R-550D Series Dual-Platform Separator

Instruction Manual

Dongguan Weichuang Electronic Equipment Co., Ltd.

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Foreword

Model: R-550D Dual-Platform Separating Machine _____

Serial Number: _____

Spindle serial number: _____

Software version: _____

Date of manufacture: _____

 I. R-550D Functions and Features

The R-550D is a device that uses a high-speed rotary milling cutter to separate multi-piece PCBAs according to their programming paths.

Equipment. Widely used in digital, communication, lighting and other fields. Improves manual bending, V-CUT, stamping and other methods.

To reduce defective products and improve quality, thereby reducing scrap.

1. Ultra-fast cutting speed. Designed for high quality, the high-speed drive platform is paired with high-speed rotating...

The spindle provides you with industry-leading cutting speeds, solving the problem of slow multi-plate splitting speeds.

It has achieved highly efficient and lean production.

2. Modular structure, high stability, and convenient maintenance. The modular servo control system has extremely high...

High stability, equipped with a high-grade grinding screw and high-precision guide rail, achieving a cutting accuracy of ±0.02mm, meeting [standards/requirements].

Meets various cutting needs, ensuring product quality. Modular electrical control system allows for rapid troubleshooting and convenient equipment maintenance.

Regular maintenance and upgrades.

3. Alarm light curtains for safe production. Alarm light curtains are installed on both sides above the work platform. During equipment operation, [the system will detect and respond to alarms].

Blocking the light curtain will automatically stop the equipment, preventing damage caused by human error during operation.

harm.

4. Advantages of the dual-push worktable design. Utilizing dual worktables A and B, it can operate independently or simultaneously.

Flexible use based on PCBA board size; small footprint, solving the space-consuming problem of traditional dual-machine dual-workstation setups.

It makes it easier for a single person to operate two workbenches, maximizing the synergy between human and equipment; each workbench is independent.

The system can operate independently, producing different types of boards according to production needs. If one workbench malfunctions, another workbench can be used.

The worktable can be used as usual, eliminating the situation where a single table failure would cause the entire machine to be unable to produce, as is common in traditional equipment.

5. Self-diagnostic function. The error message self-diagnostic system can automatically diagnose faults during equipment operation.

This allows for easy troubleshooting and timely resumption of production.

6. Segmented cutting for low-consumption production. Tool life management and monitoring: the milling cutter will adjust its lifespan after cutting a certain distance.

Set the cutter to automatically rise/fall to another uncut section of the cutting edge to extend the cutter's life and reduce consumable costs.

Book.

II. Warranty Period and Service Scope

This equipment has been tested and inspected before leaving the factory. Our company will provide further support if it is used within the following conditions.

Provide a guarantee.

1. Warranty Period:

This equipment is covered by a one-year warranty

from the date of

manufacture. 2. Service Scope: During the warranty period, the company will repair any malfunctions occurring under normal use free of charge, except for the following...

This condition will not be covered under warranty.

• Use of consumables and components not specified by our company.

ÿ Improper use or maintenance by the operator.

ÿNormal wear and tear of consumables.

ÿ Other natural disasters.

The color of the equipment casing fades naturally.

ÿ Changes in heat generation and noise without affecting the normal operation of the equipment.

Recommendation: If you encounter any problems during the actual process, please refer to the instruction manual or contact our company.

3. Scope of Free Services

This equipment will be provided free of charge for the following situations after leaving the factory.

Assembly, debugging, and trial operation.

• Processing procedure creation or education and training and related technical guidance.

• Training in operation, circuit analysis, and related fields.

3. Technical Parameters

project	Technical parameters
Machine Model	R-550D
Dimensions Mechanical Dimension	1100*1380*1465mm (L*W*H) (excluding base and lighthouse) Excluding the anchor and Lighthouse
weight Weight	Approximately 900 kg About900KG
Repeatability Repeat accuracy	±0.02mm
Vacuum size Vacuum power	625*600*1160mm(L*W*H)
	2.2KW
vacuuming method Dust Collection Method	Top vacuum Up Suction(External-vacuum/Built-in)optional
A Work Table Size	370mm*520mm
B Work Table Size	370mm*520mm
Maximum Route Size	350mm*500mm
Traditional systems Drive System	X/Y1/Y2/Z four-axis servo motor control X/Y1/Y2/Z Four axis servo motor control
Cutting spindle Routing Spindle	40,000 rpm/min Automatic Cooling
Cutting speed (routing speed) and cutting precision	1-100mm/sec
(cutting precision) Routing Accuracy	±0.05mm
Coordinate movement speed Moving Speed	800mm/s
Milling Cutter	ÿ0.8-3.0 Dextrorotatory ÿ0.8-3.0 R
Tool life Tool Life Control	Program Control Software Program Control
Safety protection Safety Protection	Safety light curtain Safety ling curtain
Abnormal alarm function Error Alarm	yes YES
monitor Monitor	17-inch Dell monitor
Programming method Programming Mode	Controlling CCD movement and automatic navigation via keyboard is simple and easy to learn. Through the Keyboard to control the CCD mobile, Automatic navigation,easy to learn.
power supply Power Supply	AC 220V & AC 380V

Note: The above parameters are standard configurations. Customization is available upon request. Technical parameters are subject to change without notice. The final interpretation rights belong to Dongguan Weichuang Electronic Equipment Co., Ltd.

IV. Installation 1.

Environment Setup

1.1 This equipment should be installed in a well-ventilated and dry place. Do not install it in places that are prone to corrosion or flammability.

1.2 This equipment should be installed in a location where there is no direct sunlight or high heat.

1.3 This equipment shall be installed in a vibration-free location where maintenance and inspection are easy.

1.4 This equipment should be installed in a location with minimal dust, oil fumes, and metal dust.

1.5 This equipment shall be installed in a location free from electromagnetic interference. 2. Equipment

Installation 2.1 Place

the equipment in the designated location.

2.2 Use a level to adjust the equipment to be level, and then tighten its foot cup screws.

2.3 Connect the air inlet pipe to the air inlet of the equipment.

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. Do not connect it in series with other devices.

2.6 Confirm that the upper and lower signal lines are connected normally and that normal communication can be performed.

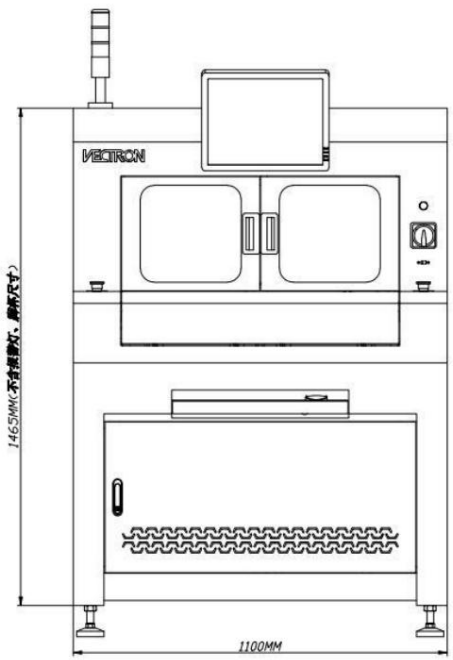
3. Power supply and electrical configuration

3.1 The standard input of this equipment is single-phase 220V AC, and the power supply of the vacuum cleaner is three-phase 380V VC.

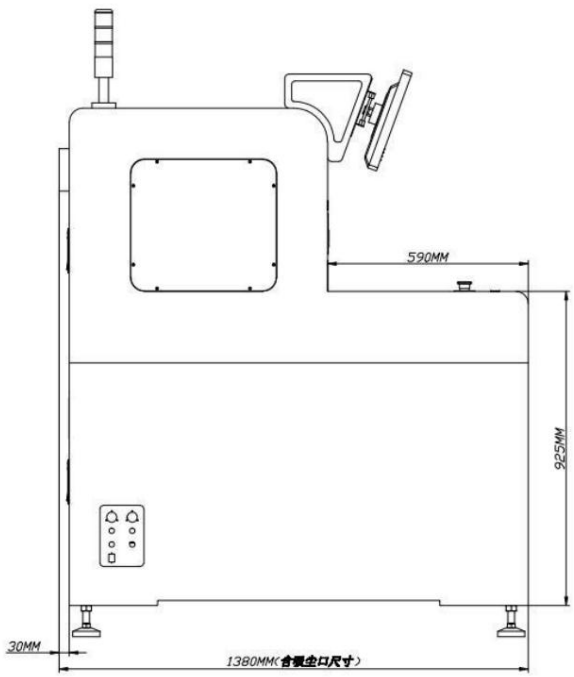
3.2 The standard air pressure of this equipment is 0.3 to 0.7 MPa.

Note: The power grid ground wire meets international requirements for computer rooms, ensuring proper grounding of the equipment casing.

V. External Dimensions and Specifications



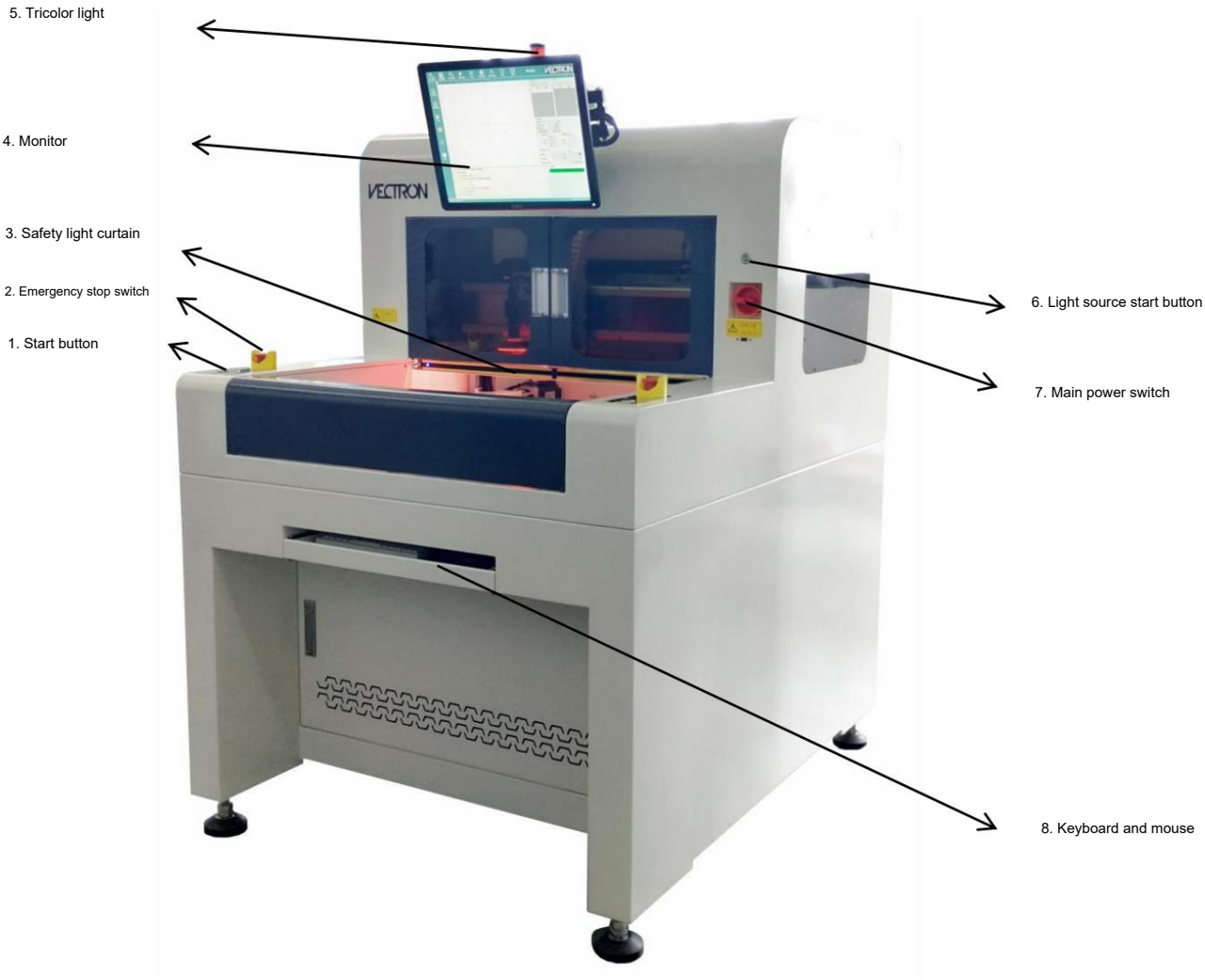
Front view



Side view

Chapter 1. Equipment and Machine Description

I. Machine Appearance Description



1.1 Start Button:

When the button light is on, pressing this button will initiate a cutting action on the corresponding work platform.

The light source is

off. **1.2** Emergency

Stop Switch: Pressing this button will stop the equipment under any circumstances. This switch is a self-locking switch.

To remove the light, rotate clockwise. **1.3** Safety Light

Curtain

If the light curtain is blocked during equipment operation, the equipment must immediately stop operating to prevent damage caused by human error.

harm.

1.4 Monitor

Used to display program interface buttons and production status. **1.5** Three-color red light:

Lights up when the equipment is not ready, the emergency stop button is pressed, the safety door is opened, or there is a malfunction.

Yellow: The equipment is working properly and is in a waiting-for-production state.

Green: This light illuminates when the equipment is operating normally.

1.6 Light Source Start Button:

Turns the lighting system inside the equipment on and off. **1.7** Main Power Switch

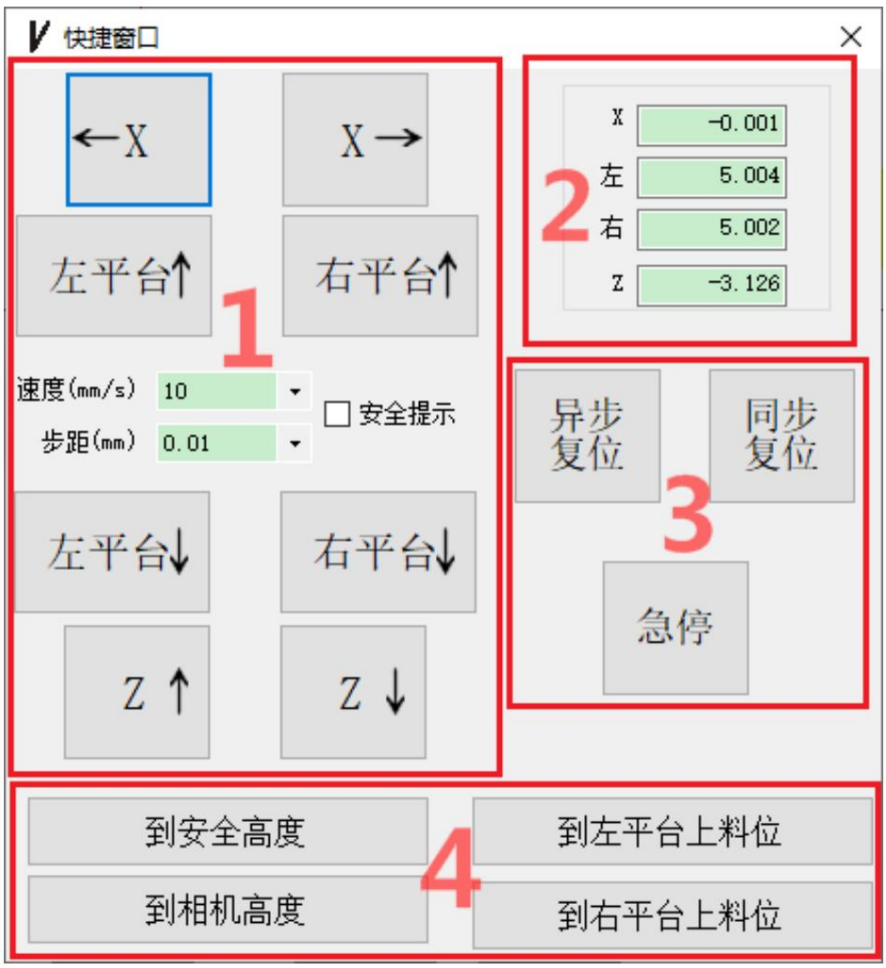
All power sources used to turn the device on and off.

1.8 The keyboard and mouse

are used for operation and data input.

II. Keyboard Button Operation Instructions

Press F2 on the keyboard (this function will be used frequently, please familiarize yourself with it), and the following image will be displayed;



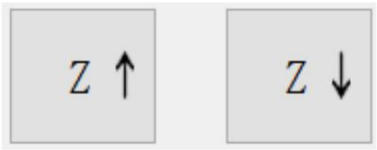
2.1 Movement keys for each axis: Click the direction key corresponding to each axis, and the corresponding axis will move in that direction;

When shortcut keys are not disabled, pressing the left and right arrow keys on the keyboard corresponds to moving along the X-axis;

When shortcut keys are not disabled, pressing the up and down arrow keys on the keyboard will move to the corresponding platform.

Note: The direction of the up and down platform movement keys corresponds to the direction displayed on the screen;

When the shortcut keys are not disabled, pressing the up or down keys on the keyboard corresponds to moving along the Z-axis;



Note: The speed should not be too fast when moving the Z-axis, otherwise it is easy to interfere with the working platform;

Speed: Selecting the "10" position indicates that the current movement speed is 10mm/s; (Shortcut keys are not disabled)

In this state, pressing the "space bar" on the keyboard will cycle through different speeds;

(This can be achieved through the "Advanced Parameter Settings" window, specifically by selecting "Speed 1", "Speed 2", and "Speed 3".)

(Set to "Speed 4");

Step size: Selecting the "0.01" position indicates that the current step size is 0.01mm; in non-disabled shortcuts...

In the state of the key, press the keyboard " The Alt key cycles through different step sizes.

(This can be achieved through the "Step Size 1", "Step Size 2", and "Step Size 3" settings in the "Advanced Parameter Settings" window.)

(Set the step size to 4).

When "Continuous Movement" is selected in "Step Size", it means that the movement will be continuous at the selected speed;

This function is typically used when moving quickly;

When a value is selected in "Step Size", it indicates how many millimeters to move at the selected speed;

This function is typically used for precise movement.

2.2 The status bar for each axis displays the current coordinate value of each axis;

2.3 Error Handling Key: If an error is detected in the system, clicking "Emergency Stop" will immediately halt the system's operation.

Okay; Click "Reset", and the system will immediately perform a reset.

2.4 Shortcut keys for the pre-set positions of the left/right platform; When using shortcut keys, the system will detect the movement of each axis.

Check for potential interference; if potential interference is detected, a prompt box will pop up, at which point you should...

Only after manual assessment and screening is the next step permitted;

III. Power-on Operation

3.1 Confirm that the equipment is correctly connected to the power and gas supply;

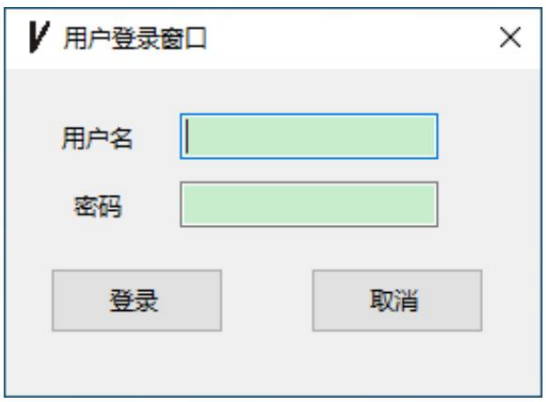
3.2 Turn on the main power switch of the equipment (rotate to the "ON" position). Each servo system of the equipment will perform a self-test.

