

EA-LB100

Laser spray tin welding machine

Say

Bright

book








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Chapter 1 Precautions for Use

Serious warning	
	<ul style="list-style-type: none">• There is a risk of electric shock.• Do not touch the parts that may be charged easily. Non-professionals should not easily change it to prevent touching Electricity.• When an emergency occurs, please press the red emergency stop switch immediately, and the machine will disconnect the power supply.• Do not use when the power cord is damaged.• When not in use for a long time, please turn off the power switch, cut off the power, and pull out the power plug.• Pay attention to the power status when performing circuit maintenance. Please turn off the power before performing careful maintenance, Check work.• This product uses a three-wire grounding plug, which must be inserted into a three-hole grounding socket. Don't change the plug Or use an ungrounded three-head adapter to make the grounding poor. If you need to extend the wire, please use grounding Three-core power cord.• Dangerous voltage inside the device! Inexperienced work is dangerous to life! system When a malfunction requires repair, only experienced and authorized experts can repair the device. Or contact the agent or manufacturer.
	<ul style="list-style-type: none">• There is a risk of injury.• Do not extend your limbs when the power is on or the machine is operating.• Do not get the machine wet, and do not disassemble the machine or pull the power cord during use.• Please pay attention to keep the machine and its surroundings clean, which will help reduce accidents.
	<ul style="list-style-type: none">• When repairing, be sure to cut off the power and air pressure, and non-professionals should not make any changes.• This product is not an explosion-proof specification and is strictly prohibited to be used in a potentially explosive environment.
	<ul style="list-style-type: none">• Before use, make sure that the heating controller components have been firmly fixed on the machine.• It is strictly forbidden to stack flammable and explosive objects or gas solvents in the work area.
caveat	
	<ul style="list-style-type: none">• Do not move the movable parts by hand to avoid damage to the machine.• Make sure not to touch the moving parts during work, otherwise it may damage the machine or cause an accident.• During the operation of the machine, please do not put your hands into the equipment at will, which may cause the user to suffer Injury or cause substantial damage to the involved objects.• When the machine is paused, please check the condition carefully before performing manual operation, otherwise it may lead to Injury the user or cause substantial damage to the involved objects.



- When taking out the equipment and various accessories from the bag, if necessary, ask someone to help take them out together to avoid packing the contents
Fall or cause an accident.
- Pay attention to the bracket or guard plate on the upper part of the machine to prevent head collision.
- After transporting to a suitable location, be sure to place the equipment on a flat ground to avoid tilting
An accident happened.

0~40°C

- This product should be used or stored in a place with suitable temperature and humidity.
- The suitable temperature requirement is 0~40 °C, and the humidity requirement is 20%~90% (no condensation).



- This equipment is heavy. Please place it in a single layer instead of stacking it to avoid damage or accidents.
outer.
- Do not stack objects within the working range of the machine.
- Before daily handling or moving, please make sure that the movable parts of the equipment have been fixed (such as X
The shaft may be fixed with sheet metal parts or rope for safety reasons), and then enter
Line handling.
- After unpacking and before use, please make sure that the movable parts of the equipment are fixed (such as X
The shaft may be fixed by sheet metal parts or rope for safety reasons) has been removed,
Then use it again.



- Regular inspection, maintenance and repair of this product will help ensure the performance of the equipment.
Extend its service life.
- Please follow the normal procedure to boot.
- Please check that there are obstacles in the movement range of the movement mechanism before starting up.



- Make sure to use the rated voltage, current frequency and pressure rating that meet the requirements
Air pressure.
- Make sure the air source is clean and clean.
- Please use suitable air pressure according to the welding components, it is recommended to use air pressure less than 0.7Mpa.

note



- Do not discard the packaging and foam of the device.
- If you need to return the robot to the original factory or point of sale due to maintenance and other factors, you should pay attention to
The original method is fixed and packaged.
- Please place the packed robot upright, not upside down or horizontally.
- The robot can be placed in the package only after it is reliably protected with foam.
- The packaging is made of non-moisture-proof material. Please do not get wet or rain during transportation or storage.
- Please do not restart within 10s after an emergency stop or power failure, otherwise the drive will be damaged.

	<ul style="list-style-type: none"> Flammable material! Risk of burns!
	<ul style="list-style-type: none"> The main harm of laser to the human body is the eyes and skin, any part of the laser can cause Burn burn. Do not look directly at the fiber laser!
	<ul style="list-style-type: none"> Wear laser protective glasses!

Unpacking method and matters needing attention

1.1 Unpacking method

- ① Place the wooden box upright on a level ground, and tear off the shock-absorbing fixed film of the outer packaging.
- ② Use an electric drill to take out the wood fixing screws of the wooden box, and open the upper cover and the surrounding covers.
- ③ Two or more people use a truck to lift the machine from the bottom of the machine, transport it to a suitable station, and place it firmly.
- ④ **Adjust the foot of the base**, Place the machine horizontally on the ground and make sure that the machine is not shaken and placed firmly. Adjustment method

as the picture shows.

- ⑤ **After unpacking and before use, please make sure that the movable parts of the equipment are fixed (such as the X axis may be out of safety**

(Considering that it should be fixed by sheet metal parts or fixed with rope) has been removed, and then used.

1.2 Column foot adjustment method

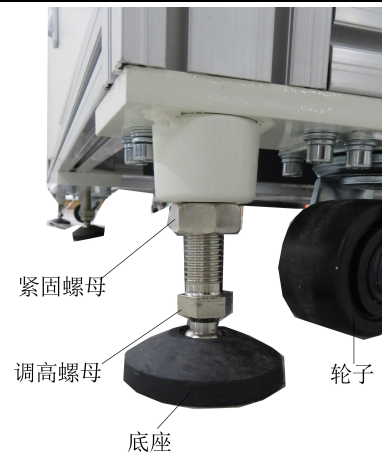
1. Rotate the lock nut to fix the height of the column foot. When the lock nut is fixed, the height cannot be adjusted; the height must be adjusted

The lock nut must be loosened.

2. Rotate the height adjustment nut to adjust the height of the column foot. If there are wheels on the bottom of the machine, you can loosen the lock before moving

Nut, and then turn the height-adjusting nut to lower the height of the column foot until the bottom pulley touches the ground and the column foot is suspended.

After the feet are adjusted in this way, the pulleys at the bottom of the machine can be used to carry the machine.



机器柱脚图

Check carefully whether the machine and accessories are missing or damaged. If you have any questions, please contact the manufacturer.

Chapter 2 Equipment Introduction

2.1 Product overview

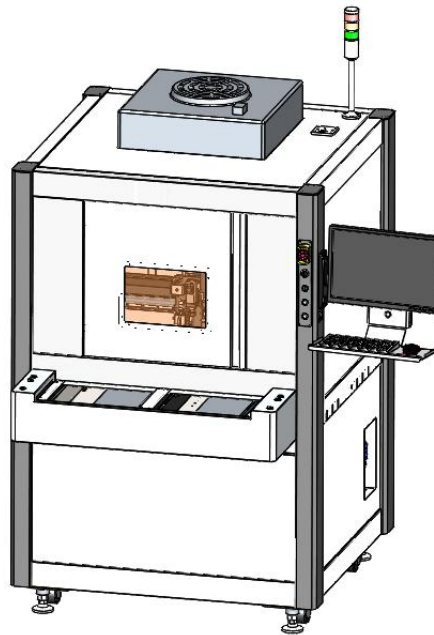
The laser spray tin welding machine brings a brand new welding solution to the surface mount process. The laser is transmitted through the optical fiber, and the laser

The high pulse energy of the light instantly melts the solder ball on the nozzle. The annular cavity is provided with an inlet for high-pressure nitrogen to enter.

High-pressure nitrogen pressure sprays the molten tin onto the solder joint surface. Multi-axis intelligent motion control platform, high-precision CCD positioning,

The integration of functions such as height measurement and solder joint detection provides guarantee for high-precision laser spray soldering; humanization of object-oriented application interaction,

Foolproof design, easy to use and safe.



System characteristics:

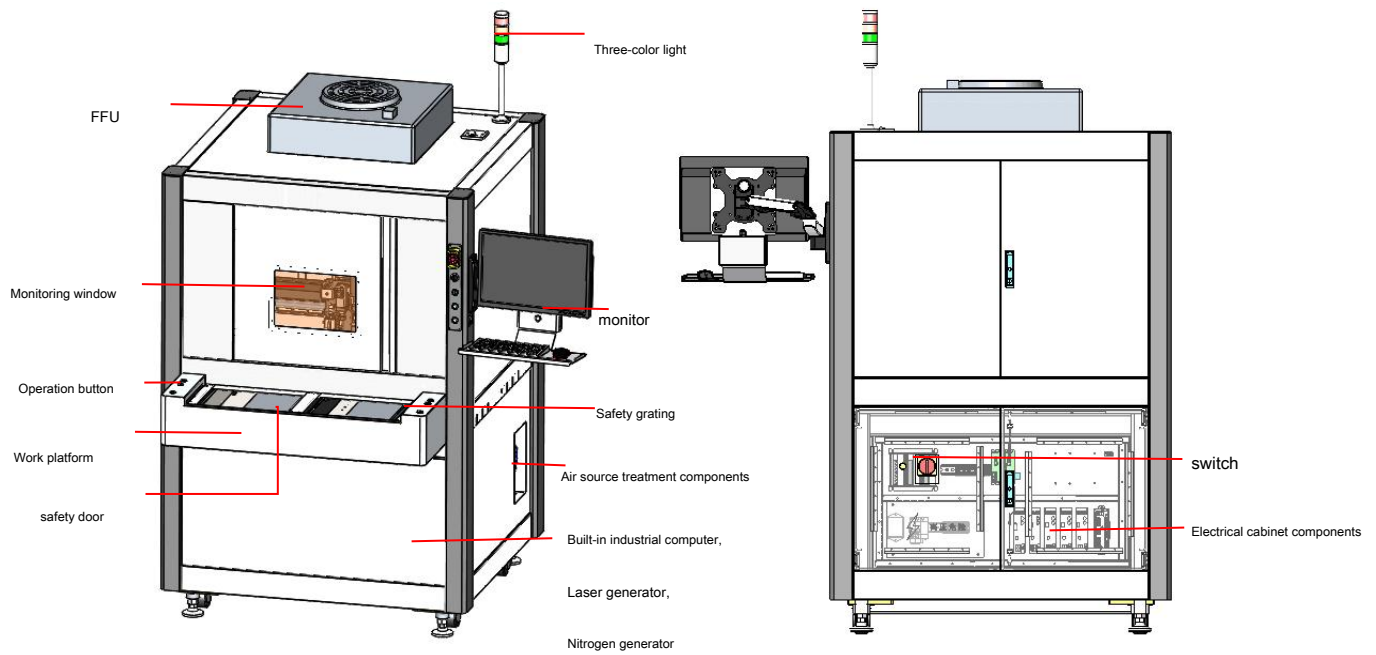
- PC control, visual operation. High-definition camera, automatic positioning, to meet the requirements of automatic processing of high-precision components.
- Molten tin is sprayed to the pad to avoid thermal stress during soldering.
- Equipped with nitrogen generation module, full protection during welding.
- No soldering flux is needed, no secondary cleaning process is required, and the life of electronic devices is guaranteed to the utmost extent.
- The soldering of different solder joints can be completed by selecting the size of the solder ball.
- The heating area is concentrated and the welding time is very short, which is especially suitable for high-end precision micro welding occasions such as fine pins and small spacing.

