VC-450M Series Inline Plasma Cleaner User Manual

JIT Industrial Asia Pte Ltd

URL: www.http://jit-asia.com.sg

Content

Preface

Model: VC-450M Inline Plasma Machine

Serial: _____

Software: _____

Date of Production: _____

I.VC-450M Fuction

VC-450M is a machine that applies high temperature and high pressure to the air in an environment that does not require vacuum to generate ionized plasma. The total number of electrons of cations and anions in the plasma is almost equal, and the plasma is in a neutral state. The ions and electrons in the plasma collide with the surface of the substrate at high speed, remove foreign matter attached to the surface of the substrate, and attach functional groups to the surface. This process can clean the surface and obtain the effect of hydrophilization. At the same time, the functional groups attached to the surface of the substrate increase the surface energy of the substrate, thereby enhancing the surface adhesion of the substrate.

Fuction :

1. Eliminate static electricity on the surface of the substrate, clean and activate the surface of the substrate, improve the surface energy of the substrate, and improve the adhesion between the adhesive and the substrate ;
2. Low plasma temperature, no damage to the substrate ;
3. No arcing, no damage to the chips of the processed products ;

Application :

1. Electronic and electrical industry (printed circuit board bonding, wafer/chip/LED, mobile phone glass cover & middle frame, etc.) ;
2. Packaging and printing industry (plastic packaging, toy products, paper & carton

printing, cosmetic packaging, etc.) ;

3. Automotive industry (lights, EPDM weather strips, interior and exterior automotive trims, instrument panels, automotive electronics, etc.) ;

4. Textile industry (outdoor clothing surface printing, fabric & non-woven fabric dyeing, shoe material gluing, etc.) ;

II. Warranty and Service Range

This equipment has been debugged and checked OK before leaving the factory. The company will guarantee it when it is used within the following conditions.

1.Warranty Period

One year after the device leaves the factory.

2.Service area

The company will repair the faults during normal use during the warranty period free of charge, but will not be covered by the warranty in the following cases.

★Use consumables and components not specified by VECTRON.

★Improper use by the operator or improper maintenance.

★Normal loss of consumables.

★Other natural disasters.

★The color of the device shell fades naturally.

★The heat and noise change without affecting the normal operation of the equipment.

Noted: If you encounter problems that you do not understand in the actual process, please check the manual, or contact our company.

3.Free range of services

This device will provide free service for the following situations after leaving the factory.

★Assembly debugging and trial operation.

★Processing program making or education training and related technical guidance.

★Operation, circuit analysis and other related education training.

III.Specification

No.	Item	Specification	Noted
Model		VC-450M	Appearance white

1	Device Platform Section	Size(mm)	800*1270*1450 (W*D*H)	Excludes footings and lighthouses
2		PCB Size(mm)	50*50~450*400 (X*Y)	
3		The distance from the front edge of the equipment to the fixed track	About 320mm	
4		Overboard track height (mm)	900+/-20	
5		Overboard height (max)	40mm	
6		Board direction	Lift→Right	Adjustable R→L
7		Processing speed range (mm/s)	10~300	
8		Z-axis height control	software control	
9		Z-axis height adjustment range (mm)	0~80	
10		Abnormal alarm	Air pressure, power, temperature and other abnormal alarms	Digital air pressure
11		Control System	Industrial control + servo control	
12		Track load	10kg	
13		Delivery system	Track transfer (automatic width adjustment)	one-piece chain
14		Stop system	Cylinder	
15		Operating system	Win10	
16		Equipment operating software	VECTRON control software	Chinese/English
17		Vacuuming and deodorizing system	Forced negative pressure exhaust + dust box	
18	Equipment	Power Supply	AC220V 50/60Hz	

19	electrical part	External air source (MPa)	CDA 0.4~0.8	
20		Total power (KW)	2.5	
21	Plasma System Section	Plasma System Type	Single head, rotary spray	import system
22		Plasma System Power (W)	600~800 (Max)	
23		High voltage discharge voltage (KV)	8~12	
24		Working discharge frequency KHz	40	
25		Gas flow (L/Min)	40	
26		optimal handling height (mm)	12~16	
27		Nozzle model	Ø20mm/ 90°	Optional Ø40, Ø60

Note: The above parameters are standard configuration. If there are special needs, they can be customized according to customer requirements. If the technical parameters are changed without prior notice, the final interpretation right belongs to "VECTRON".

IV.Installation

1.Environment setting

1.1This equipment should be installed in a ventilated and dry place, and do not install it in a corrosive and flammable place.

1.2This equipment should be installed in a place with no sunlight exposure and high heat.

1.3This equipment should be installed in a place free from vibration, easy maintenance and inspection.

1.4This equipment should be installed in a place with less dust, oil and gas and metal dust.

1.5This equipment should be installed in a place free from electromagnetic noise interference.

2.Equipment installation

2.1Place the device in the specified position.

2.2Adjust the level of the equipment with a level and tighten the screw of the foot cup.

2.3 Connect the air connection tube to the air connection port of the device.

2.4 Connect the power plug to the device.

2.5 Grounding requirements: Please connect this device to the ground wire of the distribution box separately, and do not connect it in series with other devices.

2.6 Confirm that the upper and lower signal lines are connected properly and can communicate normally.

3.Power supply, electrical configuration

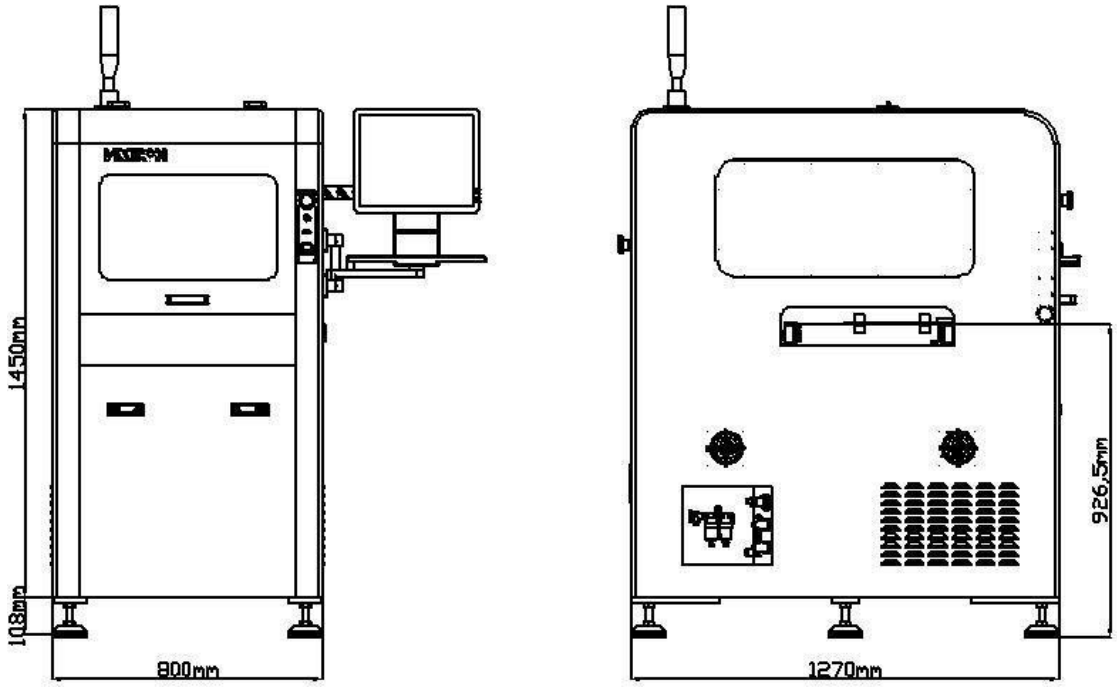
3.1The standard input of this equipment is single-phase 220V AC 50/60Hz, 2.5KW.

3.2 The standard air pressure of this equipment is 0.4-0.6 MPa.

3.3 This equipment has high-voltage circuit devices, please do not touch devices with high-voltage signs.

Note: The ground wire of the power grid meets the international requirements of the Equipment room, and ensures that the equipmen shell is well grounded.

V.Appearance Size



Front view **Side view**

Chapter 1: Machine Description

I. Machine Appearance Description

1.1 Lighthouse

Red: Illuminates when the equipment is not ready, the emergency stop button is pressed, the safety door is opened, or there is a fault.

Yellow: The device is normal and lights up when it is in the state of waiting for production.

Green: This light is on when the device is operating normally.

1.2 Monitor

Display program interface buttons and processing status

1.3 E-stop botton

Whenever the button is pressed, the device stops functioning. The switch is a self-locking switch, if you want to remove it, please turn it clockwise.

1.4 Main Power Switch

Turn all power to the device on and off.

1.5 Digital Pressure Gauge

Used to monitor the air pressure to meet the equipment requirements

1.6 USB Port

Used for connection and communication between industrial computer and external devices.

1.7 Convey Track

Used for PCB board to enter the equipment for surface treatment.

1.8 Electronic port

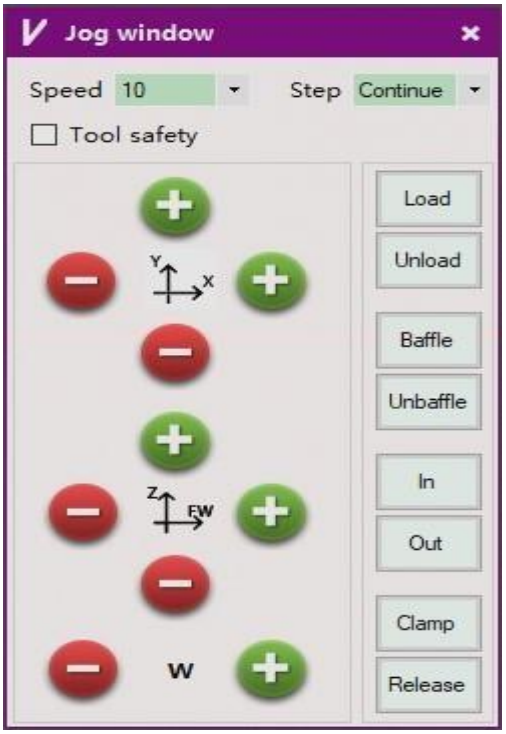
Used to connect external power and air sources to the device.

1.9 Cooling Fan

After the main power switch is turned on, the cooling fan will run automatically, mainly to dissipate heat for the internal circuits of the device, the host and other components.

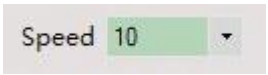
II.Keyboard Button Operation Instructions

Press the keyboard F2 shortcut window (this function will be used frequently); Display as shown below ;



X represents the X axis of the nozzle; Y represents the Y axis; Z represents the Z axis of the nozzle; W represents the PCBA feed track;

①Speed: Select the "10" position, indicating that the current moving speed is 10mm/s, as shown in the figure below ;



② Route:Selecting a certain value indicates how many millimeters the corresponding axis moves when the left mouse button is clicked once; if "Continue" is selected, it will move continuously with the value selected in the speed.

③Tool Safety(Nozzle security): If this parameter is selected, it means that after the nozzle moves to the set safe value, it is not allowed to continue to move down ;

④Loading: Click "Load", the front end of the track senses the PCBA board signal (the track width needs to be adjusted according to the width of the PCBA board), the PCBA board will be moved to the parking position, and then the pressing and clamping actions will be performed. At this point,you can move the lens to the coordinate position to be set by moving the camera up, down, left and right to perform programming actions;

⑤ Unloading: Click "Unload" to perform the action of loosening and lifting the board, and the conveying track will send the parked PCBA board to the exit at the rear end of the track, waiting for the board to be taken out ;

⑥ Baffle \ Unbaffle : click "fender" or "release board", step by step to perform the corresponding action;

⑦In: Click " In" ,Single-step the action of entering the board and transfer the PCBA board rail to the baffle Location;

⑧Out: Click “Out”, Single-step execution of the board-out action requires the PCBA board to be in the state of placing the board and releasing the board;

⑨Clamp\Release: “Clamp” Or “Release”, Step through the corresponding action ;

III.Boot Operation

3.1Confirm that the equipment is properly connected to the power and air supply ;

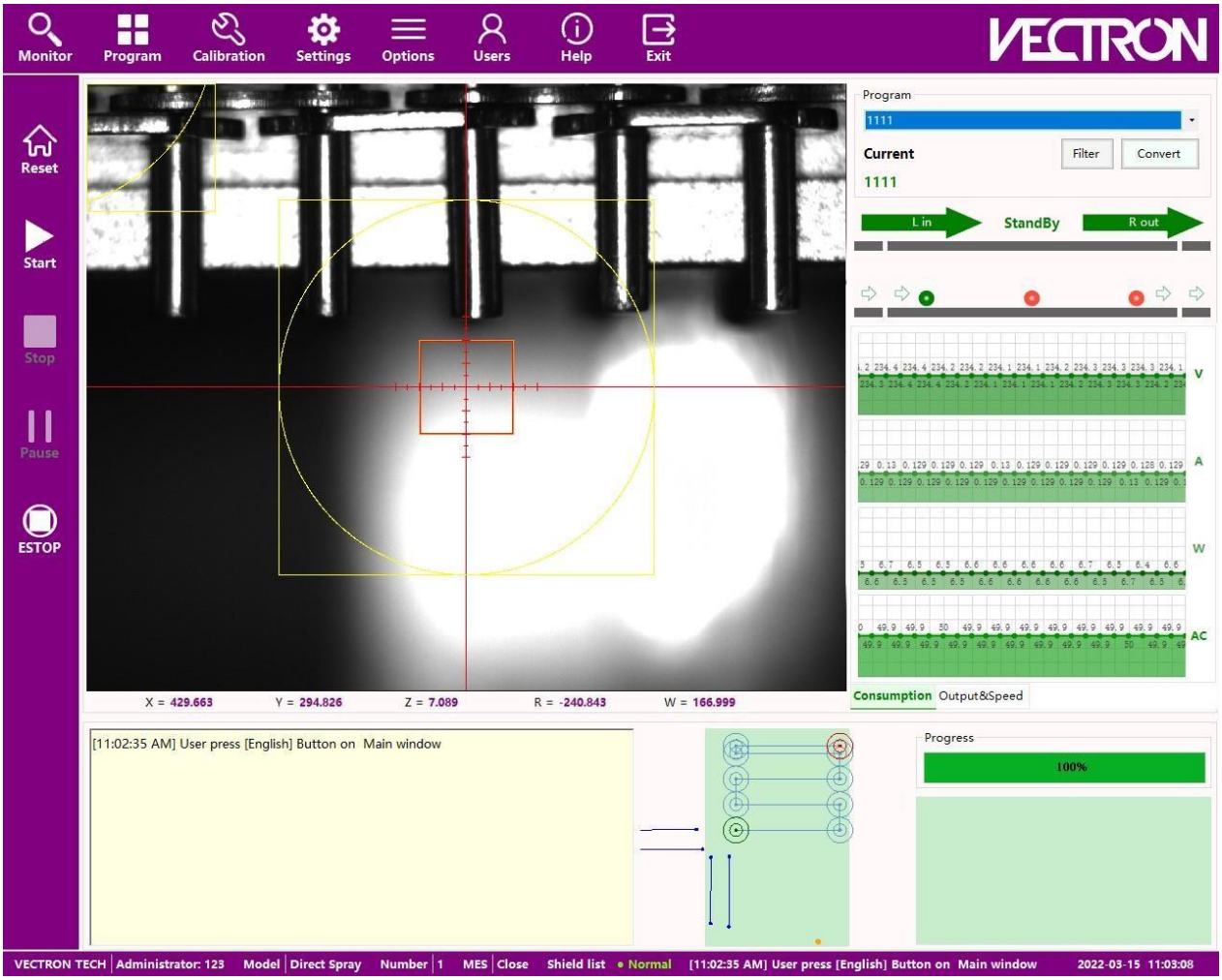
3.2Turn on the main power switch of the device (rotate it to the "ON" state) ; 3.3 After the equipment is powered on, press the "light source start button" button to light up the lighting system of the equipment; then press the "PC POWER start button" button for about two seconds to power on the industrial control computer of the equipment;

3.4After the equipment industrial control computer is started, double-click the sub-board computer control software on the display desktop “ 

”

A login window will pop up, as shown below :

After entering the login name and login password (the default login name is: 123, and the login password is: 123), click "Login" to enter the main interface of the control system. As shown below :



3.5Click the "Reset" button at the top left of the main interface, and after the device is reset, it can operate normally.

IV.Shutdown Operation

4.1Make sure that the equipment is in a shutdown state ;

4.2Click on the top right of the main interface " 

", Prompt whether to exit the system, click "Yes" to exit the control system ;

4.3Press the "light source start key" button to turn off the equipment lighting system ;

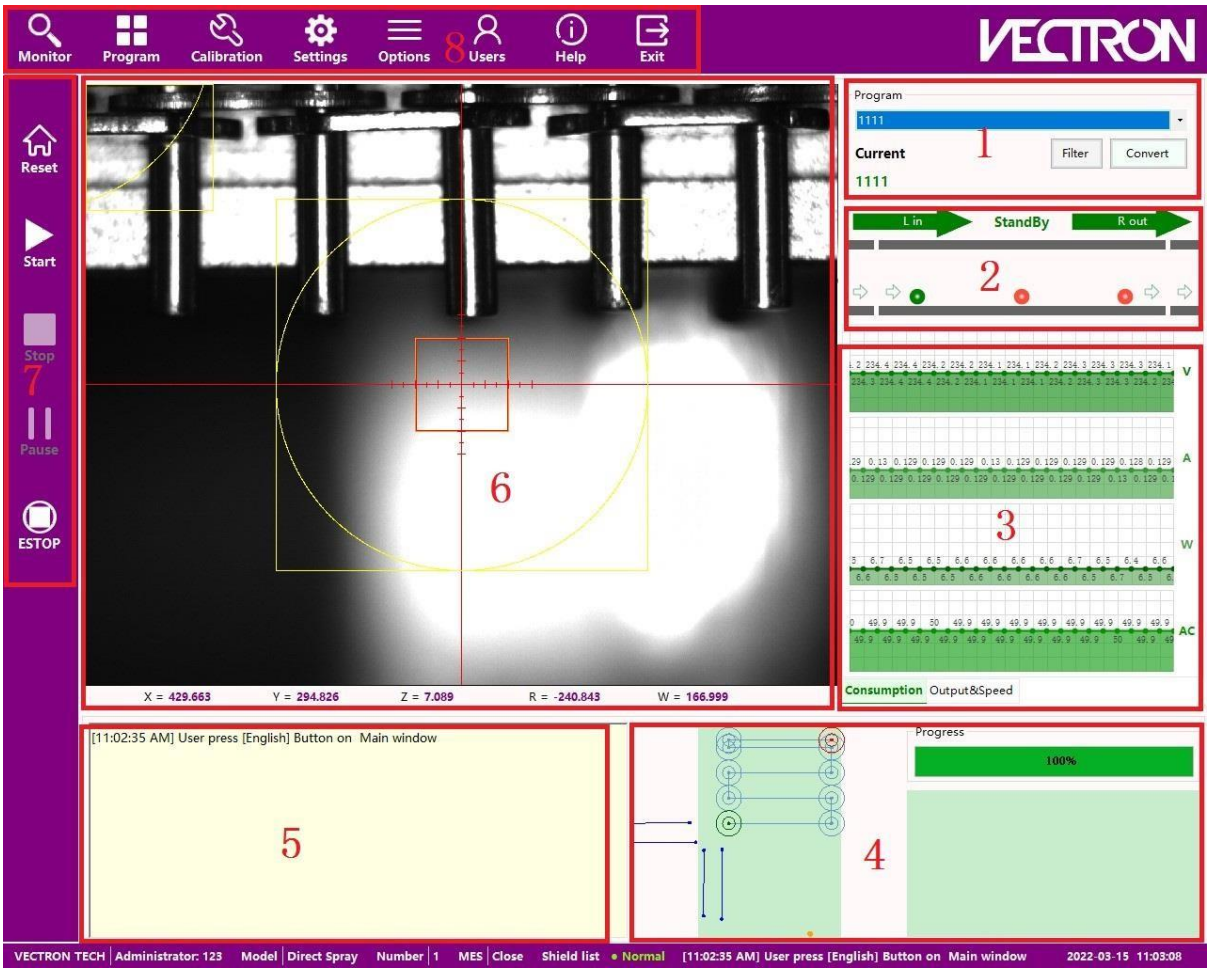
4.4Exit the Windows system ;

4.5After the above steps are completed, turn off the main power switch of the device (rotate it to the "OFF" state), and the shutdown operation is completed at this time.