And the industrial control computer starts up;

3.3 After the equipment is powered on, press the "Light Source Start" button to turn on the equipment's lighting system;

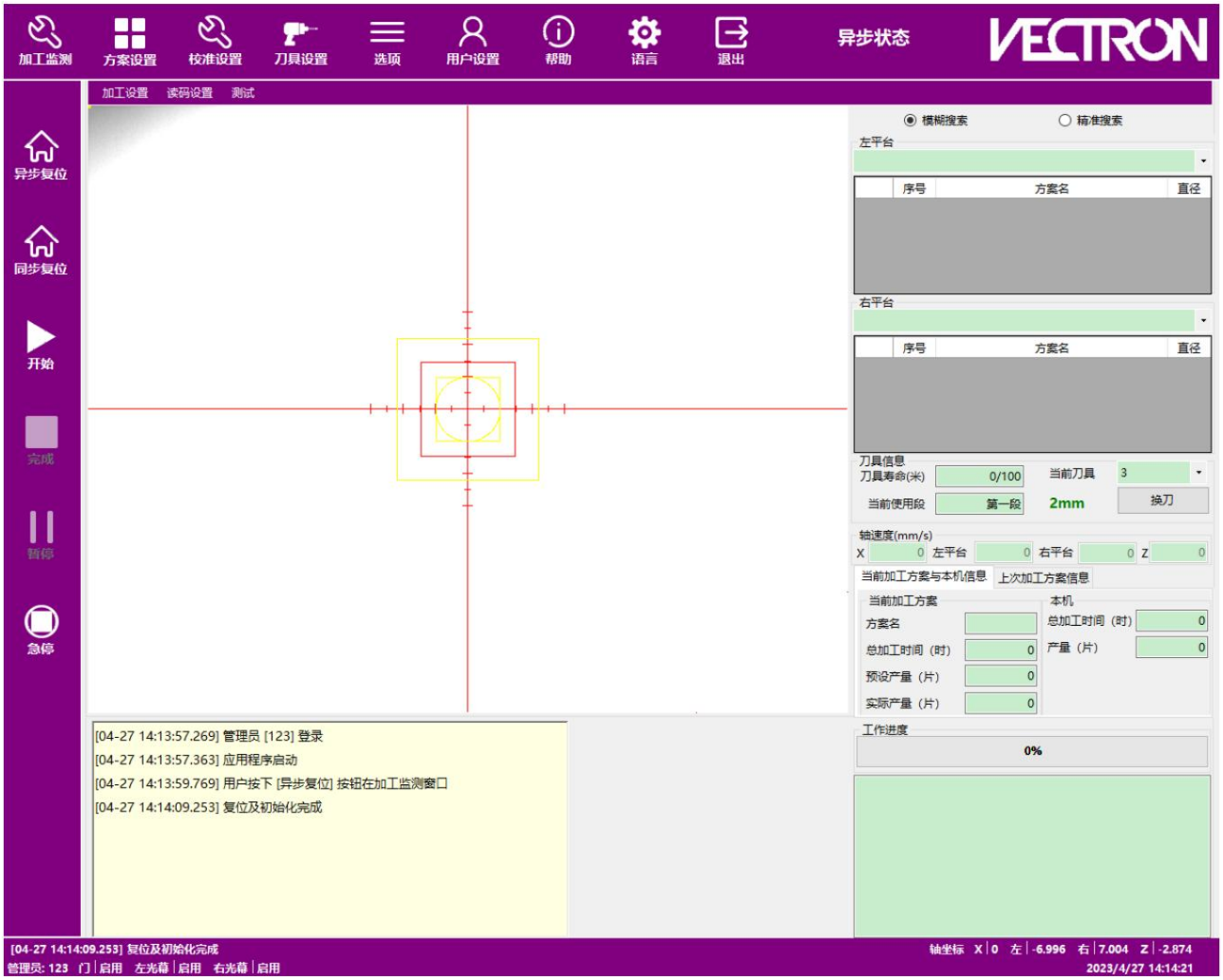
3.4 After the equipment's industrial control computer starts up, double-click the PCB control software on the Windows operating system desktop.

Upon clicking the "", a login window will pop up, as shown in the image below:



After entering your username and password (default username: 123, password: 123),

After clicking "Login", you will enter the main interface of the extension unit control system. See the image below:



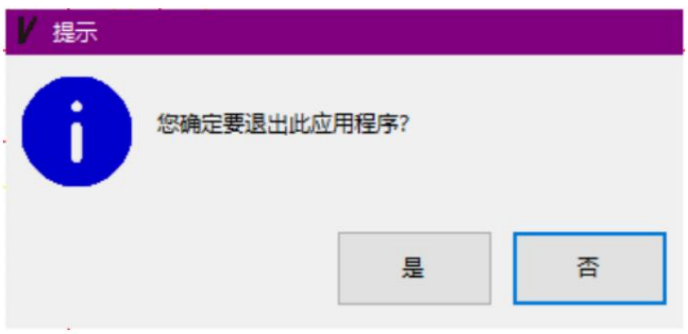
3.5 Click the "Asynchronous Reset" or "Synchronous Reset" button in the upper left corner of the main interface (depending on the current fixture installation).

(Depending on whether it is "asynchronous" or "synchronous"), normal operation can resume after the device has been reset.

IV. Power-off operation

4.1 Ensure that the dual-platform depaneling machine is in a stopped production state;

4.2 Click the " " in the upper right corner of the main interface to display the following image;



Click "Yes" to exit the control system;

4.3 Press the "Light Source Start" button to turn off the equipment lighting system;

4.4 Shut down the Windows system;

4.5 After completing the above steps, turn off the main power switch of the equipment (rotate it to the "OFF" position).

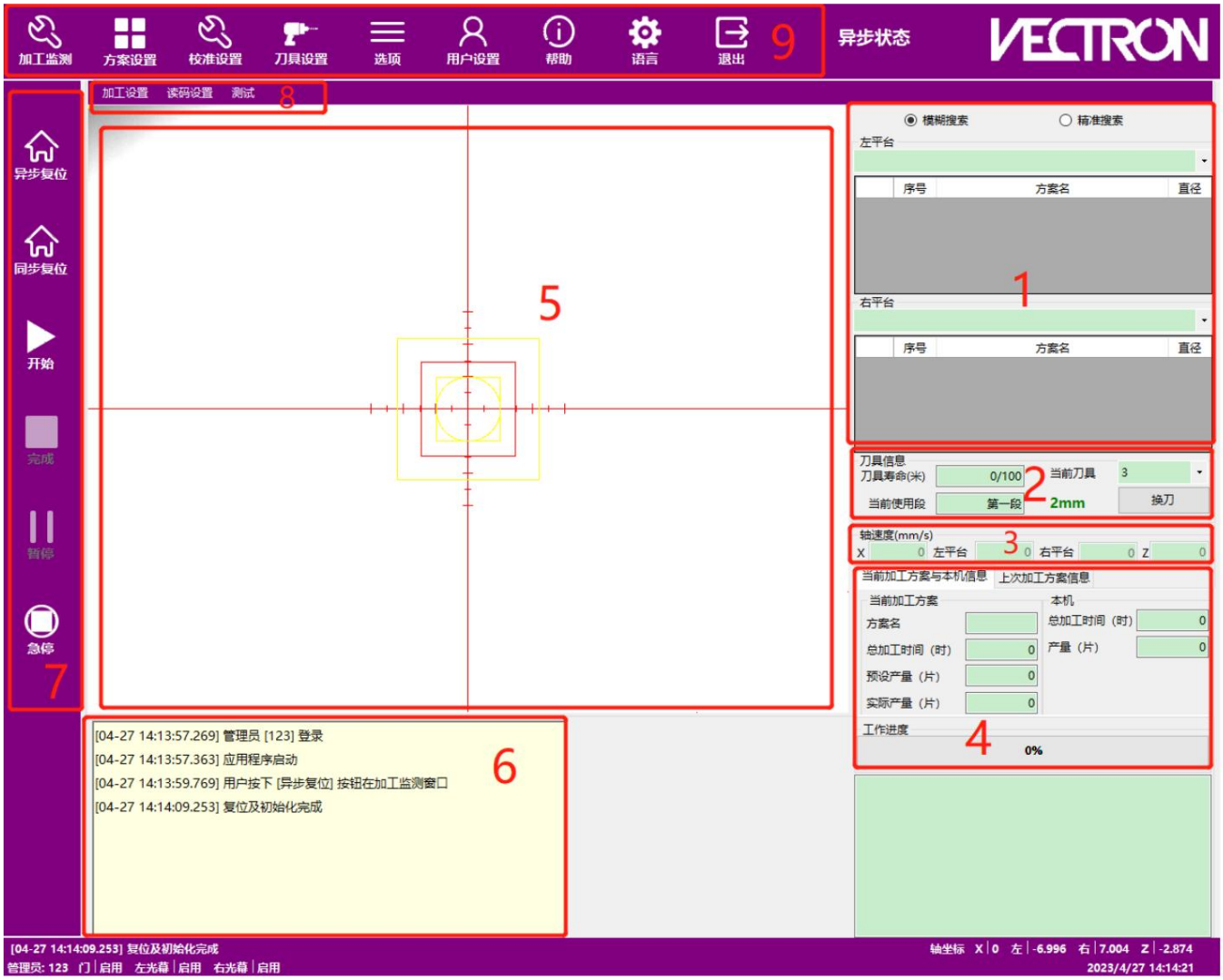
The shutdown process is now complete.

Chapter 2. Control Software Description

I. Description of Functions on the Main Software Interface :

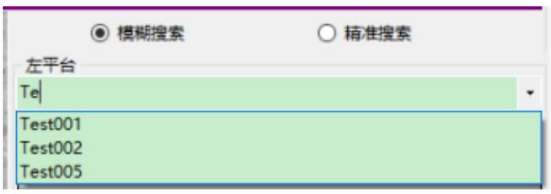
After the industrial control computer starts successfully, open the control software, enter the username and password, and complete the "Reset".

After the action, the following image will be displayed;



1. Fuzzy search for

solution management: Entering characters in the solution name in the search bar will display all solutions containing the entered characters.



Precise Search: Enter the full solution name in the search bar and press Enter to add a solution.

Alternatively, clicking the drop-down menu on the corresponding platform will display the pre-configured schemes.

Click to select the processing plan; this plan will be displayed in the processing list. To move a plan...

Generate a processing list, or change the processing order of each scheme; select the scheme, right-click, and display...

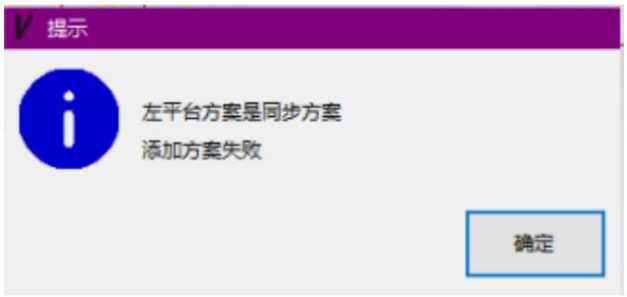
As shown in the figure below:

When selecting a solution, pay attention to the platform status displayed in the upper right corner of the interface.

When in an "asynchronous state", both the left and right platforms can choose an asynchronous solution;

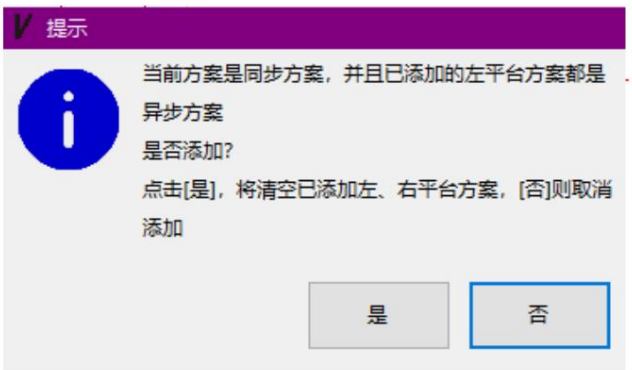
When in "synchronization mode," after the "left platform" selects a synchronization scheme, the same applies to the "right platform."

Select a plan, and the system will pop up a window as shown in the image below;



When in "synchronous state", the "left platform" selects an asynchronous scheme, as if the "right platform" selects...

If you select a solution, the system will pop up the window shown in the image below;



2. Tool Information: Displays which tool is being used in the current solution, whether it has reached its set service life, and the current tool being used.

Number of steps:

Tool Change: Clicking this button will move each axis to the set tool change position and reset the tool life;

3. Axis status

display: The moving speed of each axis of the

equipment; 4. Current/last machining scheme and

machine information 4.1 Scheme name: The name of the machining scheme.

4.2 Total processing time (hours): The total processing time of the plan.

4.3 Preset output (pieces): The pre-set quantity of products to be processed.

4.4 Actual output (pieces): The current actual quantity of products produced.

4.5 Total processing time (hours): Total processing time for this machine.

4.6 (Machine) Output (pieces): Total production output of this machine.

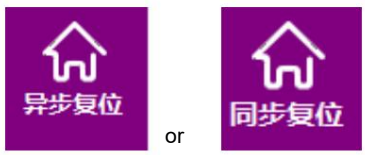
5. Viewpoint Display Window: Displays the current camera position in real time;

6. Log Display Window: Records the operator's operation process, alarm information, and cutting data in real time; 7. Equipment

Operation Control: 7.1

Reset: After opening the control software, a reset operation must be performed first; otherwise, production and operation cannot proceed.

do;



or

After a successful reset, a window will pop up as shown in the image below:

7.2 Getting Started: Select the production plan you wish to produce, click "Start," and press the start button;

Normal production is possible;

7.3 Completion: The current solution is in production. Click "Complete" to complete all aspects of the current solution.

It will only stop after the path is cut;

7.4 Pause: The current process is in production. Clicking "Pause" will immediately pause the equipment.

To restore, click "Continue," and the device will resume operation.

7.5 Emergency Stop: While the equipment is running, clicking "Emergency Stop" will immediately halt production; (If continued operation is required...)

To resume production, a "reset" process must be performed again.

8. Function Settings

In the "Processing Monitoring" mode, there are three functions: processing settings, code reading settings, and testing.

Depending on the situation, different functions can be selected to verify the chosen solution, as shown in the figure below;

8.1 Processing Settings: (1) Check "Allow Ignoring Mark Alarms" in processing mode (i.e., non-demonstration mode).

In this mode, whether the Mark was successfully evaluated will be ignored.

(2) Check "Receive pre-processing signal". After the left and right platforms have finished loading,

The processing button can be pressed in advance to save waiting time;

(3) Check “Check tolerance” to check the deviation of the mark point when marking.

Check if it is within the set range; if it is outside the range, the device will issue a prompt.

(4) Check “Check intermediate barriers” The current situation can be determined by detecting the fixture.

Synchronous or asynchronous scheme;

(5) Synchronous processing signal: The start button can be set to be effective when pressed individually or when pressed simultaneously.

Valid below;

(6) Check broken tools: Click “Check broken tools” to choose not to check or check at intervals.

Check, once per platform;

(7) Check “Check tool life” to perform the tool life detection function;

(8) Check "Switch to dust extraction port during loading and unloading" for processing on both left and right platforms.

When the current left platform solution is completed, the left platform dust suction port will automatically...

Close and open the suction port on the right platform. The same applies to the right platform.

8.2 Code reading settings: (1) Enable code reading: Check the box to enable the code reading function.

(2) Do not cut (applicable to read-only code requirements): Selecting this option will prevent the product from being cut.

(3) Reading priority: You can choose to read the code before processing or read the code after processing.

(4) Reading code type: Selectable scheme priority, read only total code, read only sub-code, read total and sub-code.

code.

(5) Save code information: You can choose log output, upload, or upload + log output.

(6) Allow code upload failure to be ignored: Check the box to allow this option to be ignored.

(7) Allow ignoring code reading failures: Checking this box allows this option to be ignored.

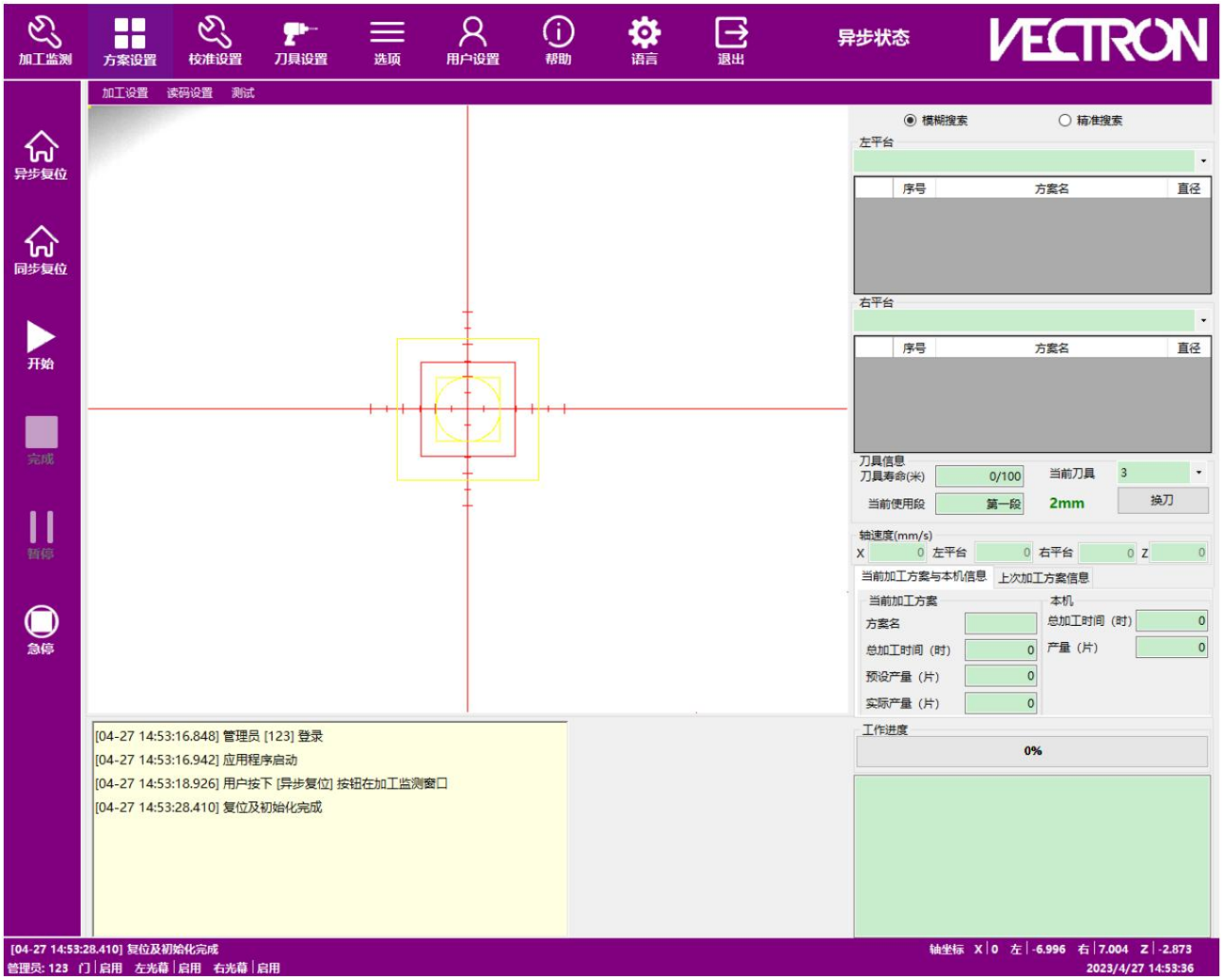
(8) Allow ignoring duplicate code alarms: Checking this option will allow it to be ignored.

