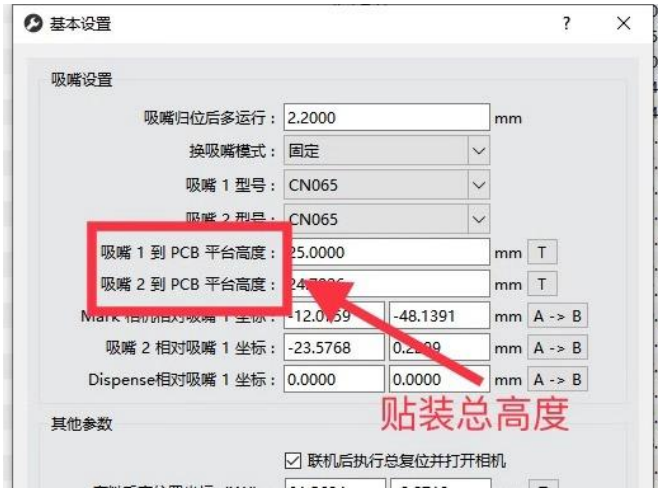
3.Setting method for insufficient falling height of reclaiming suction nozzle

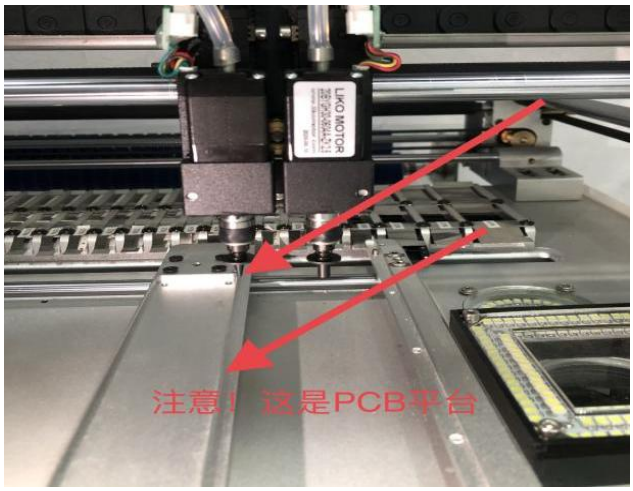


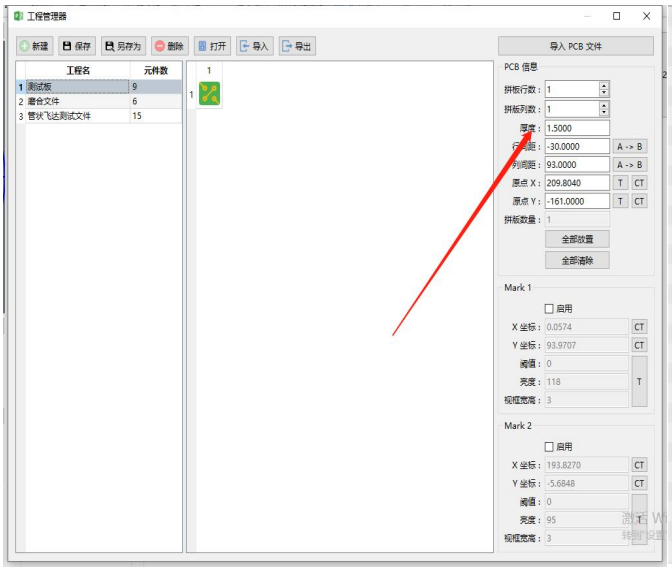
在料架中设置取料高度，以吸嘴弹簧轻微压缩为准

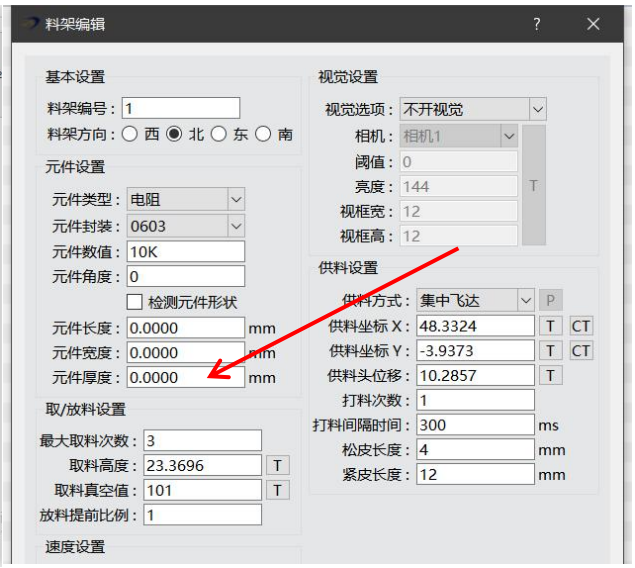
3. Solution to insufficient falling height of suction nozzle during mounting

Formula for mounting height: height from suction nozzle to PCB platform -pcb thickness - component thickness = mounting height









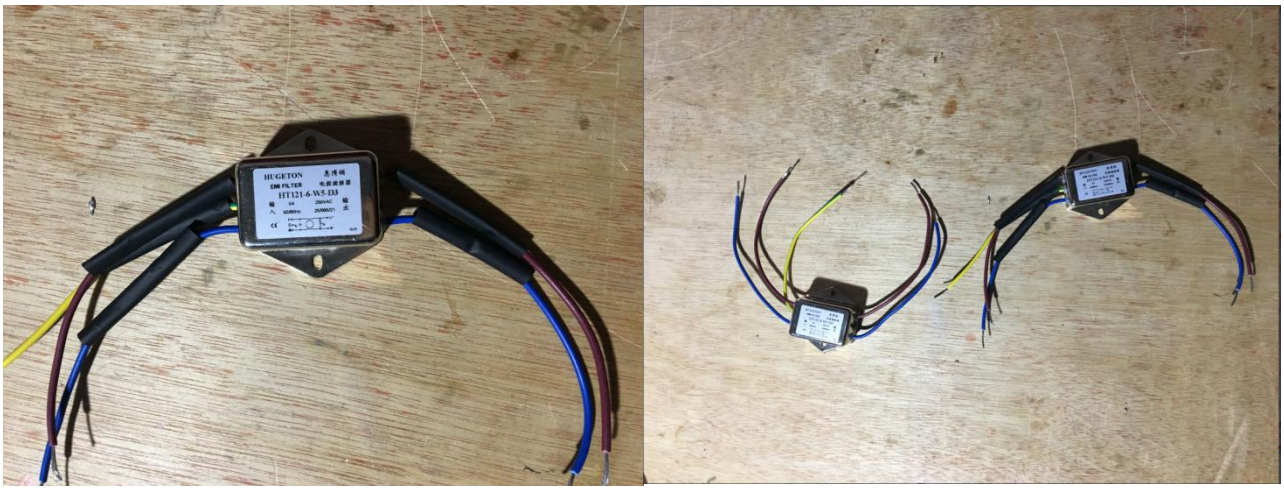
8.18. The computer is often disconnected (pay attention to the configuration of the customer's external computer)

1、This is mostly the case of external computer configuration: electromagnetic interference (surge) generated by other equipment interferes with the computer through the power line. As a result, the communication data between the USB port and the mounter is lost, causing the software communication timeout (the customer mistakenly believes that the computer is dead), and the communication can be established only after the