Chapter 2: Control Software Description

I.Software Interface Fuction Description

After the industrial control computer is successfully started, open the control software, enter the user name and password, and after the "reset" action is completed, it will display as shown in the figure below ;



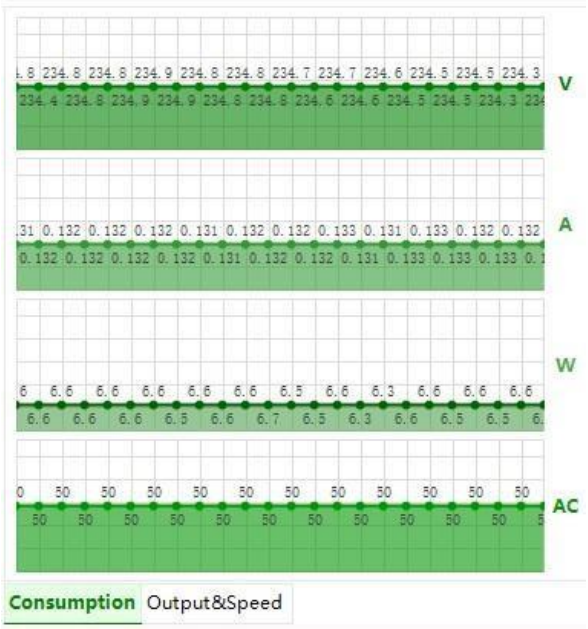
1. Program Management

Program Name: Display the name of the current production scheme and related information; if you need to change the scheme, click the drop-down menu on the right to select the scheme to be produced, and click "Convert Now" to complete the conversion of the scheme;

2. Machine State : Display the current state of the device ;

3. Plasma power consumption/yield & speed

Plasma power consumption is displayed as shown below :



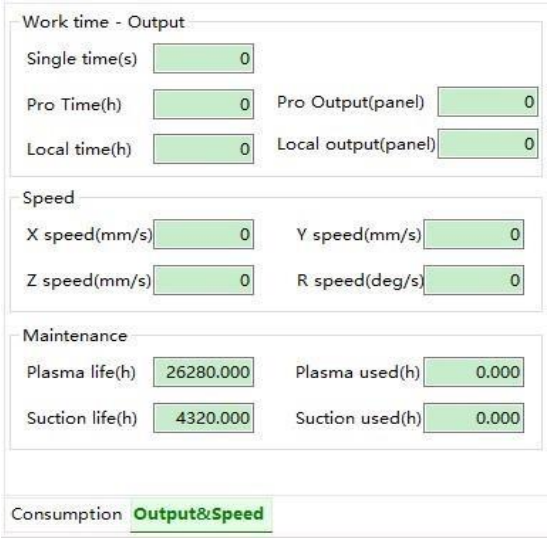
V: Displays the real-time voltage of the current device;

C: Display the real-time current of the current device;

W: Display the power of the real-time nozzle of the current equipment;

AC: Displays the real-time power frequency of the current device ;

The output & speed are displayed as shown below :



Working time - output

Time: Display the processing time of the current plan and the total processing time of the equipment;

Output: Display the processing output of the current plan and the total processing output of the equipment ;

Single time: Displays the time required to complete a single PCBA;

Speed: Displays the movement speed of each axis of the device ;

Maintenance : Displays the current plasma, vacuum cleaner life and elapsed life of the device ;

4. Work progress : Displays the spraying progress of the current program as a

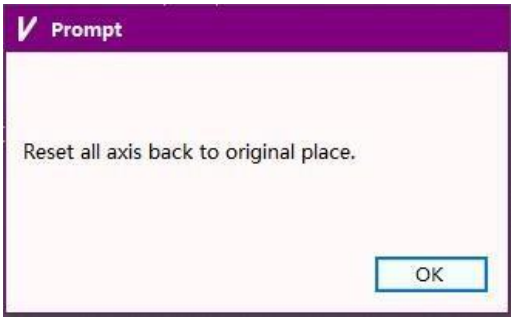
percentage and as a simulated image ;

5. **Log display window** : Real-time record of operator's operation process, alarm information and operation data during spraying ;

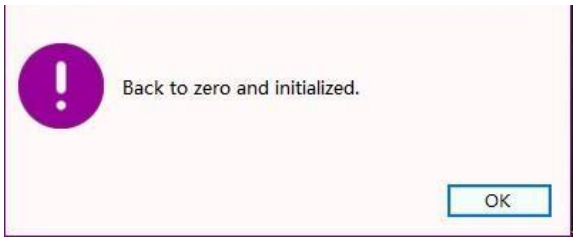
6. Viewing display window :Displays the current camera position in real time ;

7. Machine operation control :

7.1Reset: Opening the control software, the reset action must be performed first, otherwise the production and operation cannot be performed, and the system will pop up the window as shown in the figure below;



Click the "Reset" button on the upper left of the main interface, after the device reset is completed, the display will be as shown below:



7.2Start: Select the current plan to be produced, click "Start", and press the start button,the machine start working

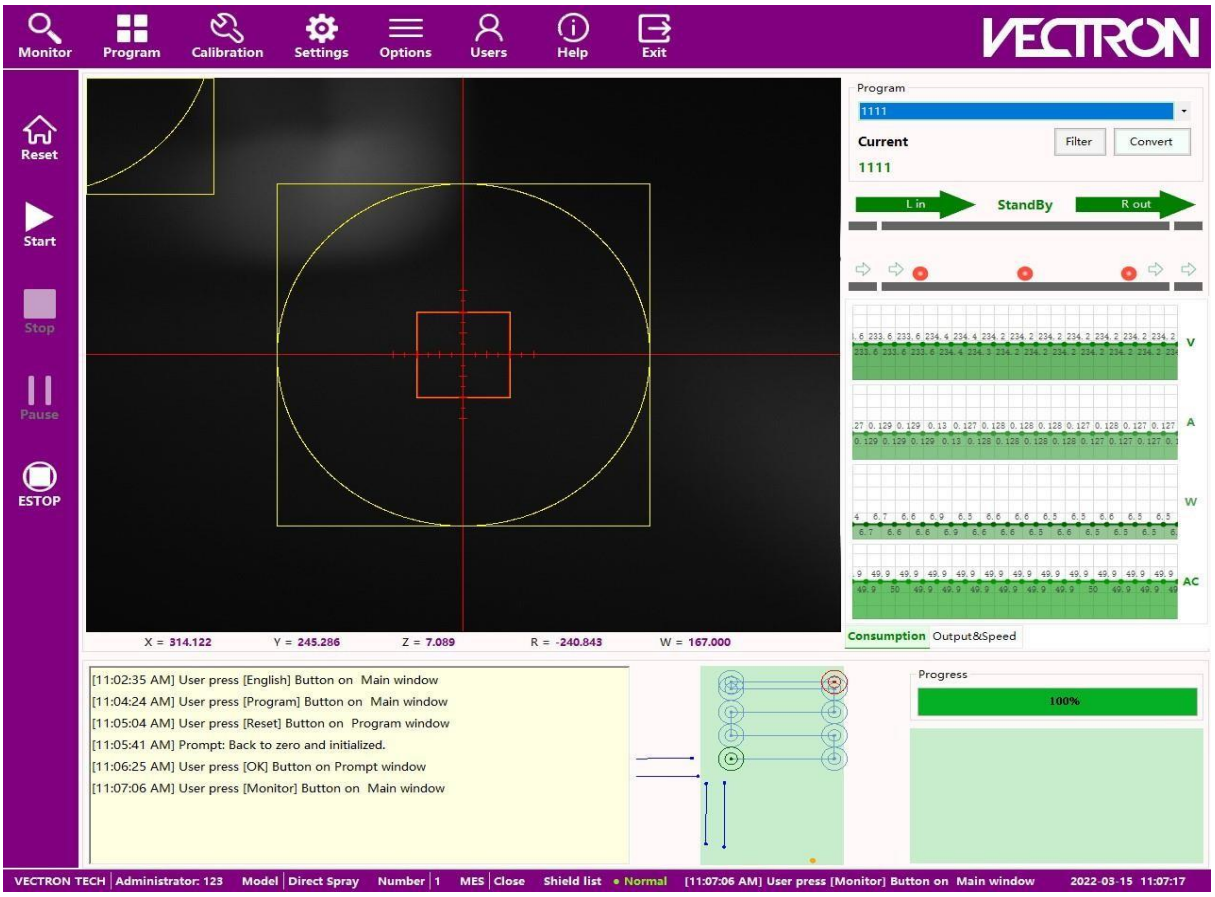
7.2Stop: When current scheme processing,Click "Stop" ,machine will be finish the whole scheme after stop

7.3Pause: When current scheme processing, Click "Pause",,machine Will be pause status immediately,if need go on this scheme,click "continues" start working;

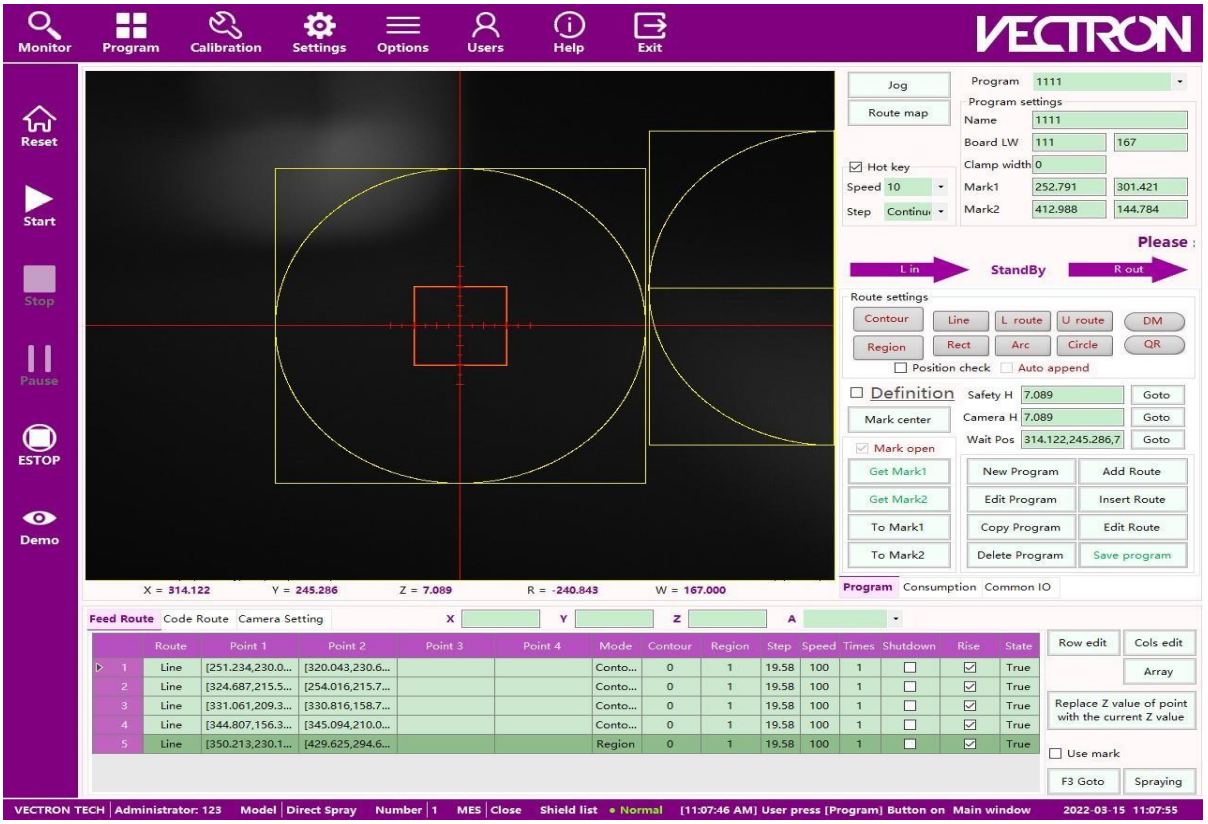
7.4E-stop: When current scheme processing, Click "E-stop", machine Stop processing immediately;(if need continues work,must be press "reset" after can back work).

8. Setting Window

8.1Processing monitoring: under the monitoring processing state, the operation of each component of the equipment can be monitored;



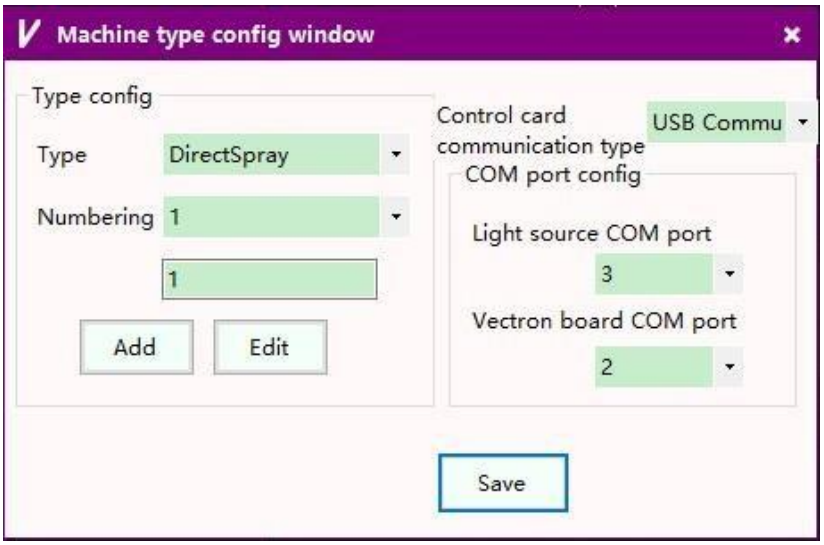
8.2Program : Click on "Program Settings" to display as shown in the figure below; this part of the content will be introduced in detail in the following chapters.



8.3Calibration： Click "Calibration Settings" to display as shown in the figure below; this part will be described in detail in the following chapters.

8.4 Options： Click "Options" to display as shown in the figure below,"Machine type","Conveyor","Front end board out","Rear end board in","Yield management"

1)Click“Machine type”, The"Machine type"pops up, as shown in the figure below;



Type: Type optional, include“ DirectSpray” n“ ObliqueSpray ”;

Number: According to different types of processing methods, add or modify the corresponding number to facilitate production management ;

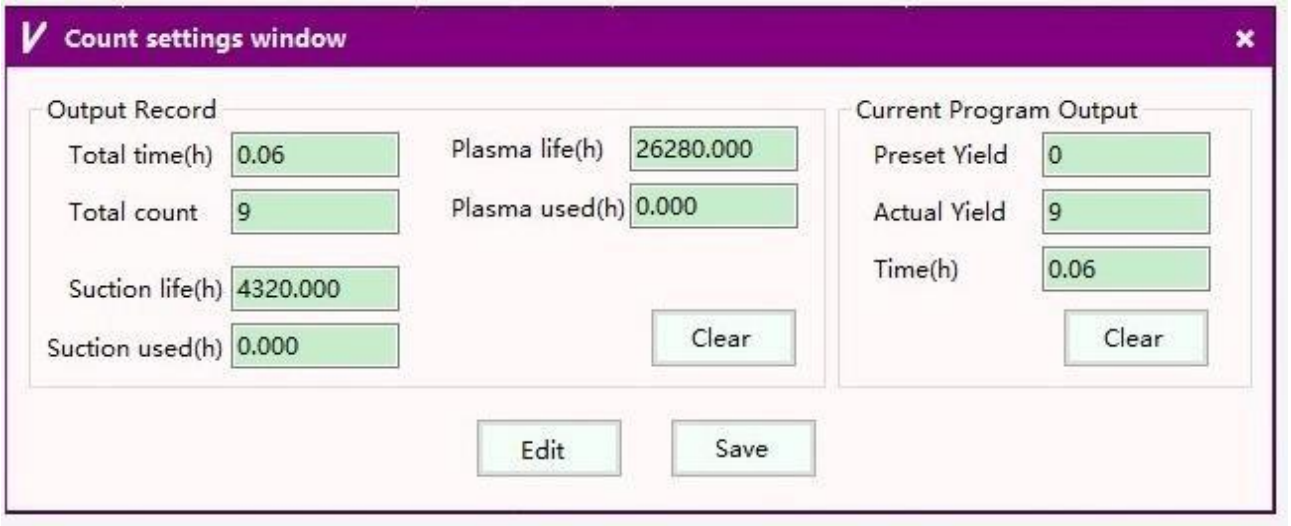
COM Port Config: Machine combine with other machine has been set before leave factory don’ t need modify; Conveyor mode: If the device does not need to spray the PCBA, it is only used as the function of transmitting the PCBA, check "The machine only passes the board";

2)Click“Conveyor Mode”, transfer PCBA only;

3)Click“Front end board out”, machine is left in board and left out board ;

4)Click“Rear end board in”, The device is the right input and the right output board; if both are selected at the same time, the right input and the left output board are used.

