

Preface

- This operating instruction is included with machine. Please keep this manual for reference at any time.
- Please read this manual carefully before operating this equipment.
- Due to the technical update and the special requirements of the product, the product may be partially different from the manual description, please in kind prevail, we will add additional instructions as much as possible.
- When the equipment is in normal use, please keep a certain space in front and behind the equipment, as necessary space for operation and maintenance. In addition, please do not obstruct the setting of the heat emission space for this equipment.
- Equipment operating environment: temperature: 5 ~ 25 °C, relative humidity: 20% ~ 95%, free from direct sunlight, no dew, no splashing water, no oil, no chemical liquid.
- The machine's technician who operates and maintains it must have computer operation skills.
- The computer configured on this machine can only be used for this machine, it is strictly forbidden to carry other movable storage device which can bring virus into the machine, so as to protect the control system.
- The U disk is properly configured to prevent the invasion of virus, and it is strictly prohibited to be used on other computers.
- For personal safety, when the equipment is running or standby, please do not open the front door or chains or the station head cover without taking safety measures, clothing and limbs must not get near the mechanical parts, otherwise, may incur body injury accidents.
- Repeated switching power supply on and off can be one of the reasons for equipment failure. After the power is turned off, please wait for at least 20 seconds before you turn on the power again.
- Do not expose the device to shock or strong vibration, otherwise it may cause malfunction.
- When cutting off the power, proceed the system exit / shutdown process in the following order. If you cut off the power supply or restarted it without following this process, the data can not be saved completely and the hard disk can be

damaged. Exit / Shutdown Procedure: Exit the application → exit Windows → disconnect the device from power.

- If the equipment is suspended, store the equipment in the proper environment: ambient temperature (0-40) °C, relative humidity (20 ~ 95)%, free from direct sunlight, no dew condensation, no splashing water, no oil and chemical liquid. Protective measures (such as covering cloth) can be taken to prevent dust and moisture.
- Please contact us in case of any questions, please do not operate blindly.

Note: Please note above mentioned matters!

Machine overview:

S-7040 Odd form insertion machine for high-speed, high-precision, high-performance equipment, is specifically developed for odd form components insertion such as large electric capacity and resistor, which integrates three bowl feeders to achieve three Material Selective insertion. Its insertion head grips the odd form components by moving the X, Y units with high insertion precision in the PCB board area, insertion angle is controlled by the steering wheel. The series of control software and operating software is developed by our company independently, all operations are controlled by a computer.

This Odd Form Radial insertion machine has following major advantages:

- △ Full computer control, English version operating system, based on the Windows platform, easy to operate, fast, simple, easy to learn.
- △ Machine vision technology applied, online automatic programming, automatic correction, automatic identification of the MARK point, highly automotive.
- △ AC servo system provide stable line operation, excluding the instability caused by line failure, to achieve a stable high-speed, energy saving.

Software Operation

1、 Safety check before operation.

Please be aware: the machine for the new installation or long-term idle state, before supply the machine with power and compressed air and operation, we must do following security checks carefully:

- 1) Check whether the power supply is the specified rated voltage.
- 2) Check whether the main power supply is connected to the machine, and the fuse is intact, branch circuit breaker is closed.
- 3) Whether the equipment is properly grounded.
- 4) Ensure no unrelated objects remain in the electronic control box and the machine movable parts.
- 5) Check if conveyor belt and synchronous belt fall off during transportation.
- 6) Check if the lead screw, slide track, insertion shaft and other heavy-duty, high-speed operational units are properly connected.
- 7) Push and pull X, Y, R1, R2, F units to see if they can move smoothly.
- 8) Check the limit detector and limitation are dislocated or not.
- 9) Check whether the emergency switch is pressed down, check the overall gas source, the power switch is at the OFF state.
- 10) Check wiring plug and air pipes between the computer, electric control box, the main and auxiliary parts are properly connected.

2. Machine Switching Guide



First of all, check the specifications of the power supply and air pressure of the device. For details, please refer to the basic parameters in this manual, and connect the power supply and air pressure as required.

Then turn the red knob switch to ON, the whole device starts to be powered on, and the boot is over; when shutting down, please wait for the software to close. After that, turn off the computer, then turn the red knob switch to OFF, and the shutdown is over.

[START]:The machine continues to run automatically (the first startup needs to be performed in the software [homepage]);

[STOP]:The machine suspends the current action;

[FEEDER]:All feeder stop and start button:

[EMERGENCY]:All axes emergency stop and enable;

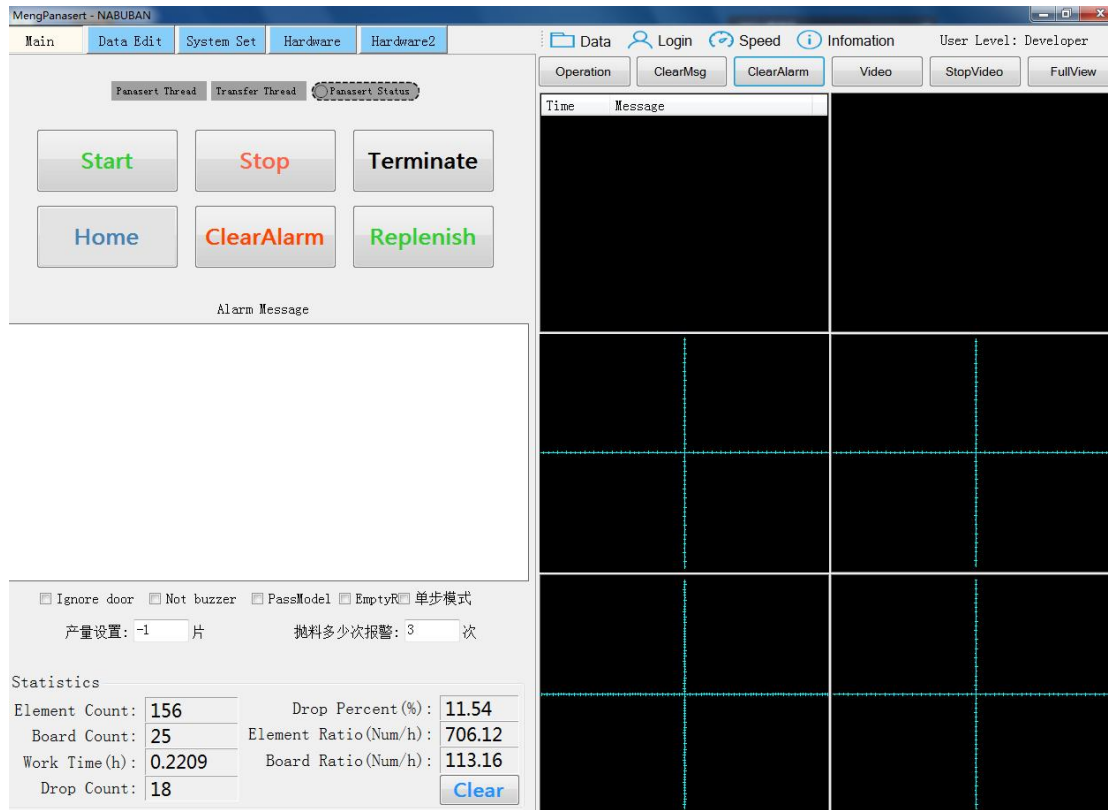
3. Software Operating Instructions

Software login: Double-click the desktop icon to open the software and enter the main page of the software



Introduction to the main interface area

The main interface is divided into five areas: "manual operation area", "function menu area", "shortcut operation area", "status display area", "camera display area";



"Manual operation area": mainly to set machine and process parameters, which are composed of five modules: [Homepage], [Data Programming], [System Settings], [Hardware] and [Hardware 2]; each module is configured according to the login authority. There is a corresponding operating area;

"Function menu area": other functions;

"Quick operation area": common functions;

"Status display area": machine status;

"Camera display area": image observation.

[Manual operation area] interface introduction

[homepage]

Reminder:!!! When manually debugging, please use speed 1. Generally, execute [lifting head], [stop position] or [dropping material] before executing single-axis movement!!!



The interface includes a menu bar with 'Main', 'Data Edit', 'System Set', 'Hardware', and 'Hardware2'. Below this are three tabs: 'Panaset Thread', 'Transfer Thread', and 'Panaset Status'. The main control area contains six buttons: 'Start' (green), 'Stop' (red), 'Terminate' (grey), 'Home' (blue), 'ClearAlarm' (red), and 'Replenish' (green). An 'Alarm Message' section is currently empty. At the bottom, there are several checkboxes: 'Ignore door', 'Not buzzer', 'PassModel', 'EmptyR', and '单步模式'. Below these are two input fields: '产量设置: -1 片' and '抛料多少次报警: 3 次'. A 'Statistics' section contains a table with the following data:

Element Count:	156	Drop Percent (%):	11.54
Board Count:	25	Element Ratio (Num/h):	706.12
Work Time (h):	0.2209	Board Ratio (Num/h):	113.16
Drop Count:	18		

A 'Clear' button is located at the bottom right of the statistics table.

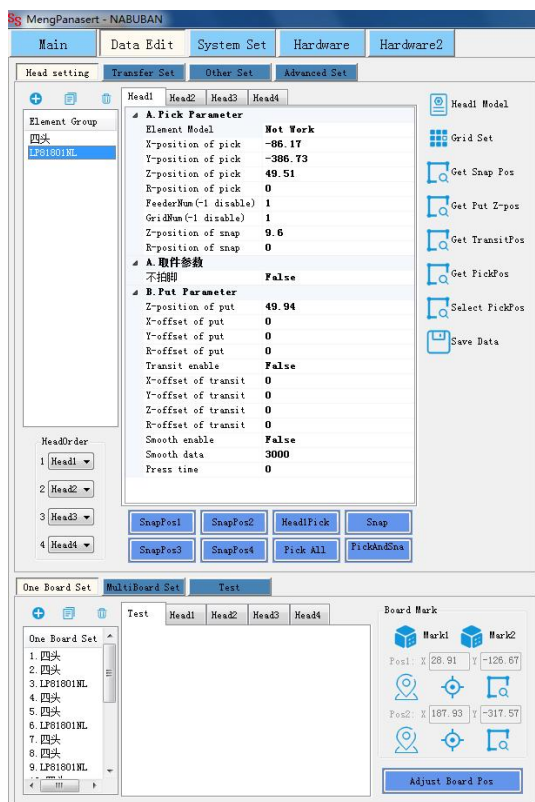
1. [Machine reset]: After clicking, the button will turn red, indicating that it is being reset; when it turns green, it indicates that the reset is successful;
2. [Start]: The machine runs production automatically;
3. [Suspend]: The machine suspends production, click [Start] to continue running;
4. [Stop]: The machine stops production and throws out materials;
5. [Clear Data]: Data reset.

[Data programming]

Reminder!!! When manually debugging, please use speed 1. Generally, execute [lifting head], [stop position] or [dropping material] before executing single-axis movement!!!

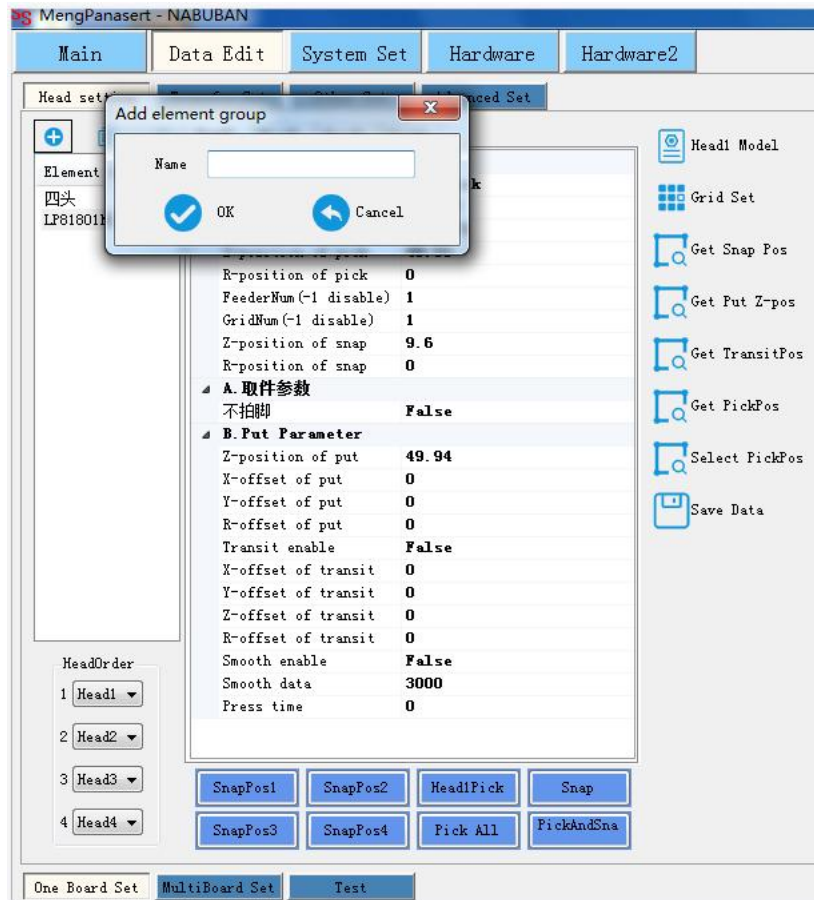
Requires administrator privileges to enter

[Front three heads]

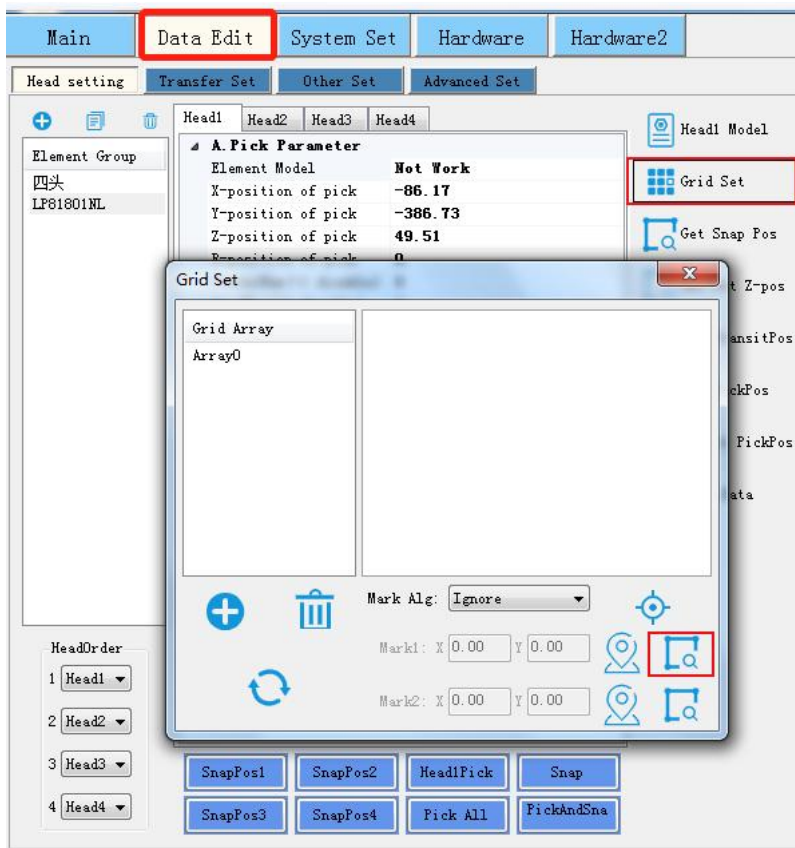


Reminder!!! When manually debugging, please use speed 1. Generally, execute [lifting head], [stop position] or [dropping material] before executing single-axis movement!!!