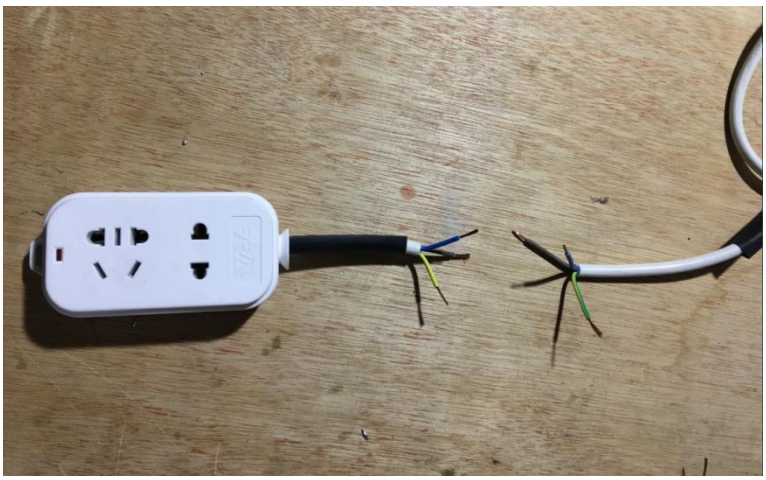
software is restarted and the USB driver is reloaded.

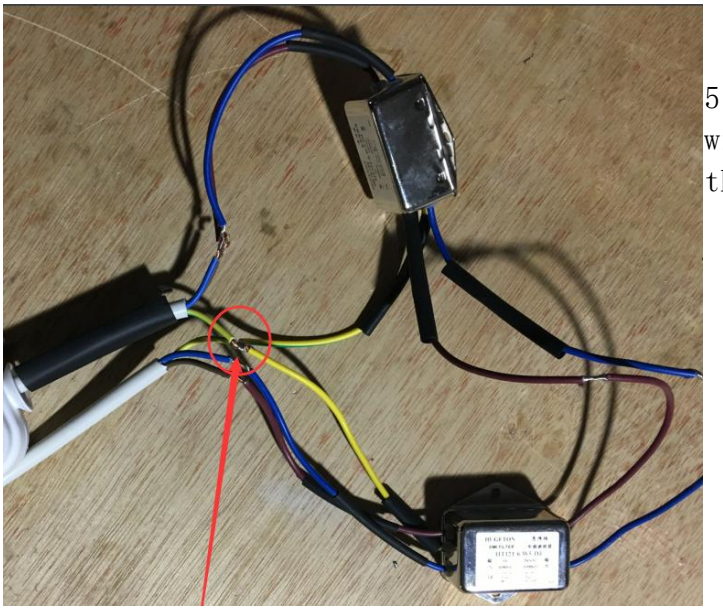
2、Please check the situation: 1. The ground wire is not good, 2. The USB impact resistance of the customer's computer is poor, 3. The air pump and the computer Mounter share the same power plug-in board or the distance is too close, 4. The USB extender installed by ourselves is of poor quality or the lead wire is too long.

3、Use two filters of the same model in series to solve the 1-3 problem. Note that the modified power plug-in board supplies power to computers, mounters and monitors separately. The air pump should be moved to other places as far as possible, and this power supply cannot be shared.

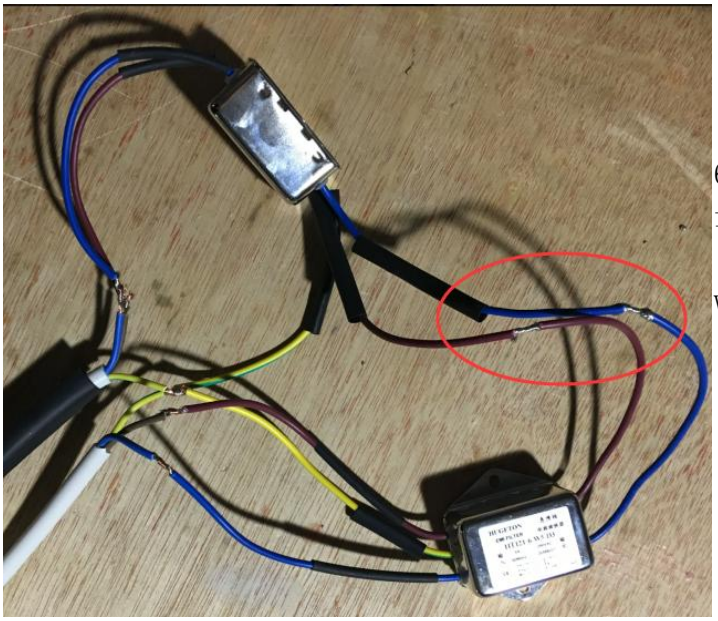


4、The "yellow and green" wire at the input of the two filters must be connected to the "ground" of the three wires of the "socket". Find the ground wire in the socket wire, "yellow green" is the ground wire.