5)Click“Yield Management”, pop up“Count Settings Window”, as shown in the figure below;



① Total time(h): The total time the machine was running time (including the total production time of other solutions) ;

② Total count: the total output produced (including the total output of other solutions) ;

③ Suction life(h)/used（h）: Indicates the available time and the elapsed time of the equipment vacuum cleaner

④ Plasma Life(h)/Used(h): Indicates the machine plasma available time and used time ;

⑤ Preset Yield: Indicates that the equipment will automatically stop production after setting the number of production;

⑥ Actual Yield: Indicates the actual production output of the current solution equipment;

⑦ Time(h): Indicates the time required for the production of the current solution equipment;

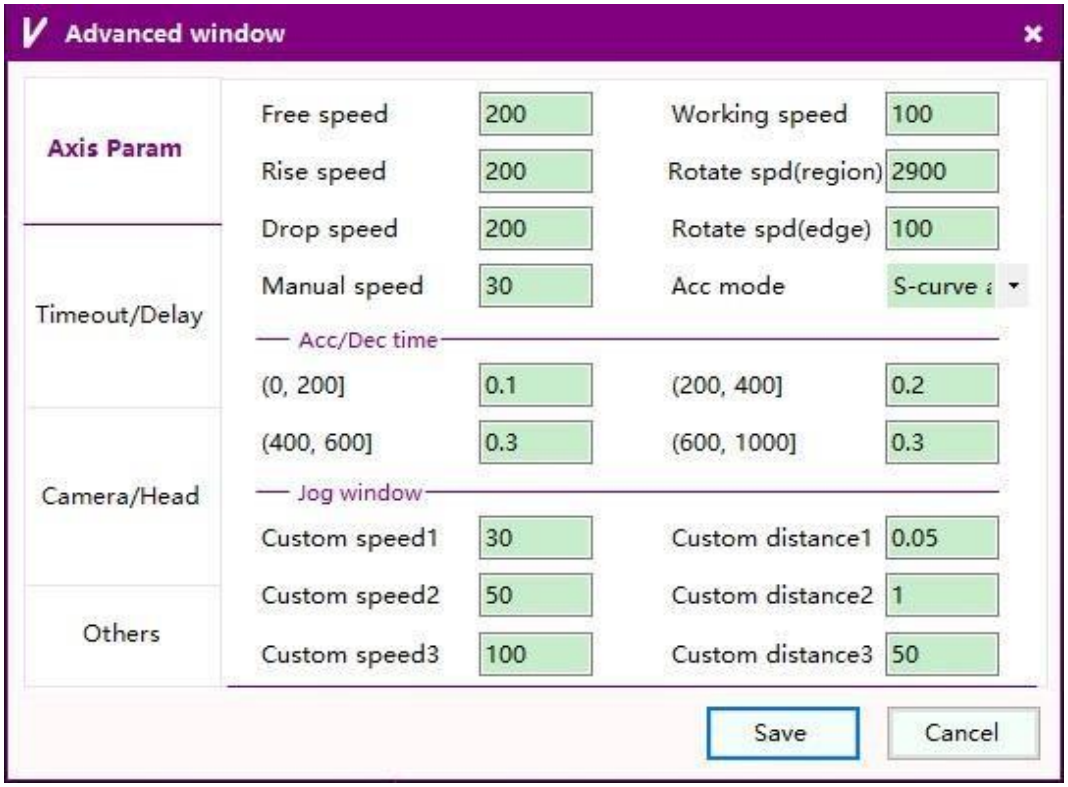
（The "estimated output" value can be modified, and other parameters cannot be modified, but can only be cleared; To clear the "local count" and "current plan count" of the machine, simply click "Clear" in the above figure, and then click "Save".）

8.5Options: Click "Options", as shown in the figure below, include "Import program"、"Export program"、"Advanced"、"IO test"、"LSource always bright"、"F2 Jog";

1)Click "Import program", Select the program to import;

2)Click "Export program," , Select the program to export;

3) Click “Advance”, pop up “Advanced window”, as shown in the figure below ;



Axis Param :

Free speed: Under working or Demo mode the speed of non-work movement , mm/s;

Rise speed: Under working or Demo mode the rise speed of Z axis mm/s;

Drop speed: Under working or Demo mode the drop speed of Z axis mm/s ;

Manual speed: Click camera image window the speed of camera movement mm/s;

Working Speed（path）: under working mode the work path movement speed mm/s;

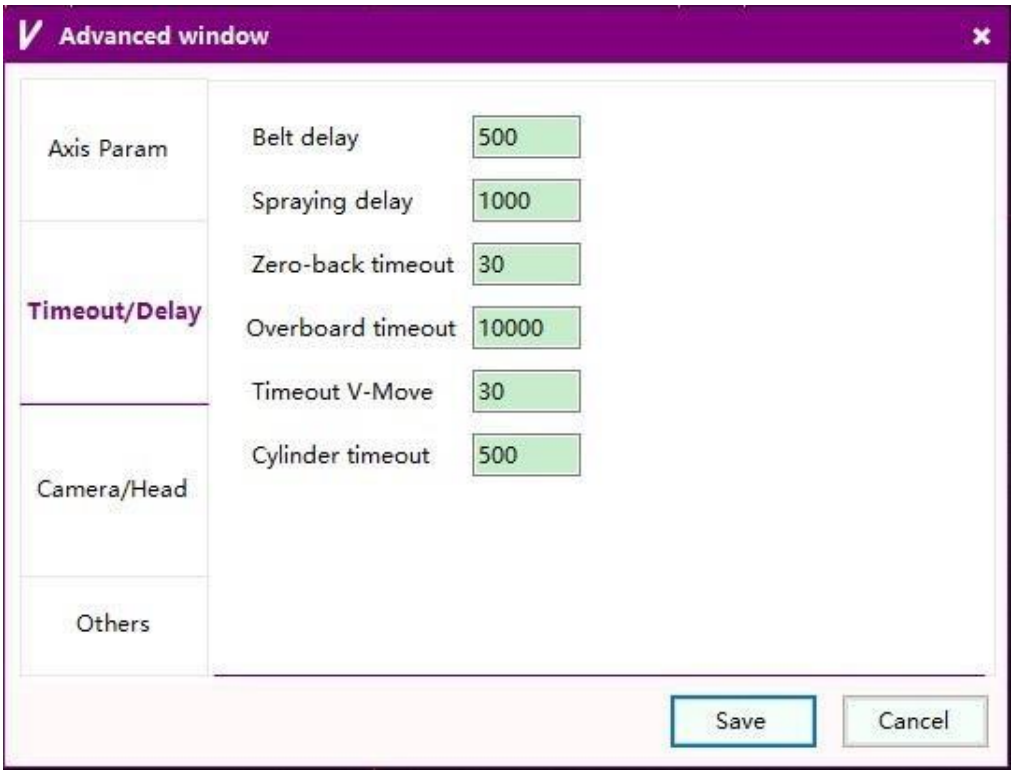
Rotate Speed（region）: The rotation speed of the R axis when spraying in the area, the unit is mm/s; the rotation speed (contour): the rotation speed of the R axis when the previous edge transitions to the next edge when the contour spraying, the unit is mm/s;

Acc Mode: When the servo accelerates, the mode has been set at the factory, please do not change it! Acceleration and deceleration time: The mode has been set at the factory, please do not change it!

Custom speed: According to your needs, set the selectable moving speed in the shortcut window,mm/s;

Custom step distance: In the setting shortcut window, the selectable single moving distance;

Timeout/Delay :



Belt delay: When it is sensed that the PCBA is transferred to the spraying position, the time that the belt continues to run to ensure that the PCBA board is transferred in place,ms;

Spraying delay: The time to spray after the corresponding time after the plasma is turned on ,ms;

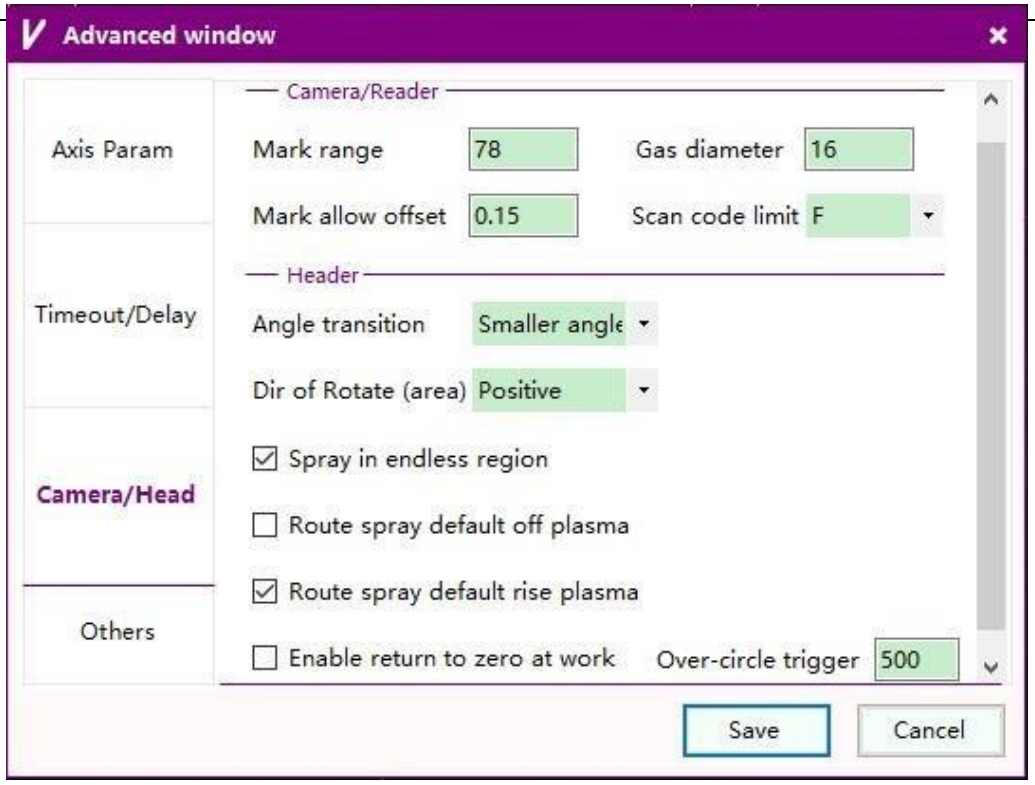
Zero-back timeout: If the device fails to return to zero within the set time, the system will alarm,s;

Timeout V-Move: If the motion axis controlled by the industrial control board does not reach the motion point within the set time, the system will alarm over time,s;

Overboard timeout: If the front track entry and exit board has not reached the designated position after the corresponding time, the system will alarm, ms;

Cylinder timeout: If the action of each cylinder cannot be completed within the set time, the system will alarm,ms;

Camera/Head :



Mark range: When setting the make mark, the effective area for dis crimination ;(Note: The unit is in pixels) !

Mark allow offset: Set the tolerance range allowed by mark, mm;

Gas diameter: Enter the corresponding diameter according to the di ameter of the currently installed nozzle

Scan code limit : When using the camera code reading function, the system will alarm when the reading code level is lower than the set value;

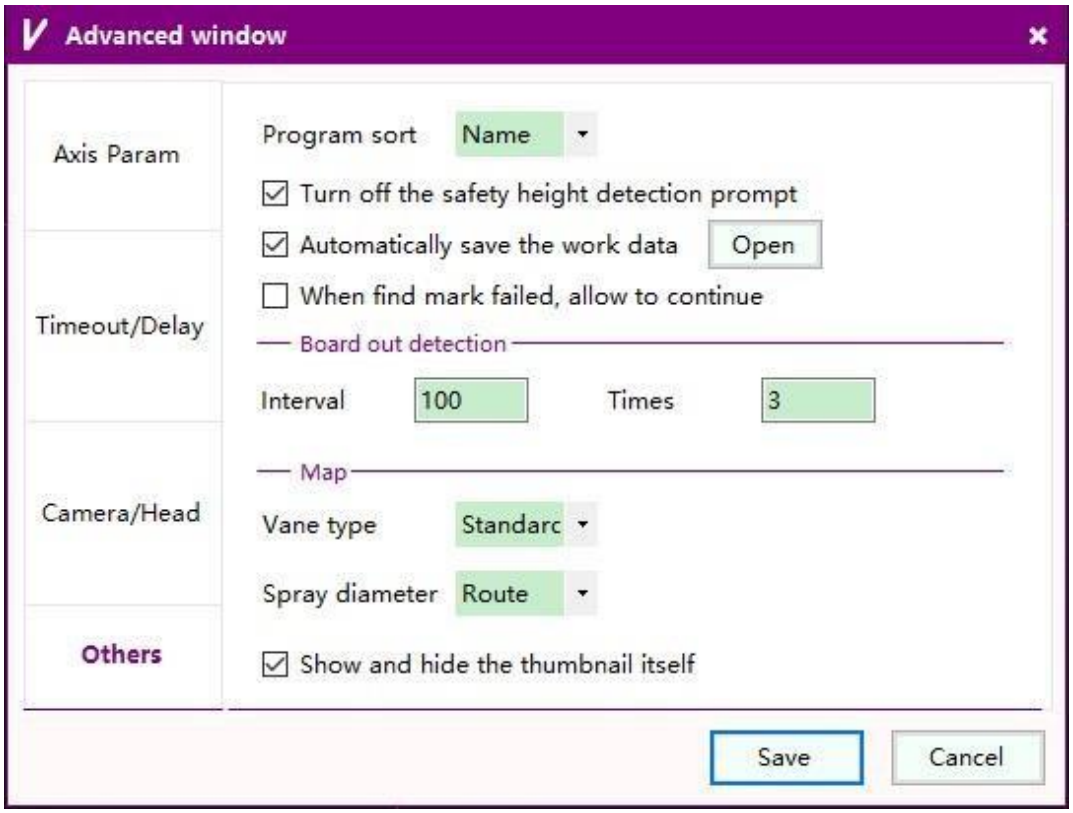
Spray in endless region: When clicked, Spray in endless region, otherwise no spray ;

Route spray default off plasma: When clicked, the plasma is tur ned off after spraying;

Route spray default rise plasma: When clicked, after spraying, rise nozzle;

Enable return to zero at work: When clicked, The spray head rotates more than the trigger circle and returns to zero ;

Other



Program sort: Provide "creation time" and "program name", and choose according to the actual situation;

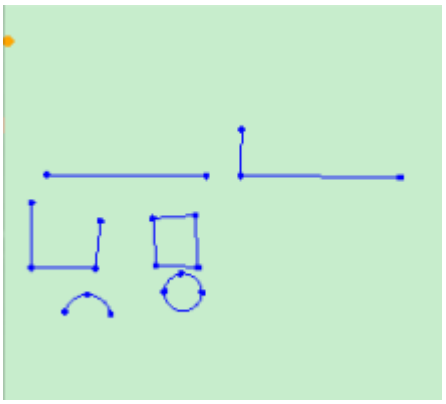
Turn off the safety height detection prompt: When clicked, turn off the security prompt ;

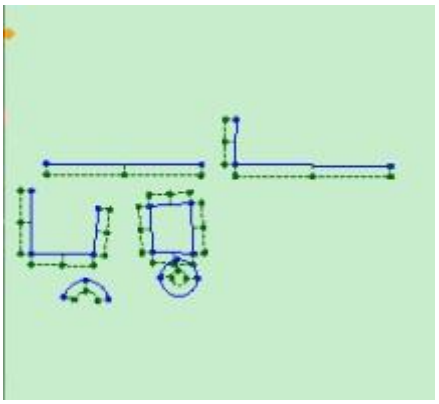
Automatically save the work data: When clicked, machine to record production

Board out detection: The mode has been set at the factory, please do not change it!

Thumbnail:

Vane type include "Simple"、"standard", shown as below:



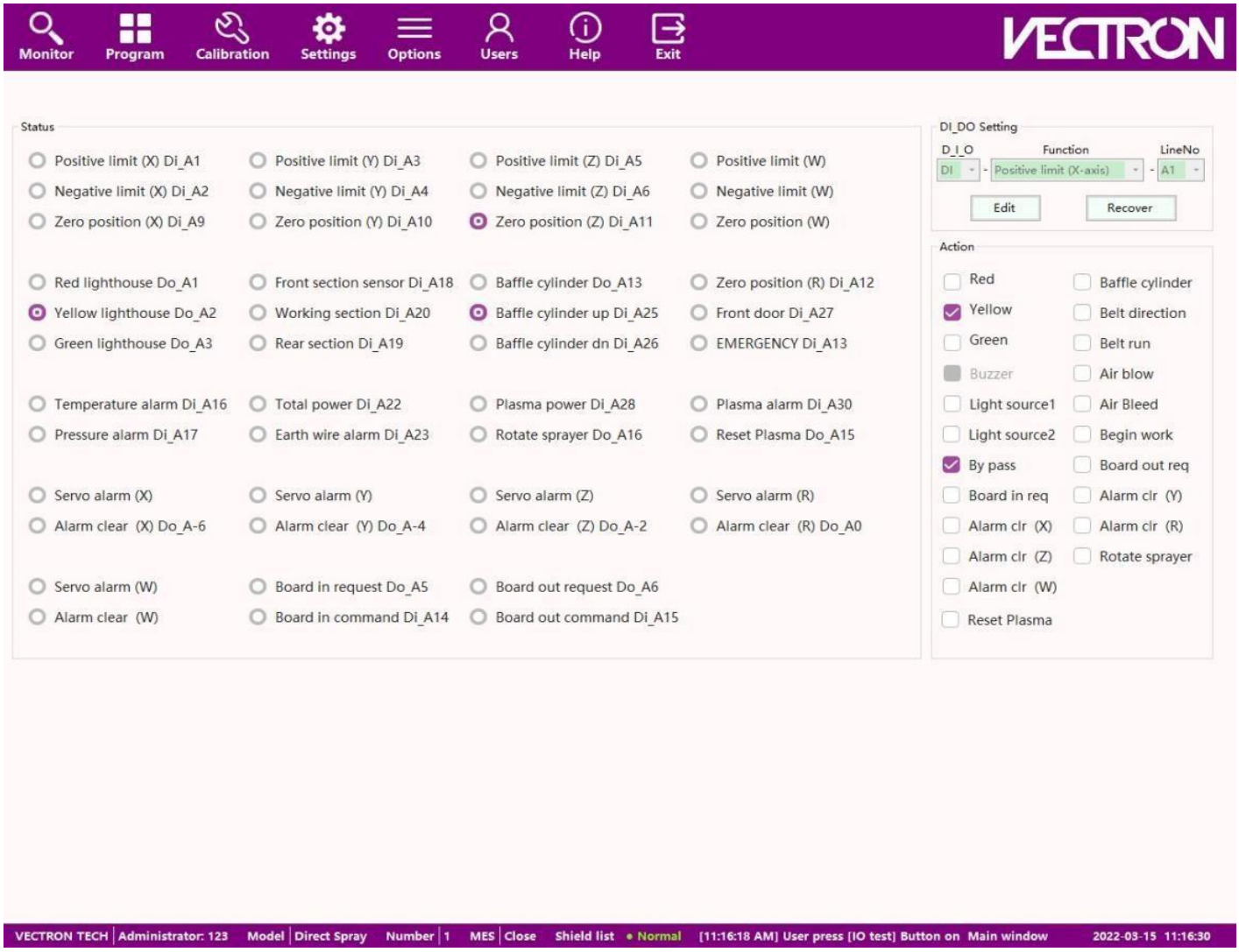


（Simple） （Standard）

Area circle diameter ： Follow system： Use the diameter value of the nozzle of the machine to draw a circle;

Follow path： The layout value set according to the diameter is drawn as the diameter value of the circle;

4) Click “IO test”, as shown in the figure below;



Drive card parameter: This interface displays the status of each axis, limit switch positive, limit switch negative, origin, switch, input IO, output IO and so on.

