Mingseal

GS-600

Cabinet Dispensing System Operation Manual

Changzhou Mingseal Robot Technology Corp.

www.mingseal.com

Copyright：

Current version：

V1.0

Operation instruction：

Before installing or operating the software, please read this manual in detail, and then follow the instructions in the manual. If abnormal operation occurs, please contact the company. We will serve you wholeheartedly.

1 Introduction

1.1 Summary

The GS series universal cabinet operating system software uses orbital transmission technology to achieve automatic loading and unloading and automatic transmission functions. Machine vision technology is used to automatically position the workpiece, then the workpiece gluing position is calculated according to the teaching trajectory, and the rubber coating is automatically completed.

The GS-600 cabinet dispensing system is tailor-made for the on-line production of semiconductor packaging processes and is suitable for under filling, cavity filling, wafer bonding, and sealing. This manual is mainly used as reference materials for production operators, process engineers, and service engineers. At the same time, beginners of Mingseal products can also use this information to have a basic understanding of this system. This chapter mainly introduces the GS-600 series cabinet dispensing system, describes in detail the system configuration, the list of standard and optional equipment, the location of the components, and explains the functions of the main components of the GS-600 dispensing system. This section covers the following:

■ System Description	■ Standard Equipment
■ Random manual	■ Optional equipment
■ Training	■ Glue valve
■ Related dispensing materials	■ System characteristics

1.2 System Description

The GS-600 can achieve high-precision, highly reproducible work results, suitable for mass production and processing. GS-600 is widely used in a variety of glue materials, production processes and substrates in semiconductor packaging and assembly processes. The GS-600 is easy to integrate with Mingseal's injection and dispensing valves, including the PJS-100.

The system uses Mingseal's GS series general-purpose cabinet operating system software, which is convenient for customers to upgrade according to their needs, the program can be applied to other workstations or re-import the online system.

Suggested applications include:

■ Underfill	■ seal cover
■ BGA solder joint-enhancement	■ Chip encapsulation material
■ Chip scale encapsulation	■ Non-flow Underfill
■ Cavity filling	■ Conductive glue
■ Wafer	■

1.3 Safety

The GS-600 series cabinet dispensing system will involve heat, air pressure, electrical and electronic, mechanical equipment and hazardous materials during operation. For all operators or workers close to the dispensing system, it is crucial to fully recognize hazards and dangers. Security protection and system operation are closely linked. Only the correct operation and maintenance, dispensing system is safe and reliable. For additional information, see section 2  ***Warning !***  ***Be Careful !***

Carefully read the Safety Data Sheet (MSDS) for all glue materials applied to the dispensing system. MSDS provides guidance on the use of this chemical material, disposal, safety protection information, etc

1.4 Random manual

The GS-600 series cabinet dispensing system is equipped with an installation and operation manual for the main system components and software. For specific system components or special configurations, you will receive an additional instruction manual. In general, these additional instruction manuals are prepared for some advanced troubleshooting problems or new configurations.
The following is an example of a list of manuals that may be shipped with the GS-600 Series Cabinet Dispensing System. The optional manual may or may not appear, depending on the configuration of your option.

■ GS Series Universal Cabinet System Operation Manual
■ Dispensing valve manual (specification depends on the valve）
■ Original Equipment Manufacturing Manual (Applicable）

1.5 Training

Mingseal will provide you with a series of offline or online high quality training courses covering dispensing, dispensing platforms, valves, software and practical cases. We are dedicated to providing you with detailed courses tailored to your actual needs in the laboratory. With the aid of a variety of laboratory facilities, we have the ability to provide you with a better learning experience. Students will have the opportunity to reassemble disassembled machines and solve equipment failures on site, and you will also learn a great deal of installation skills. In addition, the control and productivity of your equipment will not be affected by classroom teaching.

1.6 Related dispensing materials

The GS-600 cabinet dispensing system is suitable for the following materials. If the materials you use are not shown in the table below, please consult Mingseal.

■ Flip Chip & CSP Underfill Material
■ DAMS and filler sealing material
■ LED Sealing material

■ Sealing cover material
■ Reagent spray material
■ Silica gel

NOTE: It is the responsibility of the end user to consult the Material Safety Information Sheet (MSDS) for all chemical materials that may be used in dispensing systems. MSDS provides user guides, disposals, and security information for this chemical material.

1.7 GS-600 series standard configuration

System characteristics	GS-600	
Application	Edge Banding, Paste, UV Adhesion, Underfill, Seal, Gold Wire Spray, DAMS& Fill	
Transmission system		
Independent/Online	Online	Independent
Double track selection	Yes	Yes
Conveyor chain		
5.5mm flat belt O-belt	Optional	Optional
Vision & Light Sources		
Vision	Automatic PR/Digital Camera	Automatic PR/Digital Camera
Light Sources	Red/Blue	Red/Blue
Camera（30W、12W）	Optional	Optional
Lens (35mm lens, telecentric lens)	Optional	Optional
Dispensing needle positioning & maintenance		
Height sensor	Laser	Laser
Needle position corrector	Yes	Yes
Needle residue cleaning device	Yes	Yes
Clean cup	Yes	Yes

Vacuum, heater selection and control		
Three-stage heater, non-contact heating, vacuum	Optional	Optional
Others		
Low level warning	Yes	Yes
The program controls glue and valve pressure	Yes	Yes
Signal light	Yes	Yes
FFU	Yes	Yes
Power Manager (20A)	Yes	Yes
Precision electronic balance（0.1mg/0.01mg）	Optional	Optional

1.8 Standard equipment

1.8.1 Automatic pattern recognition (visual) system

The recognition system consists of a 30W/120W Basler digital camera, light source, and Advantech industrial computer. The companion software includes Visual Studio (VS) and the corresponding graphics recognition engine for Windows. The identification system mainly has the following three characteristics:

- The operator is able to set the dispensing position on the substrate. The operator can observe the vivid picture with the help of the camera's viewfinder and edit the dispensing operation program in the graphical user interface.
- During job production, the system can automatically apply the program statement edited by the user to the actual dispensing position on the substrate. Comparing and calibrating between the set dispensing position and the actual dispensing position on the substrate by the advanced pattern recognition system. Corner locators and bitmap mode locators allow better positioning.
- The vision system can be used for routine quick installations for visual-needle offset calibration and maintenance station position determination.

Basler digital camera can communicates directly with the host computer

through related software, without direct video capture. The camera can currently shoot at 120 frames per second.

1.8.2 Calibration process injection

With this feature, when you dispense with Mingseal's jet valve, the repeatability of the volume can be corrected for maintenance during the long-term production process, increasing the processing capacity (Cpk). Dispensing patterns can be edited with precisely determined weights. CpJ periodically samples the weight of each dot after each pattern is dispensed and then calculates the number of dots required for each pattern. With this information, CpJ optimizes line speed based on the maximum dispensing interval.

1.8.3 Computer system

The computer system includes an Advantech industrial computer with the display fixed on a bracket that can adjust the angle of rotation. Visual Studio (VS) software runs on Windows 7.

1.8.4 Conveyor belt

The conveyor belt transports the machined workpiece from the upstream processing system or the feeding mechanism to the dispensing table, and then to the downstream processing system or to the feeding mechanism. All conveyors are compatible with SMEMA standards and the width of the track can be adjusted. The conveyor system uses a multi-station mobile technology that allows all parts to move simultaneously. This minimizes the time required to move the conveyor belt, thereby increasing productivity. The system is available in single and dual track configurations.
Double-track conveyor belts ensure parallel movement of two channels during continuous production, reducing the time lost from non-dispensing operations. In some practical applications, dual track conveyors can increase production capacity by 60% to 80% compared to single track conveyors. Dual track conveyors can also be independently controlled, and individual tracks can be adjusted for different sizes to increase process flexibility.

1.8.5 Windows 7 version of Visual Studio (VS) software

Visual Studio (VS) software running under Windows 7 is Mingseal's patented software and software developed for the Windows 7 environment for dispensing applications.

1.8.6 Integrated height detector

The integrated height detector automatically adjusts the distance between the dispensing tip and the workpiece surface in the system, which helps to improve the positioning accuracy during dispensing.

1.8.7 Status signal lamp device

Status lights are real-time display devices for the operator. The signal status lights have different color lights or sound alarms to show the system status. For details, refer to 2.12 Status signal lamp device.

1.8.8 Low pressure warning

When the air pressure in the system is too low, a low pressure warning will send a low pressure warning sound signal. The low voltage limit can be set via Visual Studio (VS) software.See the Visual Studio (VS) User Guide for details or get additional information through online consultation.

1.8.9 Precision pneumatic and temperature control components

GS-600 is equipped with a proportional valve, glue digital pressure gauge, negative pressure digital display, temperature control instrument, precision pressure regulator, easy to use for high-precision and simple debugging. They are mainly used to adjust the pressure and heating temperature of the glue. For details, see 3.12 Digital Table Initialization.

1.8.10 The program controls the pressure of glue and related valves

The electric pressure control valve can control the valve pressure and glue pressure. These regulators are already integrated in the system platform. For example, all pressure values can be set using Visual Studio (VS) software (unlike manual valve adjustment). This can reduce the operator's possibility of misoperation when manually adjusting the pressure regulating valve. Programmable control of glue and associated valve pressure devices is standard on the GS-600.

1.8.11 Emergency shutdown（EMO）

The EMO button of the GS-600 Series Dispensing System allows the operator or technical service engineer to stop all dispensing operations immediately

during an emergency in the event of an emergency. This feature can effectively prevent personnel injury or damage to the dispensing system and work pieces.

1.8.12 Safety chain

The safety interlock is a built-in safety feature of the system. When the lid is opened, the servo motor of the dispensing system can be automatically shut down and all dispensing operations can be stopped. It can prevent people from being accidentally injured by the executing agency in motion.

1.8.13 Work table

The table consists of a needle-type vacuum cleaner cup, a white ceramic plate, a high-precision balance (optional), and a needle position corrector. The Visual Studio (VS) software setup process allows operators to quickly and securely debug the location of the service desk. Refer to the Visual Studio (VS) User's Guide or consult online help for details on the setup process.

1.8.14 System lighting

The dispensing system is equipped with a light source that illuminates the dispensing area when the system is started.

1.8.15 Ventilation system

The GS-600 Series Dispensing System is equipped with an FFU that filters excess heat, fumes, exhaust gases, and microparticles through the filter in the FFU and cleans the dispensing system environment.

1.9 Optional equipment

1.9.1 Substrate heater

A dedicated heating tool is used to ensure the fluidity of the glue on the substrate. GS-600 series can choose contact or non-contact air heating two ways. The heating tool is tailored to the customer's substrate and type of tool. GS-600 series can be configured with functions such as dispensing preheating, spot heating, dispensing and then heating. The temperature value can be set in the software program.

1.9.2 Preparation station / post-waiting station

The GS-600 Series preparation station/post-stand-by station does not have a heating function. If you want to increase productivity by requiring a heating station or a buffer station, you can select additional installations. In addition, the GS-600 Series reserve/post wait stations have a heating function. GS-600 series can be configured with functions such as dispensing preheating, spot heating, dispensing and then heating.
The GS-600 series can be configured with single or dual track conveyors. A dual track configuration (GS-600) can configure up to 6 heaters. This configuration is suitable for applications with long preheating cycles and long flow times.

1.9.3 Electronic balance scale

The GS-600 series can be equipped with electronic balance scales with different precisions, with an accuracy of 0.1 mg and 0.01 mg, respectively.

1.10 Glue Valve

GS-600Series Dispensing Systems can be configured with the following Mingseal Piezoelectric Jetting and Dispensing Valves：

■ PJS-100PiezoelectricJetting Valve
■ DC-600 Series needle pressure control valve

For more information, please refer to the dedicated glue valve manual

1.11 System characteristics

All the illustrations in this section shows the view and component characteristics of the dispensing system at different angles. The main parts, accessories and switches are numbered. The numbers in the illustrations and the numbers in the numbered labels are all explained. Detailed instructions for some components are highlighted in other sections of this manual.

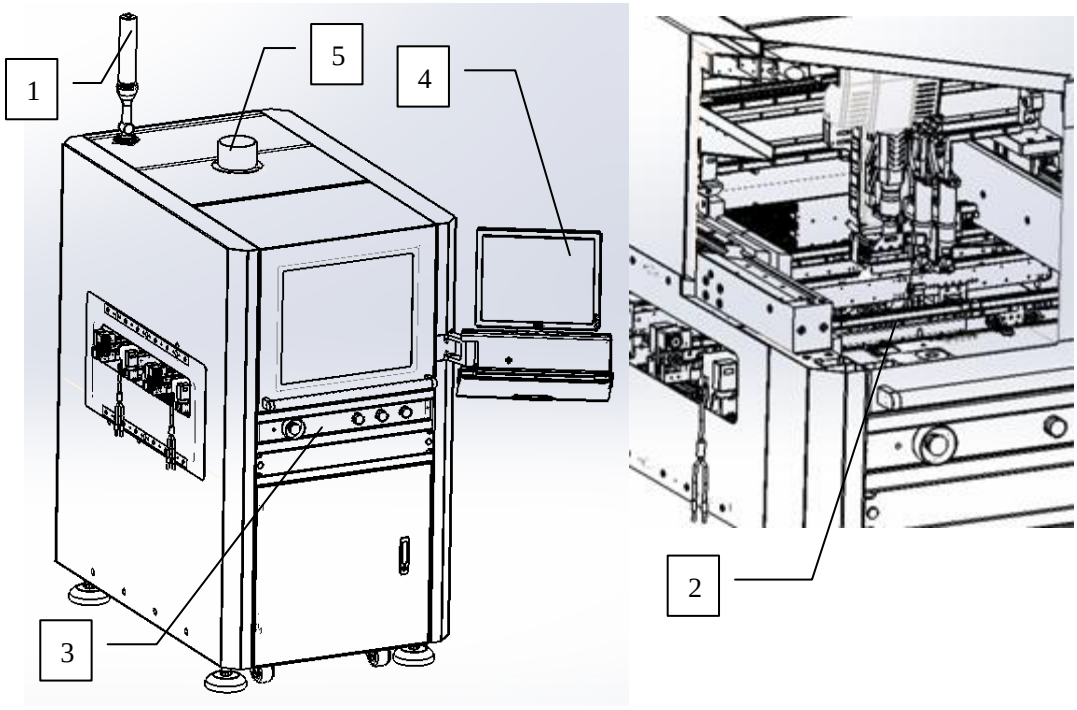


Fig. 1-1 GS-600

No.	Name	Description
1	Status signal lamp device	The status light is used to display the operating status of the system and can also warn the operator when unusual conditions occur.
2	Dispensing area	All dispensing operations occur within the dispensing area. See 1.11.1 Dispensing Area for details.
3	Control panel	Emergency stop button, grounding belt jack, 24V switch button, system lighting button, and temperature control meter are all located on the control panel. See section 1.11.3 Dispensing Area for details.
4	Computer	The dispensing system is equipped with an Advantech industrial computer that runs Visual Studio (VS) dispensing software under the Windows 7 operating system.
5	FFU	The ventilation exhaust system is connected to the plant's ventilation exhaust system to remove excess heat, smoke and exhaust fumes

1.11.1 Dispensing area

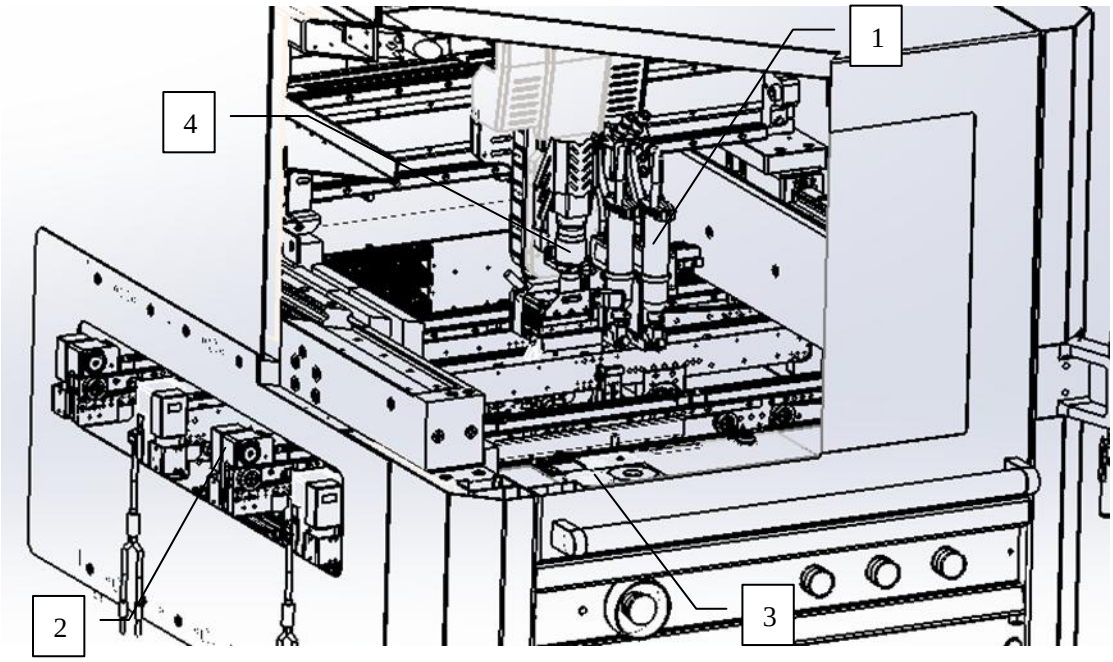


Fig. 1-2 GS-600 dispensing area

No.	Name	Description
1	Glue Valve	Glue Valve (as the picture showsPJS-100) The glue material conveyed from the pressure device is adjusted or controlled, for example, from a syringe. The equipment includes a dispensing valve and a Piezoelectric Jetting Valve.
2	Conveyor belt	The conveyor belt transports the machined workpiece from the upstream device to the dispensing operation area, and then delivers the workpiece to the downstream device after the dispensing operation. All conveyor belts are SMEMA compliant and can adjust the end rail width. The dual-track type ensures synchronized operation of both channels for continuous dispensing.
3	Work table	The table is composed of glue/blowing glue/suction glue/ceramic plate/needle position corrector
4	Vision identification system	The compact, high-resolution black-and-white camera and lens are the main components of the pattern recognition system. They are fixed on the dispensing

		head and the visual range encompasses all working surfaces.
5	Height sensor (not shown)	The height sensor measures the height of the substrate and sends the corresponding signal to the system calculator. The height information is used to position the dispensing needle to ensure a precise and appropriate distance between the needle and the surface of the workpiece。

1.11.2 Work table

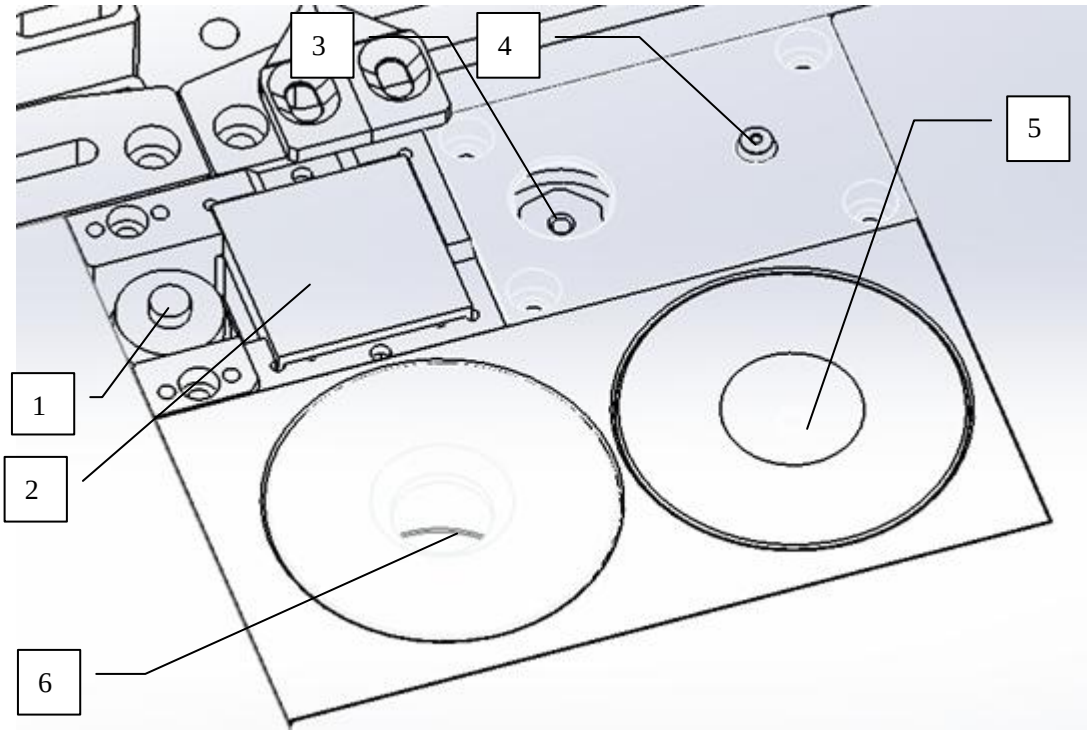


Fig. 1-3 Work Table

No.	Name	Description
1	Needle position corrector	Used to correct the height of the Z axis of a replacement dispensing needle or injection valve.
2	Dispensing	Dispensing tiles are capable of offsetting operations in

	tiles	conventional dispensing where glue spots can be sprayed on the ceramic tile.
3	Blowing glue module	Insufflations of the dispensing needle or the nozzle of the injection valve is cleaned by blowing air.
4	Suction glue module	It mainly consists of a small storage device and a disposable plastic cup and a vacuum generator. The air flow enters the cup through the clean feed port and removes excess glue from the needle or nozzle remaining on the valve.
5	Electronic balance	The electronic balance is used for flow calibration. The electronic balance is an optional configuration. The precision can be divided into 0.1mg/0.01mg.
6	Dispensing module	After the glue is sucked or blown, the injection valve or the dispensing valve pre-sends the glue. Collecting adhesive

1.11.3 Control panel

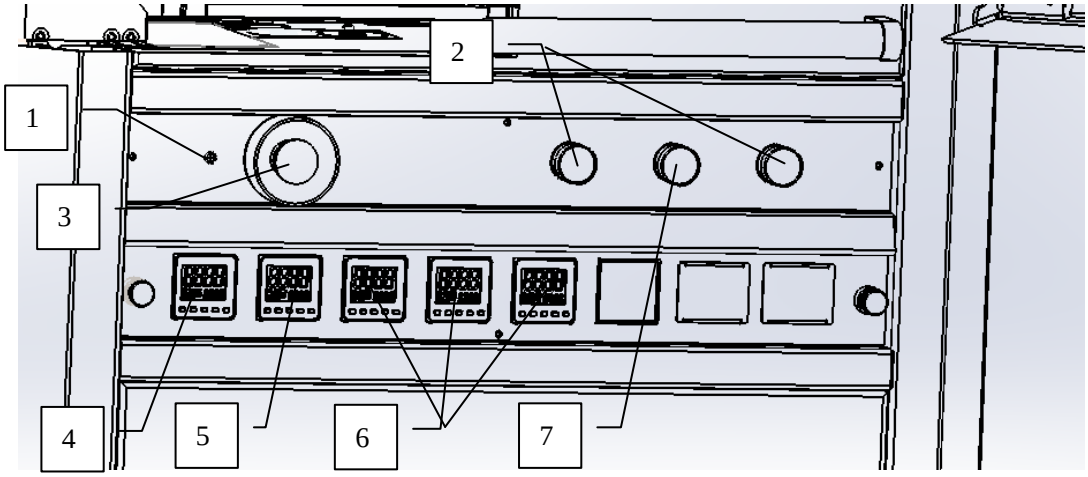


Fig. 1-4 Control panel

No.	Name	Description
1	Belt grounding socket	A grounding strap worn by the operator can be inserted into this hole to prevent the generation of static electricity (ESD) to avoid damaging the workpiece during dispensing operations.
2	Start/stop button	When the power of the dispensing system is turned on, the green start button will light up. The red stop button can turn off all dispensing actions and eliminate gas pressure. However, the computer's power remains on normally.
3	emergency stop button（EMO）	EMO button is part of the built-in safety feature and is located on the dispensing system's control panel. When the emergency braking function EMO is activated, the air pressure of the pneumatic system is released and the linear motor is braked. The power supply of all components except the computer and display will be cut off.
4	Valve nozzle temperature control table	Shows the temperature acting on the valve nozzle
5	Valve bucket temperature control gage	Shows the temperature of the valve bucket.。
6	Reserved products jig heating controller	Preheating station and waiting station’s heating process temperature controller
7	System lighting	Used to illuminate the dispensing area when the system being started

1.11.4 Front view

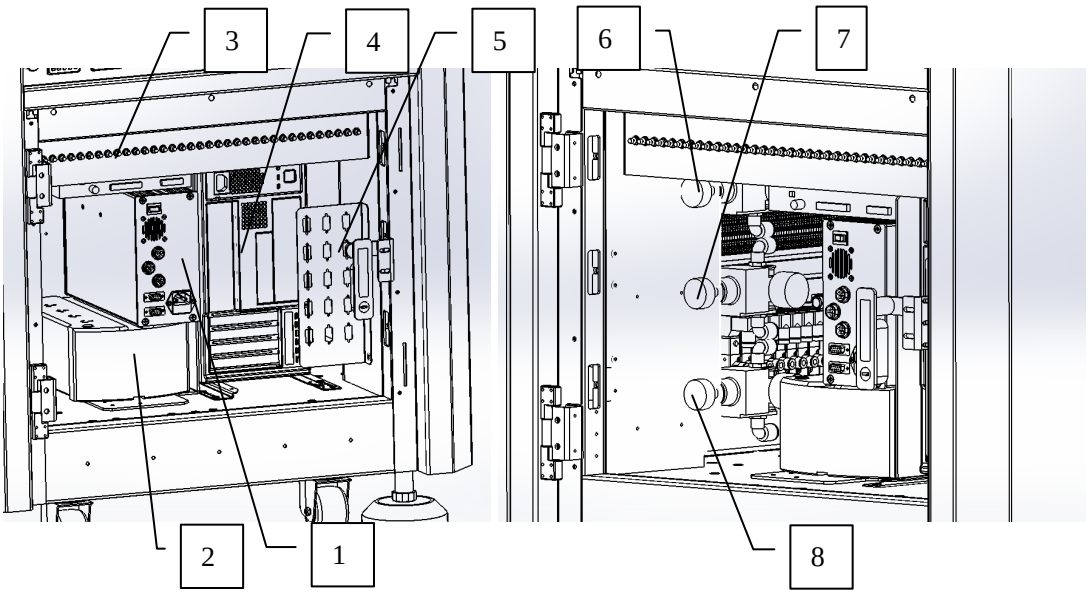


Fig. 1-5 Front cabinet

No.	Name	Description
1	The piezoelectric jetting valve controller	PJS-100 piezoelectric jetting valve controller
2	UPS Power	When the device is powered off, it can provide reserve power to the computer to avoid loss of files.
3	Throttle valve	Adjust the speed of the reciprocating motion of the actuator (cylinder) in the conveying mechanism
4	Industrial computer	Writing and executing VS software for industrial hosts。
5	Communication Interface Panel	Industrial host serial port communicates with various electrical components through RS-232 and 485。
6	Precision pressure regulator	Drive actuator (cylinder) required air pressure regulator.
7		Tooling vacuum adsorption pressure regulator.
8		Switch the air pressure of the piezoelectric injection valve and the regulator valve of the DC-600 valve inlet air pressure.

1.11.5 Rear view

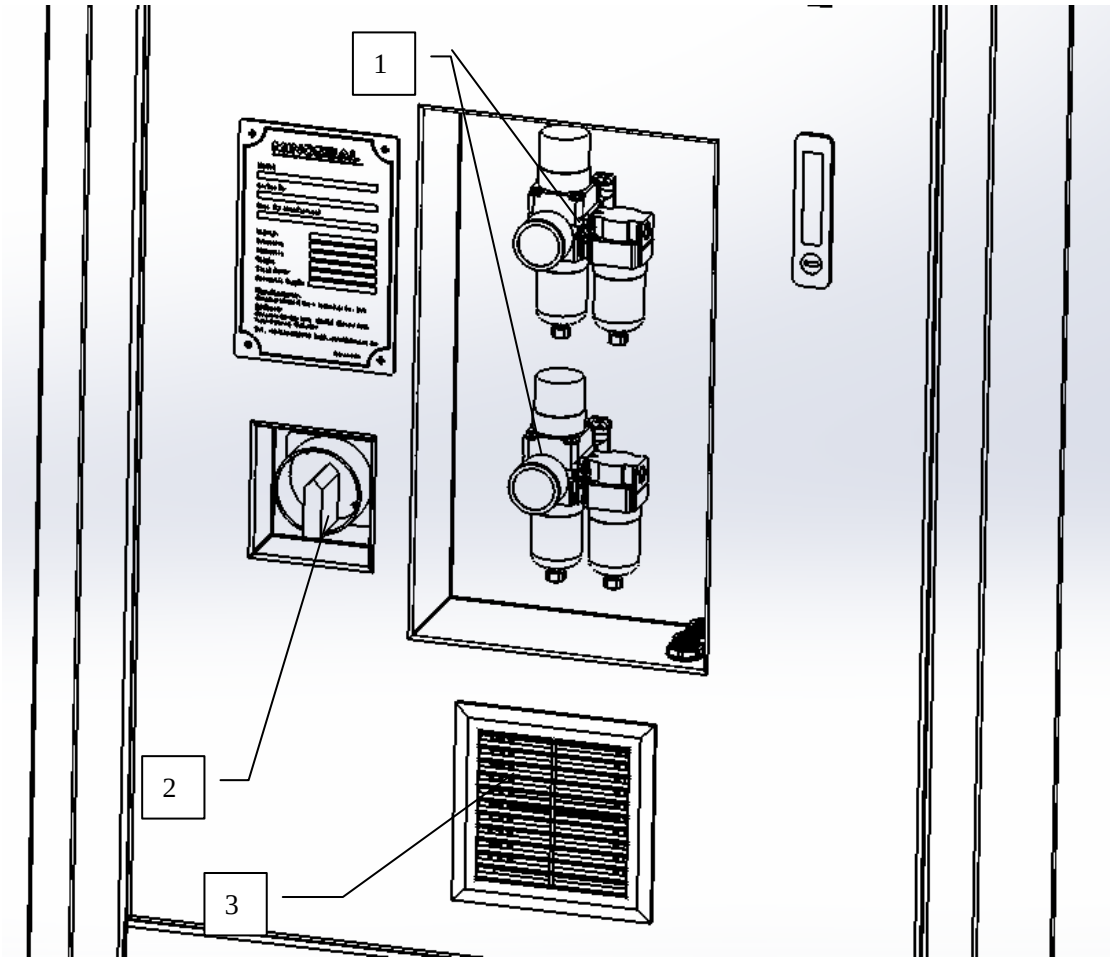


Fig. 1-6 Rear view

No.	Name	Description
1	Main air source control valve Supply air source control valve	The system is equipped with a main air source control valve and a supply air source control valve. They can control the air pressure delivered to the system. The control valve has a built-in air filter and a sink to ensure that the air supply to the system is dry and clean.
2	Power cam switch	The on-off switch of the device's main power supply.
3	Cooling fan	Cool the rear cabinet and avoid overheating of the rear cabinet.

1.11.6 Rear panel connection

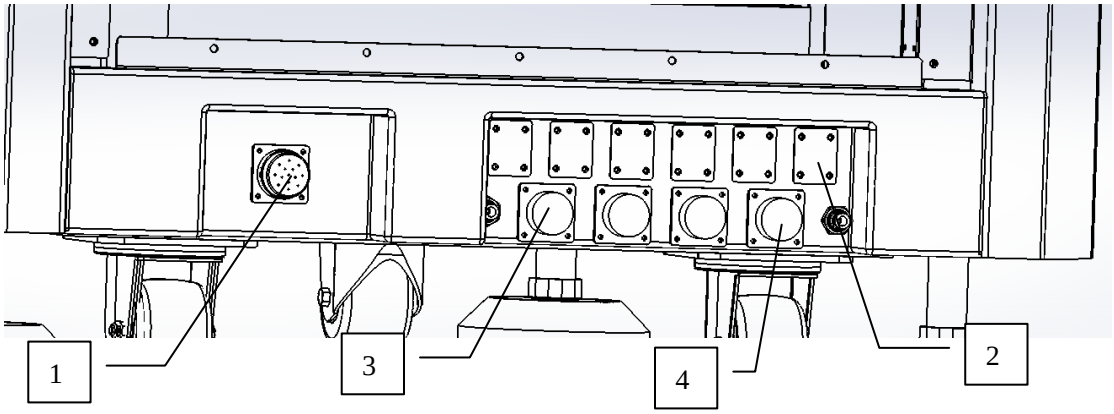


Fig. 1-7Rear panel connection

No.	Name	Description
1	Main power line	The main power line connects the dispensing system with the factory power supply. (The Picture shows a 20A power line)
2	Network Interface	PLC communication, transmission mechanism and upstream equipment or downstream equipment network cable communication interface.
3	SMEMA upstream interface	Allow SMEMA communication between the transport mechanism and an upstream device such as a feed device
4	SMEMA downstream interface	Allow SMEMA communication between the transport mechanism and a downstream device (such as a feed device)

2 Safety

2.1 Summary

This chapter mainly introduces some basic safety knowledge to better operate and maintain the GS-600 series dispensing system. This chapter mainly includes the following:

■ Expected use	■ Laser radiation
■ Basic safety precautions and protective measures	■ Emergency shutdown
■ Handling protective measures	■ Safety chain
■ Earthquake protection measures	■ Maintenance shutdown
■ Safety warning label	■ Status signal lamp device

In order to better optimize the safe operation of the dispensing system, we will refer to the safety protection and recommended operating procedures in this manual.

 ***Warning !***  ***Be careful !***

Unsafe equipment conditions can result in personal injury or property damage. Failure to comply with the manual's specifications may result in invalidation of an already established safety system if it is incorrect or mis-operated.

 **Note :** Safety is the common responsibility of the equipment manufacturer (Mingseal) and the end user (equipment user). All safety precautions and protective measures should comply with local regulations and corresponding environmental facilities.

2.2 Environmental Facilities Requirements

In order to ensure good performance and safety of the system, it is necessary

to install the dispensing system in an environment that meets the installation, operation and maintenance guidelines. For details, refer to the GS-600 Installation, Operation and Maintenance Manual. If you have any questions, please contact the relevant technical support personnel of Mingseal.

2.3 Expected usage

If you use the Mingseal device for the intended use and use as mentioned in non-random materials or documents, it may result in personal injury or property damage. The following are some examples of unexpected use of the system

■ Use incompatible glue materials	■ Unauthorized modification
■ Unauthorized or skip safety devices	■ Use unsupported or damaged parts
■ Use uncertified auxiliary equipment	■ Excessive operation exceeding the rated maximum value of the device

2.4 Basic safety precautions and protective measures

When operating and maintaining the GS-600 Series Dispensing System, strictly follow the recommended safety precautions and precautions listed below to avoid personal injury or equipment damage.

 ***Warning !***  ***Be careful !***

Failure to follow safe operating practices can result in personal injury or equipment damage.

2.4.1 Personnel security

■ Only specially trained personnel are allowed to operate, maintain and repair equipment。
■ If the power supply is not disconnected, if the system needs to be maintained, it must be present at the same time. Before using the system for the first time, all safety warning labels on the system must be affixed, the position is clearly discriminated and all instructions on the mark are strictly observed.。
■ In the event of a dangerous situation where a person may be injured, the red emergency stop (EMO) should be immediately pressed. Before performing maintenance on this dispensing, make sure that the device power supply is securely locked and marked, and that the air supply is turned off.
■ Before the repair or maintenance of the dispensing system is performed, the power of all connected upstream and downstream devices must be locked and marked
■ When using the conveyor belt as a stand-alone unit (offline state), ensure that the equipment is equipped with an optional conveyor cover plate assembly to prevent personal injury or equipment/workpiece damage.
■ When operating this system, do not wear loose clothes or accessories. At the same time, in order to prevent the long hair may be entangled with the moving parts, the long hair must be tied
■ When operating the dispensing system, do not touch the dispensing unit, conveyor or other moving parts
To prevent personal injury, be sure to wear insulated gloves when near a fluid heater or heater module. If your system has an optional laser height sensor, use extreme caution during operation to avoid staring directly at the laser beam or mirroring the laser beam from a smooth surface.
■ Before starting the system, make sure that the main power line and the main air line are securely connected.
■ If you are working in a closed space, ensure that there is enough uninterrupted air/heat and cold air flow to ease the stress caused by the environment and personnel.
■ When the volatile organic compounds (VOC) content in the operating environment exceeds the safe value, the ventilation or filtration system must be turned on
■ Adequate space should be reserved near the dispensing system for maintenance and people move. Also, sufficient space should be reserved for the control panel or cover plate so that the door

of the cover plate can be fully opened.
■ Make sure the power supply in the factory area is safe grounded
■ Compressed air lines and wires should be checked regularly to prevent damage
Make sure all pipes and wires do not cross the road or sidewalk Make sure all pipes and wires do not cross the road or sidewalk Careful consideration should be given to the handling and transportation of environmental facilities before lifting heavy objects
■ Keep a clean and orderly work environment

2.4.2 Material safety

■ Strictly press "material safety information sheet" (MSDS) to make proper use, cleaning and disposal of the glue material and the corresponding contact container of the point glue system. ■ (such as syringe, solvent cup, liquid storage tank, etc.).
■ When cleaning dispensing equipment and spills, chemical materials are properly used and handled in accordance with the MSDS recommendations.
■ When handling or cleaning all chemical materials, ensure that the dispensing system's ventilation system is in normal working
■ Learn how to deal with emergency treatment methods that are recommended in the Material Safety Information Sheet (MSDS)
■ Personal protective equipment（PPE） should be worn in accordance with the factory's safety practices and MSDS requirements from the material manufacturer.
■ When encountering a variety of chemical materials during operation, MSDS should be consulted to ensure compatibility of all materials
■ If possible, you should save or reuse unused materials. Please read the MSDS carefully before storing or reusing unused chemical materials

2.4.3 Prevent damage to dispensing systems and workpieces

■ When the workpiece may be damaged, immediately press the dispensing system's EMO button.

■ When processing electro statically sensitive parts, ESD should be used. Before handling these parts, the ground wire should be properly connected to the anti-static floor.
■ If corrosive glue or conductive glue spills, follow the instructions on the MSDS provided by the manufacturer of the chemical material, and immediately carry out cleaning and cleaning. If fluid enters the inside of the machine, contact Mingseal's technical support immediately.
■ Strictly adhere to all system maintenance procedures specified in the manual.
■ Keep the dispensing area tidy; ensure that there are no dumping or other obstacles in the dispensing area.
■ When the system is running, make sure that the compressed air inlet and outlet are not blocked.

2.5 Handling protective measures

2.5.1 Considerations

Operators should carefully consider the following factors before handling heavy loads

■ Whether heavy objects have dangerous warning signs for lifting, as shown below 
■ Can moving or carrying the equipment be more beneficial and safer for achieving the ultimate goal?
■ Do you need to wear personal safety guards? Examples include gloves, back protection, etc.
■ Do you need someone to help you carry heavy objects together?
■ Do you know the path and destination of transportation?
■ Are the equipment or heavy objects to be transported packed and ready to be safe? (The doors have been locked, the power supply or air hoses have been removed, loose parts have been tightened, earthquake protection pins have been removed, etc.)

2.5.2 Considerations

During handling, the weight of carrying heavy objects or the volume of carrying

heavy objects should be reduced as much as possible. Operators should also strictly observe the following specifications:：

■ Near the object being carried, both feet shoulder width.
■ Hold the handle tightly and keep the handle as close to the body as possible。
■ Lift your head and shoulders first, keep your back straight, and then use your leg to slowly and gently stand up.
■ When changing direction, move your feet first and do not twist your body.
■ When transporting heavy objects on a trolley or other handling equipment, should be a "push", rather than "pull" approach to reduce the pressure on the back.
■ When put down the weights, you should bend your knees, slowly, gently put down the weight, pay attention to your finger out from under the heavy loads.

2.6 Earthquake protection measures

In the event of an earthquake disaster, your dispensing system must be safe and reliable, and will not move due to earthquakes, resulting in possible personal injury or damage to equipment and other facilities. The leveling device (foot pad) of each dispensing system should be fixed to the floor. For details, refer to the GS-600 Installation, Operation and Maintenance Manual.
As a safety precaution, all potentially hazardous electrical energy sources should have automatic and system disconnected functions when the power is turned off.

 ***Warning !***

All operators must abide by the factory's seismic safety instructions.

2.7 Safety warning sign

The safety warning mark affixed to the GS-600 series dispensing system is used to indicate the potential danger zone and remind the relevant personnel to take necessary safety precautions. Table 2-1 shows the safety alert labels that you may see on your dispensing system.。

 ***Warning !***  ***Be careful !***

Compliance with the safety warning label, otherwise it will cause serious injury or damage to the dispensing system. Worn or damaged safety warning labels should be replaced with new labels of the same product number as soon as possible

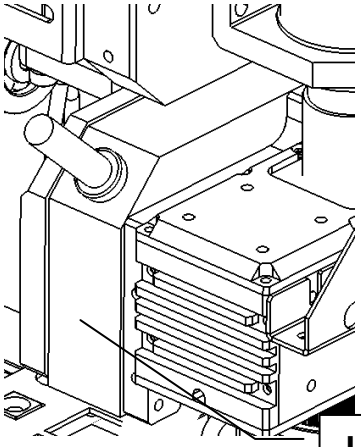
Warning type	Sign	Dangerous situation
Electrical (Electricity)		This symbol warns that a high voltage component may cause electric shock, burns or death. When working in these areas, great care must be taken. Cut off and turn off the power before maintenance
General warning		This label requires personnel to attach great importance to certain parts, otherwise it may cause serious bodily harm to users.
Heavy (handling dangerous）		This symbol warns that the weight of the part to which the symbol is affixed is heavy and may cause strain on the person's muscles or injury to the back when the person lifts the part.
Moving parts		Parts used to warn sports may cause serious injury to the hand or fingers. Please keep your hands away from moving parts. The relevant power supply should be disconnected before operation.
Hands are wrapped/ moving parts		This mark is used to warn the movement of parts of the device that may have caught a handle or finger in the machine, causing injury. The power should be disconnected before operation.
Hot surface		Thermal warning signs indicate parts or surfaces that may be hot. When working near these areas, care should be taken to avoid burns.
Laser radiation		If your system is equipped with a laser height sensor, this symbol is used to indicate possible laser radiation hazards.
Reading operation manual		Warning related personnel should read the operator's manual before operating the machine

Note：

(1) Rectangular logos contain icons and text descriptions. These tags are transported to the world along with the machine, except for Europe.
(2) The logo of the triangle is only an icon. These tag randomizers were shipped to Europe together, see "CE Marking" equipment.

2.8 Laser radiation

Warning !The height sensor uses a Panasonic laser. Do not look directly at the laser beam. If you look directly at the laser beam, it may cause serious eye damage.
The GS-600 series dispensing system is equipped with a laser height sensor. In addition to the basic system security measures, you should also take the following security measures:

■ Operate the laser height sensor in strict accordance with the relevant provisions of the equipment's random operating manual. If you fail to comply with this rule and are exposed to a laser beam, it may cause harm.	 LDS module
■ Do not disassemble the laser head. The height sensor does not automatically stop the laser emission when the head of the sensor is disassembled.	
■ Never just the laser beam and its reflected beam.	
■ Check the laser beam path. Never pass the laser beam through the human eye	
■ Do not open the cover when the laser is on。	

Note： The laser beam is harmless to human skin, so there is no problem with the hands and arms being exposed to the laser beam. The only health hazard is when you expose your eyes to a laser beam that can cause

serious eye injury.

2.8.1 Laser height sensor specifications

Specification	Panasonic Laser Products
Light source	Red semiconductor laser
Maximum power	1.0Milliwatts
Emission wavelength	655Nanometer
Spot diameter	0.1X0.1mm
Reference distance and range	30mm±4mm
Environmental scope	-10～+45°C(Do not freeze) 35～85%RH(No condensation)
Ambient light source	3000lux（Max）

2.9 Emergency shutdown

In the event of an emergency or a machine malfunction, the EMO button should be pressed immediately. GS-600 series, large button with red EMO button, is located on the control panel. Once the EMO button is activated, there is no potential energy in the actuator and the cylinder in the dispense work area drops back.

Warning !

In emergency situations, if the EMO button cannot be used to shut off the potential energy of the entire dispensing system, it may cause serious damage or injury to the entire dispensing system and the operator.。

2.9.1 Emergency shutdown situation

Emergency shutdowns should be selected at least when the following conditions occur:：

- If any person is in danger of injury due to parts or hazardous materials that may move, or if there is a risk of electric shock.
- If the dispensing system's valuable parts or workpiece may be damaged

2.9.2 Emergency stop recovery

 ***Warning !***

Do not restart the dispensing system until the condition causing the emergency stop has not been eliminated.
Failure to comply with this may result in serious personal injury or damage to the dispensing system.