8.3 Testing: This function is used for simulating scenarios during software development and will not be described in detail here;

9. Settings Window

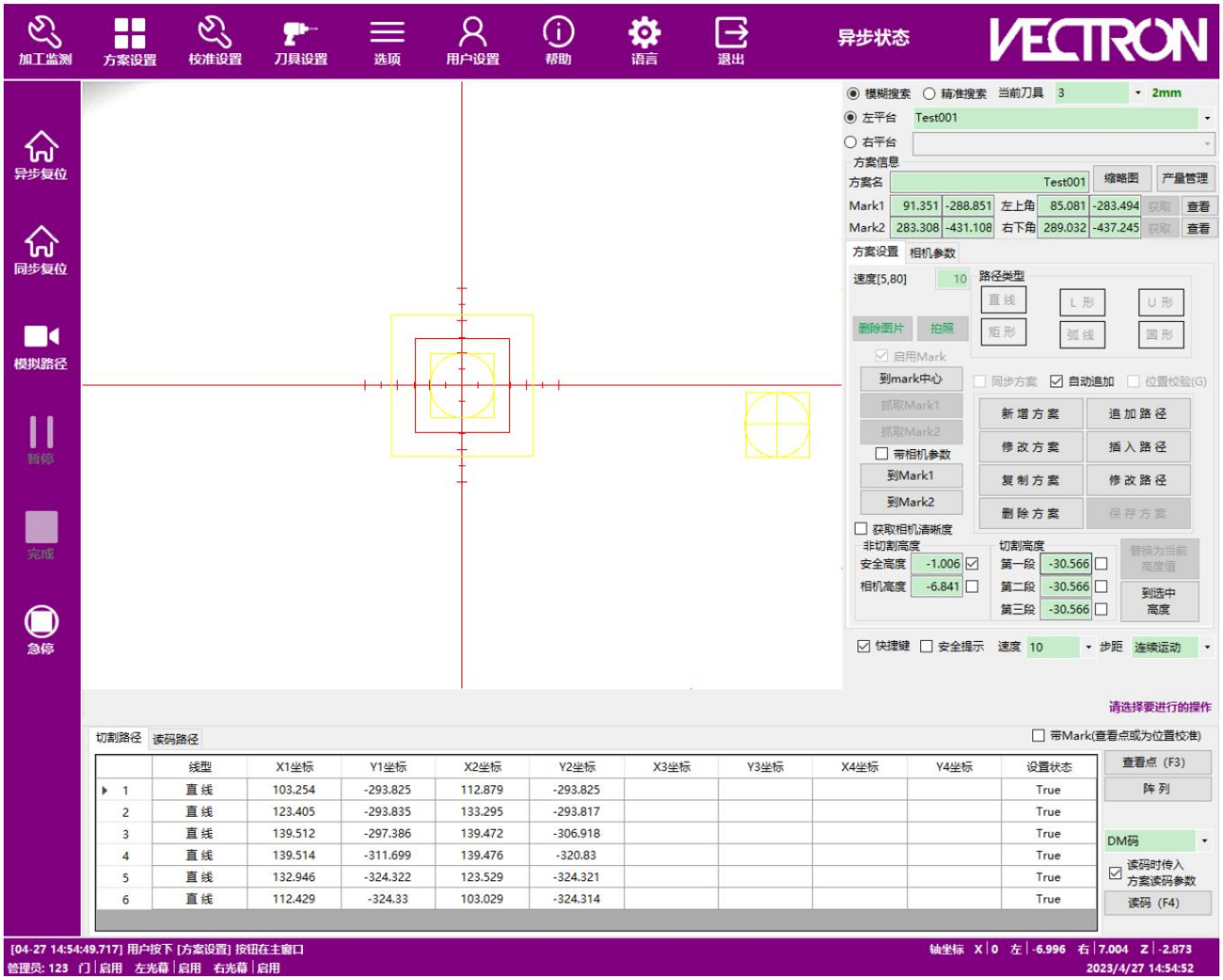
9.1 Processing Monitoring: This section monitors the operation of various equipment components during processing.

The preceding content has already been introduced.



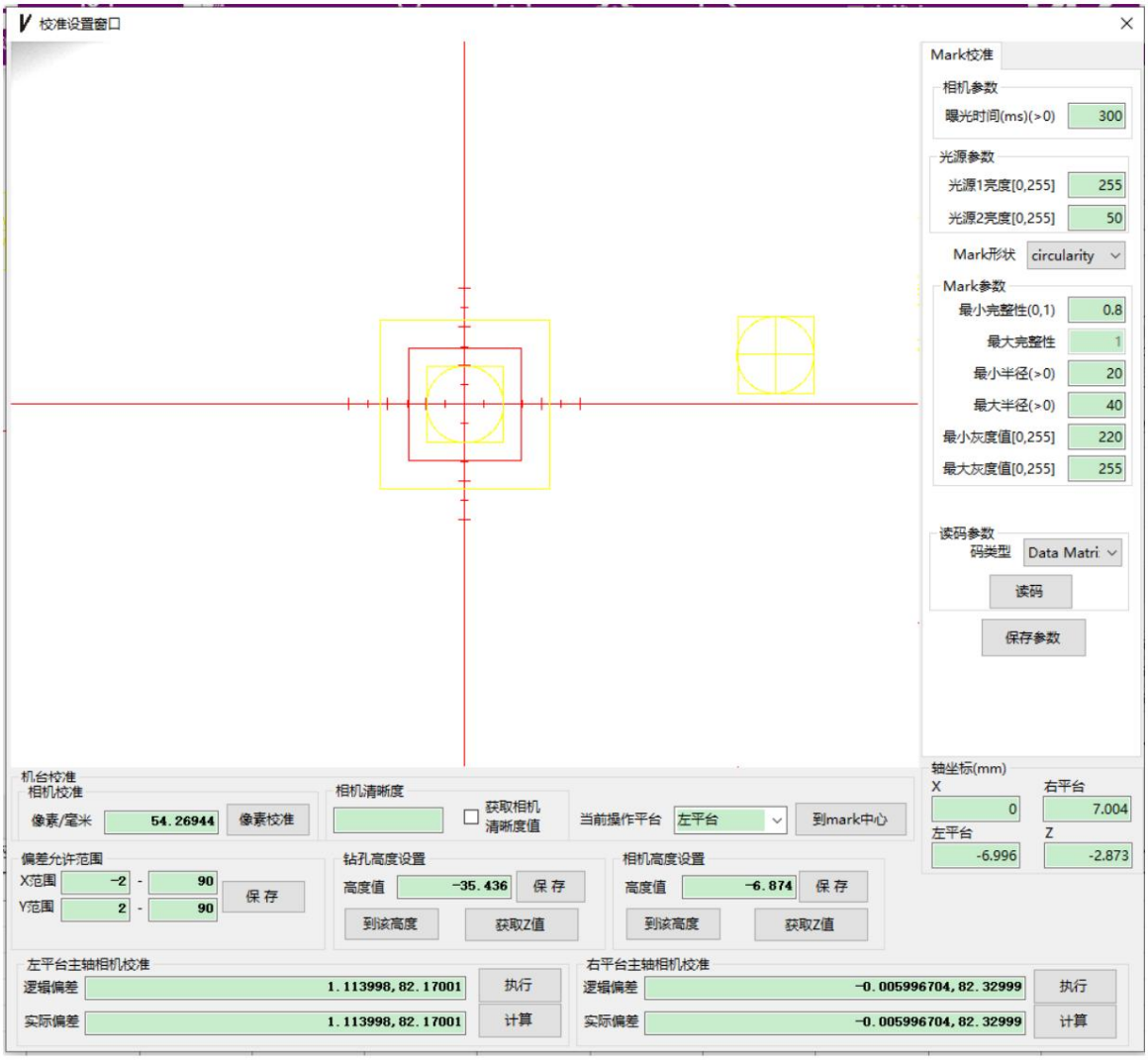
9.2 Scheme Settings: Click "Scheme Settings," as shown in the following figure; regarding this part,

A detailed introduction will be provided in later chapters.



9.3 Calibration Settings: Click "Calibration Settings," as shown in the following figure; regarding this part,

A detailed introduction will be provided in later chapters.



9.4 Tool Settings: Click "Tool Settings" to display the following figure;

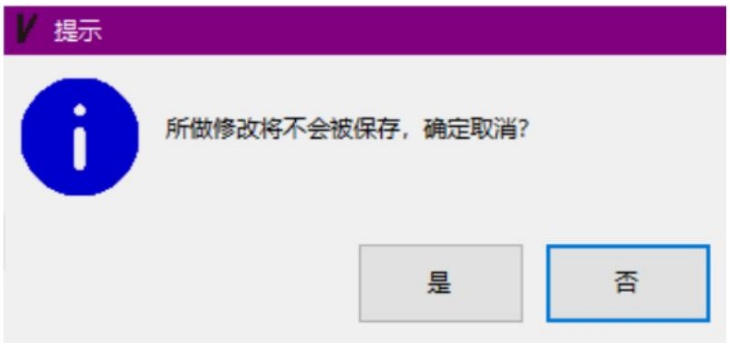
Clicking "Add Tool" will display the following image;

Enter the "Tool Name" and "Tool Diameter" information, move the spindle to a convenient tool change position through the shortcut window, and click "Set Tool Change Position". The system will record the set position coordinates.

Click "Go to Tool Change Position" to check if the set position is correct;

Set the tool lifespan for each segment (up to three segments per tool) and check "Enable";

Once you've confirmed the information is correct, click "Save". If you click "Cancel", the following window will pop up.



Operations such as "Copy Tool," "Delete Tool," and "Modify Tool" are similar and will not be explained in detail here; 9.5 Options:

Clicking

"Options" will display the following image, including "Advanced," "IO," "IO Settings," "Spindle," "Control Card Settings," "Manual Movement (F2),"

"Solution Import/Export," "Maintenance Reminder Settings," "MES Integration Settings," and "Integration Settings."

(1) Click “Advanced” to bring up the “Advanced Parameter Settings Window”. As shown in the figure below;

Working speed: The speed of movement along the X and Y axes during machining (range 0-1000mm/min) when not cutting.

sÿ ,

Cut-up Speed: The speed at which the Z-axis moves upward after cutting (range 0-800mm/s); **Cut-down Speed:** The speed at which the Z-axis moves downward when cutting begins (range 0-200mm/s); **Manual Speed:** The speed of each axis in manual mode (range 5-200mm/s); **Scheme Cutting Speed Range:** The minimum and maximum speeds set during scheme settings; **Speed:** The selectable speed in the settings window (unit: mm/s); **Step:** The selectable movement distance in the settings window (unit: mm); **Acceleration Mode:** The mode used for servo acceleration. This mode is pre-set at the factory and should not be changed! **Vacuum Cleaner Timeout:** The time after which the vacuum cleaner automatically shuts off when the device is in standby mode (unit: s); **Spindle Timeout:** The time after which the spindle automatically shuts off when the device is in standby mode (unit: s); **Mark Recognition Range:** Sets the effective area for marking marks.

(Note: Units are pixels!) Offset strategy: The mode is set at the factory; please do not change it!

Y2 Synchronization Position: The position has been set at the factory; please do not change it!

Prepare traffic light delay waiting time: Prepare the delay time for the traffic light to turn on (in milliseconds); Mark point distance tolerance: Set the allowable tolerance range for the Mark (in millimeters);

Light source serial port: The corresponding serial port has been set at the factory; please do not modify it!

Software controls intermittent buzzer and constant green light: Intermittent buzzer and constant green light are enabled by default;

Use a color camera: Check the box to enable this feature (a color camera is required);

Display color image: Check the box to display a color image (requires a color camera);

Code recognition range: Setting the code recognition range (in pixels);

Total code reading time per cycle: Setting of total code reading time per cycle (unit: ms) Single image code reading time: ,

Setting of code reading time for a single image (unit: ms) X, Y acceleration/deceleration time: Pre-set at the factory, please do not change! ,

Check positioning completion signal: This function is enabled when checked (disabled by default). Use command coordinate ,

system: This function is enabled when checked (disabled by default). Find Mark settings: Select the method for finding the ,

mark point, set the wait time, and the time interval.

Allowable deviation, timeout; Spindle type: Check

"Enable" to set spindle communication connection port, direction of rotation, speed, and waiting time.

between;

Non-cutting height lower limit: Set upper and lower platforms, allowing downward movement along the Z-axis in the non-cutting state.

The coordinates of the lowest position of the movement;

Cutting height lower limit: Sets the upper and lower platforms, allowing downward movement of the Z-axis during cutting.

The coordinates of the lowest position;

Left Platform Loading Position: Sets the loading position on the left platform;

Right Platform Loading Position: Sets the loading position on the right platform;

Camera Height: The default height of the camera when setting up the upper and lower platform for taking a Mark;

Safety Height: The default safety position of the Z-axis when setting the upper and lower platforms for machining (when "Break" is enabled).

When using the "blade detection" function, this value needs to be set to the height of the broken blade sensor.

First cutting height: Sets the first default position for the tool. Second cutting height: Sets the second default position for ,

the tool. Third cutting height: Sets the third default position for the tool, as shown in the image below. ,

,

(2) Click “IO”

IO Window: This interface displays the status of each axis, the positive position of the limit switch, and the limit switch status.

Negative, origin, input I/O, output I/O, etc.

A lit circle indicates that this function is enabled; a checked square indicates that this function is activated. This function is generally used when the device malfunctions to facilitate troubleshooting, so it will not be explained in detail here.

(3) IO settings: Used during debugging, not described in detail here; (4) Check "Spindle", the electric spindle will start; (5) Control card settings, as shown in the figure below:

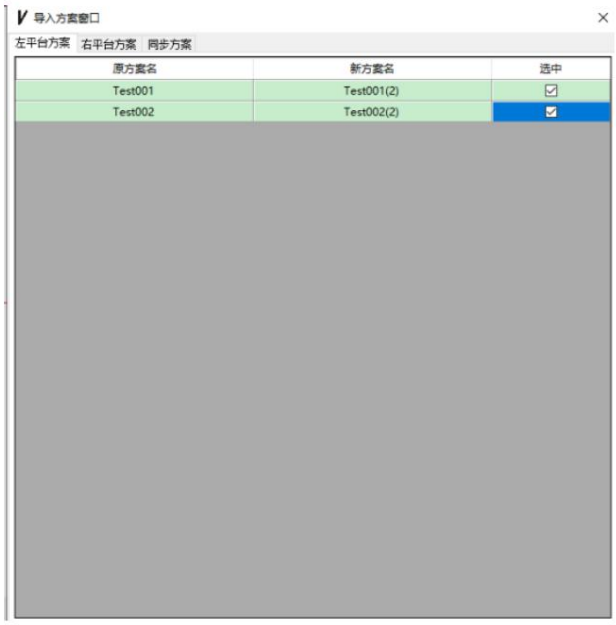
"Return to Origin Setting" mainly targets the parameter settings for each axis drive of the equipment, including the zero return direction. The settings include homing speed, pulse signal, etc. The "Status" section primarily monitors the current status of the device and its various signals. (Note: This window is only accessible to service engineers and software engineers; homing settings...)

(The parameters cannot be modified arbitrarily, otherwise it may cause machine malfunction.)

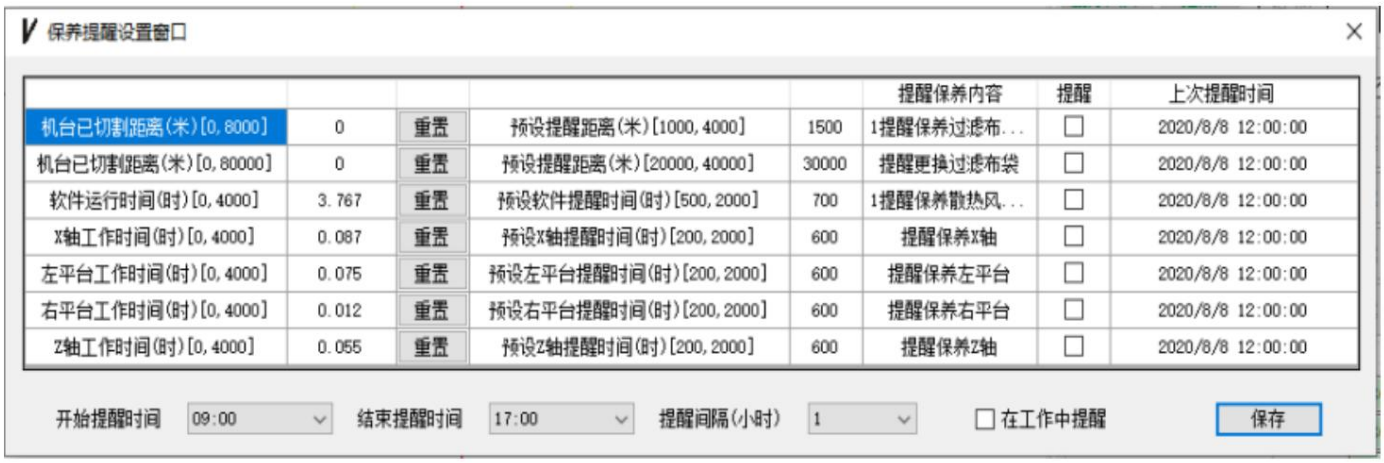
(6) Click "Manual Movement (F2)" for further details; This function is related to pressing " The F2 key has the same function, so it's not the same here.

(7) Scheme import and export: Schemes prepared on the same model of machine can be imported into or exported from the machine.

It was shipped to the same model of machine.