When the circle is lit, it means this function is valid; if the square is checked, it means that this function is activated ; when the equipment is faulty, it will be used for the convenience of checking the cause of the fault, and will not be explained in detail here.

5) Click "Light source always on", when the checked state is displayed, it means that the camera light source is always on; if it is in the unchecked state, wait for the PCBA to be loaded successfully → find the Mark point successfully → after the code is successfully read, the camera light source does not turn on during the spraying process Bright.

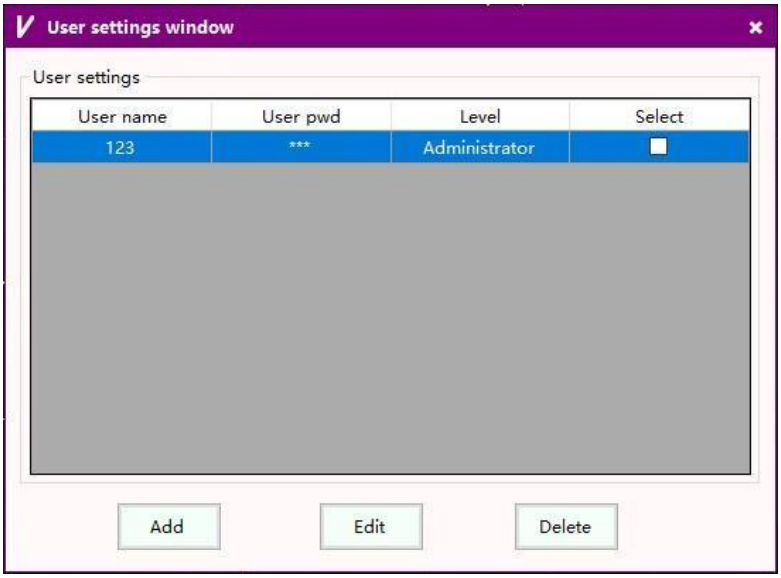
(Note: This function only works during automatic spraying.)

6)Click "Quick Function", and the "Quick Window" will pop up. The content of this part is the same as pressing "F2", and will not be explained in detail here.

10.6 Users Settings: Click "Users Settings", it will display as shown below,

1)Click "Switch user", Pop up "User Login window", display as shown below; press User name and password can enter software;

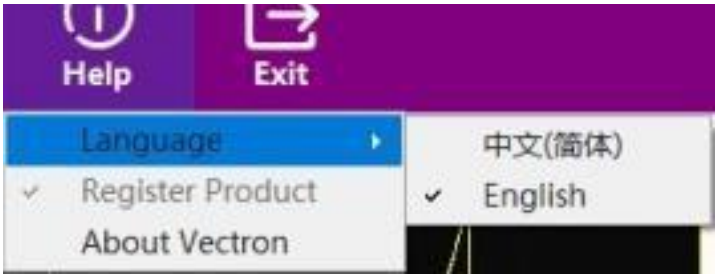
2)Click "User settings", Pop up "User settings window", as shown below;



In this window, users with different permissions can be created, which are divided into three types: administrator, engineer, and operator. This function is relatively simple and will not be explained in detail here.

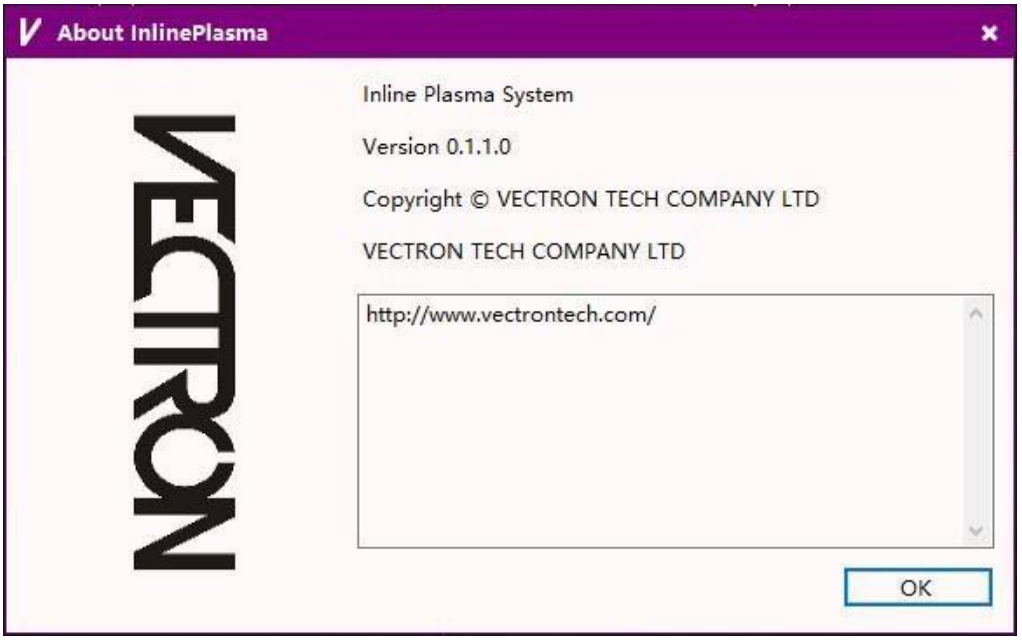
10. 7 Help: Click "Help", as shown below;

1)“Language”, can be switched to“ 中文” 或“ English”;



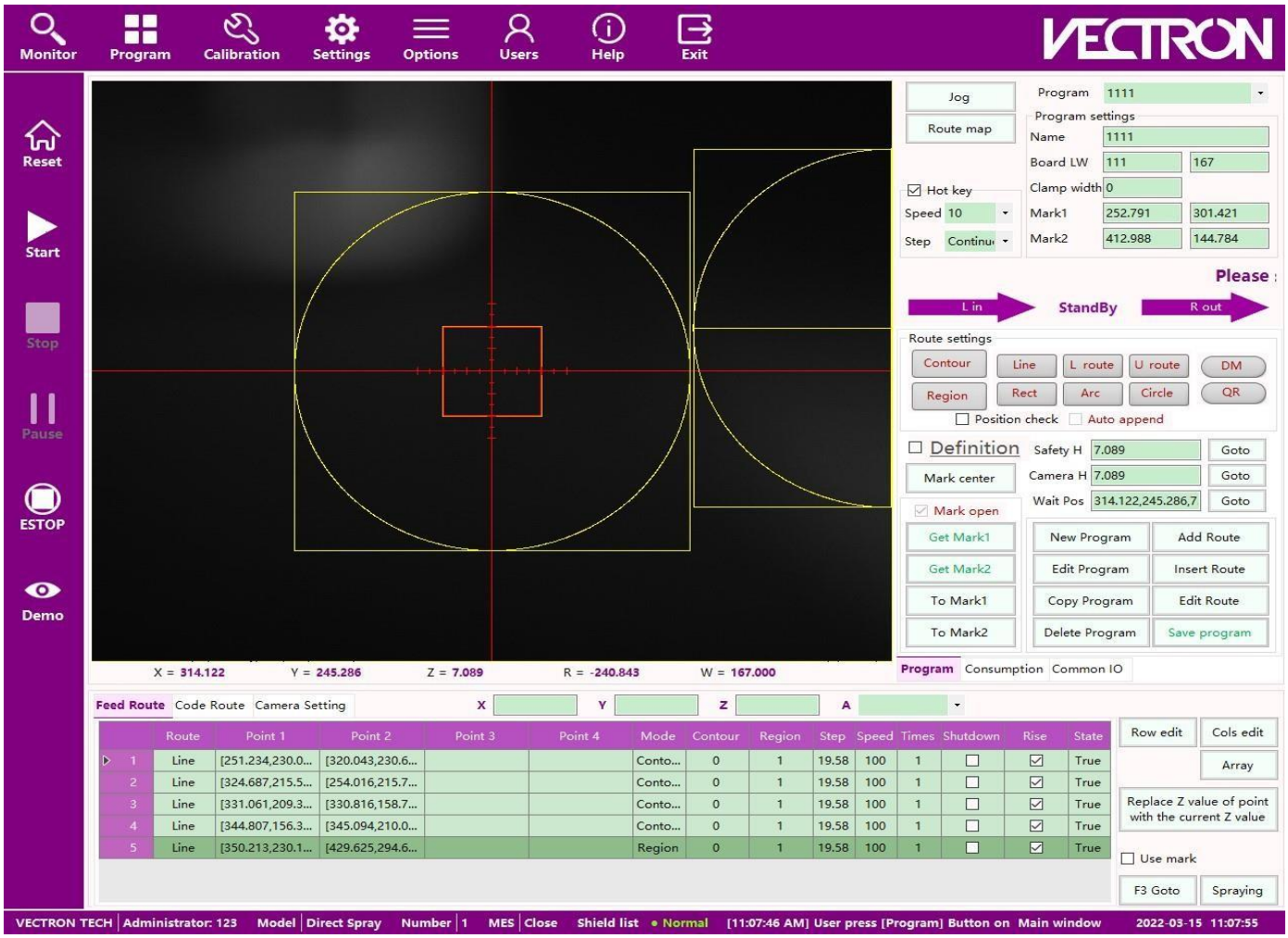
2)"Register Product", this window is only used when registering a product orupgrading a product, and will not be described in detail here.

3)Click“About Vectron”, Pop up window as shown below;



This window is only used when registering a product or upgrading a product.

II.Program Setting



1. New Program: Click " New Program", the new scheme can be set up.

2. Edit Program: Click "Edit Program", The content of the currently selected scheme can be modified.

3. Copy Program: Click "Copy Program", Re-enter the program name and save to copy the content of the currently selected program.

4. Delete Program: Click "Delete Program", the currently selected scheme is deleted.

5. Add Route: Click "Add Route", You can add a spray route to the last spray route of the currently selected scheme.

6. Inset Route: Select a certain line of route in the current program and click "Insert route" to add a spray route before the selected route.

7. Edit Route: Select the spraying route to be modified in the current program, and click "Edit route" to modify the spraying route.

8. Save program: In the "Add program", "Edit program", and "Copy program" window, click "Save program" to save the contents of this program.

The following takes the newly added program as an example to introduce the contents of the program setting interface;

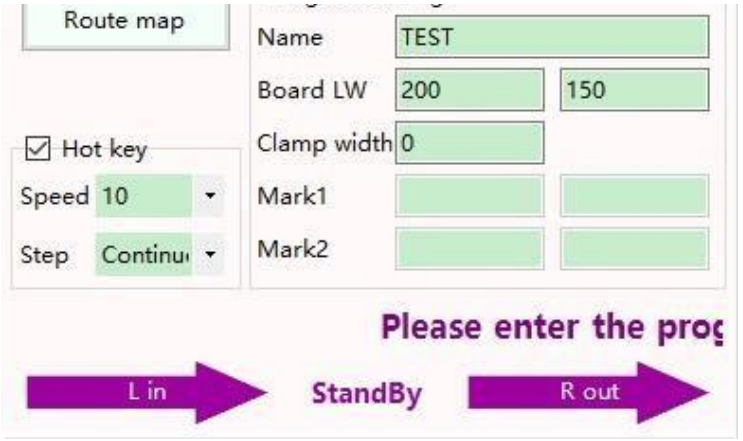
（1）Click“New program”，Enter the corresponding content according to the purple prompt font in the figure below;

①In "Program Name", fill in the program name, such as "TEST";

② In the "length and width of incoming board", fill in the length and width of the PCBA, such as "length: 200, width: 150"; (when filling in the width, add 0.5 to 1mm according to the width of the board);

③ In the "splint width", fill in the width of the splint according to the PCBA situation; In the process of loading, it is found that the clamp is not tight, and then make fine adjustments until the tension of the splint is suitable;

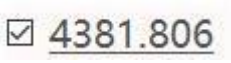
④ Click“Save program”， the new program name setting can be completed.



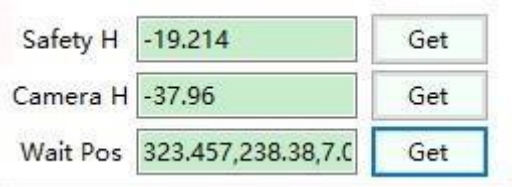
（2）Click“Edit Program”， Set other contents of the program;

① **Safety Height**：According to the thickness of the PCBA board, move the Z-axis of the nozzle, so that the nozzle is 2-3mm higher than the highest component on the board surface, click "Get", this position is the "safe height";

Camera Height：Click "Sharpness", as shown in the figure below, when the value is the largest, the coordinate value of the Z axis at this time is the camera height, click and click "Get", this position is the "Camera Height";



Wait Position: move the nozzle to the vicinity of the PCBA to be sprayed, click "Get", this position is the "waiting position";

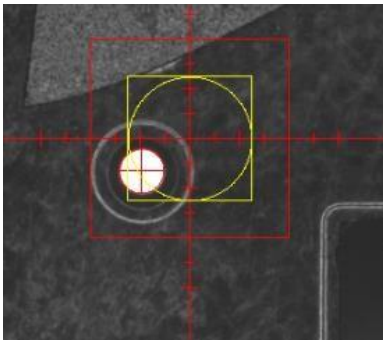


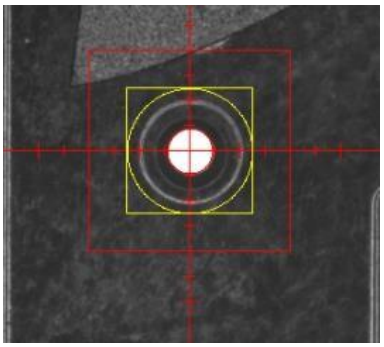
② Click "Enable Mark Points" to set Mark Points;

1） Move the camera cross cursor to the PCBA board Mark1 point, click "to Mark

Center"

The software will automatically find the Mark center, click "Grab Mark1" to complete the Mark1 point setting;



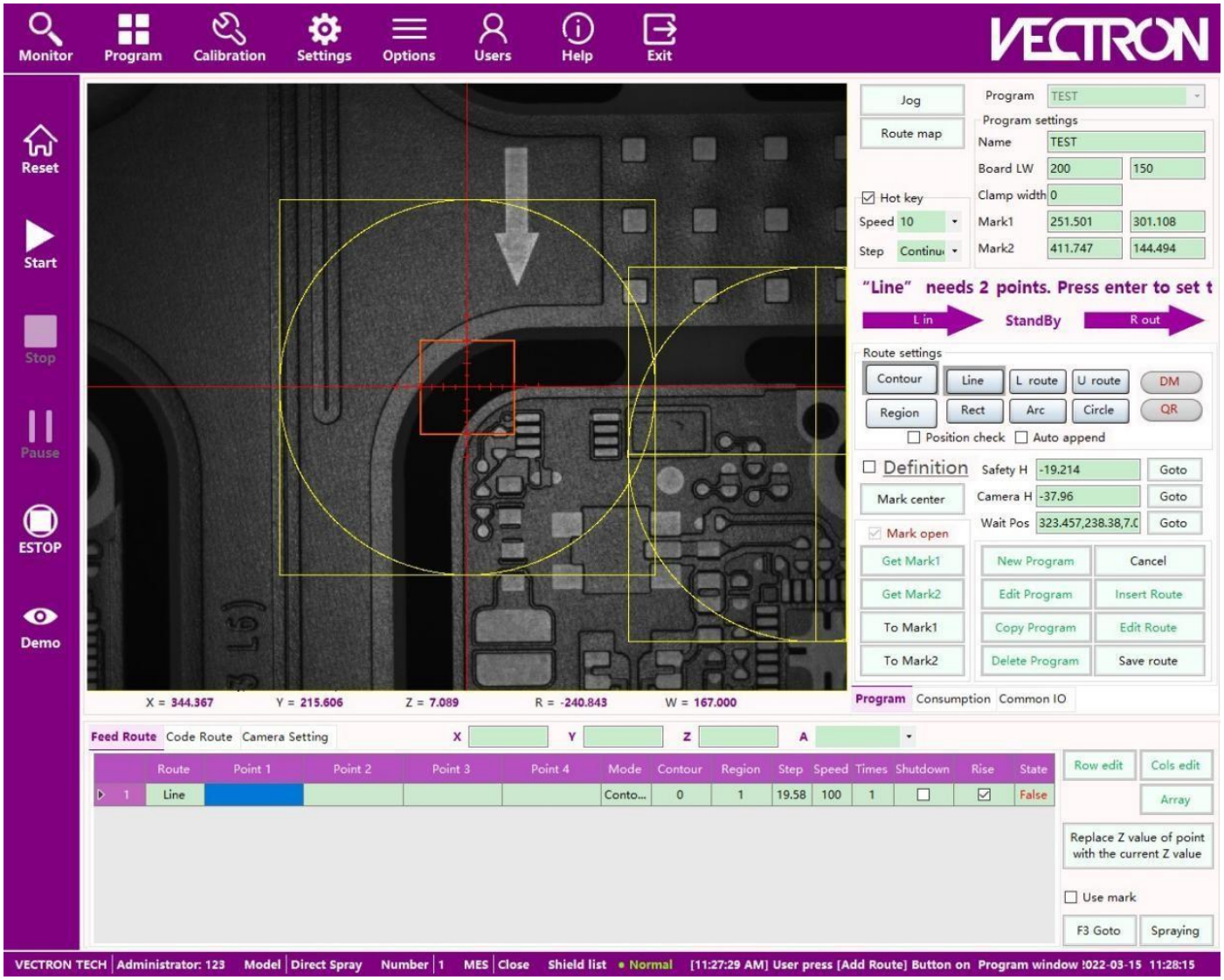


2) Click "To Mark1", Verify that the Mark1 position is correct;

3) According to the method of setting Mark1 point, set the position of Mark2 point; (if the system cannot automatically find the Mark center, you need to reset the Mark parameters, click "Calibration Settings" to perform "Mark Calibration", this part will be in the "Calibration Settings" chapter details);

4) Click "Save program", to completed.