How to restore the system after an emergency shutdown：

- Check and eliminate the cause of the condition that may have caused the emergency stop.
- If necessary, turn off the door in the dispensing area
- Rotate the EMO button clockwise to return to the initial position
- Click on the reset button icon in the operating software

2.10 Safety chain

Safety chain is an electronic connection device, the device immediately stops the current operation. If the front cover of the dispensing system is opened during operation and the safety interlock is activated, all dispensing operations will be stopped immediately to protect the operator's safety and avoid injury.

2.10.1 Safety chain recovery

2.11 Maintenance shutdown

The dispensing system should be stopped before equipment maintenance or parts replacement:

- Stop the dispensing system. See 4.12 System Shutdown for details.
- Carry out "blocking of electric and pneumatic energy sources" as detailed below

2.11.1 Cutting of electric and pneumatic energy

The lockout procedures and requirements for Lockout/Tagout (LOTO) may vary, but it is the end user's responsibility to ensure that these are in compliance with local safety regulations. The purpose of LOTO is to help you reduce the risk of personal injury and damage to the dispensing system caused by unplanned electrical equipment, startup, or sudden discharge of stored electrical energy during equipment repair, maintenance, and operation. It is recommended to use the LOTO function of the GS-600 in the following cases：

- ✧ When adjusting wires, ties, pulleys, or moving parts
- ✧ When servicing ball screws, bearings or motors
- ✧ When troubleshooting, maintaining, servicing or replacing electronic components or components

There is no need to activate LOTO when servicing electronic, pneumatic, hydraulic components, or components on a module that will stop the entire system. If the GS-600 needs to be repaired or maintained while the GS-600 is in operation or at work, it needs to be trained by qualified personnel. When the maintenance work is carried out, other people should be present at the same time

How to cut off electric or pneumatic energy：

■ After pressing the emergency stop button, turn the main power cam switch on the rear of the unit.
■ Unplug dispensing system main power cord
■ Rotate the main air pressure knob counterclockwise to 0 kPa and disconnect it from the main air supply

 ***Warning !***

If your dispensing system is equipped with a heater, allow sufficient time for the heater to cool sufficiently before repair or maintenance. It may cause serious burns.

2.12 Status signal lamp device

The status light device shows the status of the system. In unusual situations, the operator can be warned. The signal lights are red, yellow, green, and can be always on or flashing. The signal light also has a voice-activated alarm

function. Table 2-3 lists the different status conditions represented by different colored signal lamps.
The software and hardware together control the light of the signal device. Security critical status always has priority. The software-driven blinking display signal command has priority over the fixed-statement statement command.

Model lights	System status
Red	**Steady alarm** All actions, including output, valve operation, and related control units, will not work until the fault condition is cleared Possible conditions： Emergency shutdown or abnormal equipment
Yellow	**Operate manually.**
Green	**Fully automatic operation**

3 Software installation &un-installation

3.1 Summary

This chapter mainly introduces some software installation and un-installation knowledge to better operate and maintain the GS-600 series dispensing system. This chapter mainly includes the following：

■ Software Installation
■ Software startup
■ Software configuration
■ Software uninstall

3.2 Software Installation

- Insert the installation disk or insert the U disk in the CD-ROM drive；
- Double-click to open the drive；

➢ Double-click the "GS-600 V1.0.0.msi" file to run the installer. Figure 2-1 shows the installation wizard interface. Click the Next button. In the installation path interface shown in Figure 2-2, select the software installation location and click the Next button. After confirming that you want to install the software, click the Install button to start installing the software, as shown in Figure 2-3. After the software installation is complete, click the Finish button to exit the installation wizard, as shown in Figure 2-4

Fig. 3-1 Installation guide

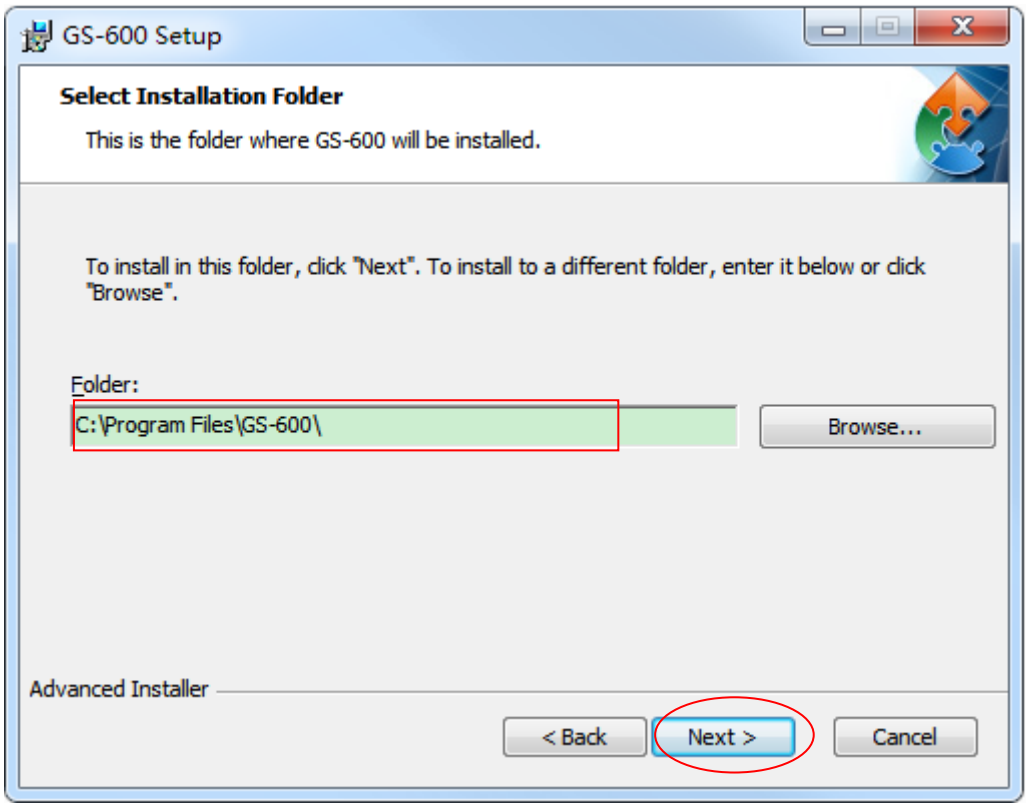


Fig. 3-2 Installation path

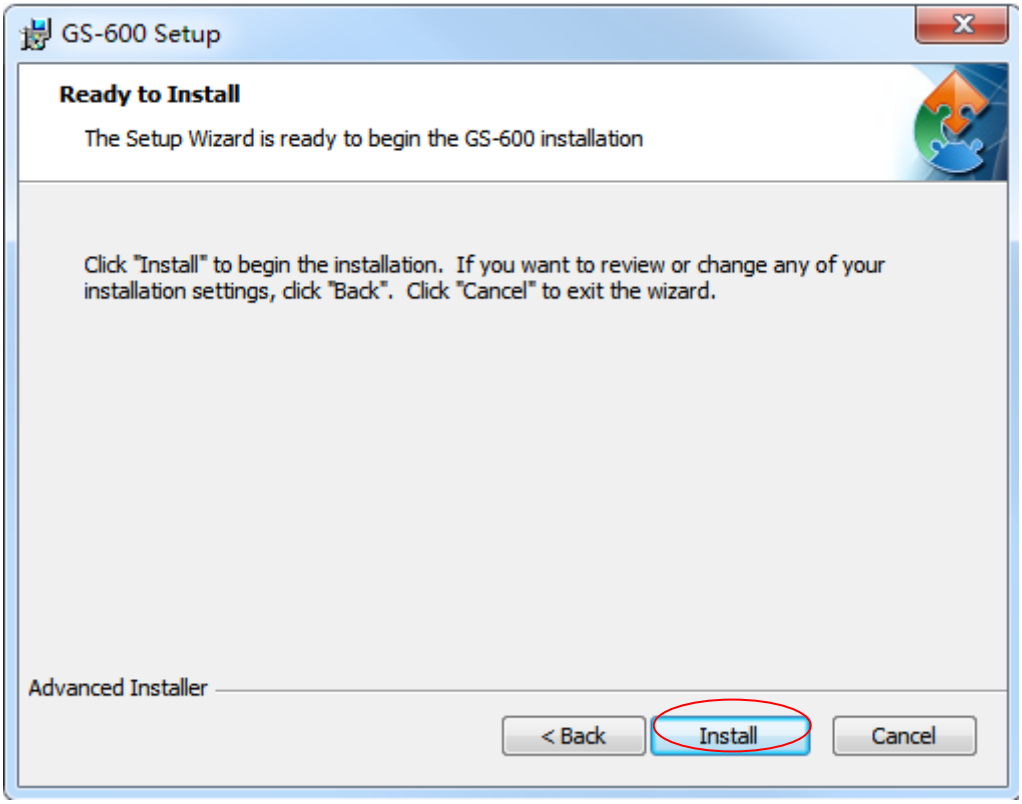


Fig. 3-3 Confirm the installation

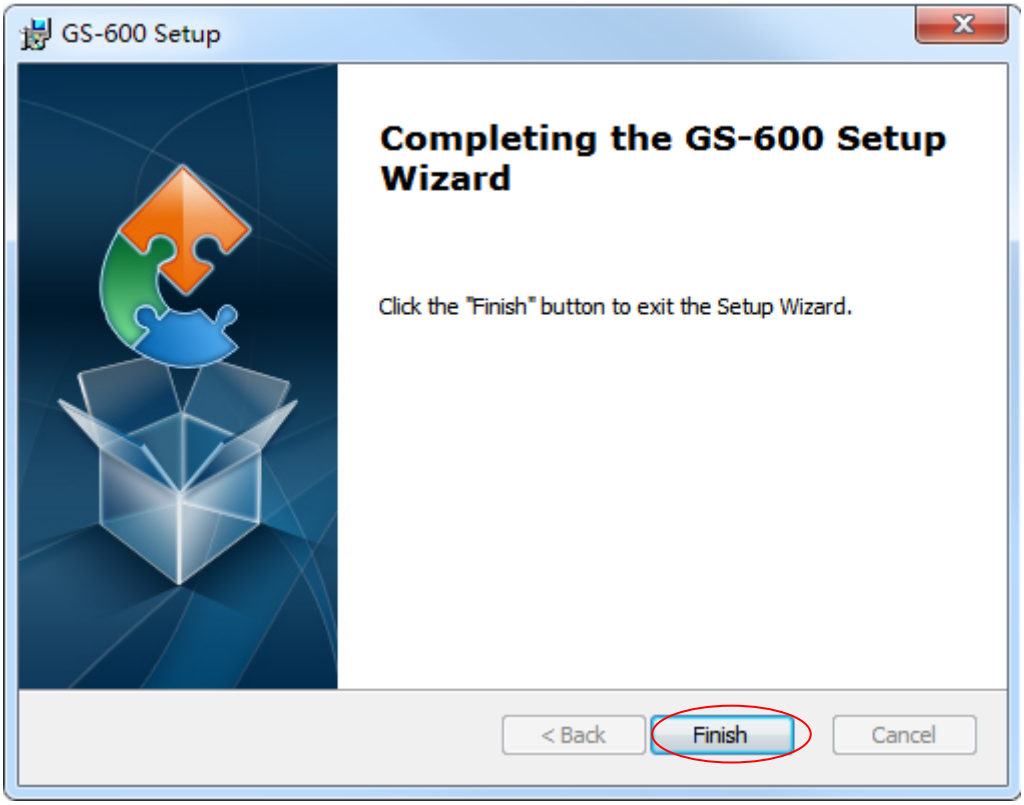


Fig. 3-4 Installation is completed

- Copy all the configuration files in the "Configure" folder to the installation path "C:\Program Files \GS-600", as shown in Figure 2-5:

名称	修改日期	类型	大小
Configuration.xml	2018-01-03 11:19	XML 文件	1 KB
GTS800_floor.cfg	2017-04-07 13:03	CFG 文件	10 KB
HeatParam.json	2017-07-01 13:15	JSON 文件	1 KB
JsonTest.json	2018-01-02 16:34	JSON 文件	2 KB
ParamConfig.ini	2017-10-11 16:33	配置设置	1 KB

Fig.2-5 Profile

Note：

After the installation is complete, a software shortcut appears on the desktop，

Right click -> Properties -> Compatibility: Select compatibility mode: windows7, privilege level: Run this program as an administrator.

Before installing the GS-600 host software, make sure that the driver for the camera you are using is installed. See the accessories for the camera driver installation details.

3.3 Software Installation

- Method one: Click on the desktop "GS-600" shortcut to start the program;
- Method two: Click "Start", find "GS-600" folder, stand-alone "GS-600", start the program;
- Method 3: Open "My Computer", enter the installation path "C:\Program Files \GS-600", find the file "GS-600.exe", double-click to run.

3.4 Software configuration

1) Open the software "GS-600" and click the "Settings" button;

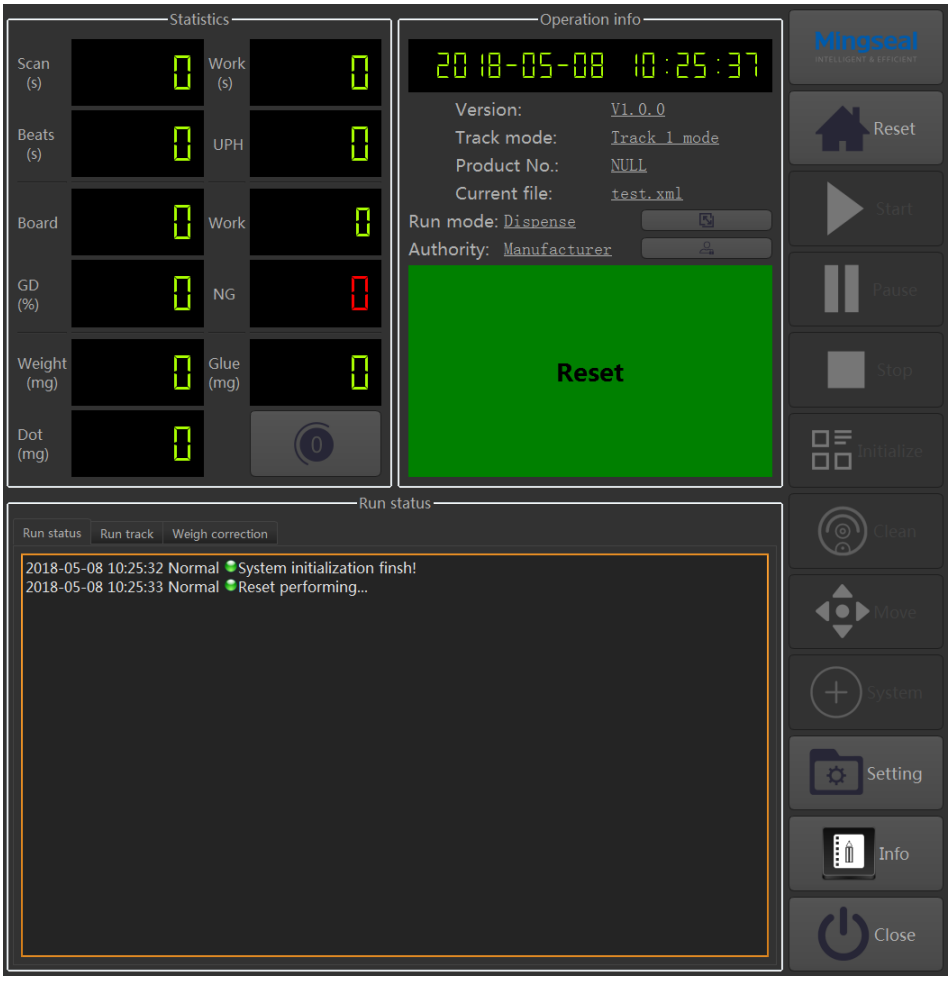


Fig. 3-6 Main interface

2) Click "Configuration Options", select "Motion Control Parameters", set the stroke to "400/600/40/360", set the pulse-mm resolution to "1000/1000/500/1000" and click the "Settings" button;

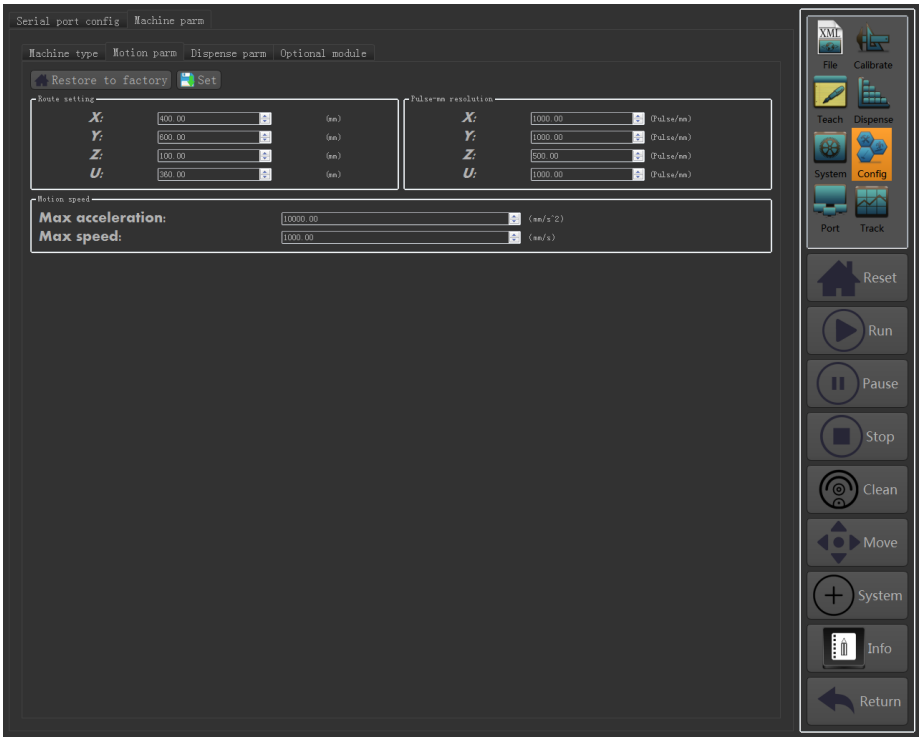


Fig. 3-7 Motion control parameters

3) Select "Machine Type" and select "Cabinet". According to the actual model, select the feeder, clip feeder, etc. Then click the "Settings" button;

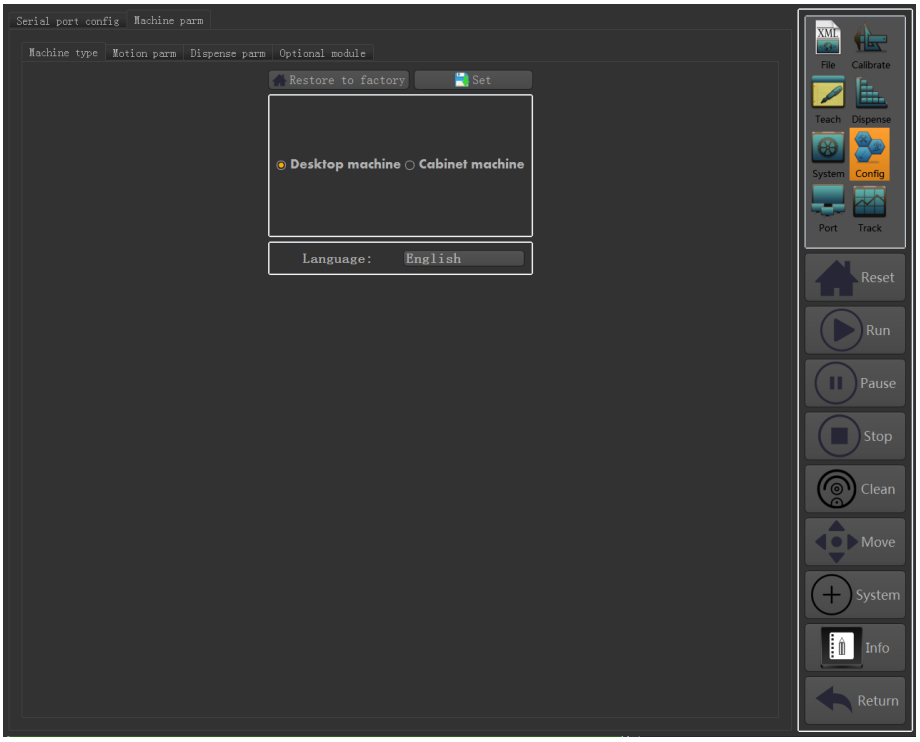


Fig. 3-8 Machine type

4) Select "Optional Module", set the machine configuration, and click the "Settings" button;

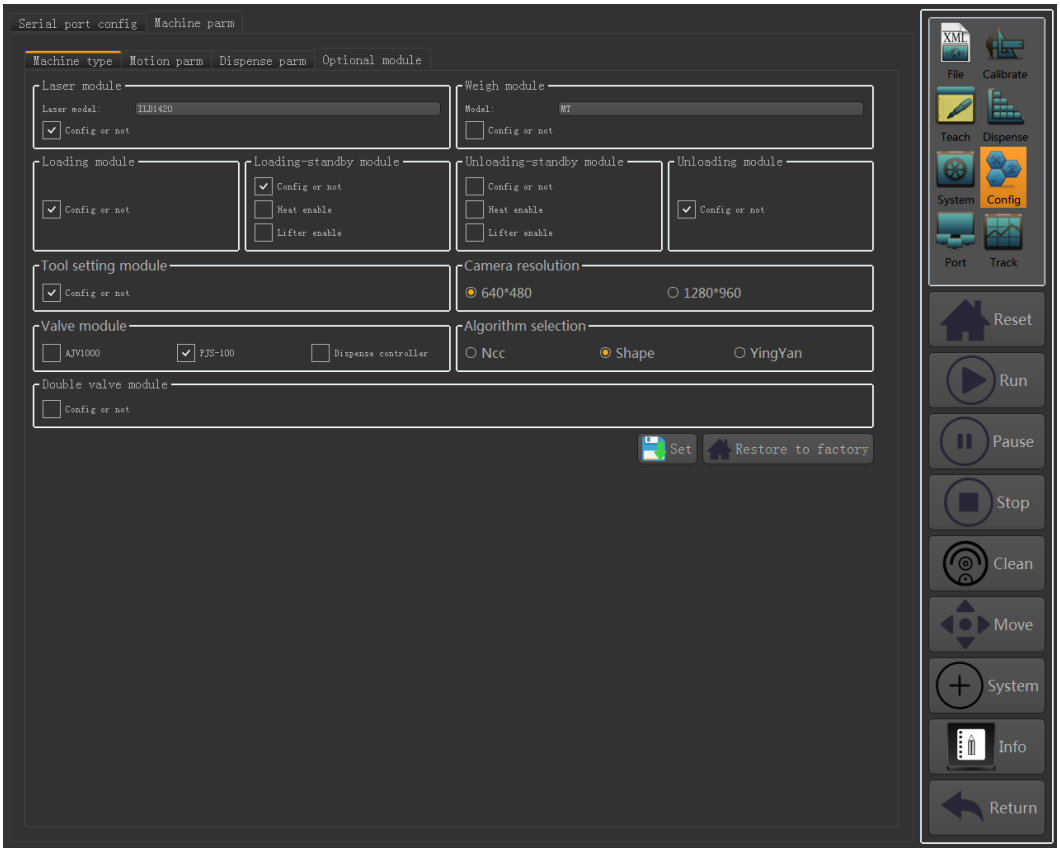


Fig. 3-9 Optional module

5) Select "serial configuration", set the serial communication parameters according to the interface prompts and the actual serial number, and then click the "save" button;

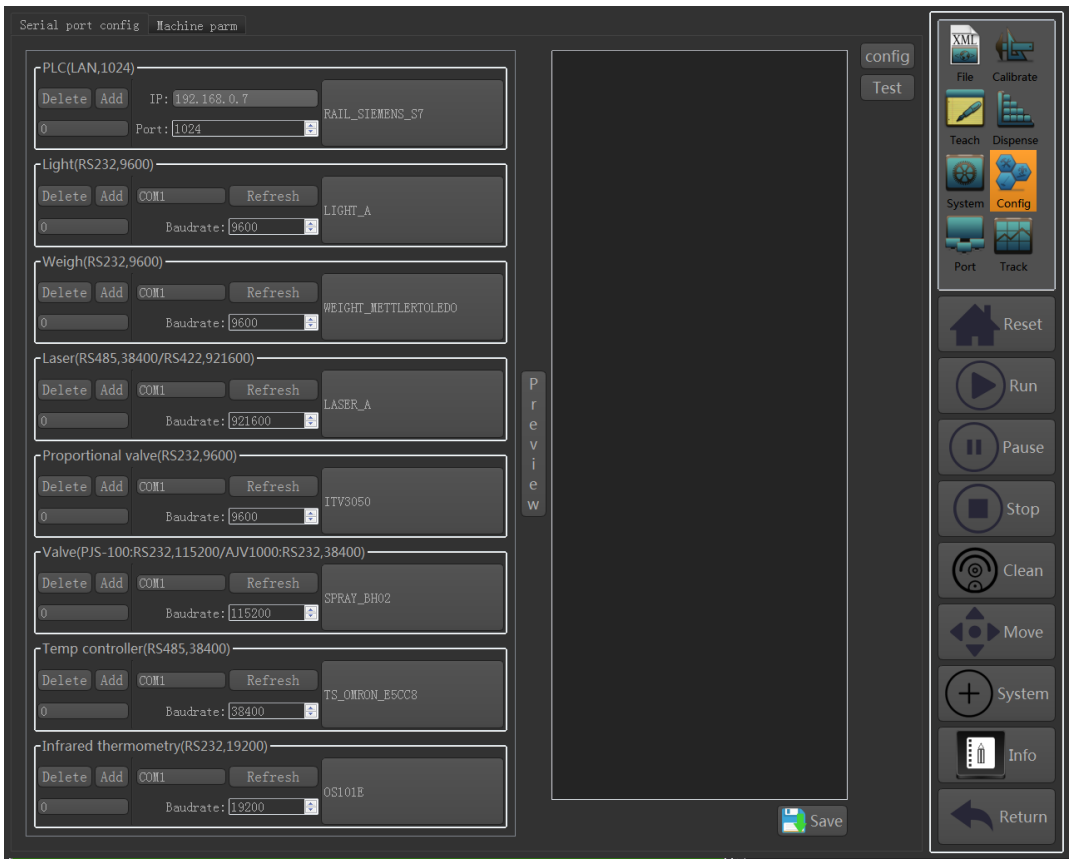


Fig. 3-10 Serial configuration

6) After the configuration is complete, restart the "GS-600" software.

3.5 Software uninstall

- Method one: Click "Start", find "GS-600" folder, stand-alone "Uninstall GS-600", uninstall program;
- Method two: Click "Start", enter "Control Panel", select "Add/Remove Programs", find "GS-600" in the list, click "Change/Remove" to uninstall the software.

4 The main interface introduction

The main interface of the GS-600 upper computer and its components are shown in Figure 3-1. The main interface is mainly composed of a button area, an array/image area, a data statistics area, a running state area, a communication state area, an orbit running state area, and an operation information area.

The button area mainly includes reset, start, pause, stop, initialize, glue, move, system, settings, information and close buttons;

Array/image area is mainly used to display image and array information;

The data statistics area is mainly used to display matching and operating time, UPH, pass rate and weighing related information;

The operating status area is mainly used to display software operating information, weighing charts and running track information;

Temperature control display area is mainly used for real-time monitoring of heating device temperature;

The communication status area is mainly used to display the communication status between software and devices;

The orbital zone is mainly used to display the real-time status of the orbital transmission;

The operation information area is mainly used to display software version, task name, track and operation mode and operation permission related information;

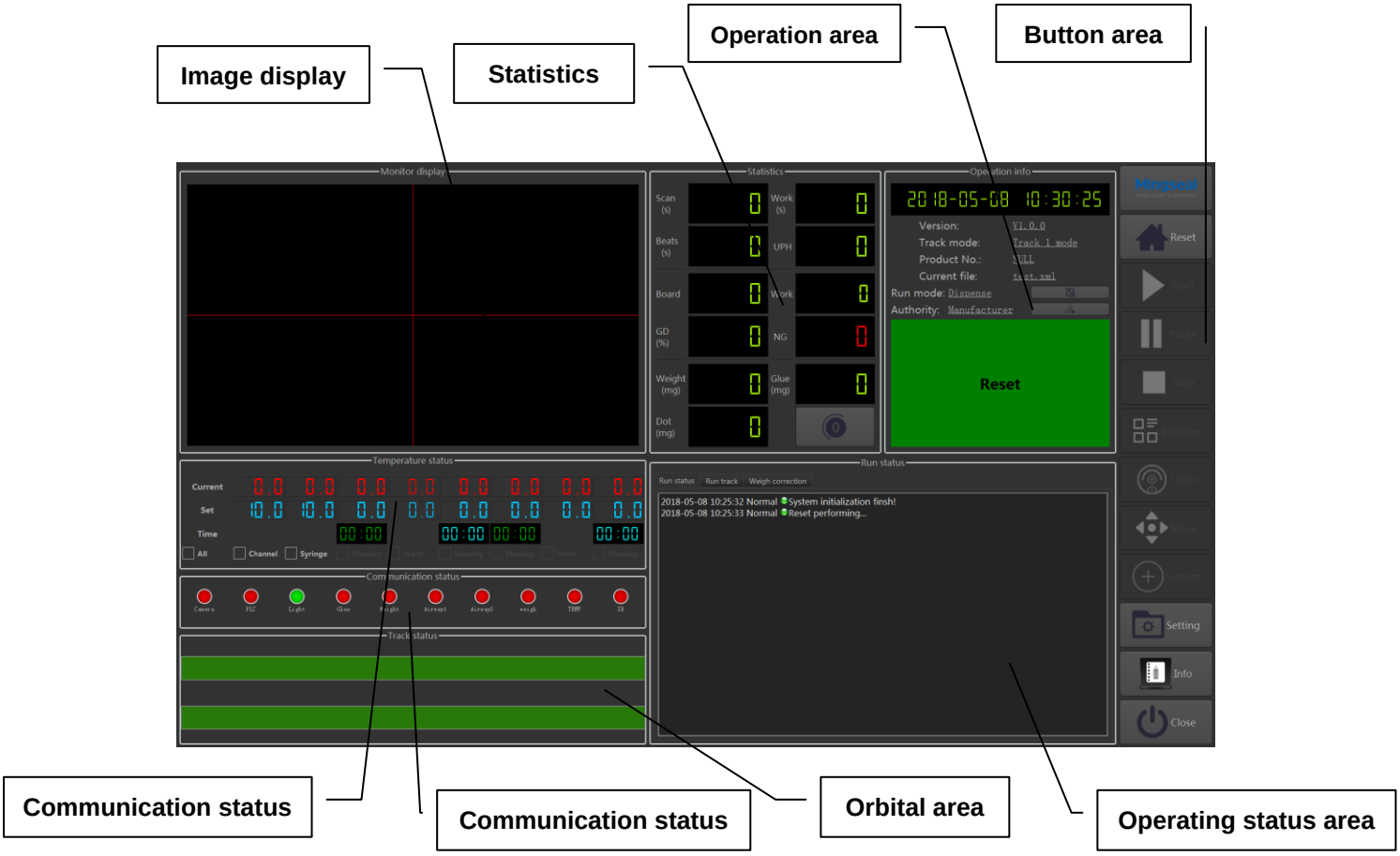


Fig.4-1 Main interface

4.1 Common functions introduced

4.1.1 Summary

This chapter mainly introduces some commonly used functions. After the software is installed, when the software is started for the first time, there is no teaching task, so the message shown in Figure 4-1 will pop up.

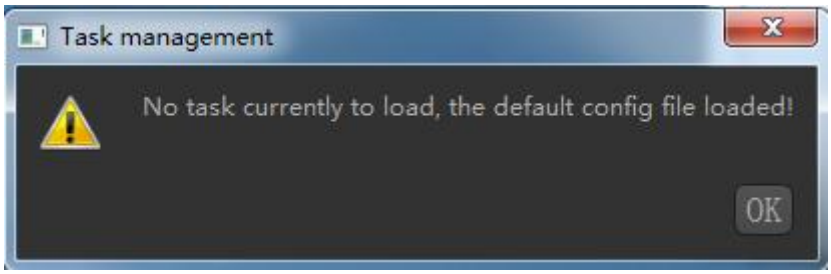


Fig. 4-2 Information

Software commonly used functions include：

■ Mobile platform	■ Light source control is used to set bi-color light source switch and brightness
■ Light source control	■ Dispensing correction operation when replacing needle or glue barrel during work
■ Dispensing correction	■ Quickly achieve dispensing height and position deviation calibration
■ Weighing test and anti-blocking	■ Weighing test to achieve glue stability chart display
■ Mobile platform controls machine axis movement	■ Anti-blocking function prevents valve or needle from clogging

4.1.2 Mobile platform

Click the “move” button on the main interface or the setup interface, the interface of the mobile platform will pop up, and the function to control the machine movement will be realized, as shown in Figure 4-3.

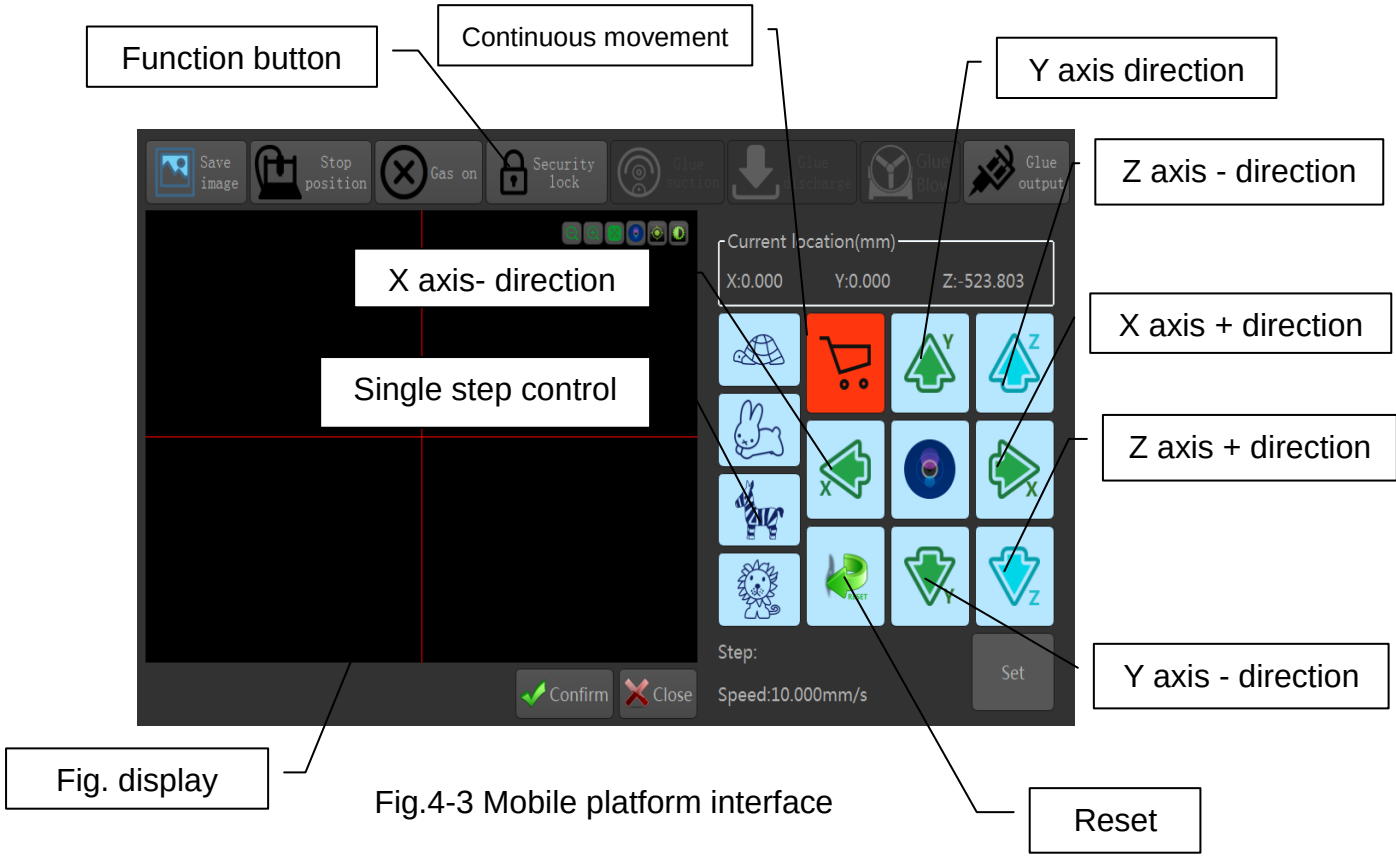


Fig.4-3 Mobile platform interface

■ Step move	You can set four single-step moving steps. Click the button of each axis according to the selected moving step. The machine will move several pulses in the corresponding direction.
■ Continuous movement	Two continuous movement speeds can be set. According to the selected movement speed, press the left mouse button on each axis movement button and the machine can move continuously until the button is released.
■ Reset	The machine to perform a reset operation
■ Current position	Display the current coordinates of the machine

■ Settings	Setting the moving speed of the machine axes, and single step stride
■ Save picture	Save the currently displayed image
■ To stop	If the software has set the machine axis stop position, click this button, the machine will be positioned to this position
■ Turn on the gas	Air source switch, control whether the dispensing gas supply
■ Electronic locks	Control whether the front door of the machine is locked
■ Suction	If the software has set the location and parameters of the glue, click this button, the machine will automatically perform the glue suction.
■ Discharge glue	If the software has set the location and parameters of the glue, click this button, the machine will automatically execute the glue discharging operation.
■ Blowing glue	If the software sets the blowing position and parameters, click this button, the machine will automatically perform the blowing action.
■ Glue out	After pressing this button, the valve or needle will always be glued out. After releasing this button, the glue will stop.

4.1.3 Light source control

Click on the light source control button will pop up the light source setting interface, as shown in Figure 4-4; the light source control includes the blue and red light configuration. During use, different light source configurations can be used according to different workpieces to achieve the best effect.

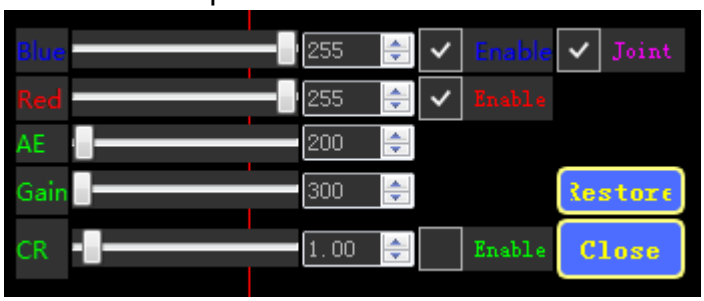
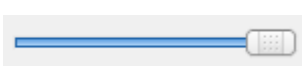


Fig. 4-4 Light settings interface

➢ 启动 and 启动 The option is used to control the light source to be turned on and off, the check is turned on, and unchecked is turned off;

-  and  Used to control the brightness of the corresponding light source, the setting range is 0-255;

-  The option is used to control whether to adjust the brightness of multiple light sources at the same time. When two are selected, the light source brightness is adjusted, and the light source brightness changes synchronously.10;

-  Used to set the camera's exposure and gain parameters, different models of cameras, different adjustment range;

-  Used to set the image contrast, the greater the value, the more obvious the image contrast.

4.1.4 Dispensing correction

Click the "System" button on the main interface or the setting interface, and then click the "Dispensing Correction" button. The dispensing correction interface will pop up. This operation is used when replacing the needle/nozzle or plastic bucket. Follow the steps below to quickly correct the dispensing height and position deviation, as shown in Figure 4-5.

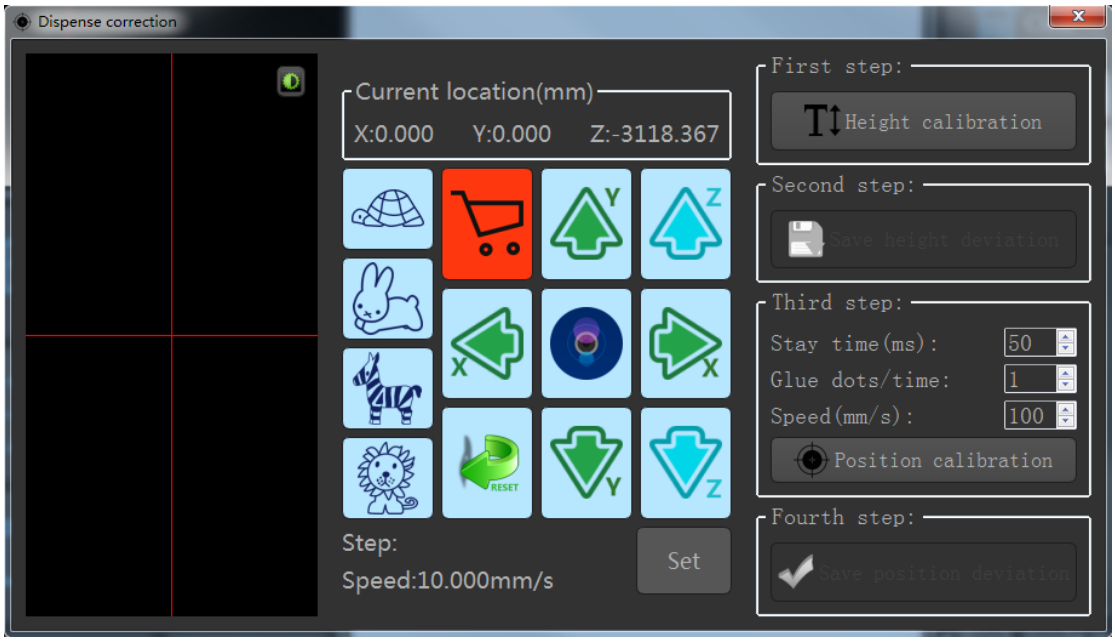


Fig. 4-5 Dispensing correction

➢ Step one：Dispensing height calibration, click this button, the needle/nozzle will automatically move to the tool setting tool to perform tool setting operation. After the tool setting is completed, the deviation from the previous tool setting result will be automatically calculated and updated to all tasks. Glue height automatic calibration;

➢ Step two：After the height calibration is completed, decide whether to perform the height deviation operation;

➢ Step three：Dispensing position calibration, calibration of position deviation between needle, camera and laser. First, set the number of glue points/time, moving speed, and glue dwell time. Then click the “Dispensing Position Calibration” button. The machine will automatically dispense glue at the base point and move the camera center to the camera’s base position;

➢ Step four：The center of the camera cross is aligned with the center of the glue through the mobile platform, click the "Save position deviation" button, the deviation value is automatically updated to all tasks, deviation calibration is completed.

4.1.5 Weighing test

Click the "system" button on the main interface or setting interface, and then click the "Weighing test" button, the weighing test interface will pop up, according to the following steps can calculate the CPK value of the glue, determine the stability of the spray valve, such as shown in Figure 4-6.

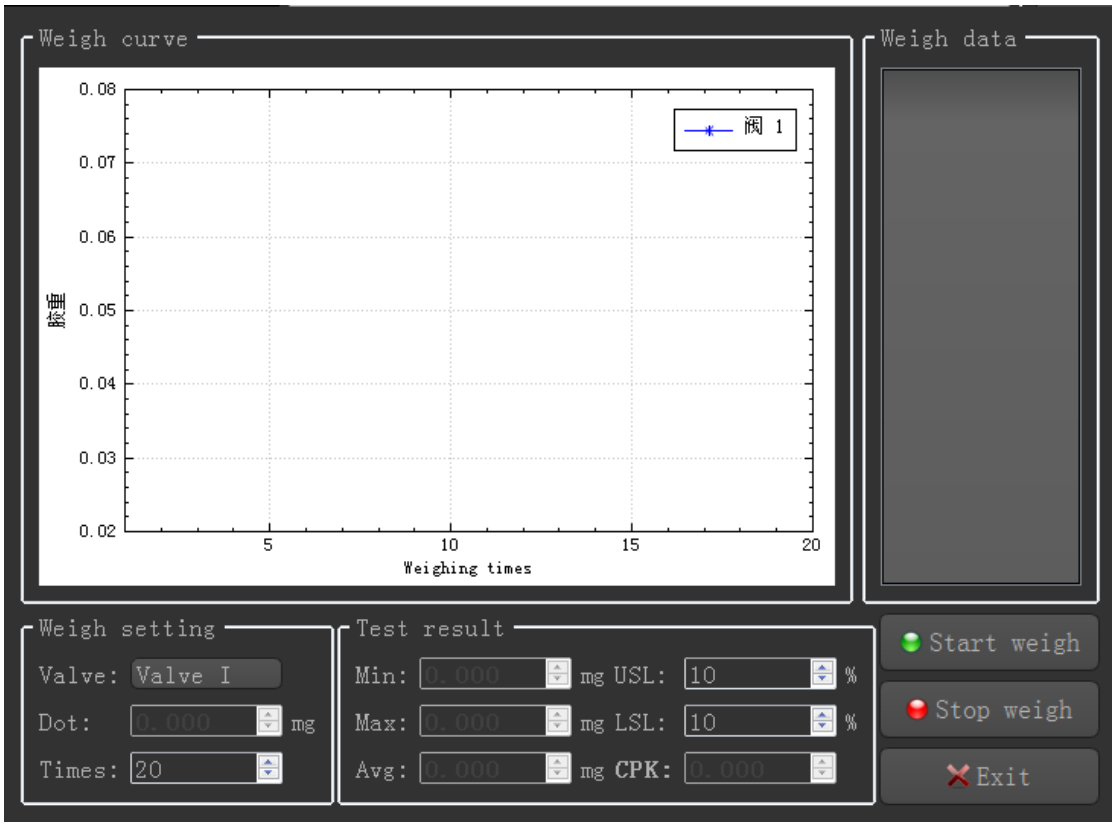


Fig. 4-6 Weighing test

- Step one: set the number of weighing, the machine executes the cycle times of the glue and weighing action; the point weight has been tested in the system calibration interface and will be automatically displayed on the interface.;
- Step two: set the percentage of USL and LSL; USL represents the percentage of point weight error upper limit, LSL point weight error lower limit percentage;
- Step three: click the “Start Weighing” button, the machine will automatically spray and weigh in the weighing area. At the same time, the weighing weight and graph will be displayed. After the number of weighing is completed, the maximum value, minimum value and average value will be automatically displayed. Value, and calculate

the CPK value, weighing test is completed。

4.1.6 Anti-blocking

Click the "system" button on the main interface or setting interface, and then click the "blocking" button, it will pop up the anti-blocking interface, realize the function of the needle/nozzle clogging when the machine is idle; according to the following settings, it can realize the anti-blocking operation , as shown in Figure 4-7.