2.2 Specifications

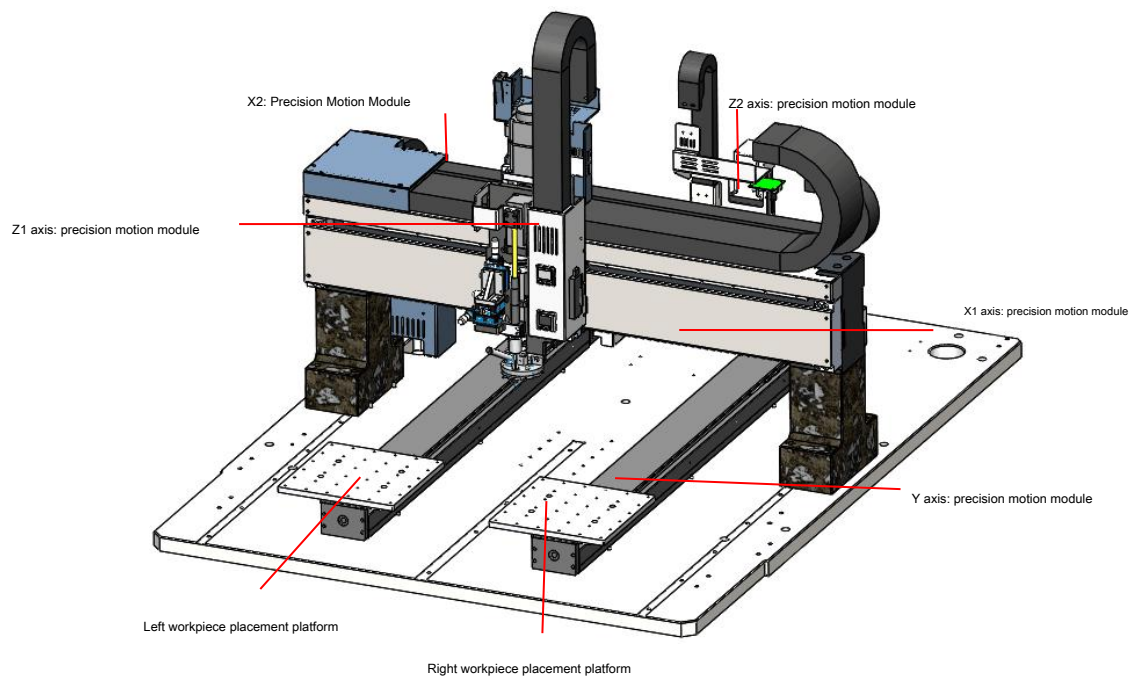
model		EA-LB100
Rated voltage (AC)		220V, 50Hz/60Hz
Machine power (W)		2000
Laser wavelength (nm)		1064
Position the CCD pixel (W)		500
Position the light source		White LED light ring-24V
FFU unit filtration efficiency		99.99%@0.3um ~ 99.999%@0.3um
Axis dynamic range	X 1(mm)	0~700
	X 2(mm)	0~700
	Y (mm)	0~790
	Z1 (mm)	0~100
	Z2(mm)	0~60
Shaft speed range	X1 (mm/sec)	0.1~800
	X2 (mm/sec)	0.1~800
	Y (mm/sec)	0.1~800
	Z1 (mm/sec)	0.1~800
	Z2 (mm/sec)	0.1~600
Repeatability	X/Y/Z axis(mm)	± 0.01
way to control		Motherboard + PC
noise		< 60dB (measured at a distance of 1m during no-load operation)
Use environment	temperature	0 ~ 40 °C
	humidity	20% ~ 90% (no condensation)
Dimensions (mm)	long	1200
	width	1460
	high	1930
Welding area size (mm)		300*250
Weight (kg)		961
Note: X1 and Z1 correspond to laser welding position, and X2 and Z2 correspond to visual positioning		

2.3 Equipment component description

2.3.1 Appearance of the device



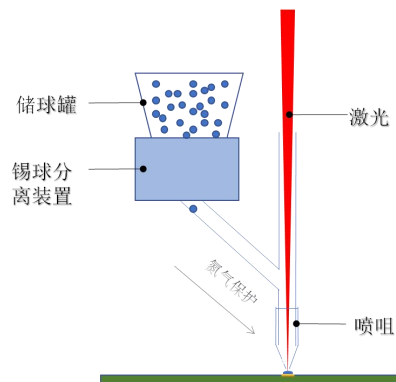
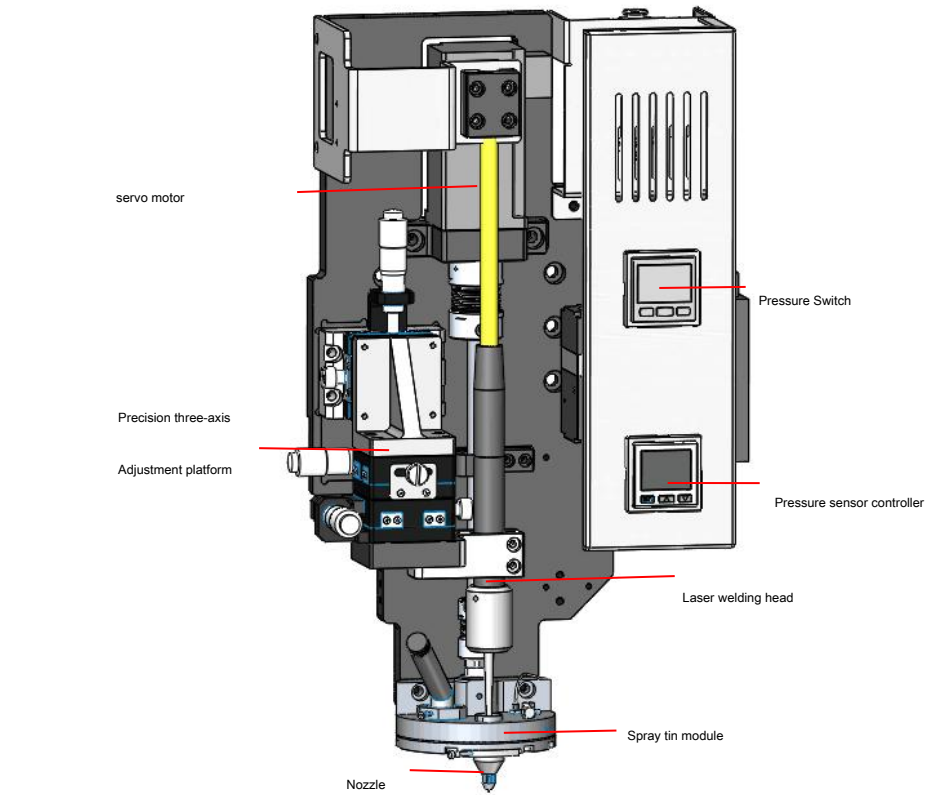
2.3.2 Motion Module



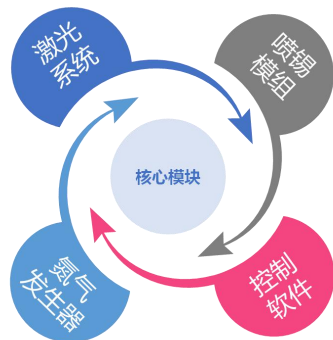
- Double-station feeding: the left-side product moves to the optical inspection, and then moves to the welding position for welding. At the same time right station

The product moves to the optical alignment, the left welding and the right optical alignment can be performed simultaneously.

2.3.3 Spray tin module

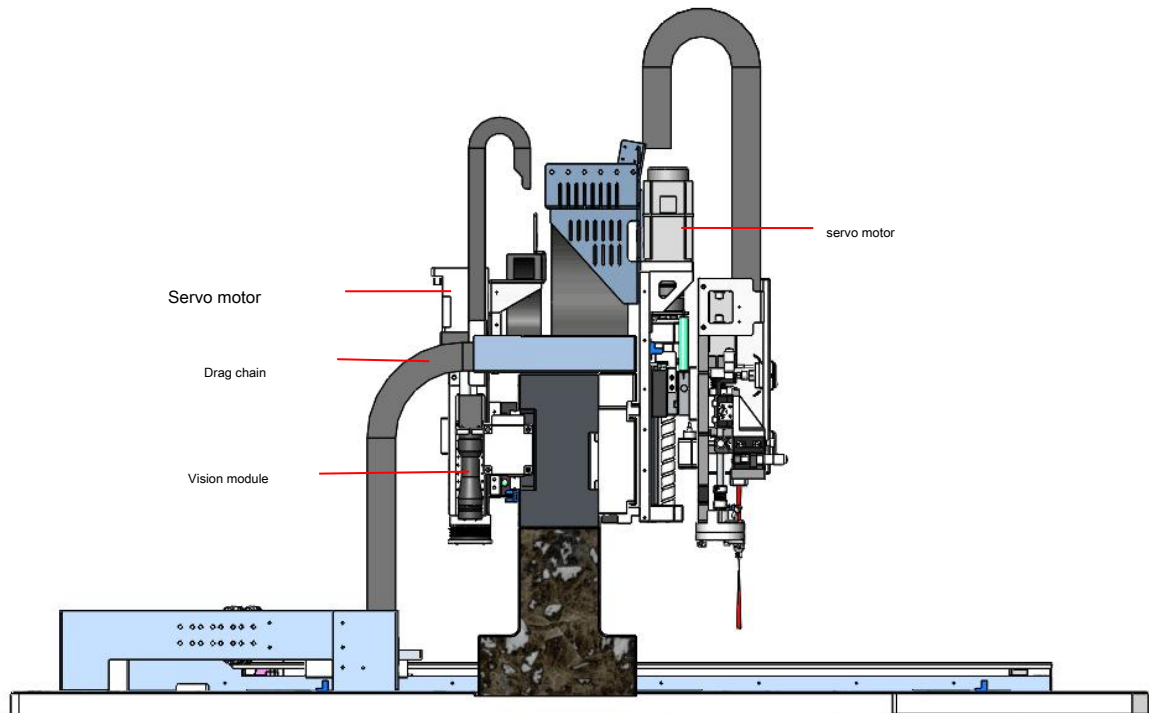


- Laser tinning module: system closed loop control
- System, no ball leakage, multiple balls possible

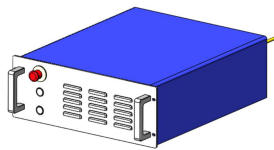


- Heating source-high quality laser
- Solder ball separation and pressure control
- Inert gas protection against oxidation
- Optical positioning, height measurement, energy control

2.3.4 Visual positioning module



2.3.5 Laser generator

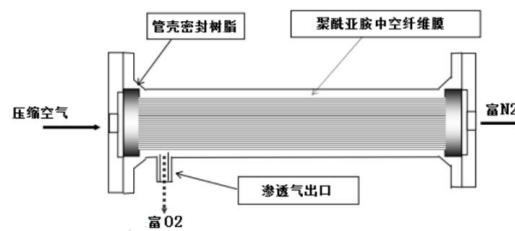


- Output through optical fiber, wavelength 1064nm

2.3.6 Nitrogen generator

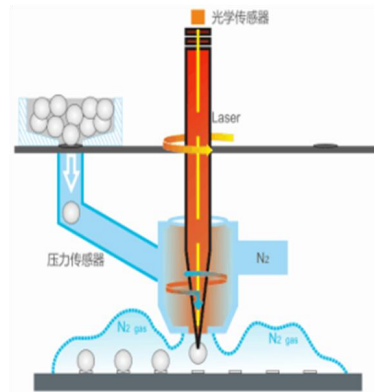


- Packed in a cylindrical pressure vessel by polyimide hollow fiber membrane bundles, used at both ends
The resin is sealed and fixed. Compressed air enters from the hollow fiber membrane yarn, O₂
Selectively permeate hollow fiber membranes; enriched oxygen is discharged from the permeation port of the membrane group, enriched
Nitrogen is collected at the outlet of the hollow fiber membrane.

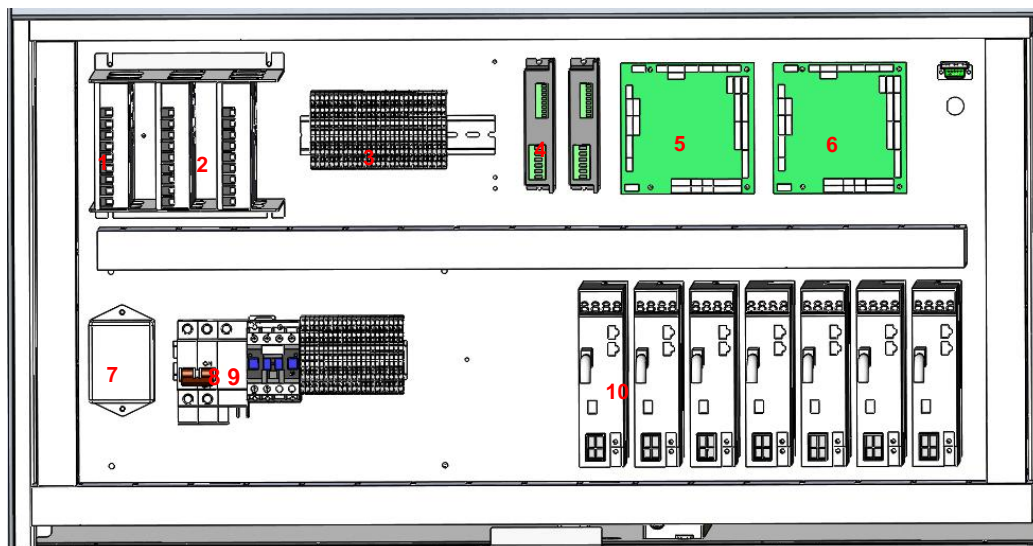


2.4 Working principle

The laser is installed above the nozzle of the solder ball through optical fiber transmission, and the solder ball reaches the nozzle through the separation module. At the same time, the high-precision air pressure The sensor detects the pressure change of the inert gas in the module. Control the laser to turn on through signal transmission to the motherboard, let the laser melt the tin ball. At this time, the high-pressure inert gas can ensure that there is enough pressure to drop the molten tin ball to form a solder joint, and it can also ensure the molten solder Tin will not be oxidized.



2.5 Electric cabinet distribution description



The electrical cabinet components are distributed as follows:

1. 24V DC power supply 2. 48V DC power supply 9075A motherboard

3. Terminal 4. stepper motor driver 5. laser station 7. filter

6. Height measuring station 9075A motherboard

8. Leakage protector 9. AC contactor 10. Servo

Servicing motor driver

2.6 Function description of operation buttons



Panel buttons	Function description
【TEST RUN】 key	Test point spray tin test command button.
【N2】 key	Nitrogen on/off command button.
【L PREPARE】 key	The left Y axis prepares the command button.
【STOP】 key	Stop running command button.
【START】 key	Start/pause running command button.
【R PREPARE】 key	The right Y axis prepares the command button.
【EMERGENCY STOP】 key	When an emergency occurs, press it to stop the operation of all equipment and cut off the power supply of the motor.
【POWER】 key	Machine power-on command button
【LASER POWER】 key	Laser turn on or turn off the laser command button.
【LASER PREPARE】 key 【RESET】	Laser ready command button.
key	All electrical equipment of the machine is automatically reset, and the light is on to indicate that the "reset" is in place.

