Robot Manual

(7 Inches-I Series)

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1. Safety Instructions

 Please read the manual carefully before installing and using the machine to avoid personal injury or machine damage due to improper operation.

For detailed instructions, it removes the covers or safety protectors in some illustrations of this manual when drawing the pictures. In practical operation, make sure to install the cover or safety protector to original position as per the requirement, and then operate the machine according to the instruction in the user manual.

The illustrations in this manual are representative samples, which may be different from the products you received.

The information in this manual is mainly the general description or characteristic that may not be completely consistent with the practical machine, or applicable due to product further development.

During system debugging and running, please set up relevant safety protectors. The Company will not be responsible for any damages caused by miss operation or disobeying the operation procedures.

1.1 All Robots Safety Regulations

1) The operator, maintainer and relevant personnel must read through the manual, and make sure to understand the contents of the manual.
2) The series of robot is designed for injection molding machine (IMM) ONLY.
3) Any modification or altering against to the original design of the robot is not allowed.
4) Any improper installation and operation may result in injury to personnel and/or damage to equipment.
5) Please contact the manufacturer or your agent immediately if there is any problem with robot.
6) Please note that our robot must be cooperated with other safety device (i.e. safety door) in order to operate in normal condition.
7) Ensure all installations meet with safety requirements before operating.
8) Without the written agreement of the manufacturer, for any loss or injury

caused by improper modification or misuse of the rotor, the manufacturer will not be liable for any loss or human injury.

1.2 Safety Concerns

1) The maintenance, overhaul and etc., must be executed by professionally trained personnel.
2) Any unrelated personnel should keep away from robot working area while it is running. All electrical wiring must be completed by professionals, and in accordance with design of specifications and wiring instructions.
3) Use safety fence to indicate working area while installation.
4) For the safety operation, the hand controller should be placed outside the robot working area.
5) Ensure bolts and nuts are tightened to the right torque while installation.
6) Ensure there is no following matter with the compressed air: phosphate-containing oil, organic solvents, sulfite gas, chlorine, acids and stale compressor oil.
7) The air pressure should be kept at 6MPa ±0.1MPa while operation.
8) When robot is operating, it may have little vibration, please remove any on the top of robot.
9) Press EMERGENCY STOP button immediately when accident occurs.
10) Don’t modify the robot structure and control box. Please contact manufacturer or your agent if any modification is needed.
11) Turn off power supply and compressed air before maintenance and adjustment. Also set up warming singles and safety fences.
12) Please use SHINI original parts if there is any replacement.
13) Our robots apply to all safety standards which are required.
14) Please read the user manual carefully as a safety guideline.
15) Unauthorized personnel must inform the relative supervisor, and understand all safety rules before entering robot working area.
16) All maintenance, operation, repair and service must be done by professional technicians.
17) Please order a new user manual from the manufacturer or your agent if the user manual is damaged. Safety must be the first consideration.

 Attention!

Product owner has the responsibility to ensure the operators, maintenance staff and relative staffs have read user manual thoroughly.

Attention!

Any modifications or other applications onto robot should obtain the written consent from the manufacturer, for safety purpose.

Attention!

Electricity system!

If not obey the safety recommendations and hazard signs or warning symbols stuck on the robot, it may result in electric shock to personnel.

The user and operator should ensure the safety standard requirementtothe robot was satisfied. We don't provide those safety equipments in our standard robot due to different situations and requirements owned by each user (except special equipment or which has been mentioned in this manual). Please acknowledge that the safety equipment must be installed prior to the testing and running of the robot, if such safety equipment is provided by user.

No.	Marks	Meaning
1		Don't touch!
2		Caution! Danger!
3		Danger! Electric Shock Risk!

4		Caution! Cause Injury!
5		Caution! High temperature!
6		No burning

1.2.1 Emergency Stop Button

The emergency stop button is at the upper right corner of controller.

When the emergency stop button was pressed, the robot will stop running immediately. Grippers (jigs) or suction cups (vacuum device) can still operate to prevent finished products from falling off. In addition, the robot and the controller will still display the indication of error messages.

The emergency stop circuits of the robot and of the injection moulding machine are connected together by the Euromap12 or Euromap67 interface. Therefore, when pressing the emergency stop button on the injection moulding machine, the robot will be involved in emergency stop condition.

1.2.2 Transportation and Storage

Attention!

Don’t stay under the robot, when moving or hanging it!

Attention!

If you have to move and re-install the robot, must ask for assistance from the manufacturer or your agent. If you do not comply with this mandatory requirement, result in the injury to any person and robot broken or malfunction, the manufacturer and your agent will not have any responsibility.

1.2.2.1 Transportation

1) These series of robots were put in the crates before shipping and at the

bottom of the crate with space left for forklift truck to move it.

2) Before the transporting, fasten the arm anti-falling and anti-sliding bolts to prevent the arm falling or sliding.
3) The robot will move up and down without power supply, make it in upper position before packaging to ensure that the anti-drop cylinder locked the robot arm and the arm won't fall down.
4) During transporting, prevent collision causing damage to the robot.
5) Must wrap the robot with water proof plastic cover and canvas cover outside during long-distance transportation, and if necessary vacuum pumping and put desiccant in it.
6) The temperature between -25℃ to 55℃during the transportation will be good to robot. For short transportation (within 24 hours),the temperature cannot higher than 70℃.

The robot you order before shipping out from the manufacturer, it is been confirmed in good working condition, please check whether there is any damage during carrying, hanging and transporting. Please carefully dismantle the components and packaging, if you found any damage of the robot, you can use the package to wrap it again.

Any damage caused by transportation, please:

1) Feedback immediately to the transportation companies, your agent or manufacturer.
2) Claim to the shipping company, and fill in the file to request compensation.
3) Retain damaged items for testing and checking. During the wait for testing and checking, do not return it.

1.2.2.2 Unpacking Transportation

1) After dismantling outer crate and cover, check if the model number and serial number on the nameplate is the same as what it wrote on the tag on the outer crate and cover. After confirming the model number and serial number, then unpacking package, disassemble, assemble and hoist the robot:

   Loosen the bolts that fixed the adaptor and robot base on the support plate, and remove the adapter and robot base. (See the packaging diagram 1-1,1-3,1-5).

a) Use the movable hoist ring in the accessory box and fix it at the indicated position of robot, then hoist it according to the picture 1-2,1-4,1-6.

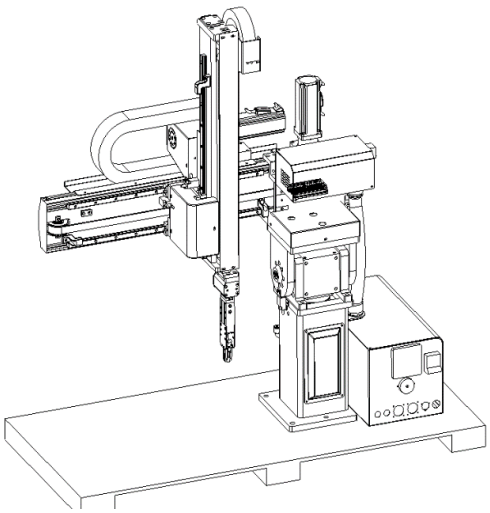
Note:

1) Remove the packing support plate should be careful to prevent the arm wrist and the machine damage or personal injury.

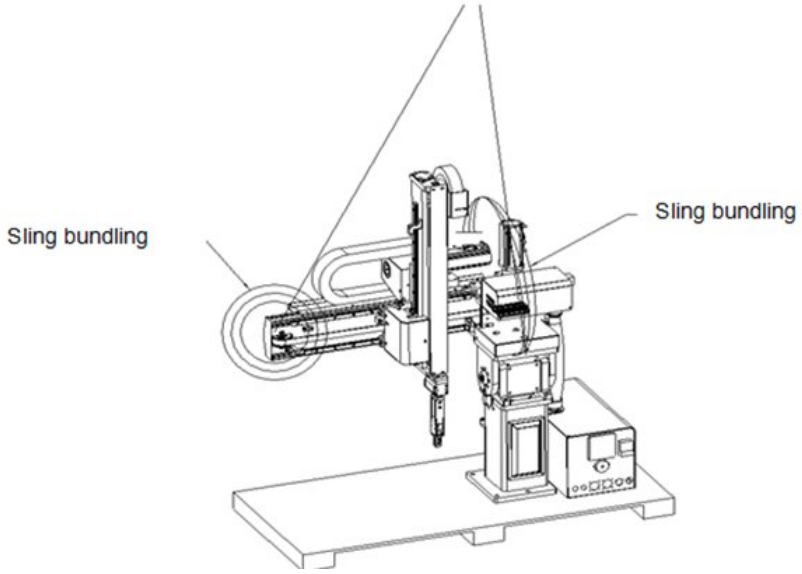
2) When hoisting the machine, it's necessary to adjust the sling length to achieve machine balance before lifting and moving.

3) The pictures are only for reference, and there may be differences in the actual model due to model modifications.

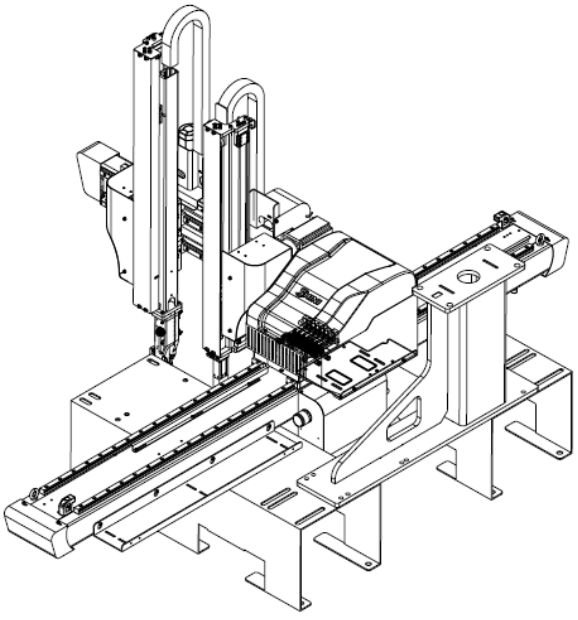
2) After dismantling, bundle up the hoist ring, and hoist with the robot's support point. Then, loosen the hoist ring after all screws are fixed tightly.