3) Click "Add Route", include "Router Setting" 、" QRcode Route setting" .Click " Auto Append ", After the route is edited, the system automatically appends one to the above route by default; click "route Settings" to display as shown in the figure below;



Spray route editing, the system provides 6 types: straight line, L shape, U shape, rectangle, arc, circle

Route type setting;

1) Line: At the front and rear positions to be sprayed, press "Enter" to confirm the two points;

2) L shape: At the front, middle and rear positions to be sprayed, press "Enter" to confirm the three points;

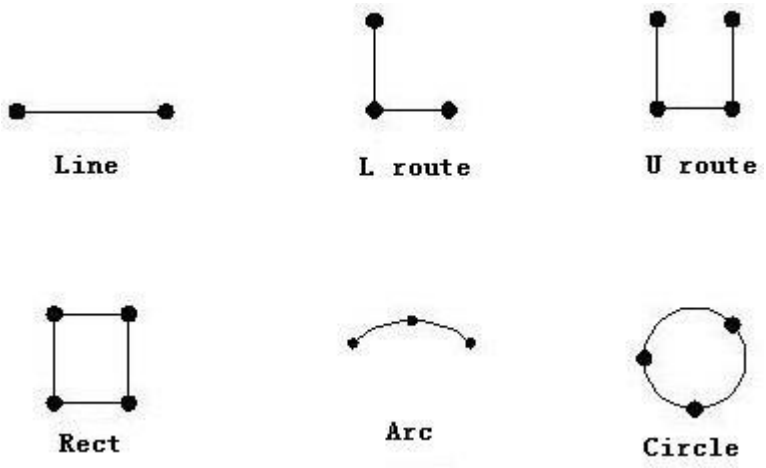
3) U shape: In the upper, lower, left and right positions to be sprayed, press "Enter" to confirm the four points;

4) Rectangle: Press "Enter" to confirm the four points at the upper, lower, left and right positions to be sprayed;

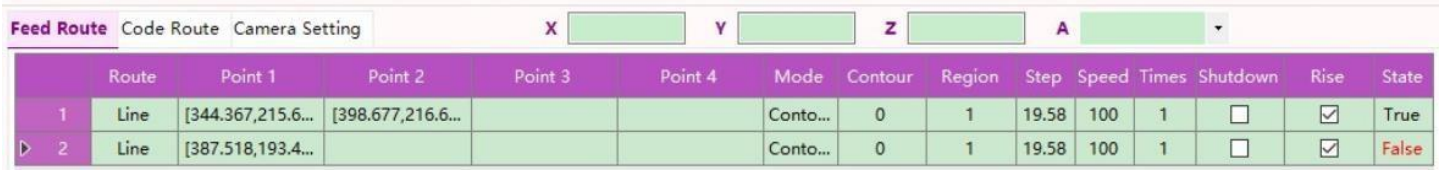
5) Arc: At the front, middle and rear positions to be sprayed, press "Enter" to confirm the three points

6) Circle: Press "Enter" to confirm the three points at the front, middle and rear positions to be sprayed

Various route type rules are shown in the following figure;

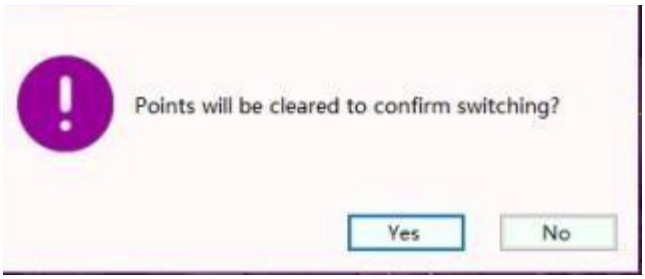


As shown in the figure below, when the setting status is "True", the corresponding route is set, otherwise it is displayed as "False";

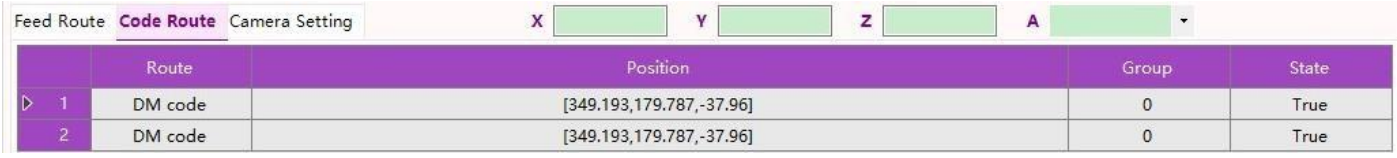


	Route	Point 1	Point 2	Point 3	Point 4	Mode	Contour	Region	Step	Speed	Times	Shutdown	Rise	State
1	Line	[344.367,215.6...	[398.677,216.6...			Conto...	0	1	19.58	100	1	☐	☑	True
2	Line	[387.518,193.4...				Conto...	0	1	19.58	100	1	☐	☑	False

If you find that the line type is wrong when editing, select the wrong line type, click the correct line type in the following figure, the system will ask whether to change it, click OK.



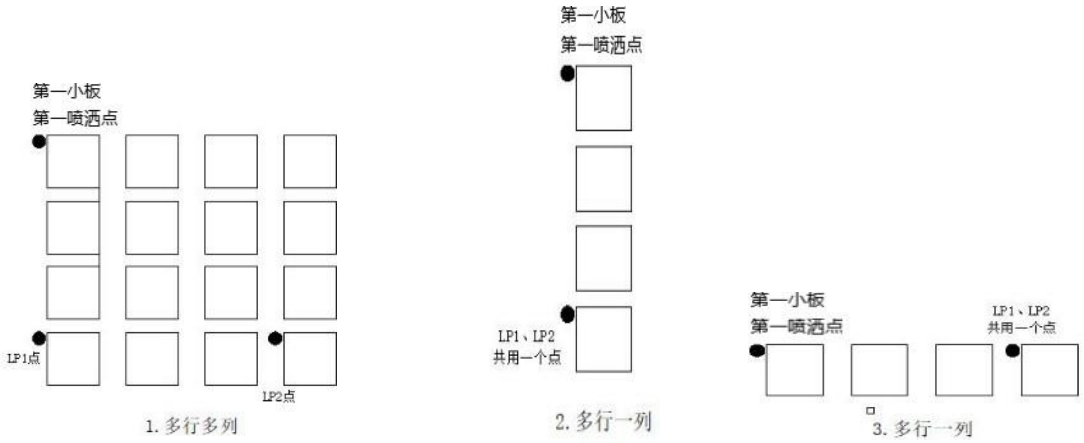
（5）According to different PCBA, if you need to scan the code during spraying, click "QR code", move the camera cross cursor to the position of the code, and press "Enter" to confirm. At this time, the scan code position is confirmed, as shown in the figure below.



	Route	Position	Group	State
1	DM code	[349.193,179.787,-37.96]	0	True
2	DM code	[349.193,179.787,-37.96]	0	True

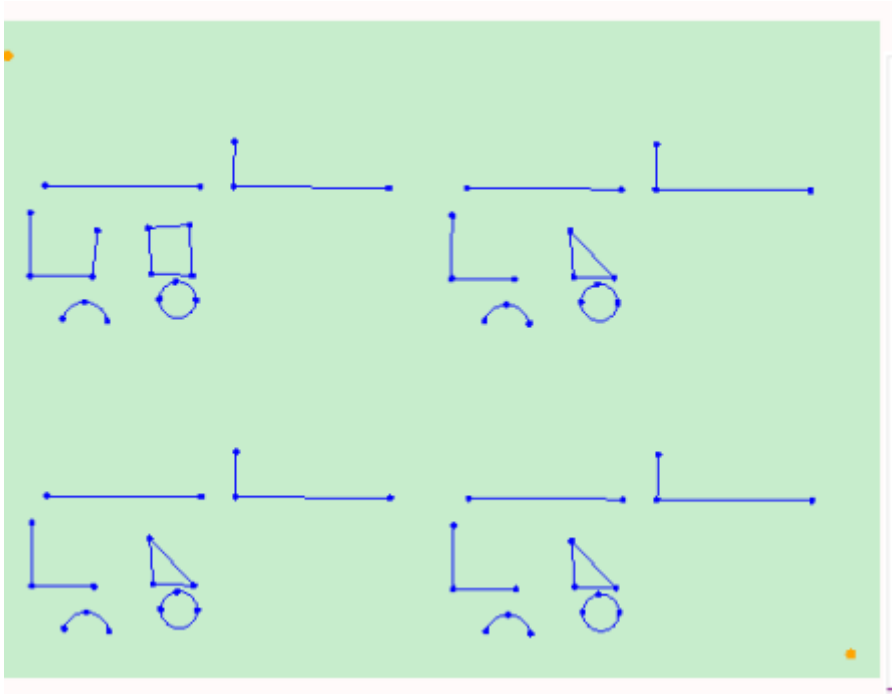
（6）If the sprayed PCBA is a regular polygonal sheet, according to the methods (1) to (5), after setting the path of the first small board in the PCBA, the "array" function can be used.

Select all the spraying paths of the first panel, click "Array", according to the situation shown in the figure below;



Move the camera cross cursor to the "TLP1" position as shown above, click "LP1", move the camera cross cursor to the "TLP2" position as shown above, click "LP2", and the "Array Window" will pop up. Enter the corresponding number of rows and columns in the window, and click "OK".

To verify that the spraying paths in the program are correct, select the program to be verified, click "Thumbnail" to view all paths,



Click "Demo Mode", select the relevant function, and click "Start".

In demo mode, "camera mode", "Spraying", "with code reading" and other functions are as follows;

Check "Camera Mode", the camera will display the location of the spray path during simulation;

Check "Spraying", the spindle will simulate spraying at the location of the spraying path;

Check "Read Code", the camera will move to the position to read the code to read the code;

You can check multiple options at the same time or individually, and the device will perform corresponding actions during presentation.

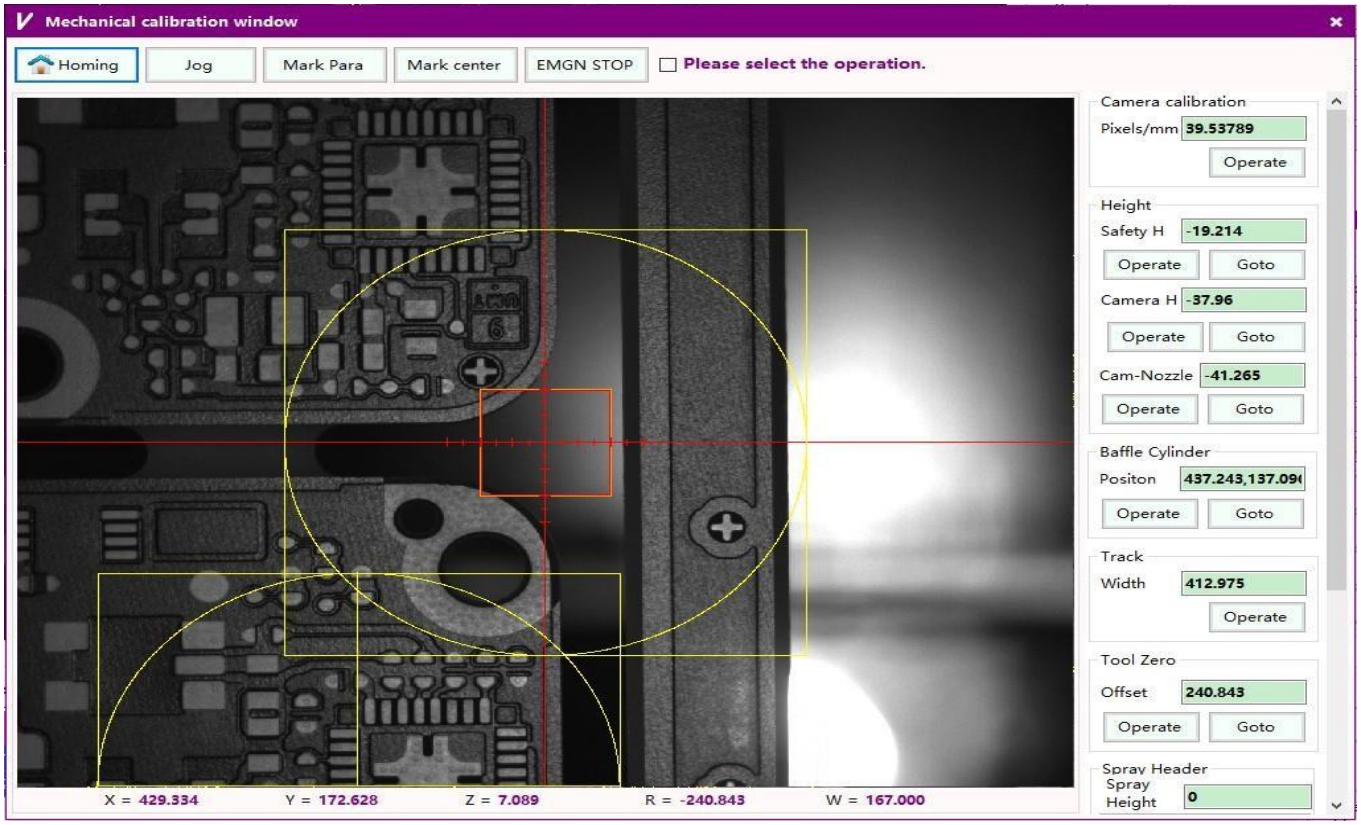
With the demo mode, verify that the program is edited correctly. If any errors are found, click Modify to make changes. At this time, click "Update Route", and the system will perform Mark compensation on all paths according to the modified Mark point deviation. If you do not click, only the modified path will be updated.

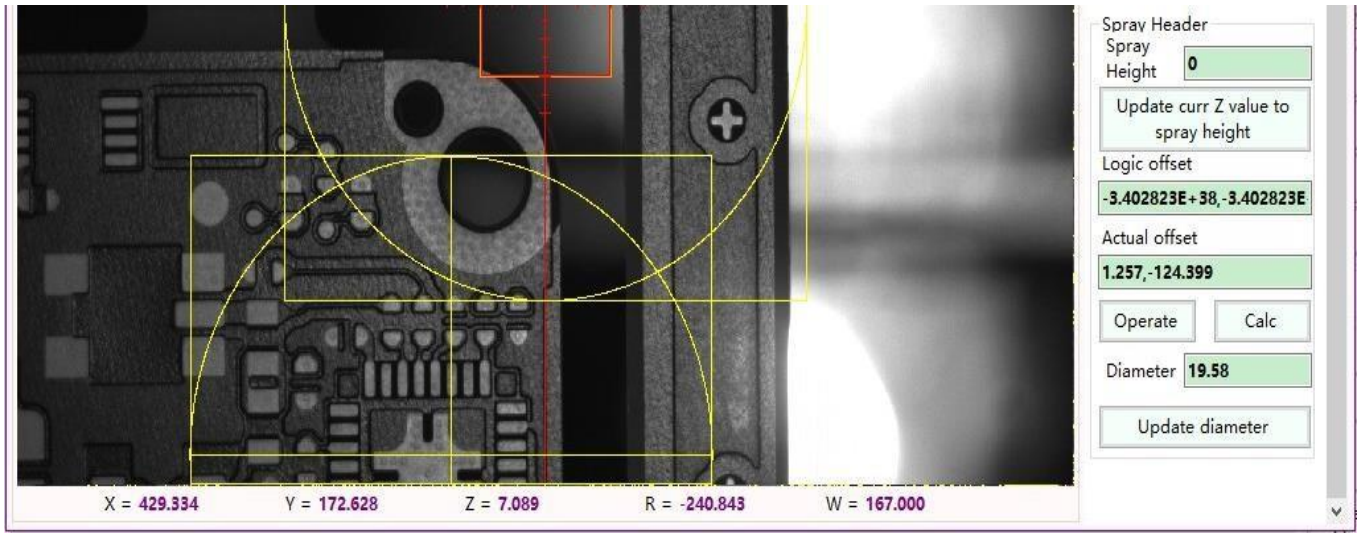
III.Mechanical Calibration

The calibration window includes two parts: "machine parameter setting" and "camera parameter setting";

After the equipment is assembled, a mechanical calibration will be done. After the mechanical calibration is completed, it is generally not necessary to recalibrate without disassembly.

1. Click "Calibration Setting", select "Machine Parameter Setting", and the "Calibration Setting Window" will pop up, as shown in the figure below;





（1）Click "Homing" in the upper left corner of the interface, and each axis of the device will return to the origin;

（2）Camera calibration

①Pixels/mm：Using the camera height that has been set, move the camera cross cursor to the center of the Mark on the PCBA board, click "Pixel Calibration", and the camera will take values at the four corners of the Mark;

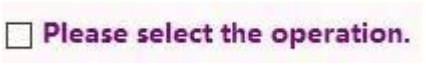
The system will automatically calculate the pixel value of the current camera.

No need to manually input, the system will automatically add the value in, if re-calibration, the system will prompt whether to replace, click "OK" to completethe camera calibration.

（3）Height Calibration:

① Safety H: Set the default safe position of the Z axis during processing, click "Operate", and then click "Get";

② Camera H: Call up the shortcut window by pressing "F2", move the camera cross cursor to the Mark center of the PCBA board, and check "Get camera sharpness value", as shown in the following figure:

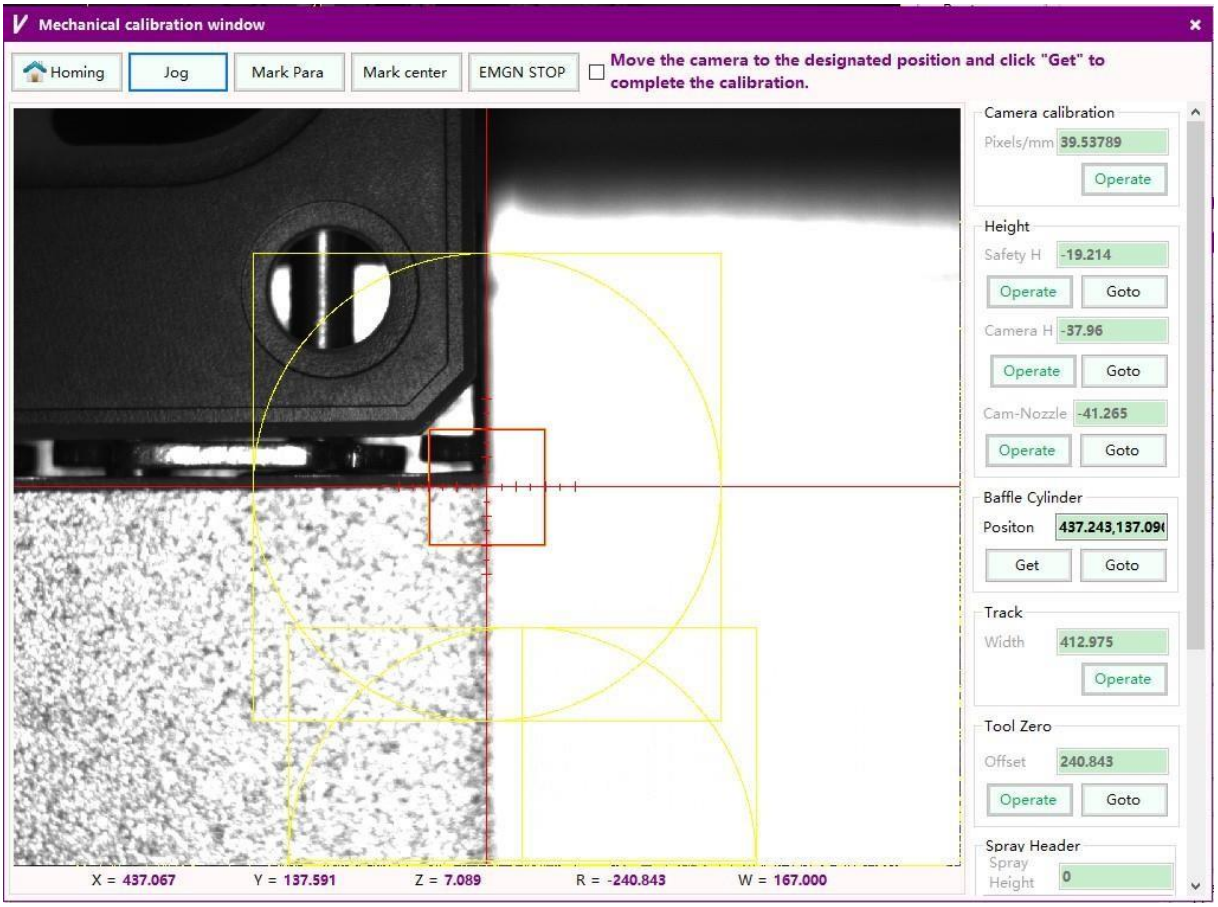


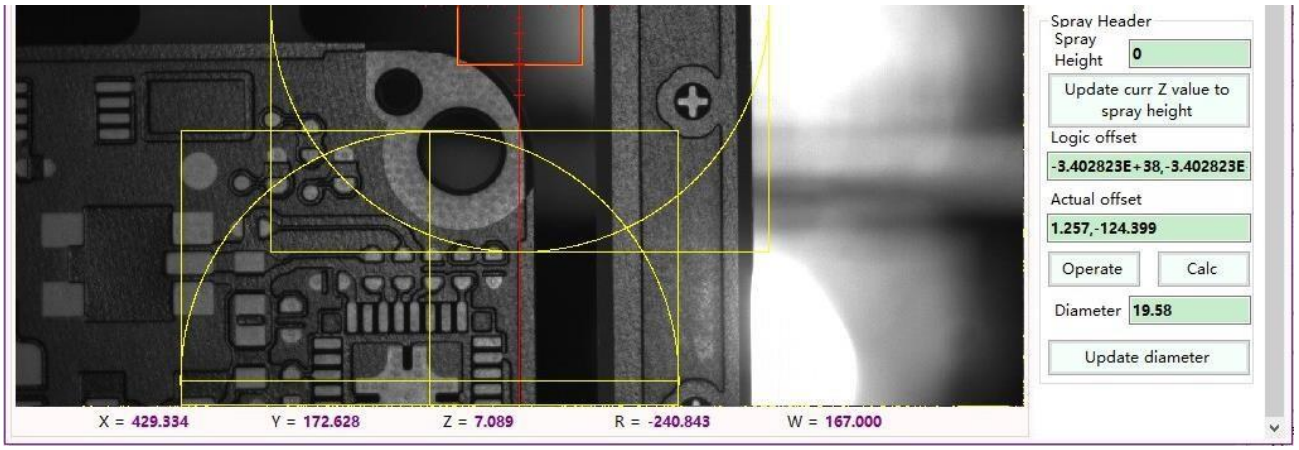
At this point, it will turn into a series of numbers, slowly move the Z axis of the spindle to make the number at the maximum value, click "Operate", and then click "Get";