Chapter 3 Mainboard Input and Output Description

model:		Quick 9075A			
		port	Enable	Features	Remarks
9075 main board (laser station)	Expand EOUT8 Exhibition EOUT9 lose EOUT10	EOUT1			
		EOUT2	√	Camera light source	
		EOUT3			
		EOUT4			
		EOUT5			
		EOUT6			
		EOUT7			
		EOUT8			
		EOUT9	√	Laser preparation instructions	
		EOUT10	√	Reset indication	
		EOUT11	√	Test instructions	
		EOUT12	√	Nitrogen on indicator	
		EOUT13	√	Left ready instruction	
		EOUT14	√	Stop instruction	
		EOUT15	√	Start instructions	
		EOUT16	√	Right preparation instruction	
	Expand EIN1 exhibition EIN2 Enter	EIN1			
		EIN2	√	Cavity pressure detection	
		EIN3	√	Nitrogen pressure alarm	
		EIN4			
		EIN5			
		EIN6			
		EIN7	√	Cavity pressure alarm	
		EIN8			
		EIN9	√	Machine test	
		EIN10	√	Nitrogen on	
		EIN11	√	Left ready	
		EIN12	√	Raster signal	
		EIN13	√	Laser power on	
		EIN14	√	stop	
		EIN15	√	Start	
		EIN16	√	Right ready	
	Input MIN1		√	Reset	

		MIN2	√	Emergency stop	
		MIN3	√	safety door	
		MIN4	√	Laser preparation	
	Main MOUT3 lose Out MOUT4	MOUT1	√	1R-pulse	
		MOUT2	√	Nitrogen switch valve	
			√	Y axis switch	
		MOUT5	√	1R-direction	
	Pass 485 News				
		232	√	Communication with the main board of the height measurement station	
Station) 9075 motherboard (height measurement)	exhibition lose Enter Expand EIN15	EIN12	√	Raster signal	
			√	Photo complete	
	exhibition lose Enter Expand EOUT2	EOUT1	√	Photo trigger	
			√	light source	
	lose Enter Main MIN3	MIN2	√	Emergency stop	
			√	Safety grating	

Chapter 4 Connection and Operation Instructions

4.1 Device connection and description

1. After the equipment is transported to the destination, the level of the equipment must be adjusted. The level adjustment of the equipment is reasonable, which can reduce vibration and equipment operation

Smoother, less noise, longer service life. To adjust the level of the machine is to adjust the screw extension on the four column feet of the machine.

Output, so that the track of the entire equipment is horizontally docked.

2. Connect air source and power source.



note:

- Before connecting to the power supply, please make sure that the main power supply on the machine is disconnected.
- Before supplying air to the machine, the impurities in the air pipe introduced into the air source must be removed.

3. The processing software is used for the parameter setting of laser welding; before using the equipment, all parameters need to be adjusted first.

To run the processing program.

4. After all wiring connections are completed, connect the power cord.

5. The main power switch is in place, please turn off the power switch when not in use to avoid misoperation by others.



switch



note:

- Connect the power cord after all the cables have been connected.
- After the connection is completed, close the back cabinet door and keep the key to the cabinet door! There are circuits and wires inside the back cabinet door, please do not Open at will to avoid damage to parts or accidents!

4.2 Operating instructions

4.2.1 Safety check before operation

When the machine is newly installed or idle for a long time, before energizing, ventilating and operating the machine, the following safety checks must be done:

1. Check whether the power supply is rated voltage.
2. Check whether the equipment is grounded according to the standard.
3. Make sure that no related objects are left on the movable parts of the electrical cabinet and the machine.
4. Check whether the transmission parts are loose.

-
5. Check whether the moving part is fixed.
 6. Check whether the emergency switch is pressed.
 7. Check whether the main power switch is in the OFF state.
 8. Open the port test and check whether the functions of each port are normal.
 9. Check whether the wiring plugs and trachea are well connected.

4.2.2 Equipment debugging instructions

1. Install and connect equipment.
2. Check the circuit and movement mechanism to prevent collision.
3. After energizing and ventilating, calibrate the stroke of each movement axis and the camera.
4. Edit the teaching program and simulate the product welding process.

4.3 Operating instructions

1. Power on and ventilate first, release the emergency stop switch (turn the emergency stop switch clockwise until the knob pops up), turn on the power

Close, open the hand slide valve on the air source, and press the reset button to reset the machine.

2. Check whether the cylinder and sensor are normal.

Precautions:

1. Welding parameters must conform to welding process parameters.
2. The welding temperature must be stable.
3. The air pressure should be stable.
4. The safety door is closed.
5. During work, no other objects can be placed around the equipment.

4.3.1 Red light and nozzle alignment

1. User login (quick) and enter the password "1".

A user login interface with a light gray background. At the top left is a black icon of two people. Below it, the text '用户名' (Username) is followed by a dropdown menu showing 'quick'. Below that, the text '密码' (Password) is followed by a text input field and a small double-checkmark icon. At the bottom, there are two buttons: a gray button labeled '登录' (Login) and a pink button labeled '退出登录' (Logout).

2. On the camera interface, click "Camera Calibration" and select "Down Camera".

图像识别 相机标定 测高标定

下相机 当前坐标: 358.39, 423.29, 129.29

手动将喷嘴移动至下相机中 记录喷嘴位置

相机高度: 45.75 记录拍摄高度

创建识别文件后自动标定 自动标定 自动校准成功

喷嘴位置: 251.12, 0.00, 45.75 定位

相机中心坐标: 123.13, 21.21 定位

喷嘴相对相机: 0.03, 0.01

X: -120.40 Y: -6.78

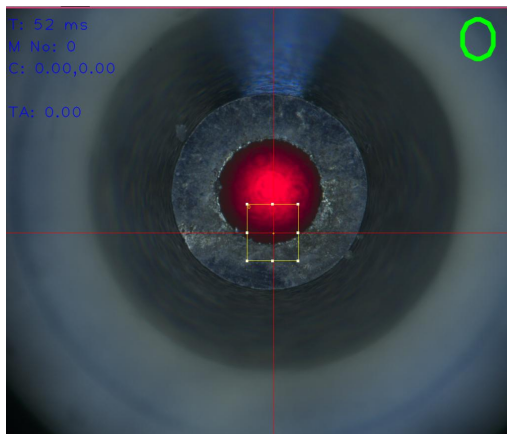
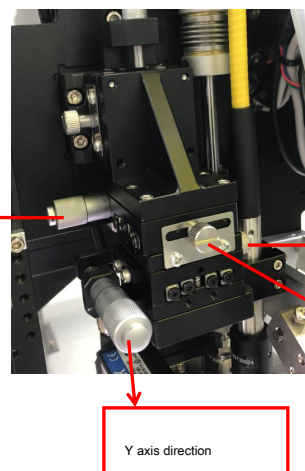
下相机标定结果: 0.03, 0.01

3. Use the manual adjustment key to move the nozzle to the top of the lower camera. Manually adjust the three-axis precision sliding table to move the red light to the nozzle

In the center, lock the three-axis precision sliding table to complete the alignment of the red light and the nozzle.



(Manual debugging key)

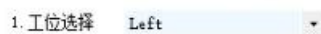


(Concentric renderings)

4.3.2 Duplex station calibration

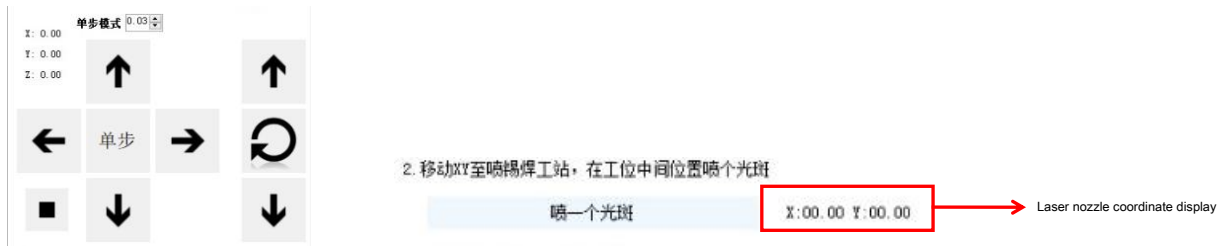
1. Both left and right double stations need to be calibrated, here is the description of the left station calibration. First, fix the 3M camera on the left

fixture pallet, and select Left in the dual-station calibration interface.



2. Use the manual adjustment key to move XY to the laser welding station, move the nozzle to 1mm above the 3M paper, and click "Spray a

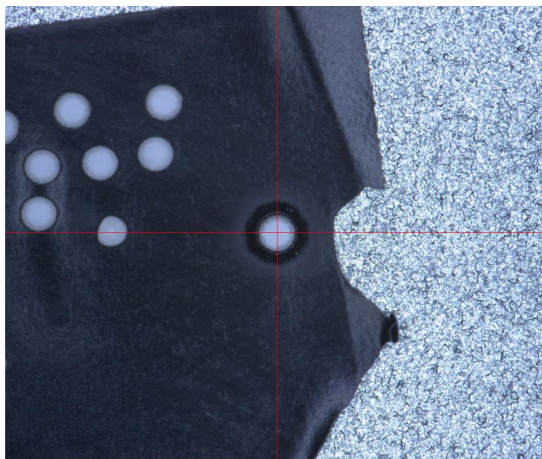
Spot", the system will record and display the XY coordinates of the laser nozzle at this time.



3. Move the left Y axis and the camera to make the light spot to the center of the camera, click "confirm that the camera has reached the center of

the light spot", the system will record and display the XY coordinates of the upper camera.

3. 移动当前Y和相机X至相机中心



(The spot is at the center of the upper camera)

4. At this time, the system will automatically calculate the relative position of the nozzle and the upper camera according to the written data and display it in the calibration result.

Click "Save Duplex Calibration Data" to save the above settings.



5. Point verification, click "Single Point Welding", and select left station welding. Spray a point on the 3M photo paper, and the Y-axis will automatically

move to the flux spray position, and observe whether the light spot is at the center of the camera. If the light spot is at the center of the camera, it means that the above left station is calibrated accurately

Unmistakable. If there is a deviation, re-calibrate or manually modify the relative position until the light spot is displayed at the center of the camera.

6. The calibration method of the right station is the same as above.

4.3.3 Laser height measurement calibration

The height measurement calibration must be established on the premise that the calibration of the nozzle and the camera is completed.

1. On the camera interface, click "Altitude Calibration", move the camera to the top of the calibration block and the calibration block is clearly in the center of the camera cross

Visible, click "record shooting height".

图像识别 相机标定 测高标定

相机中心移动到标定孔

相机高度: 45.75

记录拍摄高度

测高中心移动到标定孔

记录测高位置

测高相对相机XY: -62.50 , 2.98

定位

测高相对相机Z: 0.00

自动寻找测高位 34.800

X: 0.00 Y: 0.00

修改相对位置 保存

2. Move the laser height measurement sensor to the top of the round hole of the calibration block, move the Z axis down until the middle of the laser

height measurement sensor lights up in orange, and then click "record height measurement position".



图像识别 相机标定 测高标定

相机中心移动到标定孔

相机高度: 45.75

记录拍摄高度

测高中心移动到标定孔

记录测高位置

测高相对相机XY: -62.50 , 2.98

定位

测高相对相机Z: 0.00

自动寻找测高位 34.800

X: 0.00 Y: 0.00

修改相对位置 保存

The orange light needs to be displayed here

3. In the image recognition interface, select the name of the current job recognition on the camera calibration-height measurement hole, click "start recognition", right click the image

Select "Add RIO area" to insert the recognition box, set the parameters of the recognition file (refer to the above camera-laser spot setting), save

Set up.

图像识别

相机标定

测高标定

当前工作

识别名称: 上相机标定_测高孔

删除

开启识别

关闭相机

第一步: 基础参数

处理类型: MixTogether

曝光: 5000

处理通道: Gray

Erode

0

增益: 100

第二步: Blob参数

颜色范围:

面积>: 100000

面积<: 2000069

数目>=: 1

数目<=: 1

圆度>=: 0.100

圆度<=: 1.000

矩形度>=: 0.000

矩形度<=: 1.000

纤细度>=: 0.000

纤细度<=: 1000.000

☐ 带角度
 基准: X 0.00 , Y 0.00

☐ 设为基准
 当前: X 0.00 , Y 0.00

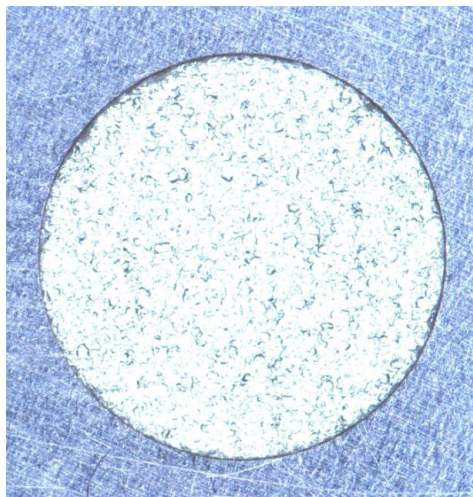
第三步: 识别名称

识别名称: 上相机标定_测高孔

☐ 启用模板

保存

新建



(Effect picture of height measuring hole)

4. Click "Locate" and "Automatically find height measurement" on the height measurement calibration interface. If the calibration is successful, it will display "Automatic calibration

After "work", "save", if the calibration fails, you need to re-make the identification file and calibrate again.