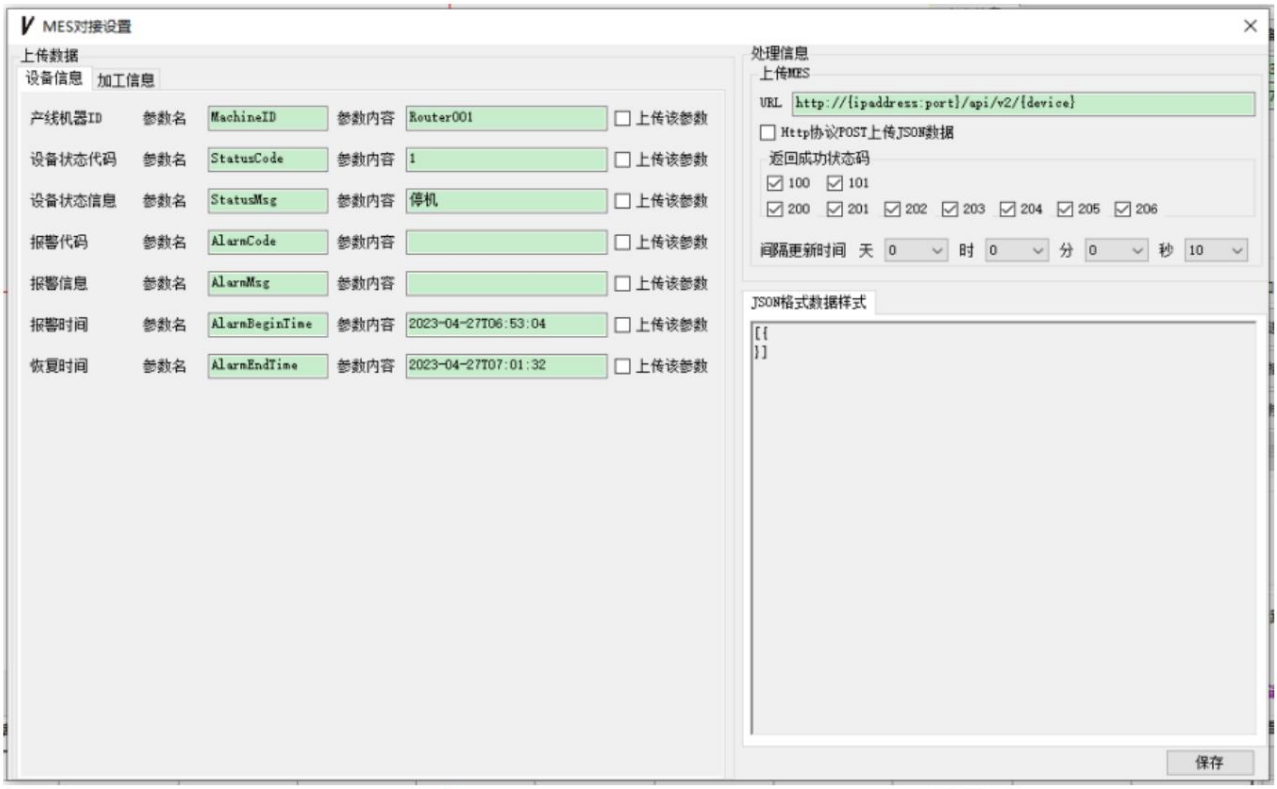


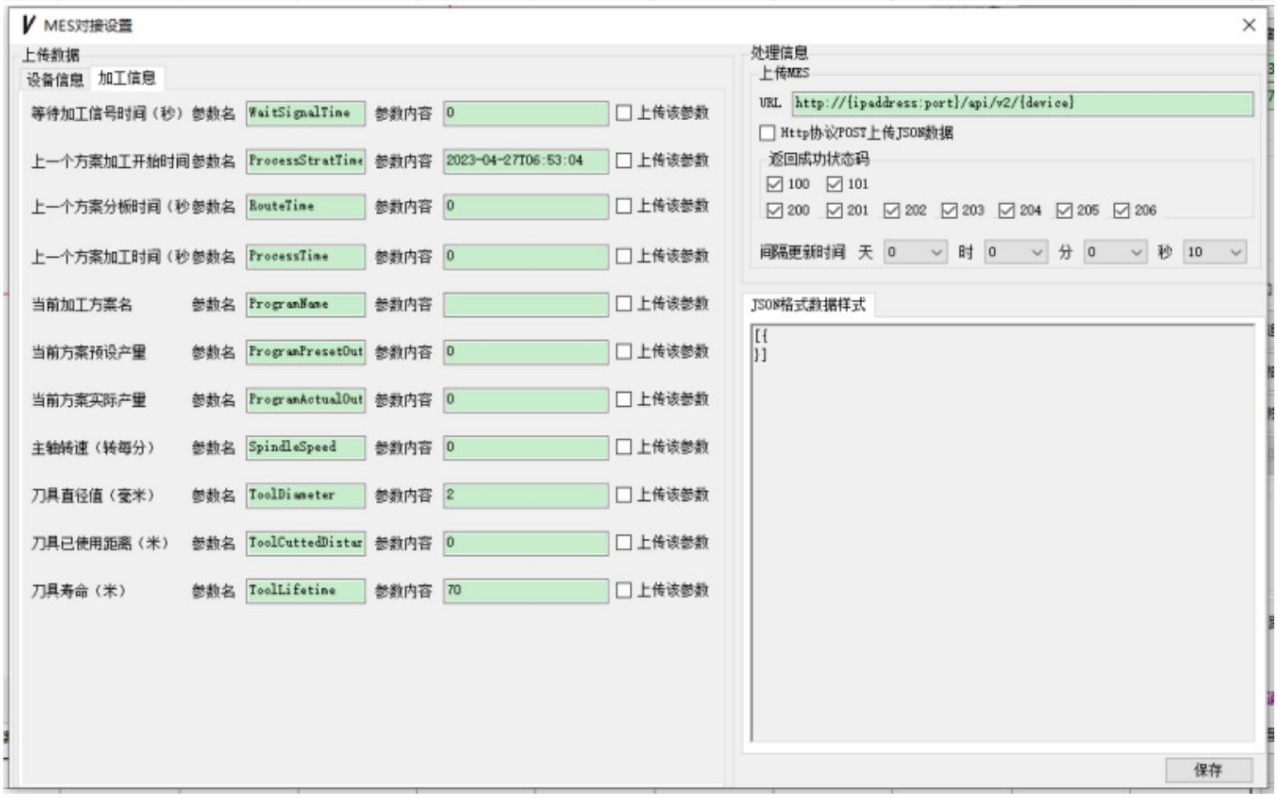
(8) Maintenance reminder settings:



The actual and preset values for machine cutting distance, software running time, and working time of each axis. (Reminder) Maintenance details and last reminder time. Check the box in the "Reminders" section to enable this reminder.

(9) MES Integration Settings:



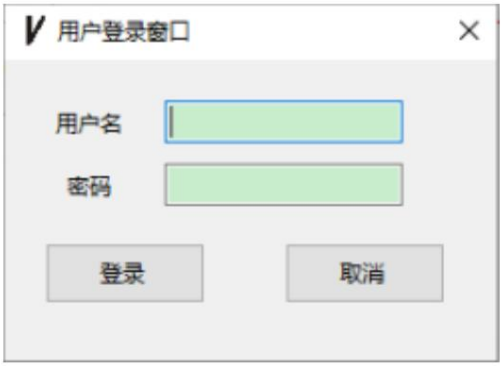


Please contact us if you require MES integration.

(10) Connection settings: Please contact our company if you need to use this function.

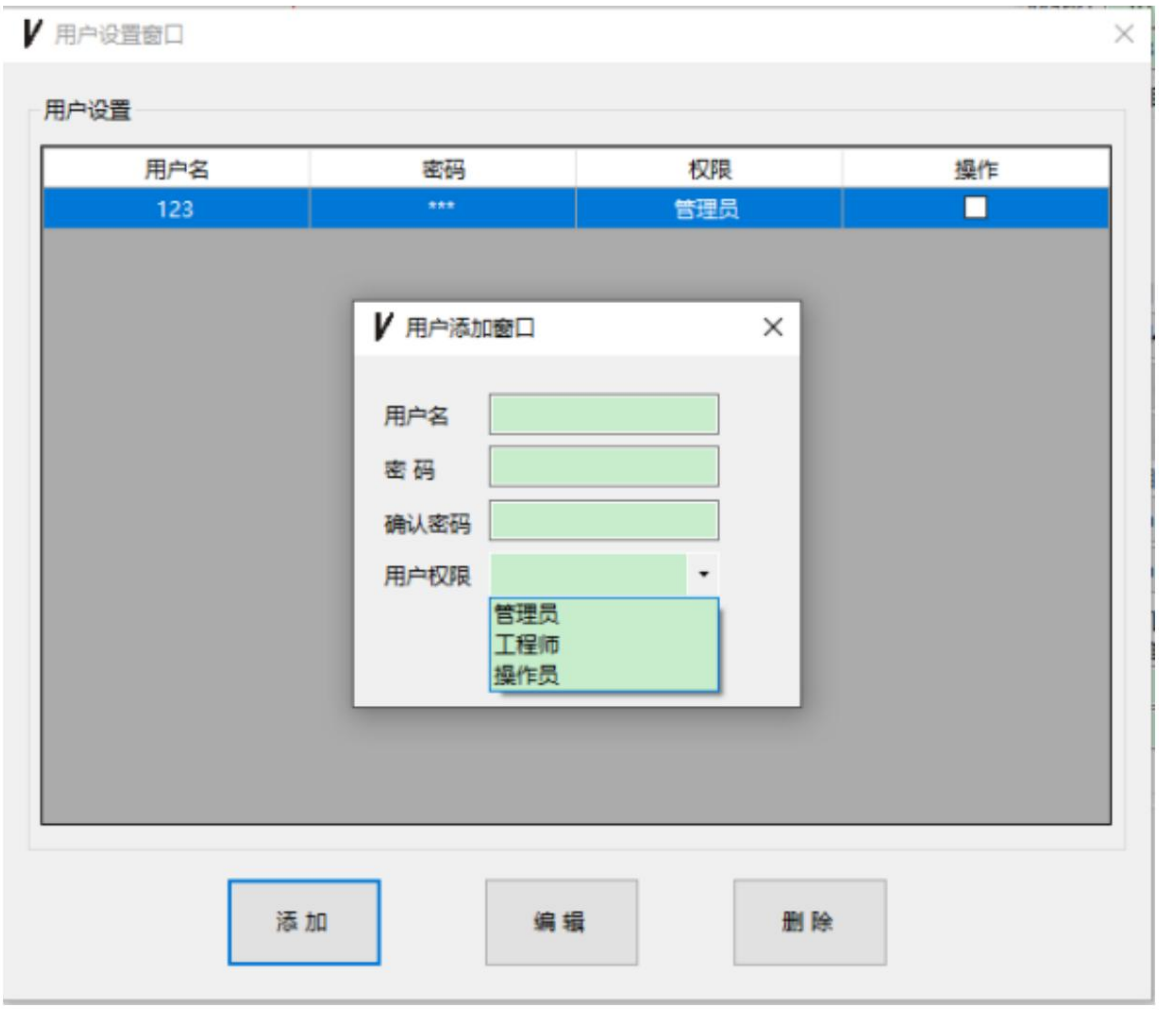
9.6 User Settings: Click "User Settings," as shown in the following image:

(1) Click “User Switch” A "User Login Window" pops up. As shown in the image below:



Enter your username and password to log in.

(2) Click “User Operations” to bring up the “User Settings Window”. As shown in the image below:



This window allows you to create users with different permissions, categorized into three types: Administrator, Engineer, and Operator.

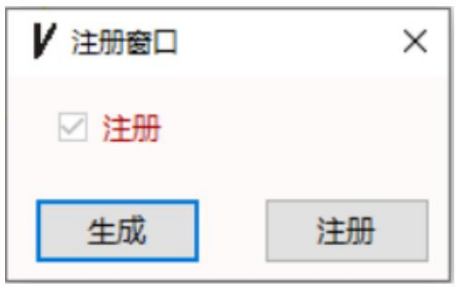
This function is relatively simple and will not be explained in detail here.

9.7 Help: Click "Help", as shown in the following figure:

(1) Click "About Weichuang" A window will pop up as shown in the image below:

This window displays the software version number and company information, etc.

(2) Click “Register Product”, and a window will pop up as shown in the figure below;



This window is only used when registering or upgrading a product, and will not be described in detail here.

9.8 Language: Simplified Chinese and English are optional.

II. Scheme Setup

1. Add a new scheme: Click "Add Scheme" to set up a new scheme. 2. Modify a scheme: Click "Modify Scheme" to modify the content of the currently selected scheme. 3. Copy a scheme: Click "Copy Scheme," re-enter the scheme name, and save to copy the content of the currently selected scheme.

4. Delete a scheme: Click "Delete Scheme" to delete the currently selected scheme. 5. Append a path: Click "Append a path" to add a cutting path at the last cutting path of the currently selected scheme. 6. Insert a path: Select a line of path in the current scheme program, click "Insert Path," and a cutting path will be added before the selected path. 7. Modify a path: Select the cutting path in the current scheme that needs to be modified, click "Modify Path," and the cutting path will be modified.

8. Save the plan: In "Add Plan", "Modify Plan", In the "Copy Scheme" window, click "Save Scheme" to save the scheme's contents.

The following section uses adding a new scheme as an example to introduce the contents of the scheme settings interface;

1.1 Select the work platform; here, we'll use the "Left Platform" as an example. 1.2 Click "Add Solution," and enter the corresponding information according to the purple text prompt in the lower right corner of the image below.

In the "Project Name" field, enter the project name, such as " "Test"; In the "Tool Diameter" field, enter the corresponding tool diameter (in mm) based on the currently installed tool spindle diameter.

Speed: Set the cutting speed of the scheme;

1.3 Setting the non-cutting height and cutting height:

The height value on this interface is the default value and needs to be modified according to the differences in different PCBA boards. Check the box next to the height value you want to modify, press "F2" to bring up the shortcut window, and adjust the movement accordingly.

Slowly adjust the height of the Z-axis at the specified speed;

Clicking "Replace with current height value" will record the current Z-axis coordinate value; clicking "Go to selected height" will move the Z-axis to the selected height value and check if the set height is correct; (If cutting height is selected, do not click "Go to selected height")

Note: When setting "Camera Height", you must check "Get Camera Sharpness", as shown below.

As shown in the figure, the camera is pointing at the board or the Mark point, and only moves up and down along the Z-axis. When the value is the largest, the coordinate value of the Z-axis is the optimal camera height.

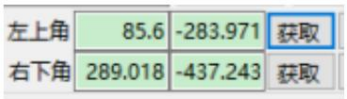
Safety height: The milling cutter on the spindle must be higher than the highest position on the fixture and the highest component on the PCBA board;

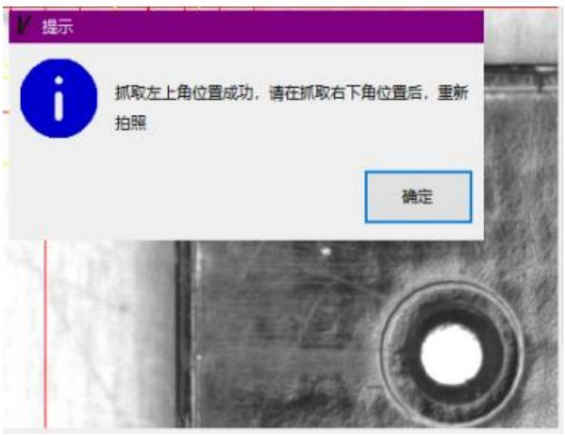
Cutting height: The height that the milling cutter can cut on the PCBA board, which can be set to multiple levels.

1.4 Set the positions of the top left and bottom right corners.

First, check the "Camera Height" box, then click "Go to Selected Height". Move the camera to the PCBA board.

Click to get it in the top left corner. The same applies to the bottom right corner.

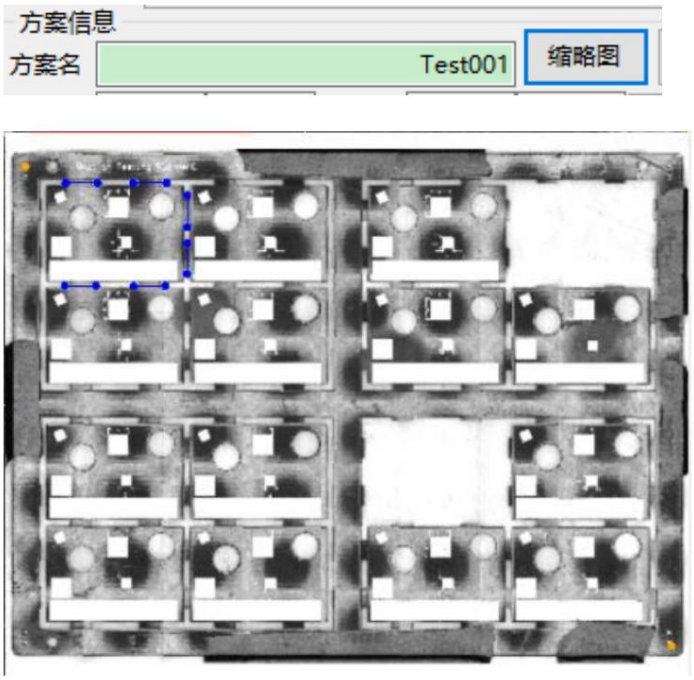




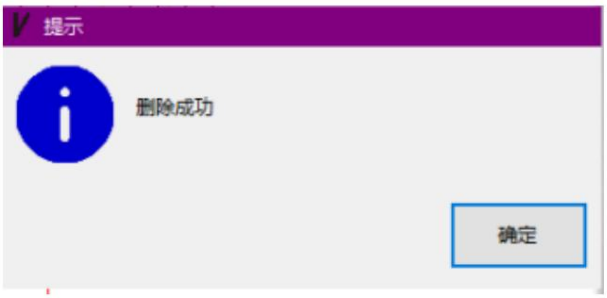
1.5 Taking and Deleting Images.

Taking a Photo: Click this button to take a photo of the PCBA board.

Once the photo is successfully taken, you can click on the "thumbnail" to view it.



Delete Image: Clicking this button will delete the PCBA board image for this solution.



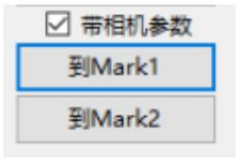
1.6 Check "Enable Mark" to set the scheme's Mark points (if Mark points are not needed, ...).

This step can be omitted; the result is shown in the image below:

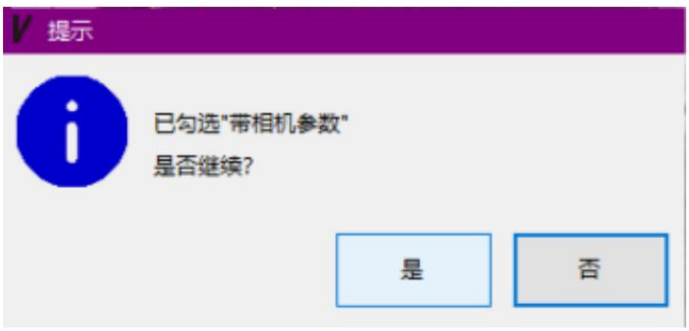
First, go to the set camera height, then move the camera crosshair to the Mark1 point on the PCBA board. Next, click "Go to Mark Center". The system will automatically find the Mark Center. (If the system cannot find the Mark Center automatically, you need to reset the Mark parameters and click "Calibration Settings" to perform "Mark Calibration". This part will be explained in detail in the "Calibration Settings" section.)

Click "Capture Mark1" to complete the Mark1 point setup; as shown in the image below:

Click "Go to Mark1" to verify if Mark1 is in the correct position;



If you select "Include camera parameters", the system will display a prompt box as shown in the image below. Click "Yes".



Set the position of point Mark2 according to the method used to set point Mark1;

After Mark2 successfully captures the data, it will prompt you whether to update the path. Click "Yes".

Click "Save Scheme" to save the settings above.

Cutting path:

Click "Append Path", check "Auto Append", and the following image will appear:

The system automatically appends a new path to the previous path after the path is edited.

After editing the path, click "Save Path".

The system provides options for editing cutting paths, including setting L-shaped U-shape, rectangle, arc, circle, 6 types of roads straight lines and diameters.

(1) Straight line: Press " " at the positions before and after the cut to be made. Enter to confirm the two dots. ,

(2) L-shape: Press "Enter" to confirm the three points at the front, middle, and back positions to be cut;

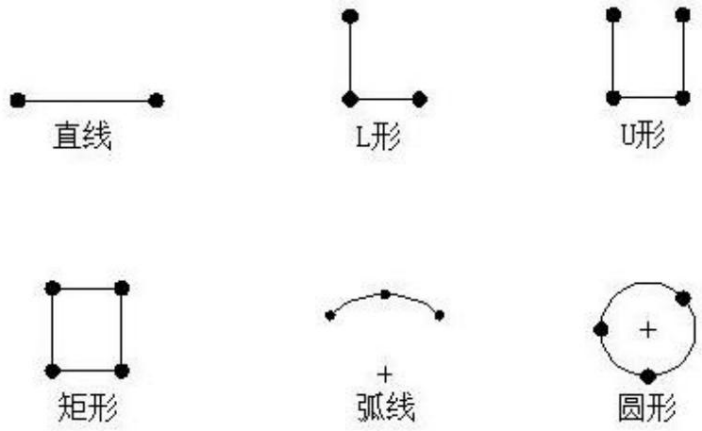
(3) U-shape: Press the "U" button at the top, bottom, left, and right positions where you want to cut. Enter to confirm the four dots;

(4) Rectangle: Press the "..." button at the top, bottom, left, and right positions where you want to cut. Enter to confirm the four dots;

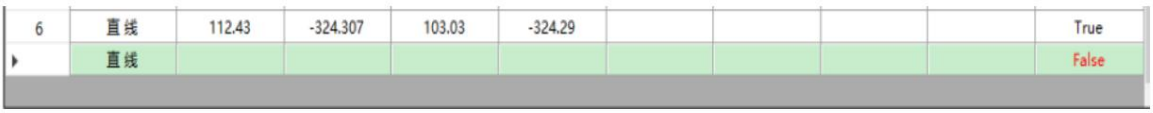
(5) Curve: Press "Enter" to confirm the three points at the front, middle, and back positions to be cut.