③ Cam-Nozzle: Call up the shortcut window by pressing "F2", move the Z axis so that the nozzle is 10-12cm away from the spray surface, click "Operate", and then click "Get";

（4）Baffle Cylinder:

① Position(Cylinder): Call up the shortcut window by pressing "F2", move the camera cross center line to align the cylinder of the track baffle, as shown in the figure below

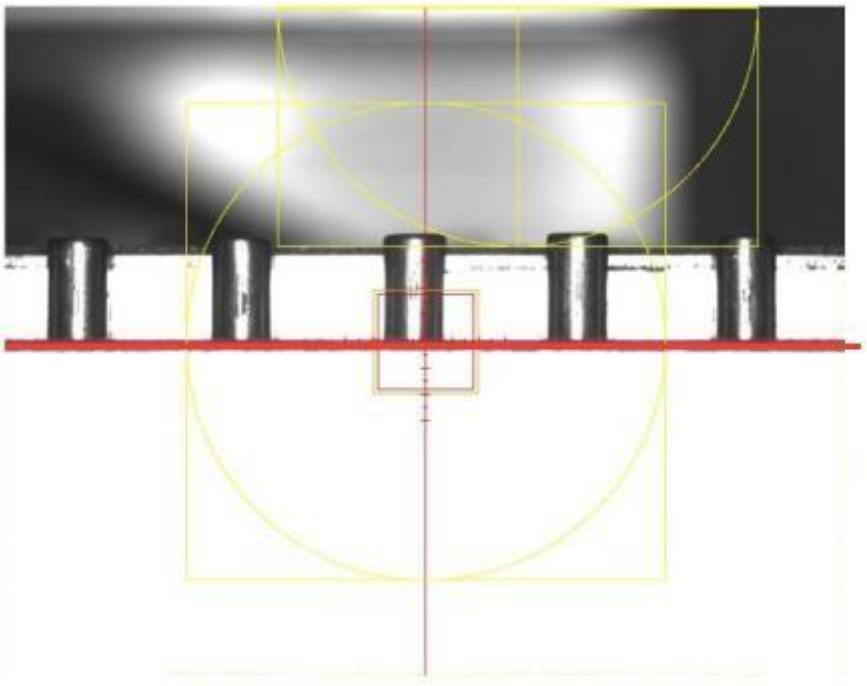




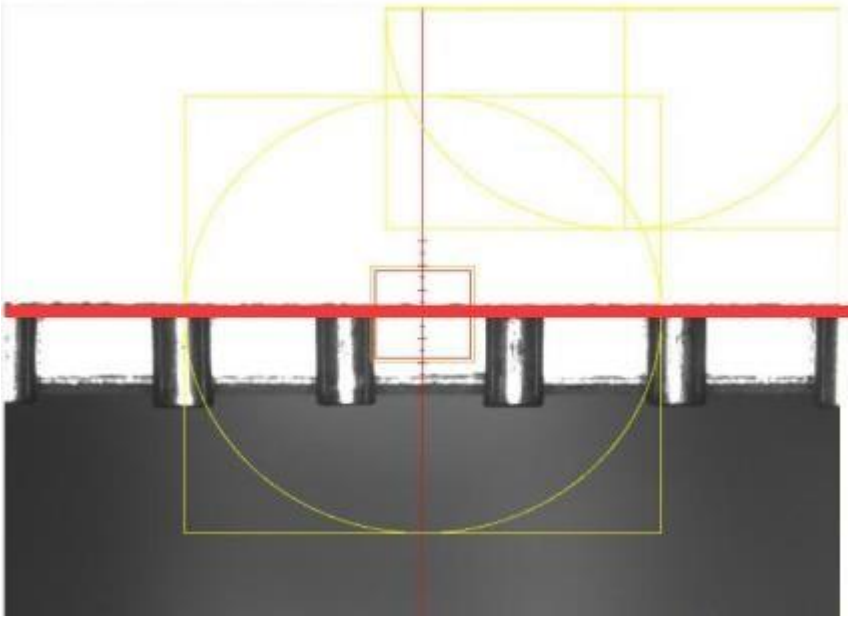
Click "Operate", and then click "Get";

（5）Track calibration:

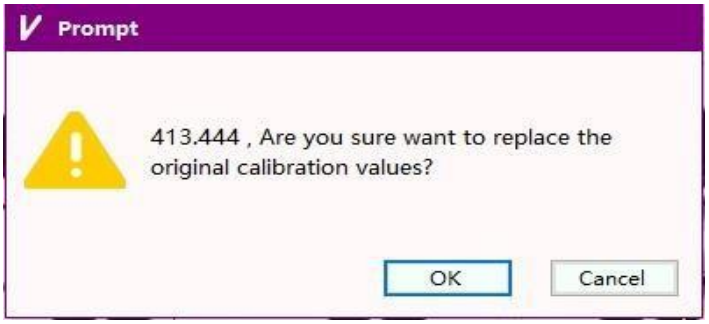
① Click "Operate", The track automatically returns to the origin, move the camera cross cursor to the inner edge of the track (as shown in the figure below), and click "TLP1";



Then move the camera cross cursor to the inner edge of the moving track (as shown in the figure below);



Click "TLP2", the system will pop up a window like as below:



Click "OK", the system will automatically update the value of the total width of the track;

When the track calibration is completed, at the board width position, enter the board width size of a PCBA , and click "Insert Board"; the track will move to the set value position; put the PCB at the front of the track, if the PCB board can be transferred smoothly , the track calibration is completed; otherwise, it needs to be re-calibrated.

（6）Nozzle Angle Calibration

This calibration must be done when the print head has a rotating function. Its purpose is to define the zero-degree angle of the working state of the nozzle. Click "Operate" to manually rotate the nozzle to a custom zero-degree angle through the shortcut key F2 according to the prompt, and then click "Get";

（7）Nozzle Calibration(Spray Header)

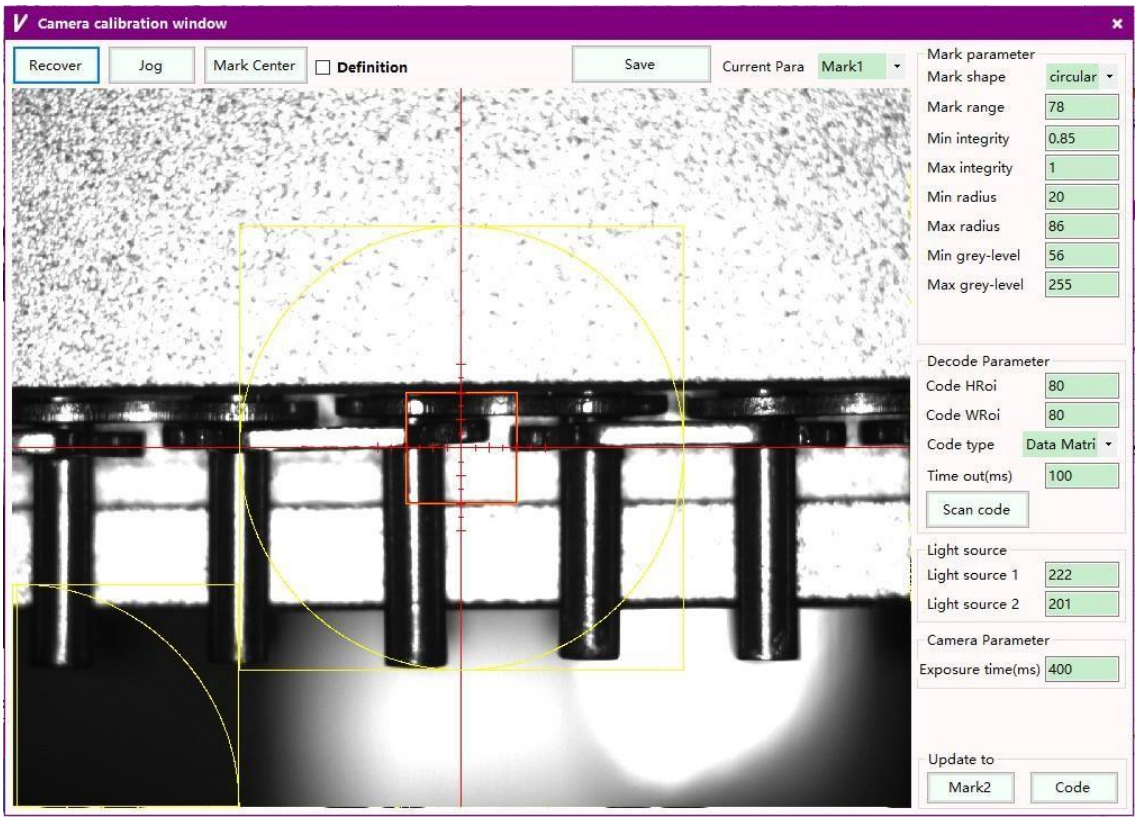
① Spray Height： In the next step the height required for the nozzle when offset compensation is performed, click "Update the current Z value to the spray height";

② Offset compensation: This item is divided into logical offset compensation and actual offset compensation. Logical offset compensation refers to the initial value manually input after calculating the center distance between the nozzle and the camera;

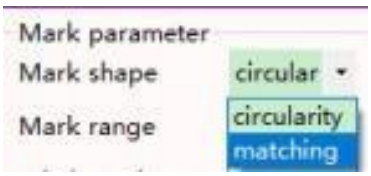
while the actual offset compensation is the actual value calculated by the software after the following operations. Click "Operate", the nozzle will spray a point on the PCBA, and move the camera cross cursor to the center of the point. At this time, manually align the camera cross cursor with the center of the point, and click "Get";

③ Diameter (Spray diameter): Click the nozzle diameter manually input the diameter of the nozzle, and then click "update diameter";

2. Click "Calibration Settings", select "Camera Parameter Settings", and the "Camera Parameter Settings Interface" will pop up, as shown in the figure below;



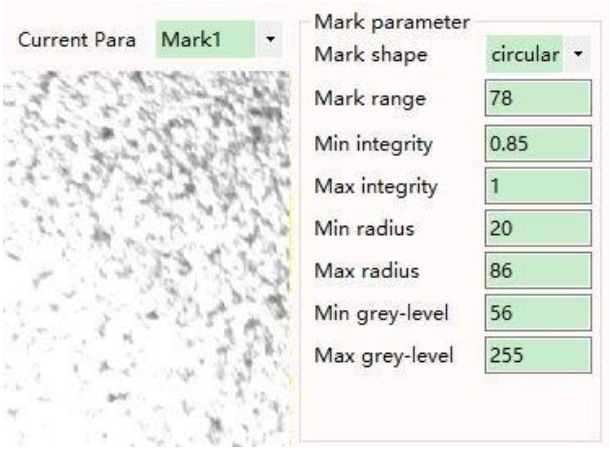
Mark parameter, including "circularity"、"matching" two model, as shown in the figure below;



The "circularity" mode is commonly used, and only the "circularity" mode is valid in "Camera Calibration";

When adjusting the "Mark parameter" in the program setting, the parameters at this time will be saved in the selected program. Therefore, when doing mechanical calibration, remember not to open the program setting interface;

（1）In "Current Parameters", select "Mark1", in "Mark Parameters", select "circularity", as shown in the figure below;



1) Mark range: when setting the photo mark, the effective area for discrimination;(Note: the unit is in pixels)! ;

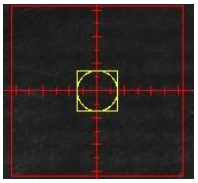
2) Min integrity: According to different Mark points, adjust the value to achieve the best acquisition effect; (the minimum value is 0.1, the larger the value, the higher the consistency requirements of the Mark point);

3) Max integrity: This value is a fixed value of 1;

4) Min radius: The unit of this value is pixel, the value of "Camera Calibration" needs to be used, and it is filled in according to the size of the Mark point;

The figure below (1) indicates that 40.53077 pixels represent 1 mm;

As shown in Figure (2) below, each small grid of the camera cross cursor represents 0.5mm;



（1） （2）

5) Max radius: Normally it is twice the "minimum radius", which can be appropriately adjusted according to the acquisition effect of Mark points;

6) Max grey-level\Max grey-level ：This value needs to be set according to the current Mark point and the gray value displayed by the camera; move the mouse cursor to the outside of the Mark edge and click the right mouse button to display as shown in the following figure (1), which is 37; move the mouse cursor to the Mark edge , click the right mouse button to display as shown in the following figure (2), the display is 255;

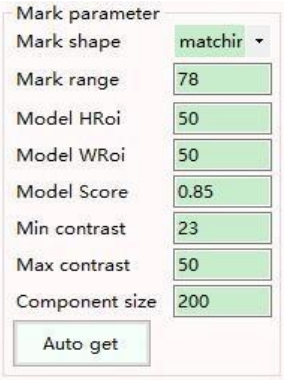
（1） （2）

Therefore, the minimum gray value is theoretically 37 (actually, in order to allow the camera to better obtain the Mark, the minimum gray value is appropriately increased); the maximum gray value is theoretically 255;

When the above parameters are set, the edge of the Mark point is surrounded by a red circle (the yellow circle is the size of the nozzle), and the camera cross cursor is just in the center of the Mark point; the obtained effect is shown in the figure below;

In the red square frame, move the camera cross cursor away from the center of the mark point, and then click "to the center of the mark", if it can be captured well, it means that the mark parameters have been set;

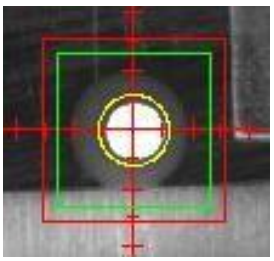
（2）In "Mark Parameters", select "matching", the display is as shown below;



Mark Shape: "matching" mode is used when the mark is non-circular; move the camera cross cursor to the center of the mark (manual centering is required), click "automatic get", and the system will automatically acquire a set of data according to the situation of the mark;

Mark range:In the range of 50-180, the larger the value, the larger the effective recognition area

1) Model HRoi(radius) (height): The unit of this value is pixel, set the search range of the matching image (equivalent to the height of the green box), as shown in the following figure;



2) Model WRoi raduis（weight）: The unit of this value is pixel, which sets the search range of matching images (equivalent to the width of the green box);

3) Model Score: The larger this value is, the higher the consistency requirements for matching images are; (the value range is 0.1-1)

4) Min contrast: The similarity of the pairing, the camera can identify

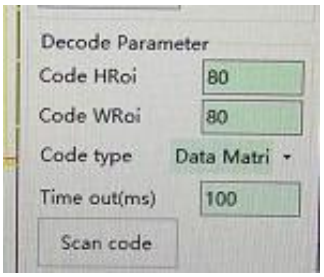
the minimum contrast threshold of the Mark point; it is determined to be successful within the range of the minimum and maximum contrast;

5) Max contrast: The similarity of the pairing, the camera can recognize the maximum contrast threshold of the Mark point, and the contrast of the current image as the Mark point is within the minimum and maximum range, it is judged to be successful;

6) Component size : When the above parameters cannot obtain the best imaging, adjusting this value can improve the effect to a certain extent;

When the above parameters are set, it is best for the Mark point only to be surrounded by a green circle;

(3) Decode Parameter



1) Decode HRoi(Height): The unit of this value is pixel, which refers to the height of the yellow box of the decoding search range;

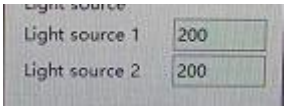
2) Decode WRoi(Weight): The unit of this value is pixel, which refers to the width of the yellow box in the decoding search range;

3) Code type: The decodable types are divided into two types: DM code and QR code;

4) Time out(ms): It means that if the decoding cannot be successful within the set time range, the software will alarm;

5) Scan code: Click this button to decode and test the image of the current camera;

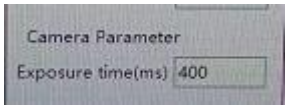
(4) Light source



1) Light 1 source: Brightness adjustment of the red light source. According to different plates, adjust the brightness to achieve the best imaging effect; (the adjustment range is 0-250, the larger the value, the brighter);

2) Light 2 source: Brightness adjustment for white light sources. According to different plates, adjust the brightness to achieve the best imaging effect; (the adjustment range is 0-250, the larger the value, the brighter);