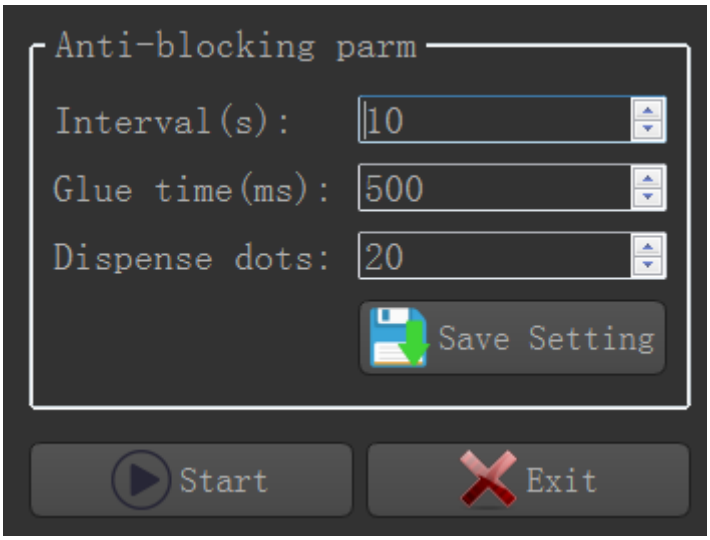


Fig. 4-7 Anti-blocking

- Anti-blocking interval: anti-blocking cycle parameter, in seconds, after a "blocking interval" time, a blocking operation；
- Suction time: The unit is milliseconds. In the blocking operation, the needle/nozzle moves to the suction position, and the suction action is performed to remove the glue on the needle/spray valve.；
- Discharge points: If the machine is equipped with a spray valve, it is the glue injection point, and the spray valve sprays glue to the set position. If the machine is equipped with a dispensing controller, it is the glue release time and the needle is glued out to the set position.；
- Click the "Start" button to start the anti-blocking operation. The "Start" button changes to the "Stop" button. Click the "Stop" button to stop the blocking operation.。

5 Task editing function introduction

This chapter mainly introduces the task editing function
The function is introduced as follows:

■ Document management	■ System settings
■ System calibration	■ Configuration options
■ Task teaching	■ Serial device
■ Dispensing parameters	■ Track setting

5.1 Document management

Click the "Settings" button on the main interface to display the setting interface; click the "File Management" button to display the task management interface, as shown in Figure 5-1-1. File management mainly implements the functions of opening files, creating new files, renaming files, copying files, deleting files, importing files, exporting files, saving files, opening groups, adding groups, and deleting groups.

Fig. 5-1-1 File Management Interface

5.1.1 Create a new file

Click the "New File" button to pop up a new file interface, as shown in Figure 5-1-2; enter the file name and product model, click the confirmation button, and start to create a file; after the file is created, a new file will be prompted for success, and A task file will be added to the left task list

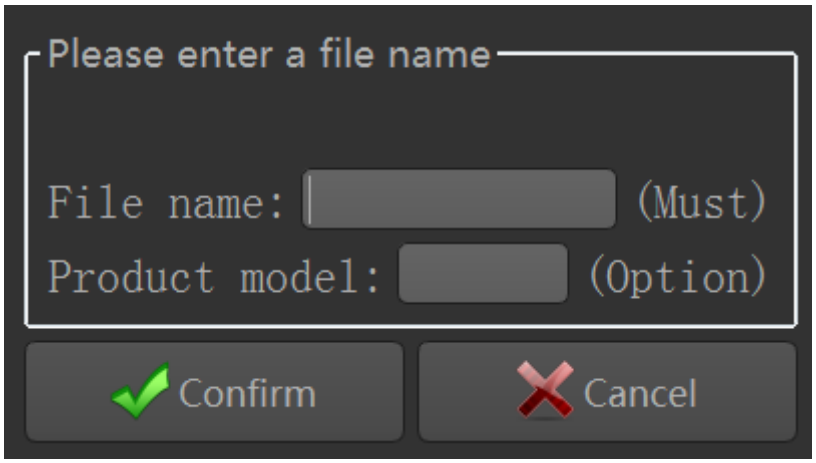


Fig. 5-1-2 Create a new file

5.1.2 Delete Files

Click the task file to be deleted. After the task file is selected, the background color will change to light blue, as shown in Figure 5-1-3; after the file is selected, click the “Delete file” button, and the delete file will pop up. Confirm the interface, select "Yes" button to delete the task file。

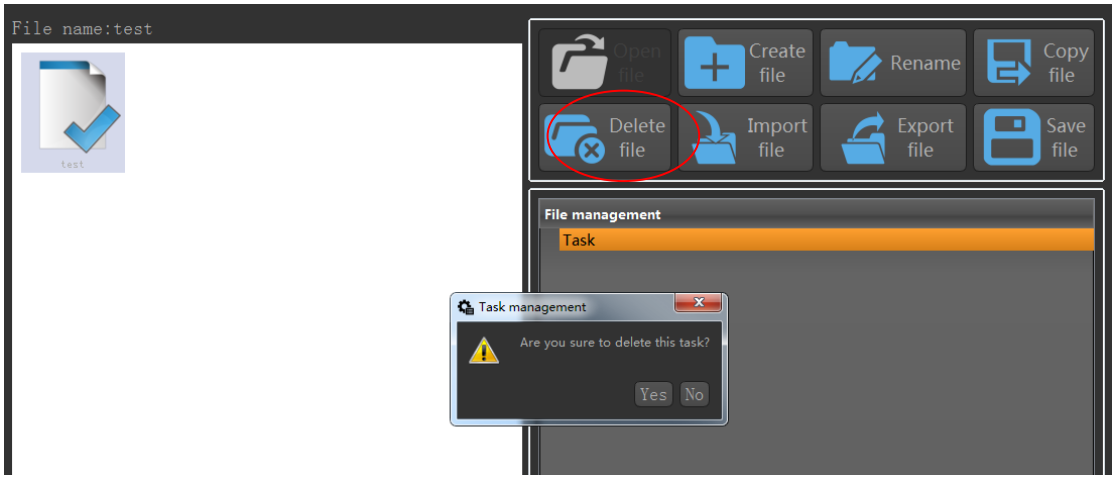


Fig.5-1-3 Delete Files

5.1.3 Turn on a file

Click the target task file to turn on, select the file, and select the task file, the background color will change to light blue, as shown in Figure 5-1-4, with "√" as the current task; after the file is clicked, the "Open File" button is clicked to switch the file. After the task file is switched over, the prompt for completion of the switch will pop up, and the icon of the target task file will display "√".

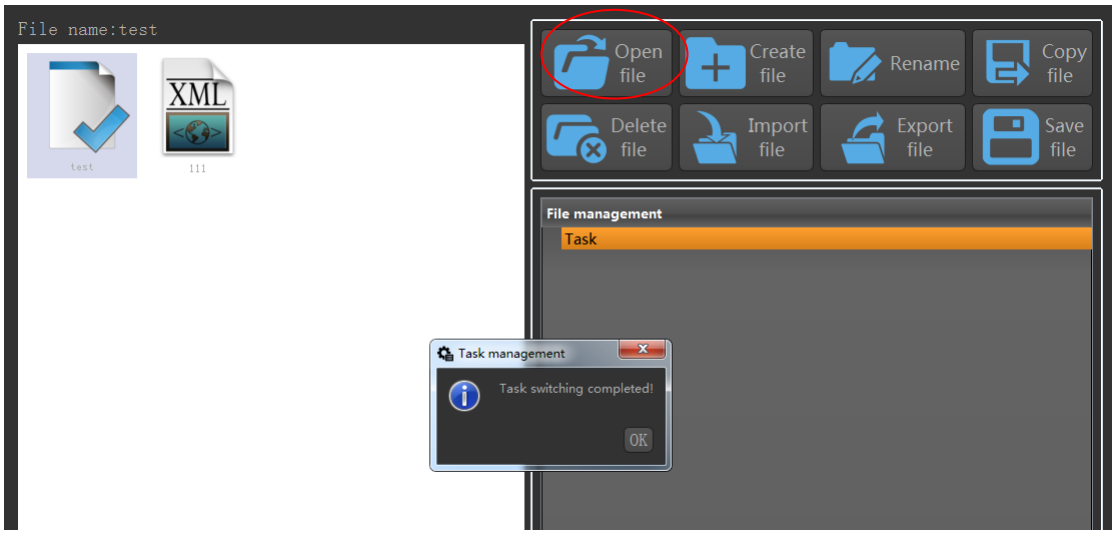


Fig. 5-1-4 Turn on a file

5.1.4 Copy files

Click the target task files to be copied, select the task file, and after the task file is selected, the background color changes to light blue, as shown in Figure 5-1-5; after the file is selected, click the Copy File button. Popup copy task file interface, enter a new file name, click OK to complete the task file copy.

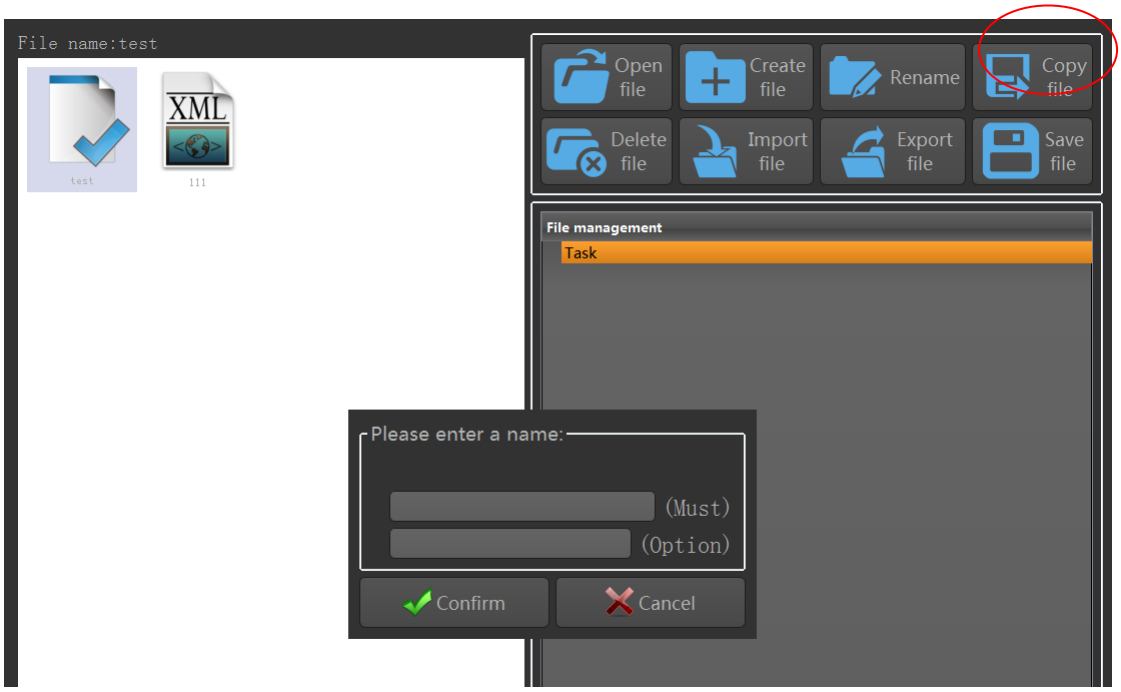


Fig. 5-1-5 Copy files

5.1.5 Importing files

Click the "Import file" button, an import dialog will pop up, select the task file to be imported, and click to open the import, as shown in Figure 5-1-6.

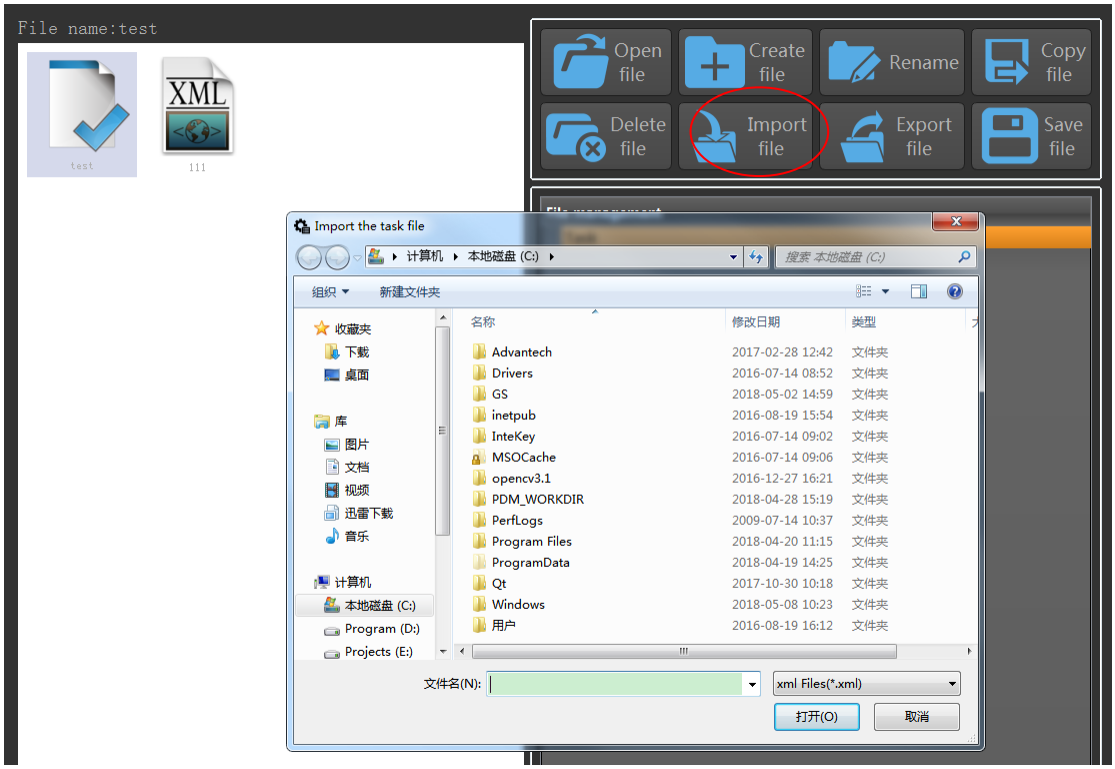


Fig. 5-1-6 Importing files

5.1.6 Export files

Click the target task file to be exported and select the task file. After the task file is selected, the background color changes to light blue. Click the Export File button to bring up the export task file interface and select the path to be saved. Click the Save button, as shown in Figure 5-1-7.

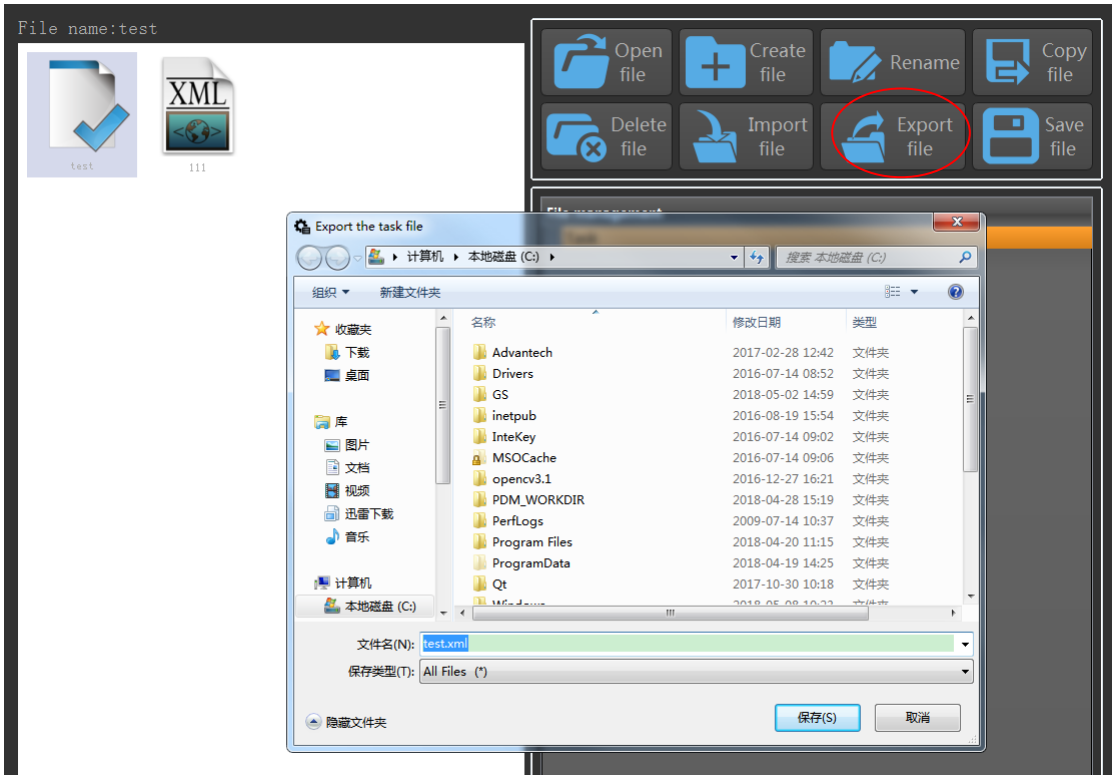


Fig. 5-1-7 Export files

5.1.7 Rename files

Click the target task file to be renamed. After the task file is selected, the background color changes to light blue. Click the Rename button to bring up the rename interface, enter the new file name and product model, and click OK. You can, as shown in Figure 5-1-8.

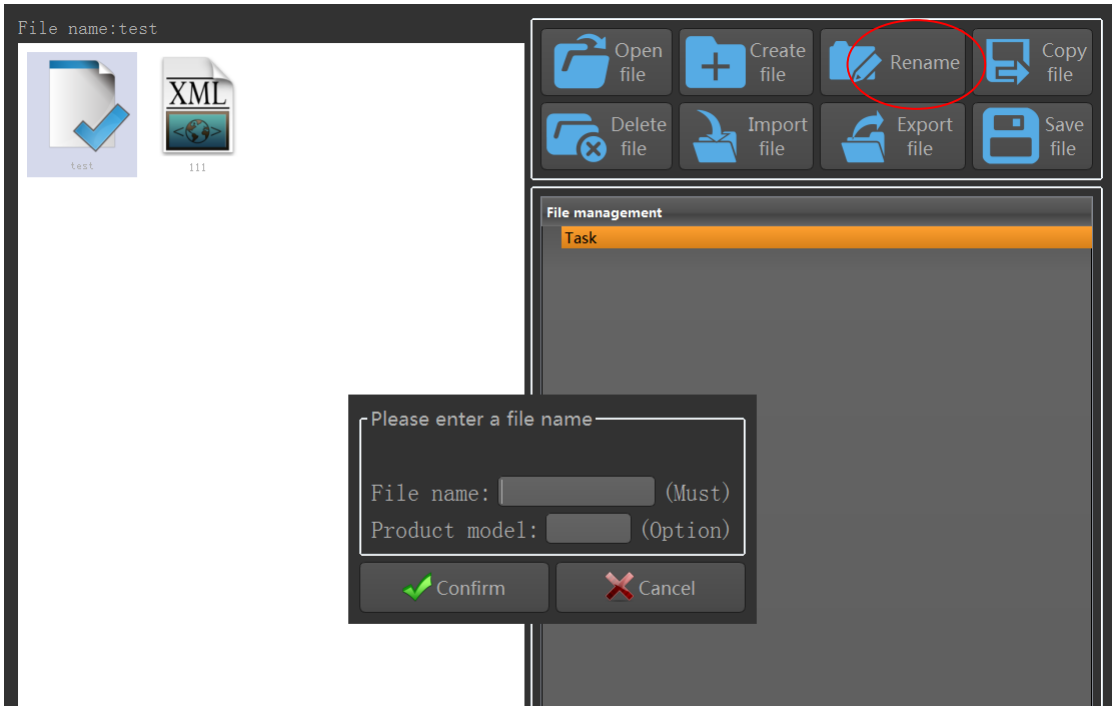


Fig. 5-1-8 Rename files

5.2 System calibration

Click the "Settings" button on the main interface to display the setting interface; click the "System Correction" button to display the system calibration interface, as shown in Figure 5-2-1. System calibration settings to achieve the main function:

■ Camera platform calibration	■ Set IR/Camera XY Deviation
■ Set the Z axis safety altitude	■ Set the location of the cleaning
■ Set nozzle/camera XY offset	■ Set the friction position.
■ Set Laser/Camera XY Deviation	■ Set weighing position
■ Set spray height	■ Set track position deviation function
■ Calibrate nozzle height (setting tool)	■

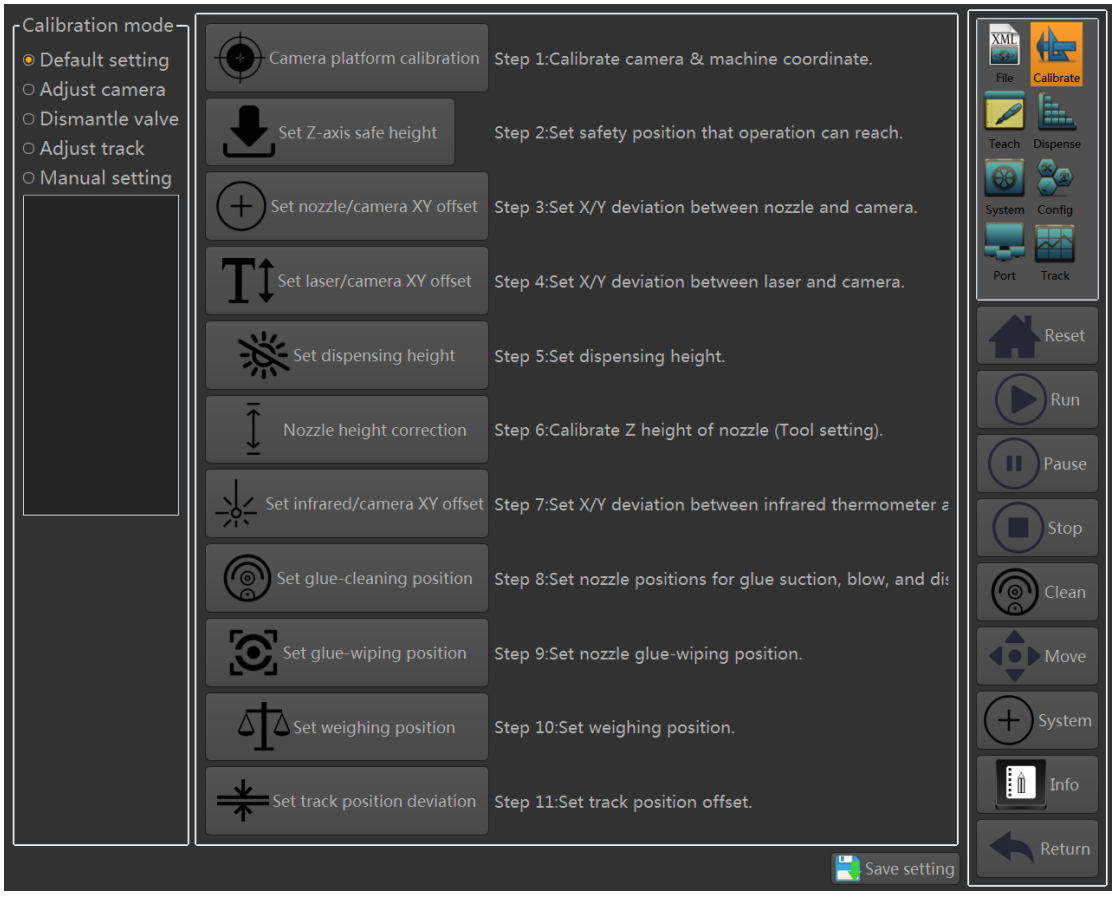


Fig. 5-2-1 System calibration

5.2.1 Camera platform calibration

The calibration of the camera platform is mainly to calculate the relationship between the camera coordinates and the machine coordinates so that the coordinates can be converted to each other during function setting and task running.

Click the "camera platform calibration" button, it will prompt whether to locate the last calibration position, according to the actual situation to choose, as shown in Figure 5-2-2;

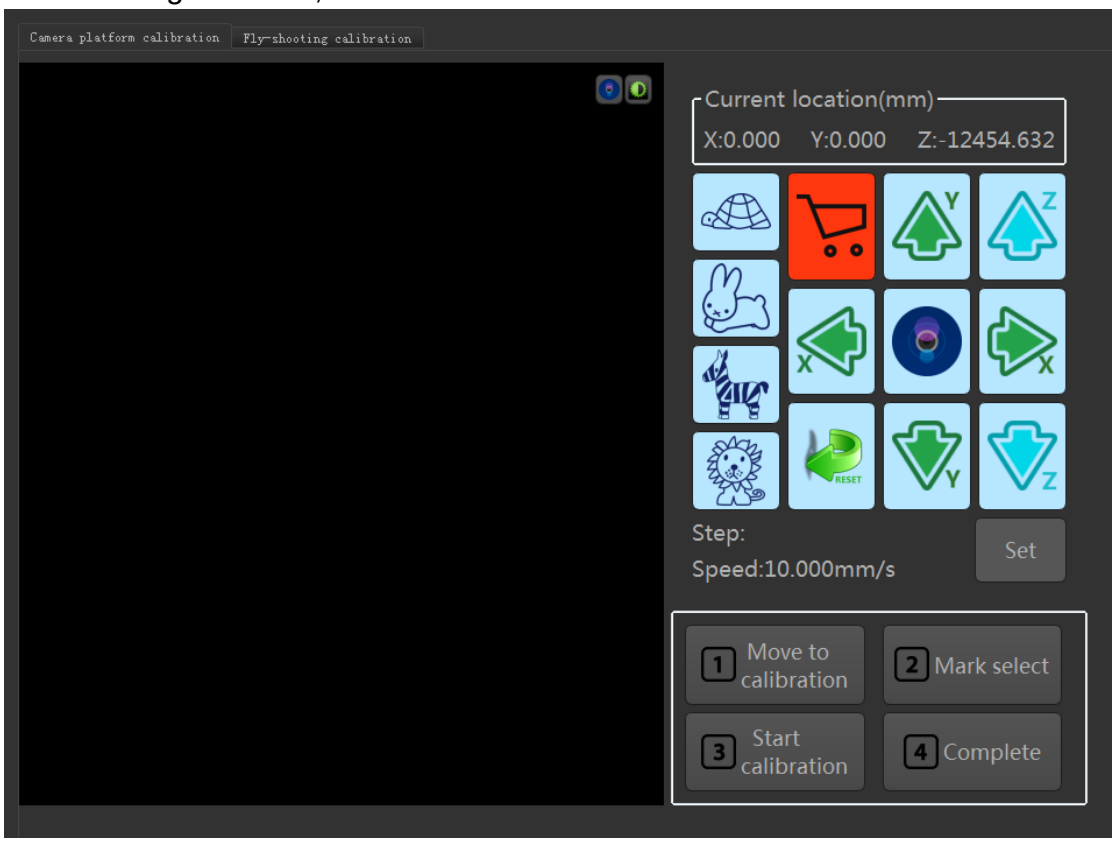


Fig. 5-2-2 Camera calibration

If the Mark point does not appear in the camera's field of view, move the Mark point to the camera's field of view by moving the platform (preferably move the Mark point to the center of the image);
Click the mark selection button and select the Mark graphic near the center of the Mark area on the left image area, as shown in Figure 5-2-3.

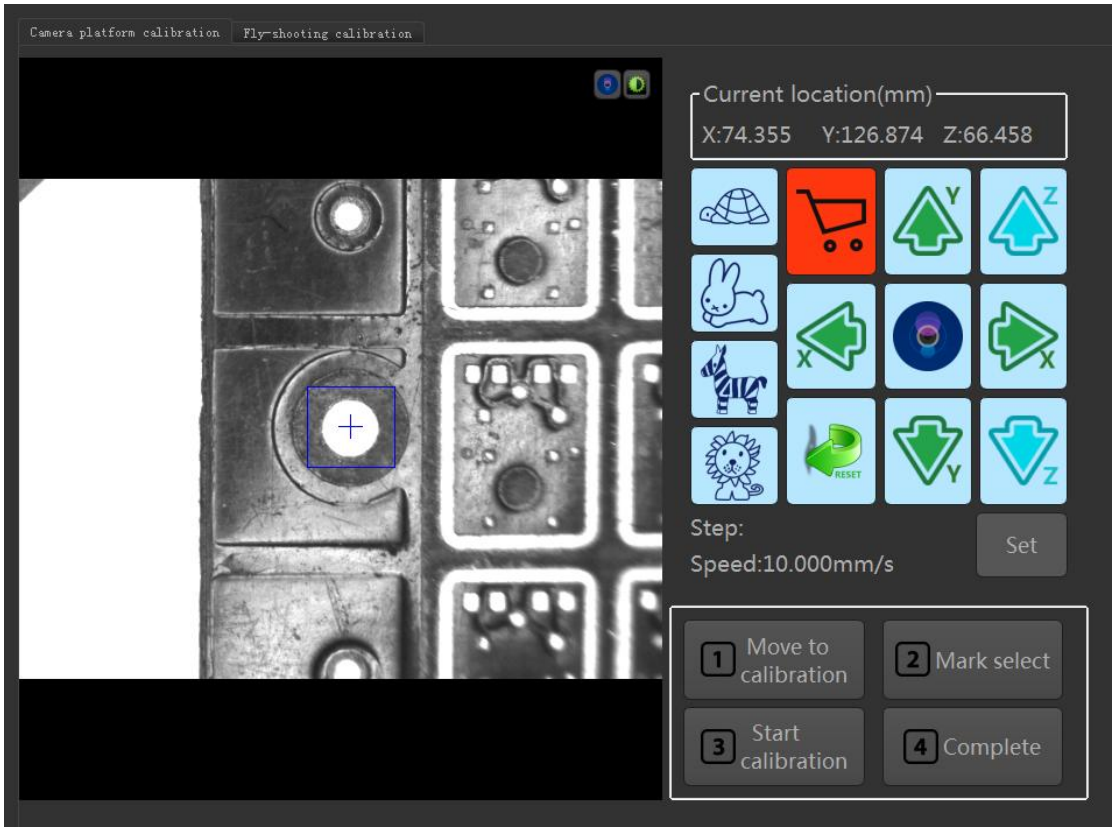


Fig. 5-2-3 Mark choose

Click the "Start calibration" button, the system starts automatic calibration, after the automatic calibration is successful, the interface will remind the user to complete the calibration.

5.2.2 Set the Z axis safety altitude

Setting the Z-axis safe height is mainly to prevent the nozzle from hitting the workpiece.
Move the nozzle right above the workpiece, and also move Z axis to the limit position of the workpiece. Click the "Save in" button to get the position coordinates. Click the "Save Settings" button to save the parameters, as shown in Figure 5-2-4 as shown:

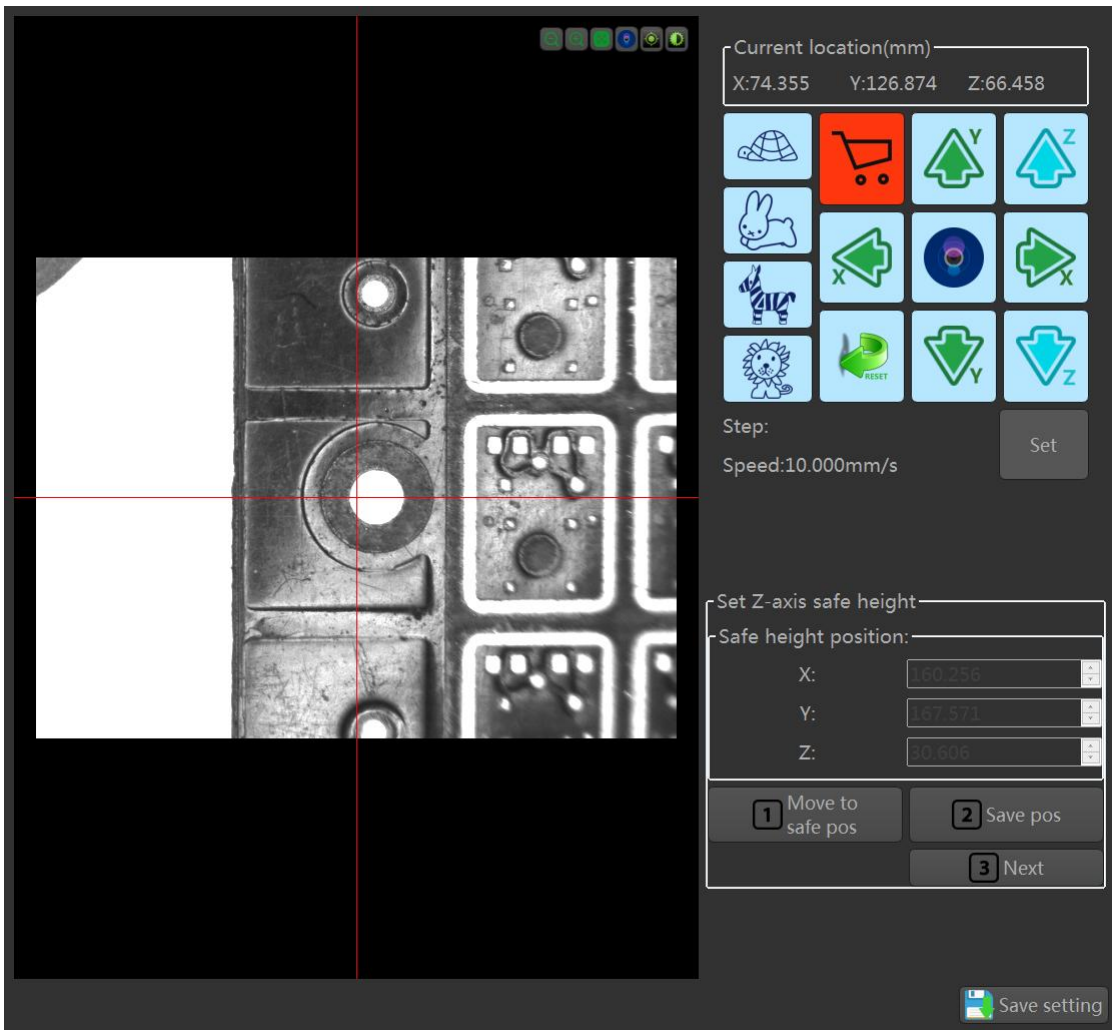


Fig. 5-2-4 Nozzle/camera position setting

5.2.3 Set nozzle/camera XY offset

Setting the nozzle/camera XY deviation is mainly to calculate the XY position deviation relationship between the nozzle and the camera.
Move the nozzle above any position on the tool setting tool, set the glue height parameter, click the "calculate glue height" button, the nozzle will automatically move to the glue exit position, and then click the "Save nozzle position" button; Set the glue time or the number of glue points, click the “Gum out” button. If the glue center in the image does not coincide with the center of the cross mark in the image display area, the mobile platform makes the center of the glue coincide with the center of the cross mark. Click Save. "Camera position" button, record the coordinates at this time, click "save settings" button, deviation setting is completed, as shown in Figure 5-2-5:

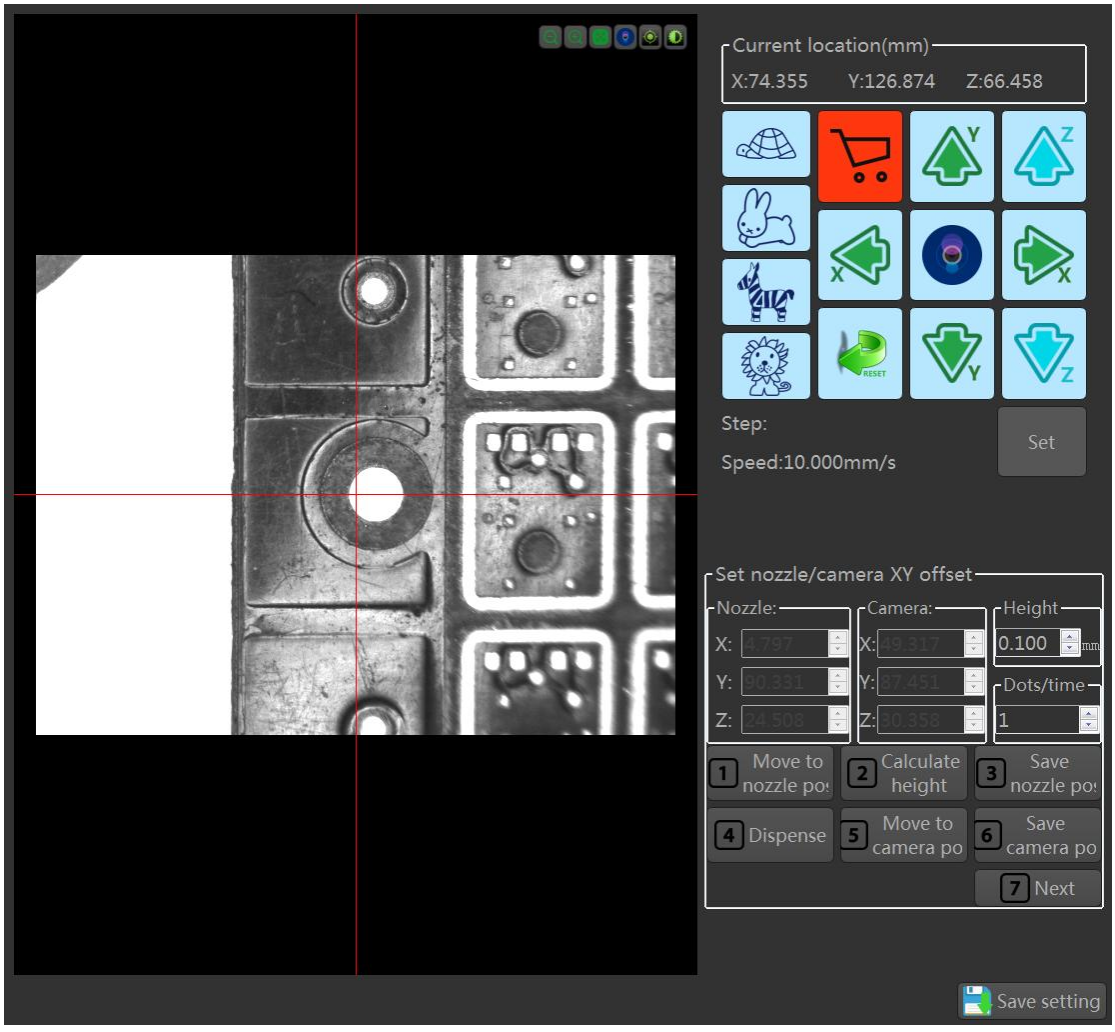


Fig. 5-2-5 Nozzle/camera position setting

5.2.4 Set Laser/Camera XY Deviation

Setting the laser/camera XY bias is mainly to calculate the relationship between the laser height measurement and the XY position deviation between the cameras.
Move the laser to the lower left corner of the calibration plate, move the Z axis, adjust the laser reading to the position near zero, click the "Save Laser Position" button, record the position, click the "Calculate Laser Point" button, according to the principle of intersecting straight lines, calculate the left corner of the calibration version;

The mobile platform makes the corner position coincide with the center of the camera cross mark. Click the "Save Camera Position" button to record the coordinates at this time. Click the "Save Settings" button. The deviation between the laser and the camera is set, as shown in Figure 5-2-6. Show:

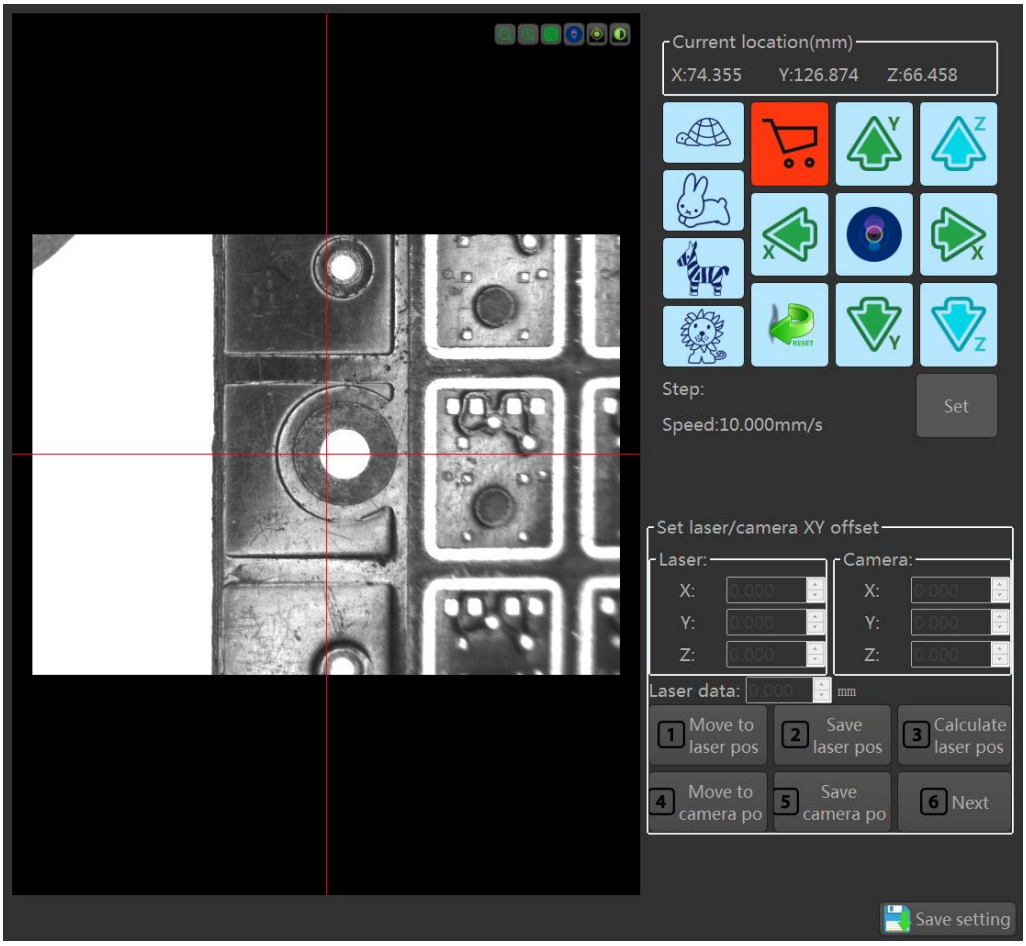


Fig. 5-2-6 Laser/camera position setting

5.2.5 Set spray height

The glue spray height is the position where the needle/nozzle discharges during the operation.
Move the camera to the workpiece dispensing position, click the "save -> switch laser" button, the laser automatically moves to the dispensing position, move the Z axis, adjust the laser reading to zero, and click "save laser position" Button, record the position at this time; set the spray height, which is the actual glue height; click the “Save Settings” button to complete the spray height setting, as shown in Figure 5-2-7:

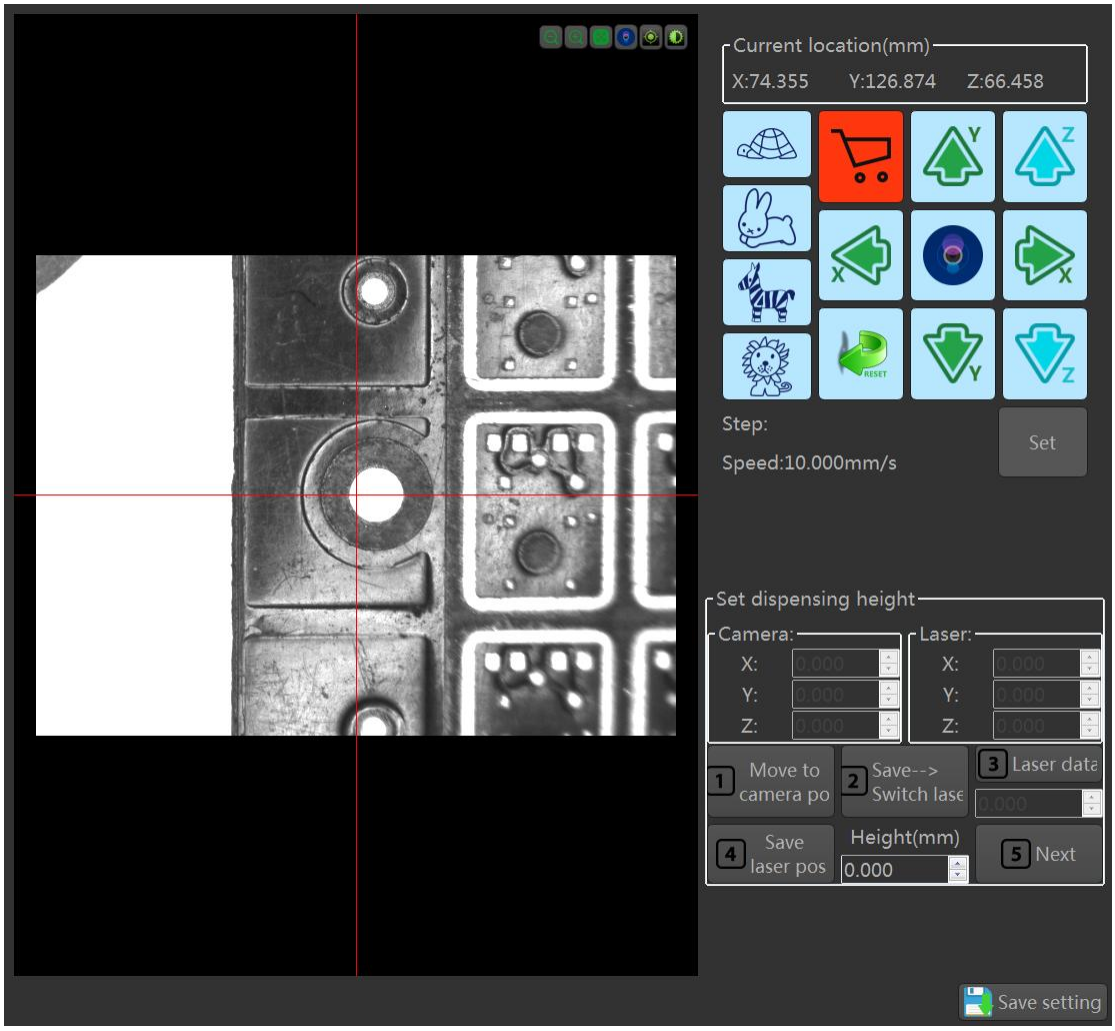


Fig. 5-2-7Set spray height

5.2.6 Calibrate nozzle height (Counter knife)

Calibration of the counter knife automatically calibrates the dispensing height deviation when replacing the needle/nozzle or plastic bucket, as shown in Figure 5-2-8:

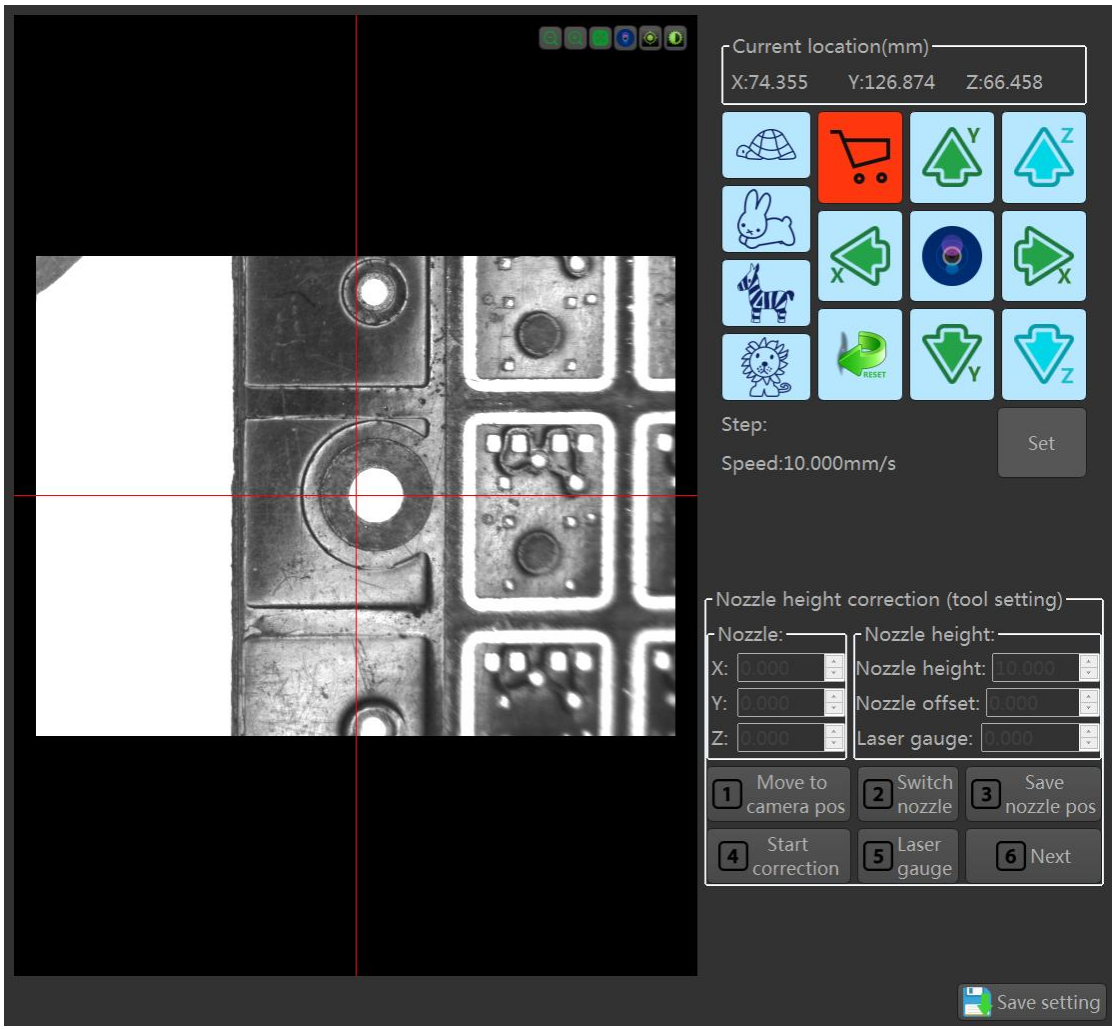


Fig. 5-2-8 Calibration of the counter knife

Move the camera to the center of the tool setter, click the "Switch Nozzle" button, the nozzle will automatically move above the center of the tool setter, click the "Save Spout Position" button, record the coordinates at this point, and then click "Start Calibration" ” button, when there is a “correction completed” prompt, the calibration of the calibration tool ends and the result of the tool verification is displayed;

Click the “Laser Ranging” button, the laser automatically moves to the center of the tool setting tool and reads the laser value at this time, and the height deviation between the tool setting tool and the workpiece is calculated.

5.2.7 Set IR/Camera XY Deviation

The infrared/camera XY offset is set to calculate the relationship between the infrared temperature measurement and the XY positional deviation between the cameras.
Move the infrared thermometer to the location with the feature point, click the "Save -> Switch Camera" button to record this location; the mobile platform makes this location coincide with the center of the camera cross mark, click the "Save Camera Location" button, record At this point, click the "Save Settings" button, and the infrared thermometer and camera deviation settings are complete, as shown in Figure 5-2-9:

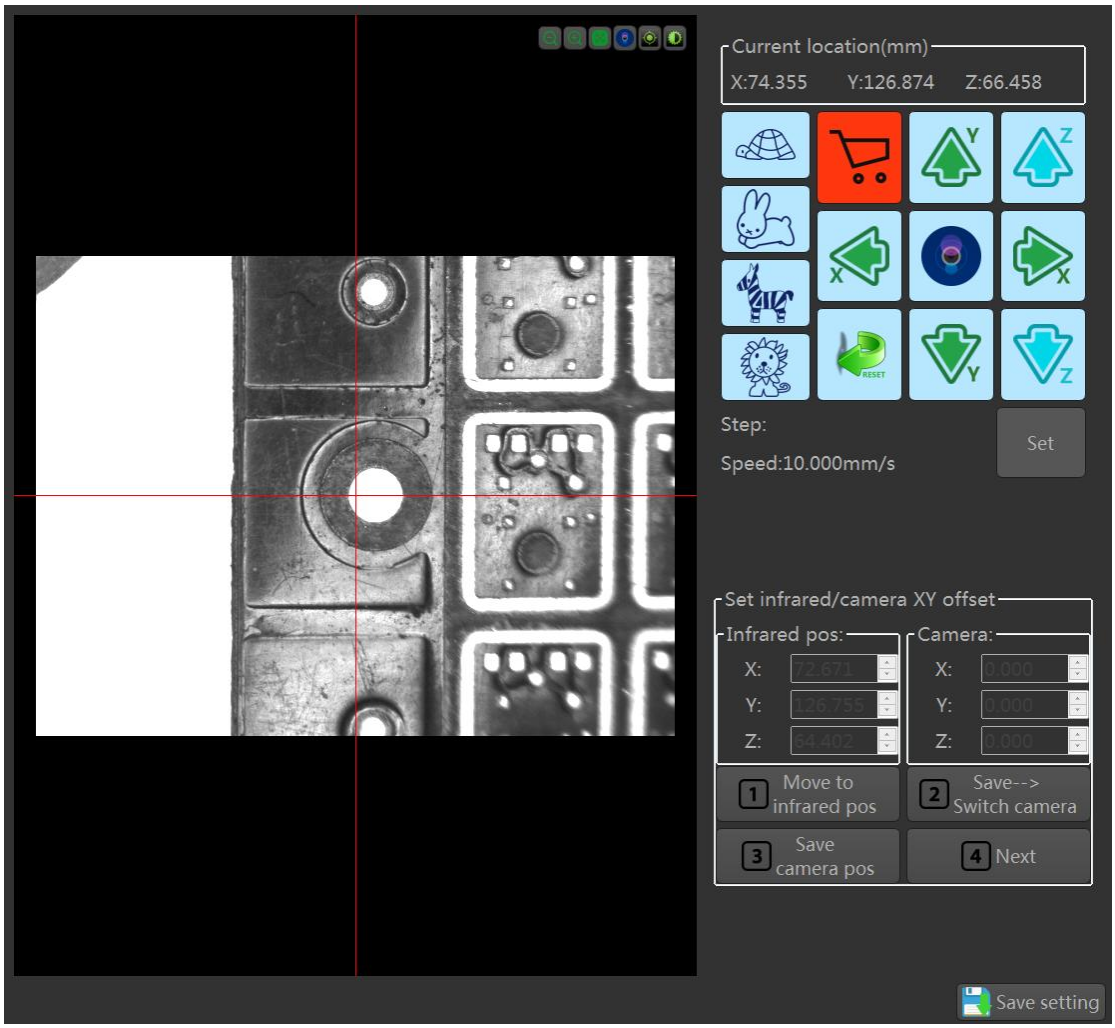


Fig. 5-2-9 Infrared/camera position settings

5.2.8 Set the location of cleaning glue

The cleaning glue consists of sucking glue, discharging glue, and blowing glue. It plays the role of cleaning the nozzle during the glue spraying process and prevents the glue from hanging and plugging, as shown in Fig. 5-2-10.

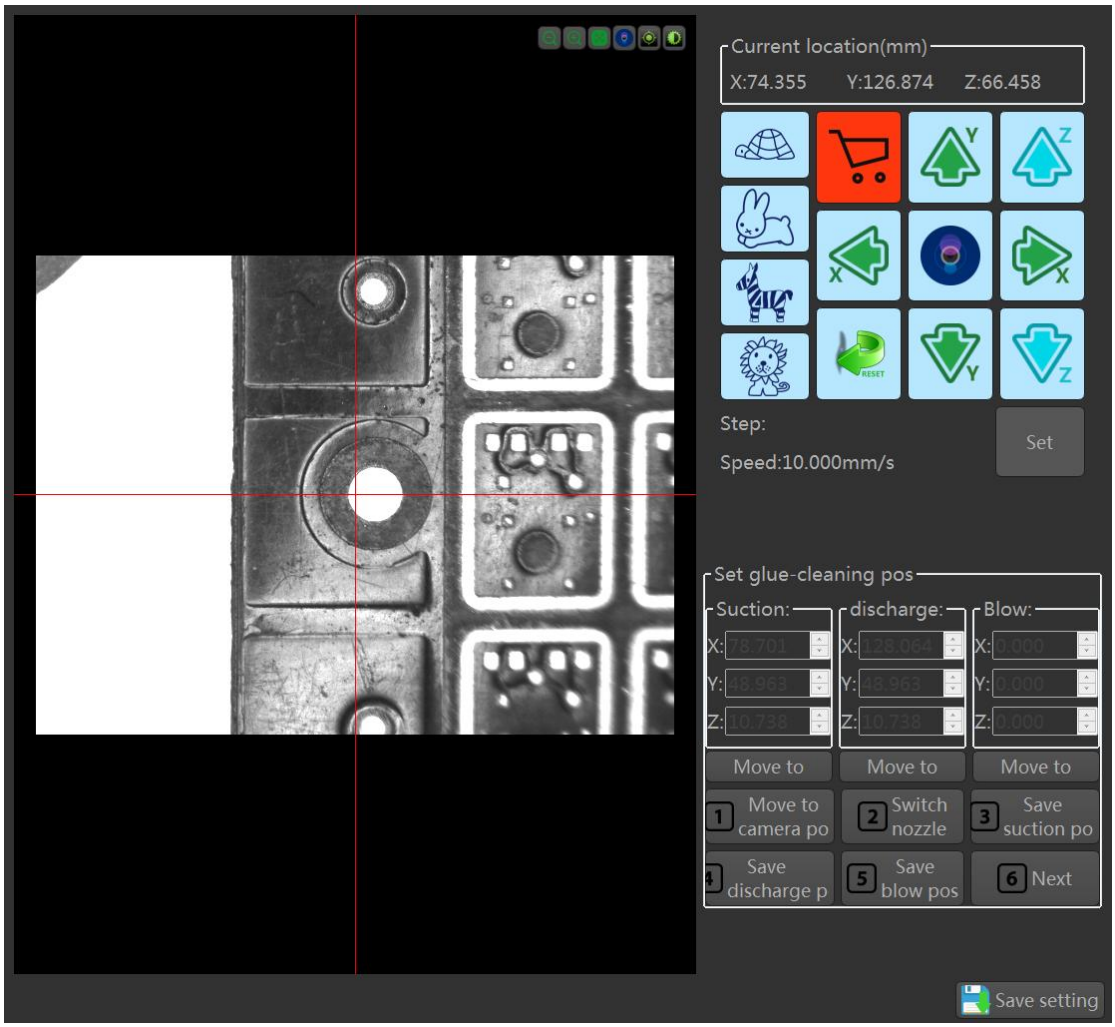


Fig. 5-2-10 Clean glue position setting

Move the camera to the center of the suction device and click the “Switch Nozzle” button. The nozzle will automatically move to the center of the suction device. Move the Z axis so that the nozzle comes into contact with the suction device. Click the “Save Suck Position” button to record. The coordinate value at this time;

Repeat the above steps to set the location of the rubber and glue respectively. Click the "Save Settings" button. The location of the glue is set.

5.2.9 Set wipe glue position

The wiper can clean the nozzle in the process of glue spraying and prevent the glue from hanging and plugging, as shown in Fig. 5-2-11:

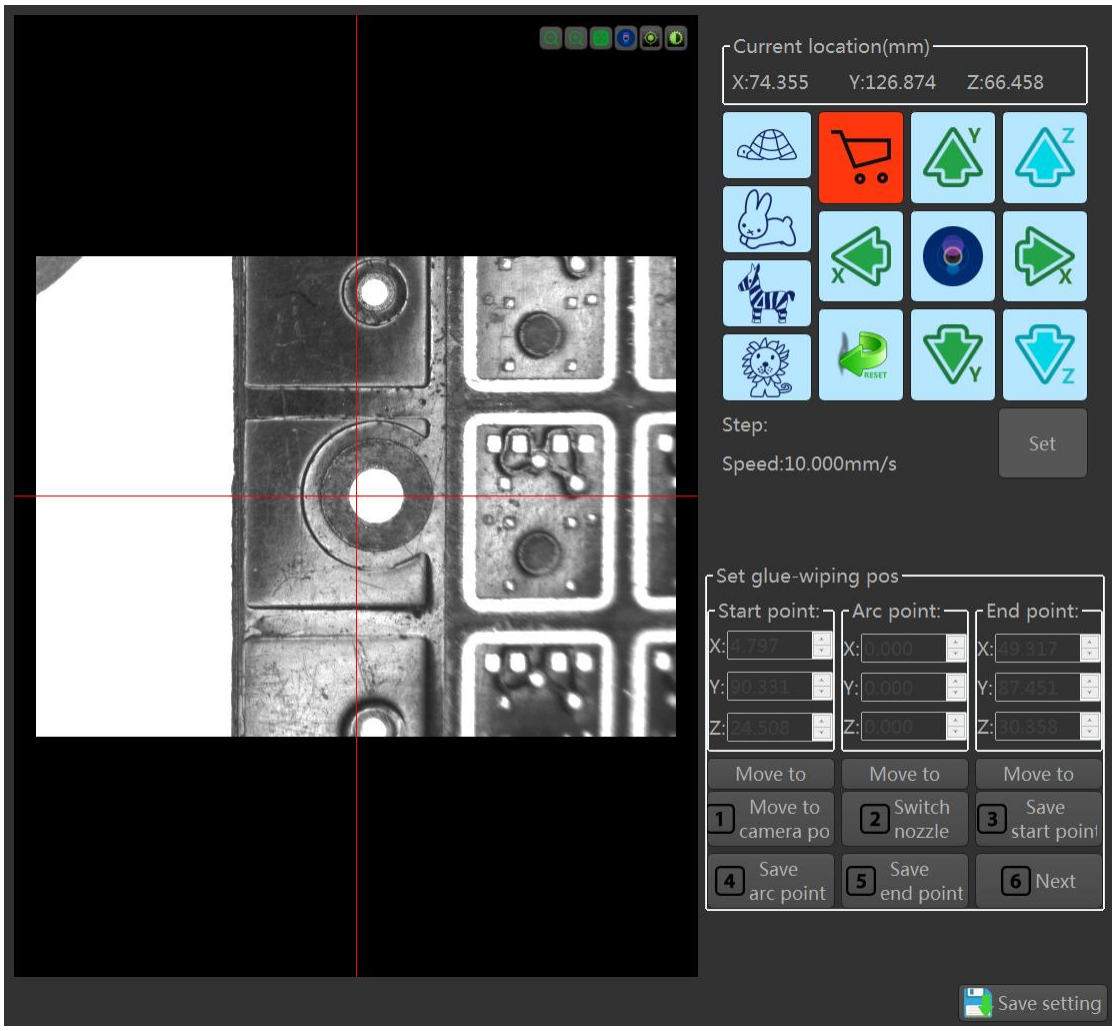


Fig. 5-2-11 Set wipe glue position

Move the camera to a certain position of the wiper, click the “Toggle Nozzle” button, the nozzle will automatically move to the top of the wiper, move the Z axis, make the nozzle come into contact with the wiper, and click the “Save Start” button to record The coordinate value at this time; move the nozzle, according to the actual situation, set the arc wiper or linear eraser, record the arc point or end point position; click the “Save Settings” button, and the eraser position setting is completed.

5.2.10 Set weighing position

The weighing operation is used to correct the speed of the spray at the job. During operation, the state of the valve and the change of the ambient temperature will cause changes in the amount of glue to be sprayed.

According to the weighing result, the amount of sprayed glue can be corrected to achieve better results, as shown in Fig. 5-2-12.

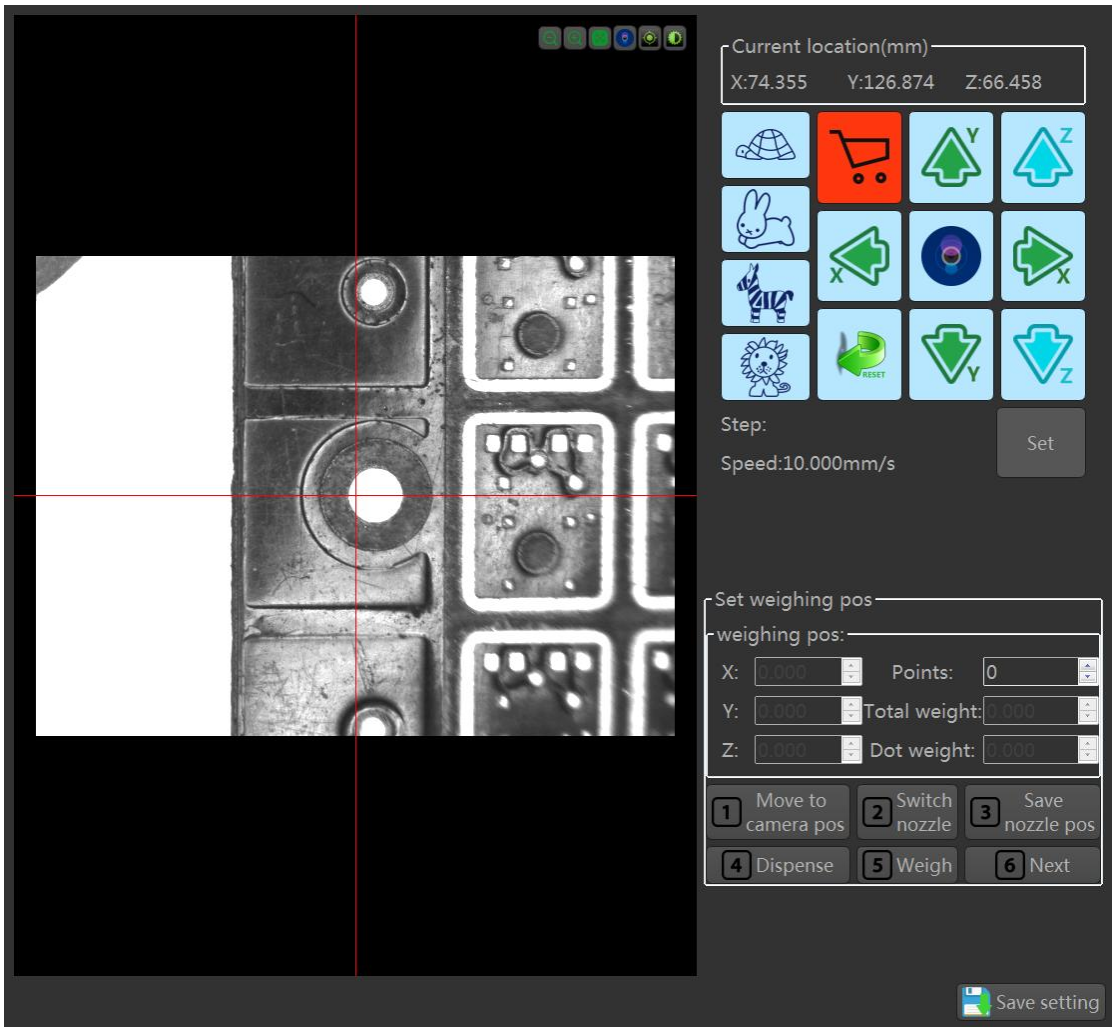


Fig. 5-2-12 Set weighing position

Move the camera to the center of the scale, click the "Switch Nozzle" button, the nozzle will automatically move above the scale, move the Z axis, set the appropriate glue height, click the "Save nozzle position" button, and record the coordinate value at this time;

Set the number of points to be called, click on the “Gum out” button, the machine will perform the suction and debinding operation first, and then the plastic on the weighing pan, and then obtain the weighing value to calculate

the single-point glue weight; click “save settings” The button, weighing position and parameter setting are completed.

5.2.11 Set track position deviation

Track position deviation setting is used to confirm the deviation relationship between track one and track two. During operation, the task of track one can be directly translated to track two, as shown in Figure 5-2-13.

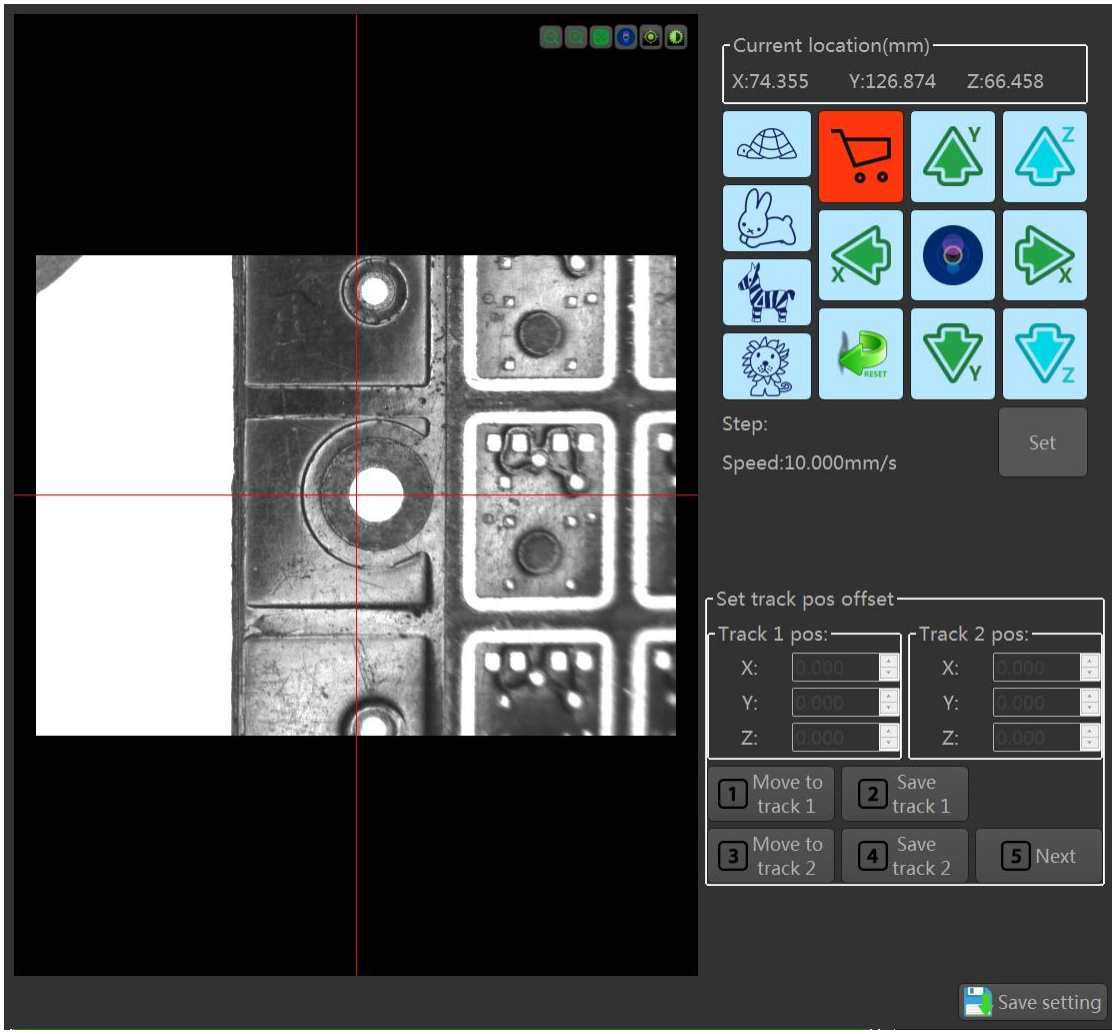


Fig. 5-2-13 Set track position deviation

Place a piece of tooling on track 1 and track 2 respectively, move the center of the camera to a position on the work piece of the track, and click the button “Save track position” to record the coordinate value at this time;
Move the center of the camera to the same position of the workpiece on the second track. Click the “Save Track 2 Position” button to record the coordinate value at this time. Click the “Save Settings” button to complete the track deviation setting.

5.3 Task teaching

Click the "Settings" button on the main interface to display the setting interface; click the "Task Teach" button to display the task teaching interface, as shown in Figure 5-3-1. Task teaching includes tasks such as creating a new task, adding a graph, adding a Mark, calling a task, placing a task, teaching a matrix, correcting a task, restoring a task, trajectory results, copying a task, deleting a task, displaying an image, saving a task, adding a trajectory, and the like.

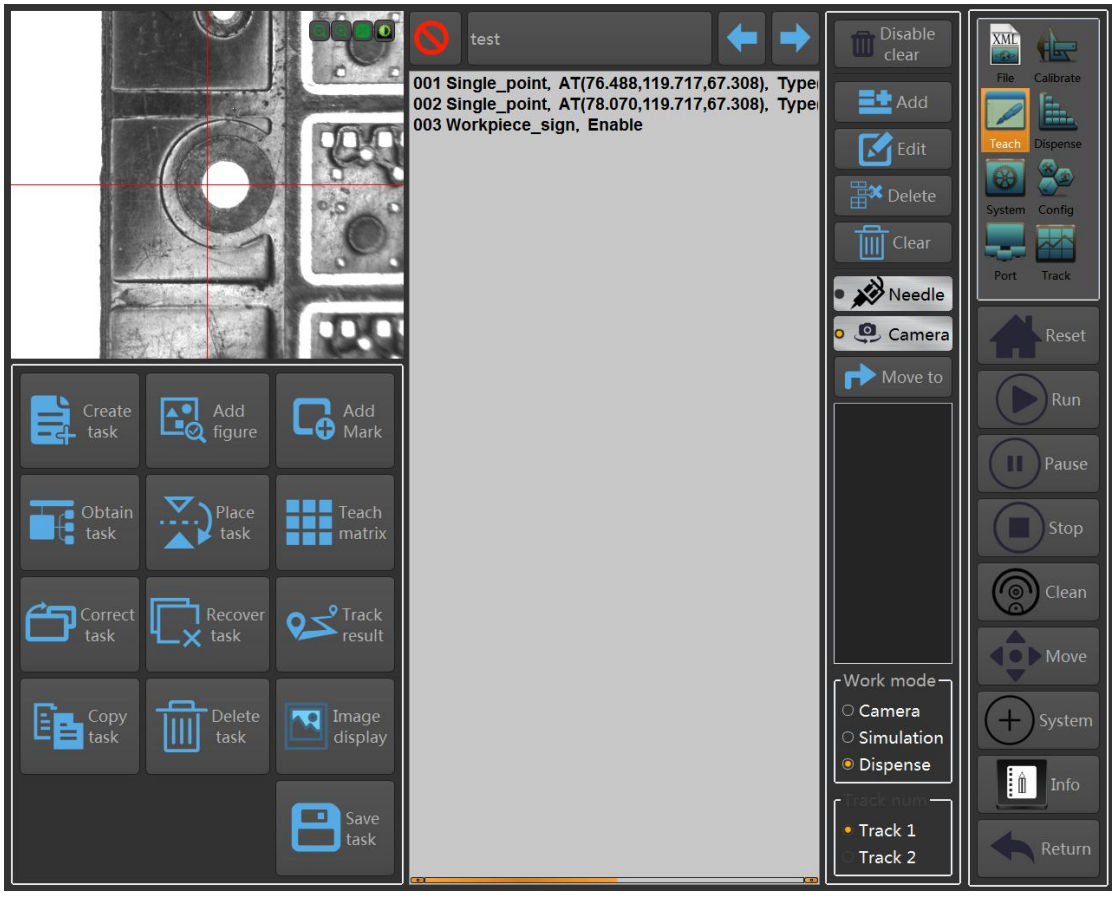


Fig.5-3-1 Task teaching

5.3.1 New task

Click the "New task" button to pop up the new task interface, as shown in Figure 5-3-2; enter the task name, click the confirmation button to start the task; after the task is established, a task file will be added to the task list above。

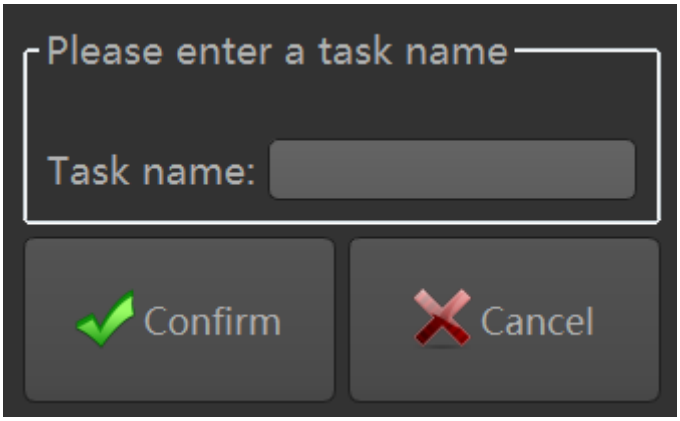


Fig. 5-3-2 New task

5.3.2 Add graphics

Click the "Add Graphic" button to pop up the Add Graphical Interface, as shown in Figure 5-3-3. Select the trace pattern to be added based on the actual workpiece condition.

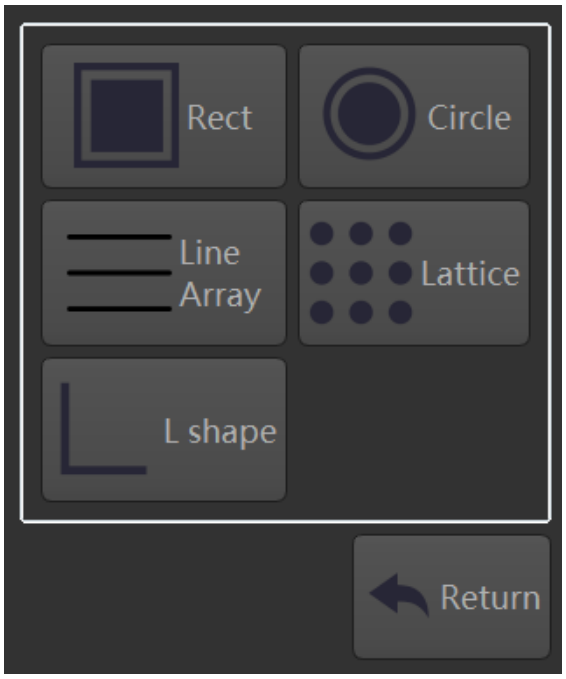


Fig. 5-3-3 Add graphics

5.3.3 Add Mark

Click the "Add Marker" button to pop up the Add Mark interface, as shown in Figure 5-3-4;

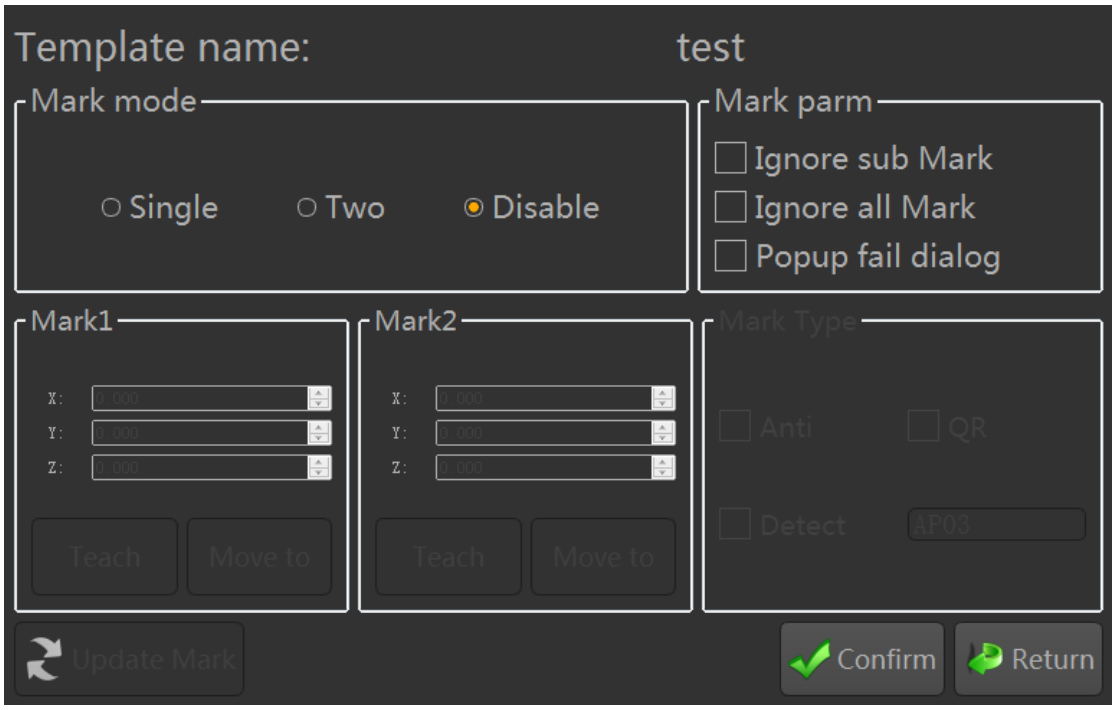


Fig. 5-3-4 Add Marker

Mark includes three modes: single point, two points, and disable. The disabled mode does not require a template image, and the task point can be set directly; single templates and multiple templates select different modes according to different workpieces.

The Marker type includes three modes: anti-reverse, two-dimensional code and detection. Anti-Mark is used to judge whether the position of the board is placed correctly; the QR code is used to identify the two-dimensional code information; the detection Mark is used to detect the glue effect.

Select the single-point mode and click the “Teach” button to pop up the Mark parameter setting interface, as shown in Figure 5-3-5.

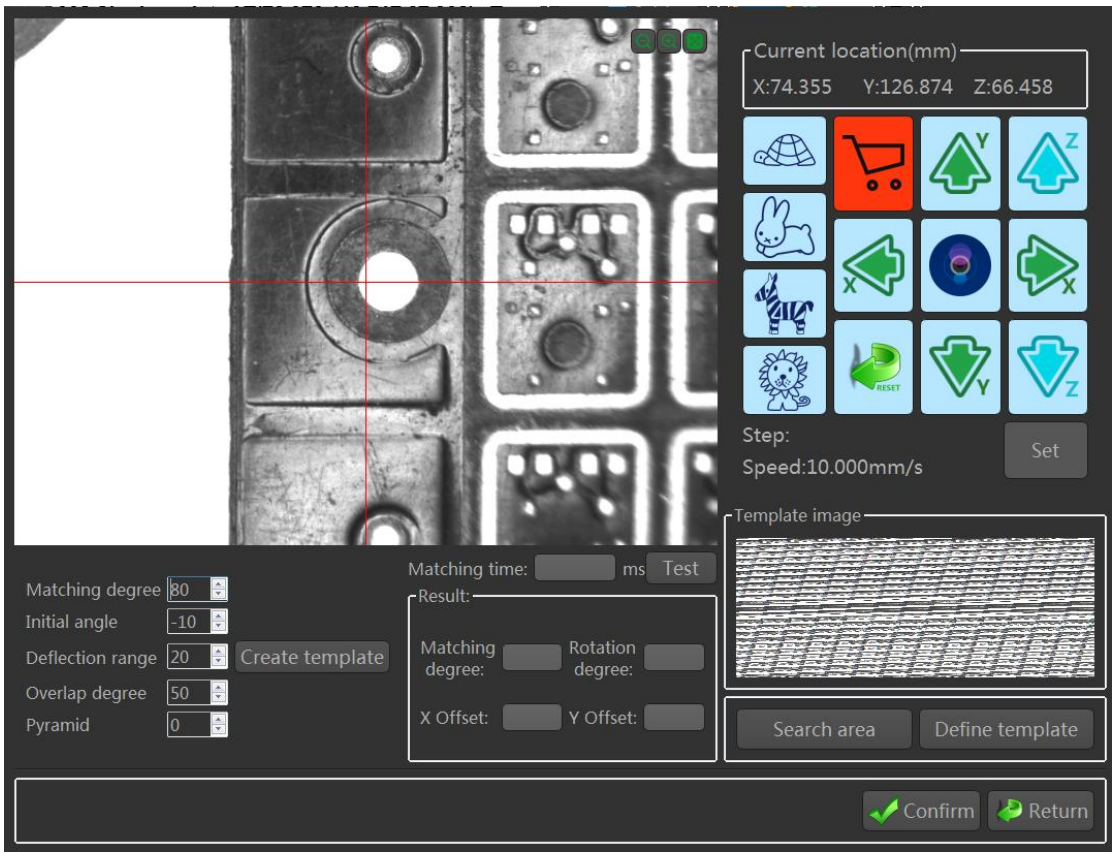


Fig. 5-3-5 Marker parameter

(1) Define the template, click the "definition template" button, pop-up template drawing interface, as shown in Figure 5-3-6; "containment area" is a visual matching area, as shown in the blue line, "deduction area" Matching part of the matching area does not participate in the matching, as shown by the green line; "contour" is the boundary resolution value, the smaller the contrast is; the click "confirm" button to complete the drawing

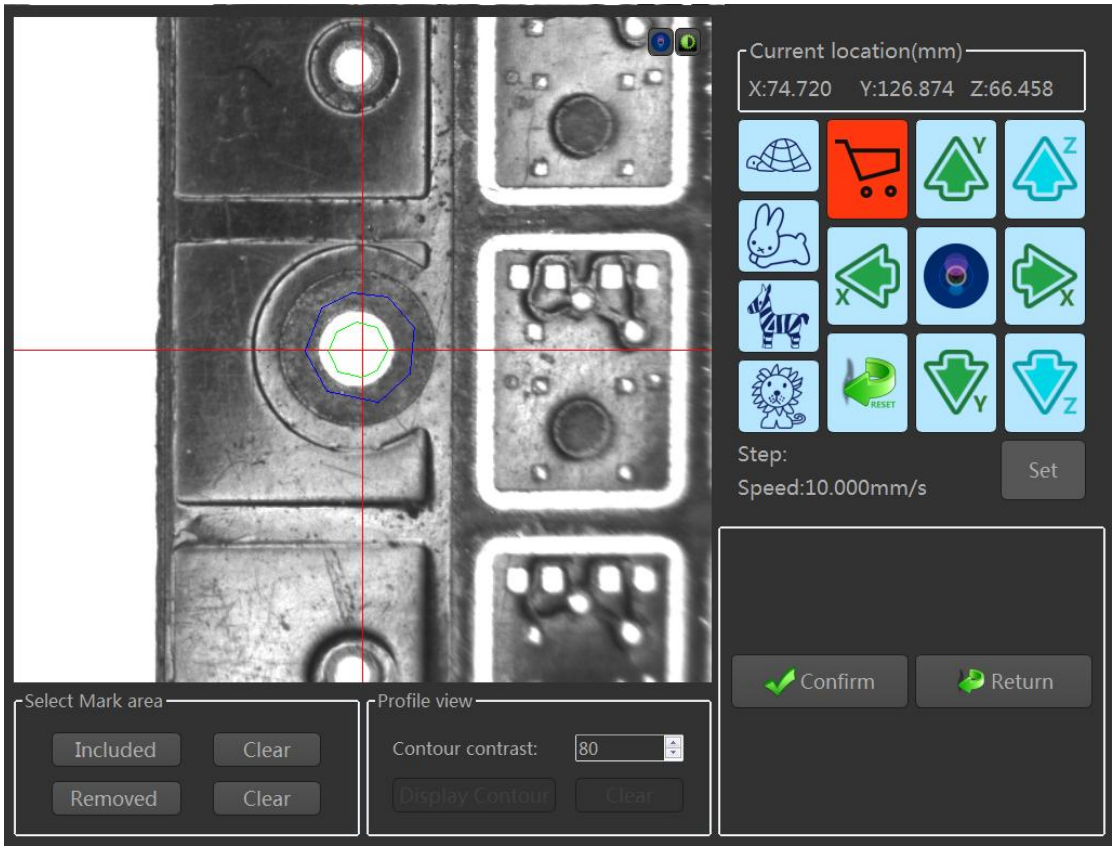


Fig. 5-3-6 Marker drawing

(2) In the search area, click the "Search area" button to pop up the search area drawing interface, as shown in Figure 5-3-7; hold down the left mouse button and drag the mouse to select a block area, and match only in this area Match; Click the "Confirm" button to finish drawing.