(6) Circle: Press "Enter" to confirm the three points at the front, middle, and back positions to be cut.

The rules for various path types are shown in the following figure:

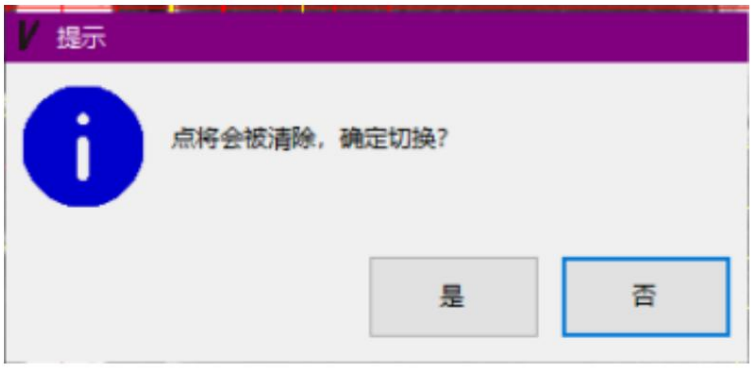


According to the editing rules of their respective path types, move the camera crosshair cursor to find the position to be cut; when the setting is "True", it means that the path setting is complete; otherwise, it will be displayed as " Fal, figure: seas shown in the following



6	直线	112.43	-324.307	103.03	-324.29					True
▸	直线									False

If an incorrect path type is found when setting the cutting path, then select the incorrect path.
Select the correct path type. The system will then display a prompt window, as shown in the image below.



Click "Yes". To change the

order of a row's cutting path, select the cutting path, right-click, and you can use the "Move Up", "Move Down", "Delete", "Disable", and "Enable" functions for the cutting path, as shown in the image below:

	线型	X1坐标	Y1坐标	X2坐标	Y2坐标	X3坐标	Y3坐标	X4坐标	Y4坐标	设置状态
1	直线	103.258	-293.801	112.883	-293.802					True
▸ 2	直线	123.409	-293.813	133.299	-293.796					True
3	直线	139.516	-297.366	139.475	-306.898					True
4	直线	139.516	-311.679	139.477	-320.81					True
5	直线	132.947	-324.301	123.53	-324.299					True
6	直线	112.43	-324.307	103.03	-324.29					True

Move Up: Move the selected cutting path up one line; Move

Down: Move the selected cutting path down one line; Delete:

Remove the selected cutting path from the path list;

Disable: The selected cutting path is temporarily disabled, but is displayed in gray in the path list;

Enable: The disabled cutting path is reactivated;

Viewing and modifying the path: To verify

the correctness of the edited cutting path, select the coordinates of the points on the cutting path to be verified.

Then click "View Point (F3)" or press the F3 key on your keyboard, or click "Modify Path" and check "Location Verification".

Press the G key on your keyboard, and the camera lens will move to the selected point. , (When using the G key function, the entire line must be selected)

path)

To modify the path coordinates, click "Modify Path". After the camera lens is moved to the selected point,

After moving the yellow circle of the milling cutter displayed on the camera to the appropriate position, press the "Enter" key to obtain the current coordinate point, and then modify it.

After you're done, click "Save Scheme".

Path Array: If the

PCBA board to be cut is a single board, the cutting path can be edited by following the steps above;

If the PCBA board being cut consists of multiple connected pieces with regular X and Y spacing, the settings can be configured after the first small piece is completed.

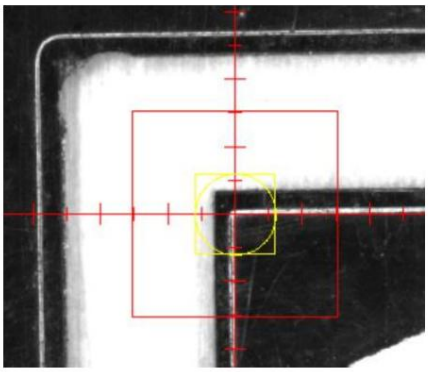
After selecting the cutting paths for the board, choose all the cutting paths for the first small board and click "Array," as shown in the image below.

As shown:

At this point, "Array" will change to "TLP1". As shown in the image below:

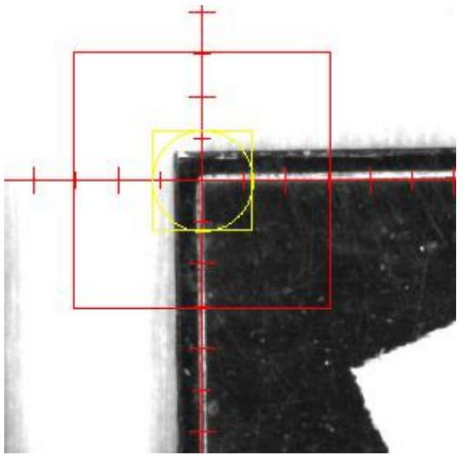
As instructed, move the camera crosshair to the first small board and find one that shares a common feature with the other small boards.

The locations of the same features are shown in the following figure:



Click "TLP1", which will then change to "TLP2". Follow the prompts to move the ，

camera's crosshair cursor to the position where the first small board in the last row shares a common feature with the first small board, as shown in the image below:



Click "TLP2", which will then change to "TLP3". Move the camera crosshair to ，

the position where the last small board in the last column shares a common feature with the first small board, as shown in the image below:

Click "TLP3", and the array window will pop up, as shown in the following figure:

Based on the arrangement of the small boards on the PCBA board, set the number of rows and columns, and click "OK".

This generates multiple cutting paths and pops up a prompt window as shown in the image below:

The arrayed cutting paths are distinguished by different colors for each group, as shown in the image below:

	线型	X1坐标	Y1坐标	X2坐标	Y2坐标	X3坐标	Y3坐标	X4坐标	Y4坐标	设置状态
1	直线	95.54	-273.503	105.232	-273.381					True
2	直线	116.25	-273.055	125.393	-272.905					True
3	直线	131.832	-276.322	131.948	-284.933					True
4	直线	132.433	-306.87	132.626	-315.556					True
5	直线	138.45	-272.467	148.142	-272.345					True
6	直线	159.16	-272.019	168.303	-271.869					True
7	直线	174.742	-275.286	174.858	-283.897					True
8	直线	175.343	-305.834	175.536	-314.52					True

After generating multiple sets of cutting paths, to prevent errors in row and column spacing, it is necessary to process each...

Check each cutting path to avoid damaging the board.

After editing the cutting path of the PCBA board, you can verify it through "Simulate Path". Click "Simulate Path" on ,

the left side of the scheme settings interface, and the system will use the "Camera Height" to pass through the camera.

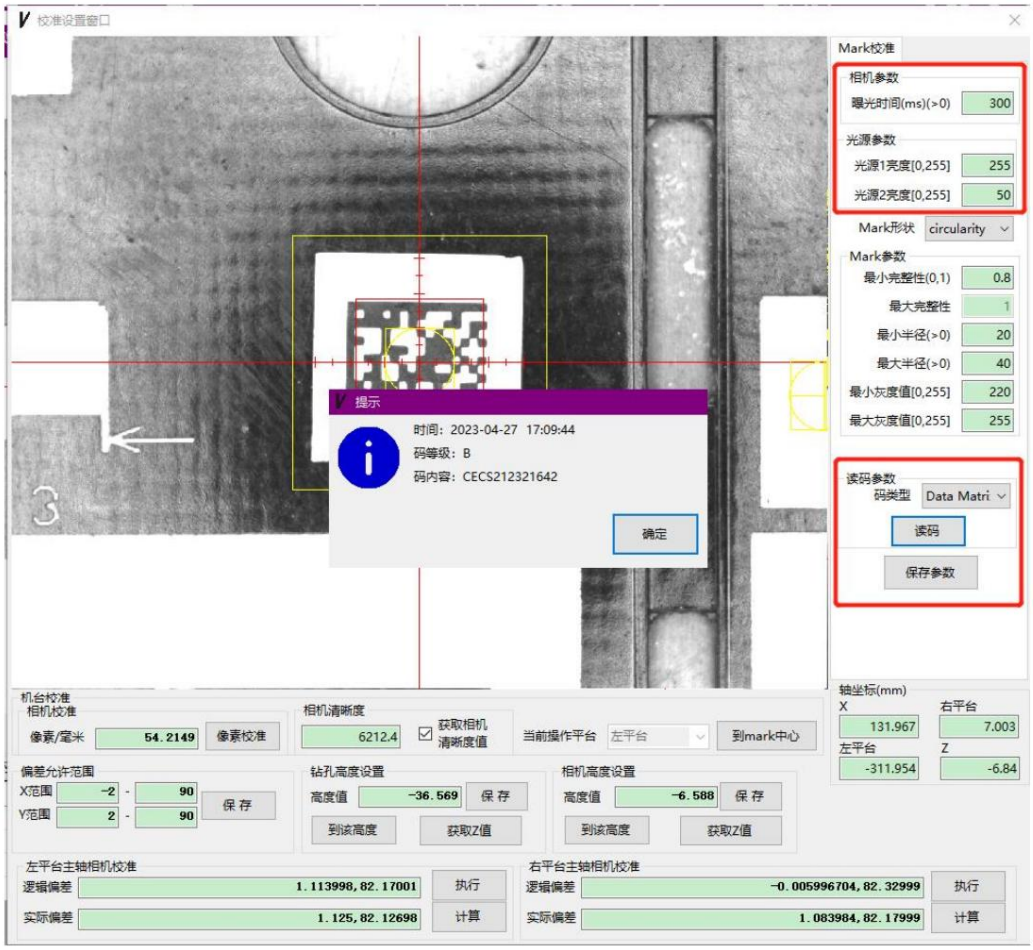
Check if the path used for editing is correct; if not, the cutting path needs to be modified.

Code reading path:

(This function is for PCBA boards that require code reading)

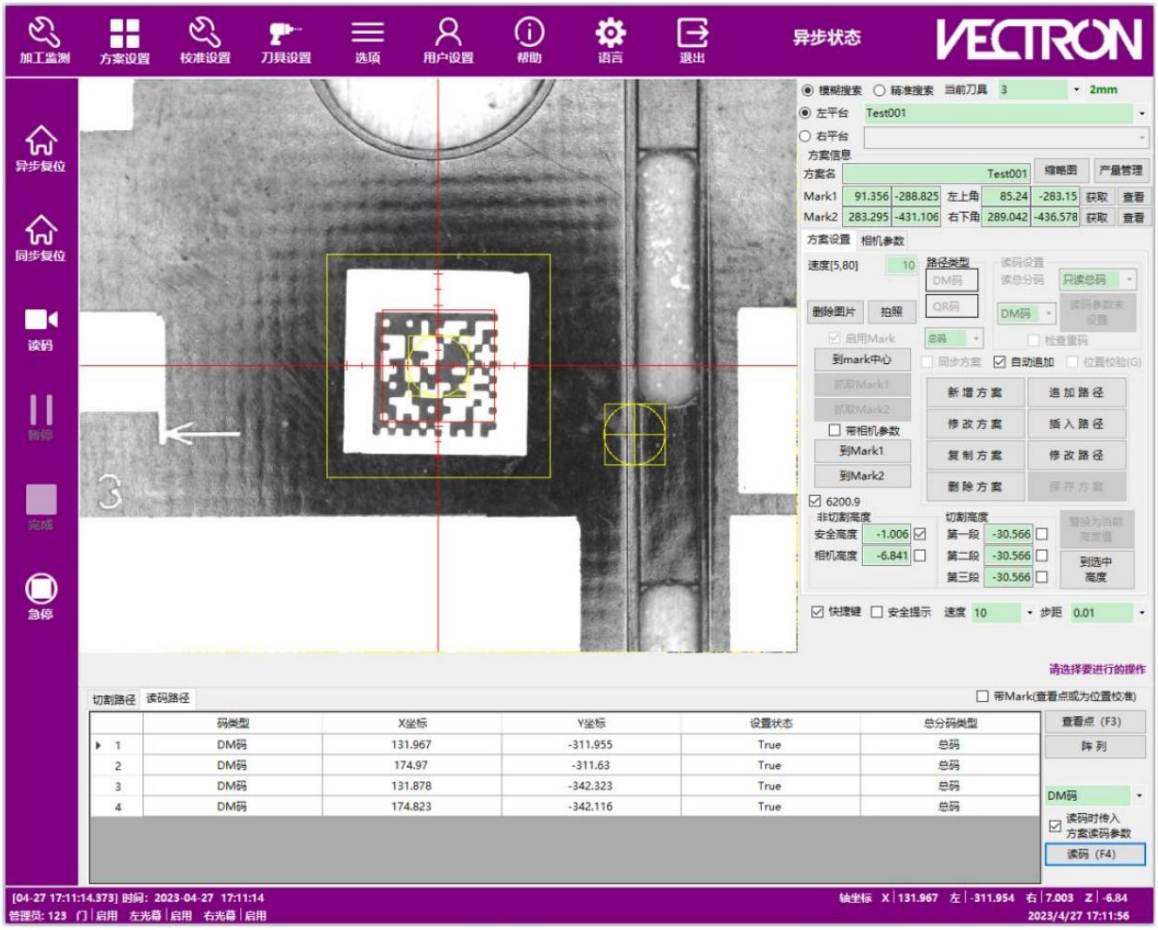
1. Clicking the code reading path will display the code reading settings interface; as shown in the image below:

2. Before creating the code reading path, you need to set or update the code reading parameters of the scheme; as shown in the figure below:



(1) First, select the code type (DM code, QR code) in the "Calibration Settings Window". Here, we will use DM code as an example. Set appropriate exposure time, light source 1 brightness, and light source 2 brightness parameters to achieve the best scanning effect. Click "Save Parameters", and then click "Read Code" to view the scanning effect. (2) After the scanning effect meets the requirements, close the "Calibration Settings Window" and go to the scheme settings interface.

As shown in the figure below:



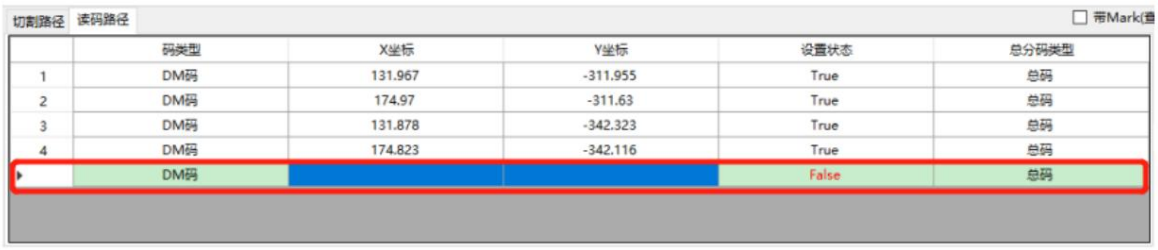
Click "Modify Scheme", as shown in the image below:

Select "DM Code" and click the button at the "Update Scheme Reading Code Parameters" location to write the currently saved reading code parameters from the camera into the scheme; the reading code settings can be selected as "Read Total Code Only", "Read Sub-Code Only", or "Read Total and Sub-Codes".

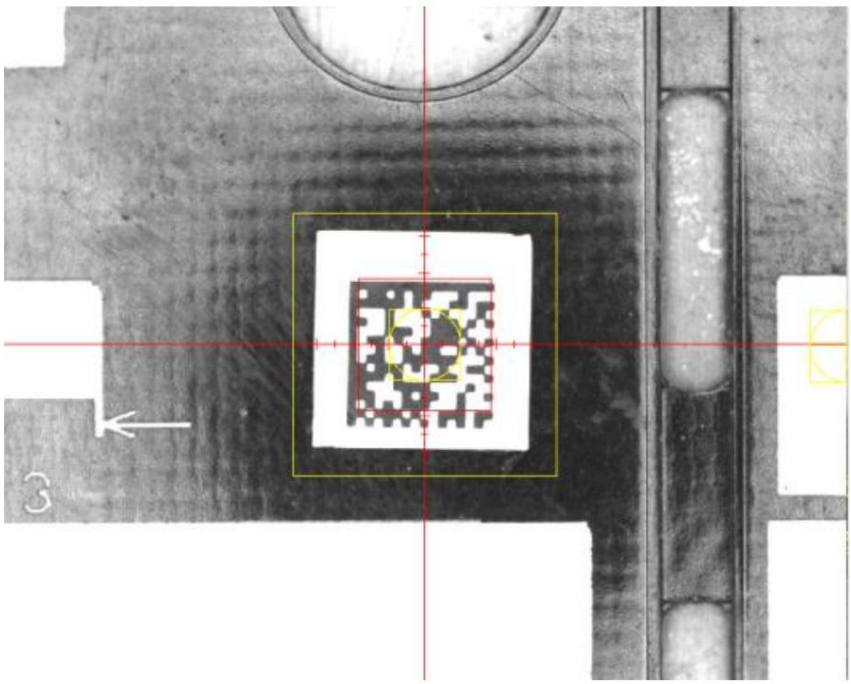
Check for duplicate characters: Checking this box will enable the function to check for duplicate characters;

Remember to click "Save Scheme" after making changes;

3. Click "Append Path" to add a code reading path, as shown in the image below:



	码类型	X坐标	Y坐标	设置状态	总分码类型
1	DM码	131.967	-311.955	True	总码
2	DM码	174.97	-311.63	True	总码
3	DM码	131.878	-342.323	True	总码
4	DM码	174.823	-342.116	True	总码
	DM码			False	总码



Select "DM" code as the path type. You can set this code reading path as "total code" or "sub-code". Center the camera on the center of the code and press "Enter" to confirm the coordinates of the current code reading path. Save the scheme after completing all code reading paths.

The method for creating a QR code path is the same as the method for creating a DM code path;

Other operations on the code reading path are the same as those on the cutting path; (such as inserting a path, modifying a path, arraying, disabling or enabling a path, moving it up or down, deleting it, etc., can be referred to the cutting path operation method).

Click "Production Management" in the upper right corner of the program settings interface to bring up the "Production Settings Window". , like

As shown in the figure below:

This machine counts:

Total processing time (hours): The total processing time for this machine. (Includes processing time for all processing methods)

Total Output (pieces): The total processing output of this machine. (Includes the processing output of all solutions)

Current scheme count:

Total processing time (hours): The total processing time for the current scheme.

Preset output (pieces): The preset output for the current plan.

Actual output (pieces): The actual output of the current plan.