图像识别

相机标定

测高标定

相机中心移动到标定孔

相机高度: 45.75 记录拍摄高度

测高中心移动到标定孔 记录测高位置

测高相对相机XY: -62.50 , 2.98 定位

测高相对相机Z: 0.00

自动寻找测高位 34.800

X: 0.00 Y: 0.00 修改相对位置 保存

Note: The parameter setting interface must first enable the height measurement function and set the measurement range value.

4.3.4 Visual recognition template settings

The visual recognition template is a template set for welding recognition points, and is named "universal recognition template" here. Production Method

Same as "Camera calibration-laser spot".

图像识别

相机标定

测高标定

当前工作

识别名称: 通用识别模板 删除 开启识别 关闭相机

第一步: 基础参数

处理类型: SeparateTechnology 曝光: 2000

处理通道: Gray Erode 0 增益: 100

第二步: Blob参数

颜色范围: 

面积>: 1 面积<: 9999999

数目>: 1 数目<: 1

圆度>: 0.000 圆度<: 1.000

矩形度>: 0.000 矩形度<: 1.000

纤细度>: 0.000 纤细度<: 1000.000

☐ 带角度 基准: X 1,221.00 , Y 1,022.50

设为基准 当前: X 0.00 , Y 0.00

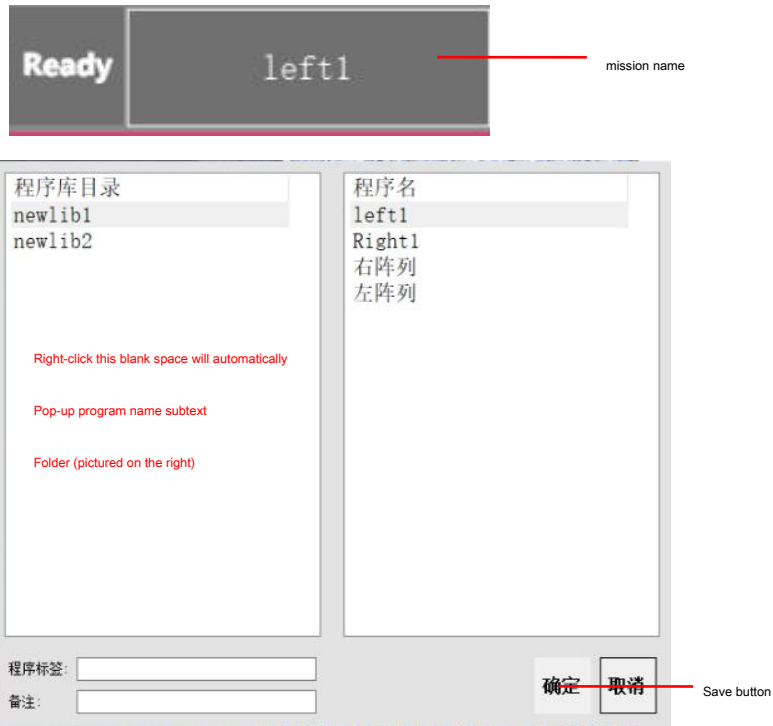
第三步: 识别名称

识别名称: 通用识别模板 ☐ 启用模板

保存 新建

4.3.5 New process

1. Create a new process folder that is the program library directory (right-click the task name in the title bar and enter the name)
2. Create a new process sub-file that is the program name
3. Save process files
4. This device is a double Y device and needs to save left and right programs.

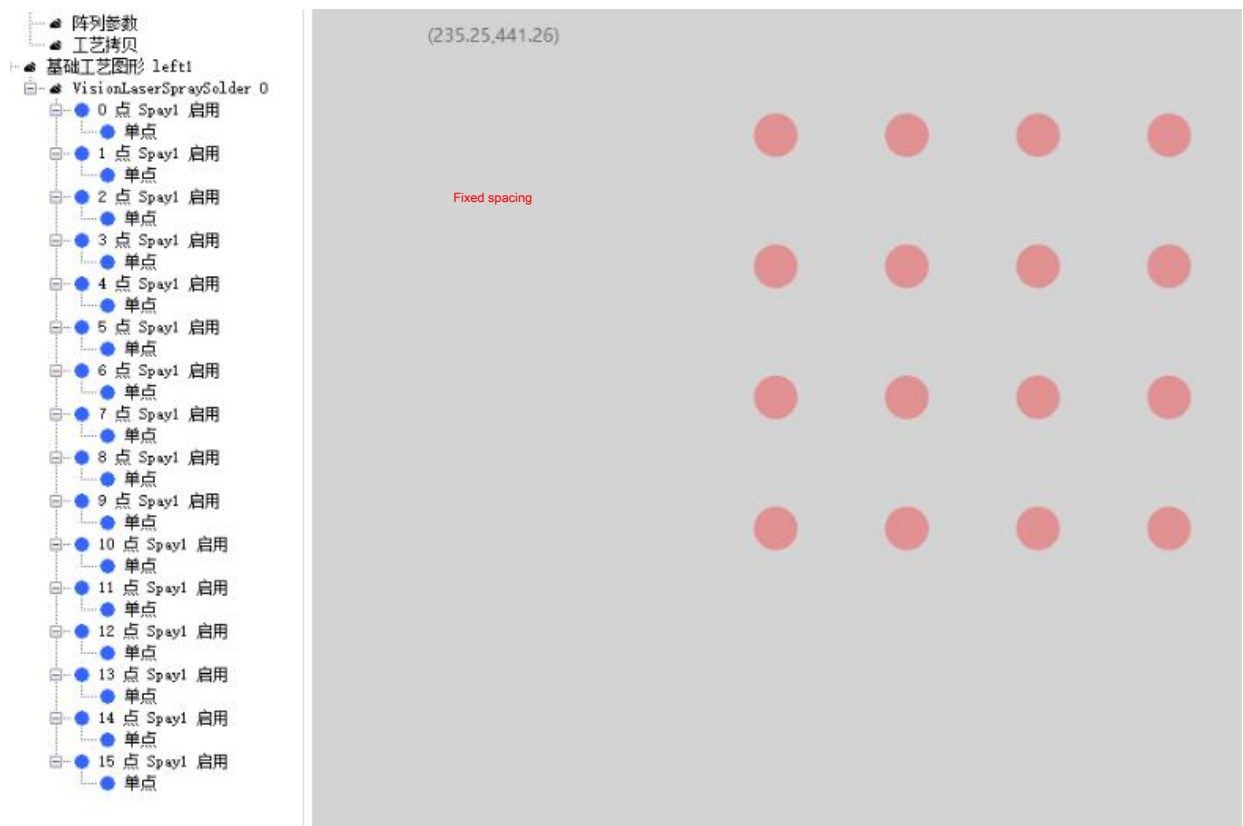


4.3.6 Editing process points

1. For products with a fixed pitch, the welding points can be set in an array, and for products with an unfixed pitch, the welding points need to be set in sequence.

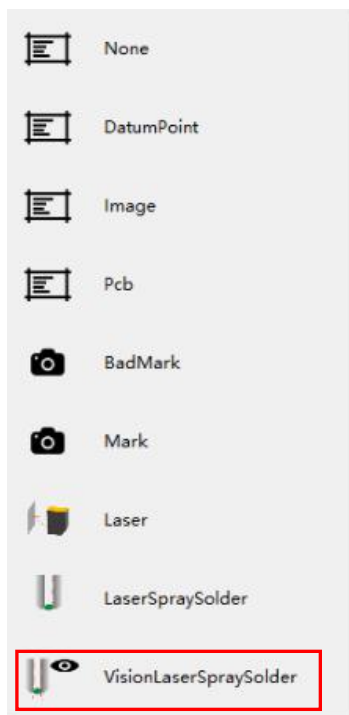
Contact bit.



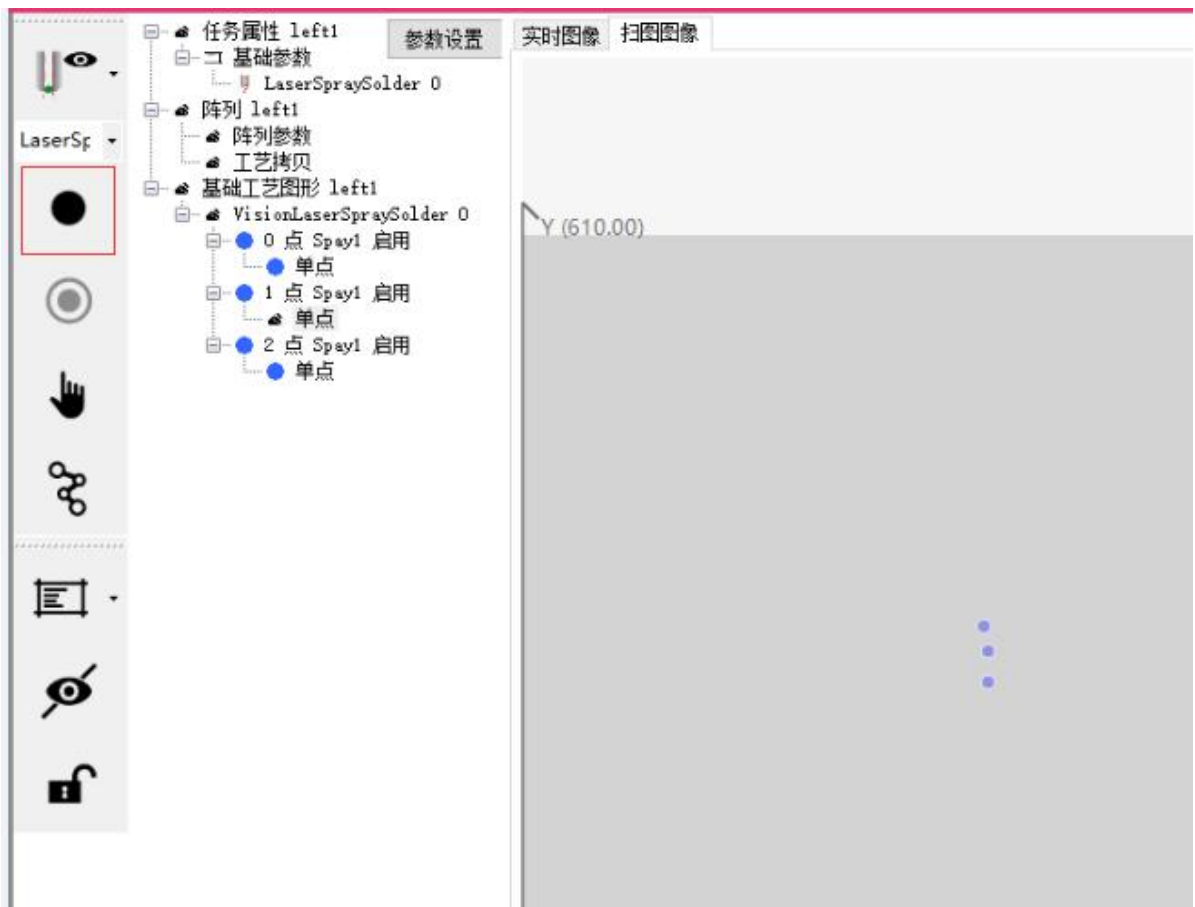


4.3.6.1 Product point setting of non-fixed spacing

1. Select the Vision Laser spray solder point in "Edit Layer", as shown in the figure below:

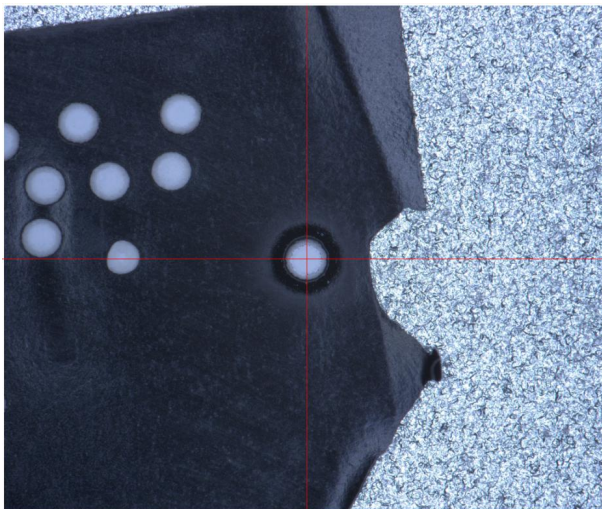


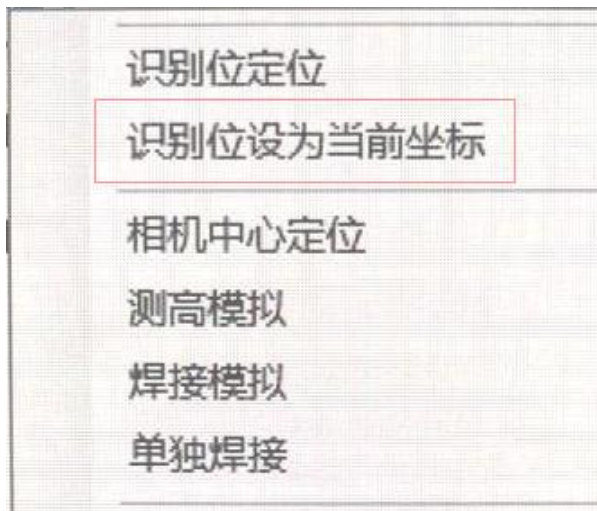
2. Click "Independent Point" and click the position to be welded in the image to obtain the welding point.