[New combination]:



[Grid setting]:



[Left/middle/right head retrieving]: Single head performs retrieving action;

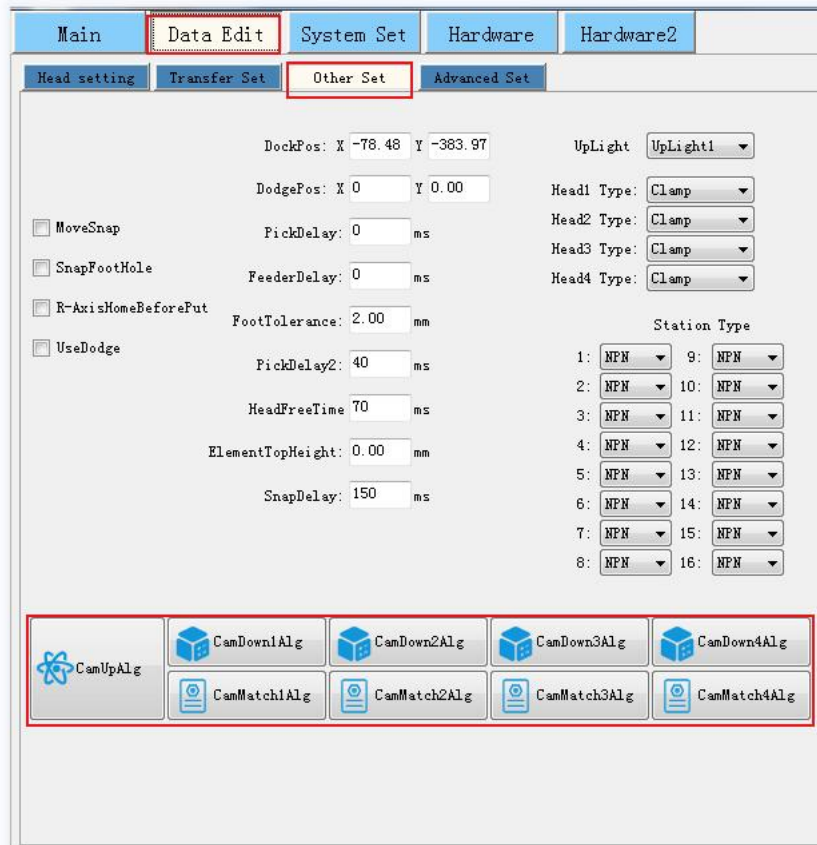
[Robot pick-up]: When the component template is [No inserted], the corresponding head at the front/rear part performs the pick-up action at the same time;

[Flying shot test]: execute the flying test action;

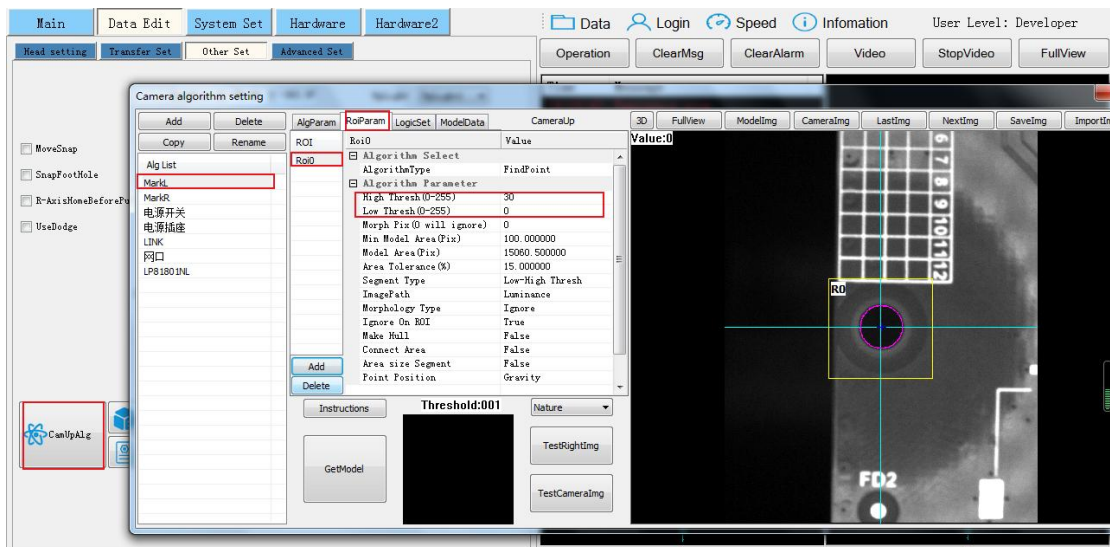
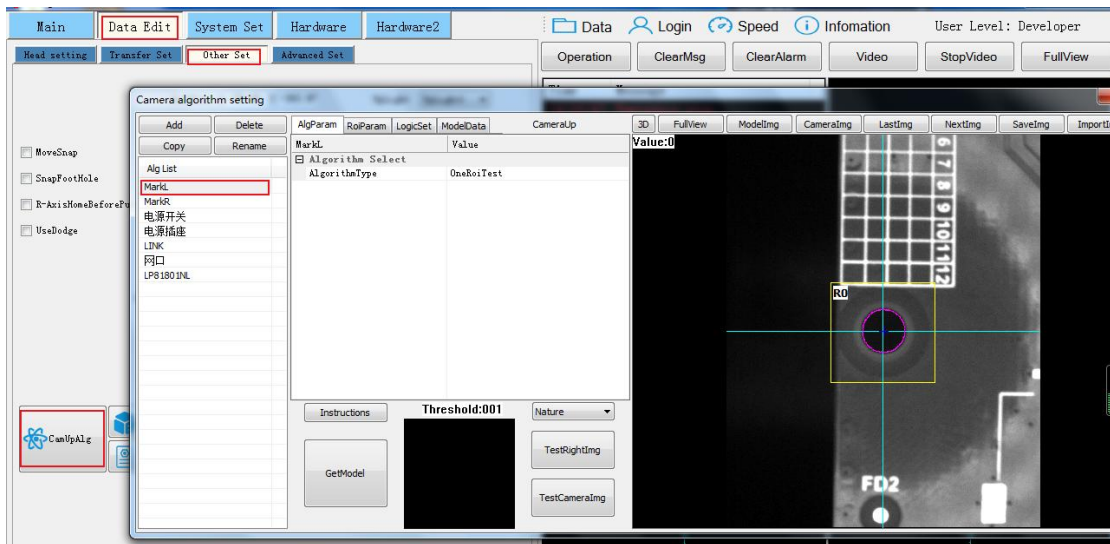
[Move to the camera position]: Execute the action of moving to the camera position;

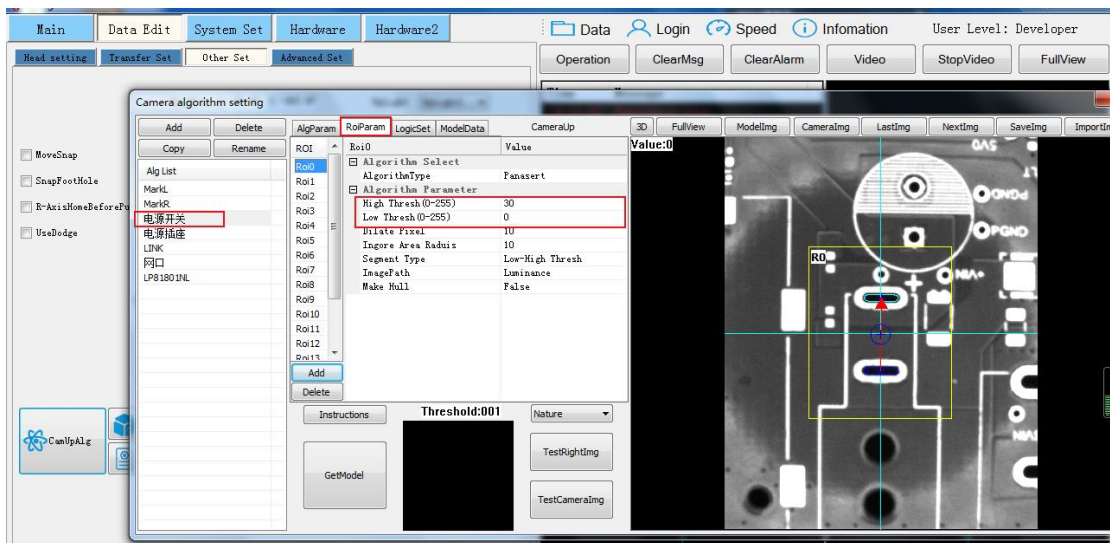
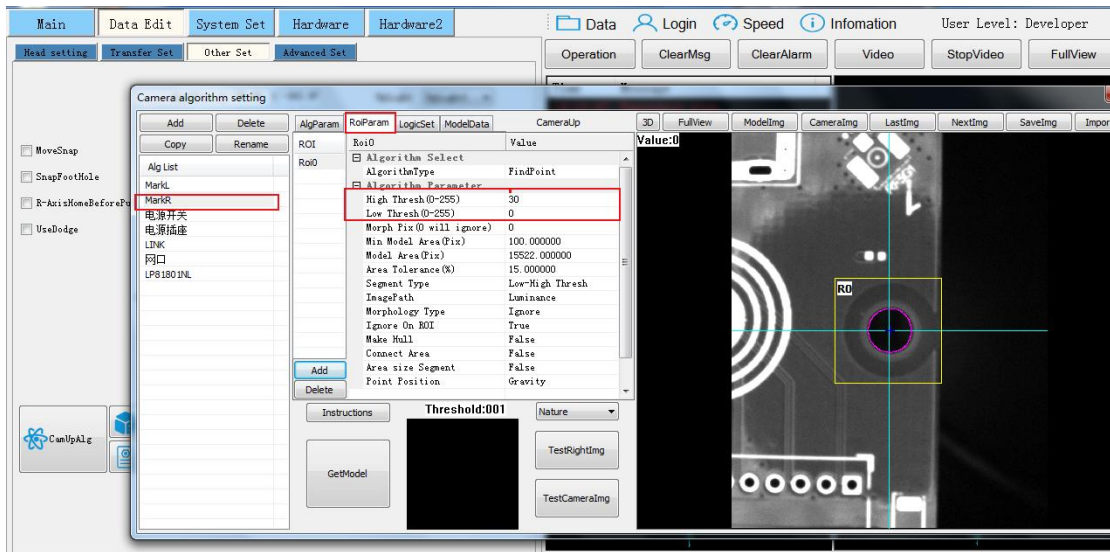
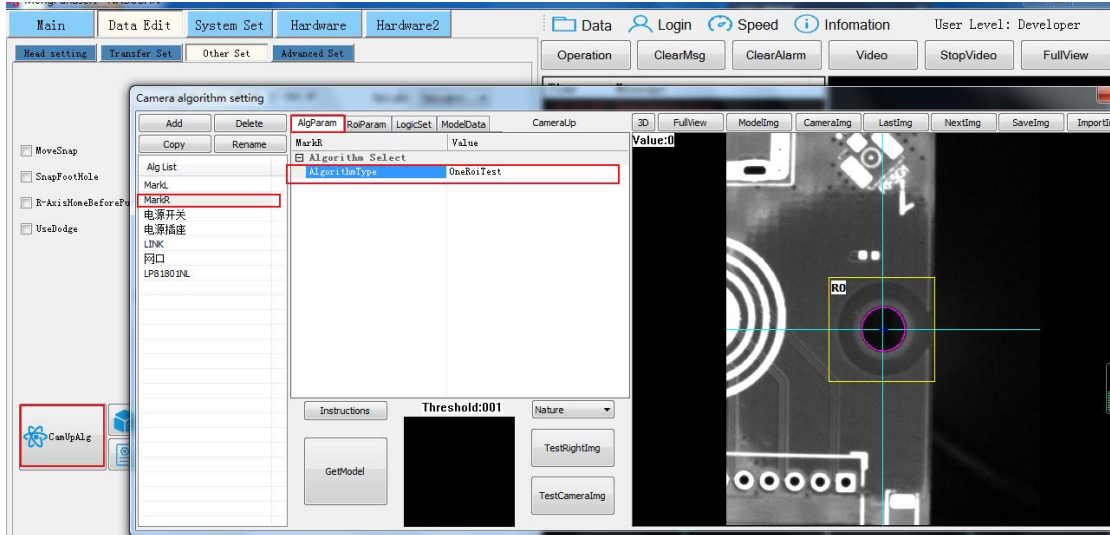
[Pickup Flying Shot]: Coherently execute the actions of [Pickup by Robot Hand] + [Flying Shot Test].