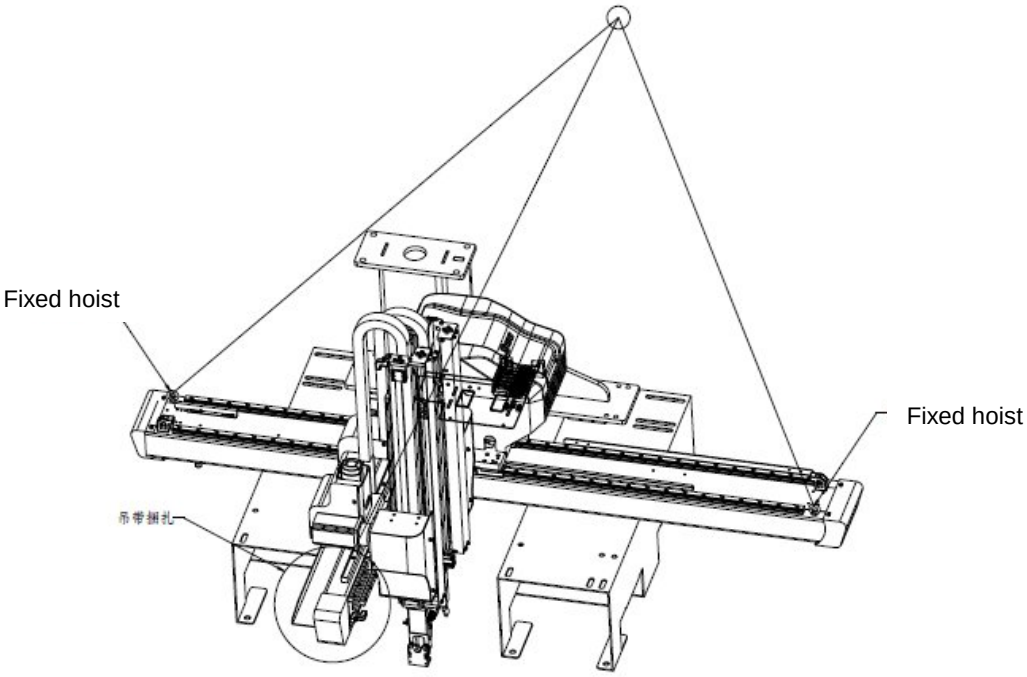
Picture 1-1: ST3 Robot Packing Illustration



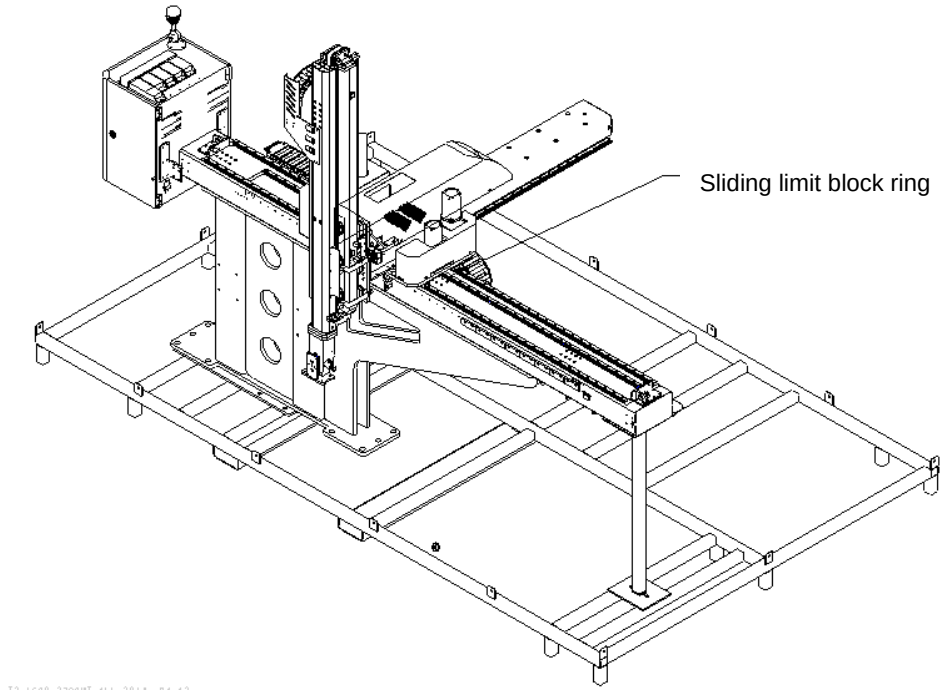
Picture 1-2: ST3 Robot Packing Illustration



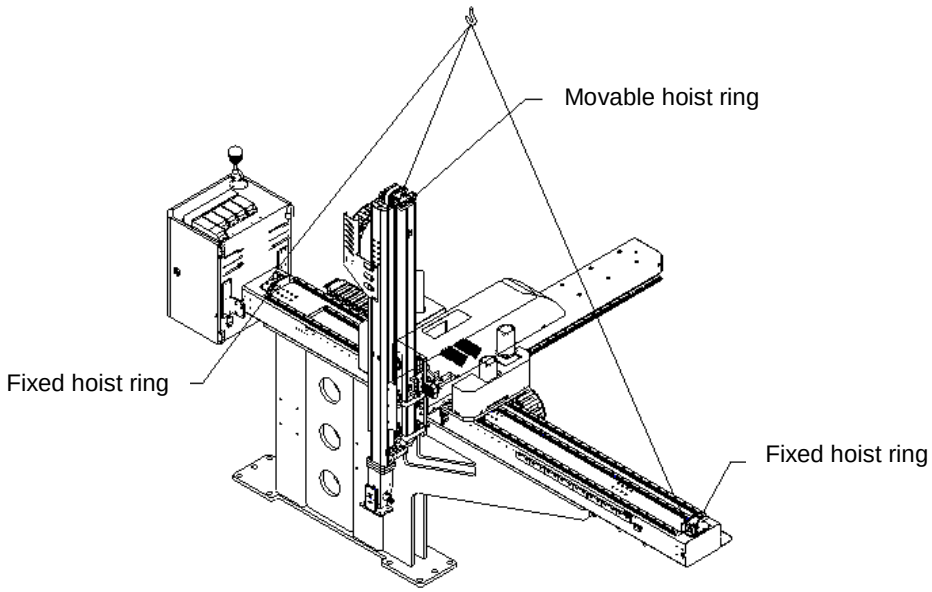
Picture 1-3: ST3 Robot Packing Illustration



Picture 1-4: ST3 Robot Hoisting Illustration



Picture 1-5: ST3 Movable-beam robot hoisting illustration



Picture 1-6: ST3 Movable-beam robot hoisting illustration

1.2.2.3 Storage

1) Remove the compressed air supply and shut down the power, if the robot won't be use for a long time.
2) Robots should be stored in ventilated, dry room to prevent rusty and electrical components get damp.
3) The robot should be carried out anti-rust, and need to be place cover on it to prevent dust and rain erosion, if robot do not use for a long time.
4) Work Conditions
5) Temperature: Between +5℃ to +40℃
6) Humidity: Temperature +40℃, relative humidity 50%
7) Elevation: Under 1000 meters above sea level.
8) Do not use the machine when the power wire was broken.
9) Do not use the machine when the air tube was broken.
10) Do not use the machine when the air pressure is not enough or too high.
11) Do not use the machine when the robot goes wrong or dismantles without professional, before the professional overhauling.
12) Don't use the machine when there're organic solvent, acidic phospholipids, sulfurous acid, chlorine and flammable and explosive dangerous matter in air.

1.2.3 Disposal of Robot

Dismantle the robot, when it went to the end service life and it's no longer used. When dismantle the robot to component parts, separate it (metal, oil and lubricants, plastics, rubber, etc.) by different ways. Entrust the authorized commission company and abide the local laws and regulations of solid industrial waste treatment.

1.3 Exemption Clause

The following statements clarify the responsibilities and regulations borne by any buyer or user who purchases products and accessories from Shini (including employees and agents). Shini is exempted from liability for any costs, fees, claims and losses caused by reasons below:

1) Any careless or man-made installations, operation and maintenances upon machines without referring to the Manual prior to machine using.
2) Any incidents beyond human reasonable controls, which include man-made vicious or deliberate damages or abnormal power, and machine faults caused by irresistible natural disasters including fire, flood, storm and earthquake.
3) Any operational actions that are not authorized by Shini upon machine, including adding or replacing accessories, dismantling, delivering or repairing.
4) Employing consumables or oil media that are not appointed by Shini.
5) If there's any problem during the application, please contact the company or local vendor.

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2. Manipulator Operating Instruction

Reset / Return Home Position 

When the system doesn't get the home position (reference position) signal and the robot is in the safety area (having signal of Y axis home position or outside mould safety area), pressing this button the robot will back to the home position (reference position) immediately. The robot must back to the home position before manual or auto-running each time.

When the system does get the home position (reference position) signal and the robot is in the safety area (having signal of Y axis home position or outside mold safety area), pressing this button will make the robot back to the home position.

Start / Pause 

When the robot is not on the program monitoring page, pressing this button will enter the program monitoring page. When the robot is on the program monitoring page, pressing this button will pause the running mode; pressing this button again,

it will enter auto running status, each axis and IO will run automatically according to the program set by the user.

(When the robot works with the injection moulding machine, it's necessary to: stop the injection moulding machine before exiting auto running, and start the injection moulding machine before starting auto running, which can avoid lots of problems caused by timing issues when the robot working with the injection moulding machine.)

Stop button 

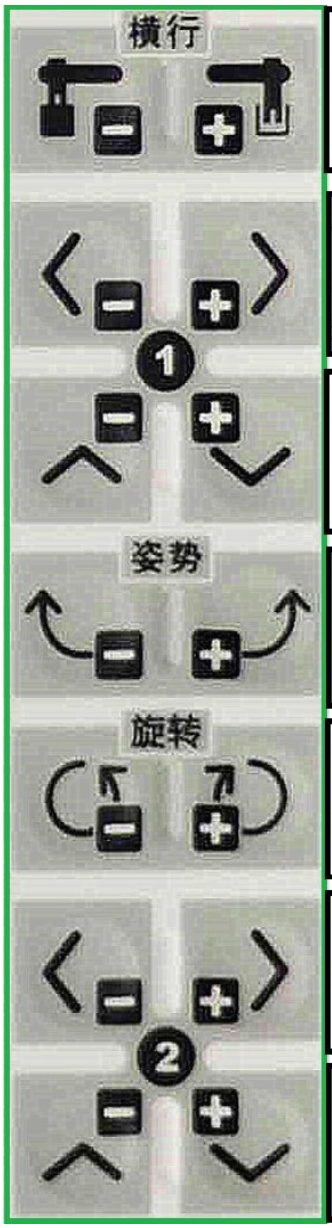
When the robot is auto running and the not on the program monitoring page, pressing this button will enter the program monitoring page.

When the robot is auto running and in the program monitoring page, pressing this button will pause auto running; then pressing start button will resume and if pressing this button again to switch to the manual mode.

Emergency stop button 

To stop the robot urgently, press this button for emergency stop then the screen shows emergency stop error message. Rotate this button to release emergency stop condition.

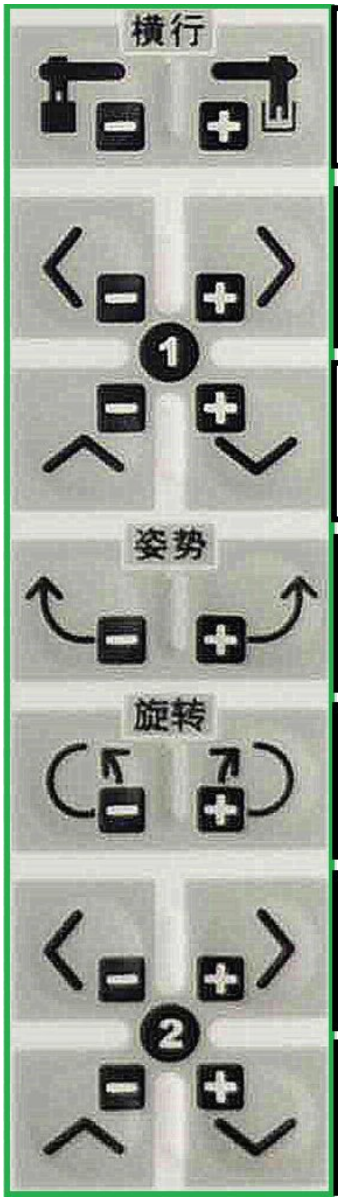
Single arm button:



	In manual mode; pressing -, Z will move to minus direction; pressing +, Z will move to Plus direction.
	In manual mode; pressing -, X will move to minus direction; pressing +, X will move to plus direction.
	In manual mode; pressing -, Y will move to minus direction; pressing +, Y will move to plus direction.
	In manual mode; pressing -, cylinder will move to horizontal position; pressing +, cylinder will move to vertical position.
	In manual mode; pressing -, sencod cylinder will rotate to horizontal position; pressing +, second cylinder will rotate to vertical position.
	In manual mode; pressing -, pneumatic 2nd arm will move back; pressing +, pneumatic 2nd arm will move forward.
	In manual mode; pressing -, pneumatic 2nd arm will move up; pressing +, pneumatic 2nd arm will move down.