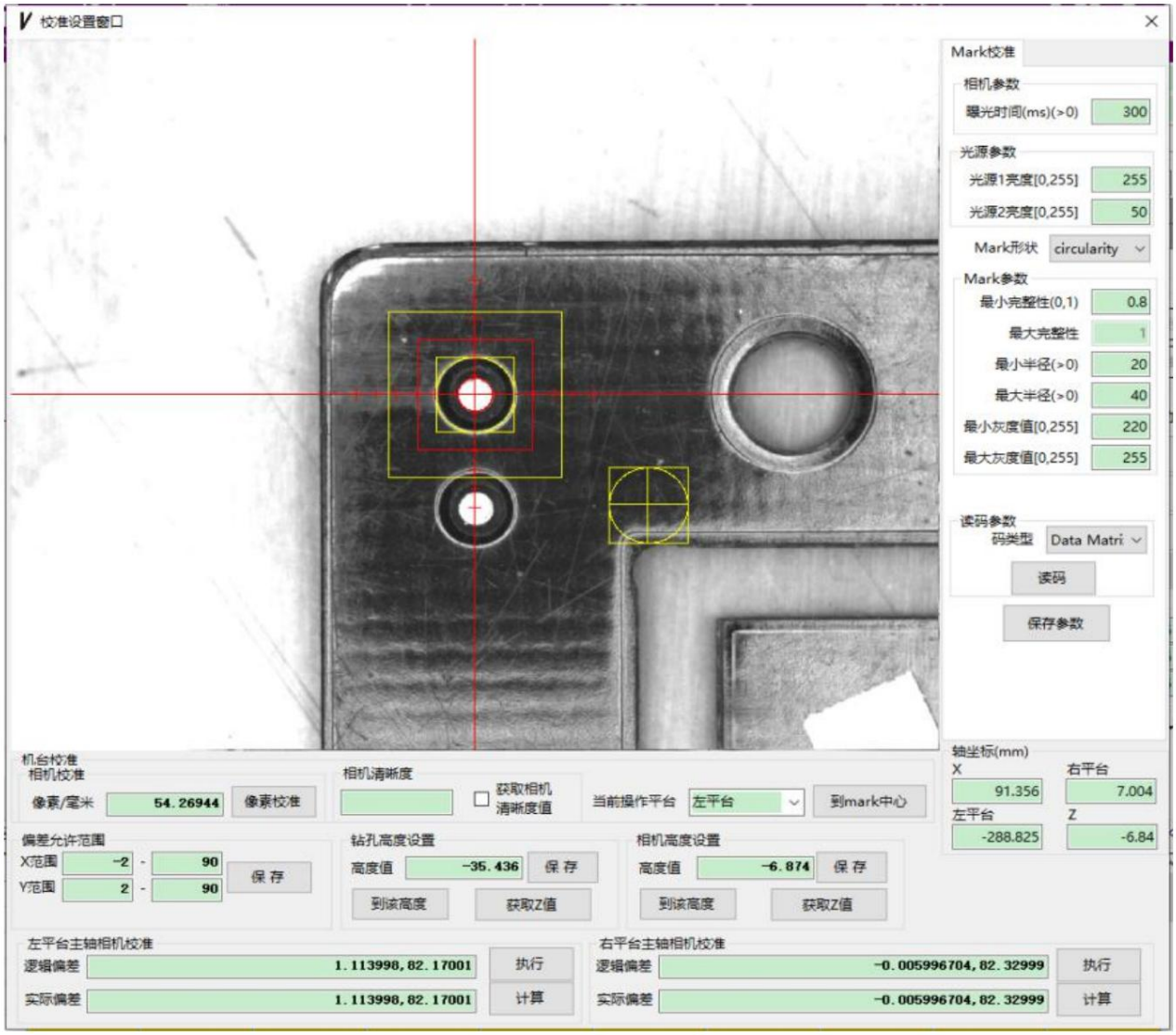
Production increment: The production increment of the current plan.

III. Mechanical Calibration .

The calibration window includes "Camera Height Setting," "Mark Calibration," "Camera Calibration," and "Main." "Axis camera calibration", "drilling height", etc.

After the equipment is assembled, a mechanical calibration is performed. After the mechanical calibration, the equipment is not disassembled. In general, recalibration is not required. Here, we will take the calibration of the left platform as an example for a detailed explanation.

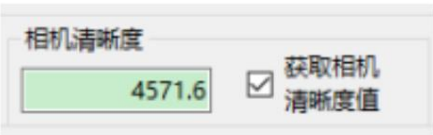
Click "Calibration Settings" to open the "Calibration Settings" window, as shown in the image below:



Before calibration, a test PCBA board needs to be installed on the work platform, and the calibration platform should be selected in the position shown in the figure below. The following is an example of the left platform:

1. To set the camera

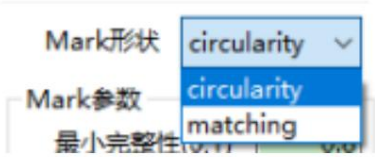
height, press "F2" to bring up the shortcut window, then move the camera crosshair cursor to the center of the Mark on the PCBA board. Check the "Get Camera Sharpness Value" box, as shown in the image below:



Slowly adjust the Z-axis height until the "Camera Sharpness Value" reaches its maximum value, then click "Get Z Value". Click "Save" to complete the platform calibration of the camera height settings;

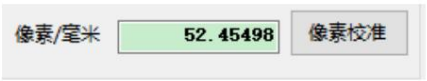
1. Move the Z-axis, then click "To this height" to verify if it is correct; 2. Mark calibration

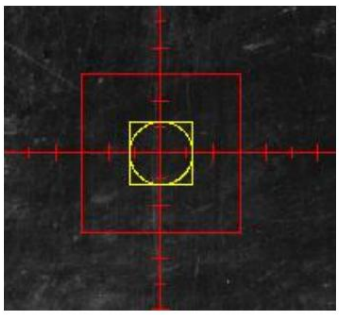
Mark calibration has two modes: "circularity" and "matching," as shown in the image below:



The commonly used mode is "circularity", and only "circularity" mode is effective in "Camera Calibration"; (1) Exposure time: Adjust the value according to different materials to achieve the best imaging effect; (minimum value is 0, the larger the value, the brighter); (2) Light source 1 brightness: Adjust the light source brightness according to different materials to achieve the best imaging effect; (adjustment range is 0-255, the larger the value, the brighter); (3) Light source 2 brightness: Adjust the light source brightness according to different materials to achieve the best imaging effect; (adjustment range is 0-255, the larger the value, the brighter); Light source 2 brightness is only effective for dual light sources. (4) In "Mark Calibration", select "circularity", as shown in the figure below:

(5) Minimum Integrity: Adjust the value according to different Mark points to achieve the best acquisition effect; (Minimum value is 0.1, the larger the value, the higher the requirement for the consistency of Mark points); (6) Maximum Integrity: This value is a fixed value of 1; (7) Minimum Radius: The unit of this value is pixels, which needs to be used with the value of "Camera Calibration", and is filled in according to the size of the Mark points; Figure A below shows that 52.45498 pixels represent 1 millimeter; Figure B below shows that each small grid of the camera crosshair represents 0.5mm;

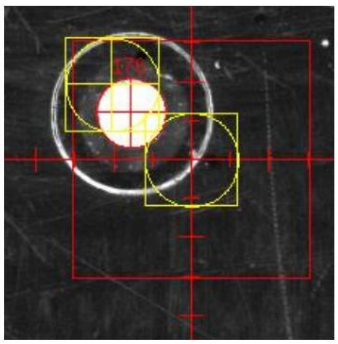


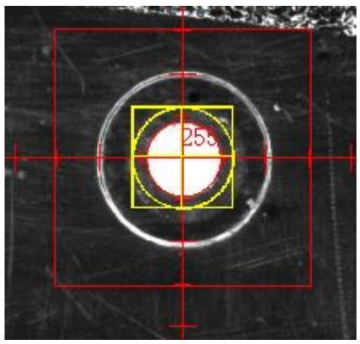


A B

(8) Maximum radius: Generally, it is twice the "minimum radius", which can be adjusted appropriately according to the acquisition effect of the Mark point; (9) Minimum

and maximum grayscale values: This value needs to be set according to the grayscale value displayed by the camera at the current Mark point; Move the mouse cursor to the edge of the Mark, click the right mouse button, and the display will be as shown in Figure C below, which shows 176; Move the mouse cursor to the inside of the Mark edge, click the right mouse button, and the display will be as shown in Figure D below, which shows 255;





C D

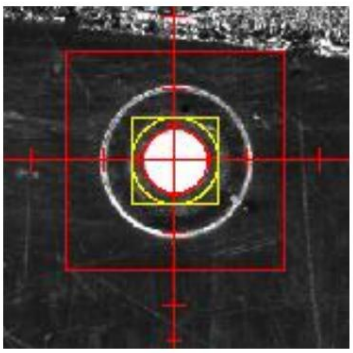
Therefore, the theoretical minimum grayscale value is 176 (in practice, to allow the camera to better capture the Mark, the minimum grayscale value is appropriately increased); the theoretical maximum grayscale value is 255; after setting the above

parameters, the Mark point will be surrounded by a red circle, and the camera will move around the Mark point.

For optimal results, the mouse cursor should not bounce around when pointing to the crosshair. (The yellow circle indicates the size of the milling cutter.)

Within the red square, move the camera crosshair away from the center of the Mark point, then click "Go".

If the "Mark Center" can be captured well, it means the Mark parameters have been set correctly; as shown in the image below:



After setting the Mark-related parameters, you need to go to the scheme interface to recapture the Mark points before they are saved to the corresponding scheme.

(10) In “Mark Shape”, select “matching”, as shown in the following figure:

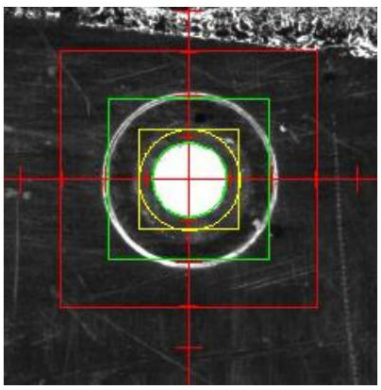
The "matching" mode is suitable for cases where the Mark is not circular.

Move the camera crosshair to the center of the Mark (you need to manually align it to the center), and click "Get Basic".

The system will automatically retrieve a set of data based on Mark's information.

(11) Template radius (height/width): This value is in pixels and sets the range of the matched image.

As shown in the green box in the image below;



(12) Template similarity: The higher this value, the higher the consistency requirement for the matched images;

(Value range is 0.1 to 1)

(13) Minimum/maximum contrast: The similarity of the pair is determined within the range of minimum and maximum contrast.

For success;

(14) Minimum component size: Adjust this value when the above parameters fail to achieve optimal imaging.

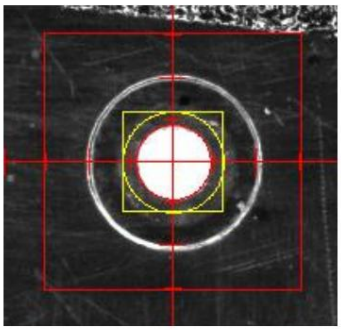
This can improve the effect to some extent;

Once the above parameters are set, the Mark point is best when its edges are surrounded by a green circle or a green shape.

3. Camera Calibration:

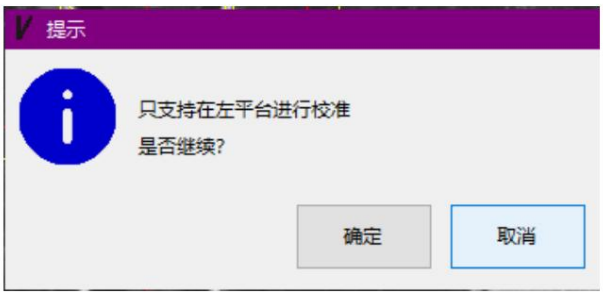
Using the camera's set height, move the camera's crosshair cursor to the center of the Mark point, and click "Go to Mark".

The "center" setting ensures the crosshair is clearly visible to the camera and easily aligned with the center of the Mark point, as shown in the image below:

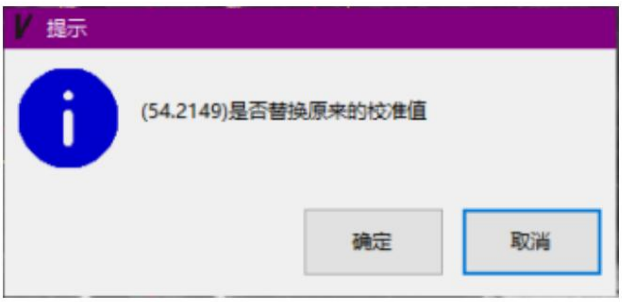


Click "Pixel Calibration" (camera calibration is only supported on the left platform) to calculate the current camera's pixel The system will automatically value and display a prompt.

A window asks whether to replace, as shown in the image below:



Click "OK"



Click "OK" to complete the camera calibration.

4. Spindle Camera Calibration:

During assembly, there is a certain deviation between the camera and the spindle. The system uses the calibration values to...

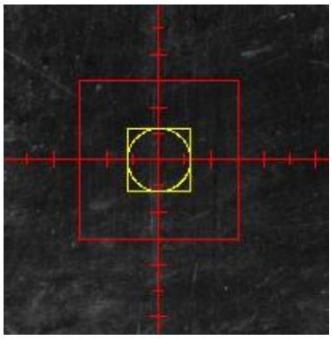
Provide compensation;

(1) Adjust the height of the Z-axis according to the installation of the PCBA board so that the milling cutter can be positioned on the PCBA board.

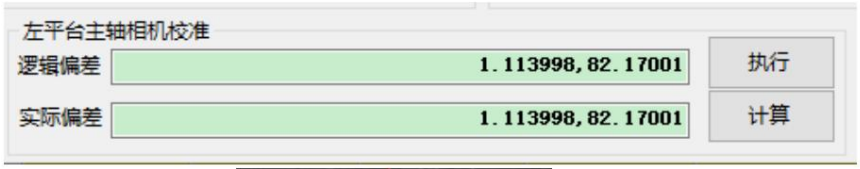
Drill a hole (Note: When adjusting the height, ensure there is space on the PCBA board) to determine the height.

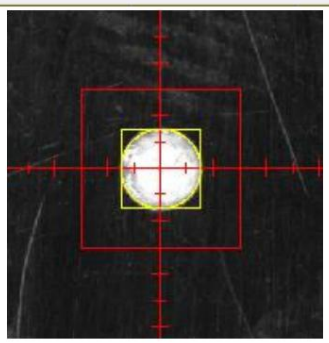
After confirming the accuracy of the readings, click "Get Z value" and then click "Save," as shown in the image below:

(2) Move the camera's crosshair cursor to the position where you want to drill, as shown in the figure below:

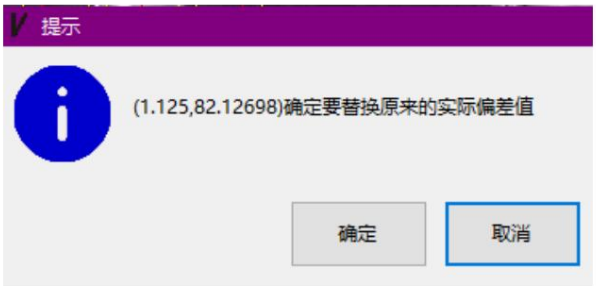


(3) Click "Execute". The spindle will drill a small hole on the PCBA according to the value on "Logical Deviation" and move the camera crosshair to near the center of the hole. At this time, manually align the camera crosshair with the center of the hole, as shown in the figure below:





(4) Click “Calculate”, and the system will pop up a prompt window as shown in the figure below:

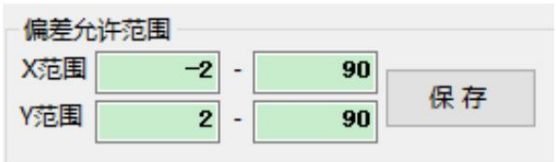


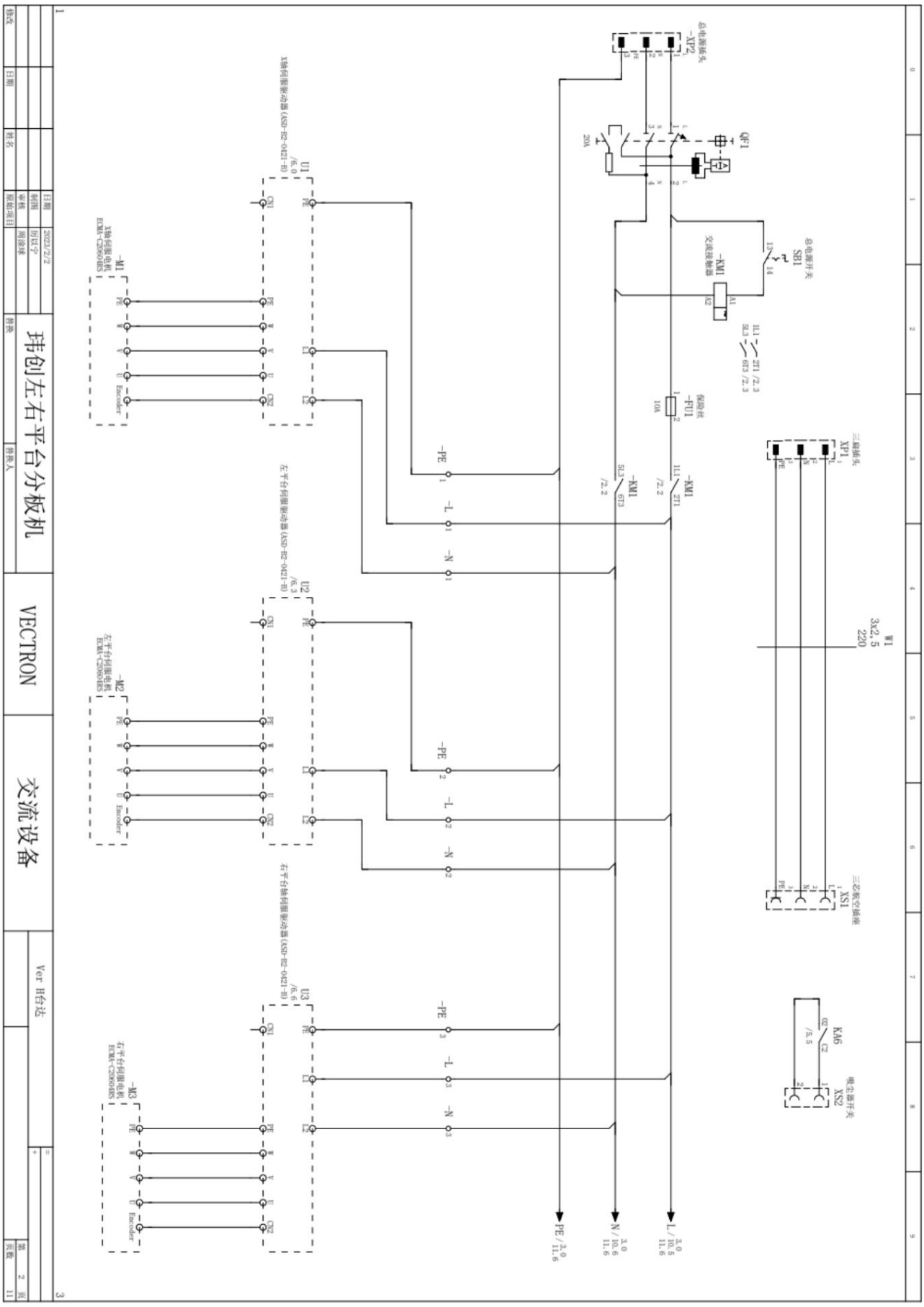
(5) Click “OK” and the system will update the value of “Actual Deviation”; (6) Copy the value of “Actual Deviation” to “Logical Deviation” and the calibration is complete.

To verify whether the "spindle camera calibration" is correct, move the camera crosshair to the position where you can drill. If the camera crosshair is aligned with the center of the hole after drilling, then the "spindle camera calibration" is correct.