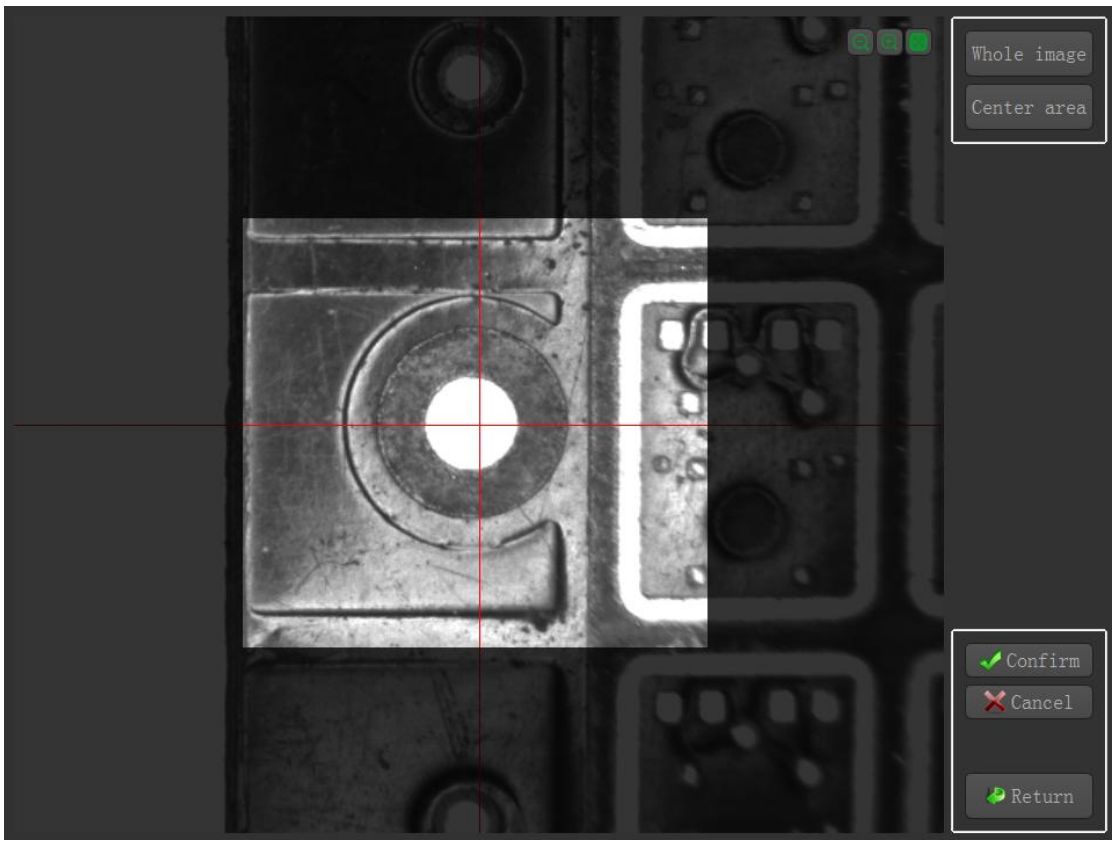


Fig. 5-3-7 Search area

(3) Create a template, modify the template parameters, and click the Create Template button. You can complete the creation; click the "Test" button to calculate the matching time, matching degree, rotation, and XY offset information.

The template parameters are shown in Table 1:
Table 1 Template parameters

Suitability	When the match degree is lower than this value, the match is considered invalid, generally set to 80 is more appropriate. The larger the parameter is, the faster the operation speed is, but for parts with more interference, the value can be appropriately reduced.
Starting angle	The current template image is the reference coordinate system. The starting angle is the angle that allows the image to rotate counterclockwise.
Deflection range	The maximum deflection angle of the parts in the parts and the template in the image to match. The smaller the value, the faster the value.
Degree	If more than one target area is found at the same location

of overlap	and different angles, the area to be returned is determined by the overlap parameter. The parameter range is 0-100, and the default is 50.
Pyramid layers	The larger the value, the less the matching time; the parameter range is 0-10

5.3.4 Calling task

Click on the "call task" button to pop up the call task interface, as shown in Figure 5-3-8;
Invoking tasks can be used in combination with multiple tasks. Select the task to be invoked from the task list, click the "Call" button, you can add to the main task, and you can set the number of calls.

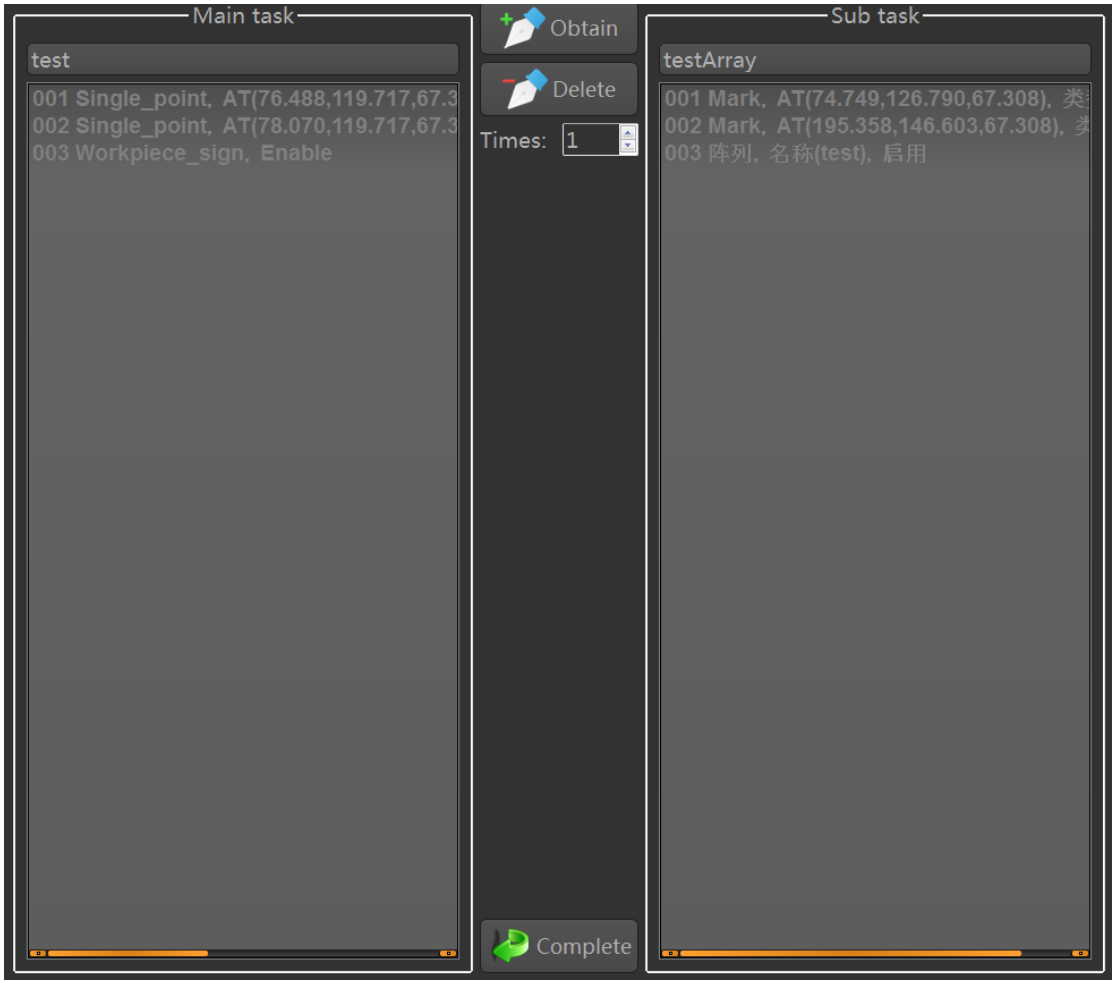


Fig. 5-3-8 Task call

5.3.5 Place the task

Click the "Place task" button, the pop-up task interface, as shown in Figure 5-3-9;

Fig. 5-3-9 Place the task

"Fiducial point": set the reference point position and calculate the deviation relationship between the placement task and the original task;
"Place task": You can select the original task you need to place and the rotation angle;
Click the "confirm" button to complete the placement.

5.3.6 Teaching matrix

Click the “Teaching Matrix” button to pop up the teaching matrix interface,

which can realize the workpiece array function, as shown in Figure 5-3-10.;

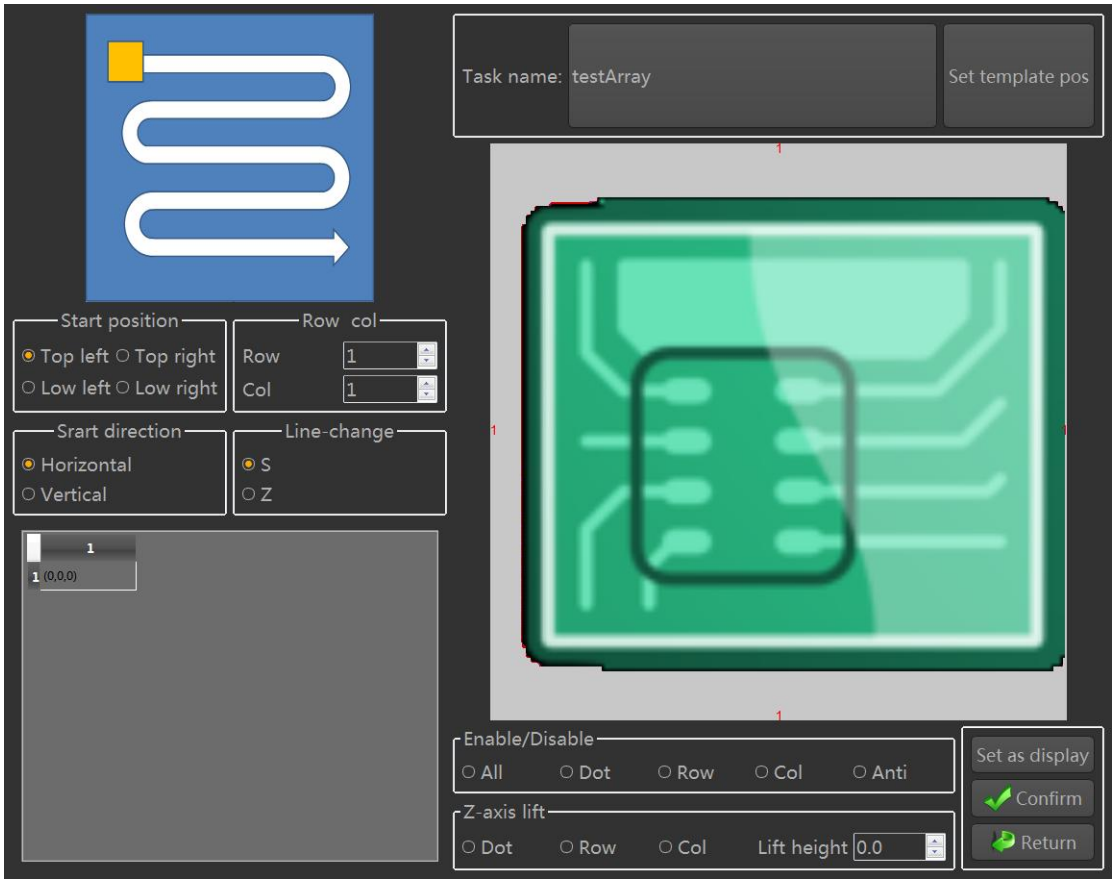


Fig. 5-3-10 Teaching matrix

"Start position": Select to start dispensing from the upper left corner, upper right corner, lower left corner, or lower right corner of the board;
"Number of rows and columns": set the number of rows and columns of the array;
"Starting direction": select horizontal or vertical dispensing;
"Line-feed direction": Select S-type or Z-type dispensing;
“array position”: Set the coordinates of the upper left point, lower left point, and upper right lighting of the array to calculate the array position information;
"Array task name": Select the task that requires the array, and set the template workpiece position to correctly calculate the array position information;
"Enable / disable": set the workpiece enable and disable status;
"Z axis lift": Set the Z axis at which workpiece position to perform the lifting action;
"Set as display array": array information displayed on the main screen;
Click the "OK" button to complete the setting.

5.3.7 Correction task

If the position of the workpiece changes, if you need to modify the track or array position information, you can click the "repair task" button, the machine performs a matching action and updates the track and array position information in order to modify the parameters.

5.3.8 Recovery task

If you need to cancel the correction task information, click the "restore task" button.

5.3.9 Copy tasks

Click the "Copy Task" button to pop up the copy task interface, enter a new task name, click OK to complete the task copy, as shown in Figure 5-3-11.

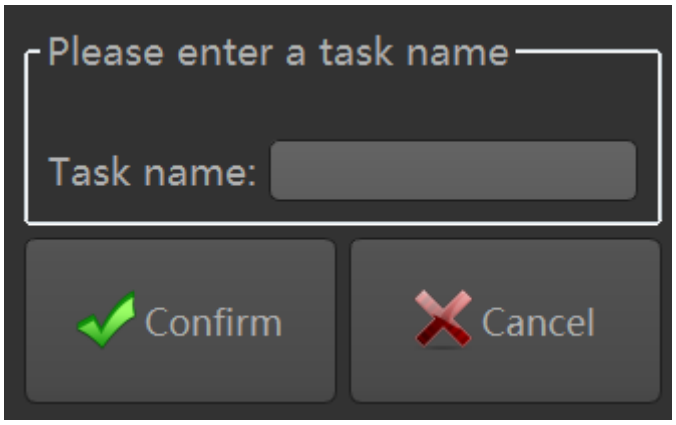


Fig. 5-3-11 Copy tasks

5.3.10 Delete task

Click the "Delete task" button, the delete task confirmation screen will pop up, select the "Yes" button to delete the task file, as shown in Figure 5-3-12

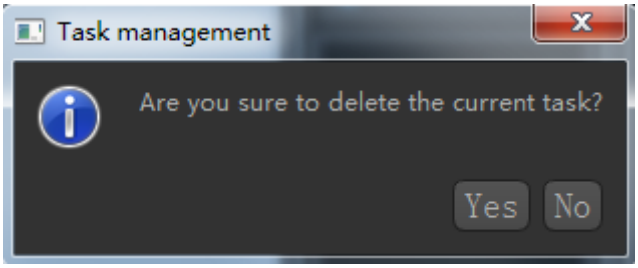


Fig. 5-3-12Delete task

5.3.11 Track results

Click the “Track Result” button. At this time, the track result interface will pop up. You can see the task track and confirm the dispensing effect, as shown in Figure 5-3-13.

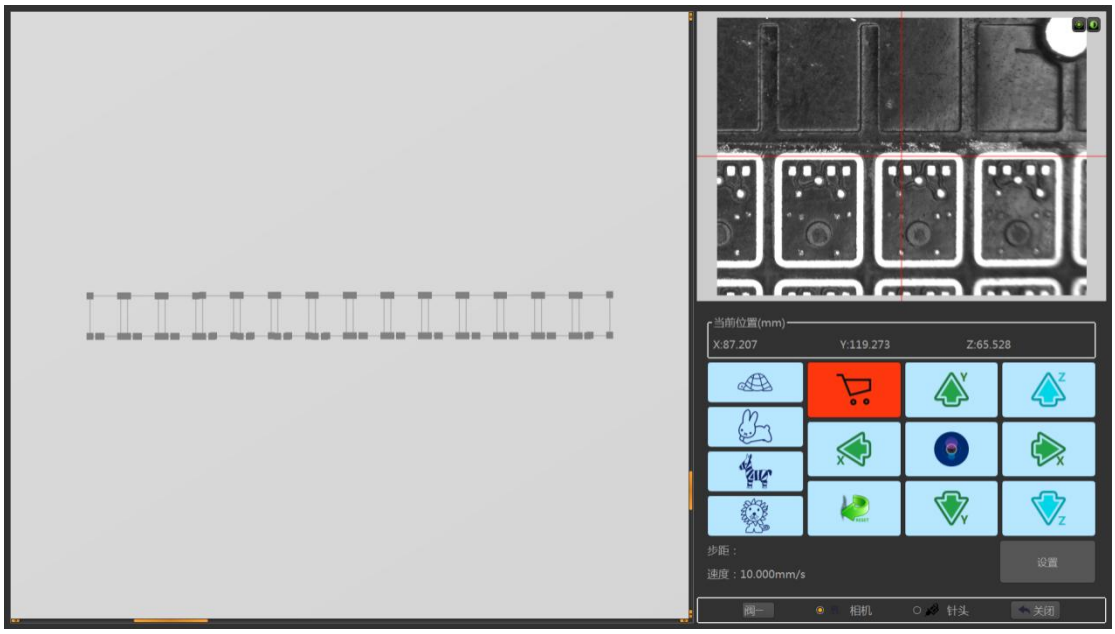


Fig. 5-3-13 Track results

The mouse arrow is placed in the track display area. Rotate the wheel to zoom in and out of the task track. Select the track point and click the left mouse button to position the camera or needle/nozzle at this position.

5.3.12 Image display

Click the "Image Display" button. At this time, the image display interface will pop up. You can view the Mark point image to confirm the photo effect, as shown in Figure 5-3-14.

Fig. 5-3-14 Image display

"Previous": Display previous image；
"Next": Displays the next image;
“Save picture”: Click this button to pop up the image save interface. After setting the save path, you can save the current image.

5.3.13 Task track

(1)Add track point: Click the "Add" button. At this time, the teaching track interface will pop up. You can add track points such as the independent point, height measurement point, workpiece mark, and board mark. You can set the point type, relative height, and glue Wait for information, as shown in Figure 5-3-15.

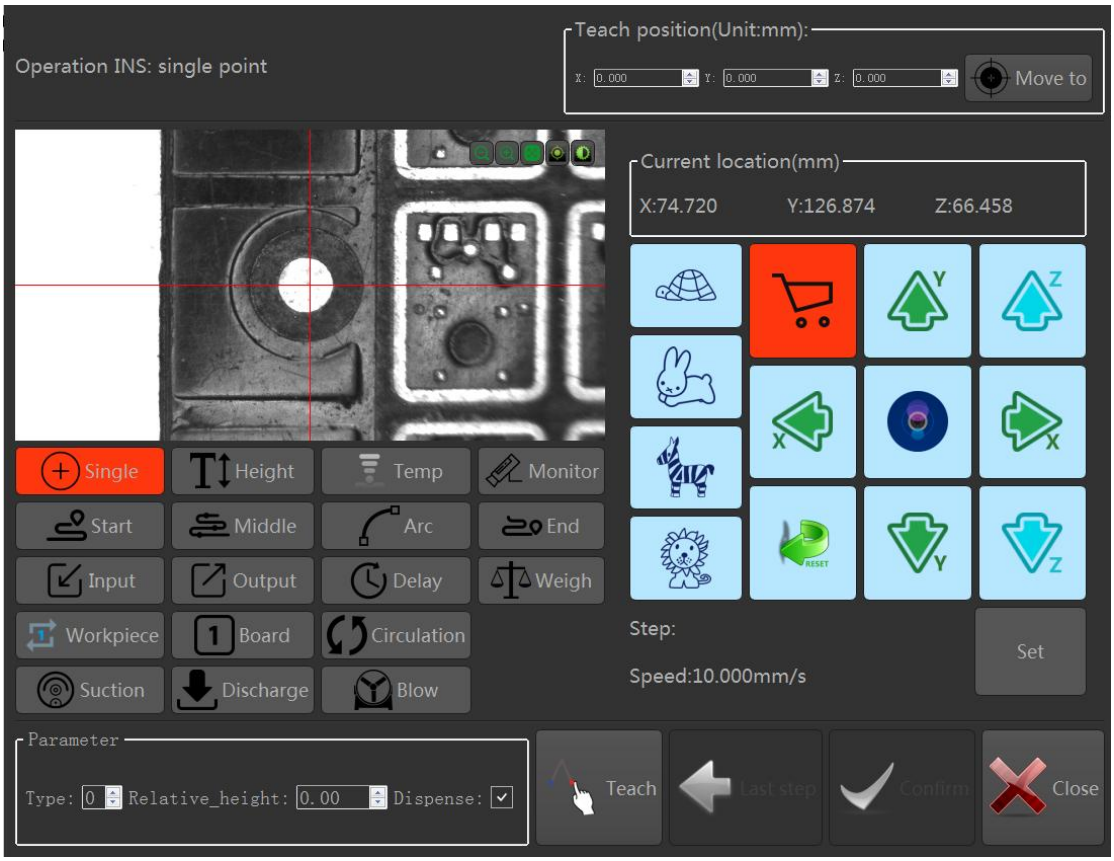


Fig. 5-3-15 Task teaching

- Select the independent point type, move the center of the camera cross to the workpiece dispensing position, select the point parameter type, set the relative height and whether the glue information, click the "Teaching", "Confirm" button, add the independent point to complete; add other types Points, the same operation.
- Independent point: The dispensing track is a point, before and after it can be inserted into the elevation point, independent point or starting point;
- Height measurement point: Elevation point: laser height position, used to correct the dispensing height, placed behind the Mark point, in front of other points;
- Temperature measurement point: Infrared temperature measurement position, used to test whether the temperature meets the requirements, placed behind the Mark point, in front of other points;
- Surveillance: Used to view dispensing results;
- Initial point: The dispensing task is the first point in the line or arc, before which you can insert an independent or elevation point, followed by an intermediate point, an arc point, or an end point;
- Intermediate point: When the dispensing task is a point other than the

first and last point in the line, it can be a middle point and an arc point before and after, and if there is no end point after that, you can also insert the end point.;

- Arc point: The dispensing task is the middle point of the arc, which can be the starting point or the middle point before, and can be followed by the middle point or the end point.
- End point: The last point of a line or arc is the dispensing task. The front point can be a starting point, an intermediate point, or an arc point. After that, you can insert an elevation point or an independent point.
- Delay: waiting time when dispensing tasks, can be placed behind the independent and end points;
- Weighing: weighing when dispensing tasks, correcting dispensing speed;
- Workpiece mark: mark the minimum workpiece, used for counting, cleaning and other operations;
- Workers board mark: the end of the calibration work plate;
- Cycles: Set the number of cycles performed this task;
- Suction: When the dispensing task is performed, the suction action is performed to prevent the glue from being applied.;
- Discharging: When the dispensing task is performed, the discharging operation is performed to prevent the glue from hanging.;
- Blowing glue: When the dispensing task is performed, the blowing action is performed to prevent the glue from being applied.

(2)Edit track point: Select the track instruction, and click the “Edit” button to pop up the editing interface, as shown in Figure 5-3-16; You can modify the point type, point location coordinates, whether the glue is out, point parameter type and other information.

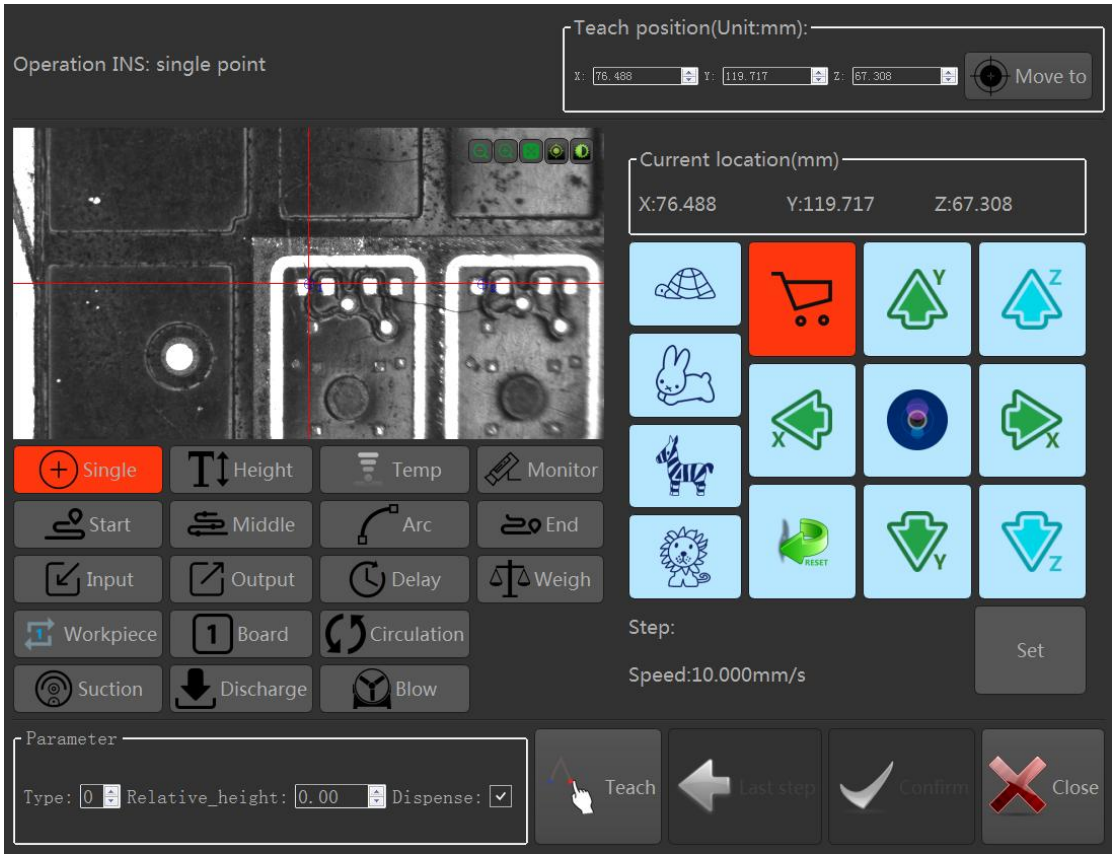


Fig. 5-3-16 Task teaching

(3) Delete track point: Select the track instruction to be deleted, click “Delete” button to pop up the confirmation interface, click “Yes” to delete.
(4) Clear track point: Click "Clear" button to pop up confirmation clear interface, click "Yes" to clear all tracks
(5) Run to: Select the track instruction you want to view and click the run To button to position the camera center or needle/nozzle at that location.
(6) Disable Clear: Click the “Disable Clear” button to clear the disabled workpieces during the debugging process to prevent leaks during automatic operation.。

5.4 System settings

Click the "Settings" button on the main interface to display the setting interface; click the "System Settings" button to jump to the system setting interface. The system settings include operation parameter settings, laser height parameter settings, infrared temperature parameter settings, and orbital parameter settings as shown in Figure 5-4-1.

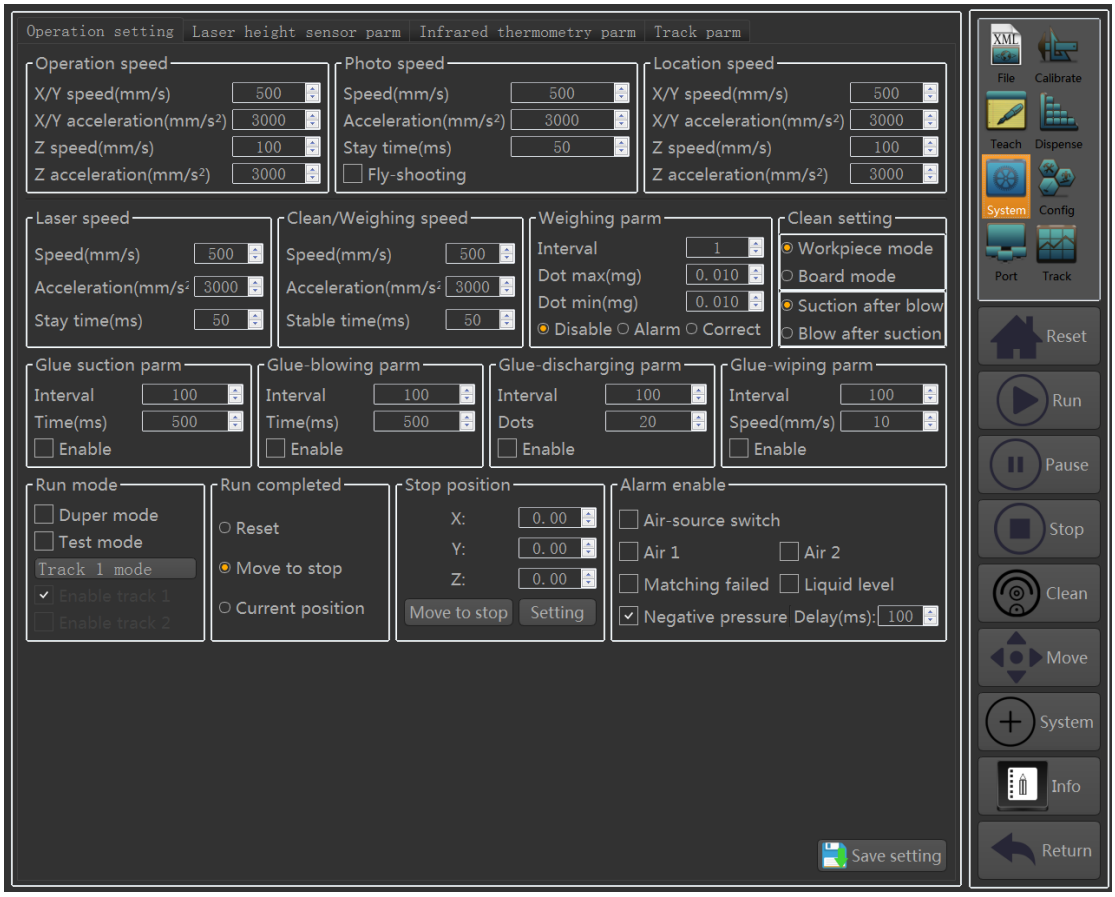


Fig. 5-4-1Task teaching

5.4.1 Operating parameters

The operation parameter settings include the motion speed parameters, operation mode parameters, clearing parameters, and alarm parameters, as shown in Figure 5-4-2.

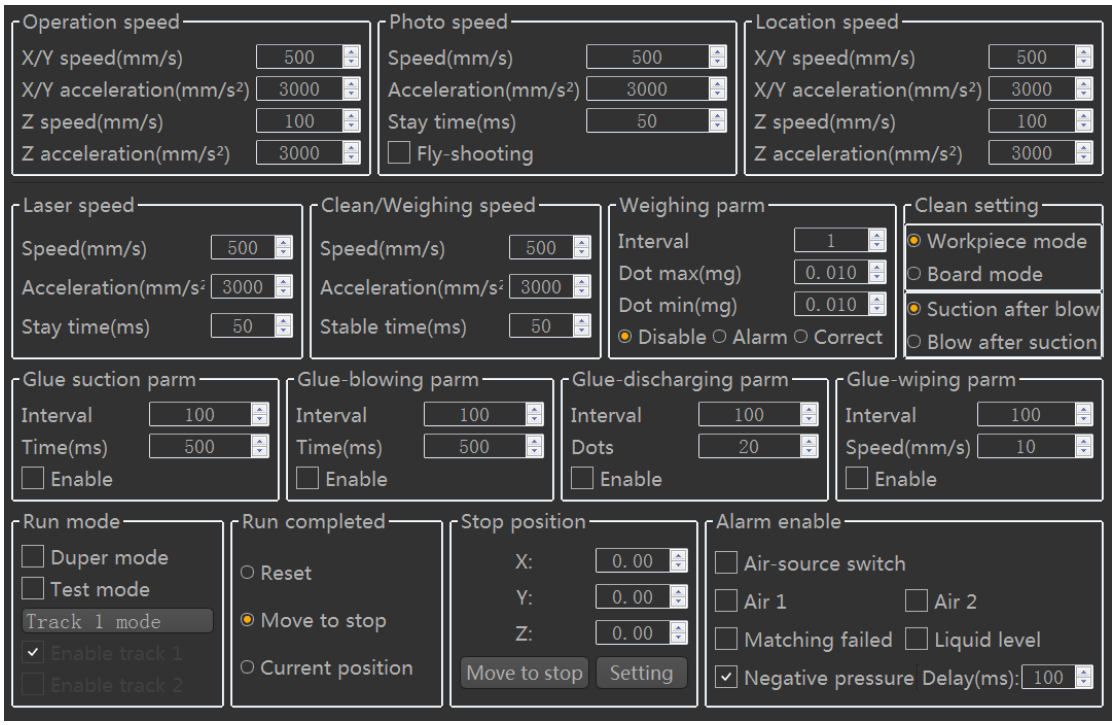


Fig. 5-4-2 Task teaching

- Running speed: the speed of the machine during dispensing;
- Photographing speed: When the camera is matched, the speed of the machine movement;
- Manual Positioning Speed: The speed of the machine's movement when the positioning operation is performed manually;
- Laser height measurement speed: the speed of machine movement when the laser performs height measurement;
- Clearance/Weighing Speed: The speed of the machine when performing a glue or weighing operation;
- Weighing parameters: set the weighing interval, the amount of single glue is limited to the weighing type parameters;
- Clearance setting: workpiece pattern takes the workpiece as the unit, and the statistical glue interval; the workboard pattern takes the workboard as the unit, and statistics the glue interval; you can set the order of blowing glue and absorbing glue;
- Suction parameters: You can set the glue interval, glue time, enable information;
- Discharging parameters: You can set the discharging interval, the number of dehydration points, enable information;
- Blowing parameters: You can set blowing interval, blowing time, enabling information;
- Wiping parameters: You can set the erase interval, erase speed, enable information;

- Operation mode: The pager mode is used for machine test, and the cycle operation task; track mode is used for track 1 and track 2 enable settings;
- Run complete: the task execution is completed, the machine can stop to zero position, stop bit or current position;
- Alarm enable: set the match failure, night pressure, air pressure, liquid level detection, negative pressure alarm enabled;

After the setting is completed, click the "Save Settings" button to complete the parameter setting

5.4.2 Laser height measurement parameters

The laser height parameter settings are mainly used to calibrate the dispensing height or alarm, including ten parameter types, as shown in Figure 5-4-3.

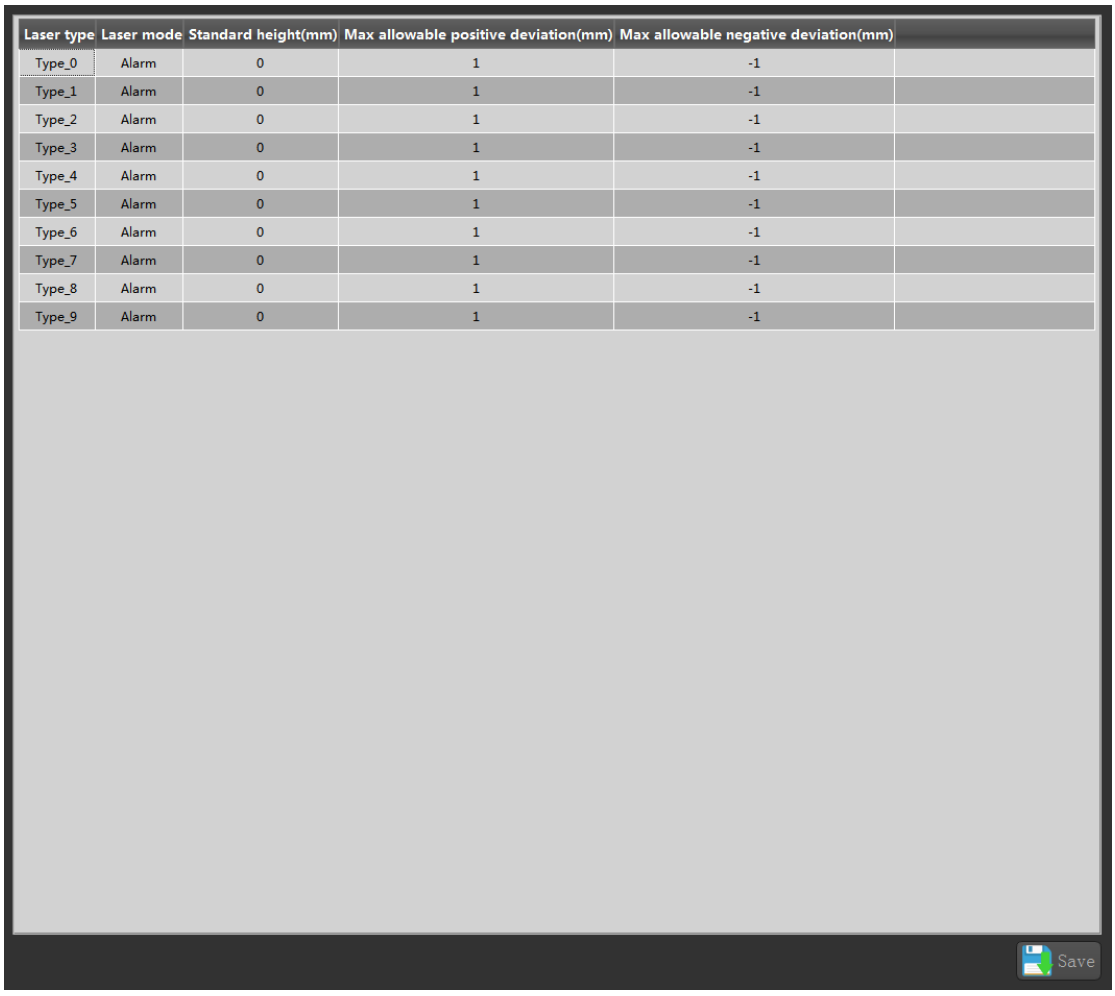


Fig. 5-4-3 Laser height measurement parameters

Laser Altimeter Mode: Includes Alarm and Calibration;

Standard height: set the laser reading when the laser height position, in millimeters, defaults to zero;
The maximum allowable deviation forward: maximum deviation, in millimeters;
The maximum allowable negative deviation: minimum deviation, in millimeters;

After the setting is complete, click the "Save" button to complete the parameter setting

5.4.3 Infrared temperature measurement parameters

Infrared temperature measurement parameter settings are mainly used to heat the temperature alarm, including ten types of parameters, as shown in Figure 5-4-4.

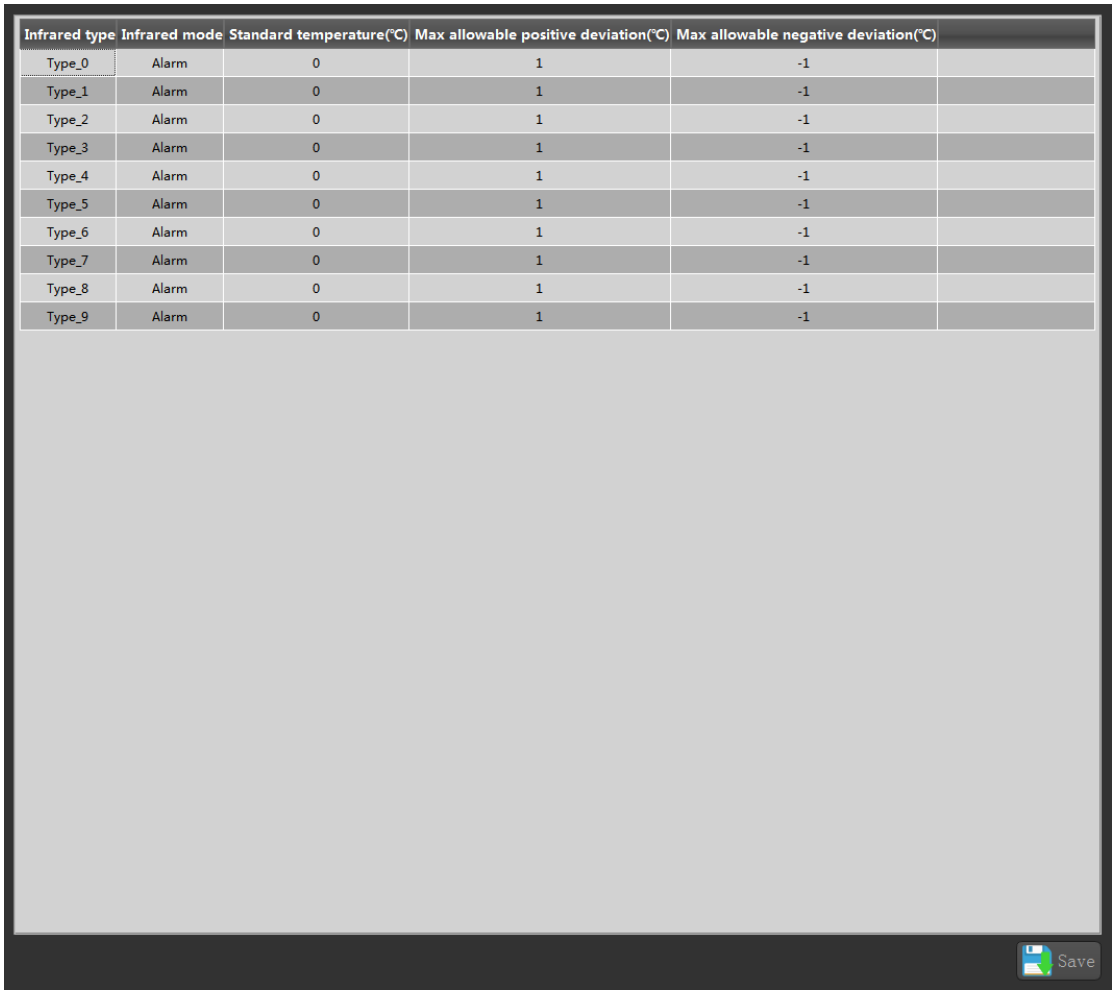


Fig. 5-4-4 Infrared temperature measurement parameters

- Infrared temperature measurement mode: including alarm and calibration;

- Normal temperature: set the infrared temperature standard temperature, in degrees Celsius;
- The maximum allowable positive deviation: the maximum deviation range, in degrees Celsius;
- The maximum allowable negative deviation: the minimum deviation range, in degrees Celsius;

After the settings are complete, click the "Save" button to complete the parameter settings.

5.4.4 Orbital parameters

The track parameter setting is mainly used to set the heating warm-up time, temperature measurement waiting time and holding time, as shown in Figure 5-4-5.

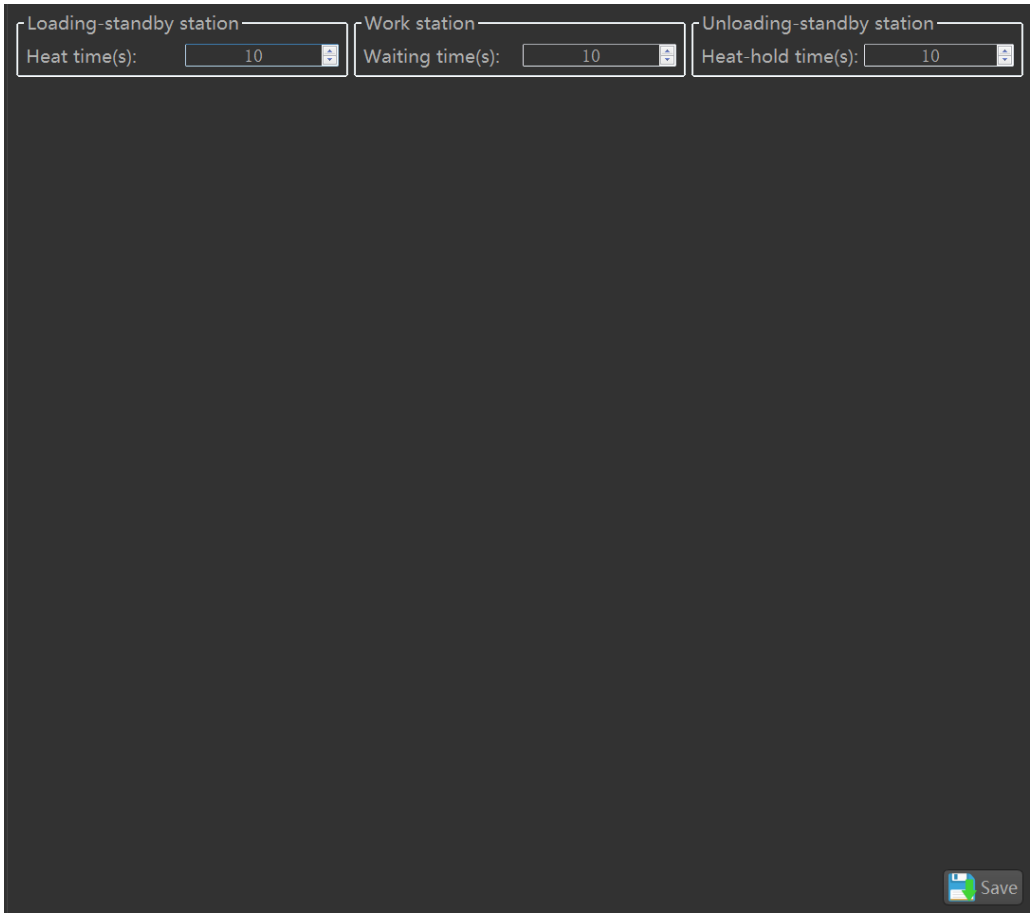


Fig. 5-4-5 Orbital parameters

Warm-up time: After the "warm-up time" time, the workboard is re-transferred

to the spray gun position;
Temperature measurement waiting time: If the temperature does not meet the requirements, after the "temperature measurement waiting time" time, again temperature measurement, know that meet the requirements;
Insulation time: After the “holding time” time, the board is transferred to the silo;

After the settings are complete, click the "Save" button to complete the parameter settings.

5.5 Dispensing parameters

Click the "Settings" button on the main interface to display the setting interface; click the "Dispensing Parameters" button to jump to the dispensing setting interface. The dispensing parameter setting is mainly used to set the relevant parameters of each task point in the glue spraying task. , as shown in Figure 5-5-1.