Note: Pneumatic second arm c axis is option

Double arms button:

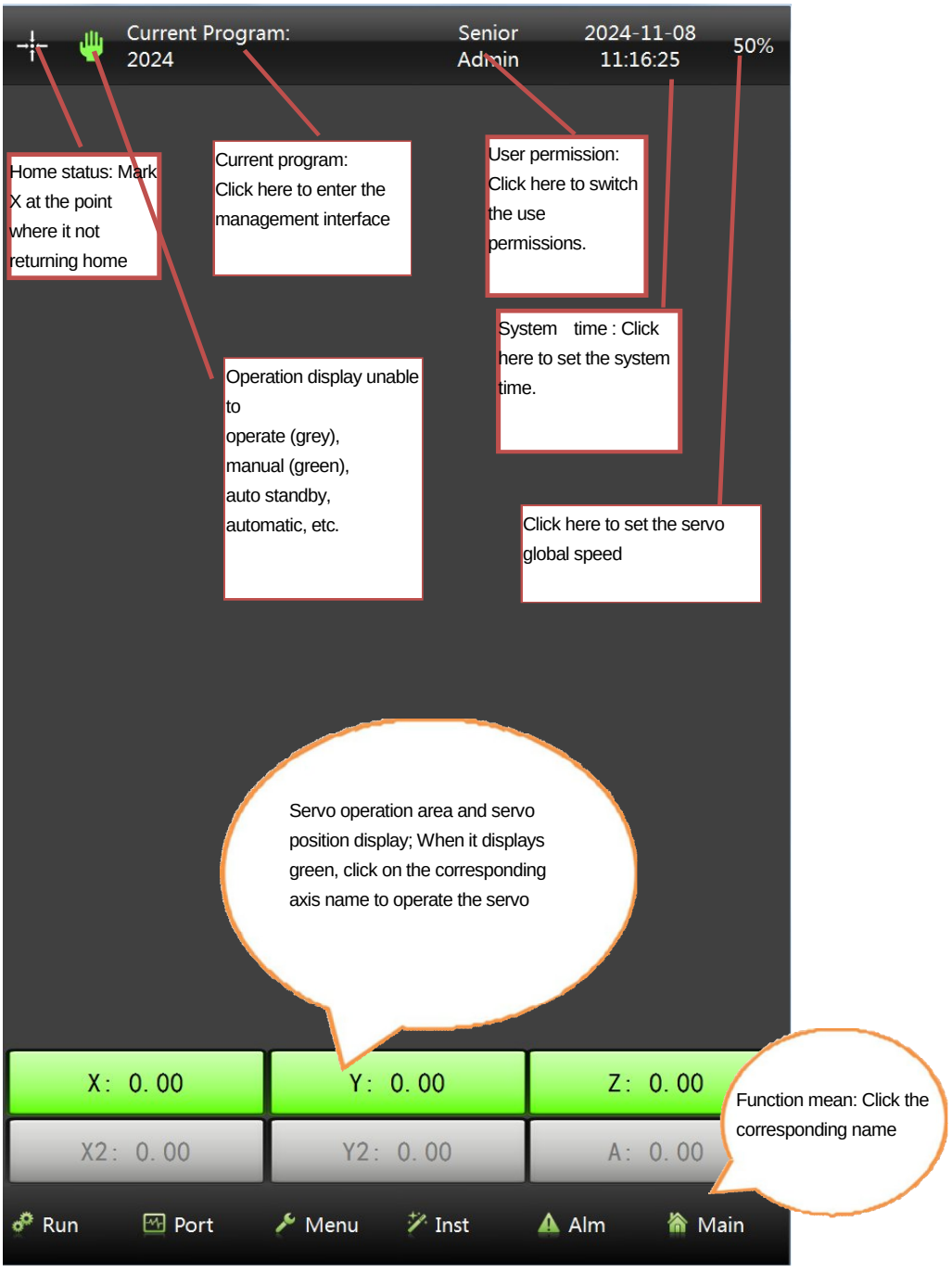
	In manual mode; pressing -, Z will move to minus direction; pressing +, Z will move to plus direction.
	In manual mode; pressing -, X will move to minus direction; pressing +, X will move to plus direction.
	In manual mode; pressing -, Y will move to minus direction; pressing +, Y will move to plus direction.
	In manual mode; pressing -, cylinder will rotate to horizontal position; pressing +, cylinder will rotate to horizontal position.
	In manual mode; pressing -, 2nd arm cylinder will rotate to horizontal position; pressing +, 2nd arm cylinder will rotate to vertical position.
	In manual mode; pressing -, X2 will move to minus position; pressing +, X2 will move to plus position.
	In manual mode; pressing -, Y2 will move to minus position; pressing +, Y2 will move to plus position.

Note: Second arm c axis is option.

3. Main Page

3.1 Basic Block

After startup, it will automatically enters the main page. The main page after returning to home is shown as following figure:



3.2 Status Sign Description

	The servo has no reference point (The servo hasn't been reset to origin after the system is powered on.)
	The servo reference point has been confirmed (The servo has been reset to origin after the system is powered on.)
	Manual mode: manual operation is enabled when it is green and disabled when it is grey.
	Press "Run "in manual mode or "Stop" in automatic mode to enter this mode, where auto run , single cycle, and single step run can be performed.
	Auto Run: In standby mode, press Auto to enter this mode.
	Single cycle run: Run current program for one cycle automatically and enter this mode in standby mode.
	Single step run: Run current program by single step and enter this mode in standby mode.

3.3 User Permission Instructions

User Permissions: The system default is operator startup. If higher permissions are required, it should switch user permissions.

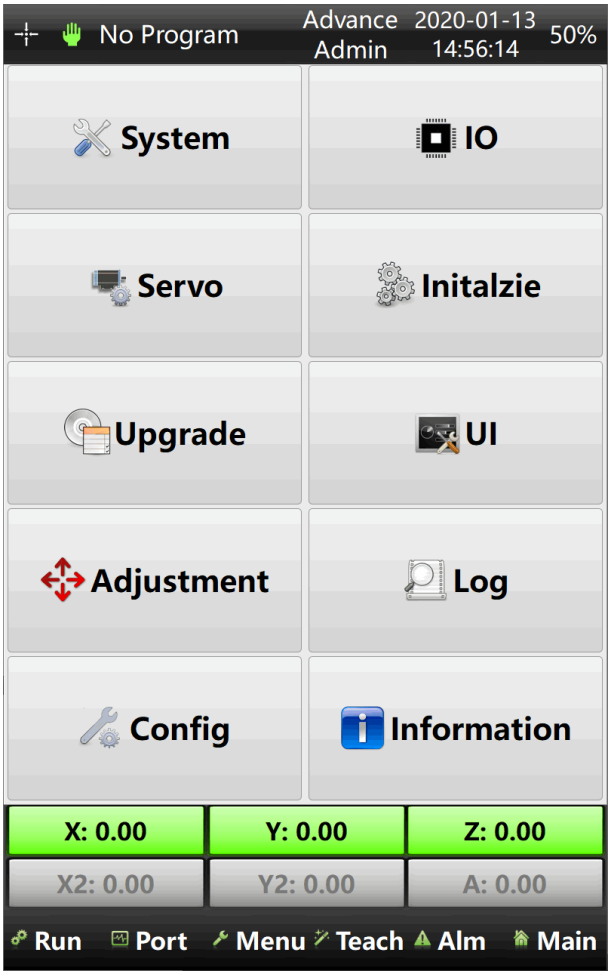
Allowed Operation	Operator	Advance Operator	Administrator	Advance Administrator
reset 0-position	√	√	√	√
loading current program	×	√	√	√
program management	×	×	√	√
modify system date and time	×	×	√	√
manually operate servo	×	√	√	√
operate program	√	√	√	√
others manually operate	×	√	√	√
teach program	×	×	√	√
general system parameters	×	×	√	√
signal configuration	×	×	√	√
reset system parameter	×	×	√	√
servo safety parameter	×	×	√	√

servo machine parameter	×	×	√	√
user interface setting	×	×	√	√
machine position operate	×	×	√	√
manufacturer maintenance	×	×	×	√
system update	×	×	×	√

Advanced operator, the system default password is 11111111, the administrator password is ********.

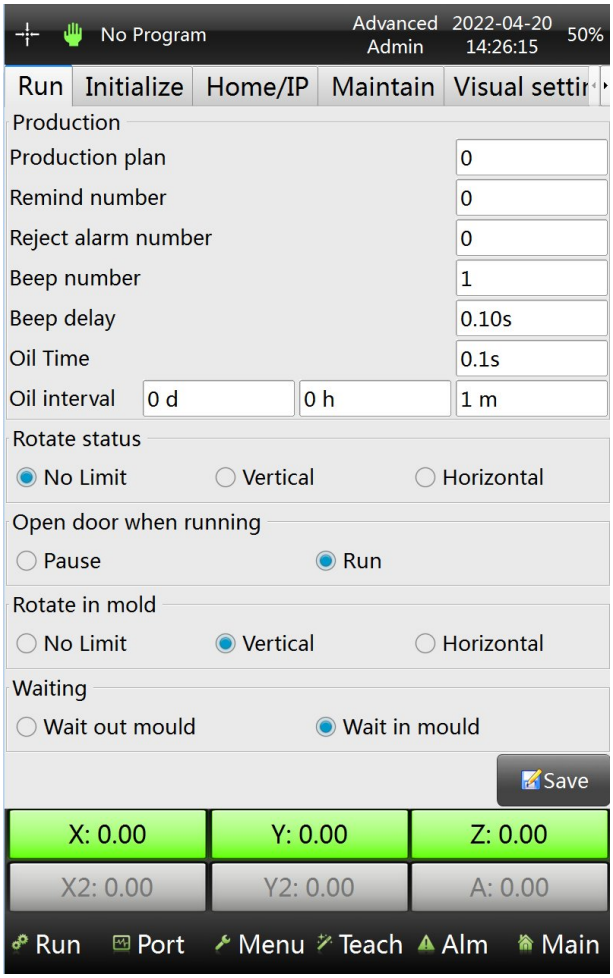
4. Function Menu Desription

Click the “Menu” button at the bottom of the page to enter the Function Menu page. System setup, I/O Port setup, Servo Setup, Initialize the program, Upgrade the system, User Interface setup, Adjustment of position, System Log, Configuration, System Information can check and set here, as photo below:



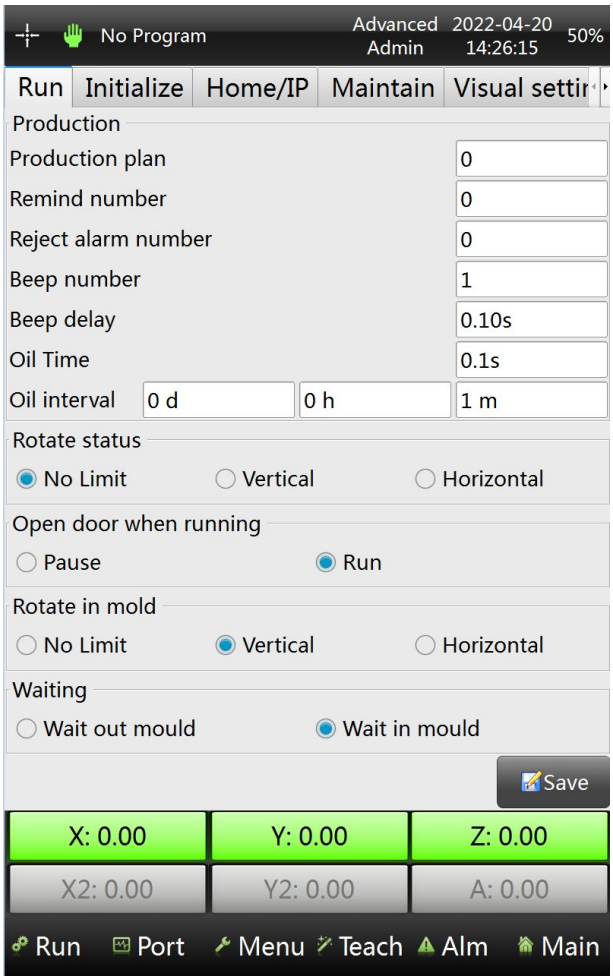
4.1 System Setup Description

System parameter includes: Run Parameter, Initialized Setting, Home position/IP, and System Maintenance Setting. Click on the system parameter on the function page to enter the system settings screen, and the display screen is shown as below:



4.2 Run Parameter Setting Page

Click on “Run Parameter” on the system setting page to enter the “Run Parameter Set Screen”, and the screen is shown as below:



4.3 Production Management

1) **A. Production plan:** Planning for production quantity and arranging the production plan of the product. When the quantity of production matches the “Production plan” value, the robot will stop running and remind you that the production plan has been completed. Set the value of “Production plan” as “0” to turn off this function.
2) **Remind number:** To set a production quantity, when he robot achieves the production quantity the system will remind you and temporarily stop the Auto running mode and remind. When the system reminds, press the Auto running button or open and close the safety door of the injection molding machine once, the production process will continue to run Auto running mode. Set the value of “Remind number” as “0” to turn off this function.

3) Reject Alarm number: To set an accumulated quantity of reject (defective products), when it achieves the quantity of reject the system sounds an alarm to remind you that the quantity of reject (defective products) is surpassing. Set the value of the “Reject Alarm number” as “0” to turn off this function. Beep number: The times of alarm beeping when setting the system alarm.
4) Alarm beep time: Set the time at each alarm beep when setting the system alarm.

Rotate status when traversing (runs in Z axis direction) :

To define the end of arm tool (pneumatic flipping cylinder) of the main arm keeping vertical or horizontal or rotatable when the robot is traversing (runs in Z axis direction).

Vertical: Allow the robot to traverse when the end of arm tool is at the vertical condition.

Horizontal: Allow the robot to traverse when the end of arm tool is at the horizontal condition.

No limit: The robot can traverse no matter the end of arm tool at vertical/horizontal condition.

Open door when running: When opening the injection moulding machine safety door will stop running temporally or keep running when the robot is running auto mode.

Rotate in mould: Allow the end of arm tool (pneumatic flipping cylinder) of the main arm to rotate in the mould area or not.

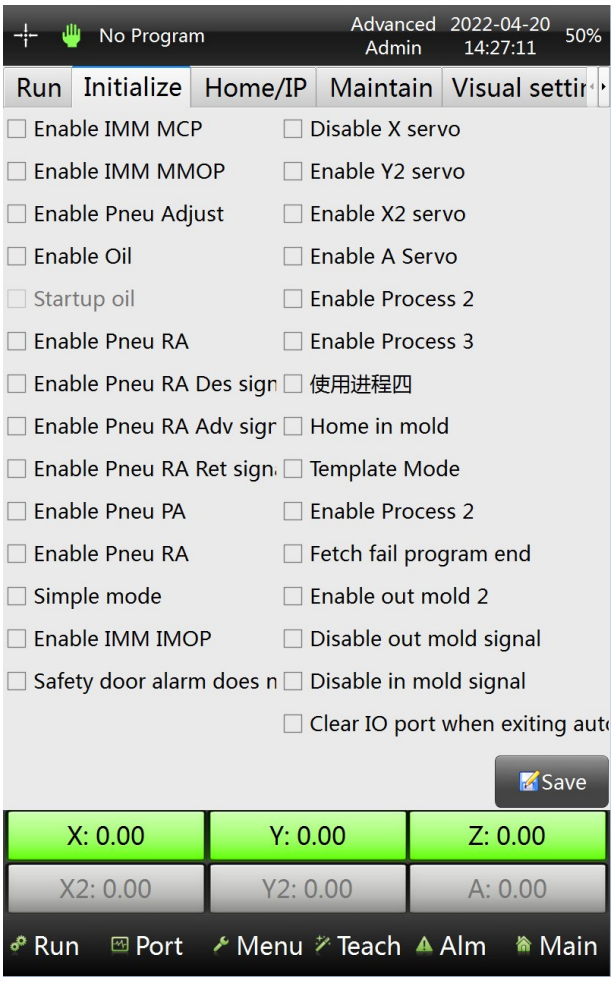
Standby option: Set whether the program is standby in mould or out of mould.

Oil filling time: Oil filling output time.

Oil filling interval: Start timing when the system starts, and when the timer reaches the set time, start the oil filling output.

4.4 Initialization Setting Screen

Click on "Initialize" button on the system settings screen to enter the "Run Initial Settings" screen. It can set whether to detect the injection moulding machine signal, use the axis or pneumatic arm, or use the parallel program processes 2,3 and 4 as well as other external safety signals. The display screen is as follows:



Enable mould close completion signal of IMM:

After it is selected, during the machine auto run, for each production cycle it must detect the mould opened signal -- mould closed signal-- mould opened signal, then the robot arm can go down and pick up the products.

IMM middle plate mould signal: After it is selected, the machine will automatically check whether the middle plate mould is opened in place before each mould decline.

Enable pneumatic adjustment: After it is selected, the adjustment function of pneumatic arm is acivated. The pneumatic arm adjustment device is an optional device.

Enable oil filling: After it is selected, the oil filling interval time set in the operating parameters is effective.

Enable startup oil filling: After it is selected, the startup oil filling is activated, it ends with the set filling time in the operating parameters.

Enable pneumatic sub arm: After it is selected, the pneumatic sub arm is used.

Enable pneumatic sub arm lower photosensor: After it is selected, the detection of pneumatic sub arm go-down in place is used.

Enable pneumatic sub arm forward photosensor: After it is selected, the detection of pneumatic sub arm forward in place is used.

Enable pneumatic sub arm retreat photosensor: After it is selected, the detection of pneumatic sub arm backward in place is used.

Enable pneumatic main-arm flipping cylinder: After it is selected, the main arm flipping cylinder is used.

Enable pneumatic sub-arm flipping cylinder: After it is selected, the sub arm flipping cylinder is used.

Simple mode: After it is selected, teaching mode is switched to simple mode, set the program pick-up, standby, and stacking placed site.

Enable IMM mould open middle signal: After it is selected, when the machine is connected to the IMM open mould middle signal, the robot arm can go down and pick up the products after it receives the signal.

Safety door alarm no output: After it is selected, the robot arm doesn’t give alarm after the safety door is opened.

Enable go-down safety: After it is selected, the go-down safety detection is enabled, only with the safety signal can the arm robot go down.

Disable X axis servo: After it is selected, the X axis is not used.

Enable Y2 axis servo: After it is selected, the Y2 axis is used.

Enable X2 axis servo: After it is selected, the X2 axis is used.

Enable A axis servo: After it is selected, the A axis is used.

Enable process 2: After it is selected, the subprogram process 2 is used.

Enable process 3: After it is selected, the subprogram process 3 is used.

Enable process 4: After it is selected, the subprogram process 4 is used.

Origin within the mould: After it is selected, the origin default is within the mould.

Non teaching mode: After it is selected, the teaching program can only be modified but cannot be taught.

Open/close safety door to end program when it fails to pick-up products: After it is selected and detected that the product has not been picked up, the program ends after opens and closes the safety door.

Enable out of mould safety zone 2: After it is selected, activate the out of mould safety 2 signal (1 to 2 or double IMMs are applicable to this function).

Disable out of mould safety signal: After it is selected, out of mould safety detection signal is not used, and it can be limited by safety zone settings.

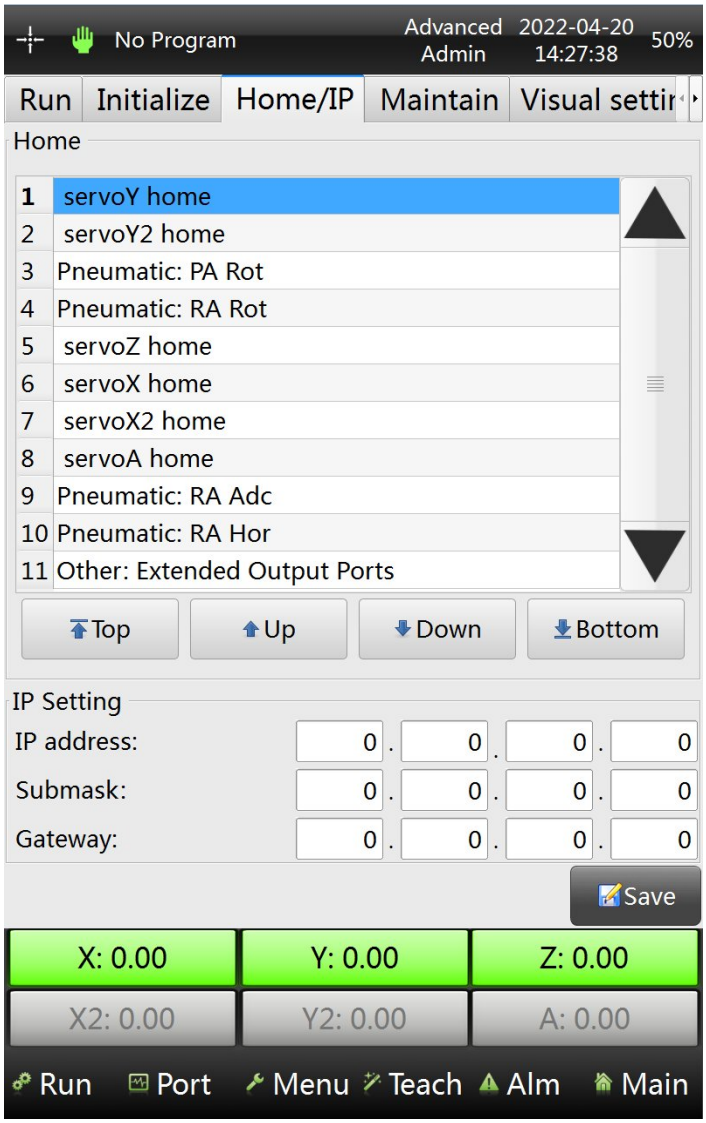
Disable in mould safety signal: After it is selected, in mould safety detection signal is not used, and it can be limited by safety zone settings.