3. In the real-time image interface, move the camera to find the first point to be welded. Right-click on the single point and select "Set Identification Position

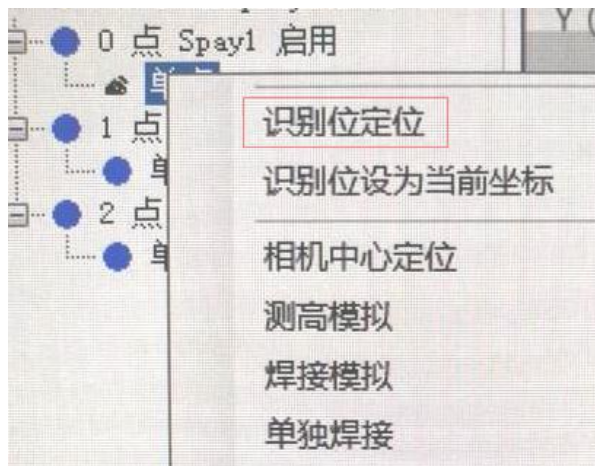
Current coordinates" to confirm the coordinates of the recognition position.





4. Move the camera to any point. Right-click the first single point and select "Recognition Position Positioning" to check whether the current position is the first

Welding recognition point.



5. Move the camera to find the second point to be welded. Right-click on the single point position of this point and select "Set the recognition position as current coordinate" to confirm

Recognize the second individual bit coordinate.

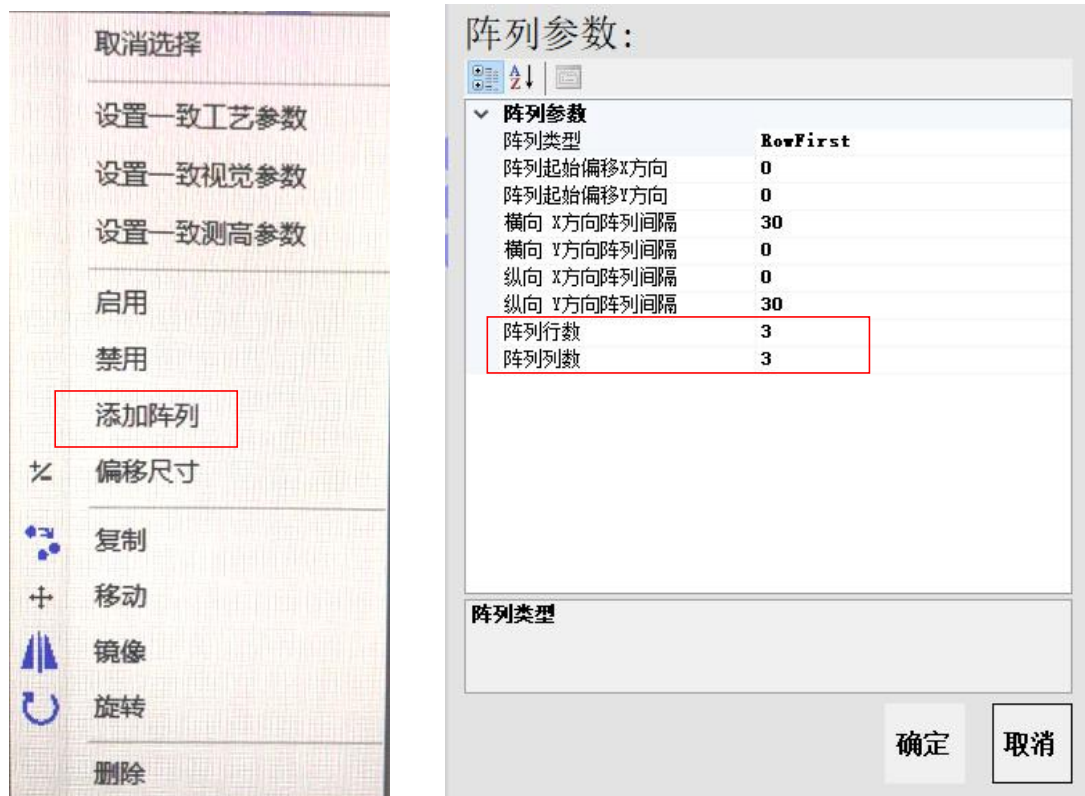
6. After successively setting the identification position coordinates, save the settings.

4.3.6.2 Fixed-pitch product point setting

1. For products with fixed spacing, only the coordinates of the first welding recognition point need to be found, and other welding recognition points are obtained sequentially through the array

Bit coordinates. Select the independent point in the image (the selected independent point is purple), right-click "Add Array", and set the array offset

Save the settings for the interval, the number of array rows and the number of array columns.



The editing method of solder paste point position is the same as above. Double-click the point to set the parameters.



工艺参数	
GLUE	
点胶工艺参数	
喷射平移速度	10
喷射个数	0
喷射高度	0
上抬高度	0
开阀时间	2
关阀时间	2
延迟出胶距离	0
提前关胶距离	0
XY空移速度	50
Z空移速度	50
POS_X	212.95
POS_Y	450.5
R	0
模式	Spay1
工艺类型	Glue
点类型	Single
点禁用	Off
点名称	
GLUE	
点胶工艺点位参数	
<div>确定</div> <div>取消</div>	

4.3.7 Parameter setting

Parameter setting includes unified parameter setting, single point parameter setting and process parameter setting.

Unified parameter settings : Left click the mouse to select all points. Right click the mouse to set consistent process parameters, consistent visual parameters,

Confirm after consistent height measurement parameters. The consistent vision parameter is only set for the vision recognition template.

工艺参数:	
激光焊接参数	
第一段激光工艺	
激光功率	0
出光时间	0
关光时间	0
第二段激光工艺	
激光功率	0
出光时间	0
关光时间	0
第三段激光工艺	
激光功率	0
出光时间	0
关光时间	0
第四段激光工艺	
激光功率	0
出光时间	0
关光时间	0
第五段激光工艺	
第一段激光工艺	
第一段激光工艺	
<div>确定</div> <div>取消</div>	

测高参数:

2

↓

▼ 杂项

独立激光测高	0n
测高类型	MeasureOffset
两次测高最大偏差	1
与参考测高最大偏差	1
独立测高偏移x	0
独立测高偏移y	0
独立激光测高参数	

独立激光测高

确定

取消

Single point parameter setting : Select an independent point and click "Parameter Setting" to set single point parameters.

六段工艺参数				焊接参数										
参数设置				视觉参数										
第一段：激光功率	<input type="text" value="0"/>	%	出光时间	<input type="text" value="0"/>	ms	延时时间	<input type="text" value="0"/>	ms	焊接高度	<input type="text" value="0"/>	mm	焊接上抬起轴高度	<input type="text" value="0"/>	mm
第二段：激光功率	<input type="text" value="0"/>	%	出光时间	<input type="text" value="0"/>	ms	延时时间	<input type="text" value="0"/>	ms	焊接偏移X	<input type="text" value="0"/>	mm	焊接偏移Y	<input type="text" value="0"/>	mm
第三段：激光功率	<input type="text" value="0"/>	%	出光时间	<input type="text" value="0"/>	ms	延时时间	<input type="text" value="0"/>	ms	启用球先准备	<input type="text" value="OFF"/>		只出光不出球	<input type="text" value="OFF"/>	
第四段：激光功率	<input type="text" value="0"/>	%	出光时间	<input type="text" value="0"/>	ms	延时时间	<input type="text" value="0"/>	ms						
第五段：激光功率	<input type="text" value="0"/>	%	出光时间	<input type="text" value="0"/>	ms	延时时间	<input type="text" value="0"/>	ms						
第六段：激光功率	<input type="text" value="0"/>	%	出光时间	<input type="text" value="0"/>	ms	延时时间	<input type="text" value="0"/>	ms						
偏移设置				定位识别文件										
第几段偏移XYZ	<input type="text" value="0"/>							<input type="text"/>						
Z轴上抬高度	<input type="text" value="0"/>	mm	X轴偏移	<input type="text" value="0"/>	mm	Y轴偏移	<input type="text" value="0"/>	mm						
测高参数				预热参数										
启用独立激光测高	<input type="text" value="OFF"/>							启用焊盘预热		<input type="text" value="OFF"/>				
测高偏移X	<input type="text" value="0"/>	mm	测高偏移Y	<input type="text" value="0"/>	mm			预热功率		<input type="text" value="0"/>	%	预热时间	<input type="text" value="0"/>	ms
								预热偏移X		<input type="text" value="0"/>	mm	预热偏移Y	<input type="text" value="0"/>	mm
								预热上抬Z		<input type="text" value="0"/>	mm			

确定

取消

Six-stage process parameters: According to the product welding process settings, the laser power parameters are generally set in two stages.

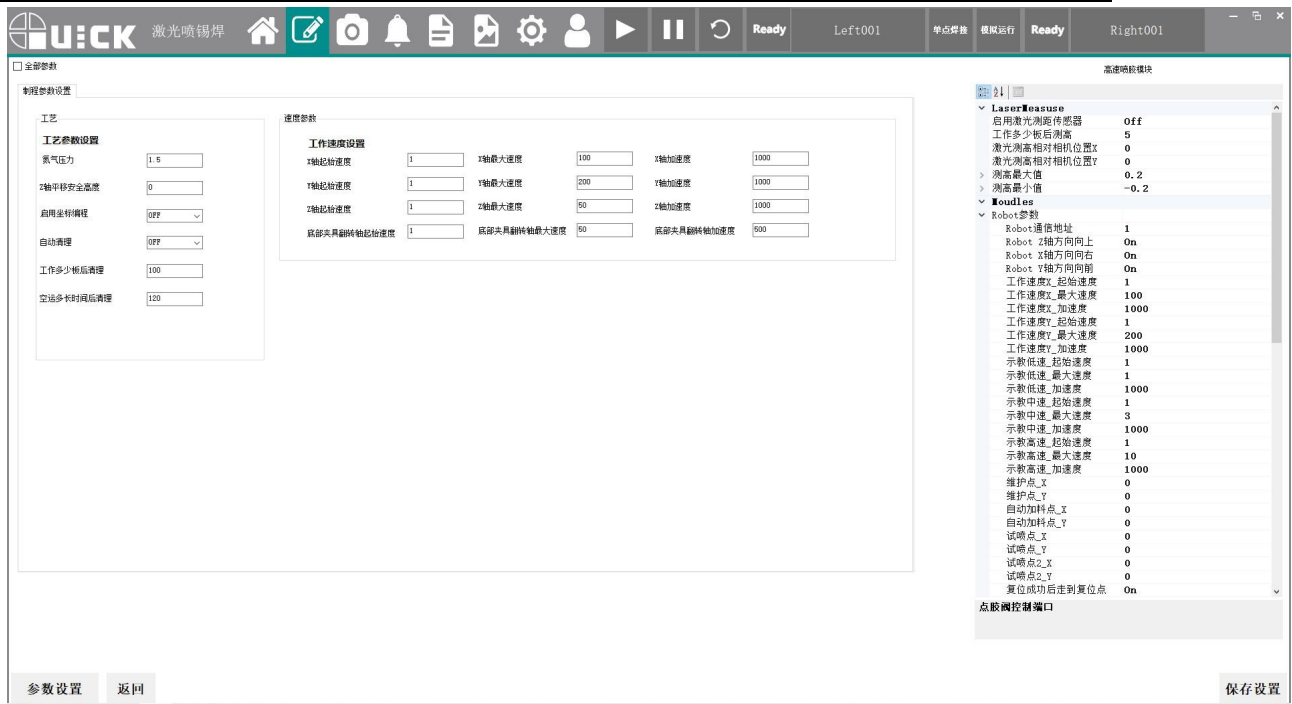
Altitude measurement parameters: set whether to enable independent altitude measurement, and the height measurement offset.

Welding parameters: welding parameter settings such as welding height, lifting height, welding offset, starting ball preparation, and only emitting light but not ball, etc.

Set.

Visual parameters: display the coordinates of the recognition point and the recognition positioning file.

Warm-up parameters: Not currently supported.



Click Parameter Settings to set the process parameters including process and speed related parameters

4.3.8 Equipment operation

Device reset, select left and right process. Place the left Y-axis product, press "Left Preparation", then press the "Start" button,


The left station product starts welding. Place the right Y-axis product, press "right prepare", the welding of the left Y-axis product is completed, and the

right Y-axis product starts welding.