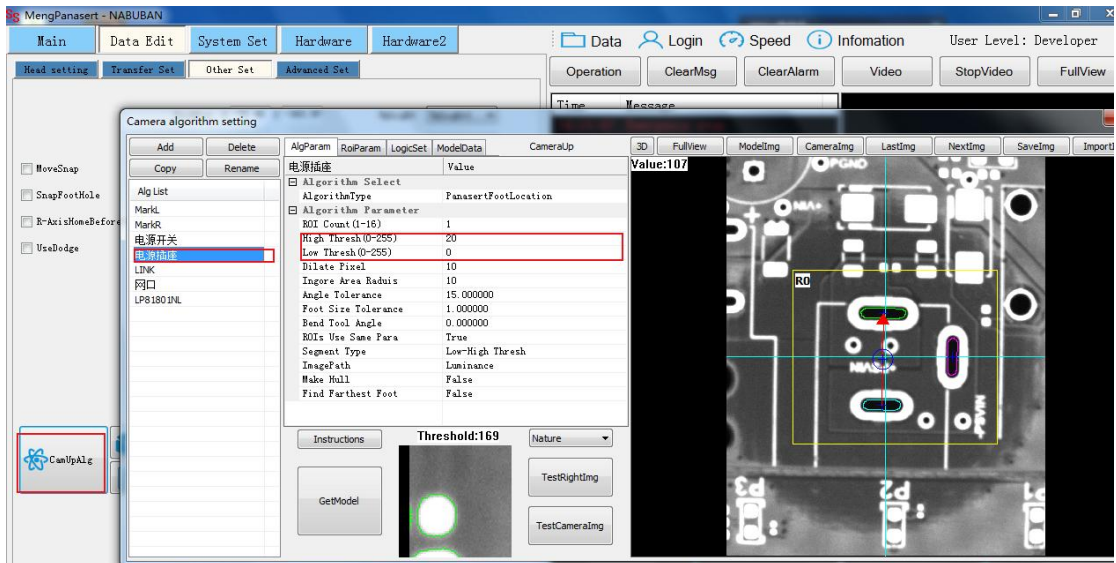
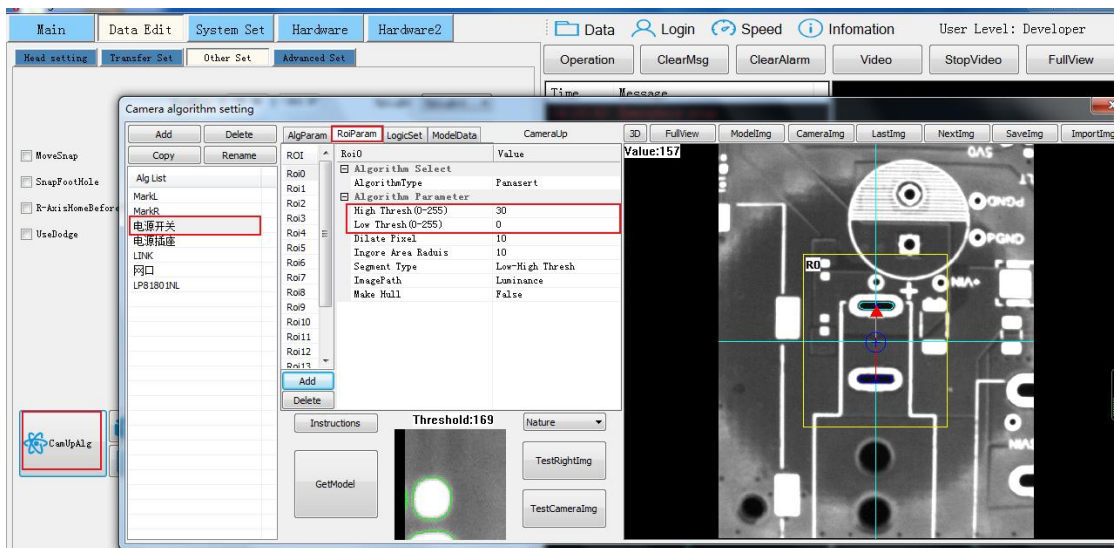
Camera algorithm settings:

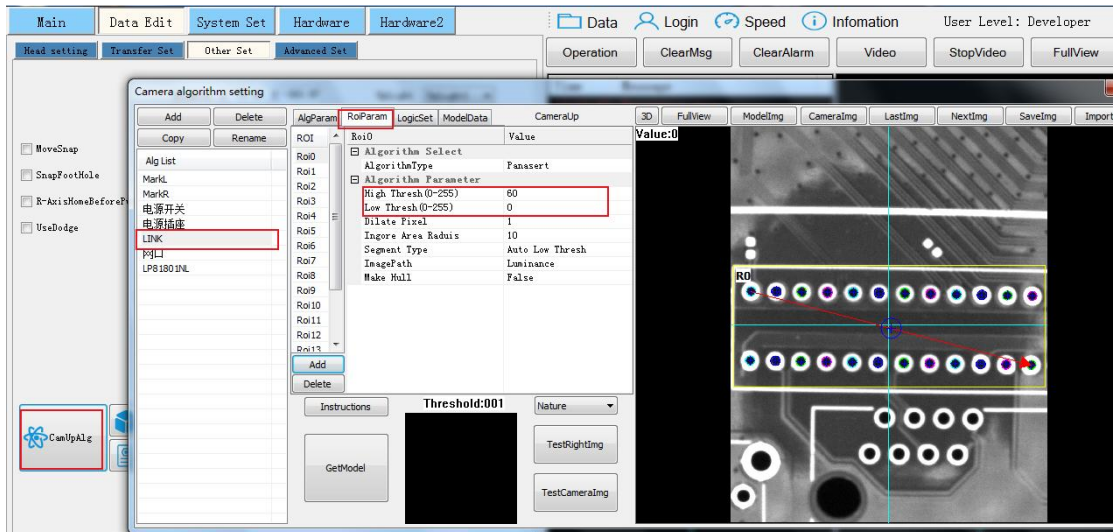
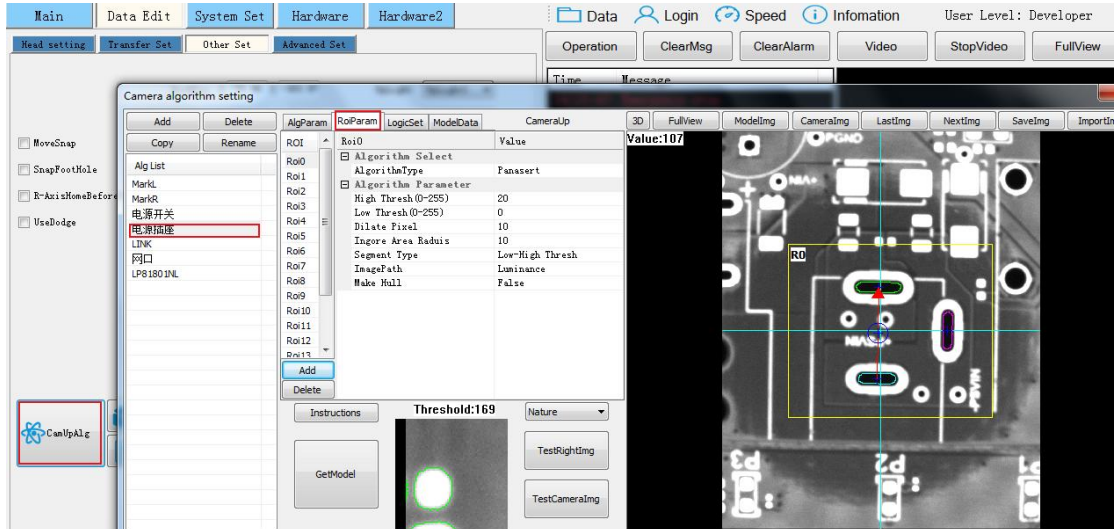


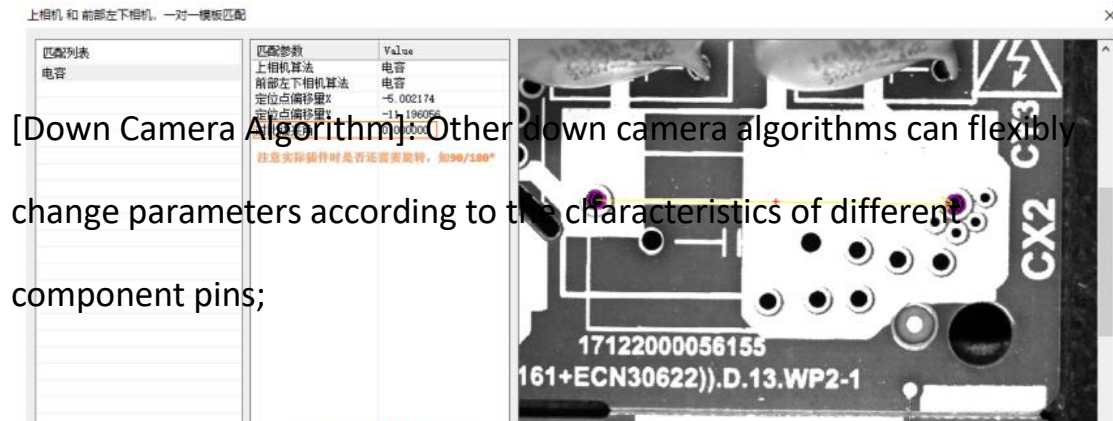
[Up camera algorithm]: MarkI/MarkR and all types of components to be inserted;



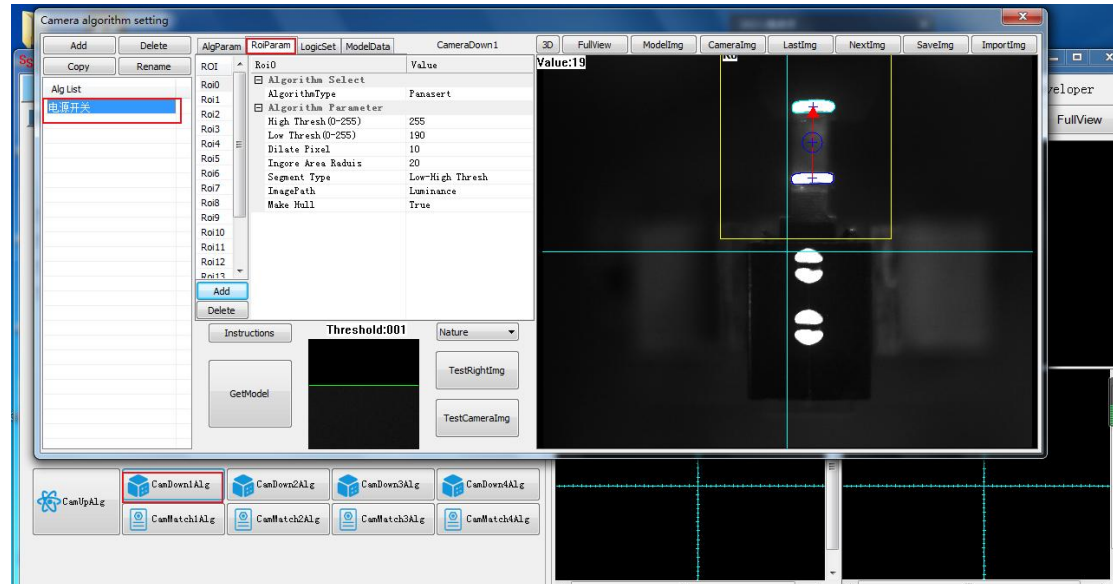
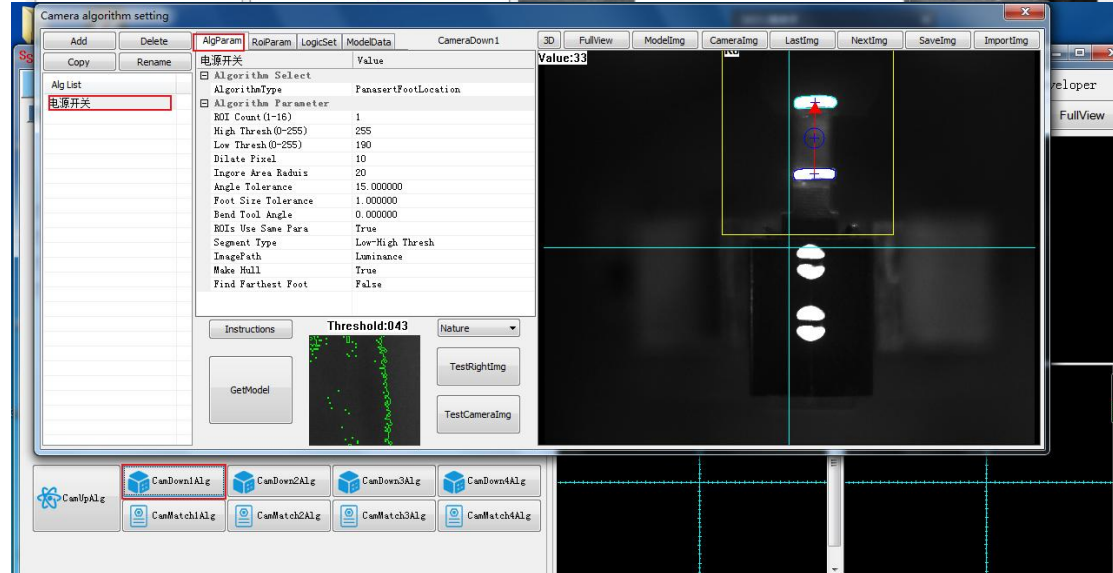