External control function: After it is selected, external control can be used and the robot arm start and stop can be controlled by external buttons.

Clear IO port when exiting the auto mode: After it is selected, the input and output will be automatically closed when exiting the auto mode.

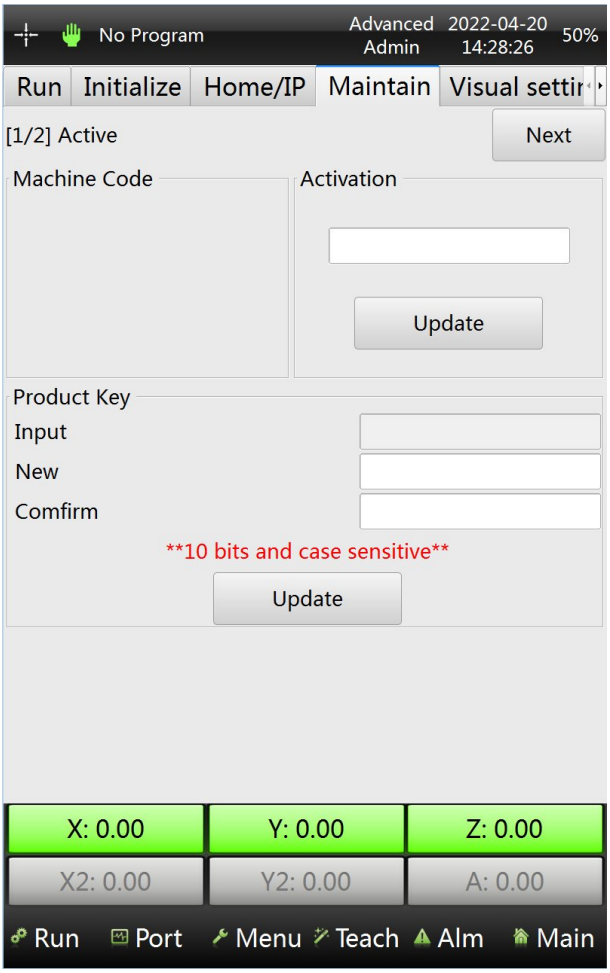
4.5 Home / IP Page

Click on the origin IP on the system setting screen to enter the initial setting screen, where each axis 0 return order and IP address can be set, and the screen is shown as below:



4.6 System Maintenance Page

Click on System Maintenance on the System Setting Page to enter the Run System Maintenance page, which displays the picture as below: System maintenance function: Each machine has a fixed machine code and it can set the maintenance time for the machine through software to get the set time, then the system will stop and alarm. To reactive, it's necessary to input the key machine code of product in the software to reactive, and it will generate a new activation code. The key default is empty.



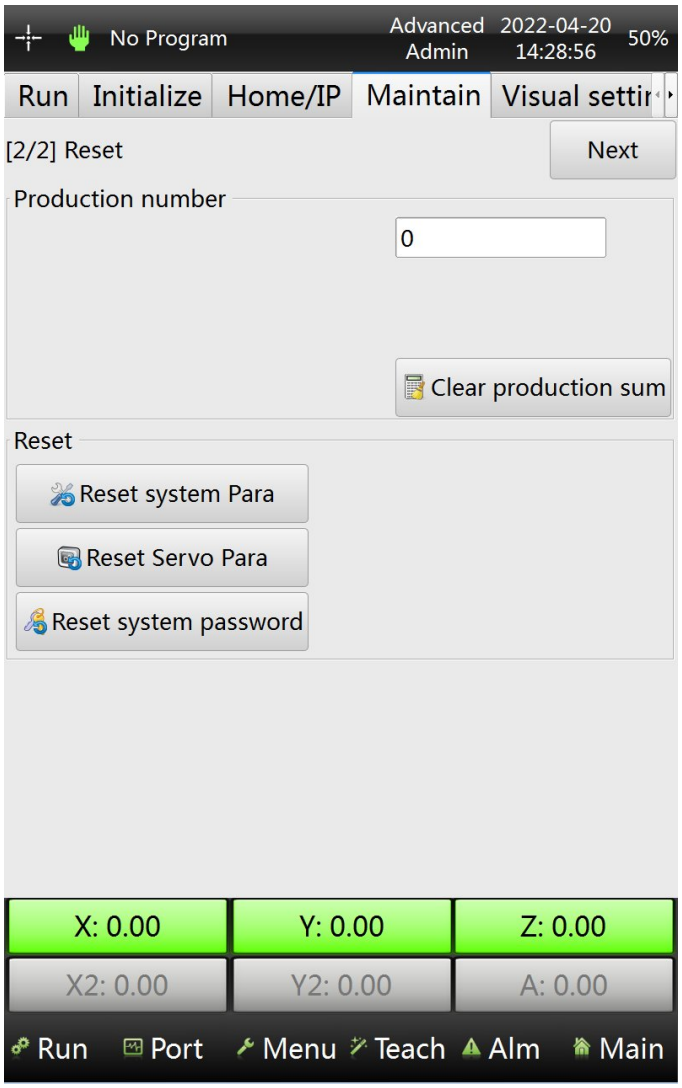
System maintains page 2:

Maintenance by mould quantities: Maintain the robot according to actual production quantities, the robot will sound an alarm and pause production to remind you to maintain the robot due to the production quantities being achieved. Press “Clear production sum” to continue production.

Parameter reset: It’s able to Reset System Parameter, Servo Parameter and System Password if needed.

Maintain

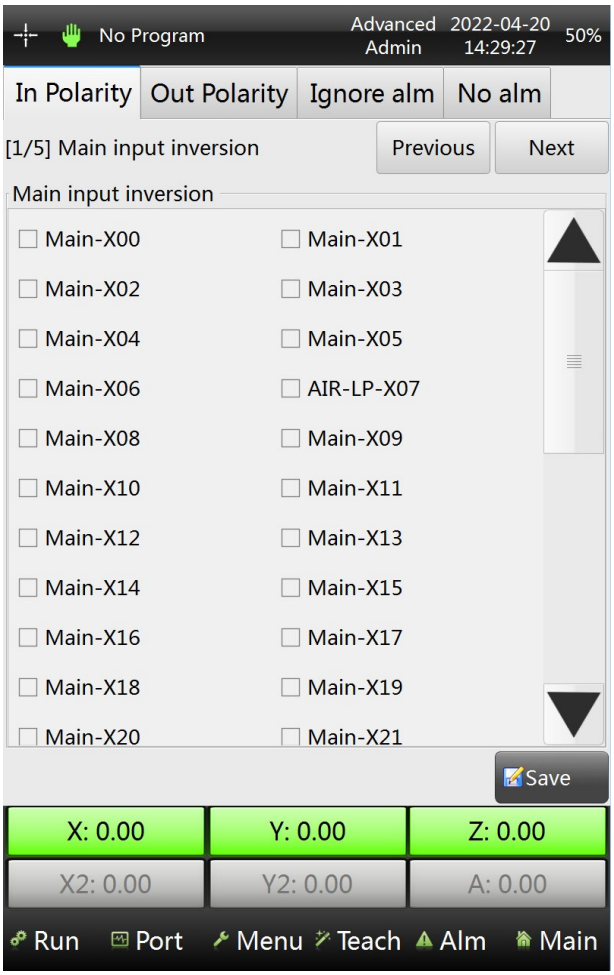
Click on maintain on the system setting screen to enter the maintenance screen, which displays the picture as below:



Maintenance Function: Maintenance cycle modules can be set according to maintenance tasks. When current modulus reaches the maintenance cycle modulus, the auto run interface will pop up a prompt for maintenance. Then, click on the reset button to to restart counting after maintaining. The maintenance work can be free editied in the content of maintenance function 8.

4.7 I/O Port Setting

Pressing the I/O page button on the upper right corner of the function menu page for “Input Polarity”, “Output Polarity”, “Ignore the Alarm” and “Ignore the Alarm in Mold Area (No Alarm)” settings, as shown below:



Input signal reversion: Not selected, the signal is valid; When it is selected, the input no signal is valid. It has a total of five pages, and can be checked by turning the page.

Output signal reversion: Not selected, the output signal is valid; When it is selected, the output no signal is valid. It has a total of five pages, and can be checked by turning the page.

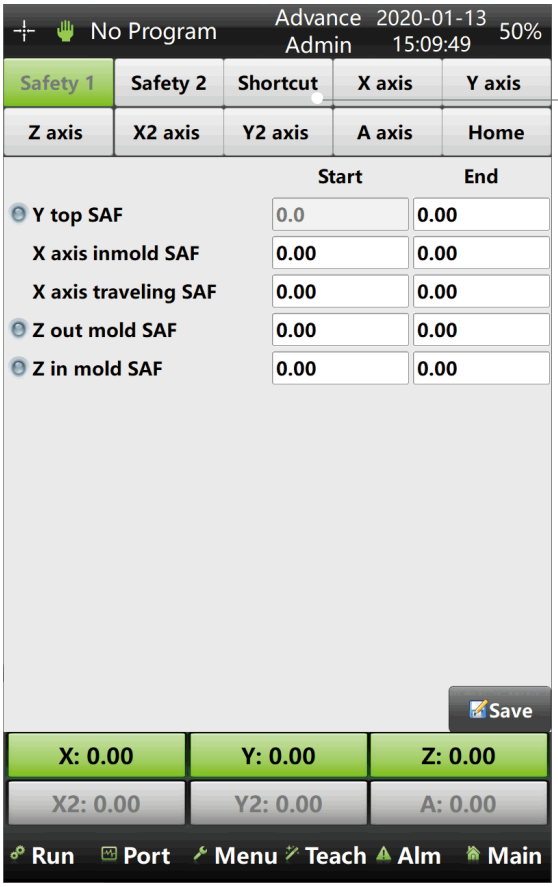
Ignore the alarm: Not selected, when the system gives such an alarm, it must stop for inspection. When it is selected, it can open/close the safety door or click on run to run continuously (under confirmed safety conditions). There're four pages for selection on this interface.

No alarm inside mould: Not selected, stop at current position when it gives the alarm. When it is selected, no alarm is given inside the mould, and it gives the

alarm when the robot ram stops before allowing the mould to close after rising. There're four pages for selection on this interface.

4.8 Servo Parameters Setup Page

On the function menu page, click the "Servo" to enter the servo setup page which allows to check and modify the settings of Safety Area, Shortcut of Homing, Running Speed, Acceleration of each Axis, Home Offset and Parameters of each axis:



Safety, Shortcut needs to be set after going to referencePressing related axis to set position

Safety Zone 1/2: The safety zone must be set within the safe range of each axis, and it will give an alarm once exceeding range.

Quick positioning: Set the pick-up point, placement point, and standby point for each axis corresponding to the machine's pick-up and placement actions.