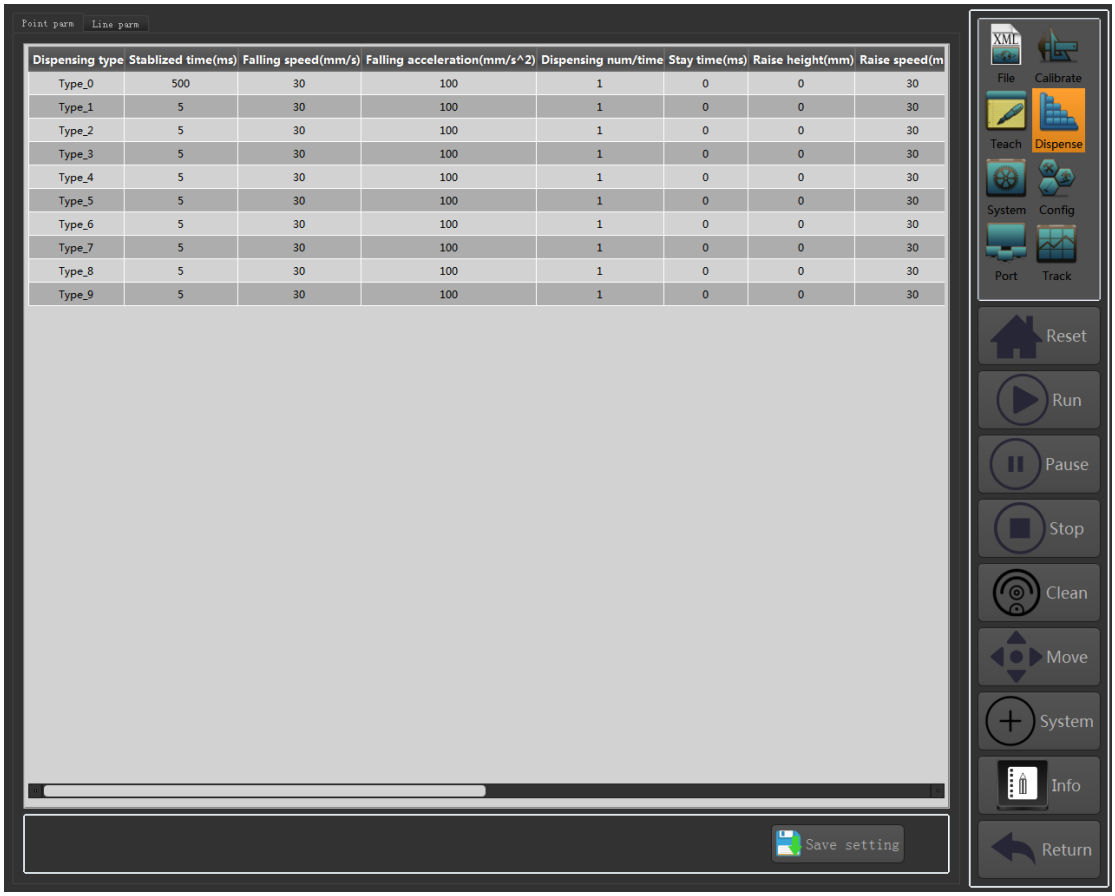


Fig.5-5-1 Dispensing parameters

5.5.1 Point parameters

The point parameter is mainly used to set the gluing parameters of the independent points in the gluing task, including ten parameter types. The meanings of the independent point parameters are shown in Table 2,Table 2 Independent point parameters:

Stability time	After the needle has been moved to the independent point, after a stabilization time, the adhesive is dispensed.
The rate of decline	The speed at which the Z axis drops to the specified position after the XY axis of the dispenser runs to the independent point
Falling acceleration	After the XY axis of the dispenser moves to the independent point, the acceleration when the Z axis drops to the specified position
Plastic points / time	If glue out is allowed, when the needle runs to the independent point, the glue signal will be output first and the glue will be started. After the glue time, the glue will stop.
Stay time	At the end of the glue-out time, the glue signal is first stopped. After the dwell time, the pattern track behind the point is run again.
Lift height	The height position where the Z axis can move after running the independent point
Lift speed	Z-axis lift speed after running an independent point
Lift acceleration	Z-axis acceleration after running an independent point
Oblique insertion height	Before the dispenser runs to the independent point, insert the height distance obliquely from the independent point, and insert it obliquely to the independent point according to the oblique insertion direction and the horizontal distance of the oblique insertion, and then return according to the original path.
Inclined horizontal distance	Before the dispenser runs to the independent point, insert the horizontal distance from the independent point obliquely. Insert the oblique distance to the independent point according to the oblique insertion direction and the oblique insertion height, and then return to the original point.
Oblique insertion direction	A total of eight directions, according to the direction of the arrow, the needle moves to the independent point in the oblique insertion direction

5.5.2 Initial point parameters

The starting point parameter is mainly used to set the gluing parameters of the starting point in the gluing task, including ten parameter types. The meaning of the starting point parameters is shown in Table 3:

Table 3 starting point parameters:

Stability time	The needle runs to the starting point and after a stabilization time, the glue is released.
Stay glue time	The needle moves to the starting point, after which it stays out of glue, it moves again.
Pre-run distance	After the needle has passed the pre-run distance, it runs to the starting point position to ensure uniform dispensing speed.
The distance traveled in advance.	The needle begins to dispense glue at the glue-out distance, and then runs to the starting point.
Dispensing speed	From this point on, to the next intermediate or end point, the speed of the machine
Dispensing acceleration	From this point on, to the next intermediate point or end point, the acceleration of the machine runs

5.5.3 Midpoint parameters

The middle point parameter is mainly used to set the glueing parameters of the middle point in the glueing task, including ten kinds of parameter types. The meanings of the middle point parameters are shown in Table 4.

Table 4 Midpoint parameters:

Dispensing speed	From this point on, to the next intermediate or end point, the speed of the machine
Dispensing acceleration	From this point on, to the next intermediate point or end point, the acceleration of the machine runs
Corner radius	The radius of the arc transition between the two tracks before and after the middle point
Arc speed	Arc trajectory, speed of machine operation
Stop the glue distance in advance	Before the middle point, "advance glue distance in advance" and start to stop glue

Lag distance glue	After passing through the middle point, after the "lag plastic distance," began to glue out
Pre-run distance	After pre-running distance, run to this point
The distance traveled in advance.	Begin glue at the position of advance glue, and then run the position
Delay distance	Stop the glue out of the distance

5.5.4 End point parameters

The end point parameter is mainly used to set the gluing parameters at the end point in the gluing task, including ten parameter types. The meaning of the end point parameter is shown in Table 5.

Table 5 End point parameters:

Stay time	When the dispensing machine runs to the end point, the glue signal is stopped first. After the dwell time, the graphic track behind the point is run.
Lift height	The height to which the Z axis can move after the dispenser reaches the end point
Lift speed	Z axis lift speed after the dispenser reaches the end point
Lift acceleration	Z axis lift acceleration after the dispenser reaches the end point
Delay distance	After the dispenser runs to the end point, it will select the deferred route according to the shape of the job graphic so that the glue will not be collected at the end point.
Delay closing time	After the dispenser reaches the end point, it waits for the delay time and then stops dispensing.
Return wiping distance	After the dispenser runs to the end point, the original route runs back for a while
Return wiping height	After the dispenser runs to the end point, after raising a certain distance, the original route runs back for a while
Return wiping speed	After the dispenser runs to the end point, the speed at the time of wiping

5.5.5 Weighing correction parameters

Weighing correction is based on the actual changes in the environment automatically change the glue speed to achieve a better coating effect, the calibration parameters shown in Figure 5-5-2.

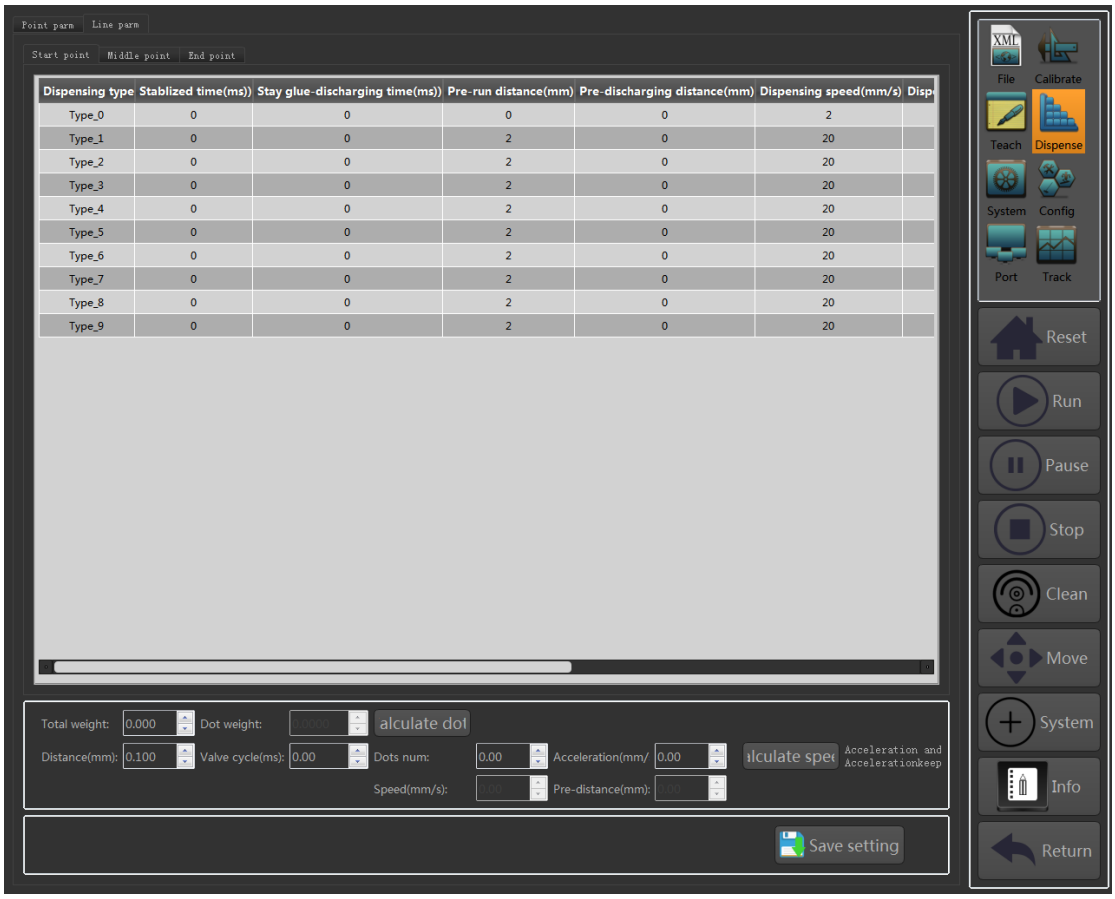


Fig. 5-5-2 Weighing correction parameters

- Total weight of glue: the amount of glue required for the workpiece gluing track;
- Distance: The total length of the track;
- Glue point weight: the weight of a single glue point, the system calibration has been calculated;
- Valve cycle: the time required for the valve to spray a glue point;
- Acceleration: Acceleration during trajectory operation;
- According to the above several parameters, correct the dispensing speed when gluing.

5.6 Serial Port Settings

Click the "Settings" button on the main interface to display the setting interface; click the "Serial Device" button to jump to the serial device interface. The serial device is mainly used to set the dispensing controller, temperature control, track, and weighing test. Height measurement parameters related to temperature measurement, as shown in Figure 5-6-1.

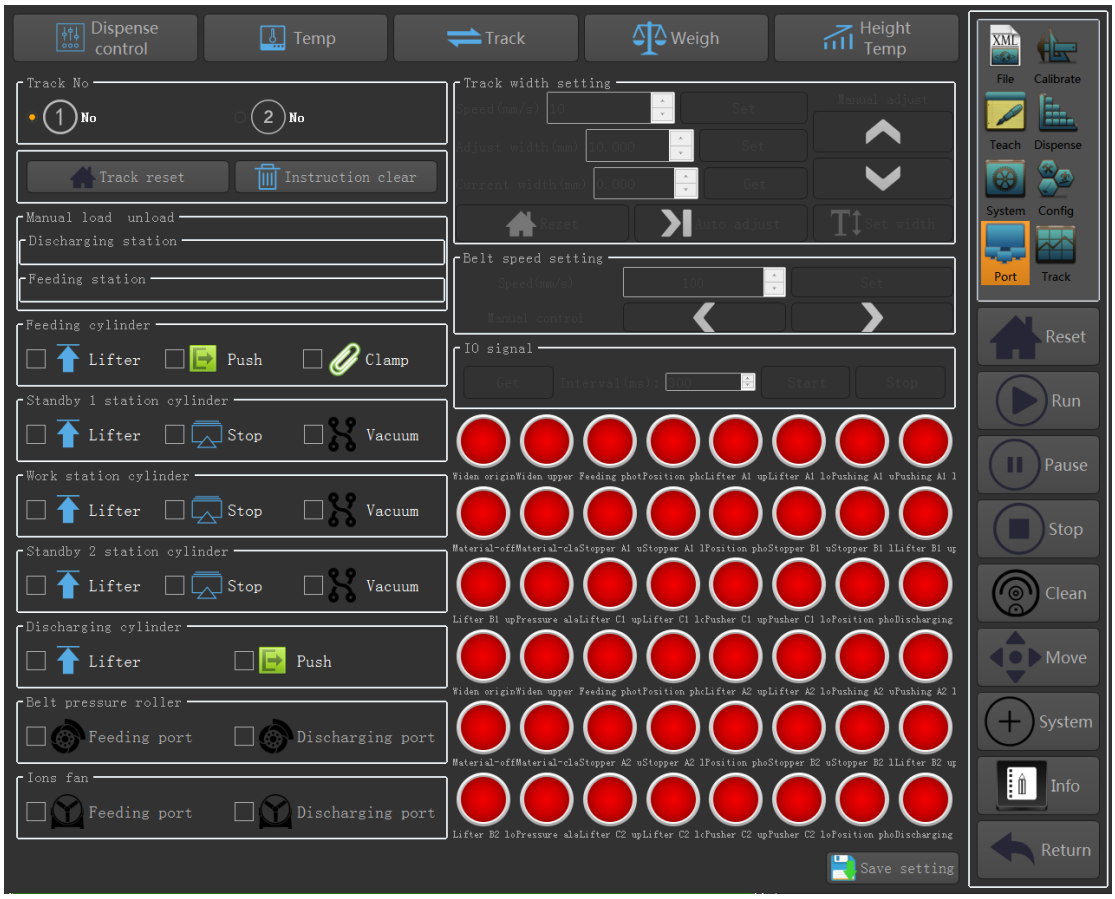


Fig. 5-6-1 Serial device

5.6.1 Dispensing control parameters

Dispensing control is mainly used to set dispensing controller pressure and dispensing controller parameters, as shown in Figure 5-6-2.

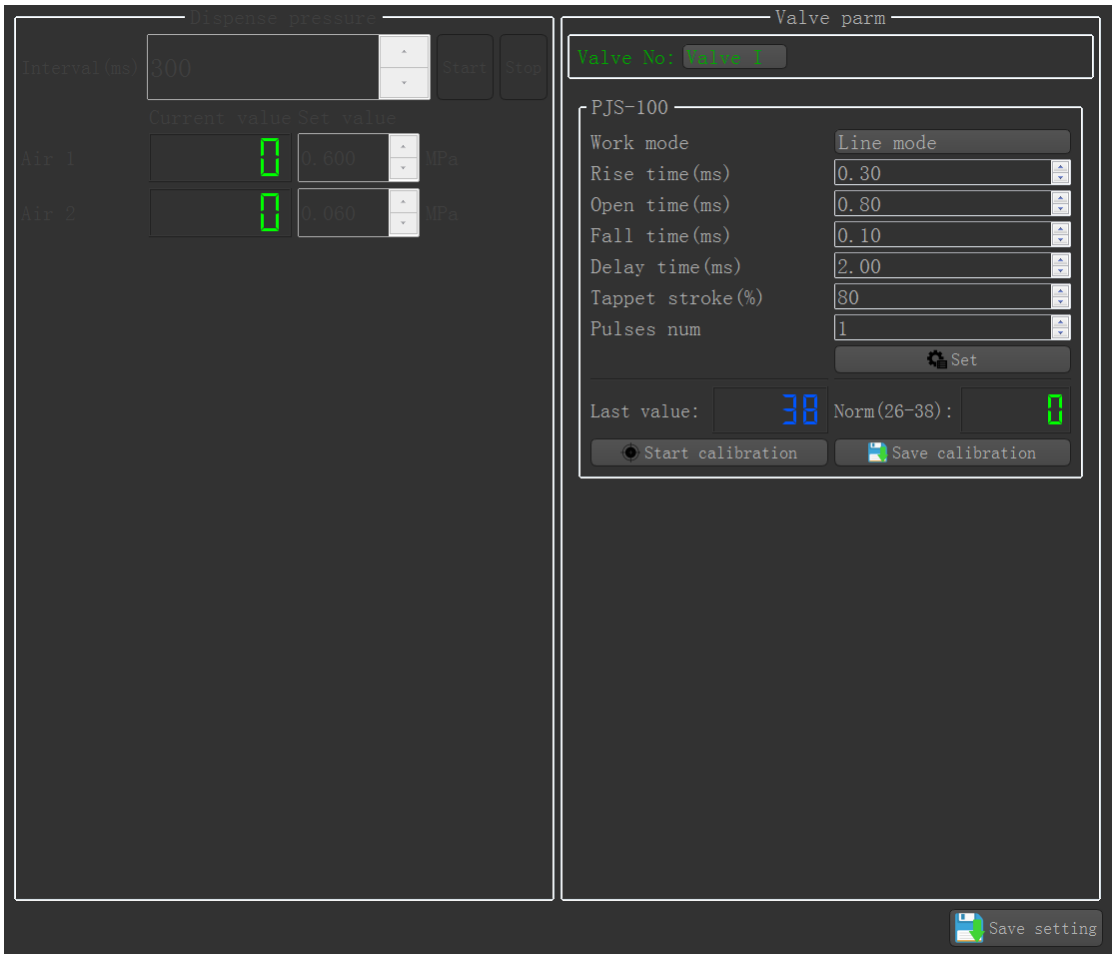


Fig. 5-6-2 Dispensing control parameters

- Spray glue pressure: set the maximum input pressure, can be modified according to the dispensing effect; set the interval time, you can cycle read the input pressure value;
- Valve parameters: control the controller parameters through serial communication;

Click the "Save Settings" button to save the parameter settings

5.6.2 Temperature control parameters

The temperature control is mainly used to set the temperature parameter of the heating module, as shown in Figure 5-6-3.

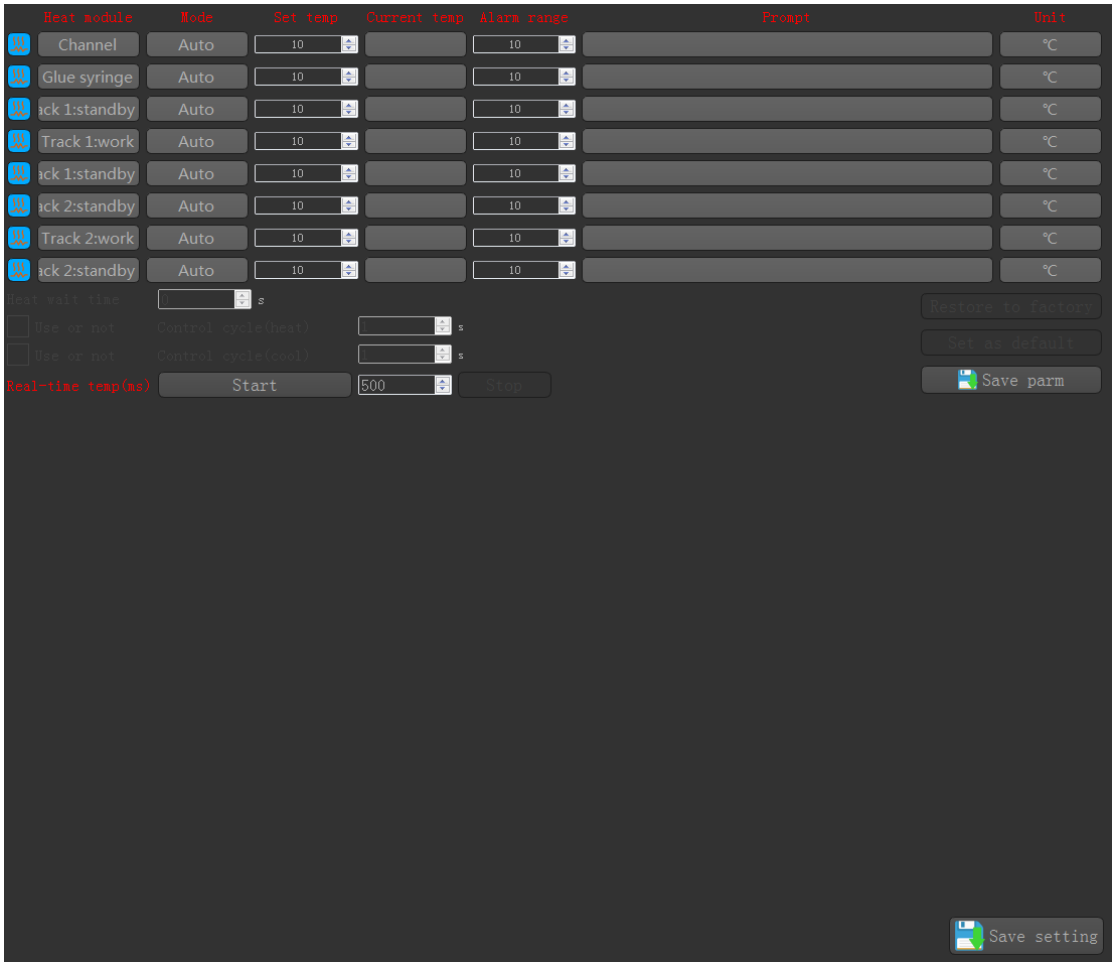


Fig. 5-6-3 Temperature control parameters

- Set temperature: Different heating modules can set different heating temperatures;
- Current temperature: Real-time display of the current temperature of different modules;
- Alarm range: alarm when the temperature exceeds the upper and lower limits;

Click the "Save Settings" button to save the parameter settings

5.6.3 Orbital parameters

The track is mainly used to control the orbital operation and the cylinder state, as shown in Figure 5-6-4.

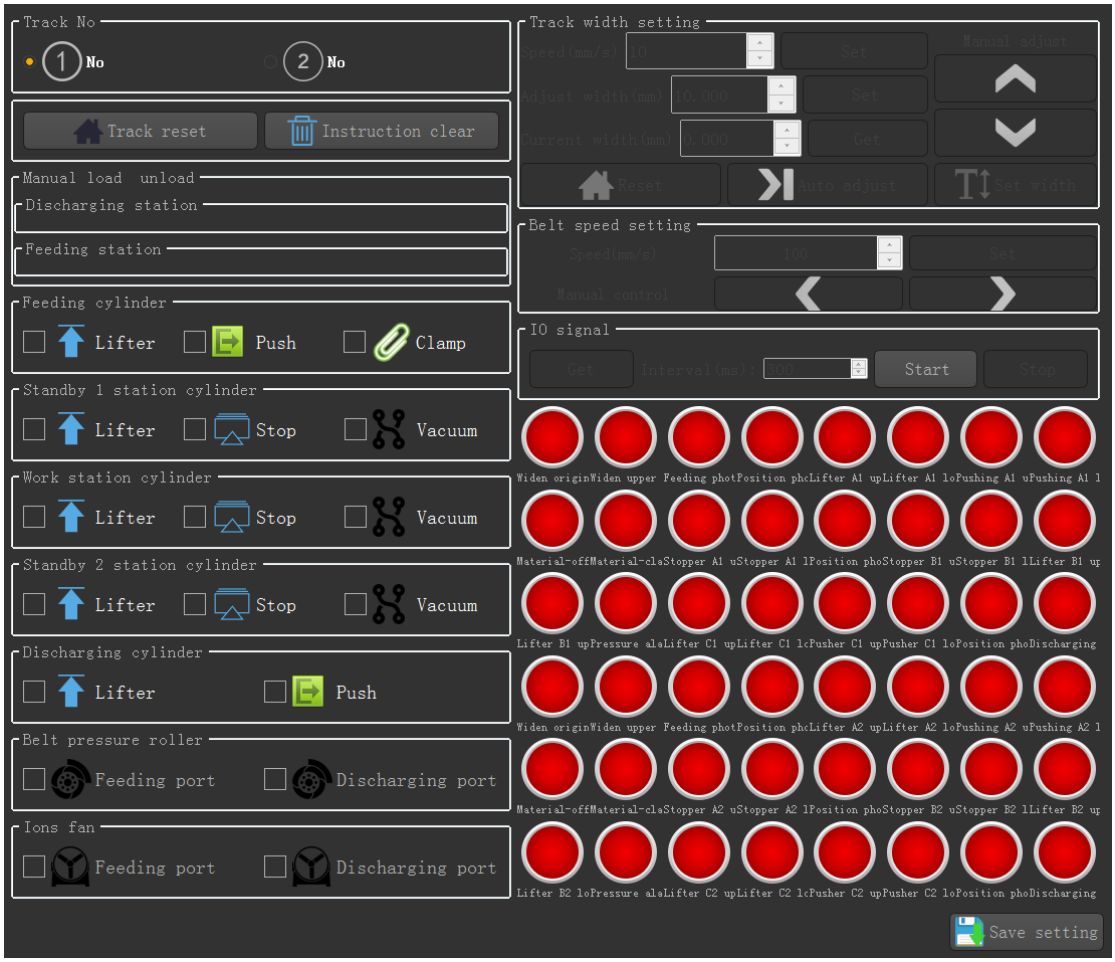


Fig. 5-6-4 Orbital parameters

- Track number: select control track one or track two;
- Track reset: Track components are moved to initial position;
- Instruction Clear: Clear all run instructions of the track;
- Manual loading and unloading: control the movement of the board to the designated station;
- Feed cylinder: control the feed station cylinder status;
- Waiting for 1 station cylinder: control the standby station 1 station cylinder state;
- Spray station cylinder: control the status of the spray station cylinder;
- Waiting for 2-station cylinder: control the standby 2-station cylinder state;
- Discharge cylinder: control the discharge station cylinder status;
- Belt pressure roller: control belt pressure roller rotation;

- Plasma Fan: Controlling Ion Fan Operation;
- Track width setting: You can set the speed, width, and width;
- Belt speed setting: Set belt transmission speed;
- I/O signal: read current status information of all cylinders;

Click the "Save Settings" button to save the parameter settings

5.6.4 Weighing parameters

Weighing is mainly used to test the electronic balance communication status, as shown in Figure 5-6-5.

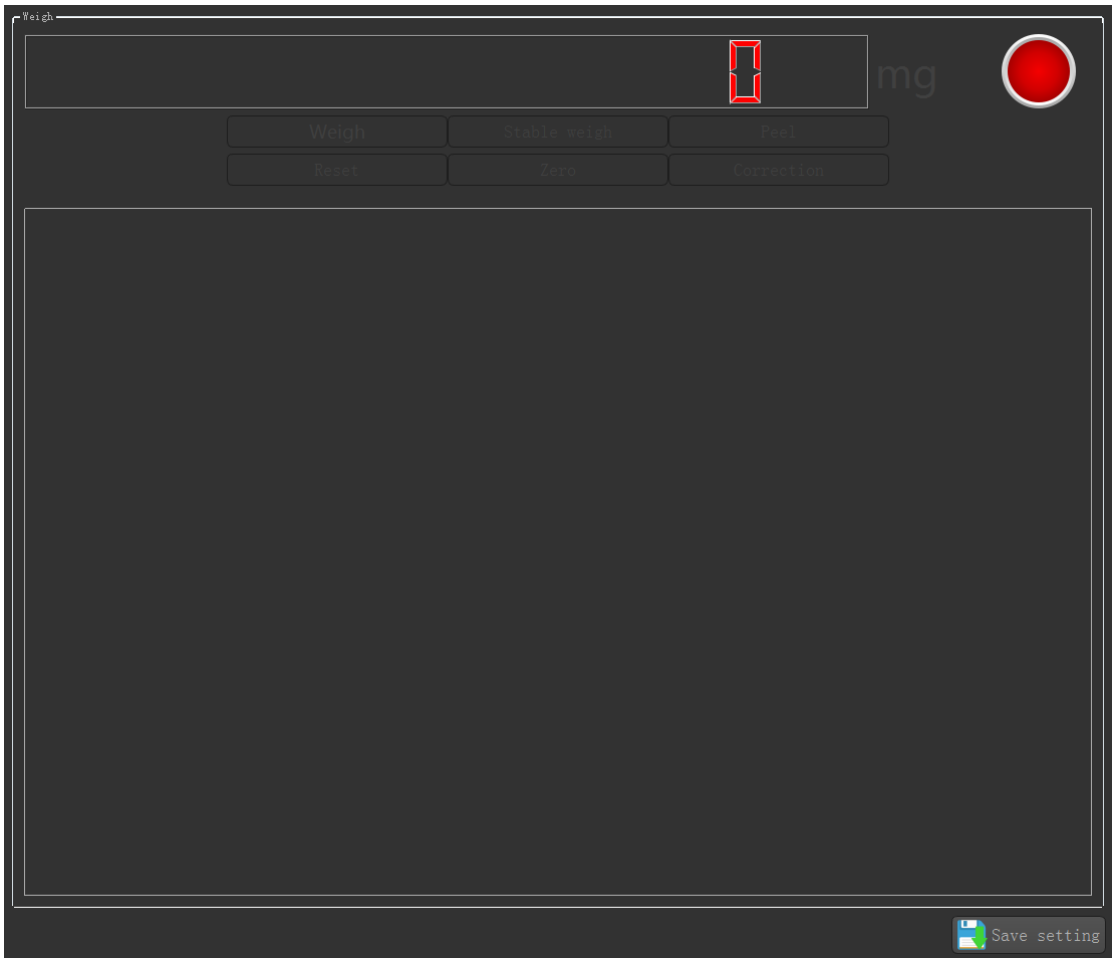


Fig. 5-6-5 Weighing parameters

- Weighing: Get the weighing value;
- Stable weighing: Get stable weighing value, slow speed;
- Peeling: Electronic balance is cleared;
- Correction: Electronic balance correction accuracy;

5.6.5 Height measurement temperature parameter

Altimeter temperature measurement is mainly used to test the laser altimeter and infrared thermometer communication status, as shown in Figure 5-6-6.

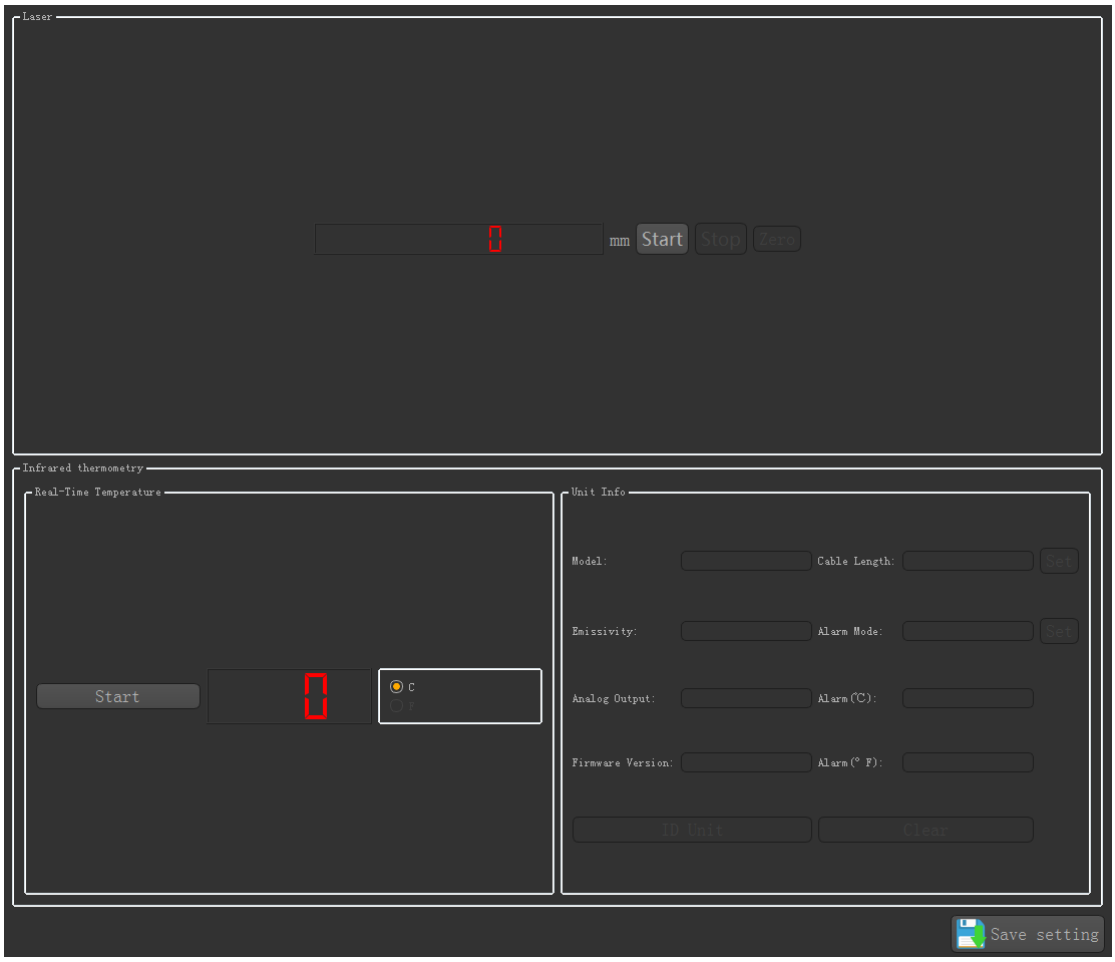


Fig. 5-6-6Height measurement temperature parameter

- Laser height measurement: Click the "Start" button to display the laser altimeter value in real time;
- Infrared temperature measurement: Click the "Start" button to display the infrared thermometer in real time;

6 User permission settings

Click the "User Permissions" button on the main interface, the user rights management interface will pop up, as shown in Figure 6-1.

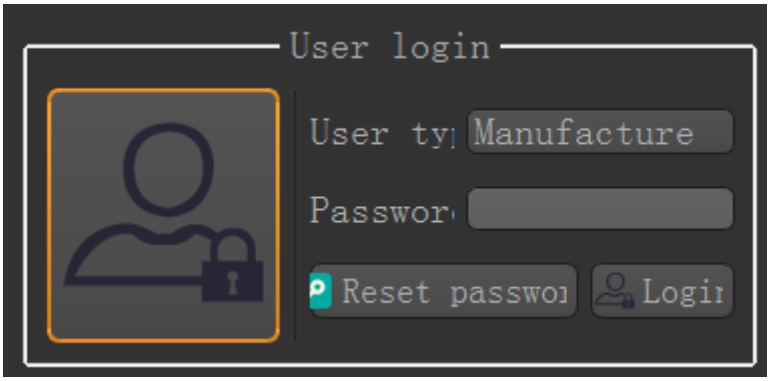


Fig. 6-1 User rights management interface

User rights management includes ordinary users, administrators, and manufacturer users. Ordinary users have image monitoring and replacement of needle/glue barrel operation authority; administrators have task editing and normal user's operation authority; manufacturer user has all operation authority.

7 Spray mode setting

In the main interface, click the "spray mode" button, the spray mode setting interface will pop up, as shown in Figure 7-1.

Fig. 7-1 Spray mode setting

- Camera mode: The camera center runs according to the gluing track, which is mainly used to test whether the template match is accurate;
- Simulation mode: The spray valve or needle operates according to the gluing track, but it does not produce glue. It is mainly used to test whether the template matching is accurate and whether the system calibration is accurate;
- Spraying mode: The spray valve or needle operates according to the gluing track, and the glue is used. This mode is used when actually gluing.

In the task teaching interface, you can also set the spray mode, as shown in Figure 7-2.

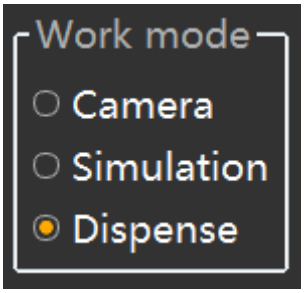


Fig. 7-2 Spray mode setting

8 Alarm interface

In the main interface, click the "initialize" button, or an error occurs during program operation, an alarm interface will pop up, as shown in Figure 8-1.

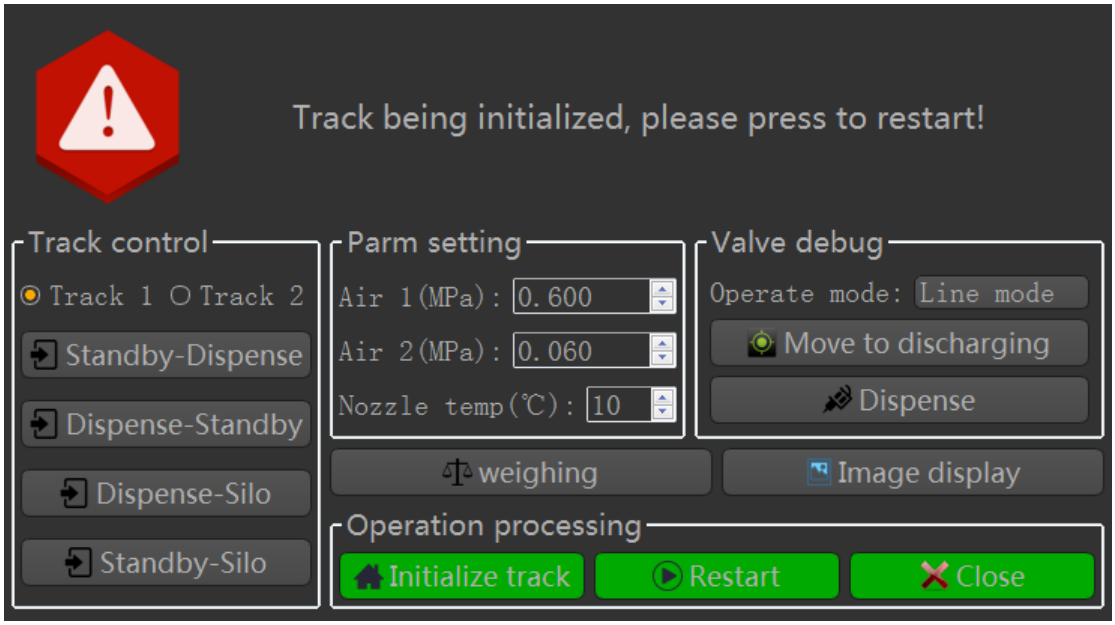


Fig.8-1 Alarm interface

- Track control: control board flow to other stations;
- Parameter setting: setting spray pressure and nozzle temperature;
- Valve debugging: you can switch the working mode, move to the row of rubber, out of plastic;
- Weighing test: pop-up weighing test interface for CPK verification;
- Track initialization: track components run to initial position;
- Re-run: The machine restarts operation;
- Turn off: Turn off the alarm interface and exit the operation.

9 Maintenance

9.1 Summary

Routine maintenance of the system in accordance with the procedures and cycles of this section can effectively prevent parts from wearing and ensure the

high quality of each dispense operation. This section covers the following:

■ Routine maintenance procedures	■ Linear motor cleaning
■ Replace consumables	■ Grating-rule cleaning
■ Empty the sink	■ Check the belt
■ Lubricated linear guide	■

 ***Warning!***

Only trained professionals can perform maintenance work

9.2 Safety first

The operation of the GS-600 series dispensing system may involve heat, air pressure, pneumatic equipment, power supplies, mechanical devices, and the use of hazardous materials. All personnel who operate or maintain the system fully recognize hazards and dangers before performing system or component operations, and the related safety precautions are of utmost importance.

 ***Warning !***  ***Be careful !***

Carefully read all of the glue material safety information sheets (MSDS) that apply to this dispensing system. MSDS provides guidance on the use of this chemical material, disposal, safety protection information, etc.
The dispensing system is equipped with a ventilation system that ensures that the ventilation system is turned on when operating and cleaning all dispensing system chemicals.

9.3 Save records

Types of maintenance (such as protective maintenance or replacement of parts) should also be saved in the maintenance records of the dispensing system. The date, item number/serial number of the replacement part, technician's name, and other relevant data should also be recorded.

9.4 Routine maintenance procedures

 ***Warning !***  ***Be careful !***

Before performing maintenance and repair operations in this chapter, you should first ensure that maintenance has been turned off.

 Note：

The following maintenance procedures only apply to the GS-600 Series Dispensing System. According to your actual dispensing nozzle specifications, please refer to the recommended maintenance method in the corresponding manual.

Daily routine maintenance procedures and intervals refer to Table 5-1.
Table 9-1 Routine maintenance procedures

Task	Frequencies	Operations
Clean dispensing area	Daily	Wipe the splattered fluid with a solvent and a soft cloth recommended by the manufacturer. Foreign matter in the dispensing area and vents should also be removed.
Clean the vacuum nozzle	Daily	1. Pull out the vacuum nozzle 2. Carefully clean the vacuum nozzle and the cleaning station cover with a solvent and small brush or soft cloth recommended by the glue manufacturer. Check if the rubber vacuum cutter is damaged and replace it if necessary.
Replace clean bench, balance cup	Daily	
Empty the sink	Weekly	Check the water level in the sink, if it is already full, you need to empty it
Check cylinder	Weekly	Check for leaks
Lubricate XYZ axial guide	Every three months	
Clean encoders, guides and wiring	Every three months	A cotton swab or liner without crumbs after the pad or swab wetted with

harness		alcohol, along the track direction of the encoder complete wiping the entire track, the track and check for damage. Similarly, the reading head cleaning, dust, dirt or foreign objects are removed.
Clean lens and light source glass	When needed	Clean the dust, dirt, or foreign materials with a liner that is free from debris。
Tight pull, change belt	When needed	

9.5 Replace the vulnerable part

Vulnerable parts are those parts that are easily replaced or discarded on a regular basis. The following parts are common wearing parts. Refer to Table 5-1 for their replacement cycle.

- Clean vacuum nozzle
- Scale and cleaning cup

Required materials and tools:

■ Nipper pliers	■ Cleaning vacuum nozzle for replacement
■ Isopropanol	■ 30ml plastic cup for replacement
■ Wiping cloth	■ Small brush
■ Rubber gloves	■ Personal Protective Equipment (as required)

9.5.1 Replace the cleaning station and the cup on the scale

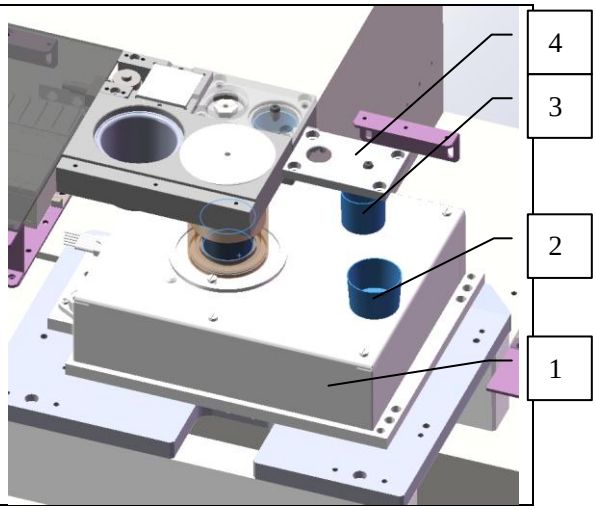
The cups on the cleaning table and the weighing table should be replaced at the recommended time intervals in Table 5-1.

How to replace the cleaning or balance cup?

1. When the dispensing system is idle, remove the cover of the cleaning station and weighing station
2. Remove and discard these plastic cups from the cleaning table and weighing table, taking care to check the inner surface for spattered glue. If there is spattered glue inside the cleaning station, wipe it clean with the manufacturer's recommended solvent and a soft cloth。

3. Place new plastic cups on the cleaning table and weighing table
4. Wipe the cover board with isopropyl alcohol and a soft cloth
5. Reinstall the cover

No.	Descriptions
1	Scale
2	Balance cup
3	Cleaning table cup
4	Cleaning table cover



9.5.2 Replace Cleaning Vacuum Nozzle

How to replace cleaning vacuum nozzle：

Warning !

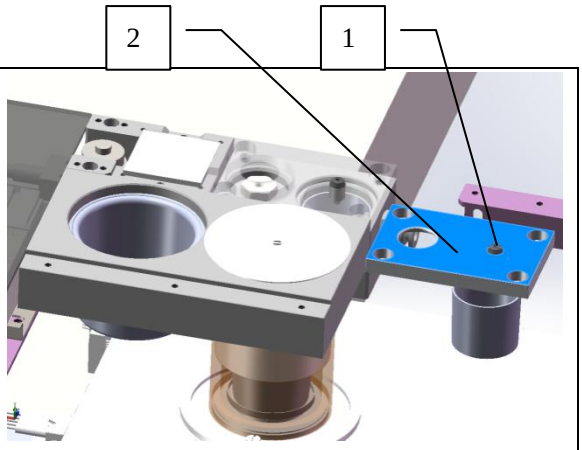
The local regulations and the MSDS provided by the manufacturer of the chemical materials and related regulations for factory operations should be observed. Personal protective equipment should be worn when handling or handling hazardous chemical materials.

- When the dispensing system is idle, open the front cover of the dispensing system.
- Remove the cleaning table cover.
- Use a nipper pliers /tweezers to clamp the top of the vacuum suction nozzle and pull it out of the top of the lid. Discard the used cleaning vacuum nozzle.
- If the lid is dirty, wipe it clean with the manufacturer's recommended solvent and a soft cloth.
- Take out a new vacuum nozzle. See Figure 5-2 for details.
- Insert a new vacuum nozzle, first put in the bottom of the narrowing, and then put the whole into the top of the lid.
- Push down the vacuum nozzle along the hole in the lid until it is completely submerged in the bottom.
- Using your fingers or needle-nose pliers, grasp the bottom of the vacuum

nozzle and slowly pull it back along the hole until it is fully seated. Bent the bottom of the vacuum nozzle within the allowable range, but you must ensure that there is no damage to the top of the vacuum nozzle.