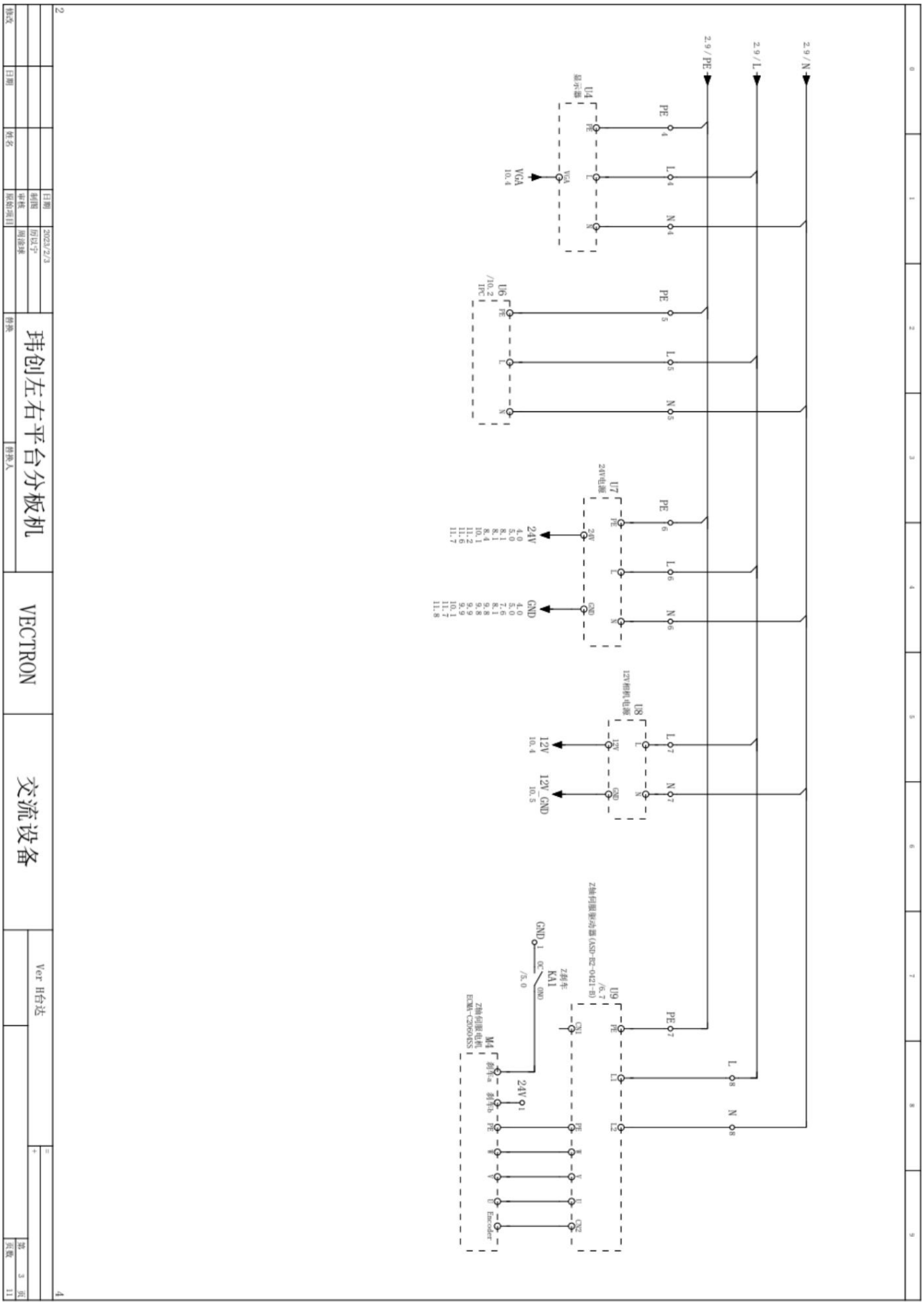
5. Tolerable Deviation Range

The X and Y direction deviation values (in pixels) are set at the factory and generally do not need to be changed.





Machine Translated by Google



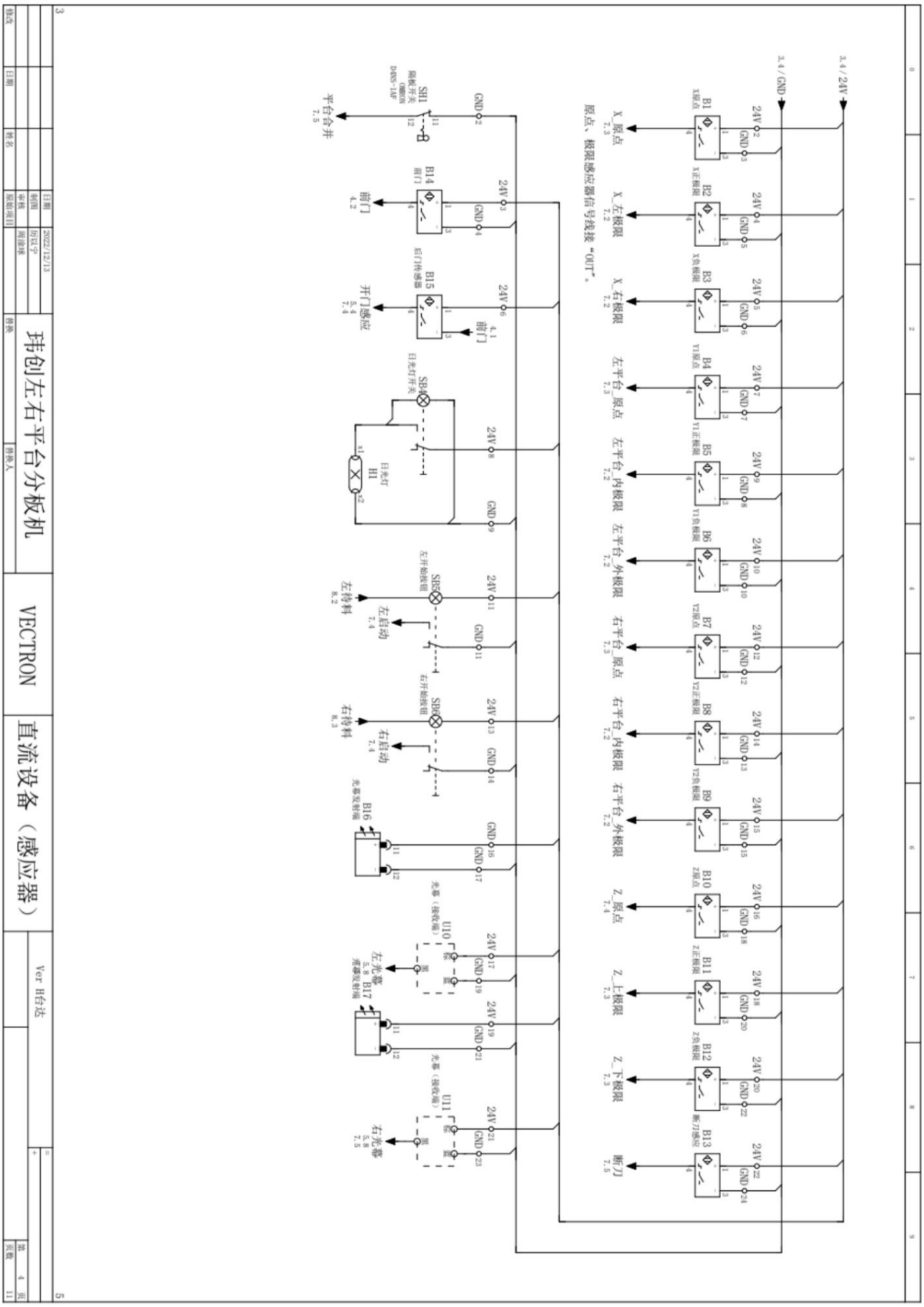
标记	处数	分区	更改文件号	签名	日期		

制图	伤以宁	2023/2/3	玮创左右平台分板机	VECTRON	交流设备
审核	周涂球				
原始项目			替换	替换人	

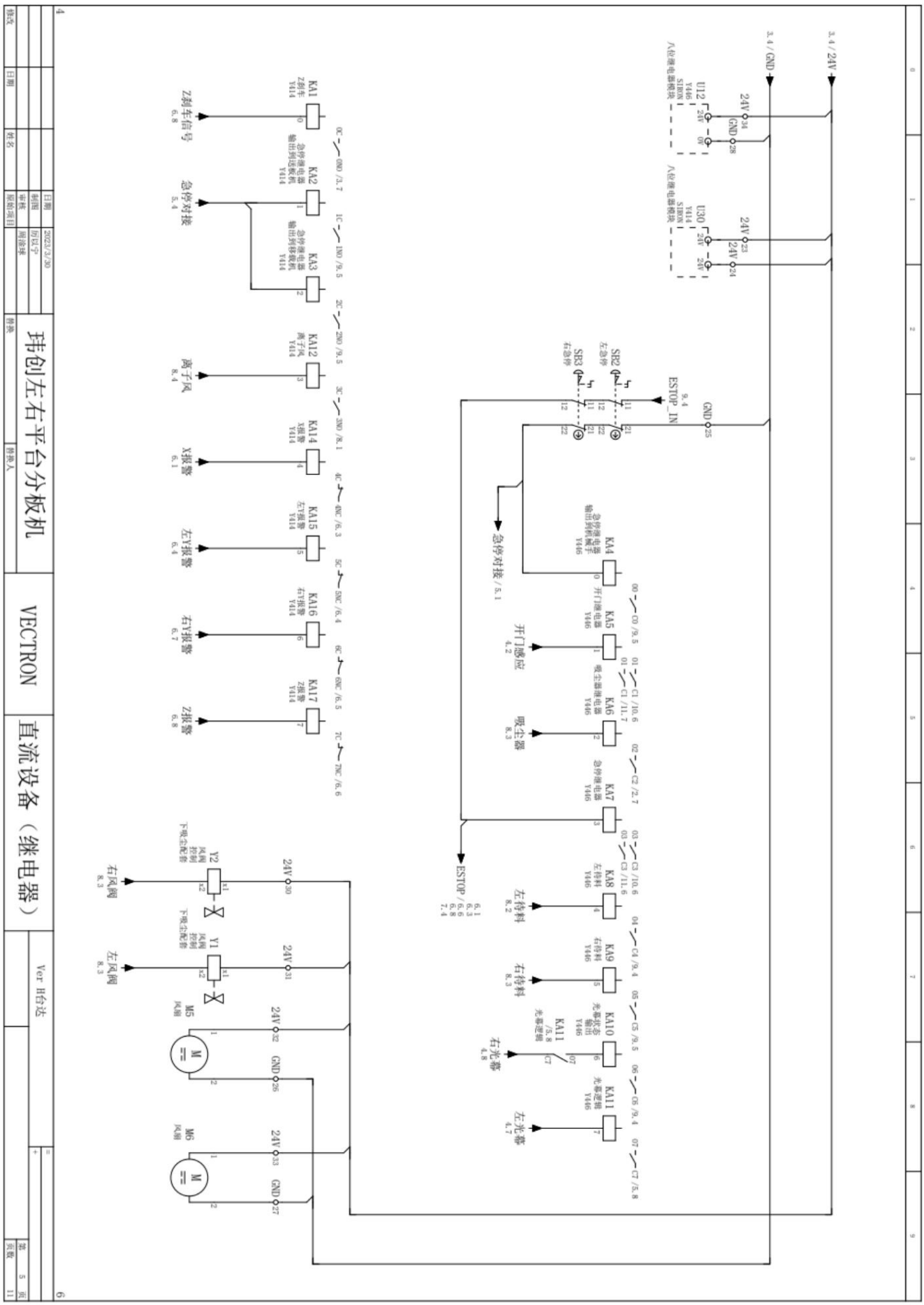
Ver H台达

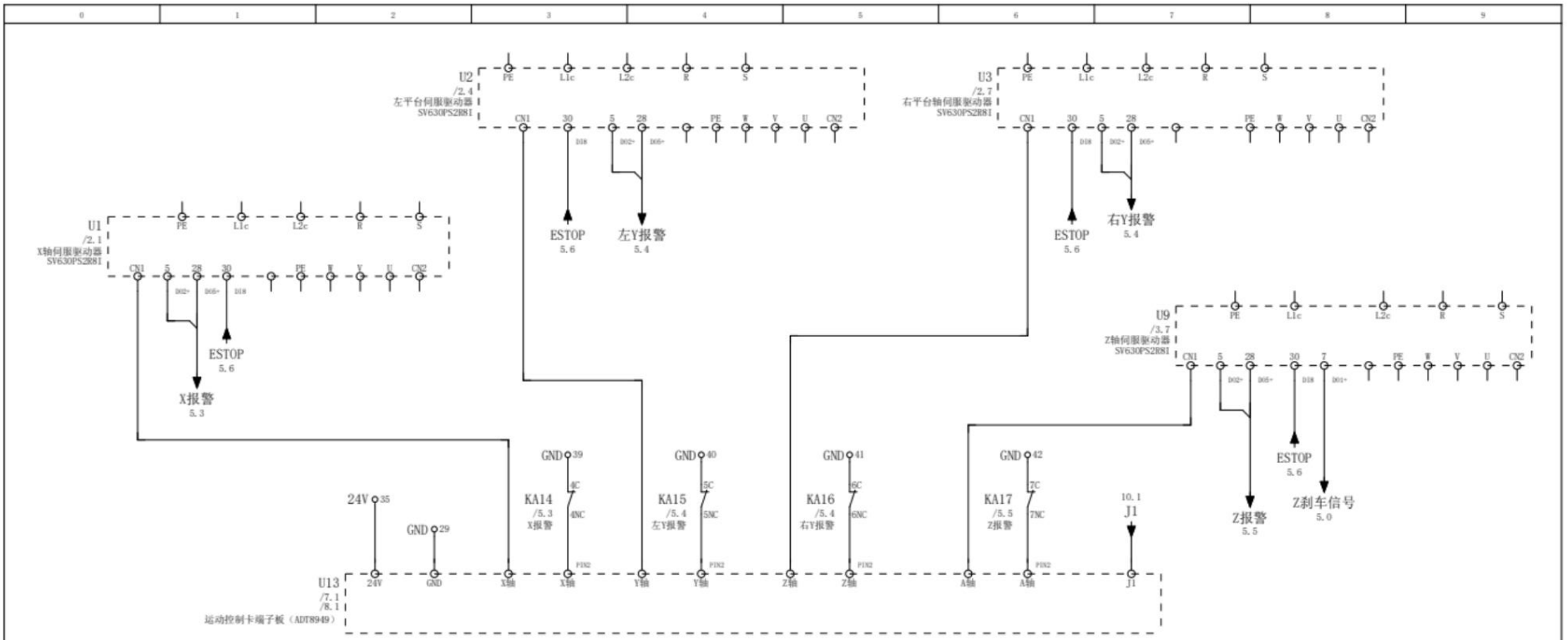
第	3	页
共数	11	

Machine Translated by Google



Machine Translated by Google



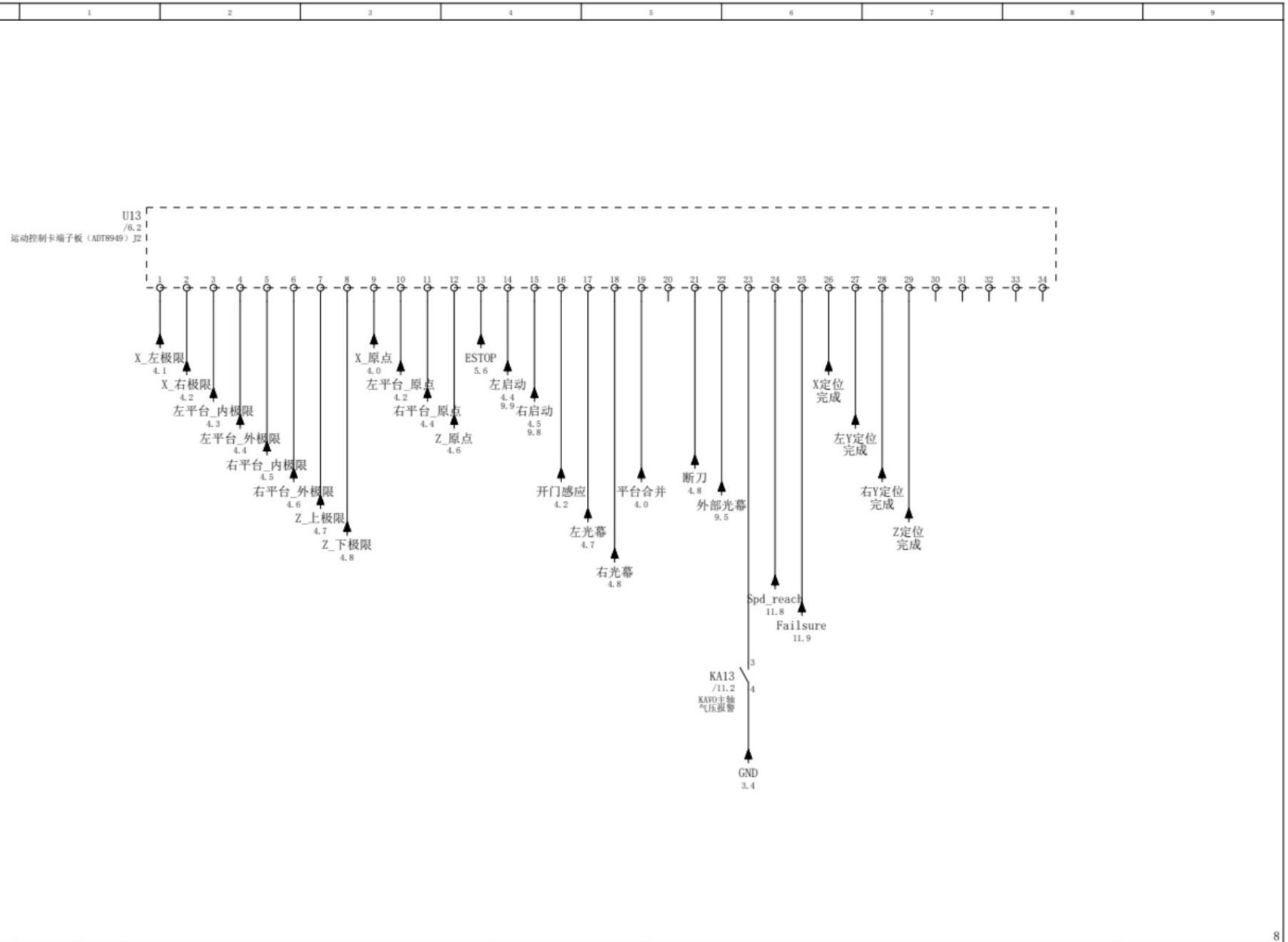


	ADT-8949卡25Pin DB头		台达B2伺服CN1端子44Pin		
	引脚定义	PIN	PIN	引脚定义	
	24V GND	1	14,6,4,27,	COM-，DO1-,DO2,-DO5-	
	EXT_OUT1	3	33	DI5-（ARST）	
	EXT_OUT0	15	9	DI1-（SVON）	
	XECA+	17	21	OA	
	XECA-	4	22	OA/	
	XECB+	18	25	OB	
	XECB-	5	23	OB/	
	XECZ+	19	13	OZ	
	XECZ-	6	24	OZ/	
	XDR+	9	42	HSIGN	
	XDR-	22	40	/HSIGN	
	XPU+	23	38	HPULSE	
	XPU-	11	36	/HPULSE	
	OVCC	14	11	COM+	
（蓝）单独拉出200cm	EXT IN0	2			
			5	DO2+（ALRM）	（红）单独拉出250cm
			28	DO5+（WARN）	
			7	DO1+（刹车继电器）	（绿）单独拉出250cm
			30	DI8-（ESTOP）	（黄）单独拉出250cm
			需要带屏蔽，引脚带热缩管保护防止误碰		