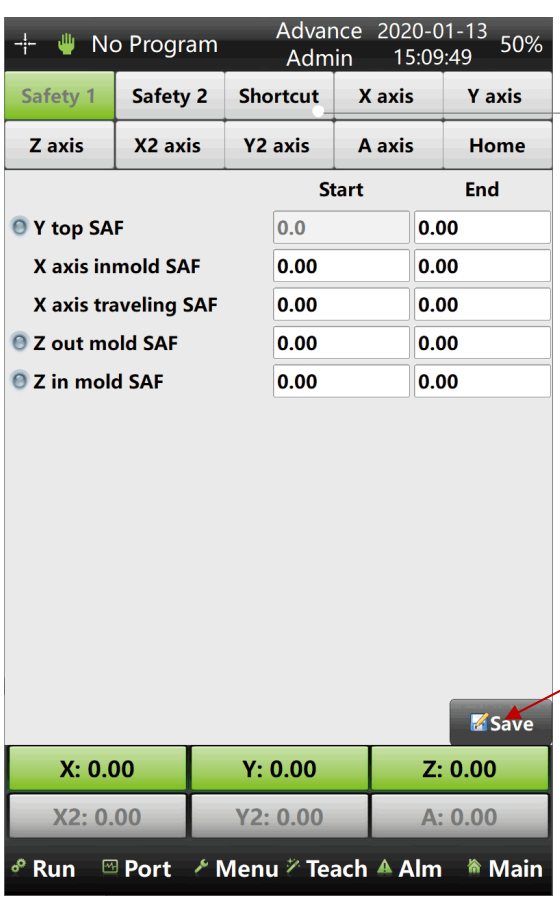
X/Y/Z axis: It requires advanced administrator privileges to acess. Mainly for setting the run distance, speed, actual position, direction, etc. of each axis. *If necessary, please follow the manufacturer's guidance to avoid the risk of

collisions.

Origin/Drive: Setting this requires advanced administrator privileges to access. Mainly for setting the homing speed, absolute value, and driver parameters.*If necessary, please follow the manufacturer's guidance to avoid the risk of collisions.

4.9 Safety Area Page

Click on the safety zone on the servo setting page to enter safety area page, where you can set the safety zone for each axis. The display screen is as follows:



Safety, Shortcut needs to be set after going to referencePressing related axis to set position

After the confirm, click it to save.

Y top SAF: The safety area that allows the arm to go down while the arm is within the mould area and without an EMO (Enable Mould Open) signal.

X in mould SAF**:** The safety area that allows the arm in mould to move without worry hitting the mould and it doesn't need any signal from proximity sensor to set it.

Z out of mould SAF: The safety area that allows the arm goes down outside the

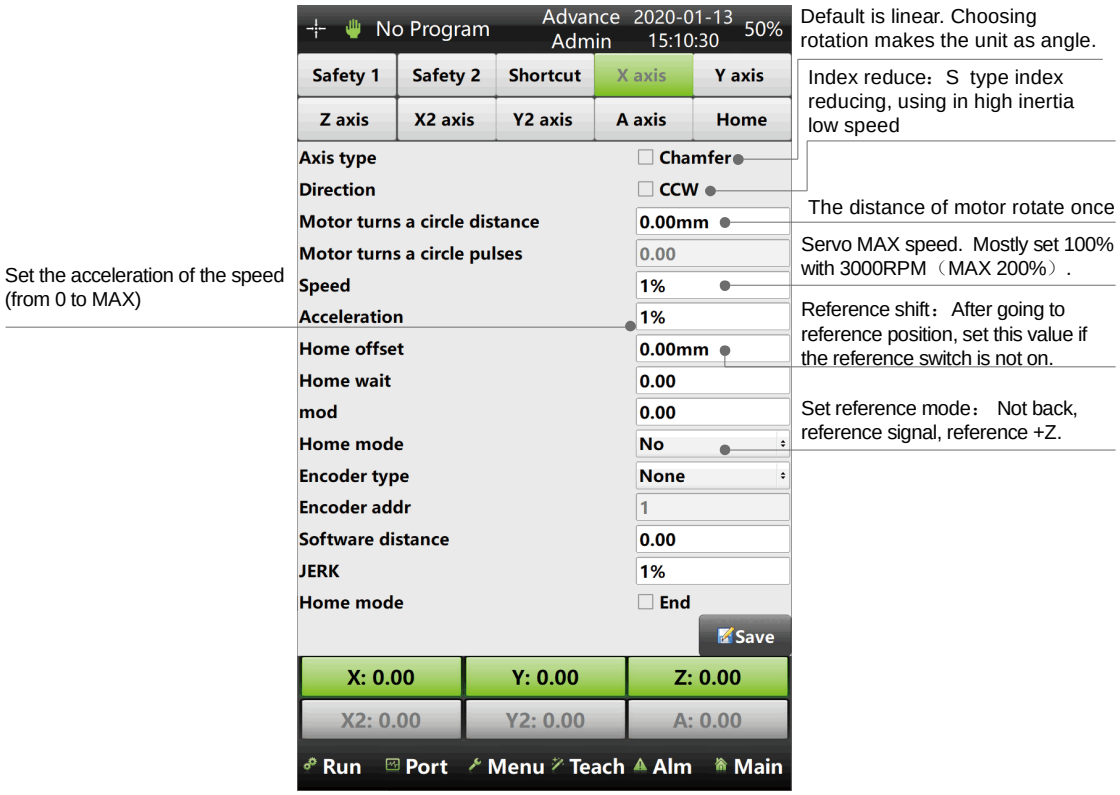
mould area.

Z in mould SAF: The safety area that allows the arm goes down within the mould area.

Safety Zone 2: Mainly set up safety zones for X2/Y2 axes, refer to Safety Zone 1 for settings.

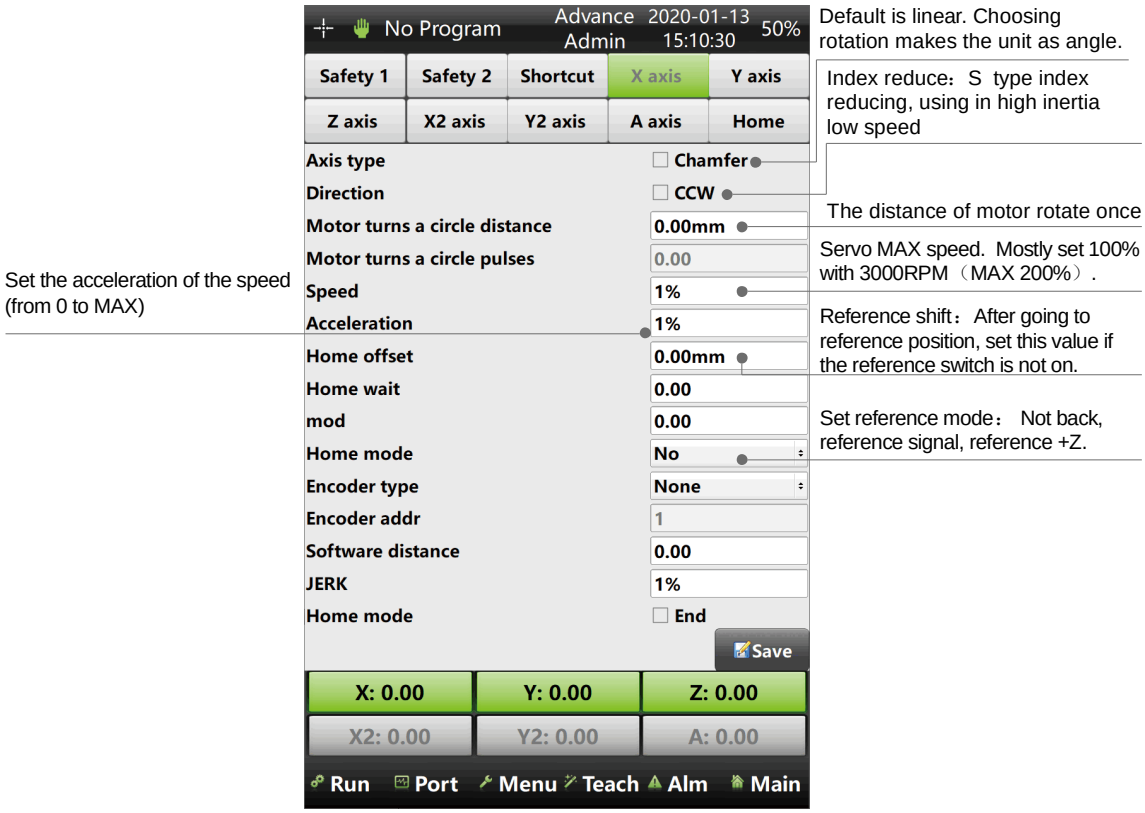
4.10 Shortcut

Set shortcut of each axis for directly moving to that position. Set the quick positioning position, easy to manually control the servo, and quickly positioned to the designated location.



4.11 Servo Axis Setting

Click on the name of each axis on the setting screen to enter the parameter settings page of corresponding axis, as shown below:



Axis type: Select the rotation and axis postion for displaying the degree. It is common to set the ABC axis for rotation.

Servo direction: Select the reversion and the axis rotation direction changes.

Motor turns a circle distance: The distance of a circle that the motor ran (The synchronous wheel's circumference divided by the reduction ratio).

Run speed: Set the maximum speed of each servo axis from 1% to the fastest of 200%. Set 100% corresponding to rated speed of 3000 revolutions per minute。

Acceleration: Set the acceleration value of each servo axis from 1% to the maximum of 100%.

Home Offset: Auto adjusts the servo's actual stop position after homing, which uses for correcting the actual home position.

Home wait: Set the standby position after homing.

Mould: Set a rotation direction, and when it reaches the set value, the system will reposition from 0.

Home mode: Here have three kinds of homing mode: "No" as not returning home,

home signal and home + Z, set not homing, then the system won't find the home position. Set the home signal, the system will establish coordinates with reference to the signal of the home position. "Home + Z": The system will establish coordinates with reference to the signal of the Z axis.

Encoder type: The setting of the encoder communication way for the absolute coder. "No" refer to the non-absolute encoder.

Encoder address: Set the servo communication slave address.