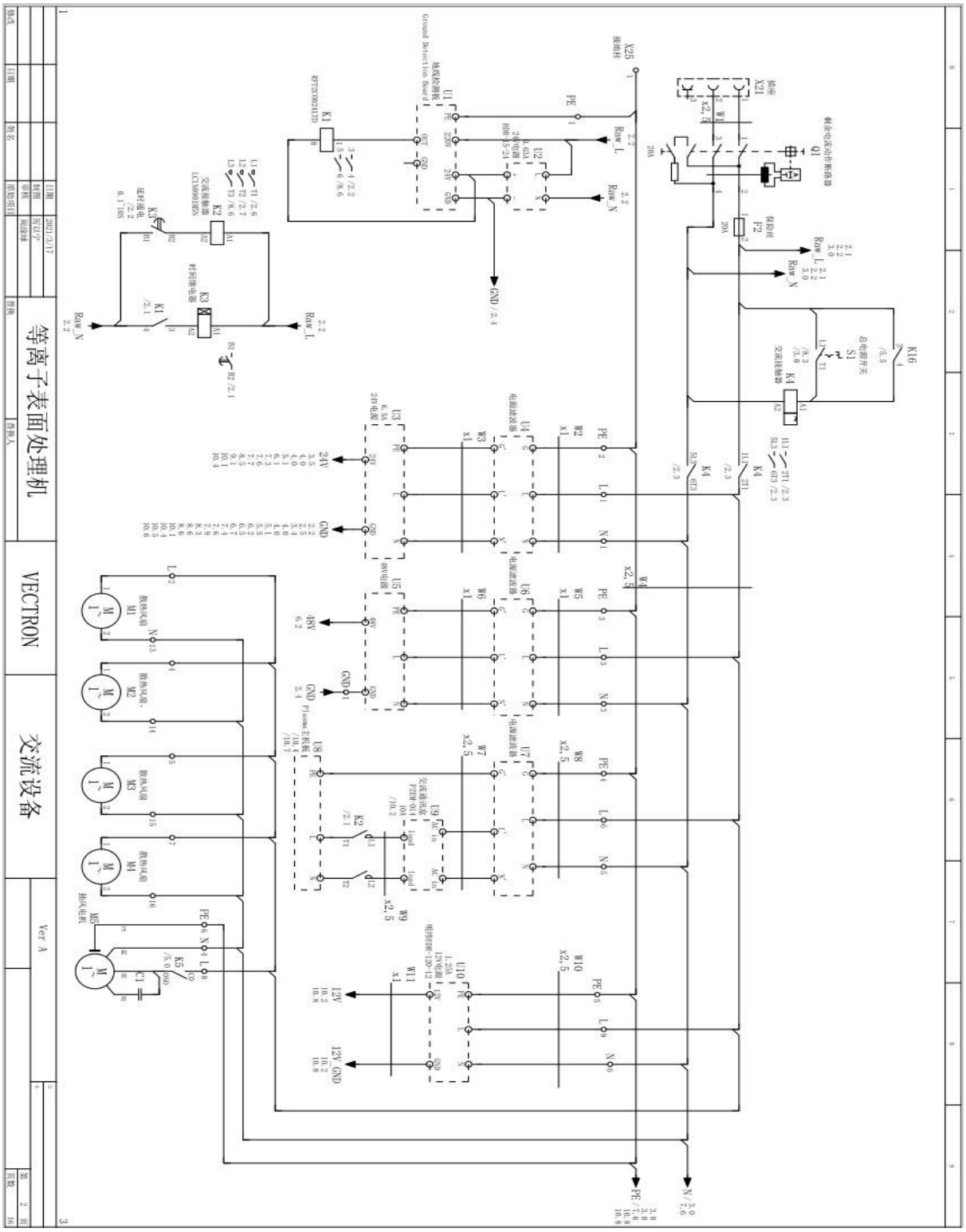
(5) Camera Parameter



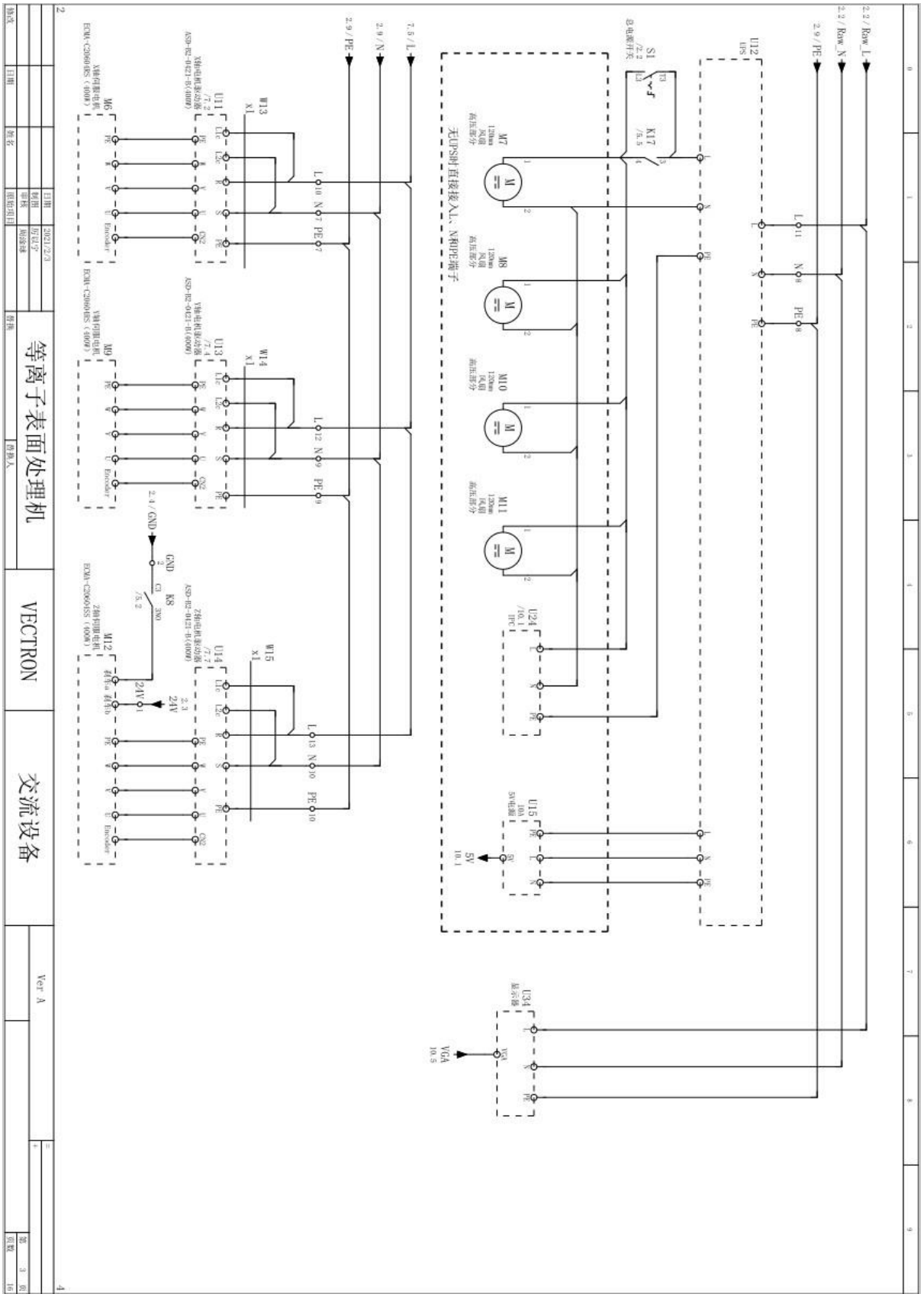
Exposure time: According to different plates, adjust the value to achieve the best imaging effect; (the minimum value is 0, the larger the value, the brighter);

Update to: Update the current parameters to "Mark2" or "Code";