4.4 Software instructions

4.4.1 Main interface

Double-click the desktop shortcut . The software will pop up the login interface, enter the user name (quick) and password (1) and then enter the main

The interface is as shown in the figure below.

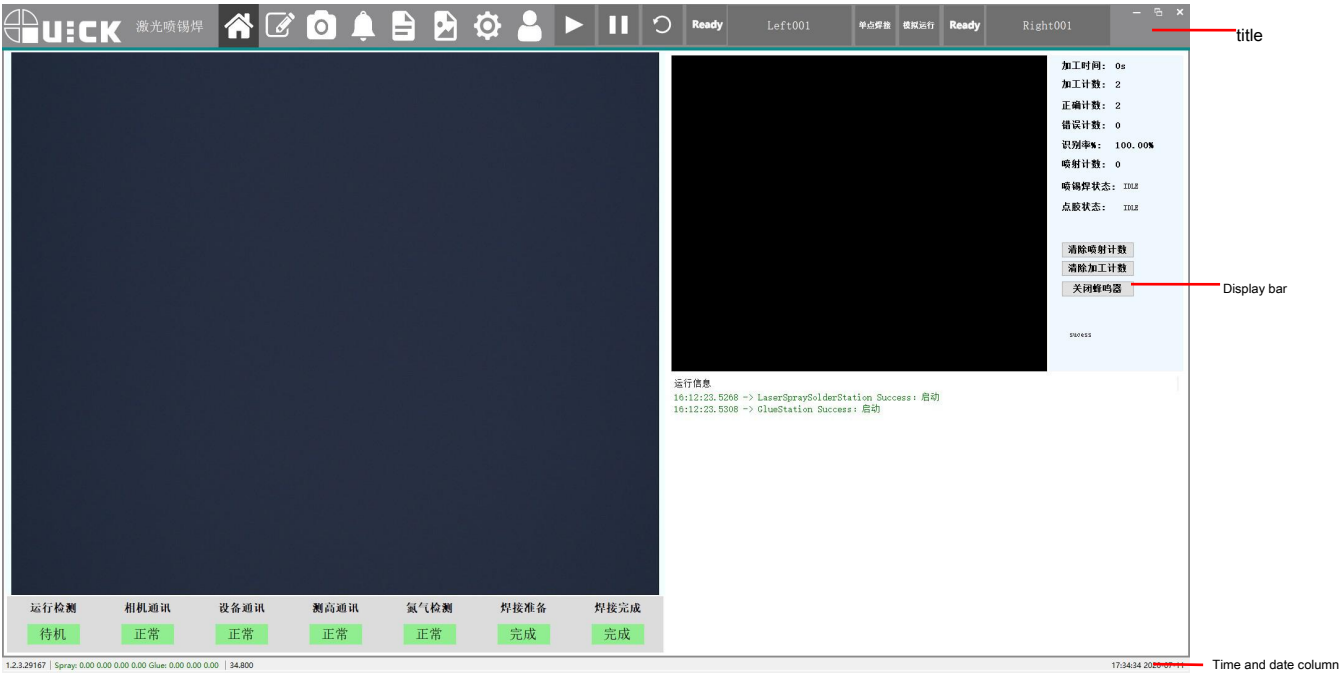


用户名

密码

登录















退出登录








The main interface can be divided into three parts: title bar, display bar and time and date bar according to functions.

1. Title bar

The content of the title bar is fixed and always displayed. The related content is shown in the figure below.

Icon	name	Icon	name
	Company LOGO		Pause button
	name of software		reset button
	Main interface		Left ready button
	Edit interface		Left process button
	Camera interface		Single point welding
	Alarm interface		Simulation run
	Data interface		Right ready button

	Picture interface		Right process button
	Set interface		Minimize the interface
	login interface		Interface adaptive
	Start button		Interface closed

2. Display bar

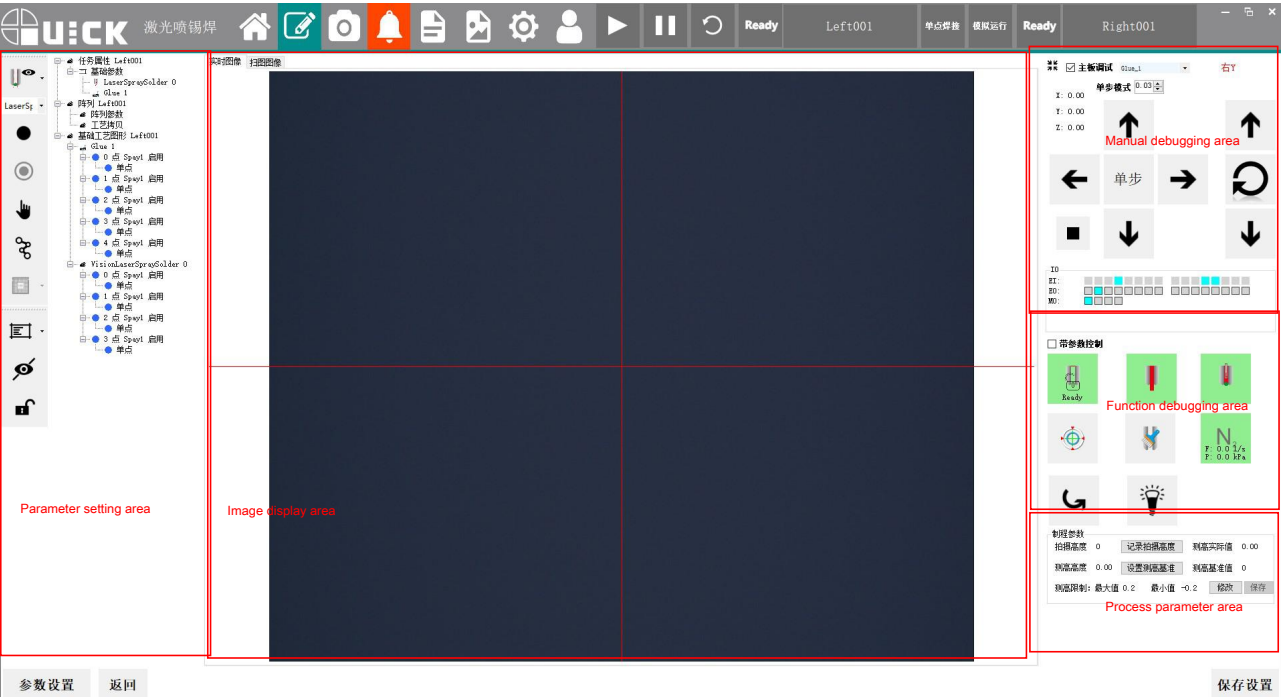
Real-time images, equipment status, processing information and other related information are displayed in real time.

Real-time image display, can switch between visual recognition real-time image and welding monitoring	Display equipment processing count, pass rate related information and corresponding buttons
Control real-time images.	Operation: count clear, buzzer shield.
The status of each module is displayed in real time. Normal status indicator is green, wait	Real-time display of equipment operating status information (including visual recognition, height measurement
Wait for the status indicator to be yellow and the alarm status indicator to be red.	Information, welding information, etc.).

3. Time and date column

The software version number and the current time and date are displayed in real time.

4.4.2 Edit interface











The editing interface is mainly composed of five parts: parameter setting area, image display area, manual debugging area, function debugging area, and process parameter area.

1) Parameter setting area: identifying points and setting of related parameters such as vision, height measurement and welding. For specific operations, refer

to section 4.4. This section only describes the functions.

image	Features	image	Features
-------	----------	-------	----------

	Laser preparation		Cleaning the welding tip
	Light alone		Automatic calibration (not currently supported)
	Solder once (out of the ball and out of light)		Select R axis individually
	Turn on nitrogen		flashlight

5) Process parameter area: shooting height and height measurement parameter settings.