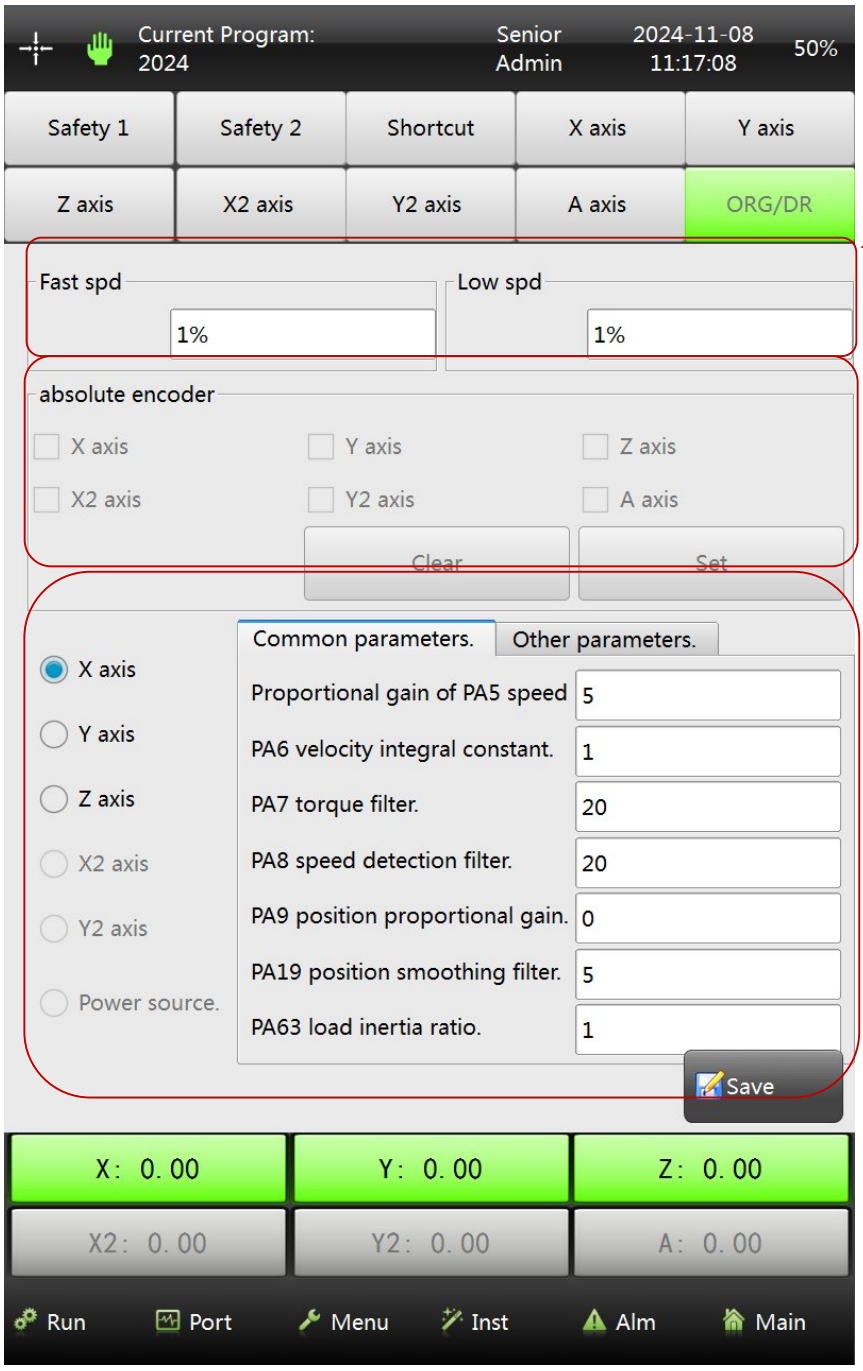
Software distance: The setting of the maximum distance of each servo axis that allows to run. The software limits the maximum travel of the servo during manual/auto operation.

JERK acceleration: Recommended value for starting the motor from speed 0 to maximum acceleration.

Homing method: Select the end, and the homing is based on sensing the end position of the actuating plate.

4.12 Homing Speed

On this screen, user can set system homing speed and the zero point of the absolute value servo (Refer to the chapter of absolute value servo). The display screen is shown as below:



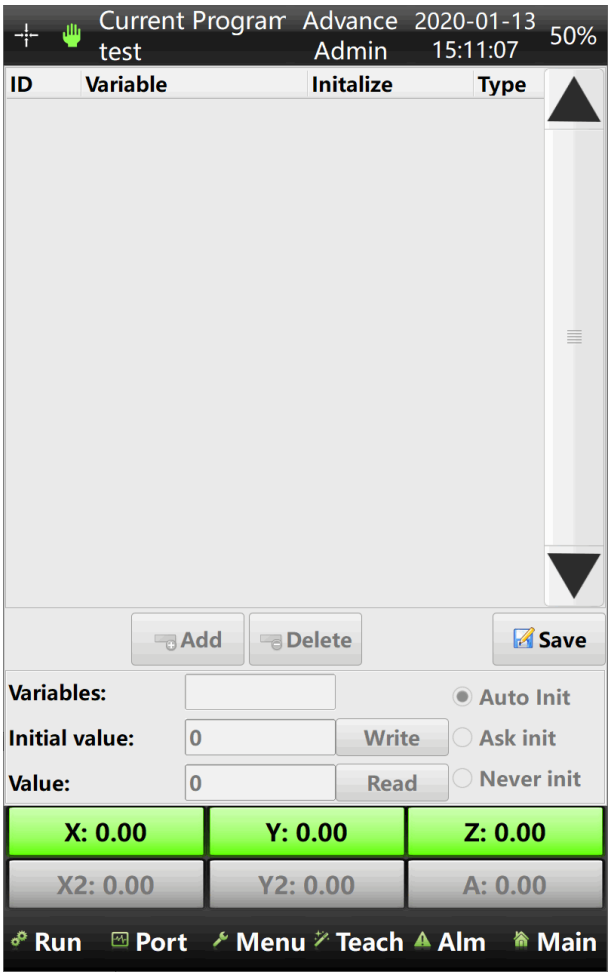
Homing speed: Set the homing speed from the minimum of 1% to the maximum of 10%.

Absolute value encoder: Select the corresponding axis and click to clear the encoder origin. Clear the accumulated multi-cycle count value of the encoder. Click on “Set Encoder Origin” to set the current positiono as the encoder origin.

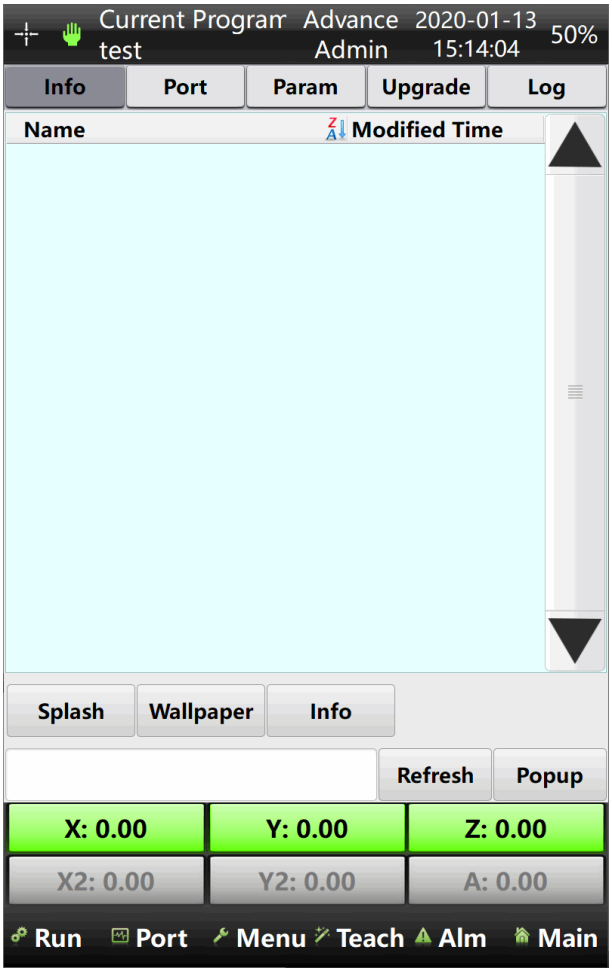
Axis Para. Setting: The common parameters are basic gain parameters, refer to the Default Parameter Setting Table. When changing other parameters specially, set them according to the parameter code.

4.13 Program Initialization

User can check the current value, and initialization method of variables. The default is automatic initialization, and the method can be selected as per the program requirement.



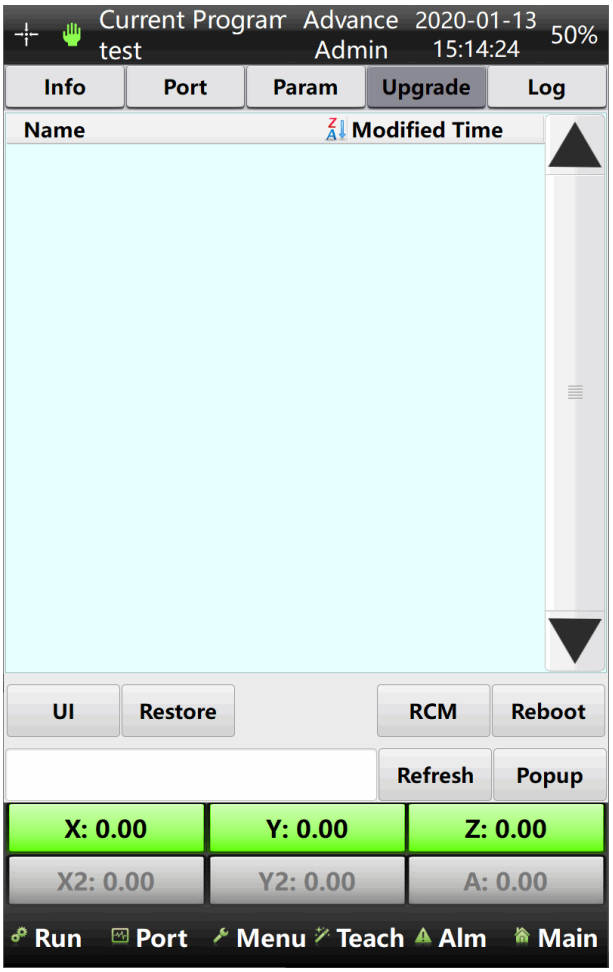
4.14 Software Upgrade



Manufacturer info: include startup screen, standby screen and manufacturer information, which is able to import through a USB. Insert a USB and then click the "Refresh" button to find the ideal picture and load it.

Port name: Edit the port name that needs to be modified on the software, and then import it through a USB flash drive. If no modification is required, it can reset the name.

Parameter maintenance: The parameters can be backed up for use, and also be used for batch setting machines. Use a USB drive can export or import settings.



4.15 System Software Upgrade

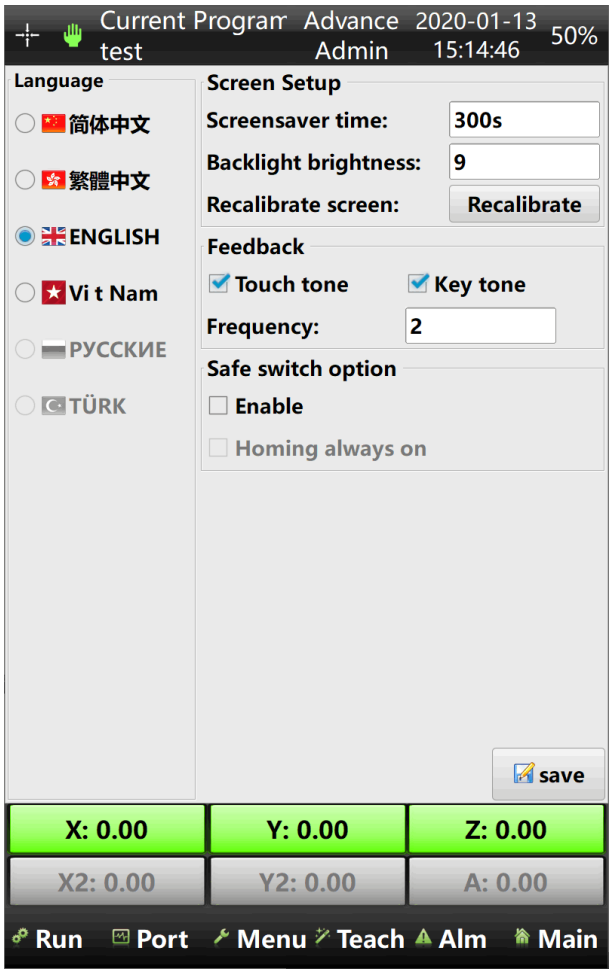
Upgrade the controller and motherboard program through a USB flash drive.