相应的B2驱动器参数设置(X,Y1,Y2丝杆导程20mm,Z丝杆导程10mm)：

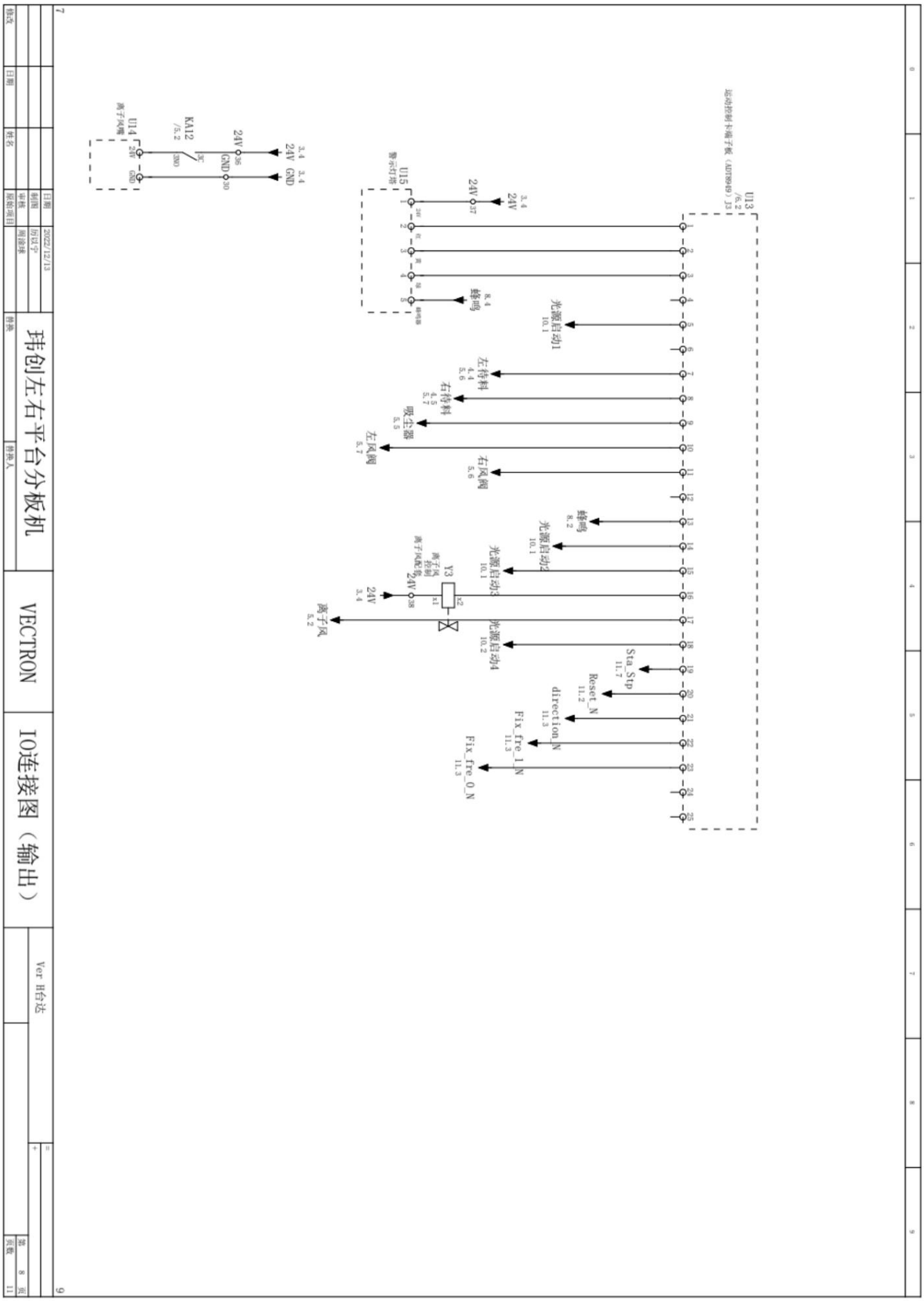
P1-00	1002	
P1-08	10	
P1-37	3	
P1-44	X,Y1,Y2:8,Z:16	
P1-45	1	
P1-46	X,Y1,Y2:5000,Z:2500	
P1-68	10	
P2-00	125	
P2-04	502	
P2-06	80	
P2-10	0101	DI1，SON，PIN9
P2-11	0000	
P2-12	0000	
P2-13	0000	
P2-14	0102	DI5，ARST，PIN33
P2-15	0000	
P2-16	0000	
P2-17	0021	DI8，EMGS，PIN30
P2-18	0000	(Z轴，设置为0108)
P2-19	0107	DO2，ALRM，PIN5
P2-22	0111	DO5，WARN，PIN28
P2-25	10.0	
P2-26	80	

			日期	2023/3/30	玮创左右平台分板机	VECTRON	伺服接线图	Ver H台达
			制图	历以宁				
			审核	周淦球				
修改	日期	姓名	原始项目		替换	替换人		第 6 页 共数 11

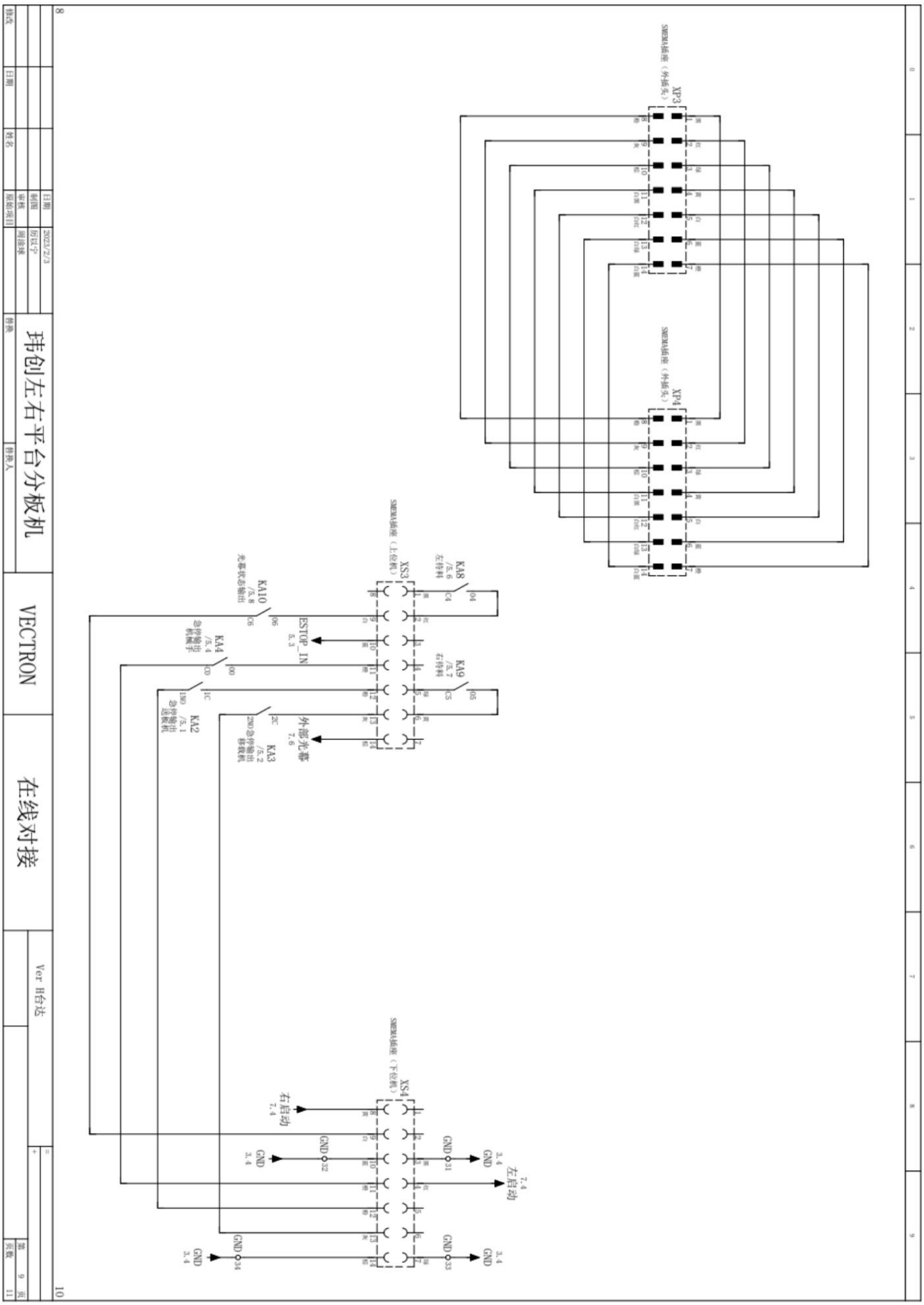


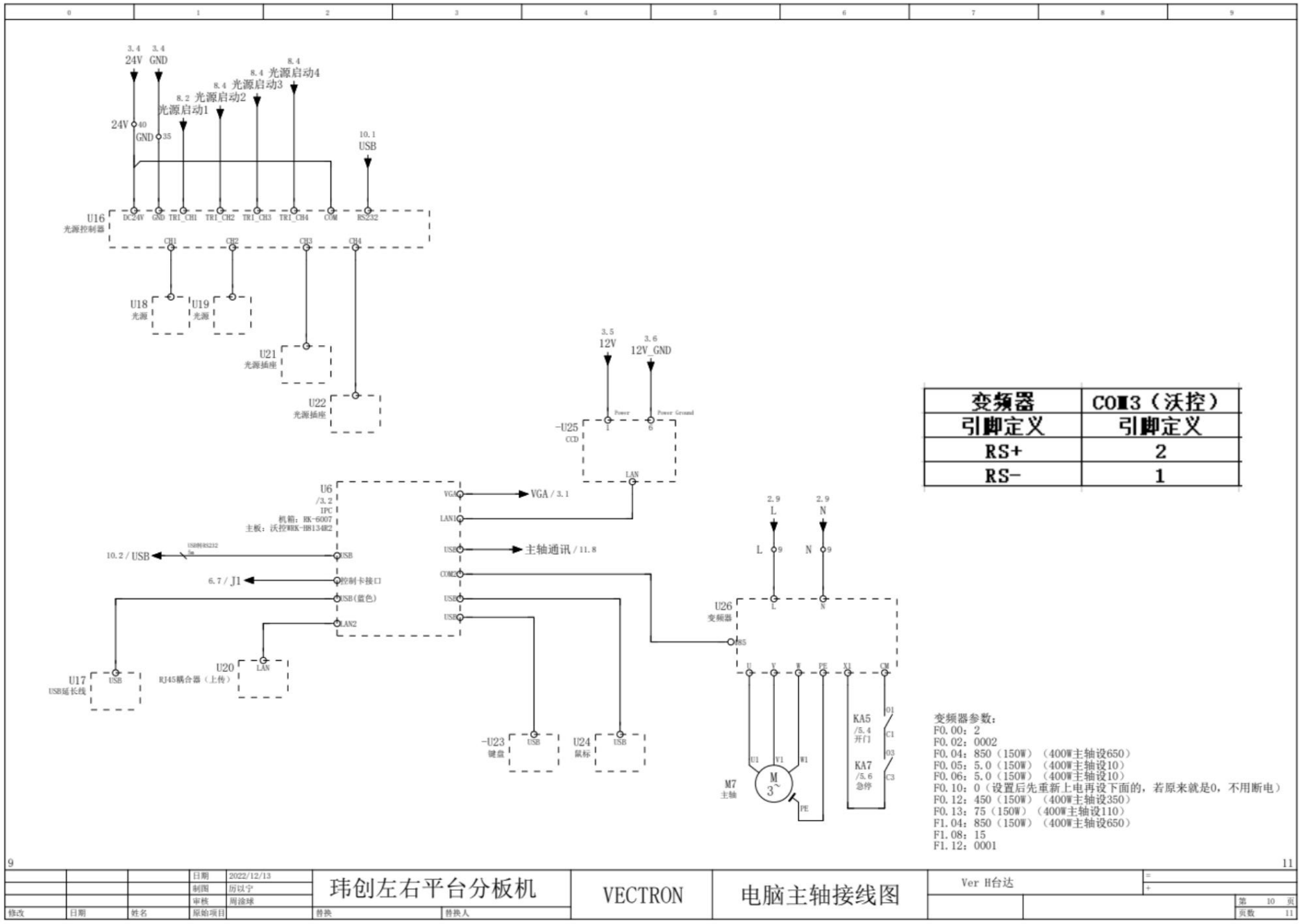
			日期	2023/2/10	玮创左右平台分板机		VECTRON	IO连接图（输入）	Ver H台达
			制图	厉以宁					
			审核	周淦球					
修改	日期	姓名	原始项目		替换	替换人			

Machine Translated by Google



Machine Translated by Google

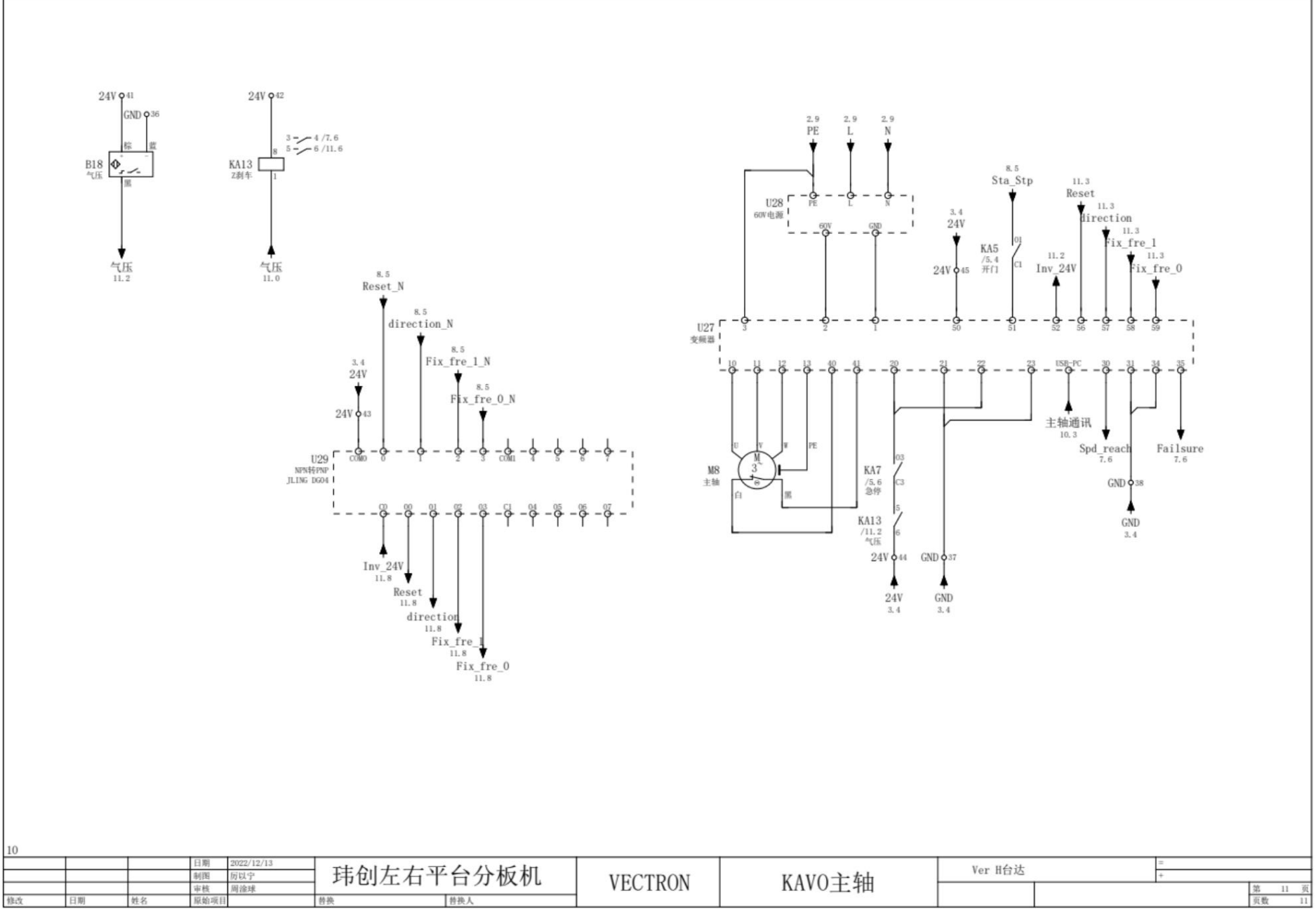




变频器	COM3（沃控）
引脚定义	引脚定义
RS+	2
RS-	1

变频器参数：
F0.00：2
F0.02：0002
F0.04：850（150W）（400W主轴设650）
F0.05：5.0（150W）（400W主轴设10）
F0.06：5.0（150W）（400W主轴设10）
F0.10：0（设置后先重新上电再设下面的，若原来就是0，不用断电）
F0.12：450（150W）（400W主轴设350）
F0.13：75（150W）（400W主轴设110）
F1.04：850（150W）（400W主轴设650）
F1.08：15
F1.12：0001

			日期	2022/12/13	玮创左右平台分板机	VECTRON	电脑主轴接线图	Ver H台达
			制图	历以宁				
			审核	周涂球				
修改	日期	姓名	原始项目		替换	替换人		



10

			日期	2022/12/13	玮创左右平台分板机	VECTRON	KAVO主轴	Ver H台达
			制图	厉以宁				
			审核	周淦球				
修改	日期	姓名	原始项目		替换	替换人		第 11 页 共 11 页

Chapter 4 Troubleshooting

I. Simple Troubleshooting 1. Power

supply failure: ÿ Check if there is

power input. ÿ Confirm if the switch in the

distribution box is adjusted or faulty. ÿ Confirm that the equipment's emergency stop is off and

the emergency stop switch is released. 2. Violent shaking during processing: ÿ Confirm that the machine's four fixed feet are

locked and that each axis runs smoothly. 3.

Inaccurate machining positioning: ÿ Check if the X, Y, and Z axis couplings are loose. ÿ Check if the camera is loose. ÿ After

checking the hardware components,

recalibrate the machine using the software.

4. Cylinder error: ÿ

Check if the air supply is stable. ÿ Check if the cylinder

sensor is working. 5. Milling cutter easily breaks.

The machining speed is too high; the cutting speed should be reduced. Alternatively, check if there is a problem with the quality of the milling cutter.

6. Poor dust collection efficiency

ÿ Confirm that the dust collector motor is rotating in the correct direction. If the direction is incorrect, you can swap the phase sequence to change the motor's

rotation direction.

• Check if the PVC pipes connecting to the dust collector are loose or cracked. • Clean the dust

collection box regularly. • Clean the filter

bags regularly.

Chapter 5 Maintenance and Care

I. Replacing the Milling

Cutter: Replace the milling cutter promptly when it reaches the end of its service life or breaks during cutting. Note: The

spindle motor must be stopped before changing the milling cutter. II. Spindle Maintenance: Clean the spindle and milling cutter fixture regularly, ideally weekly.

Note: Never use compressed air or ultrasonic equipment to clean the spindle. Cleaning

process...

Cleaning agents must not be allowed to enter the spindle.

III. Lubrication

of ball screw assemblies and other rolling friction transmission components: As long as abrasive particles and chemically active substances are prevented from entering, these components can be considered to operate with almost no wear. However, if dirt falls into the raceway or dirty lubricating oil is used, it will not only hinder the normal operation of the balls but also drastically increase wear. Prolonged use of equipment and the accumulation of dust during production will inevitably lead to

accelerated wear of ball screws, linear guides, and bearings. Therefore, regular inspection and replenishment of new lubricating oil to each transmission component are necessary. A monthly inspection cycle is recommended, but this should be adjusted according to the frequency of equipment use. Lithium-based grease can be used.

(Lithium Grease), which has waterproof and heat-resistant properties. (1) Carefully wipe the oil stains off

the surface of the guide rail and lead screw, especially the oil stains in the grooves; pay attention to the oil stains inside the guide rail mounting holes. (2)

Use a grease gun nozzle to

add oil to the inside of the transmission cavity until the internal oil stains are completely squeezed out, and remove the squeezed-out oil stains to prevent

the oil stains from corroding the guide rail.

(3) Apply a small amount of grease to the inner groove of the ball screw with your finger to maintain its lubrication. (4)

Regularly check the support bearing. Check whether the connection between the screw support and the machine tool is loose, and whether the support bearing is...

Check for damage. If any problems are found, tighten any loose parts and replace the support bearing promptly.