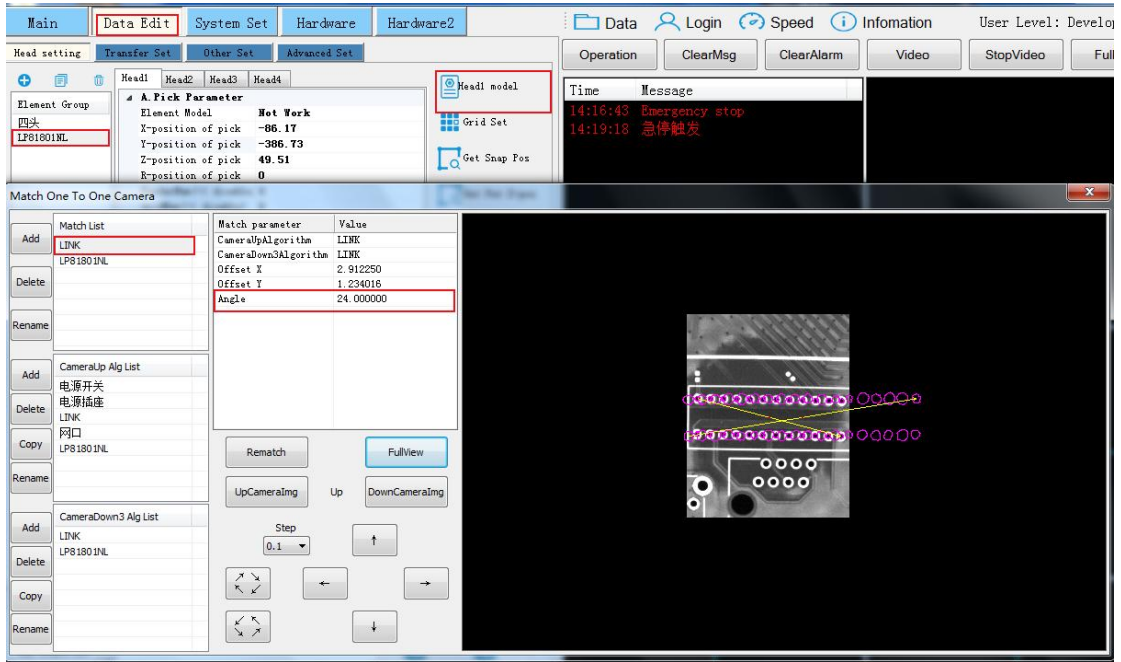




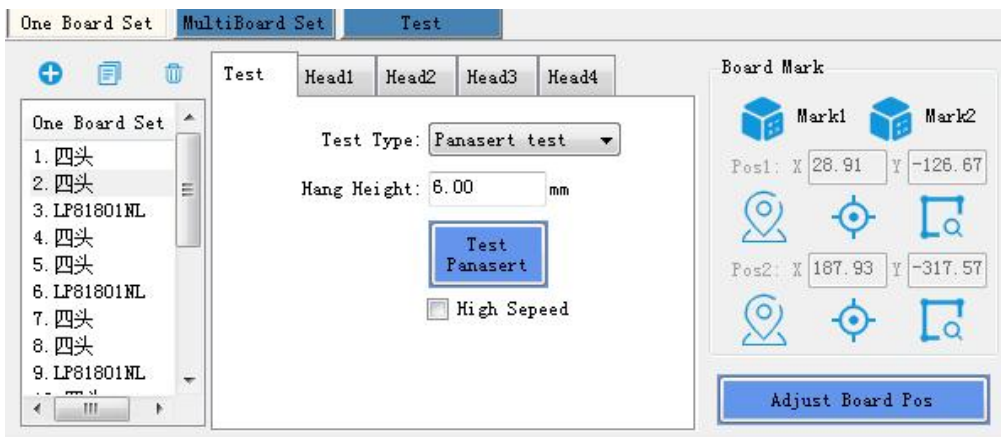
[Down Camera Algorithm]: Other down camera algorithms can flexibly change parameters according to the characteristics of different component pins;



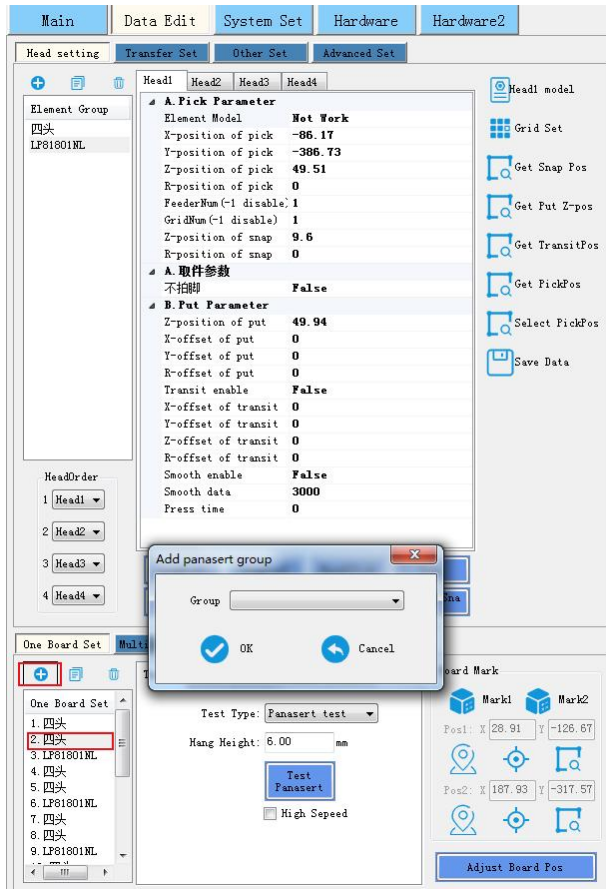
[Left/Center/Right Bottom Match Template]:



[Single imposition setting]:

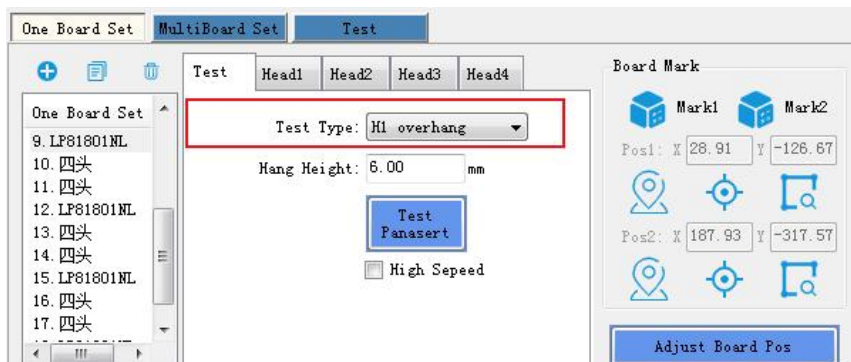


[Add new]:



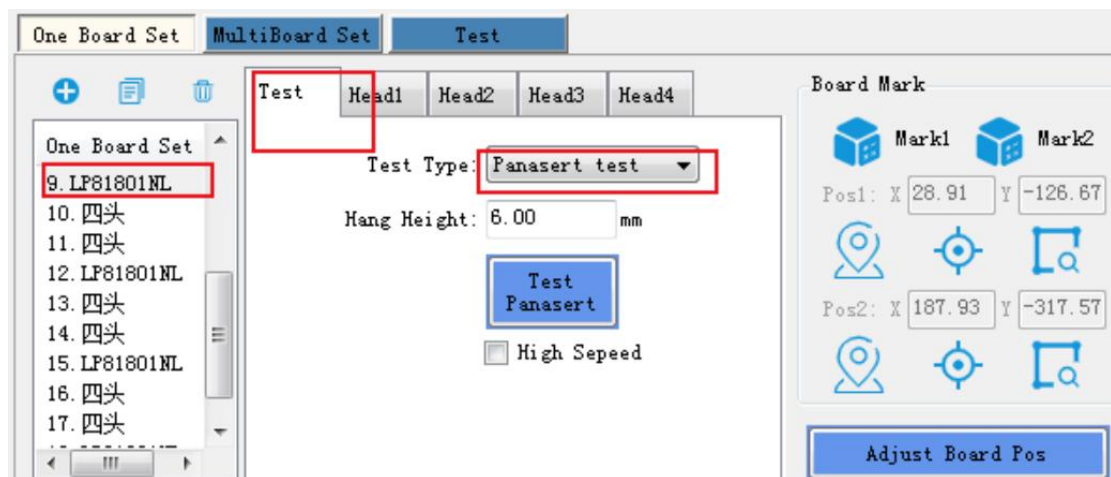
[insertion sequence]: The order of the insertion must be set before the insert test, such as the avoidance position is on the right side of the light source, the front insert sequence is left to middle to right, and the rear is right to middle to left;

[Left head hanging in the air]:

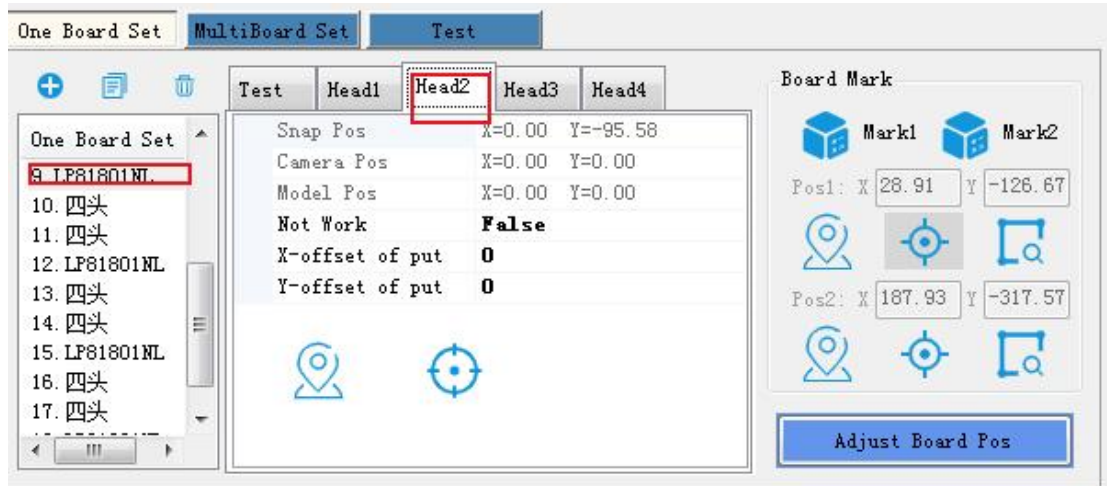




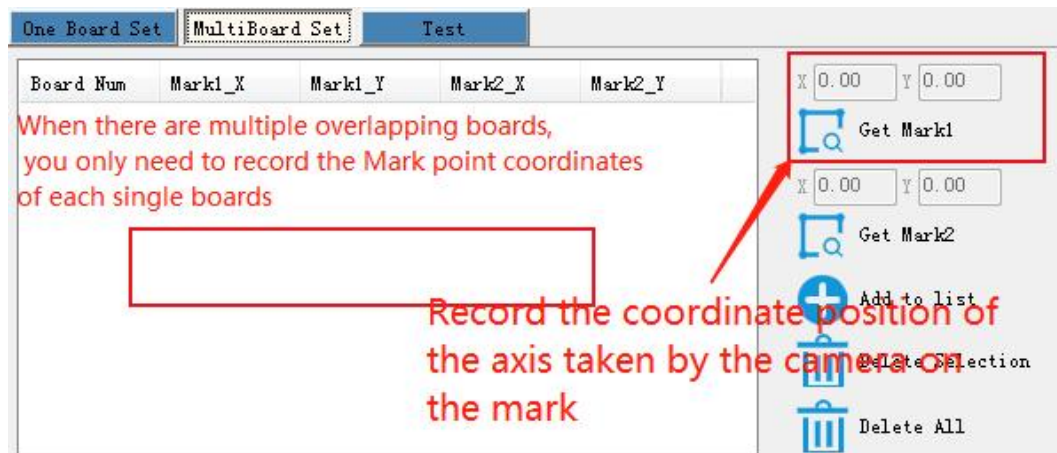
[Test insertion]:



[Automatic positioning]: Determine the axis coordinates when the upper camera captures the component and move it to the center of the camera's field of view;



[Multi-imposition setting]:



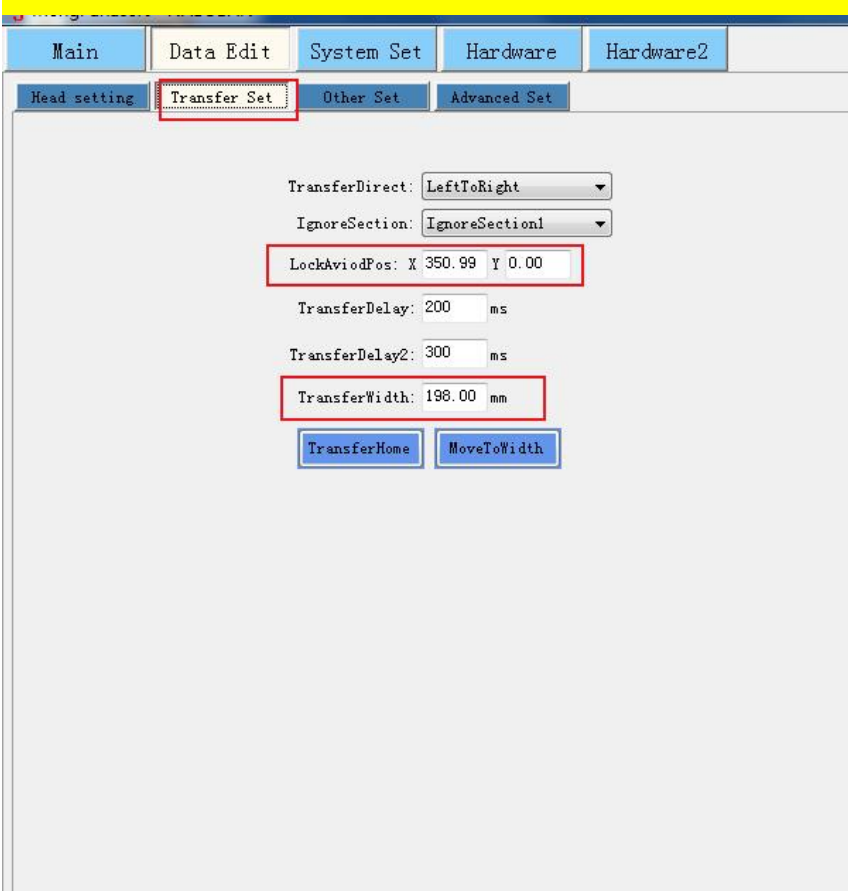
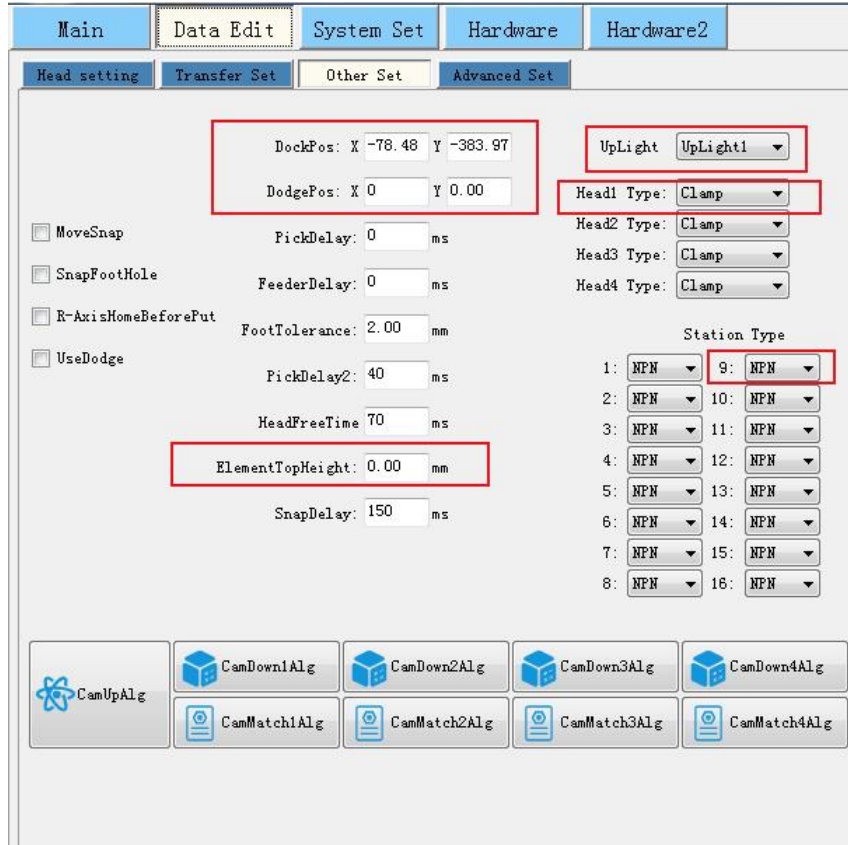
[Rear three heads]

Reminder:!!! When manually debugging, please use speed 1. Generally, execute [lifting head], [stop position] or [dropping components] before executing single-axis movement!!!

Same as above [front three heads]

[other settings]

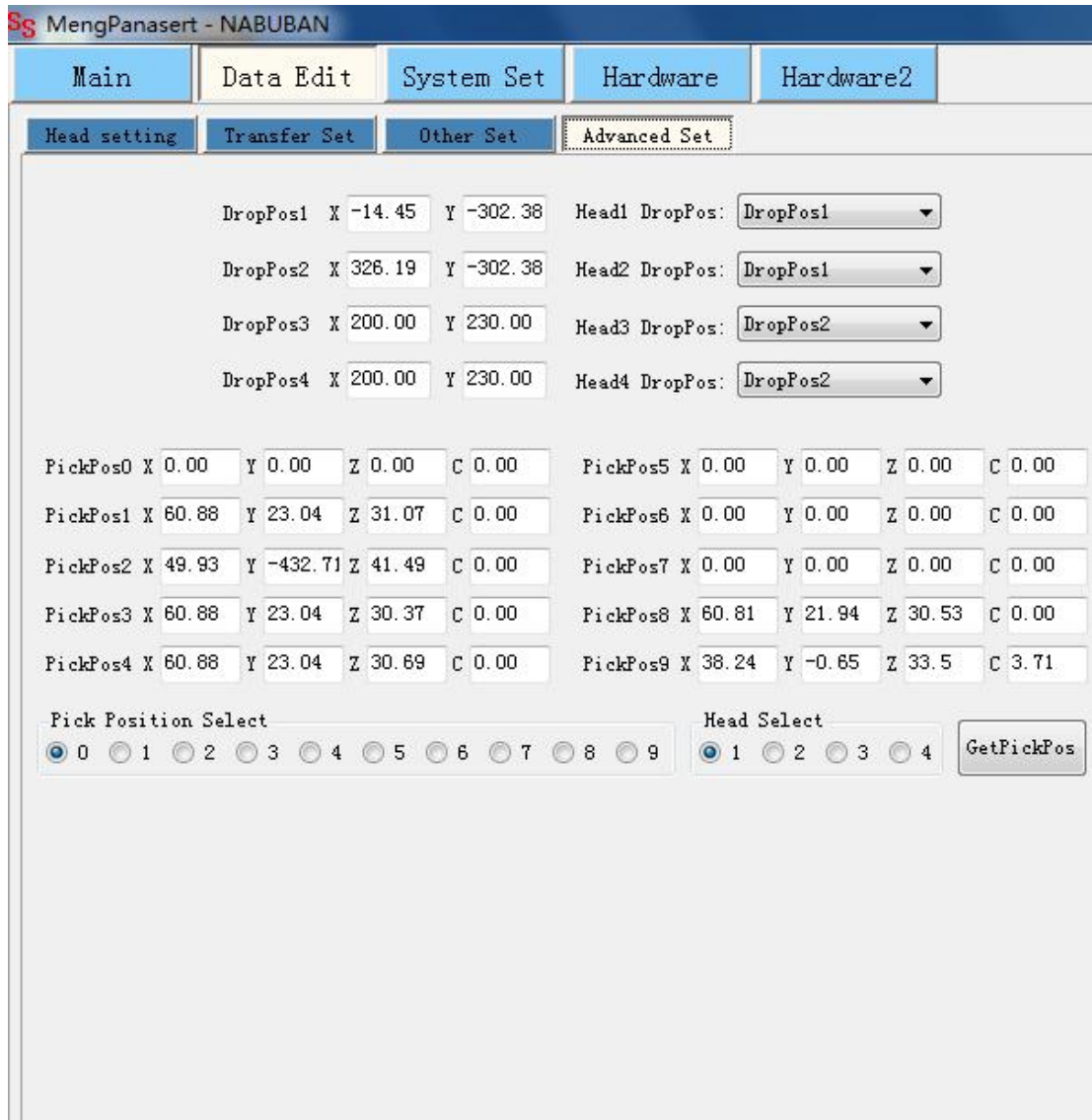
Reminder:!!! When manually debugging, please use speed 1. Generally, execute [lifting head], [stop position] or [dropping components] before executing single-axis movement!!!



1. [Head Clamping Delay]: Delay time after reaching the pick-up position (to prevent not clamping in place);
2. [Head release delay]: the delay time when the insertion is completed (to prevent the head from lifting and flying materials);
3. [Maximum component height]: Based on the height of the flying camera, the avoidance height of the component during the movement of the insertion;

[advanced settings]

Reminder:!!! When manually debugging, please use speed 1. Generally, execute [lifting head], [stop position] or [dropping components] before executing single-axis movement!!!



The screenshot shows the 'Advanced Set' configuration window. It features a menu bar with 'Main', 'Data Edit', 'System Set', 'Hardware', and 'Hardware2'. Below this is a sub-menu bar with 'Head setting', 'Transfer Set', 'Other Set', and 'Advanced Set'. The main area contains the following settings:

DropPos1	X	-14.45	Y	-302.38	Head1 DropPos:	DropPos1
DropPos2	X	326.19	Y	-302.38	Head2 DropPos:	DropPos1
DropPos3	X	200.00	Y	230.00	Head3 DropPos:	DropPos2
DropPos4	X	200.00	Y	230.00	Head4 DropPos:	DropPos2

PickPos0	X	0.00	Y	0.00	Z	0.00	C	0.00	PickPos5	X	0.00	Y	0.00	Z	0.00	C	0.00
PickPos1	X	60.88	Y	23.04	Z	31.07	C	0.00	PickPos6	X	0.00	Y	0.00	Z	0.00	C	0.00
PickPos2	X	49.93	Y	-432.71	Z	41.49	C	0.00	PickPos7	X	0.00	Y	0.00	Z	0.00	C	0.00
PickPos3	X	60.88	Y	23.04	Z	30.37	C	0.00	PickPos8	X	60.81	Y	21.94	Z	30.53	C	0.00
PickPos4	X	60.88	Y	23.04	Z	30.69	C	0.00	PickPos9	X	38.24	Y	-0.65	Z	33.5	C	3.71

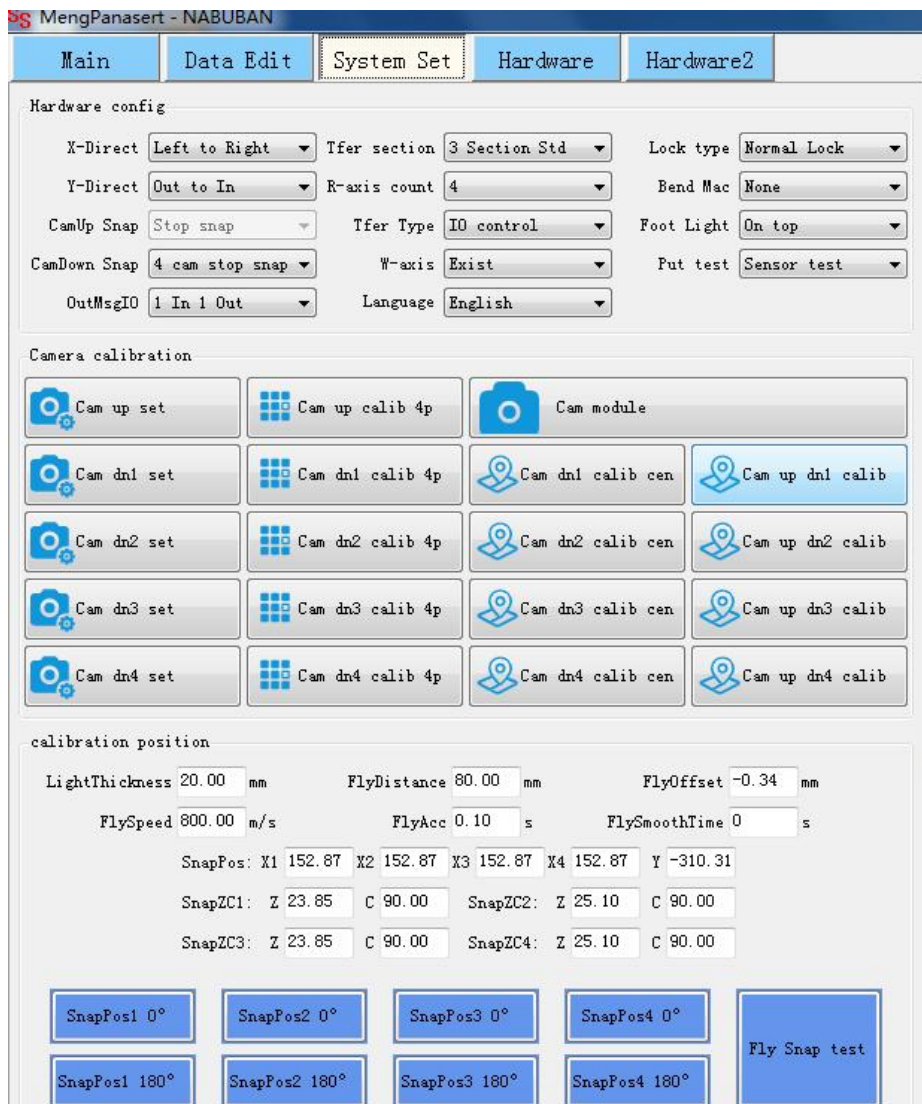
Pick Position Select: 0 1 2 3 4 5 6 7 8 9

Head Select: 1 2 3 4

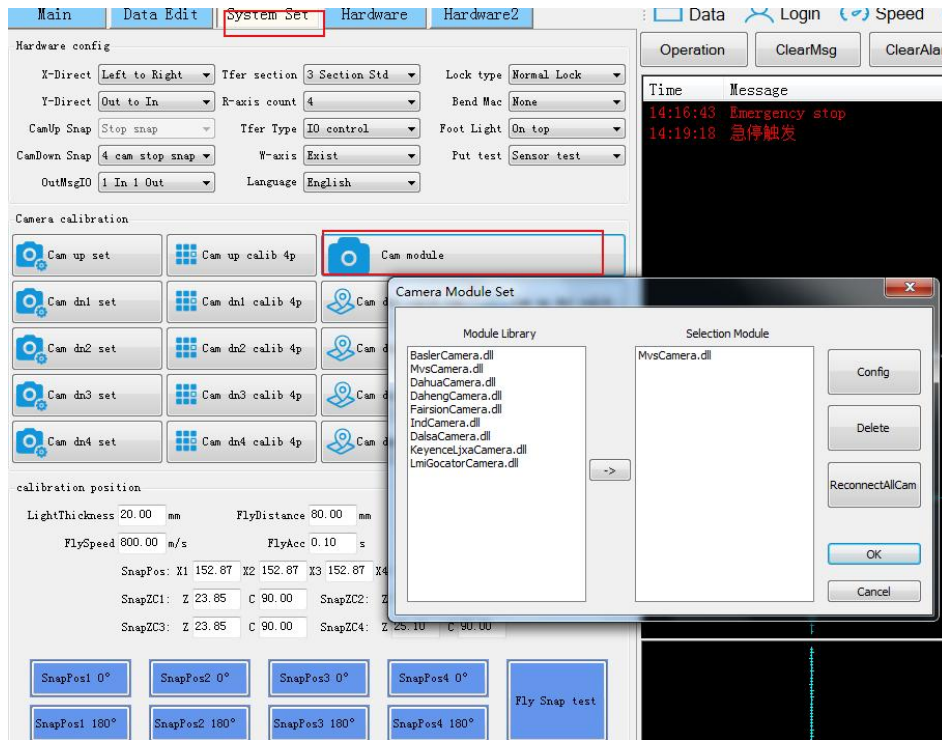
[system settings]

Reminder:!!! When manually debugging, please use speed 1. Generally, execute [lifting head], [stop position] or [dropping components] before executing single-axis movement!!!