- Reinstall the lid on the cleaning table.
- Close the front cover.

No.	Description
1	Cleaning vacuum nozzle
2	Cleaning table cover



9.6 Empty the sink

Because the water vapor contained in the factory air supply may damage the dispensing system. Therefore, the GS-600 Series is equipped with two sinks to condense and recover water vapor before it enters the pneumatic system. Every week, or whenever the sink is full, the operator or technical engineer must empty the sink.

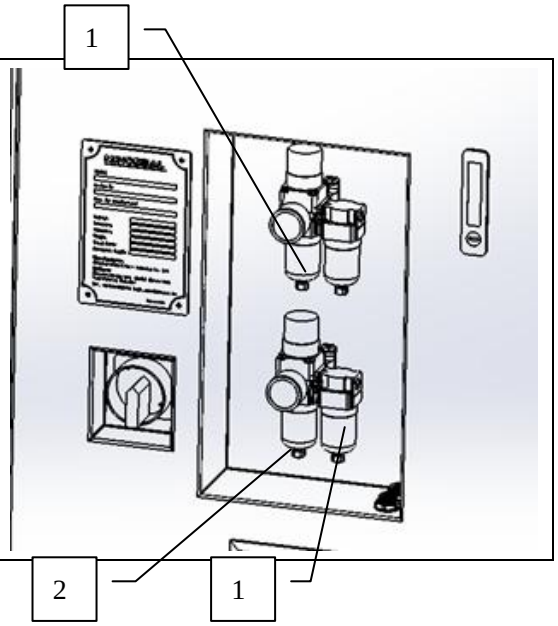
Required materials and tools：
Vapor collection container

How to empty the sink:

- The sink is located behind
- Cut off the air pressure in the factory and disconnect the air pressure input port of the main air pressure control valve from the factory air supply
- Place the container under the sink to rotate the sink knob counter-clockwise to hold the water in the sink when the sink is opened
- When the sink is empty, close the sink knob clockwise.
- Reconnect the pressure input port of the main air pressure regulator valve to the factory air supply

As shown below:

No.	Description
1	Sink
2	Drainage button



9.7 Linear guide lubrication, linear motor cleaning

To ensure smooth movement, linear motors and linear guides must be lubricated and cleaned about every three months.

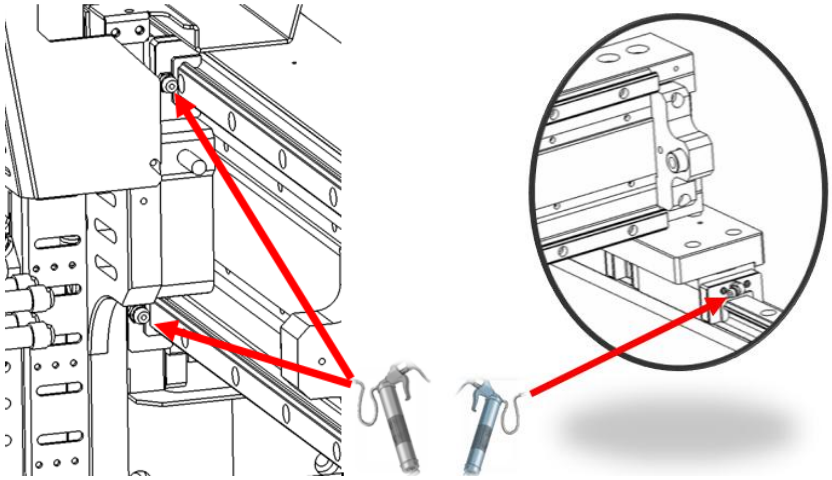
9.7.1 Linear guide lubrication

Fixed grease gun：

- Pull the grease gun handle to the bottom position until you can see the locking tab.
- Twist lock to the locked position.
- Loosen and remove the grease gun head.
- Twist off the blue cap on the cartridge grease cartridge and put the open end down into the grease gun body.
- Open the seal on the tail of the cartridge and push in the tab.
- Cover grease gun head.
- Screw the extension into the front of the grease gun head.
- Unlock the handle from the locked position.
- The air in the cartridge is cleaned by squeezing the lubricating grease into the waste recovery device until a stable flow of grease is generated in the gun body.

Lubricated linear guide：

- Maintenance shutdown, see maintenance shutdown for details.
- Use an amino cleaning agent and a soft cloth to clean the wiping X-track and Y-track. If necessary, manually move the dispensing head to any position on the track.
- Install grease guns on each adapter, and at each adapter, push the grease gun trigger to wet the grease inside the bearing. (As shown below).
- Wipe off excess grease with a soft cloth.
- Dispensing system power on.
- Use software positioning controls to move the dispensing head back and forth along the X-axis and Y-axis.
- Use a soft cloth to remove excess grease along the track.



Lubricate X-axis linear guide **LubricateY-axis linear guide**

9.7.2 Cleaning the Linear Motor and Magnet Plate (As Needed)

Purpose: Maintain the smooth operation of the equipment. Avoid damage to the linear motor due to foreign matter.

Steps:

1. Move the linear motor components to one side
2. If there is an obstacle on the surface of the linear motor magnet, it should be removed with a soft cloth. If oil stains are present, apply a clean, lint-free cloth.

9.7.3 Clean Linear Encoder (Quarterly)

Purpose: To maintain accurate dispensing of dispensing system equipment.

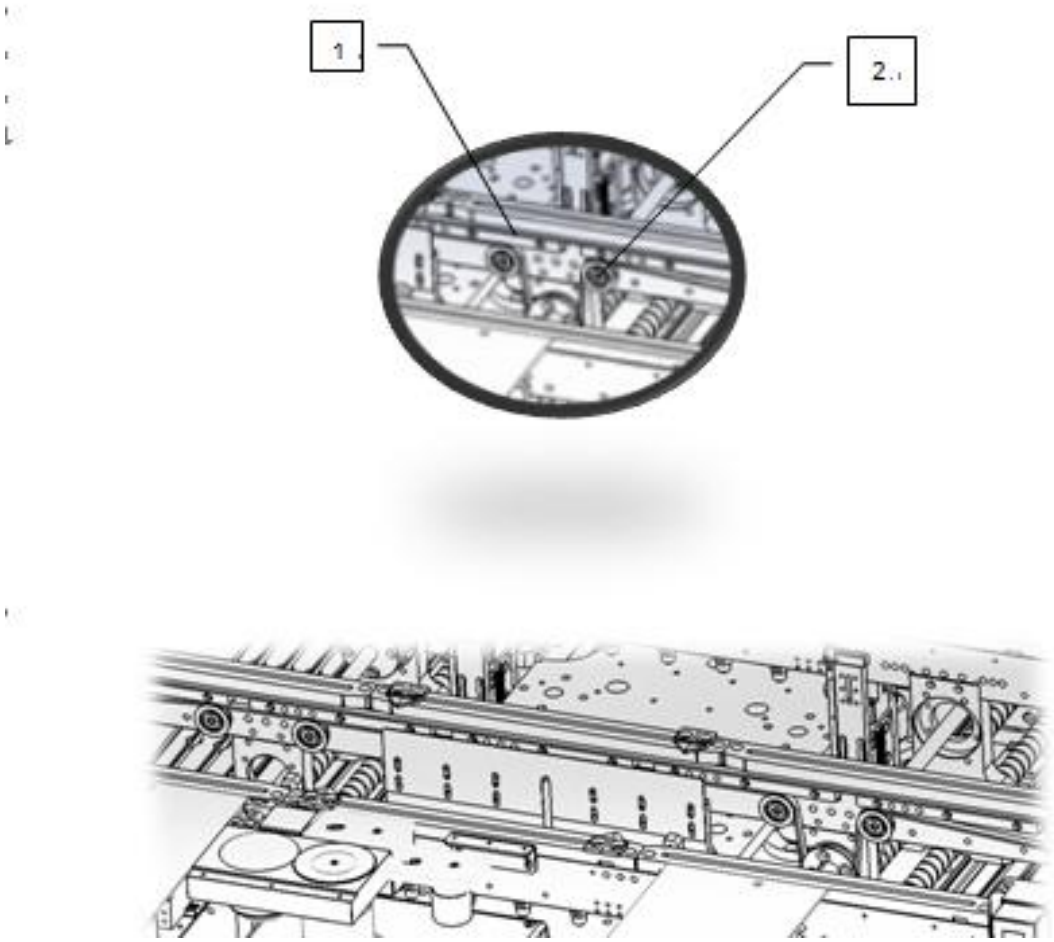
Steps:
1. Position the linear motor encoder;
2. Remove the encoder and clean the reading heads of the scale and encoder with a lint-free cloth moistened with isopropyl alcohol. Do not use acetone for cleaning;
3. After cleaning, replace the encoder and adjust the position so that the red light flashes when the entire journey is on and green.

9.8 Check the belt (quarterly)

Purpose: To maintain accurate operation of the work piece tray carrier.

Steps:
1. Rotate the belt manually and visually check the position and status of the belt.
2. Use a tension meter to check if the belt frequency is within the value range. If the belt frequency is not within the required value range, adjust the position of the tension idler.
3. If the belt is worn or damaged, it should be replaced

As shown below:



SN.	Descriptions
1	Conveyor belt
2	Motor fixed tension device

Note: If you need to change the conveyor belt, refer to the GS-600 Installation, Operation, and Maintenance Manual.

Appendix I：

Basler camera driver installation:

1. Double-click the Basler camera driver installer "Basler_pylon_5.0.5.8999.exe", the installation interface is shown in Figure 1; tick "I agree to the pylon Terms & Conditions" and click the "Next" button;

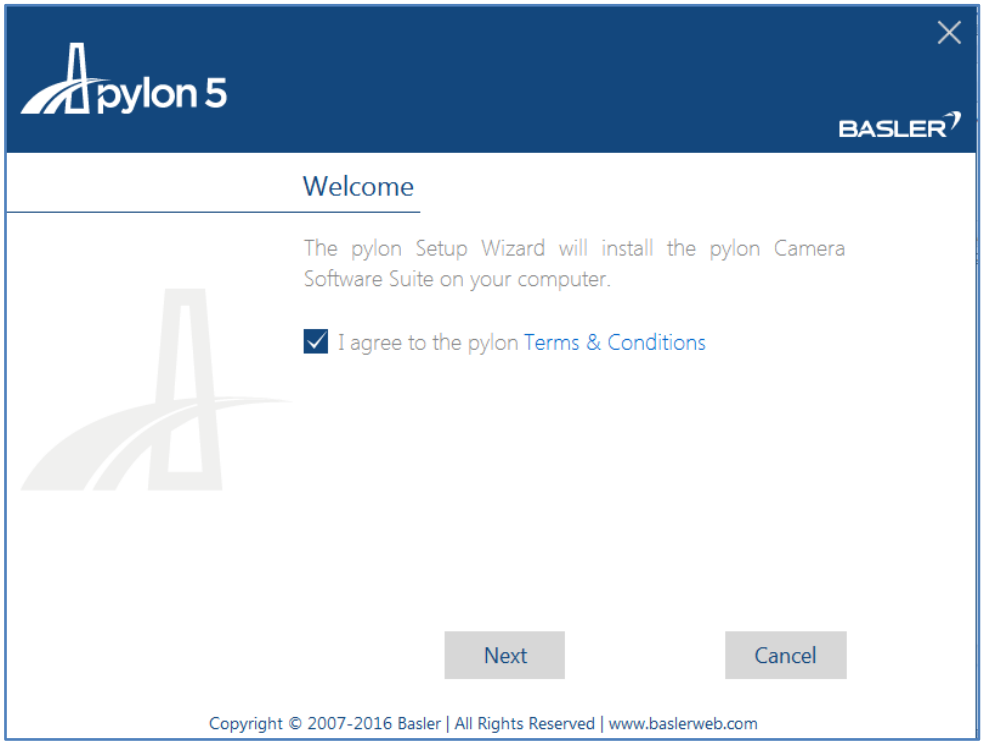


Fig. 1

1. Select “Camera User”, and click “Next” button:

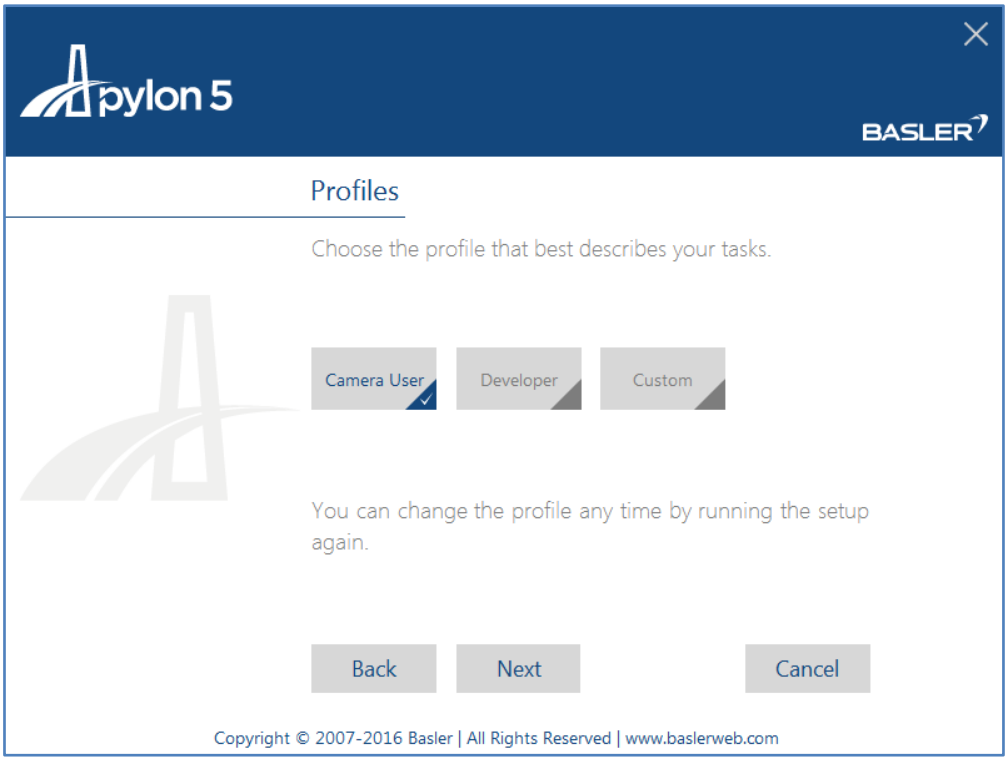


Fig. 2

2. Select “GigE”, “Camera Link”, and click “Next” button:

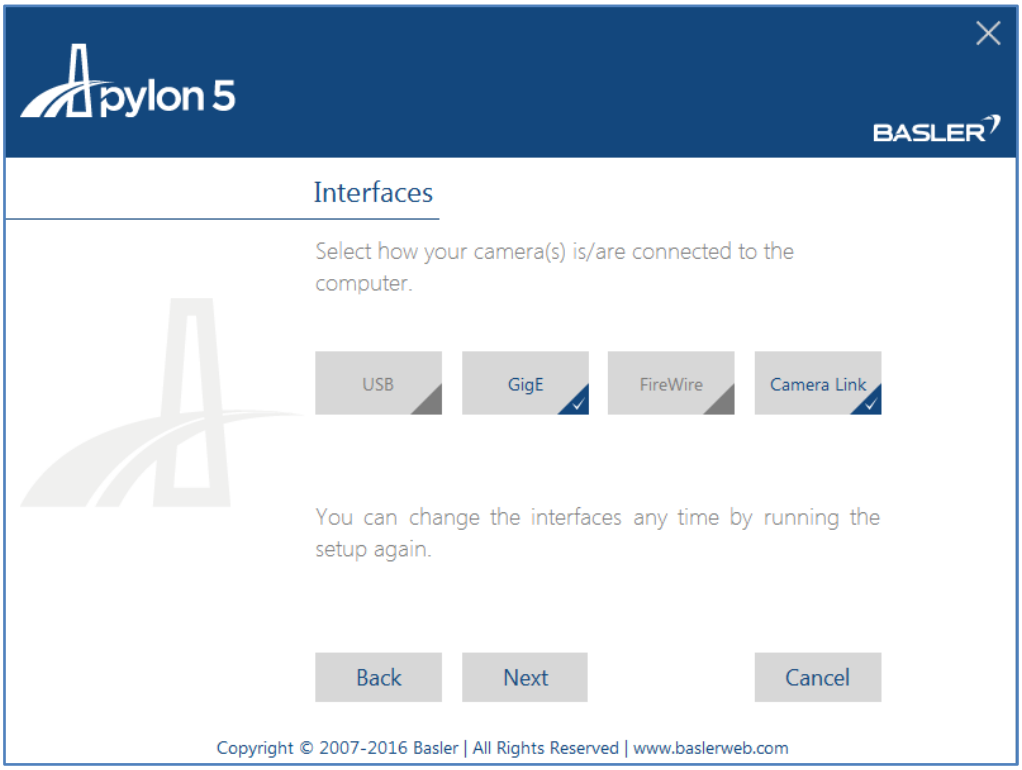


Fig. 3

3. Click “Next” button:

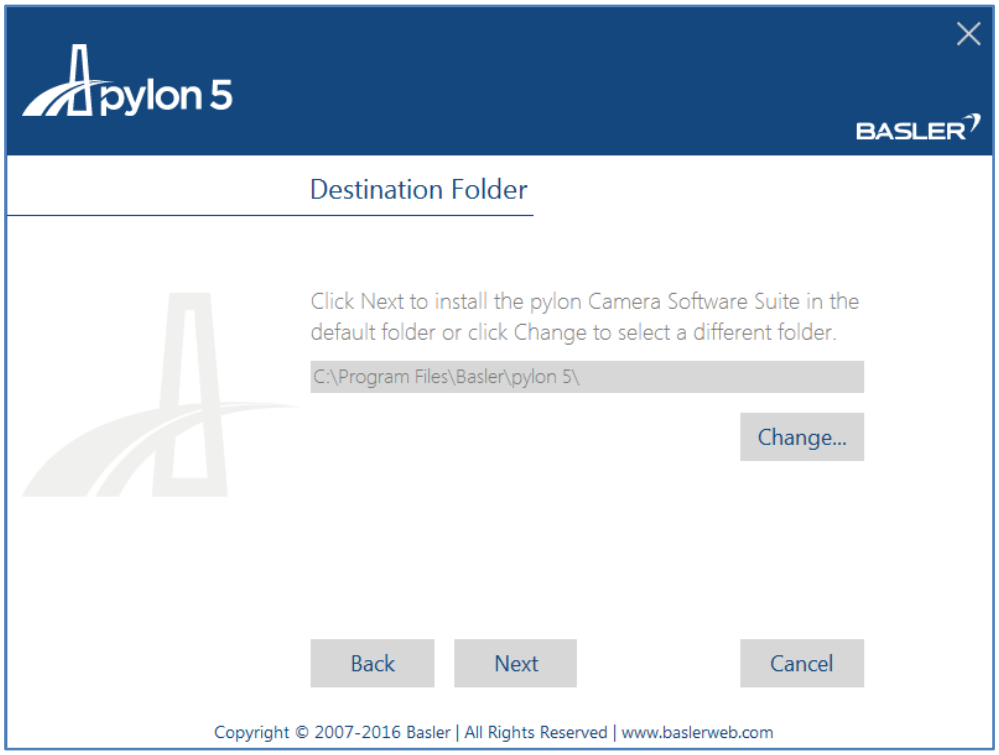


Fig. 4

4. Click “Install” button;

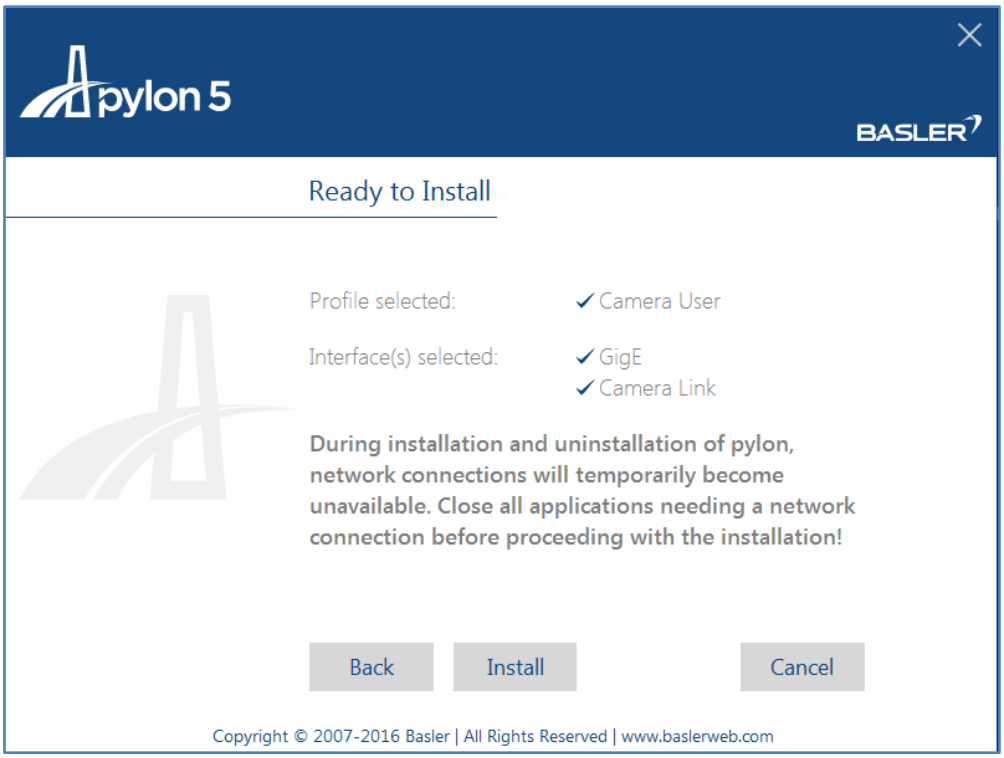


Fig. 5

5. Click “Close” button, and complete the installation;

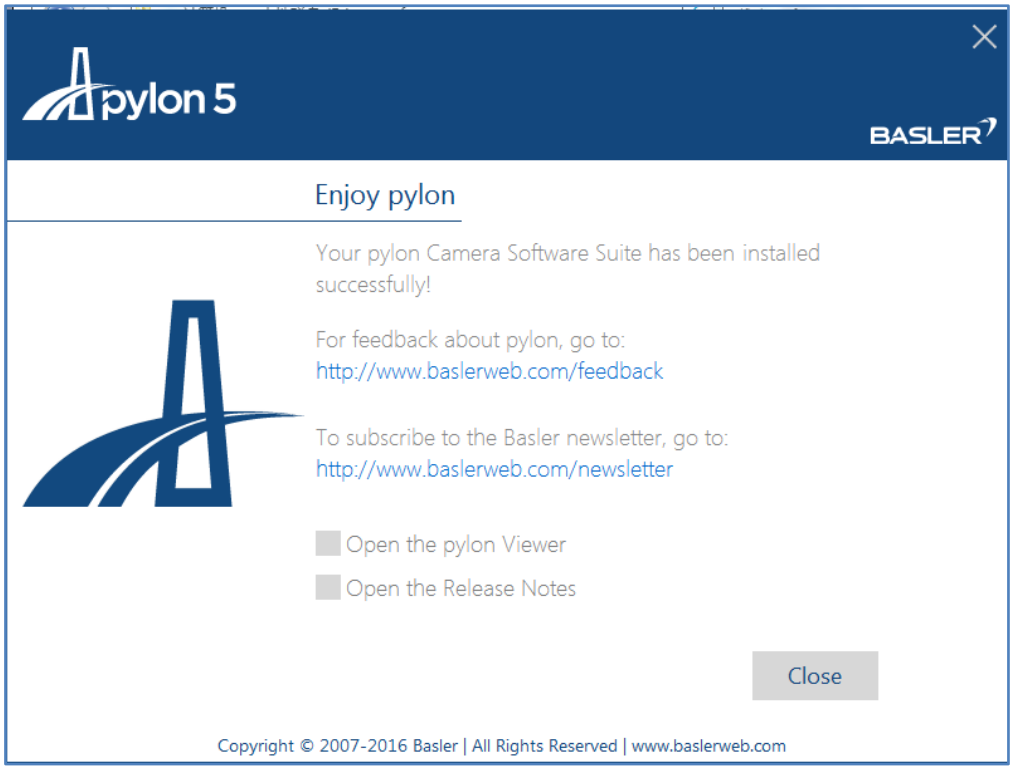


Fig. 6

Configure the Basler camera (in win7 system as an example):

1. Click the icon in the lower right corner of the desktop ( ) icon, and then click to open the Network and Sharing Center as shown in the figure (the interface will be slightly different);

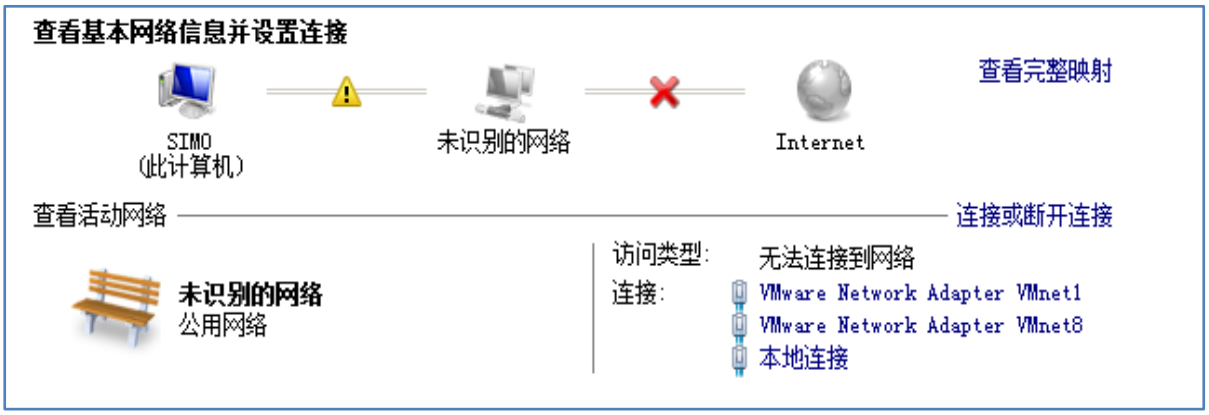


Fig. 7

1. Click “Local connection”, and click “Property” button;

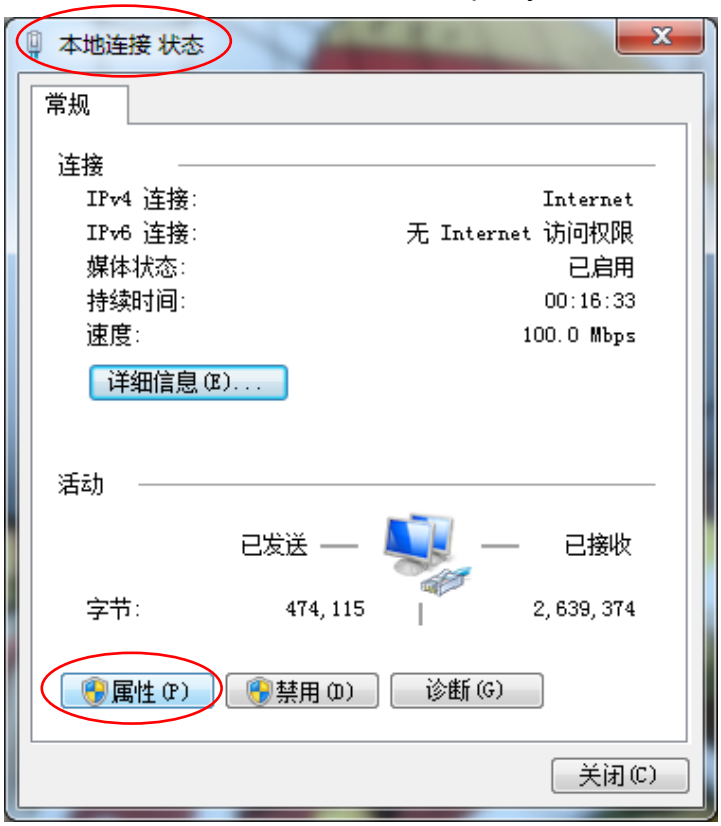


Fig. 8

2. Click “Configuration” button;

Fig. 9

3. Click the "Advanced" tab, select Jumbo frame (or jumbo frame) property, set its value to "9KB MTU", click "Confirm" button to return to the local connection status page;

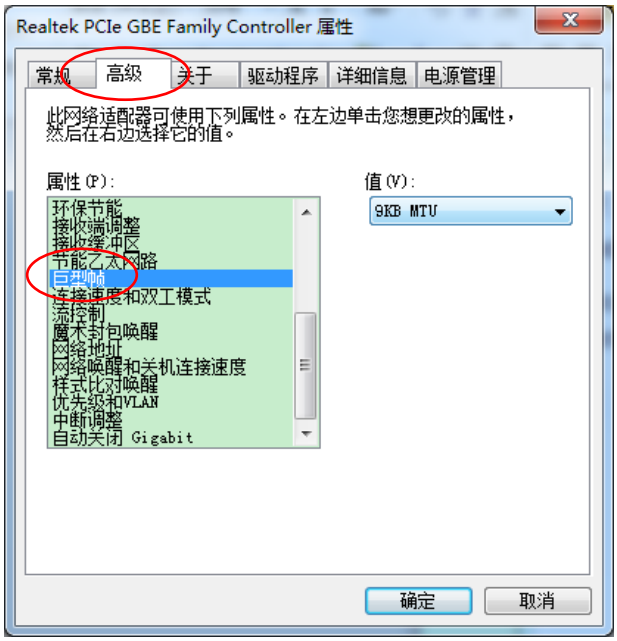


Fig. 10

4. Click the "Properties" button, select the "Internet Protocol Version 4 (TCP/IPv4)" option, click the "Properties" button;

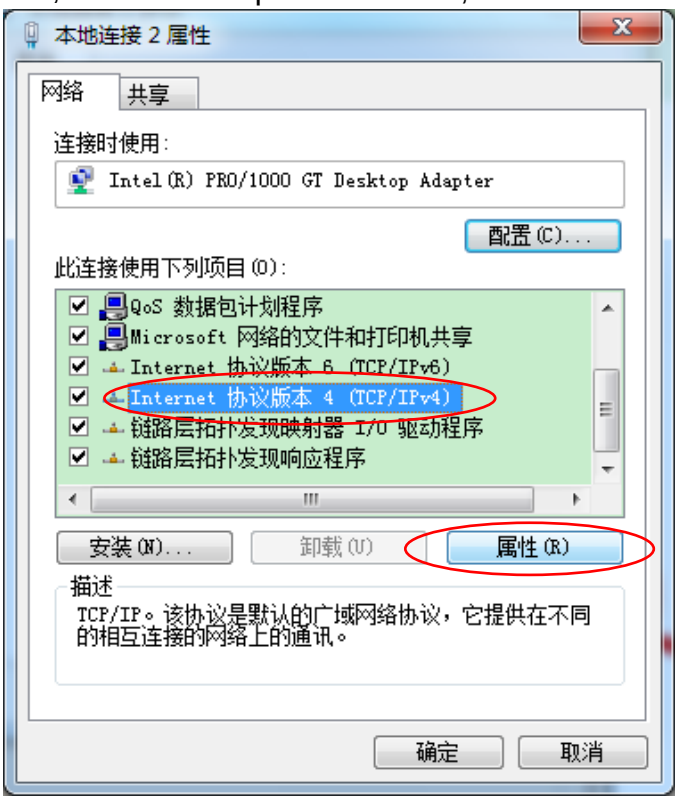


Fig. 11

6. Set the IP address as shown in Figure 12 and click OK to complete the network card setup.

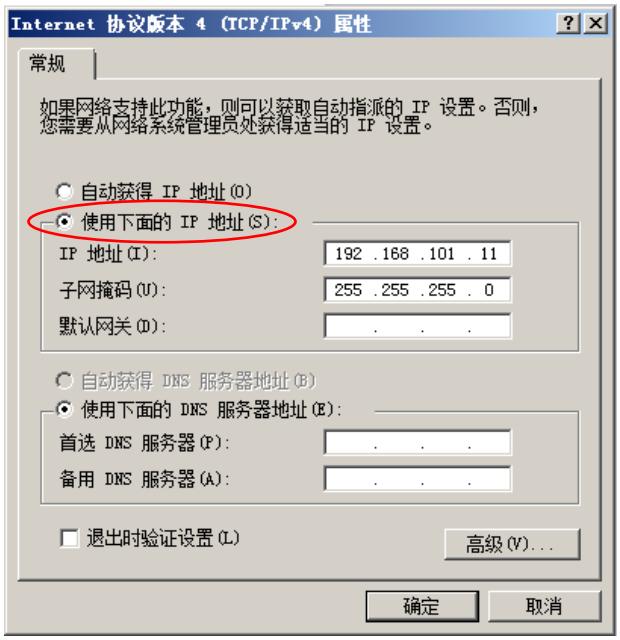


Fig. 12

7. Double-click the "pylon IP Configurator" shortcut on the desktop to open the software; set the camera's IP address as shown in Figure 13.

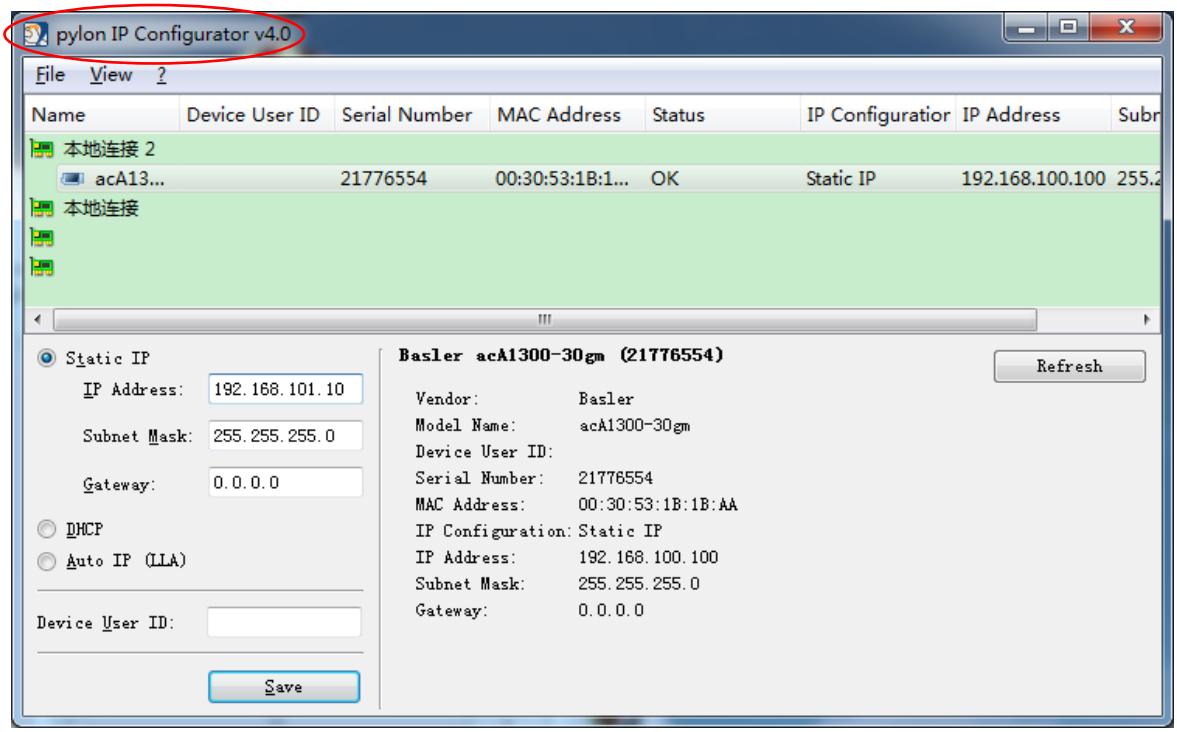


Fig. 13

8. After the setting is completed, click the "Save" button, and then click the "Refresh" button. If the camera status is as shown in Figure 14 below, the

camera IP address setting is completed; otherwise, check whether the local connection IP address and camera IP address are in the same network segment. If not, please reset it as described above.

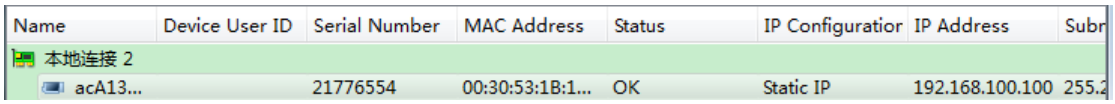


Fig. 14

Appendix II：

Googol board driver installation:

1. The first time you plug-in the Googol board, the other device options will appear as "**PCI settings**" as shown in the following figure:

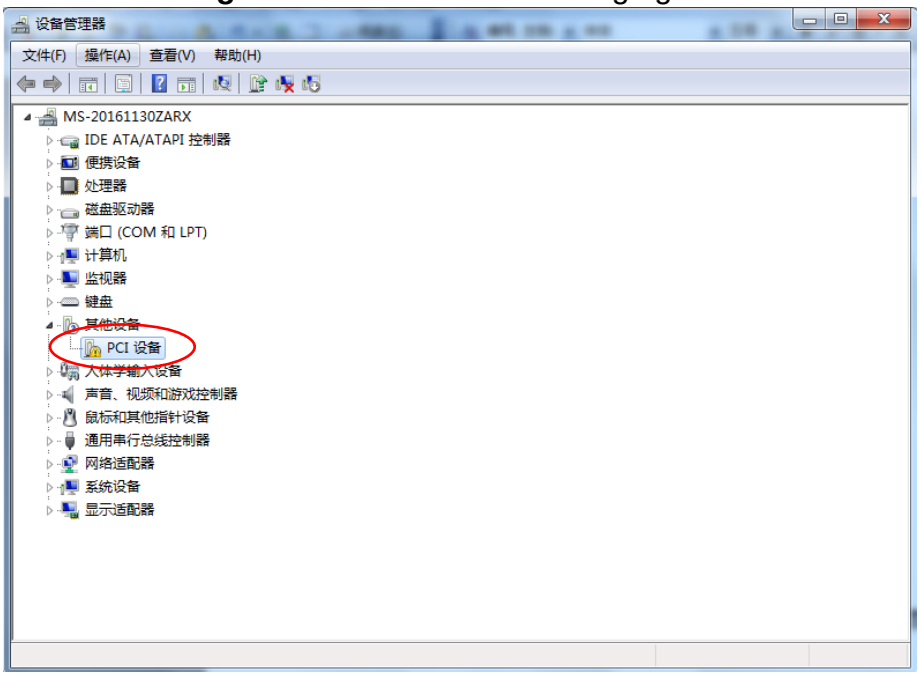


Fig. 15

2. Right-click "PCI Devices", select "Update Drivers", and click "Browse my computer for driver software";

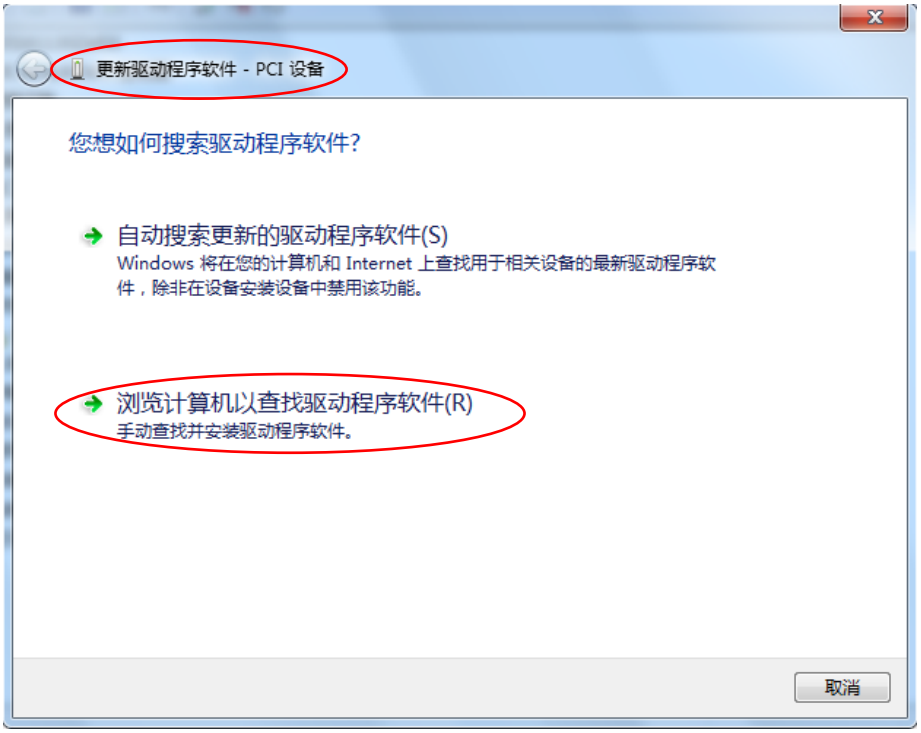


Fig. 16

3. Click “Browse” button, and select the path shown in the figure; click “Next”;

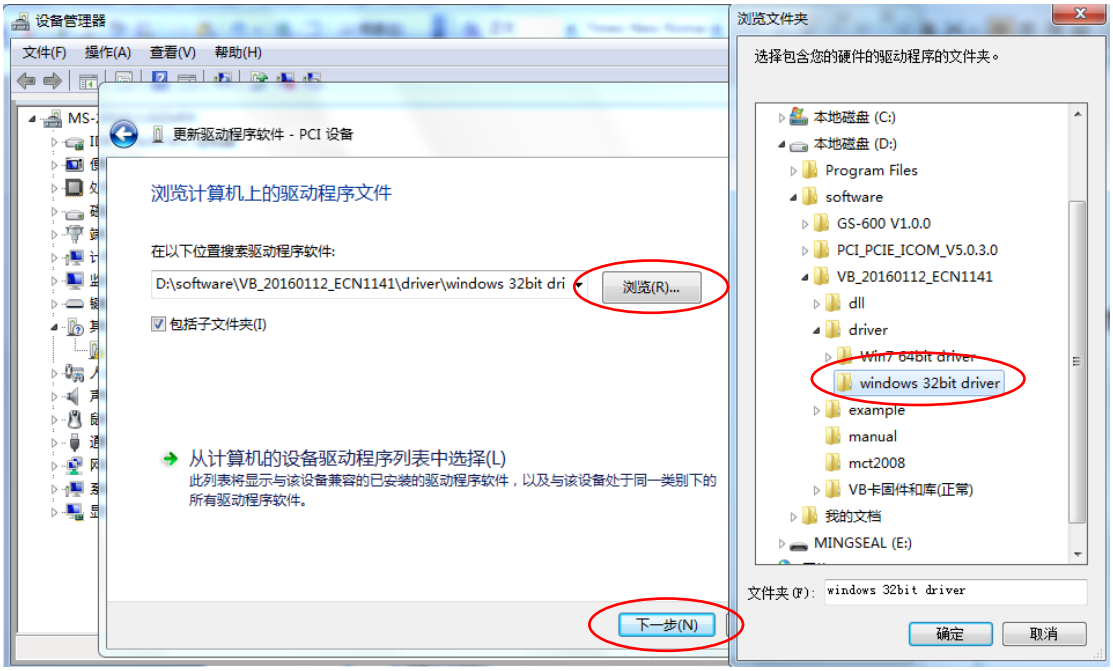


Fig. 17

4. Click “Always install this driver software”:

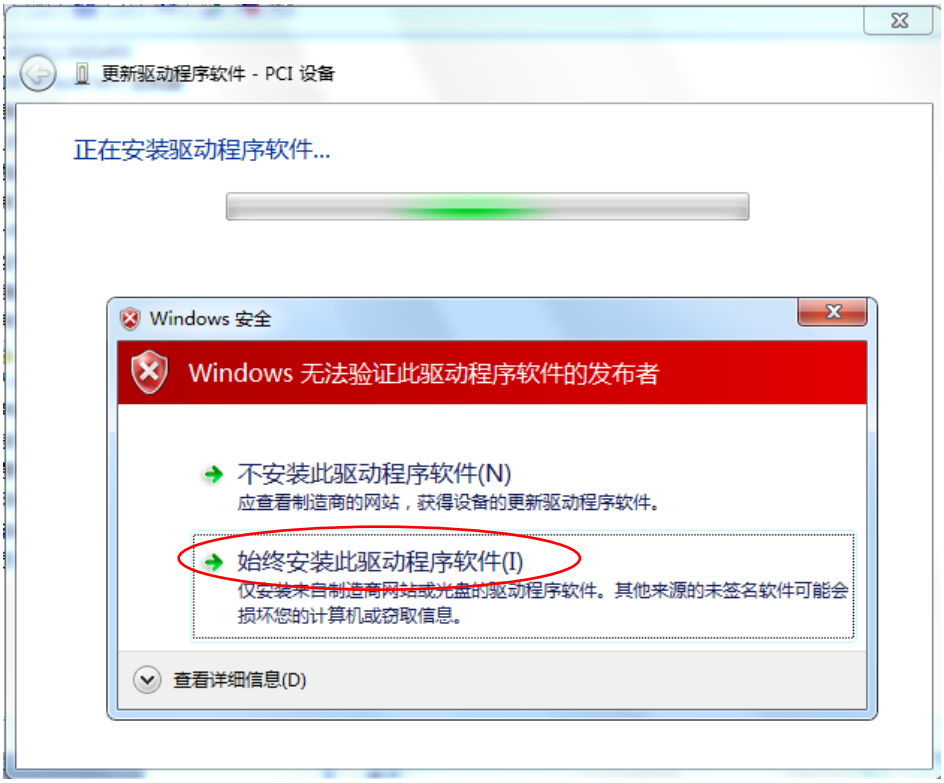


Fig. 18

5. Click “Close”, the driver update is completed:

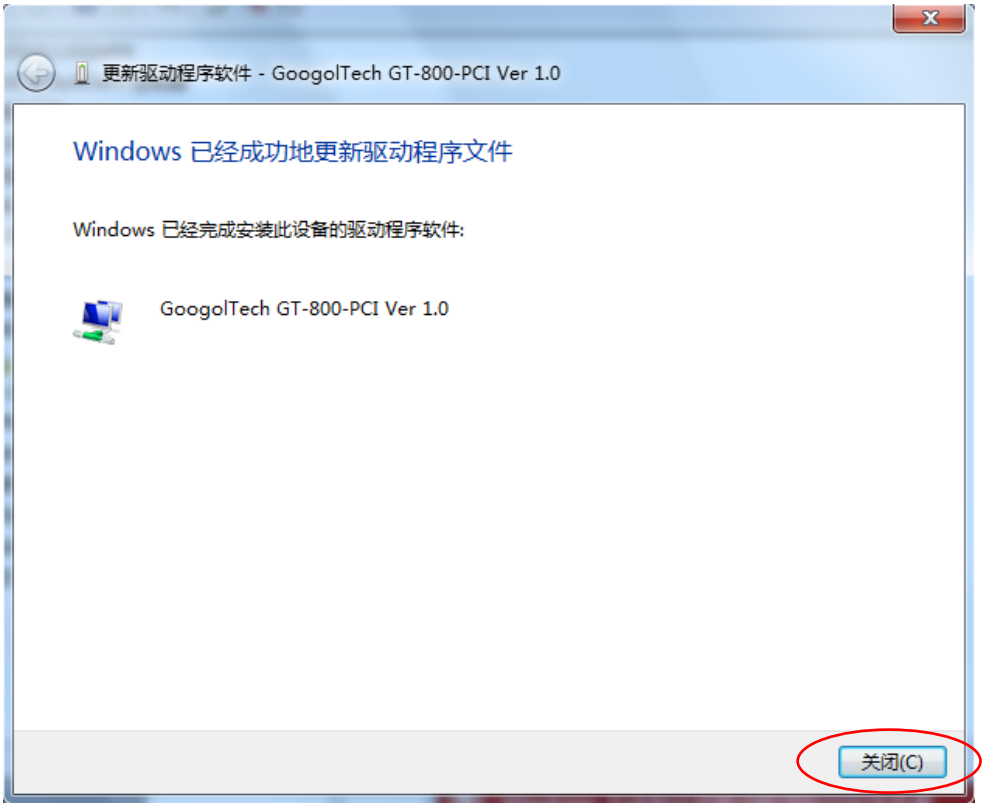


Fig. 19

6. After the driver update is completed, the following figure will appear: “GoogoTech GT-800-PCI Ver 1.0”;

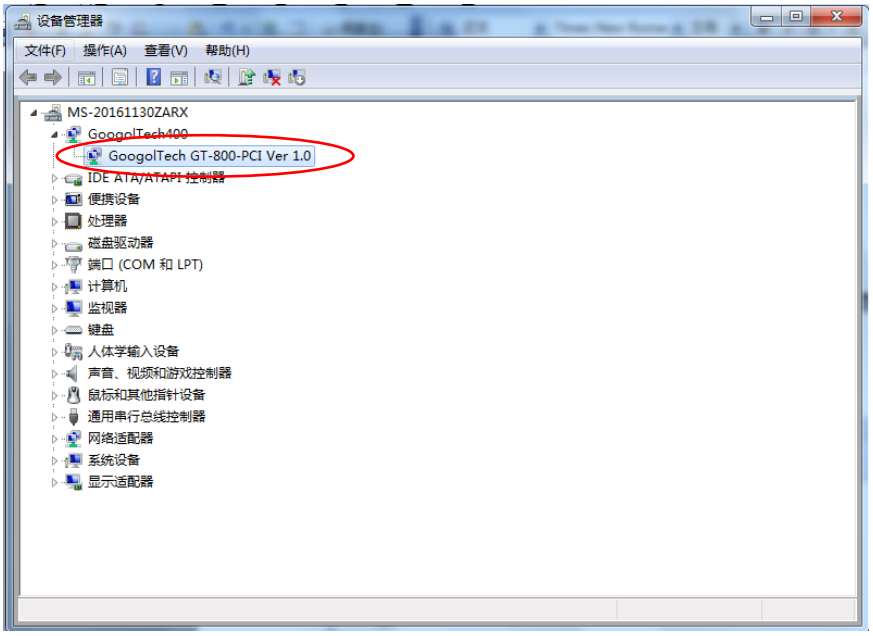


Fig. 20

Appendix III:

Halcon driver installation:

1. Double click installation file “halcon-13.0-windows.exe”, and the installing guide interface is shown in Figure 21; click “Next” button;

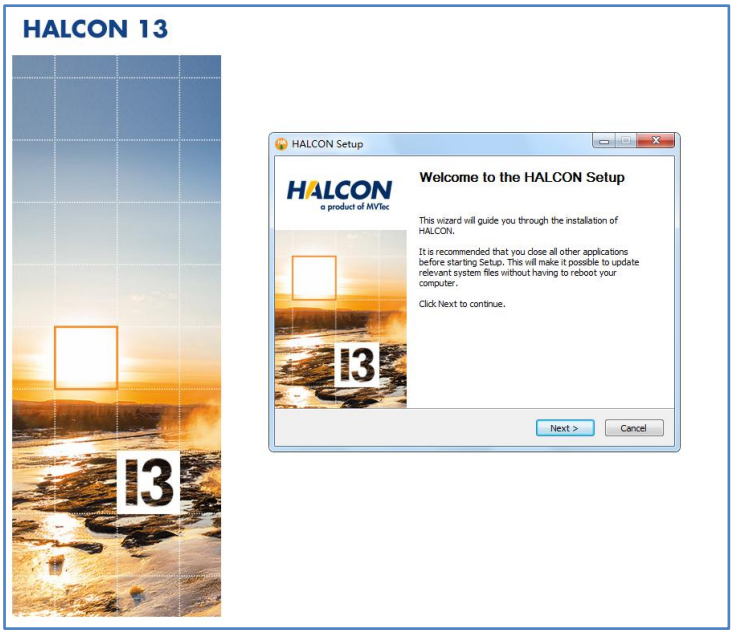


Fig. 21

2. Click “I Agree” button;

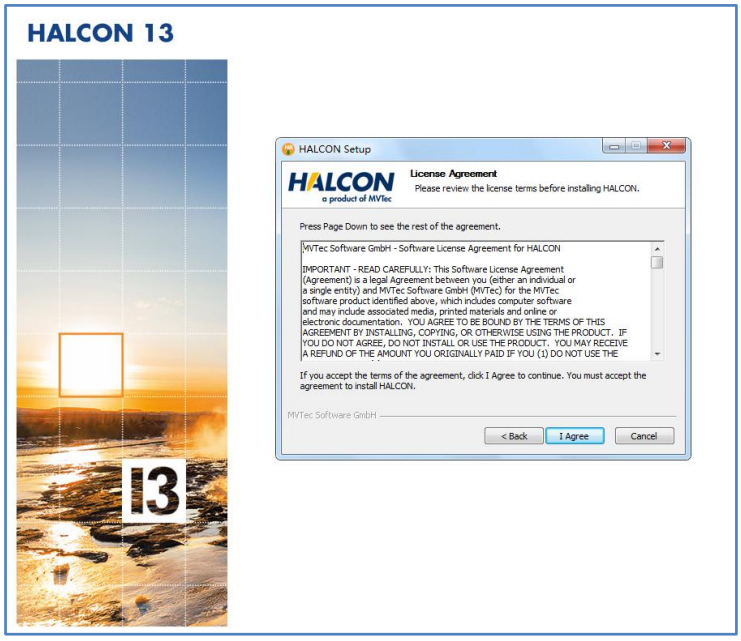


Fig. 22

3. Click “Next” button;

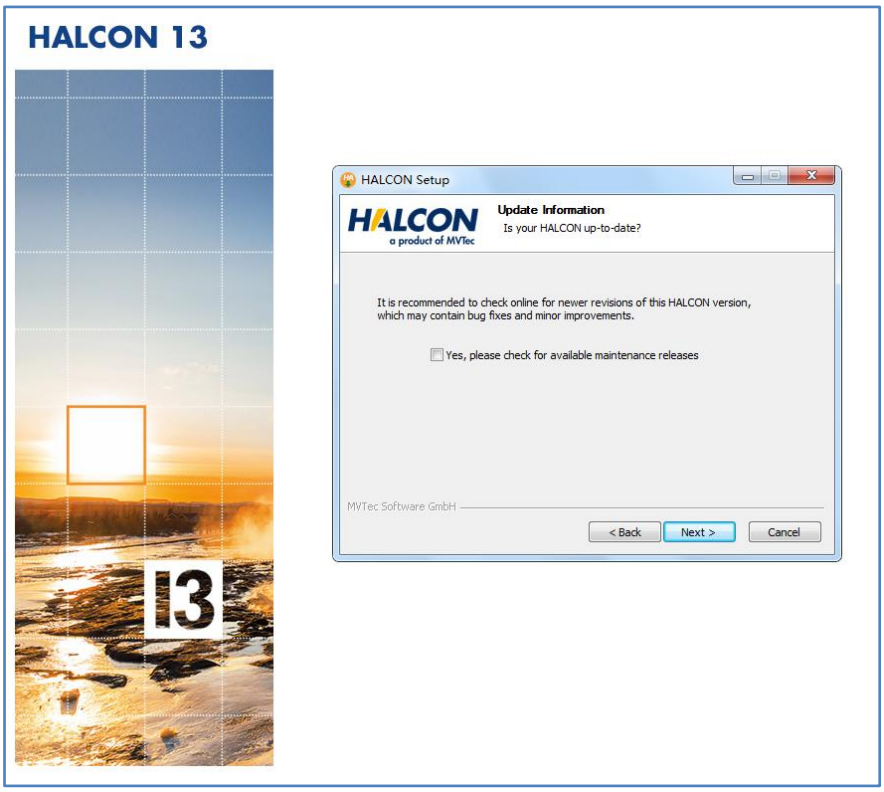


Fig. 23

4. Click “Next” button;

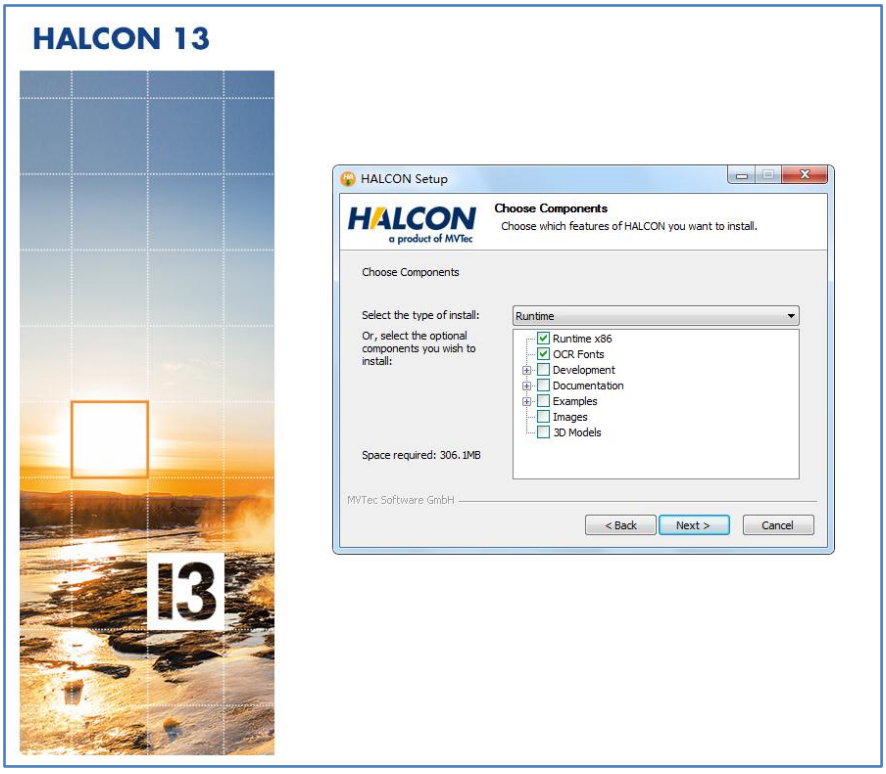


Fig. 24

5. Click “Next” button;

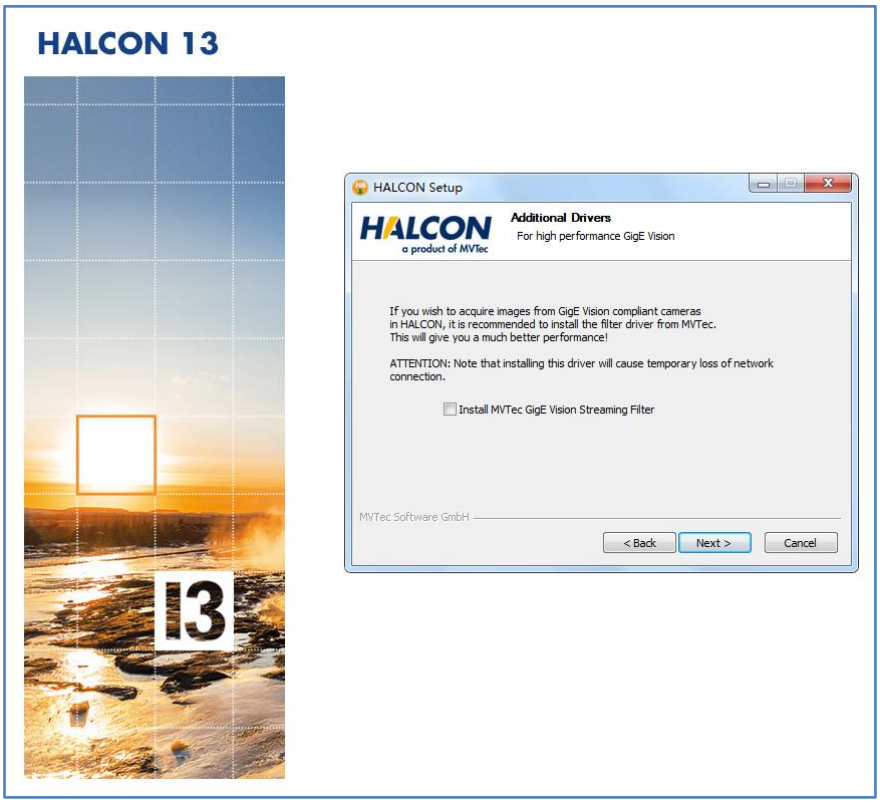


Fig. 25

6. Select setup path, and click “Next” button, to start software installation;

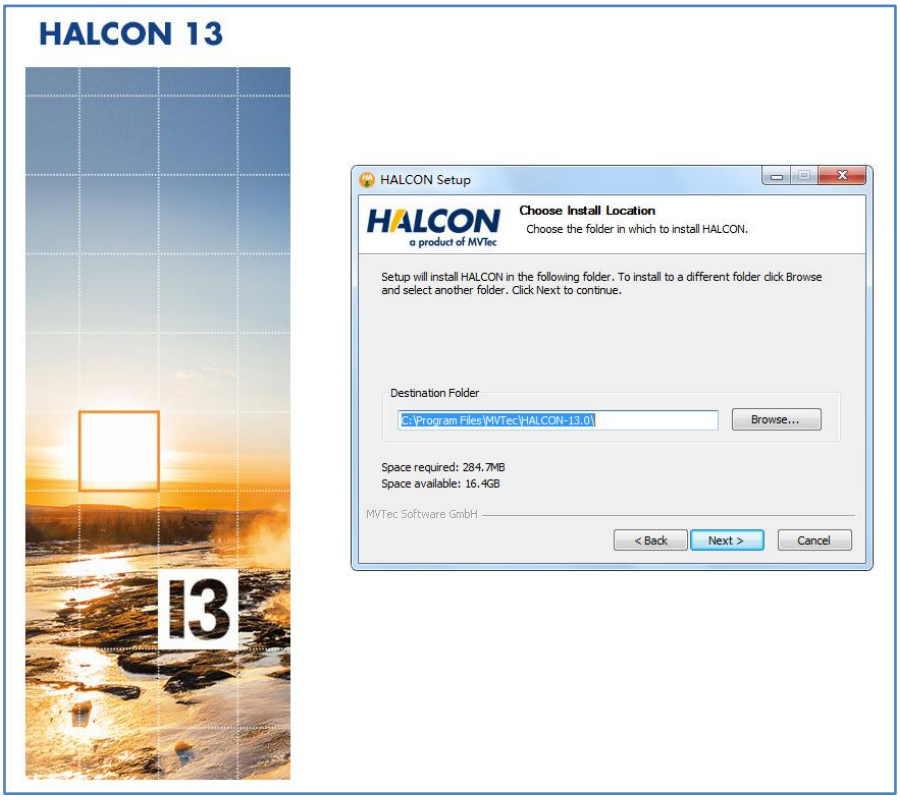


Fig. 26

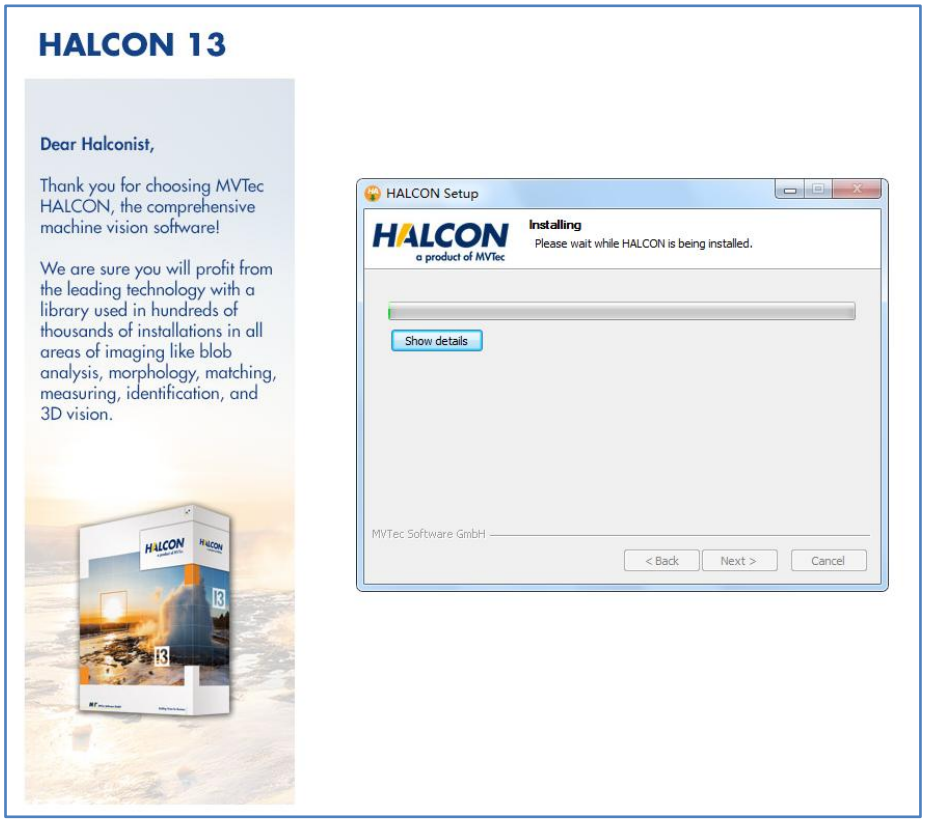


Fig. 27

6. Click “Next” button;

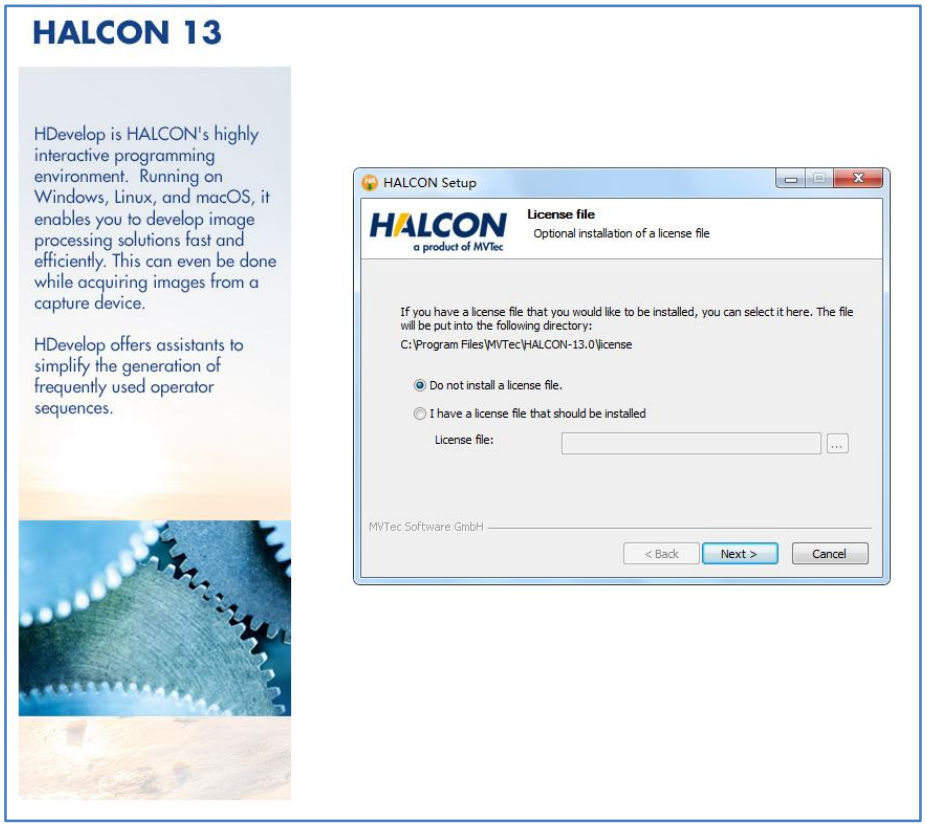


Fig. 28

7. Click “Finish” button, and finish the setup;

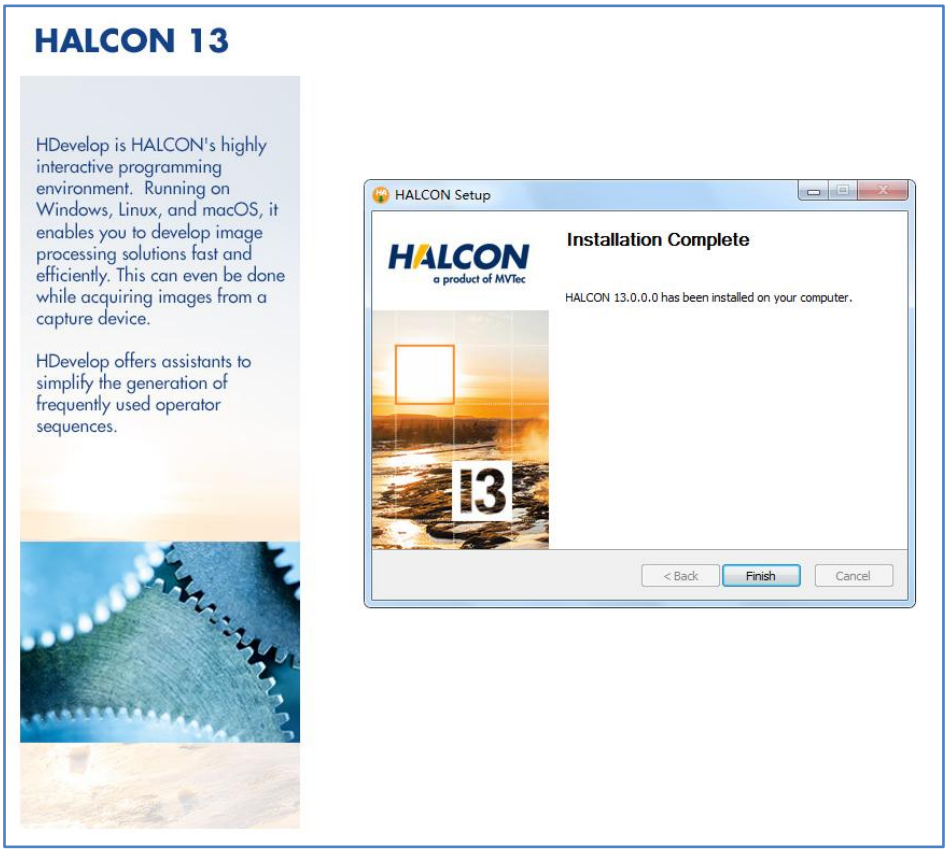


Fig. 29

Copy the ".dat" file (corresponding to the Halcon softdog) to the directory shown below;

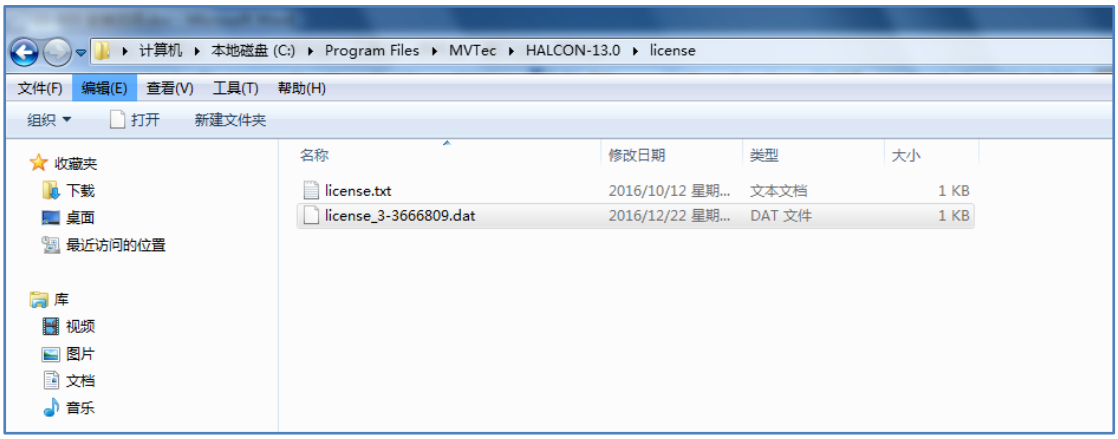


Fig. 30

Appendix IV：

PCI driver setup:

1. Double click “PCI_PCIE_ICOM_V5.0.3.0.exe”，to set up PCI serial port driver;

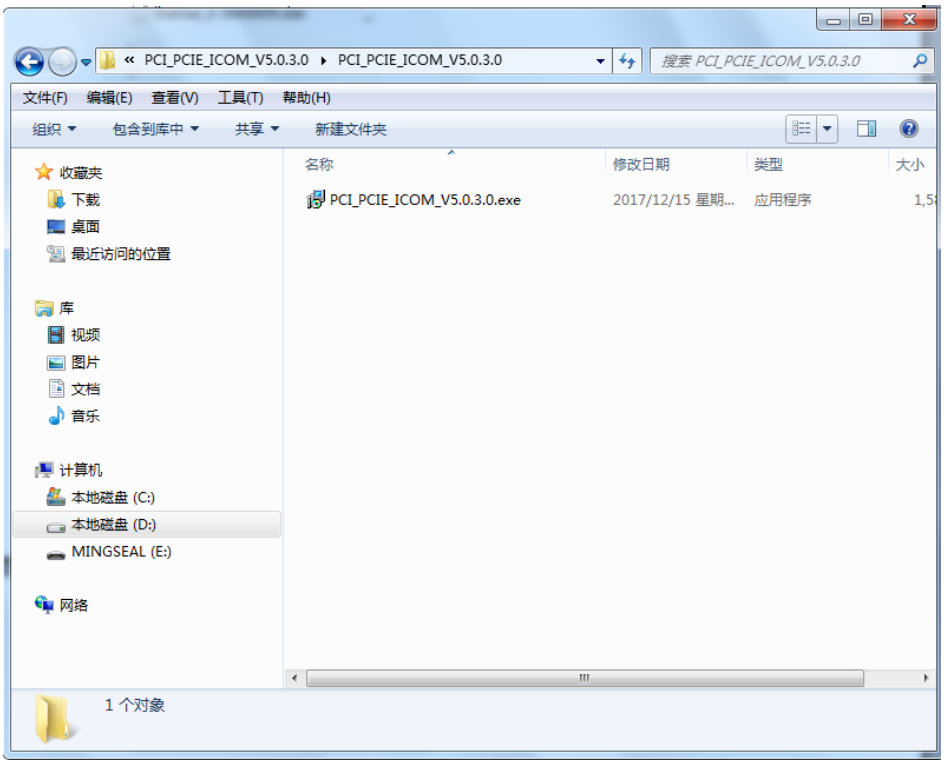


Fig. 31

2. Click “Confirm” button;

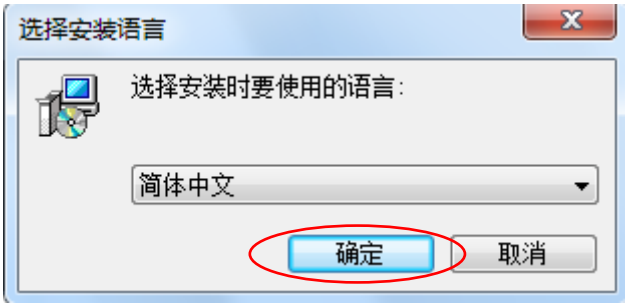


Fig. 32

3. Click “Next step” button;

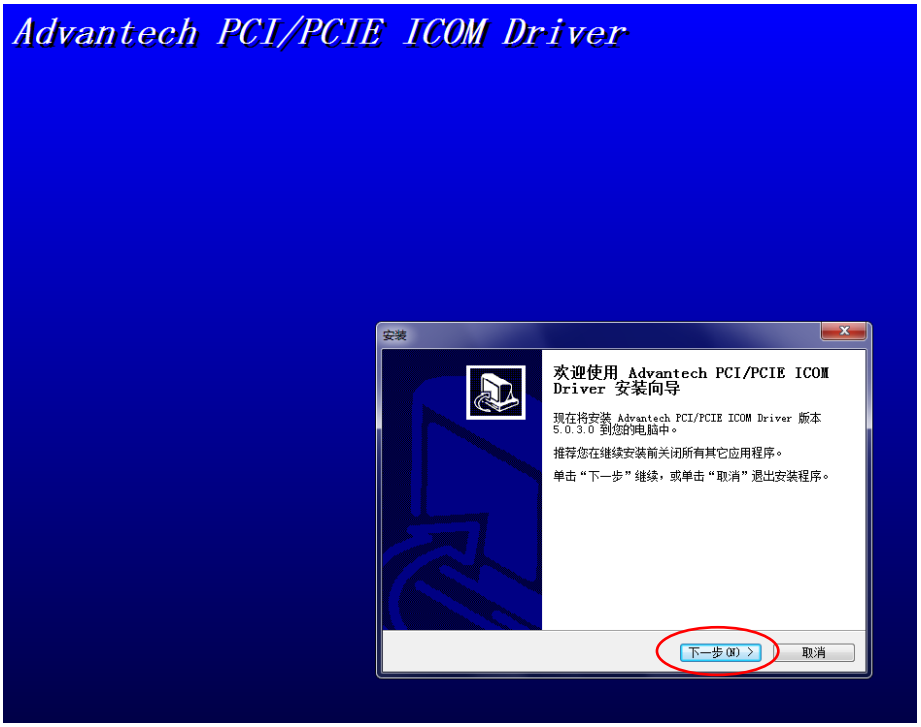


Fig. 33

4. Click “Next step” button;

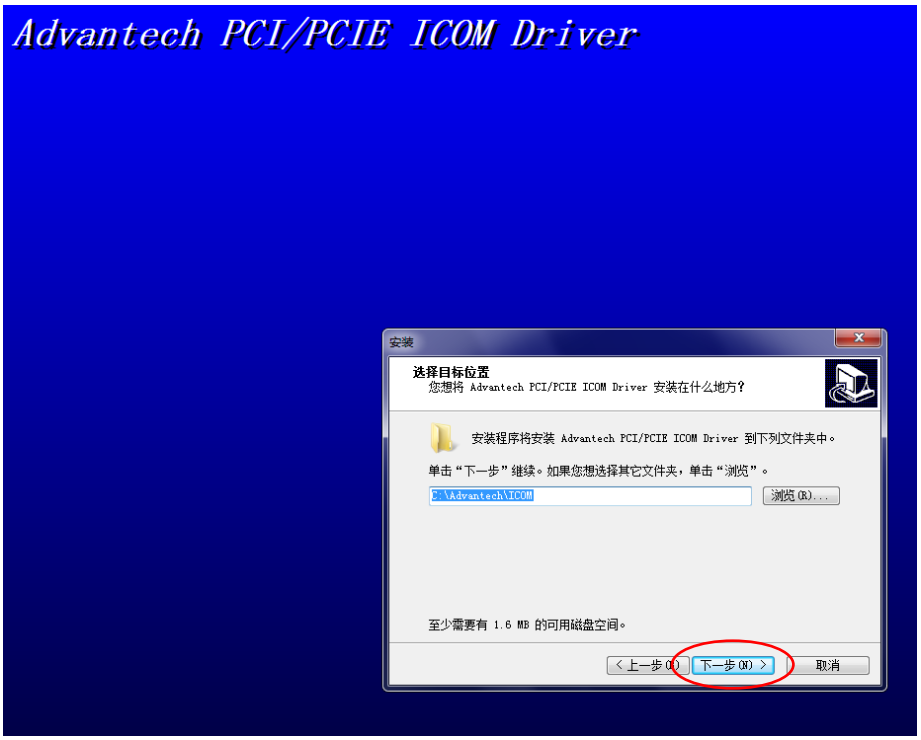


Fig. 34

5. Click “Next step” button;

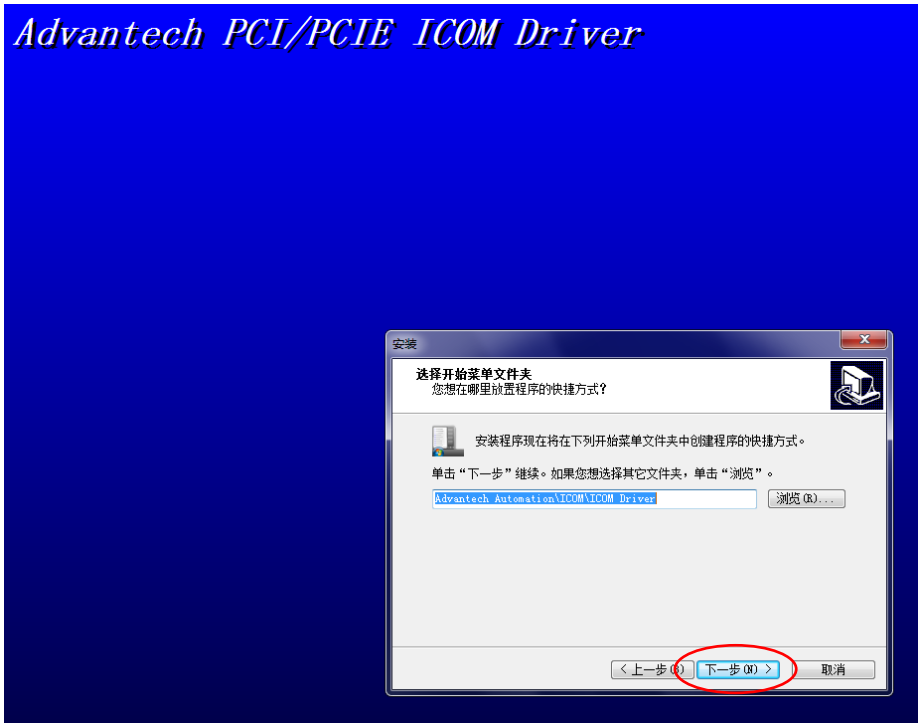


Fig. 35

6. Click “Installation” button;

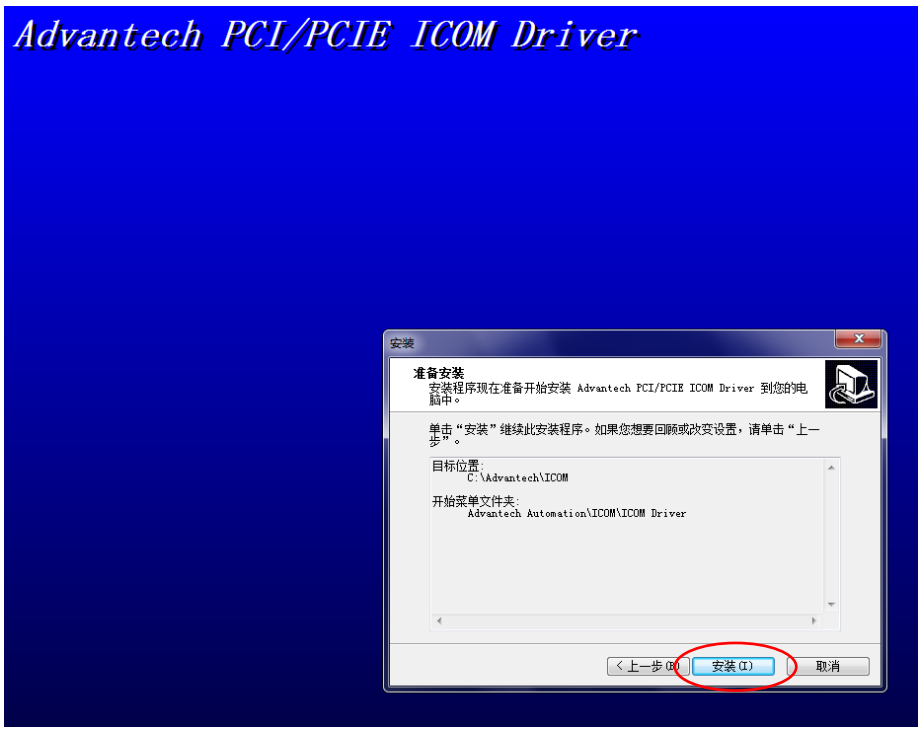


Fig. 36

7. Click “Finish” button, and restart the computer;

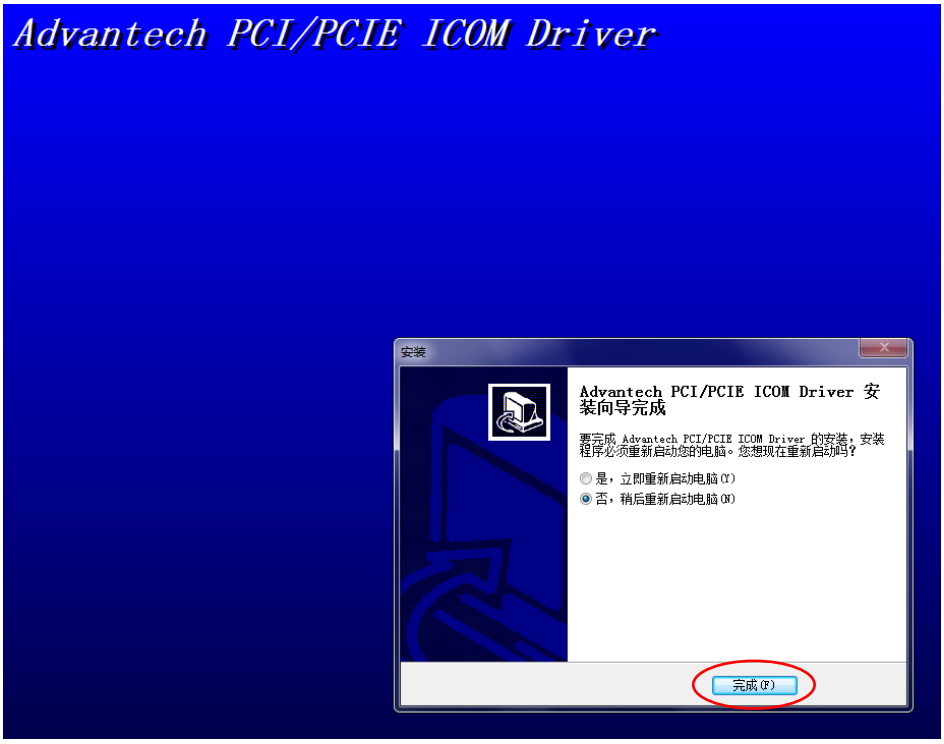


Fig. 37

Appendix V:

Electrical component setup procedure:

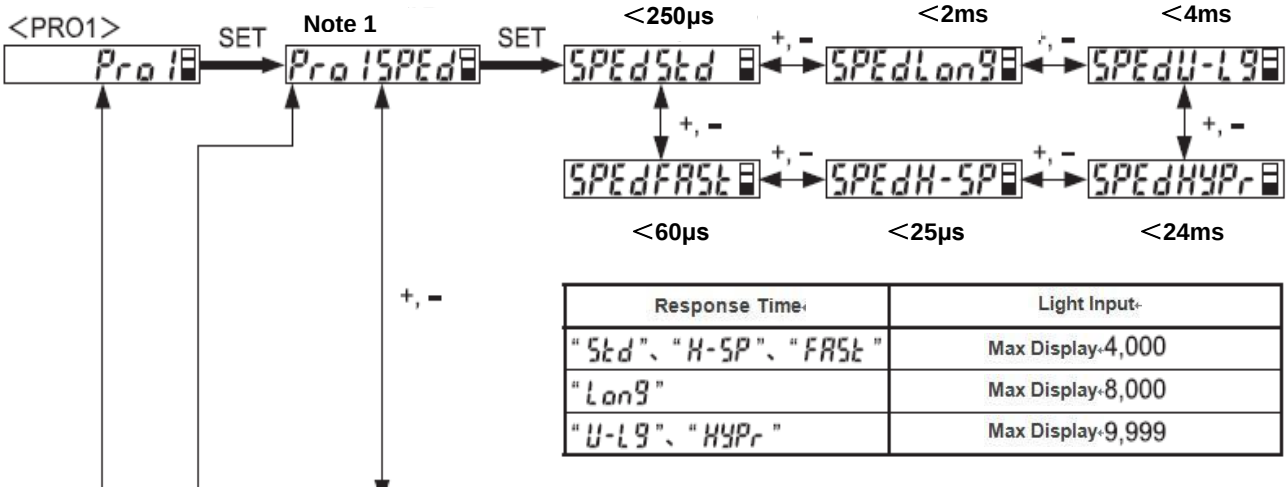
- Panasonic amplifier FX-501 response time adjustment instructions:

1. Press MODE button 3 times in digital display interface, to display PRO
2. Press SET 1time, to display PRO1
3. Press SET 1time, to display PROSPED
4. Press SET 1time, to display SPEDOLD
5. Then press + or 1 to select the needed response time
6. After the selection, press SET button, to shield the strobe; setting is done
7. Press MODE button to exit to initial display
8. interface

Notes:

1. Green numbers are set value, red numbers are threshold;
2. When threshold are over the set value, it output signal;
3.when equipment is powered on, press + or – to change the set value

Response time setting



Response Time	Light Input
"Std"、"H-SP"、"FAST"	Max Display 4,000
"Long"	Max Display 8,000
"U-L9"、"HYPr"	Max Display 9,999

- Panasonic LDS debugging steps:

Long press ENTER button -> display nnr

->Press SELECT button -> till to display Pro2

->Press ENTER button -> display average times interface AvE

->then press ENTER button -> display average times 1024

->use SELECT button, to switch average times to 64,

-> ENTER button, to save and exit the settings.

1. E5CC Temperature controller parameters settings:
   Select temperature sensor type,

   Long press 3sec -> display "CN-t:

   ->Press button to select 1 (defaults 5)

   ->Long press 3sec to save the settings

2. Temperature regulation type setting,

   Long press 3sec -> display "CN-t:

   ->Press button to select CNtL

   ->Press button to select PCd

   ->Long press 3sec to save the settings

3. Communication type setting,

Long press  3 sec -> display "CN-t:

->Press  1 sec, to display PSEL

->Press  button to select Mod

->Press  button, to display U-No

->Press  button to select 1（Different temperature controller settings parameters should not be the same, from left to right in order to increase 1,2,3,4...）

->Long  button, to display bPS

->Press  button to select 38.4

->Press  button, to display PRty

->Press  button to select NoNE

->Long press  3 sec to save the settings

4. Communication protection menu setting,

Press simultaneously  3 sec, display oAPt

->Press  button, 1sec display CCPt

->Press  button, to select 0,

->Long press  for 3sec, to save the settings

->Long press  button, to display At

->Press  button to display CMWt

->Press  button, to select ON

->Press  button to exit and save the settings

5. Heating to self-setting,

Press  button, to display 

->Press  button to display “AT-2”

（when AT in execution, the "TUNE" lamp(indicating the action) is on; after execution, it automatically back to "off"）