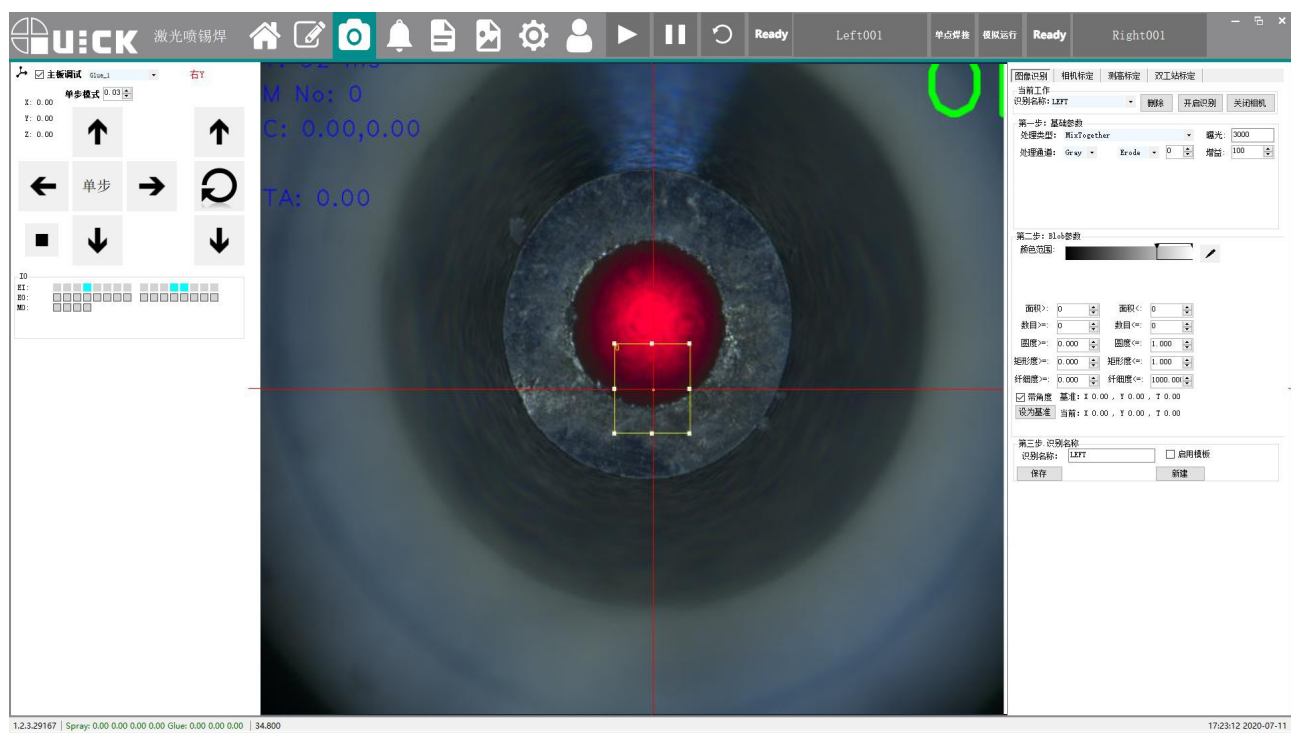
制程参数

拍摄高度 140.71 记录拍摄高度 测高实际值 34.80

测高高度 6.40 设置测高基准 测高基准值 28.4

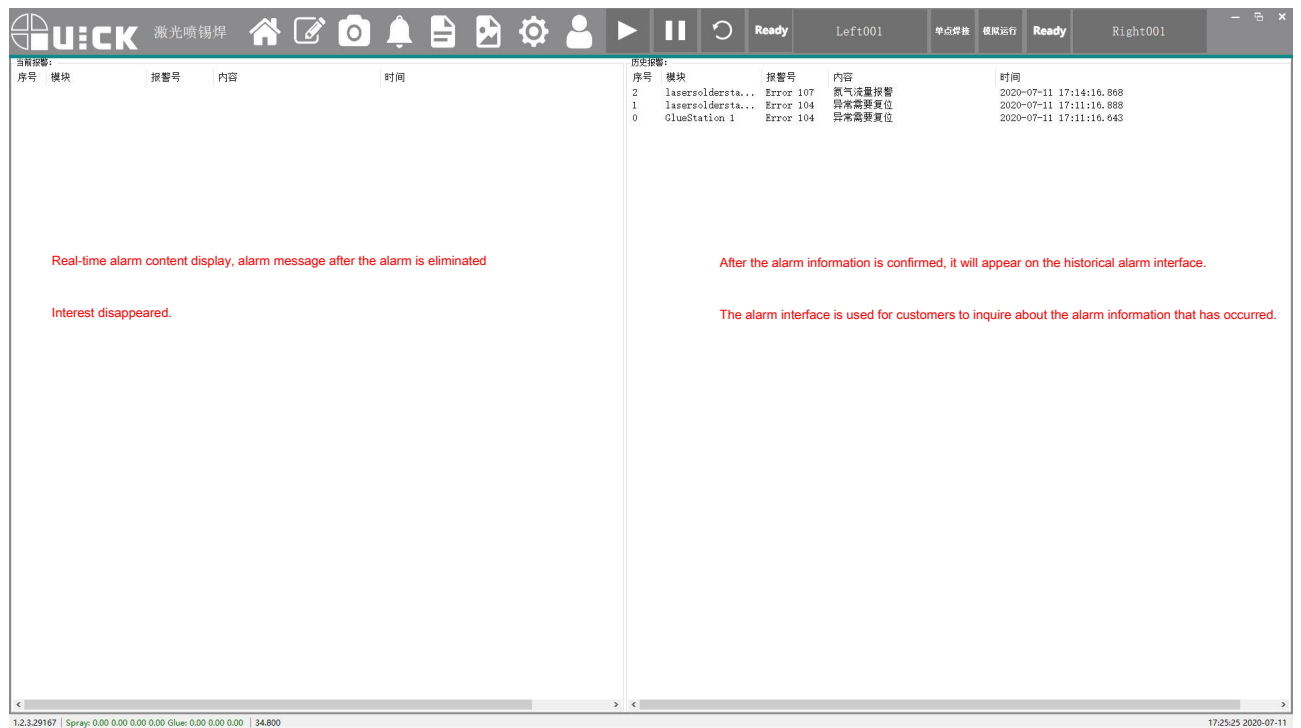
测高限制: 最大值 0.8 最小值 -0.8 修改 保存

4.4.3 Camera image interface

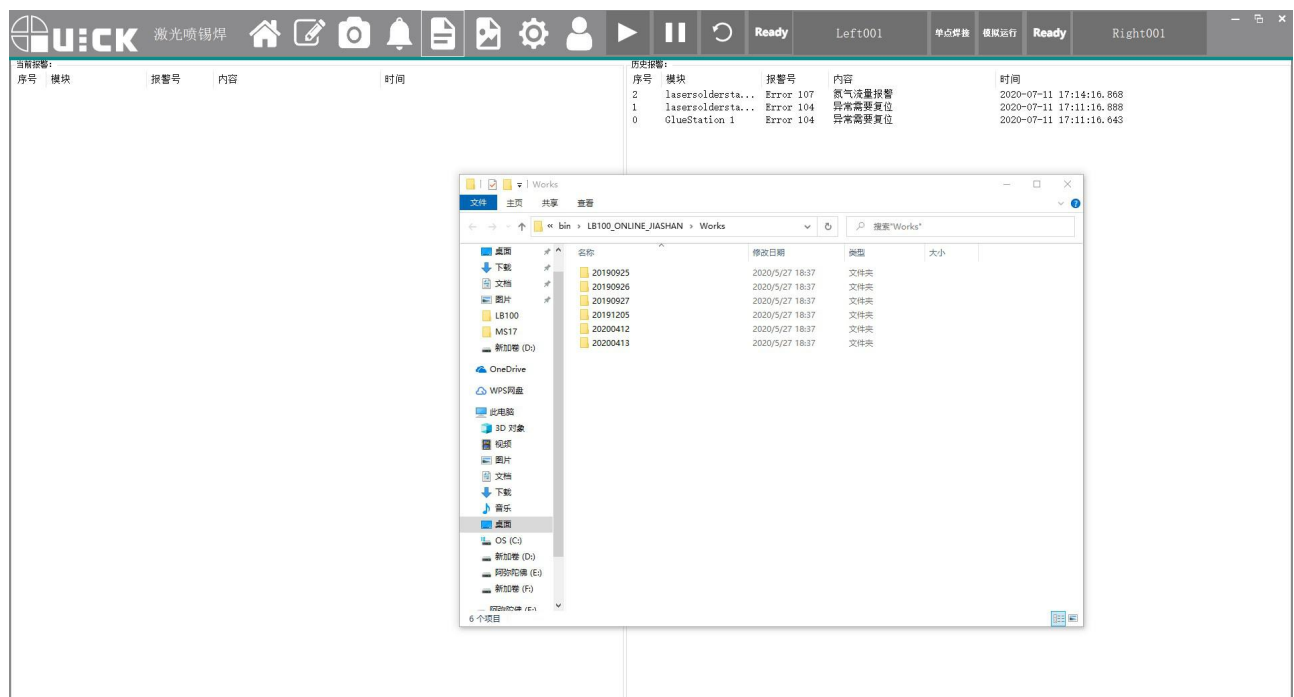


Compilation of camera image, laser, nozzle, height measurement calibration and identification files. See the introduction in section 4.3.1-4.3.3 for details.

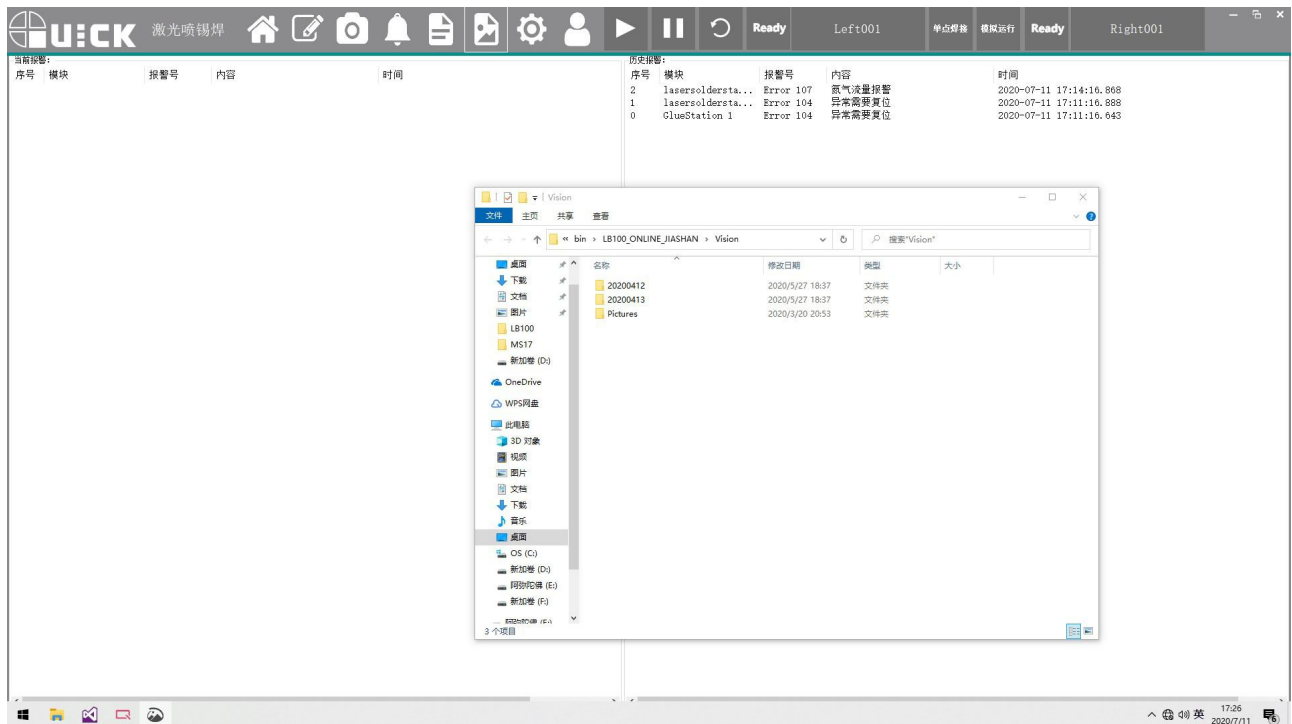
4.4.4 Alarm interface



4.4.5 Data save interface



4.4.6 Picture save path



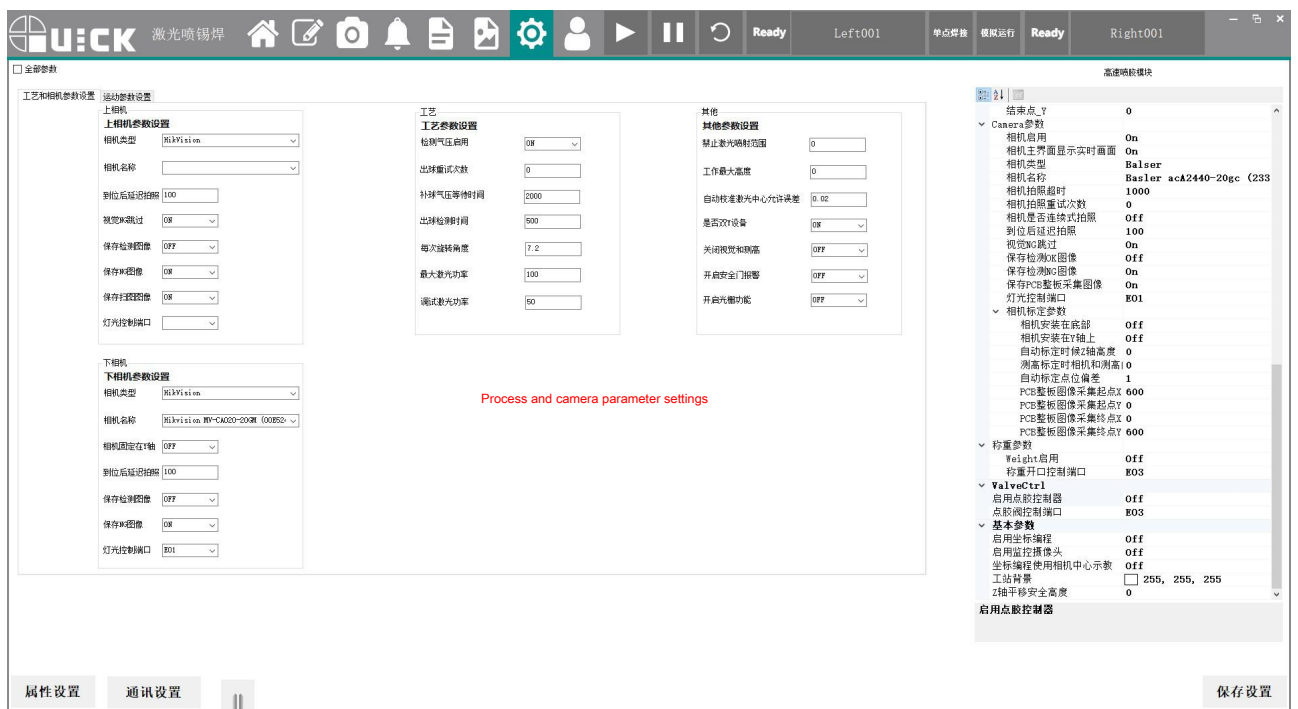
The picture save interface is used to query the saved pictures.



Default path:

4.4.7 Setting interface

The setting interface includes four interfaces: process and camera parameter setting, motion parameter setting, communication setting, and spray tin selection.





Chapter 5 Frequently Asked Questions

5.1 Faults and solutions

Serial number	Fault type	the reason	solution
1	The system cannot be reset	Please check if the emergency stop button is pressed	Release emergency stop and press reset
2	Inaccurate positioning during processing Indeed	The load is too heavy or the speed is too fast	If a certain axis deviation is particularly obvious, reduce The acceleration of this axis can alleviate this phenomenon Like, reduce the speed and acceleration before adding work.
3	The motor works abnormally	The motherboard/PLC hardware is faulty, and the motor is driven as a normal motor wiring circuit. Motor failure or motor failure.	In ensuring the safety of people and equipment Next, connect the wiring circuit of the faulty motor to the In order to make a trial and make a preliminary judgment Is the fault source in the motor, drive or Main board/PLC, then replace with new ones.
4	Turn on the fuse	If replacing the fuse still occurs The fault may be that the motherboard is broken.	Replace with new products
5	The motor is at the origin when reset Jitter	The photoelectric switch is damaged or the drive board has a problem.	Replace the photoelectric and still fail question.
6	X axis only goes in one direction movement	Generally, the X-axis drive board is broken to make.	Replace with new products
7	The machine keeps alarming	If the alarm still remains after troubleshooting It may be that the emergency stop switch is broken or the report The warning signal is not fed back.	Press emergency stop to see if the power will be cut off, see if it is Whether there is a fault.
8	Drive motor drive shaft broken crack	Due to long-term forced operation, drive The screws of the shaft and the base are loose, resulting in Cracks, causing wear and tear.	Remove the drive shaft and weld, tighten and loosen Of screws.
9	Moving parts are stuck	The proximity sensor screws are loose, causing The offset of the proximity sensor position.	Calibrate proximity sensor
10	Machine accuracy is reduced	1. The guide rail is loose 2. X-axis and Y-axis are not perpendicular.	1. Readjust the straightness of the guide rail to be vertical Degree and levelness. 2. Adjust the link bolts of the beam and the machine.
11	There is a foreign body in the screw	1. Sundries seep into the bearing or damage. 1. Clean or replace the bearing. 2. Lack of lubricating oil.	2. Add lubricating oil.

Serial number	Fault type	the reason	solution
12	The screw swings when it is running. There are periodic scratches.	1. The screw rod is bent due to misoperation 2. The screw rod and the motor shaft are not concentric.	1. Replace the screw 2. Readjust or replace
13	Pressure gauge needle jumps when working Move, and then set the pressure value Swing back and forth nearby.	The valve sealing surface is moisture or oxidized 物Attachment.	Disassemble the valve to remove the attached moisture and oxygen Chemical removal
14	Sliding block movement lag, guide Rail fever is serious and out Current wear	The gap between the guide rail and the slider is too small.	1. Adjust the gap between the guide rail and the slider 2. When wear and puncture, you need to remove the guide rail, Slider, repair the puncture parts damaged by scratching.