Vendor permission is required to enter:



[camera module]:

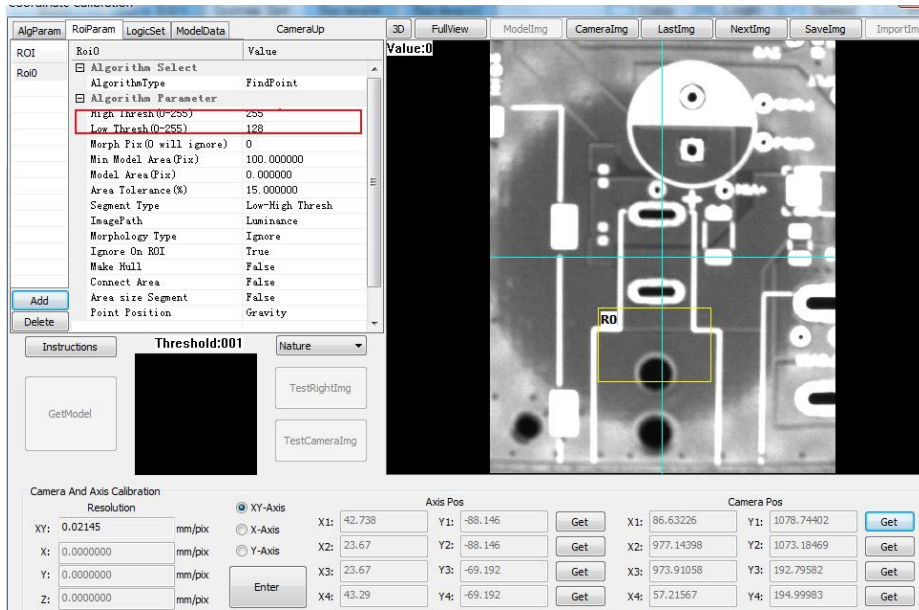


Calibration preparation:



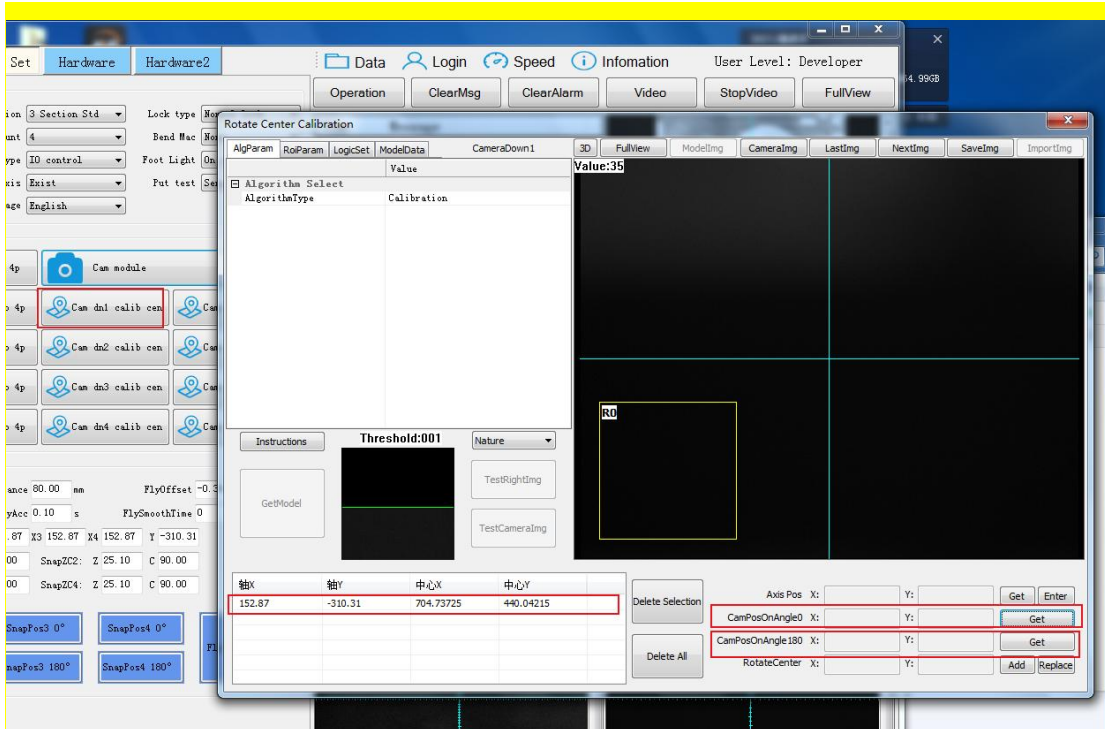
[Calibration of 4 points on the upper camera]: Establish the relationship between the coordinate system of each camera and the coordinate system of the real world, and determine the resolution of the camera;

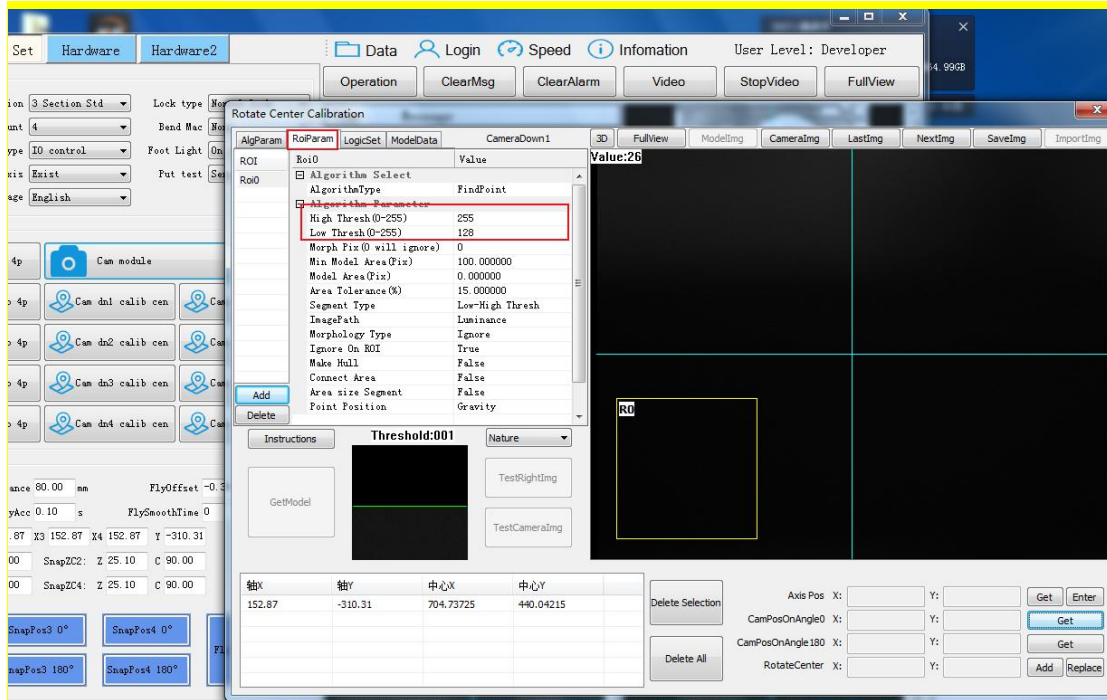




[4-point calibration of the lower left camera]:

[Bottom left camera rotation center]: Angle correction, determine the center coordinates of the rotation axis;





[Left upper and lower camera alignment]: Determine the coordinate system of the upper and lower cameras;

Up and down camera angle: The angle between camera rotation in the horizontal direction (the rear camera is installed opposite to the front, and the rear camera needs to be set at 180°);

[Move the front part to the 0 degree standard position]: the heads 1, 2 and 3 on the front part move to the [front camera position], and the Z axis moves to the [mark position]

(1~6)Z], the R axis rotates to the [marking position (1~6)C];

[Move the front part to the 180-degree standard position]: the No. 1, 2 and 3 heads of the front part move to the [front camera position], and the Z axis moves to the [mark position]

(1~6)Z], the R axis rotates 180° from the [marker position (1~6)C];

[Front calibration positioning flying]: execute flying shooting action;

[Light Source Thickness]: Based on the bottom of the light source, the actual height of the light source;

[Top plate position]: the absolute position of the top plate axis;

[Flying speed]: Y-axis speed (according to speed 4 parameter configuration);

[Flying acceleration time]: Y-axis acceleration time (according to speed 4 parameter configuration);

[Flying smoothing time]: Y-axis smoothing time (configured according to speed 4 parameters);

[Flying tail distance]: Y-direction travel from the camera position to the end of flying shooting;

[Flying Compensation]: Time compensation magnification of flying shooting, so that the image positions of stop shooting and flying

shooting are consistent; F: indicates the front flying shooting; B: indicates rear flying shot

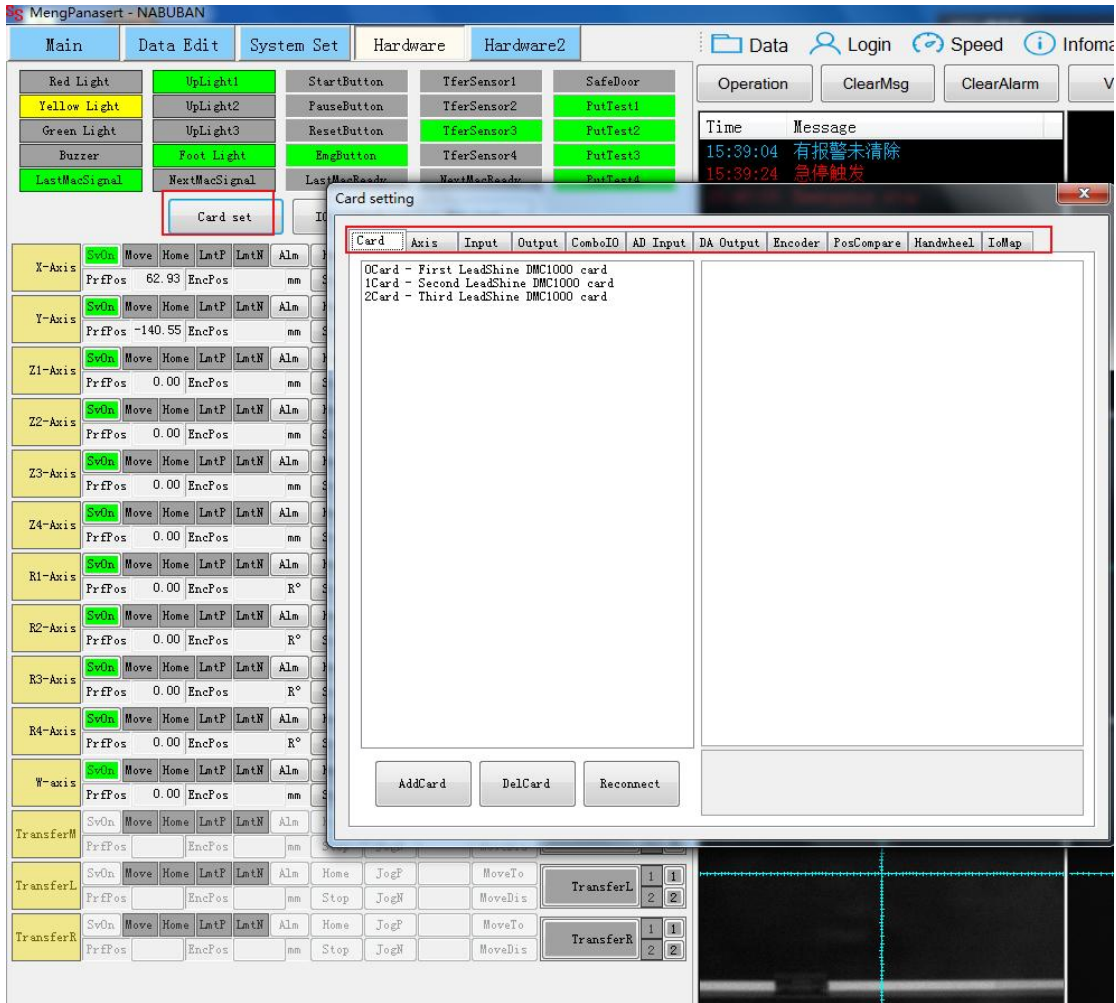
[hardware]

Reminder:!!! When manually debugging, please use speed 1. Generally, execute [lifting head], [stop position] or [dropping material] before executing single-axis movement!!!