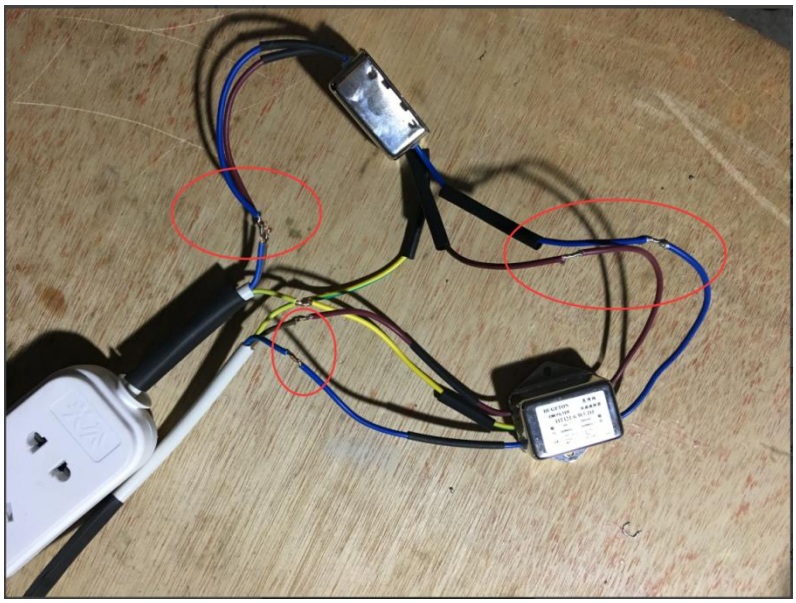
5、Connect the yellow and green "ground wire" at the input of the two filters to the ground wire of the socket



6、Finally, connect the output of one filter to the input of the other filter. [note] the colors of the connecting wires here must correspond one by one.

7、Connect the input wire of the filter at the remaining input end with the wire with "plug".

Wire colors correspond one by one. Then connect the output wire of the filter at the remaining output end with the wire with "insertion".



8.19. Generate static electricity (there is a sense of electric shock when touching the machine)

In the equipment, the central ground of the common mode filter capacitor of the switching power supply is connected with the shell, and the shell is connected with the ground wire in the single-phase three wire system. All capacitors have a certain impedance value, so more or less the casing will carry a certain potential. If there is no ground wire installed, there will be a very obvious feeling of "electric shock" when contacting the casing.

When the shell of switching power supply works normally, a large number of high-frequency electromagnetic waves will be emitted from the surrounding space. These electromagnetic waves will gather on the shell to form static electricity and gather. When there is a suitable discharge circuit and someone contacts the shell, it will discharge externally, and the user will feel the feeling of "electric shock".

According to the requirements for (electromagnetic compatibility mc.em) and safety in the national standard. The main content of the design is the design of noise filter. The use of switching power filter can effectively inhibit the noise in the power grid from entering the equipment (power supply), and can also suppress the noise generated by the equipment (power supply) from polluting the power grid. There are

two kinds of noise, common mode noise and differential mode noise. In order to suppress these noise pollution, a filter circuit must be used. In order to suppress common mode interference, two capacitors should be connected to the ground on the two input lines L and N respectively. If it is grounded, this part of the interference signal flows into the earth to achieve the function of filtering. If it is not grounded, it will flow into the human body if people touch it. That is, we understand the phenomenon of leakage. (the voltage of this part is AC, generally up to about 110V). At the same time, it is stipulated in the national standard gb4943 (safety of information technology equipment), so the relevant electrical appliances (including power supply) must be grounded.