5.2 Daily inspection and maintenance

Safety instructions for daily inspection and maintenance:



Risk of electric shock

Be sure to open the door of the control cabinet after power off.

Cut off the power supply for 5 minutes before replacing the servo unit (including the rectifier) and the control power unit. During this period,

Please do not touch the terminal!



Risk of electric shock and injury

After the repair, please do not forget the tools in the electric control cabinet, and confirm whether the door of the electric control cabinet is closed.

During maintenance, paste "No power on" and "No power on" on the main power control cabinet and related control boxes.

Wait for the warning sign to prevent non-related personnel from closing the switch.

Inspection cycle of each item of the robot:

Check when the power is off						
Check item	Check location	Daily 1 month	3 months 6 months 12 months inspection	an examination	an examination	an examination
Confirm the presence of screws/bolts Loose/sway	Guard plate, cover plate screw	√	√	√	√	√
	Robot setting bolt	√	√	√	√	√
	Lock bolts of each mechanical shaft	√	√	√	√	√
	Bolts/screws around the shaft					√
	Screws of motors, reducers, etc. Bolt/screw					√
Confirm whether there is a connection socket Loose.	External connection on the robot	√	√	√	√	√
	Socket					
	Robot cable unit		√	√	√	√
Visually check for presence	Robot appearance	√	√	√	√	√
External defects, remove the attached Dust and other dirt.	External cable		√	√	√	√

Check whether there is the position of each axis of the bending robot Or position shift, necessary Repair or properly place.		√	√	√	√	√
State of grease	Please refer to the following "Ball wire The maintenance of the bar Maintenance of the rail"				√	√

Check when power is ON (when power is on)						
Check item	Check location	Daily 1 month	3 months 6 months 12 months inspection	an examination	an examination	an examination
Confirmation of work area	Each axis					√
Shake the electrical and external cables (including machine Cable, confirm whether there is any disconnected (Robot cable unit)					√	√
In MOTOR ON state Press each machine by hand in the state Manipulator, confirm whether there is shaking move.	Each robotic arm					√
Human-computer interface function Is it normal, including each Buttons and button lights, Whether the emergency stop button can be used The drive is powered off. in case Check if there is a touch screen Whether the touch screen function is correct often.	Operation panel, emergency stop button, lighthouse. (touch screen)	√	√	√	√	√
Check if there is any abnormality Sound, abnormal vibration.	All	√	√	√	√	√

Maintenance cycle of robot equipment

Maintenance of equipment	Maintenance project	Maintenance time	Remarks
Electric control cabinet body	Check whether the door of the electric control cabinet is closed every day		
	Close		
	Check that the sealing part has No gaps and damage	per month	
The fan in the cabinet and the wind on the back fan	confirm the fan rotation	appropriate	When turning on the power

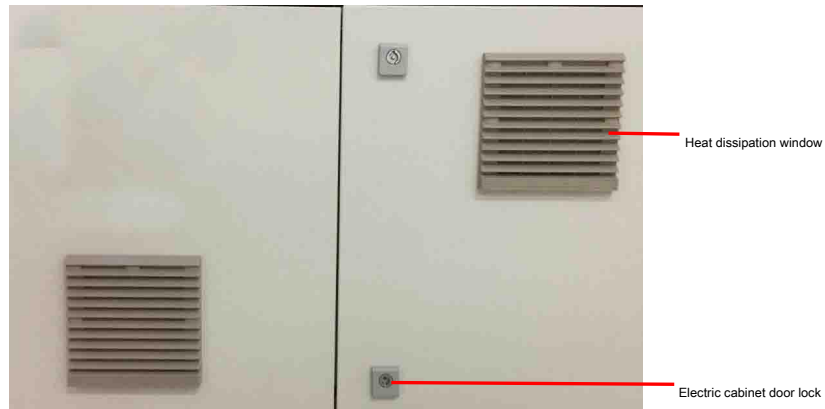
Emergency stop button	Action confirmation	appropriate	When the servo is turned on
Safety switch / safety door	Action confirmation	appropriate	In debug mode
Nozzle	Whether it is worn	Before processing	
Calibration module	functioning normally	Before processing	

5.2.1 Maintenance of the electric control cabinet

1. Check whether the electric control cabinet door is closed

Make sure that the control cabinet door is in a perfect closed state under any circumstances, even when the control cabinet is not working.

Avoid debris from entering the electric control cabinet.



2. Check for no gaps and damage

When opening the door, check whether the edge of the door is damaged.

Check whether there is abnormal dirt inside the control cabinet. If so, clean up as much as possible after finding out the cause.

When the control cabinet door is closed, check that there is no gap.

3. Check the heat dissipation of the control cabinet and avoid the location of the control cabinet close to the heat source.

4. Check the indicator light (next to the operation button), replace the faulty bulb, and replace the plastic lens if it is cracked or worn.

5. The filter cotton of the heat dissipation window will accumulate dust for a long time, which is not conducive to the ventilation and heat dissipation of the control cabinet, and needs to be replaced in time. The heat dissipation window of

Integrated injection molding process, the heat dissipation window needs to be removed and replaced when replacing.



5.2.2 Maintenance of cooling fan

If the cooling fan rotates abnormally, the temperature in the control cabinet will rise, and the electric control cabinet will malfunction, so check the cooling fan.

The fan in the control cabinet and the rear fan rotate when the power is turned on, so please check if the fan rotates and feel the exhaust

The air volume of the vent and the suction vent, confirm whether the rotation is normal.

5.2.3 Maintenance of emergency stop button

Description of emergency stop button:

Emergency stop is independent of the electrical control of all robots and can stop all robot movements.

Emergency stop is to stop the robot by cutting off the power of all servo motors, but the power of the brake on the servo motors is not disconnected.

The emergency stop button must be released and the robot restarted so that the robot can operate again.

Note: Emergency stop can only be used when it is really needed, it is indeed an emergency. Emergency stop cannot be used for normal program stop

Stop, turn off the robot, etc.

The obvious control part on the machine has an emergency stop button. Before the robot moves, please use the emergency stop button to confirm after the servo is powered on.

Can it be disconnected normally?

5.2.4 Confirmation of power supply voltage



Caution Electricity! When measuring with a multimeter, do not touch the metal part of the test lead.

1. Adjust the range of the multimeter to the AC voltage range, 500V range.
2. Make sure that the red envelope test lead is at the V/Ω terminal and the black test lead is at the COM terminal.
3. Use the red and black test pens of a multimeter to measure the live and neutral parts of the leakage protector to detect the voltage value (normal voltage value)

210V-230V).

5.2.5 Daily maintenance and maintenance of oil-water separator

1. Do not drop or subject it to strong impact during installation to avoid damage.
2. After confirming that it has been safely and reliably fixed to the welding robot with screws, it can be used.
3. It is recommended to use air pressure less than 0.7Mpa.
4. Frequently drain the accumulated water in the oil-water separator, remove it regularly and clean it with a test tube brush.

5.2.6 Maintenance method of linear guide

1. Replenish grease every about 100km. Even if you don't use it often, you should refill it once a month.
2. Do not add too much grease.
3. Do not apply grease directly to both sides of the slider without injecting it into the inner side of the slider.
4. Prevent the slider from entering foreign objects to affect the life.
5. Lubricating grease steps:

①

In the stopped state, inject 0.7cc of grease from the grease nipple

②

Let the slider move back and forth to make the inner steel ball roll completely

3

After repeating ① and ②, check whether there is any trace of grease adhesion at the end of the slide rail.

5.2.7 Ball screw maintenance method

1. Use the oil gun to inject several times, after each injection, let the screw shaft rotate half a circle (inject 0.7cc each time, if you need to inject 7.0cc,

This requires 10 injections). Note: Injecting the specified amount of grease at one time will make the amount of grease injected into the nut insufficient.

2. After injecting a certain amount of grease, push the lead screw slider and move it back and forth to distribute the grease evenly.

5.2.8 How to replace the protective lens

- 1) Precautions before installing the optical lens: wear clean clothes, clean your hands with soap or detergent, and wear light and clean

White gloves; it's strictly forbidden to touch the lens directly with your limbs; take the lens from the side of the lens when taking the lens, and do not directly touch the lens plating

On the surface of the film.

- 2) When assembling the lens, do not blow into the lens with your mouth; the lens should be placed steadily on a clean table with a few lenses underneath

Head professional paper. Take care when taking the lens to prevent bumps and falls, and do not apply any force on the coating surface of the lens; installation

The lens holder should be clean, clean the dust and dirt in the lens holder with clean compressed air, and gently put the lens into the lens holder

in.

- 3) When the lens is installed on the lens holder, do not use too much force to fix the lens, so as not to deform the lens and affect the beam quality.

- 4) Precautions when replacing the optical lens: Take care when removing the lens to prevent damage to the lens; before opening the package, do not

Put any pressure on the lens; when removing the protective lens, wear clean gloves and take it out from the side of the lens; when removing the lens package,

Avoid dust and other dirt attached to the lens; after taking out the lens, the lens should be placed on the special paper for optical lens; install the lens on the lens

When seated, do not use excessive force to avoid lens distortion.

5.2.9 How to clean the lens

Tools: cotton swabs for optical fiber, isopropanol, compressed air

Steps: Use compressed air to clean the dirt on the lens that needs to be removed; use a new special cotton swab moistened with isoacetone to transport it from the center of the lens along the circumference

Move, scrub the lens, replace with a new cotton swab after every week, repeat the above operation until the lens is clean; the cleaning will be completed

Observe the lens in a well-lit place. If the surface of the lens is in good condition, it means that the lens has been cleaned.

If there are spots, watermarks and other defects, you need to continue to clean the lens; place the cleaned lens on the lens holder.

Lens storage: 1) The storage environment temperature is 10 °C-30 °C, do not put the lens in the freezer, otherwise the lens will be easily damaged by

condensation and frost when taken out; storage temperature greater than 30 °C will affect the coating on the lens surface.

- 2) Store the lens in a box and place it in a vibration-free environment, otherwise it will easily cause the lens to deform.

5.2.10 Storage of solder balls

Note on the use of solder balls:

1. When using, please take out the necessary amount each time to avoid taking out too much at one time.

2. Please keep the used tin balls in containers separately.

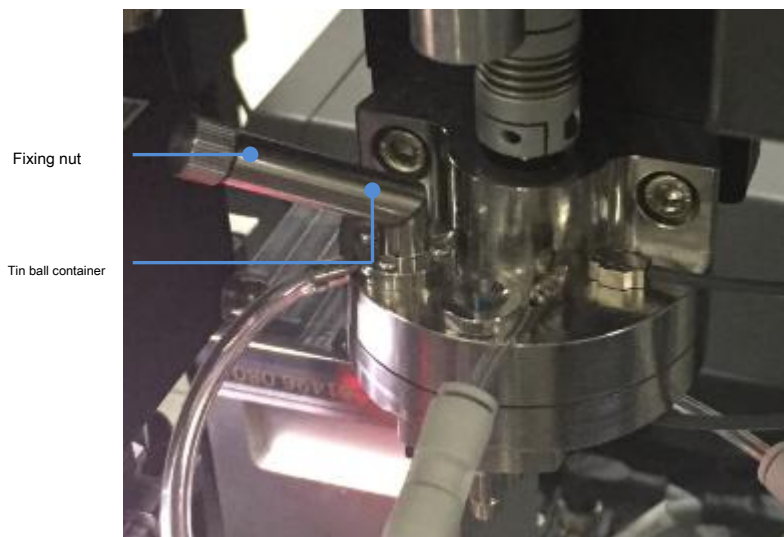
3. When the solder ball is used again, the reliability of use must be confirmed again before use.

4. When using the solder ball, do not shake it vigorously or shake it strongly.

Solder ball maintenance method:

1. The storage condition is $25\pm 10^{\circ}\text{C}$, the relative humidity is below 60%RH, and the storage period is 12 months. 2. The storage place must try to avoid the tin ball from being shaken, damp, and exposed to light. It may cause the quality of solder balls to decrease.
 3. It is recommended that the tin balls that are not used temporarily should be stored in the original tin ball bottle, and the inner and outer covers should be locked, and it is best to be vacuum packed in aluminum foil bags.
- Keep.
4. Please try not to open the lid if you haven't used the solder balls to avoid oxidation of the solder balls due to air entering.

5.2.11 Operation steps for adding solder balls



Tool: Funnel

Steps: 1. Before adding solder balls, you need to cut off the power of the equipment and turn on the light for 1 min before operation.

2. Unscrew the fixing nut, as shown in the figure above.
3. The funnel is fixed on the tin ball container.
4. Slowly add tin balls to the funnel. When the tin balls in the funnel are not flowing, the tin ball container is full.

5.2.12 Maintenance of plexiglass/acrylic board

After the plexiglass/acrylic comes into contact with chemicals, silver threads and cracks will appear. Do not use alcohol/ethanol and other low-carbon alcohol wipes

Wipe its surface; in addition, organic glass/acrylic can be dissolved in many chlorinated hydrocarbons: such as dichloroethane, trichloroethylene, chloroform, toluene,

Ethylene acetic acid, acetone and other solvents, so you should avoid contact with these reagents when wiping plexiglass/acrylic.