Vendor permissions are required to enter:

Main	Data Edit	System Set	Hardware	Hardware2								
Red Light	UpLight1	StartButton	TferSensor1	SafeDoor								
Yellow Light	UpLight2	PauseButton	TferSensor2	PutTest1								
Green Light	UpLight3	ResetButton	TferSensor3	PutTest2								
Buzzer	Foot Light	EmgButton	TferSensor4	PutTest3								
LastMacSignal	NextMacSignal	LastMacReady	NextMacReady	PutTest4								
Card set		IO control		Run test								
X-Axis	SvOn	Move	Home	LntP	LntN	Alm	Home	JogP	MoveTo	HeadL1	1	1
	PrfPos	62.93	EncPos			mm	Stop	JogN	MoveDis		2	2
Y-Axis	SvOn	Move	Home	LntP	LntN	Alm	Home	JogP	MoveTo	HeadR1	1	1
	PrfPos	-140.55	EncPos			mm	Stop	JogN	MoveDis		2	2
Z1-Axis	SvOn	Move	Home	LntP	LntN	Alm	Home	JogP	MoveTo	HeadL2	1	1
	PrfPos	0.00	EncPos			mm	Stop	JogN	MoveDis		2	2
Z2-Axis	SvOn	Move	Home	LntP	LntN	Alm	Home	JogP	MoveTo	HeadR2	1	1
	PrfPos	0.00	EncPos			mm	Stop	JogN	MoveDis		2	2
Z3-Axis	SvOn	Move	Home	LntP	LntN	Alm	Home	JogP	MoveTo	CylinderL	1	1
	PrfPos	0.00	EncPos			mm	Stop	JogN	MoveDis		2	2
Z4-Axis	SvOn	Move	Home	LntP	LntN	Alm	Home	JogP	MoveTo	CylinderR	1	1
	PrfPos	0.00	EncPos			mm	Stop	JogN	MoveDis		2	2
R1-Axis	SvOn	Move	Home	LntP	LntN	Alm	Home	JogP	MoveTo	CylinderHold	1	1
	PrfPos	0.00	EncPos			R°	Stop	JogN	MoveDis		2	2
R2-Axis	SvOn	Move	Home	LntP	LntN	Alm	Home	JogP	MoveTo	CylinderLock	1	1
	PrfPos	0.00	EncPos			R°	Stop	JogN	MoveDis		2	2
R3-Axis	SvOn	Move	Home	LntP	LntN	Alm	Home	JogP	MoveTo			
	PrfPos	0.00	EncPos			R°	Stop	JogN	MoveDis			
R4-Axis	SvOn	Move	Home	LntP	LntN	Alm	Home	JogP	MoveTo			
	PrfPos	0.00	EncPos			R°	Stop	JogN	MoveDis			
W-axis	SvOn	Move	Home	LntP	LntN	Alm	Home	JogP	MoveTo			
	PrfPos	0.00	EncPos			mm	Stop	JogN	MoveDis			
TransferM	SvOn	Move	Home	LntP	LntN	Alm	Home	JogP	MoveTo	TransferM	1	1
	PrfPos		EncPos			mm	Stop	JogN	MoveDis		2	2
TransferL	SvOn	Move	Home	LntP	LntN	Alm	Home	JogP	MoveTo	TransferL	1	1
	PrfPos		EncPos			mm	Stop	JogN	MoveDis		2	2
TransferR	SvOn	Move	Home	LntP	LntN	Alm	Home	JogP	MoveTo	TransferR	1	1
	PrfPos		EncPos			mm	Stop	JogN	MoveDis		2	2

Sports card configuratio



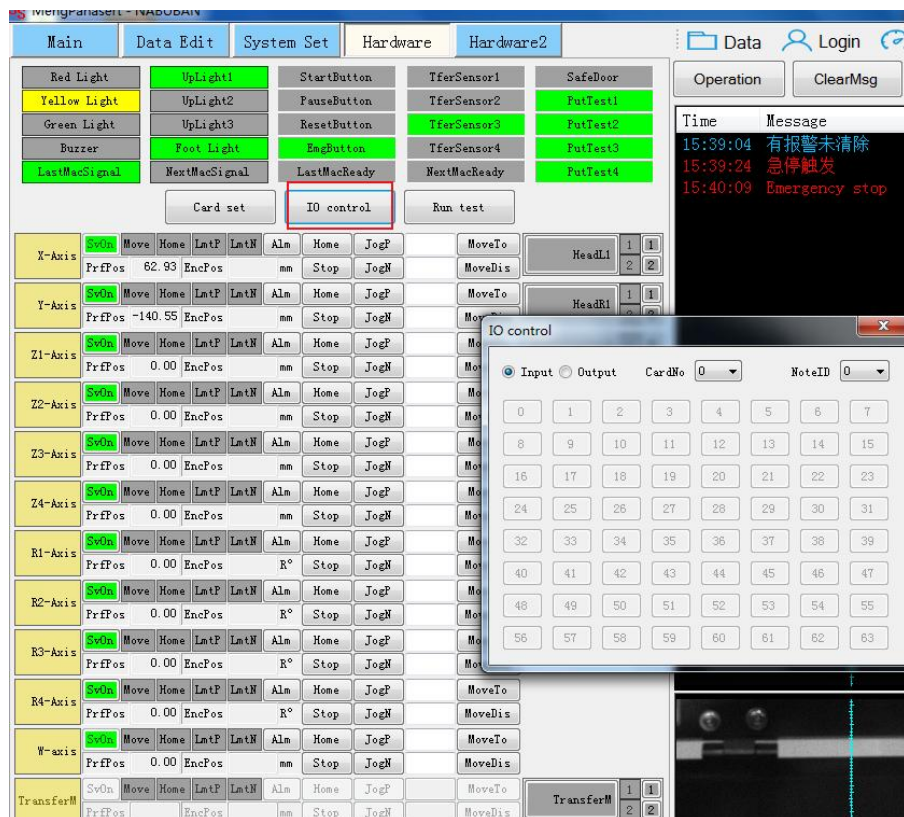
Pulse equivalent: the number of input pulses required for the mechanism to move 1mm; pulse equivalent = the number of pulses for one revolution of the motor ÷ the lead of the screw

For example, the subdivision of the driver is set to 6400 (6400 pulses are required for one revolution of the motor), and the lead screw with a pitch of 5 travels per revolution.

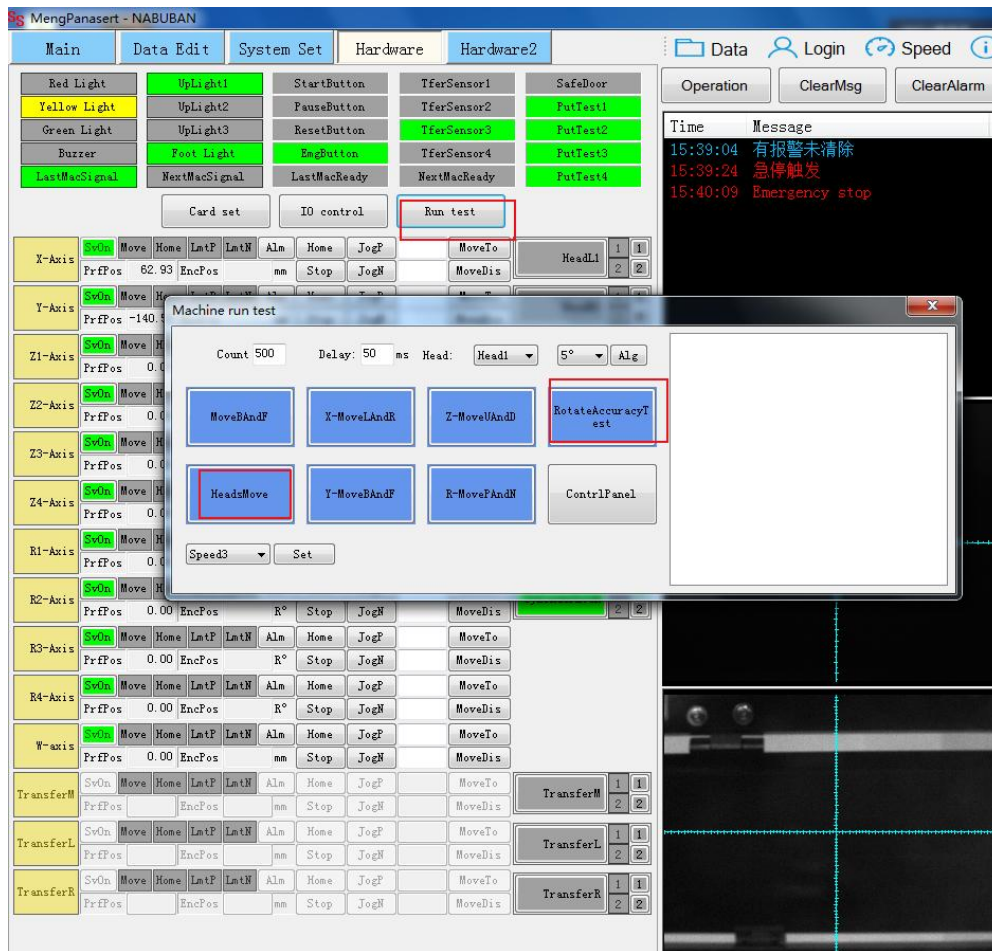
5mm, pulse equivalent: $6400 \div 5 = 1280$ pulses;

Rotate the R axis by 1°: $6400 \div 360 = 17.78$ pulses, and rotate 10, 100, and 1000 circles respectively to correct the pulse equivalent.

[IO control]:

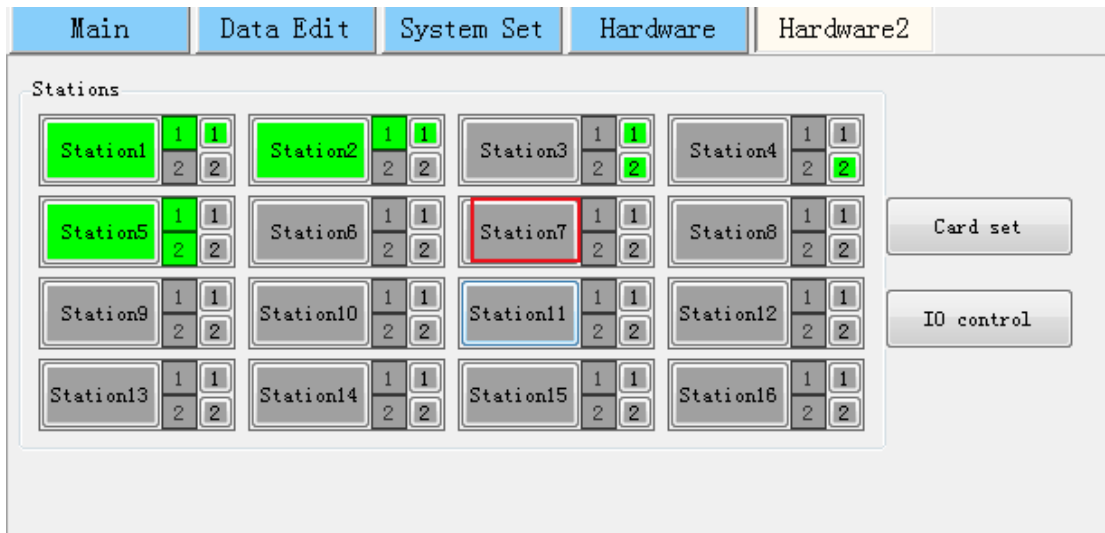


[Machine run-in]:



[Hardware 2]

Reminder:!!! When manually debugging, please use speed 1. Generally, execute [lifting head], [stop position] or [dropping material] before executing single-axis movement!!!

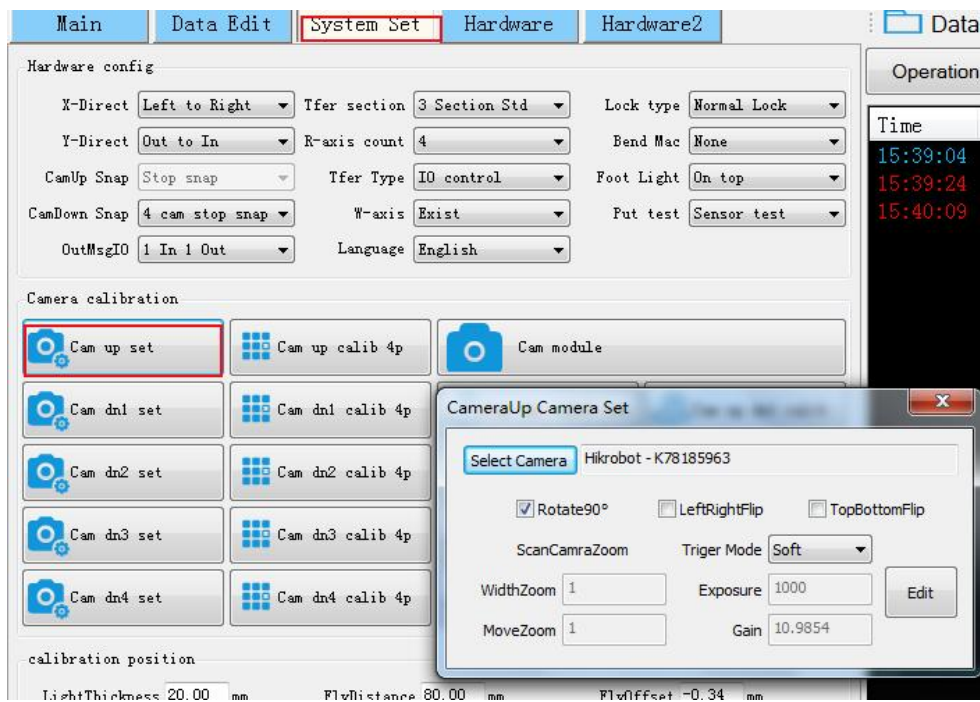


[Function menu area] interface introduction

[Document]

1. [Load data]: Load the selected data file into the software, including axis, camera algorithm and process parameters, etc.;
2. [Save data]: save data to the specified file path;
3. [Save data as]: data backup;
4. [On the camera] etc.