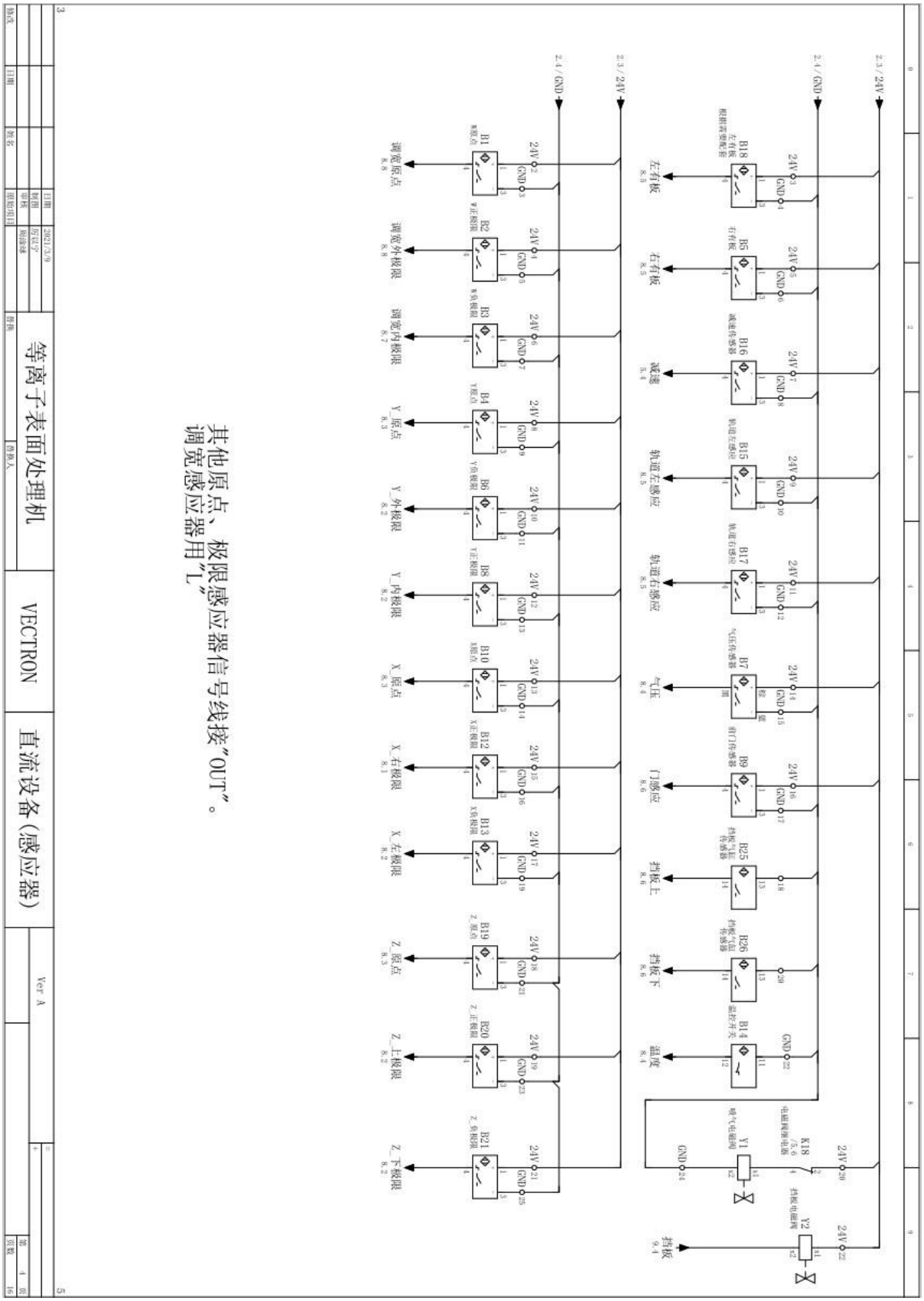
Chapter 3: Equipment Circuit Diagram



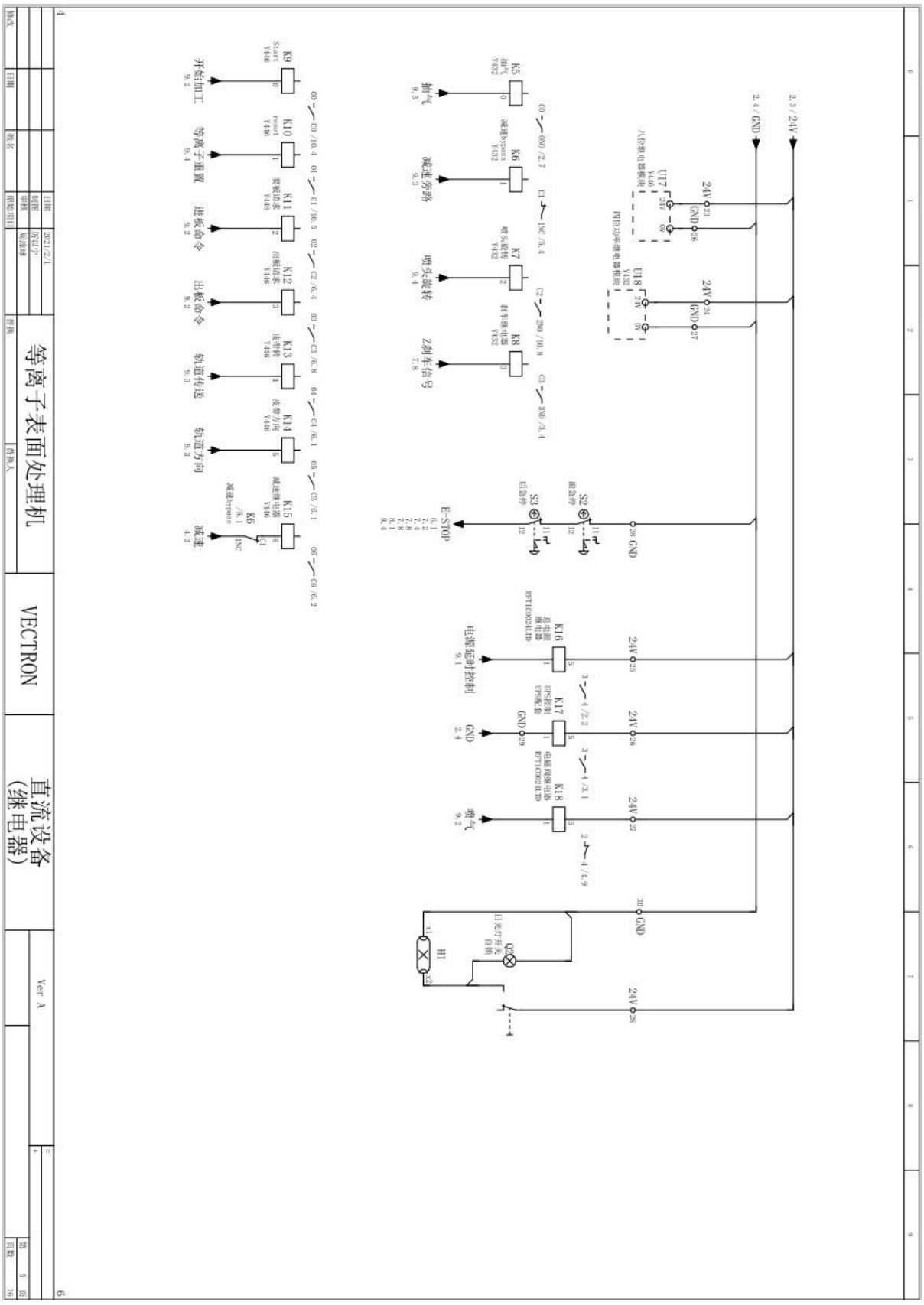
AC power supply diagram



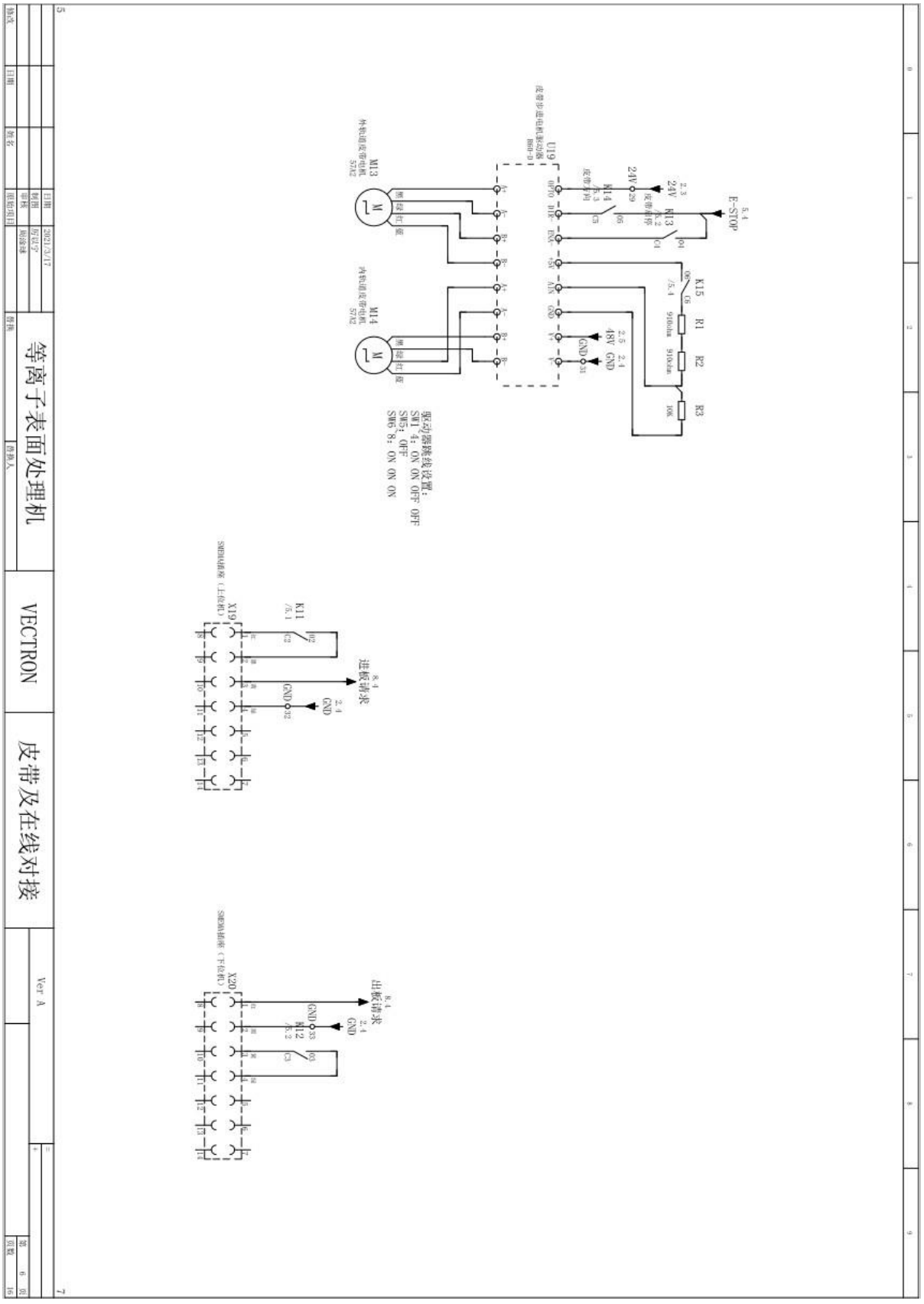
AC equipment power supply diagram



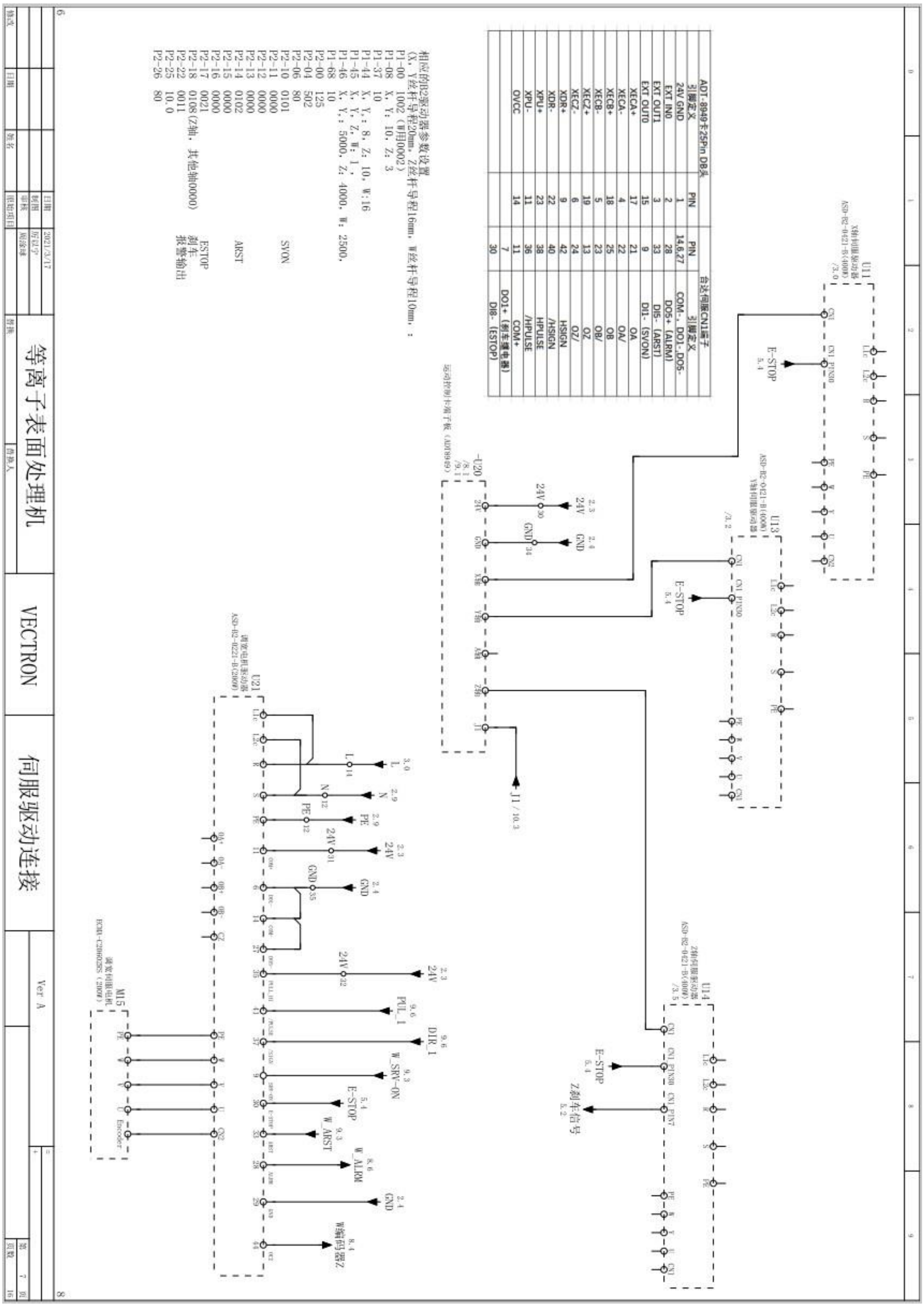
DC equipment power supply diagram (inductor)



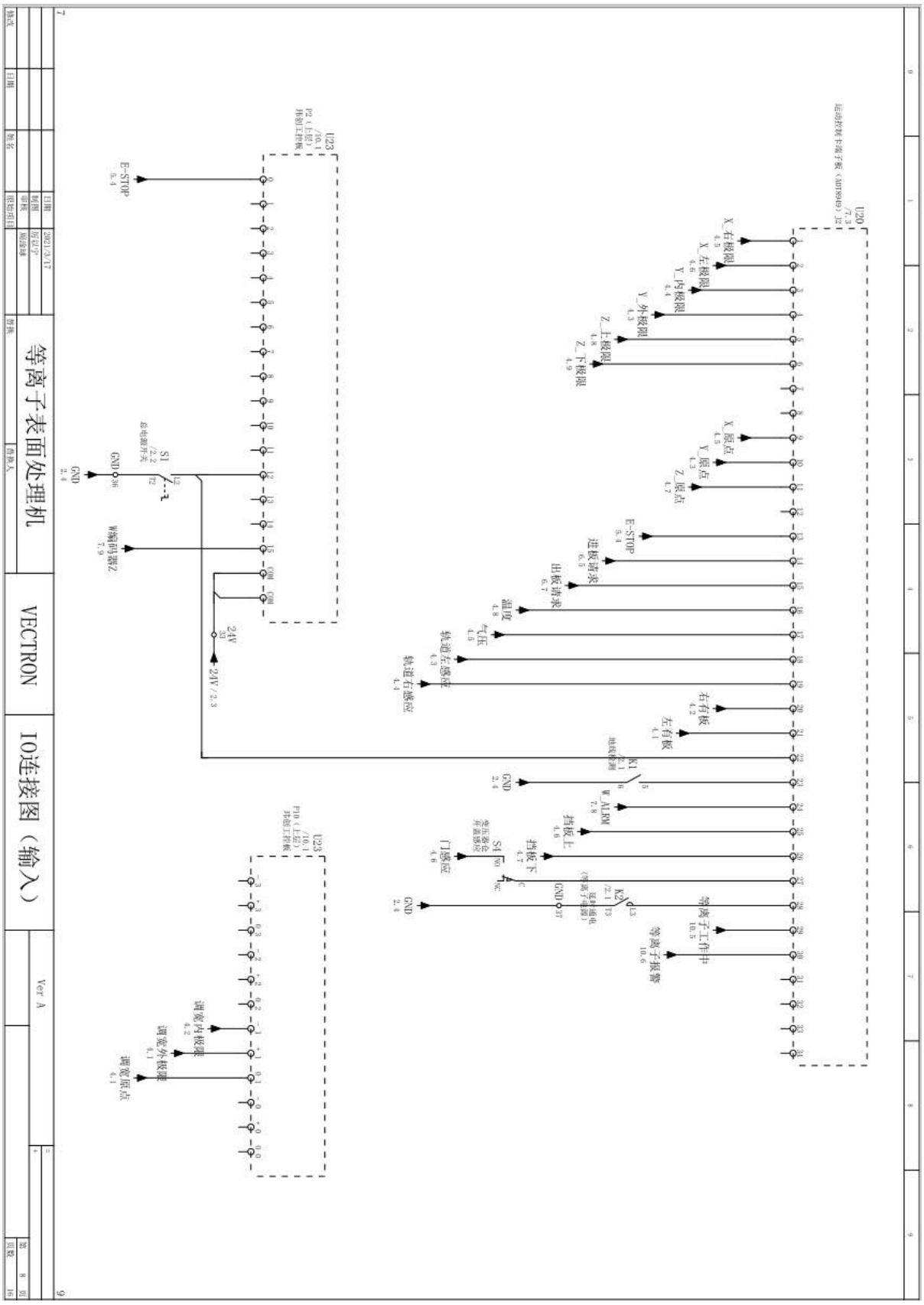
DC equipment power supply diagram (relay)



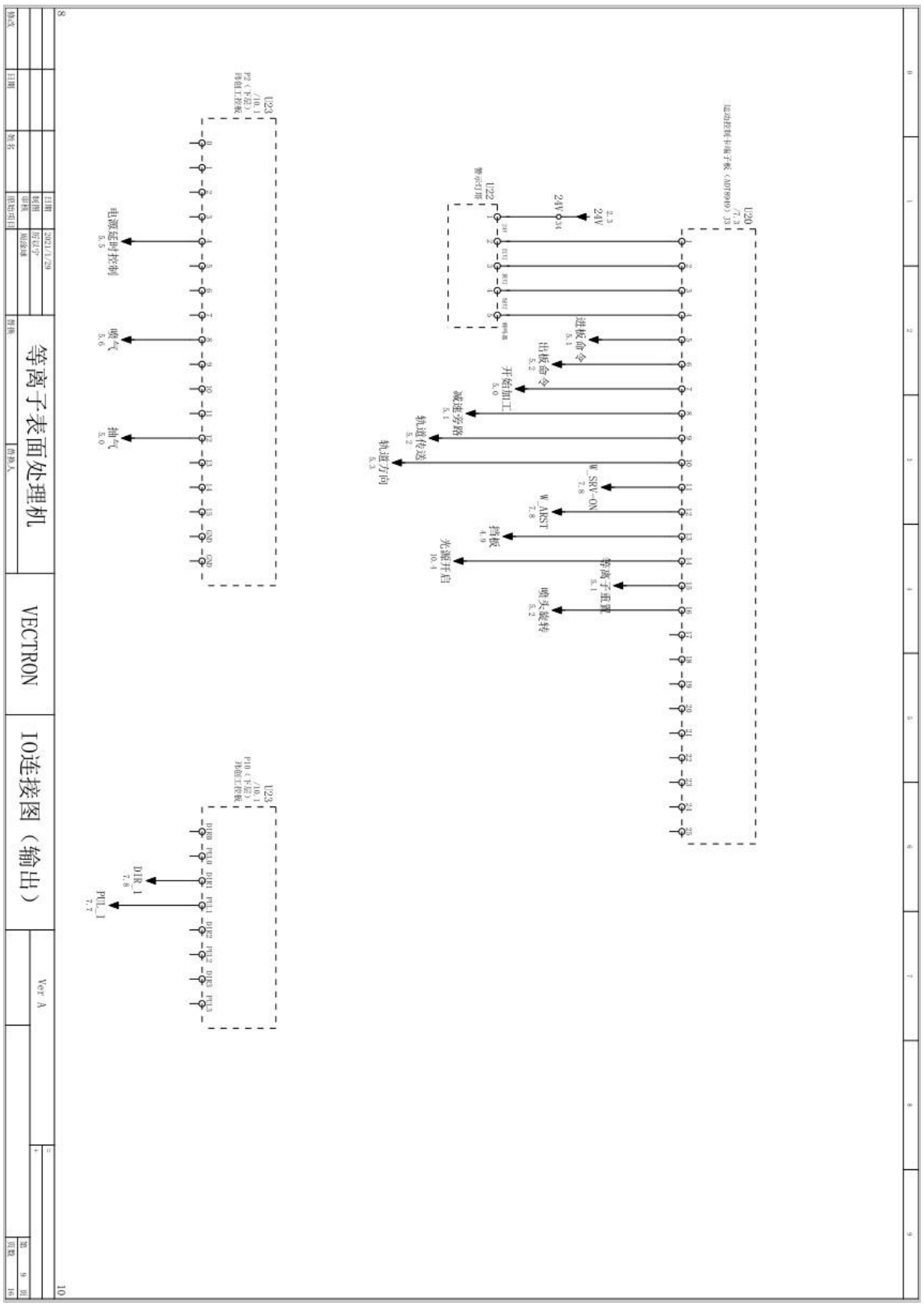
Belt and online docking wiring diagram



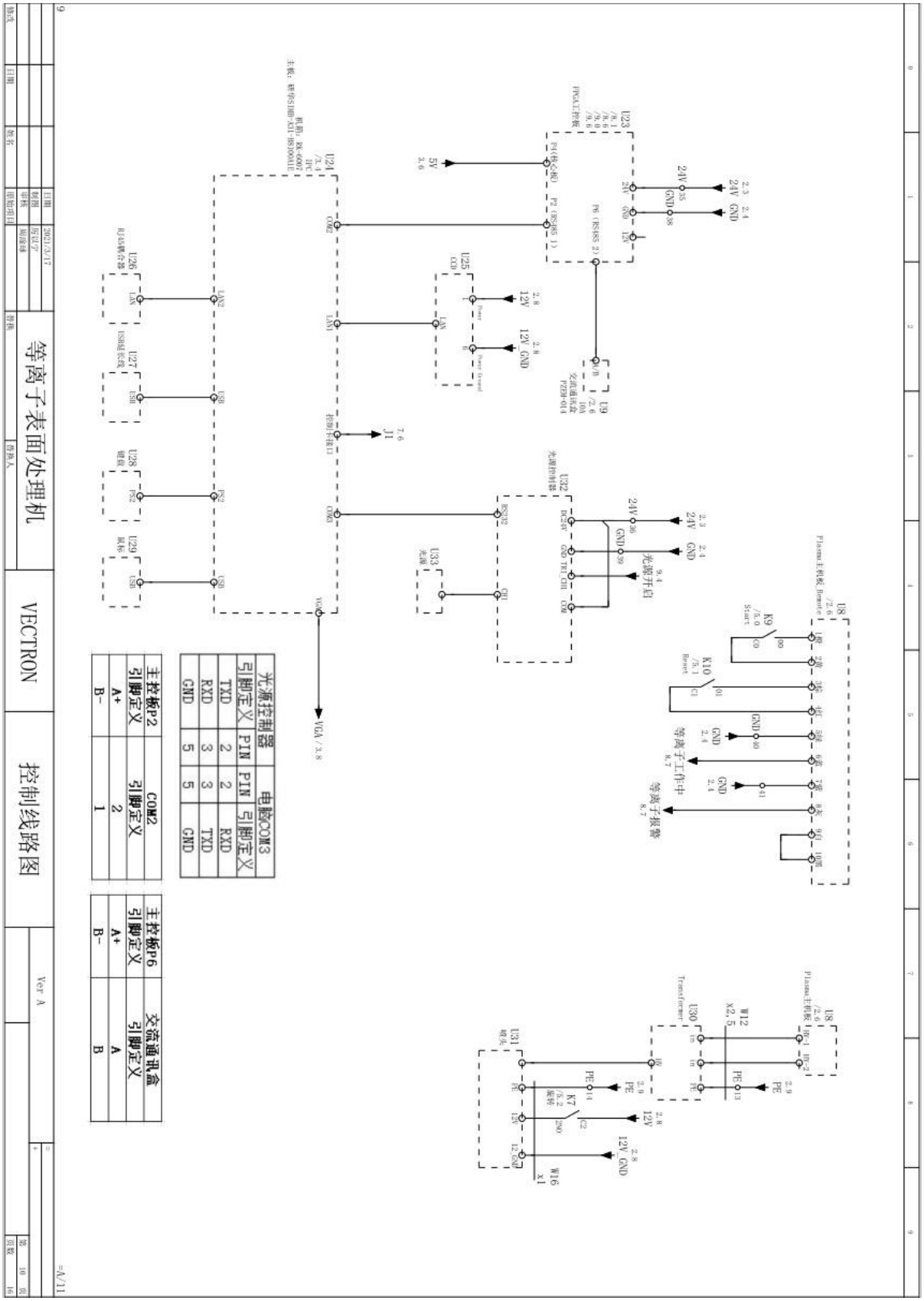
Servo drive connection wiring diagram



IO Connection Diagram (Input)



IO connection diagram (output)



Control circuit diagram

Chapter IV: Troubleshooting

I. Easy troubleshooting

1.The power supply does not turn on

★ Check if there is a power input.

★ Confirm whether the switch of the distribution box is powered on or whether the switch is broken.

★ Confirm that the emergency stop of the device is turned off and that the emergency stop switch of the device is dismissed.

2. The equipment shakes violently during processing

★ Confirm that the four fixed foot cups of the machine are locked and that each axis runs smoothly.

3. Crash to limit switch

★ The X, Y axis of the nozzle triggers to the limit switch, the equipment will issue a warning, at this time, you can press the emergency stop switch, manually remove the nozzle.

4.Air pressure alarm

★ The equipment has certain requirements for air pressure, such as unstable air pressure, which will cause damage to Plasma, the equipment will issue a warning and stop running, and the air circuit fault needs to be investigated.

(Plasma working pressure is 0.18-0.27MPa).

5. The conveyor belt does not move

★ If the conveyor belt does not move, it is necessary to check whether the conveyor belt preload is too large to cause skidding, or the conveyor belt preload is not enough, causing the active wheel friction to be insufficient to drive the belt to run.

II. Machine maintenance

(1) Every working day, the dirt of the equipment and guide rail must be cleaned, so that the equipment is kept clean, and the air source and power supply must be turned off when leaving work;

(2) If you leave the machine for a long time, turn off the power to prevent non-professionals from operating;

(3) Pay attention to whether there is lubricating oil on the surface of the X and Y guide rails and screws of the equipment to keep them well lubricated! It is recommended that the inspection period is one month, but it needs to change depending on the frequency of use of the equipment, and physical and chemical grease (Lithium Grease) can be used, which has waterproof and heat resistance characteristics.

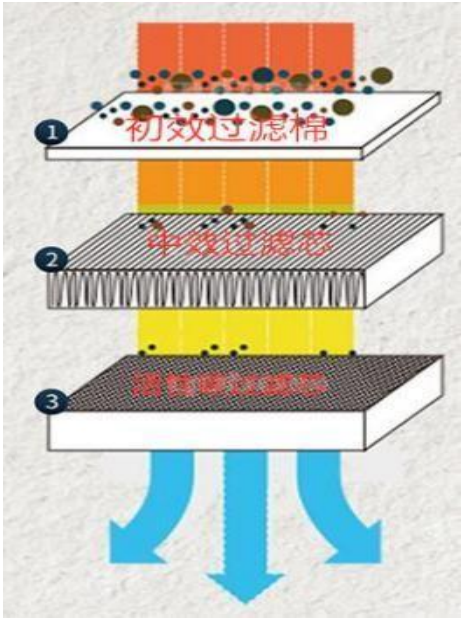
(4) For plasma generator electrode maintenance, it is recommended to clean the electrode surface with polishing cotton once every two months.

III. Air purification maintenance

This equipment will produce a large amount of ozone during the working process, ozone has a strong bactericidal effect, studies have shown that ozone can kill more than 99% of the killing propagules in 5 minutes; at the same time, ozone also plays a role in deodorizing purposes, many indoor air purifiers to the principle of strong oxidation of ozone, Oxidize the organic matter in the air to achieve the purpose of purifying the air.

Air filter principle: The carbon method filters the exhaust gas, which can effectively purify various effective substances and make the ozone concentration reach a reasonable level。

1. Primary filter cotton, the general use cycle is 1-2 months;
2. Medium efficiency filter element, the general use cycle is 3-6 months;
3. Activated carbon filter cotton, the general use cycle is 6-12 months;



The above replacement cycle, depending on the operating time of the equipment, when it is found that the ozone smell in the production process is relatively heavy, the above filter element needs to be replaced.