[set up]:



[Exposure time]: The time to press the shutter, the longer the time, the brighter the captured image, and it is easy to over- or under-exposure missing details;

[Gain]: Control photosensitivity, the bigger the gain, the brighter the image, and the more noise signal will be amplified.

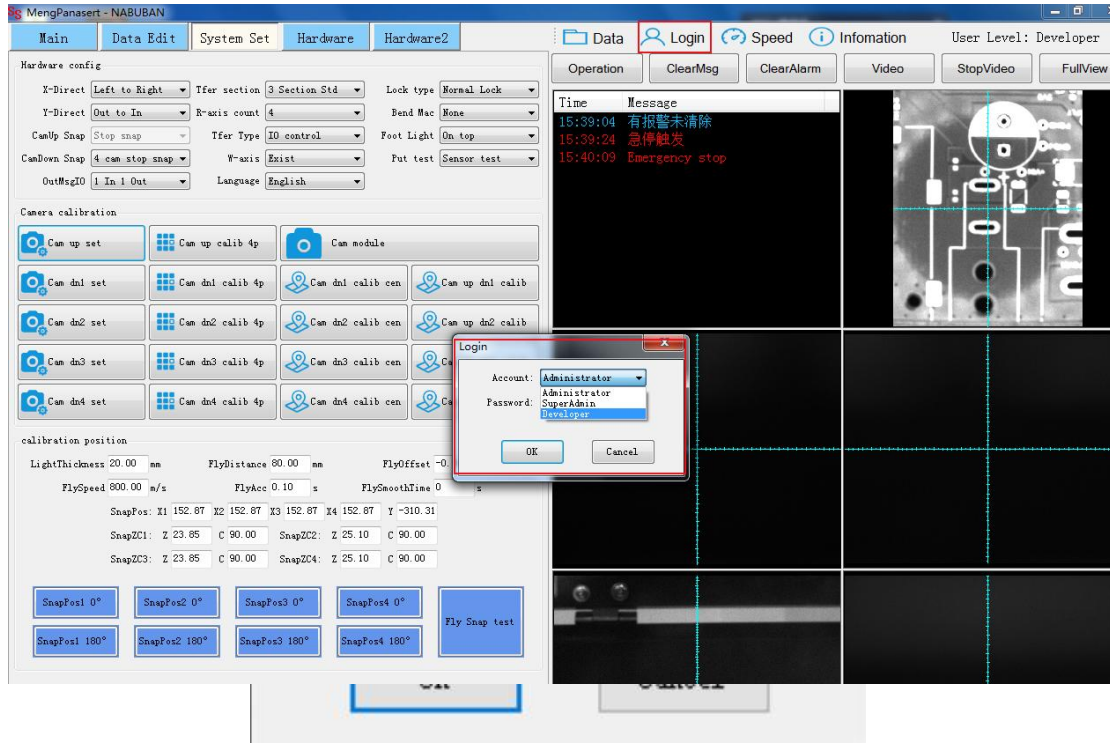
[Trigger mode]: trigger camera photo mode, soft: soft trigger; Line0: falling edge; Line1: rising edge;

[Save Image]: Save the current camera image;

[Load Image]: Load the selected image path into the software.

[user]

1. [User Login]



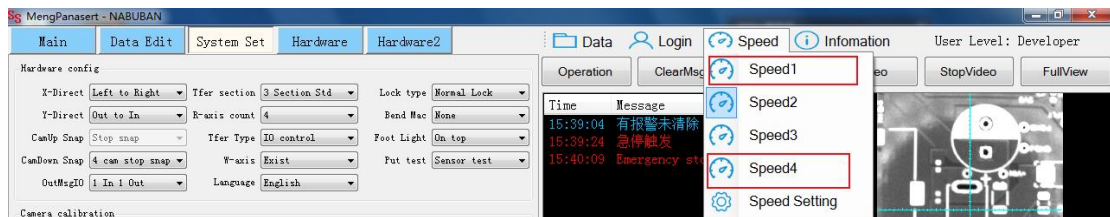
2. [Change Password]

3. [Logout]: The authority will be replaced with the lowest level - "Operator".

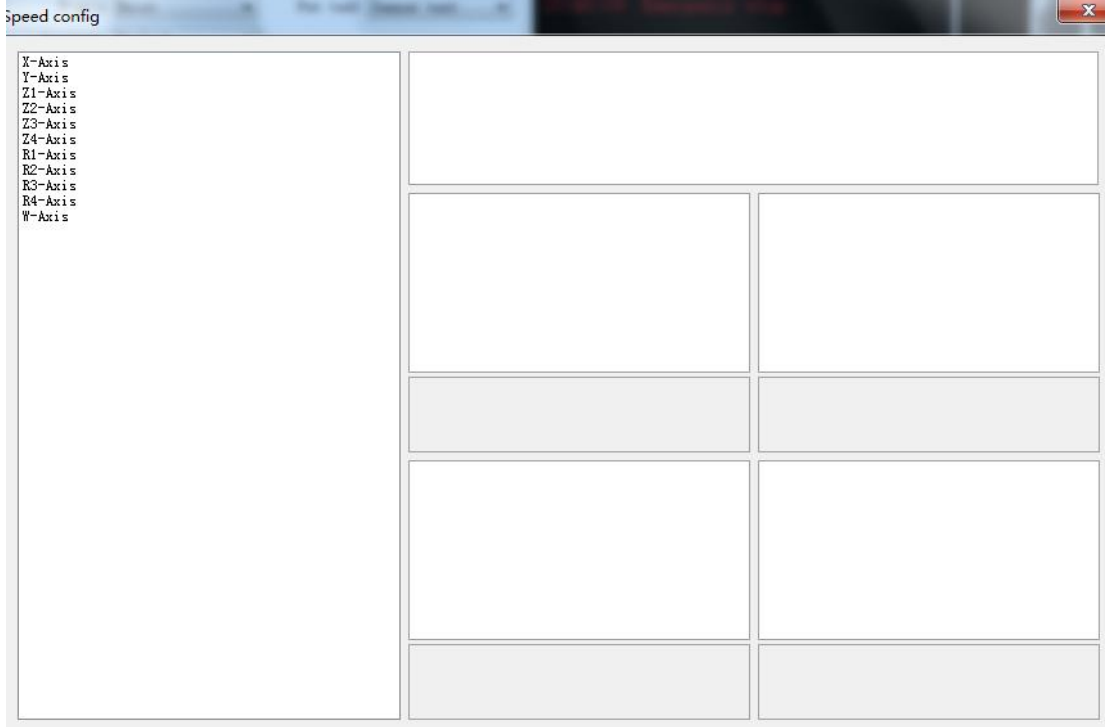
[speed]

[Speed 1]: Speed 1 is used for debugging, and speed 4 is used for automatic inserted;

[Speed setting]: the speed configuration of each axis;



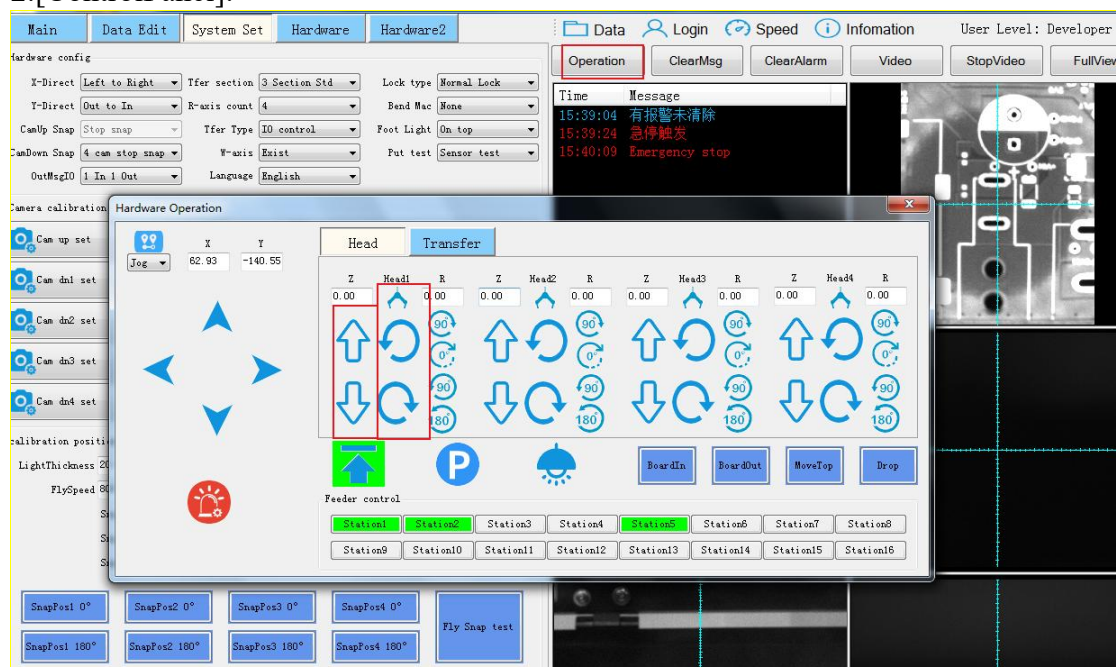
[information]



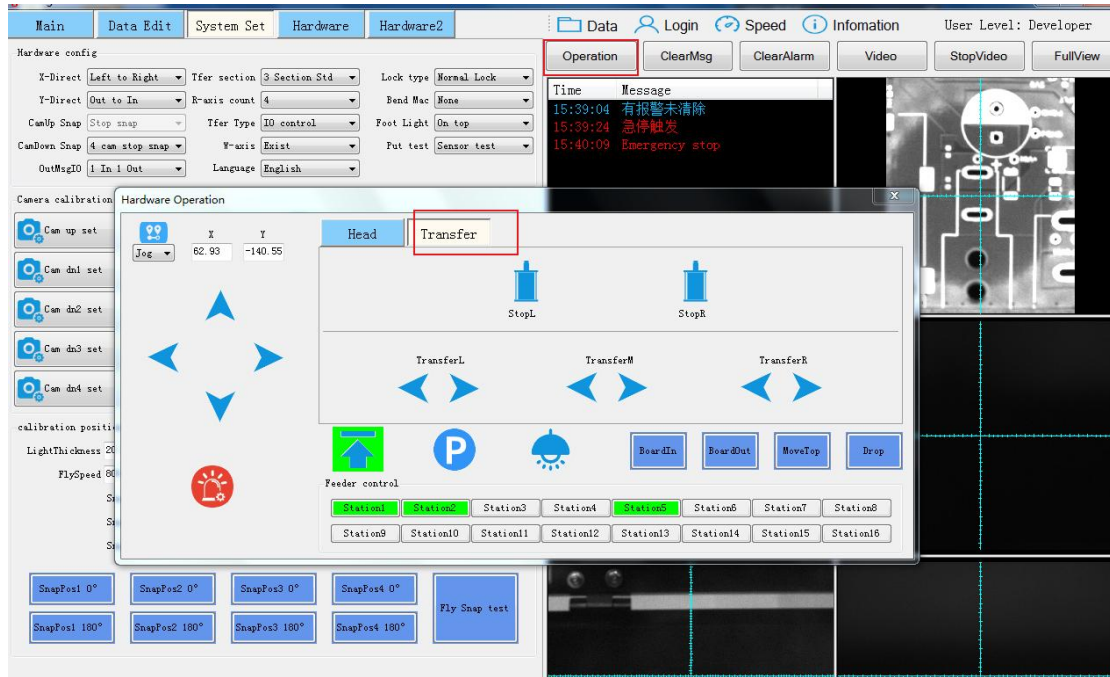
【Quick Operation Area】 Interface Introduction

Reminder:!!! When manually debugging, please use speed 1. Generally, execute [lifting head], [stop position] or [dropping material] before executing single-axis movement!!!

1. [Clear alarm]: Reset the alarm reminder on the logic of the program;
2. [ControlPanel]:



[hand wheel]:



- [Clear all axis alarms]: reset the alarm information on the driver;
 - [Lighting lamp]: top light source, illuminate the interior during manual debugging;
 - [Vacuum pump]: Generate negative pressure, suitable for negative pressure clips;
 - [Top]: Execute top action according to the thickness of the top;
 - [Parking position]: The safe position of the machine standby;
 - [Board Feed]: When there is a board sensed, execute the board feeding action;
 - [Outboard]: When the board is sensed, execute the board out action;
 - [Lift the head]: All the Z axes return to the safe position (please pay attention to the Z axis position during manual debugging);
 - [Throwing]: Execute throwing action
3. [Clear information]: Reset the information reminder on the logic of the program;
 4. [Overall display]: All camera images are displayed as a whole;
 5. [Stop/Photo]: Execute photo mode;
 6. [Video Mode]: Execute video mode.

[Status display area] interface introduction

operation logic

Reminder:!!! When manually debugging, please use speed 1. Generally, execute [lifting head], [stop position] or [dropping material] before executing single-axis movement!!!

Access board 1->Pickup parameter 2->Up and down camera algorithm setting 3-> template matching 4->Single/multiple imposition setting 5-> Imposition Correction 6->Left, middle and right suspended 7->inserted parameter 8 >test inserted 9-> run automatically 10

Line distribution

1. Line distribution is divided into: main circuit diagram, IO wiring diagram, wiring diagram, etc.
2. Working area signal: including track signal distribution, feeding signal distribution, XY axis signal distribution, Z axis signal distribution.
3. Driver board line signal: including emergency stop, component light source, front safety light curtain, rear safety light curtain, driver board, air pressure detection, fluorescent lamp, etc.Line distribution.