Please note that the restore button is to restore the previous version of current version that only can be restored once.

System Log: It can log and clear system logs on this interface.

Configuration: It is used to configurate parameters for fixed mode.

5. Interface Setup Page



1) Language: Select the system language
2) Screensaver time: Set the operator screensaver time, and the minimum is 0 min.(no screensaver), and the maximum is 30 mins.
3) Backlight adjustment: Adjust the backlight of the display screen, the darkest is 0 and the brightest is 9.
4) Recalibrate the touch screen: If there is a positioning deviation of the touch screen, click the recalibration button to recalibrate the screen.
5) Font settings: Font base size can be set.
6) Feedback: If the touch screen or prompt sound is selected, there will be the sound prompt.

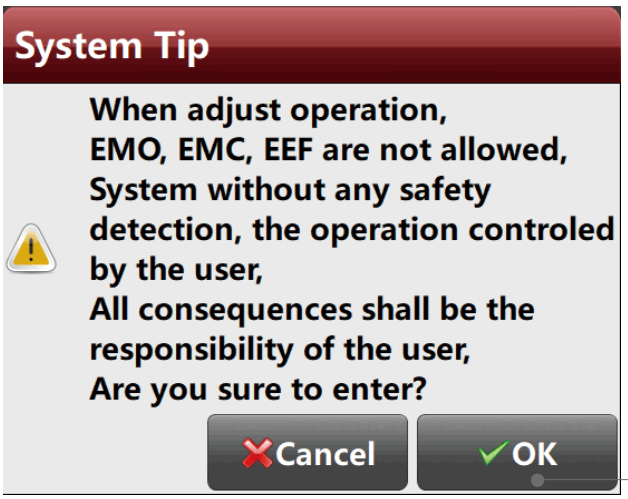
Set the frequency of button/prompt sound; There are a total of 3 levels of frequencies available:

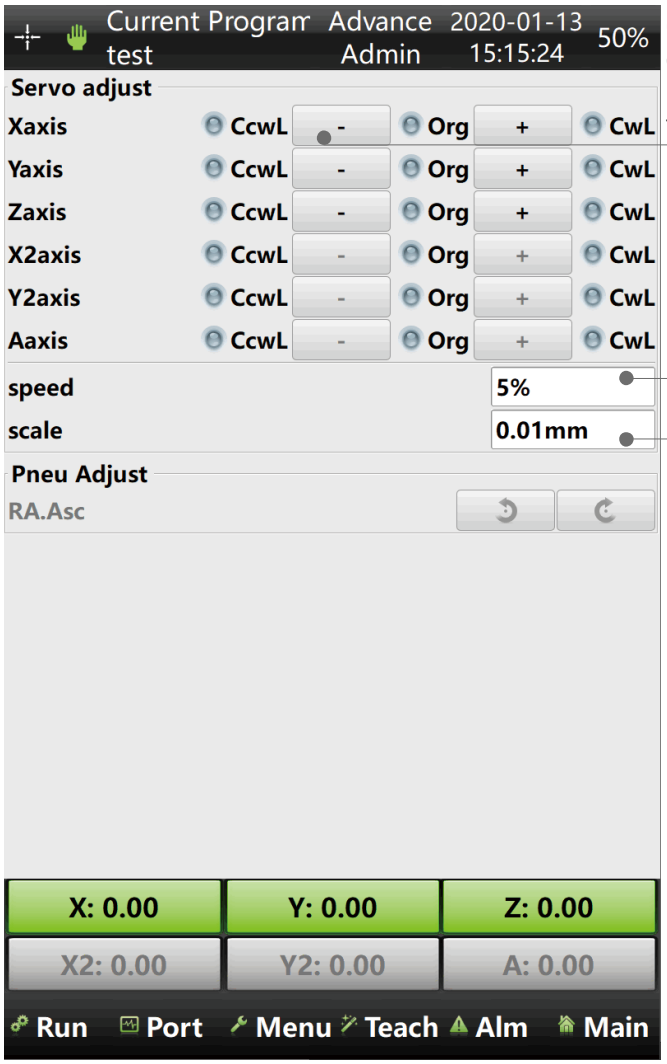
1: Low frequency
2: Normal
3: High frequency

7) Safety switch configuration: Set whether to use the safety switch or not, and whether it has to press long for homing.
8) Knob switch - effective after restart: set the knob switch to switch between stop, manual, and auto status. This parameter change will take effect after restart.

5.1 Adjustment Page

When certain alarms occur in the system (such as the mould open signal of robot arm disappears in mould) that restrict manual operation, it can enter this screen for servo operations. Then, the system doesn't perform any safety checks, which must be confirmed by operators on their own.



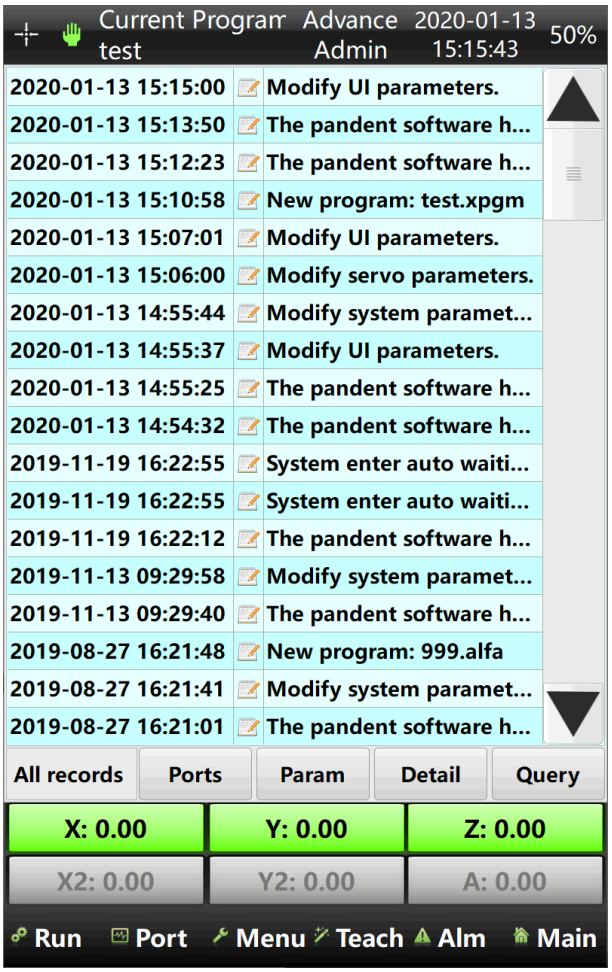


Click X- and X+ to check the direction is right or wrong. (X- to original position)

Reference speed

Distance per pressing

5.2 System log



Checking System log, Alarm record, and reminder record on the System Log page.

Ports and Parameter: checking the port status and information when an alarm occurs.

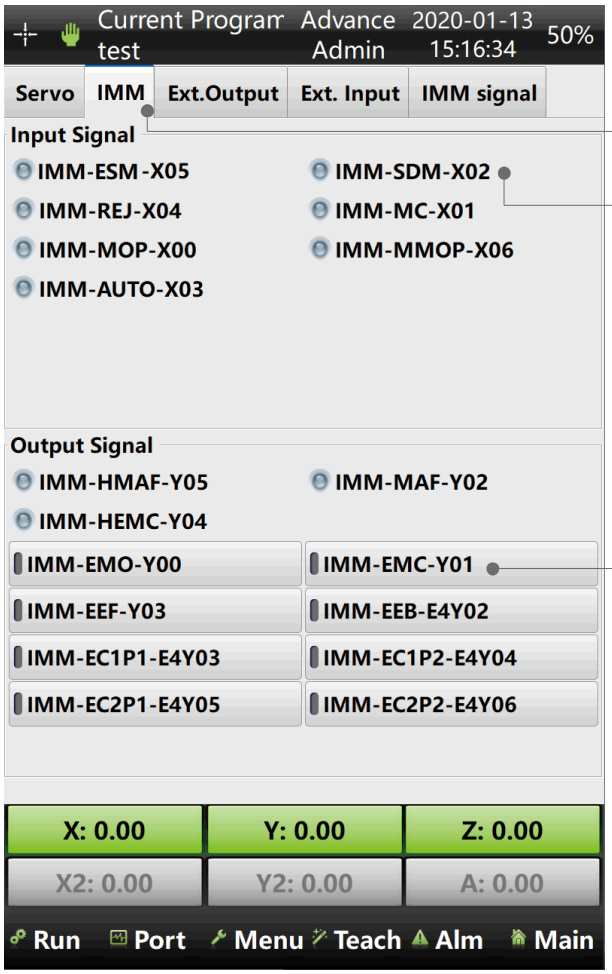
5.3 Configuration

The remaining page from the original interface which doesn't have any functions except to check the current version of main board and controller.


Current Program
test
Advance
Admin
2020-01-13
15:16:03
50%
UI SV3.35(32bit)-double / SYSTEM V1.00_1.00 / SR6807B / 0-0 /
LIB V4.8.4
X: 0.00
Y: 0.00
Z: 0.00
X2: 0.00
Y2: 0.00
A: 0.00
Run
Port
Menu
Teach
Alm
Main

6. Port

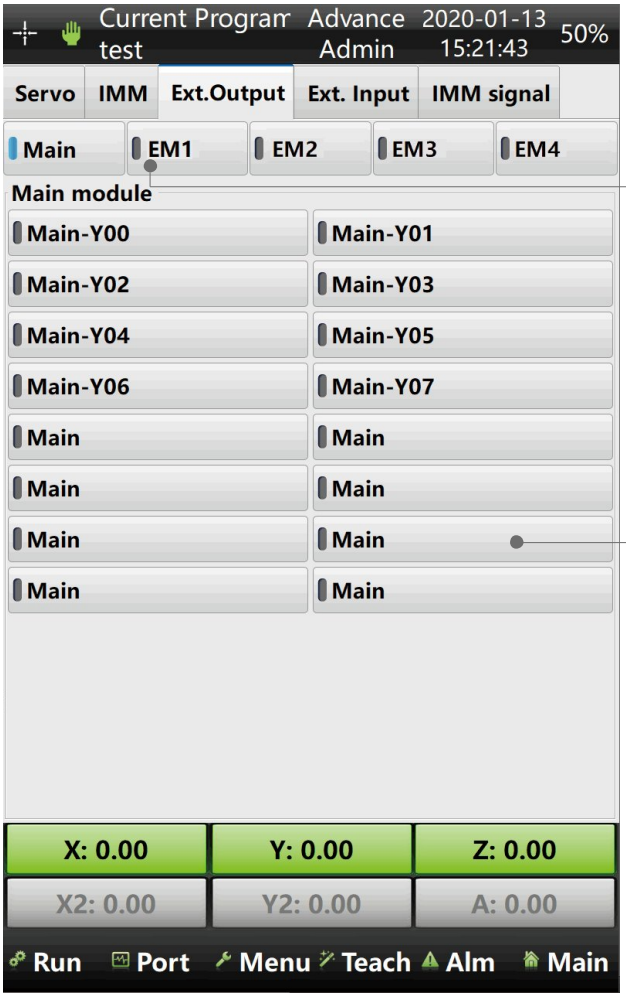
Touch the “Port” page button at the bottom of the function button bar. Check the System I/O signal (Servo signal, IMM signal, expanded output, expanded input, robot signal) on this page.



Select these pages to check the signal status

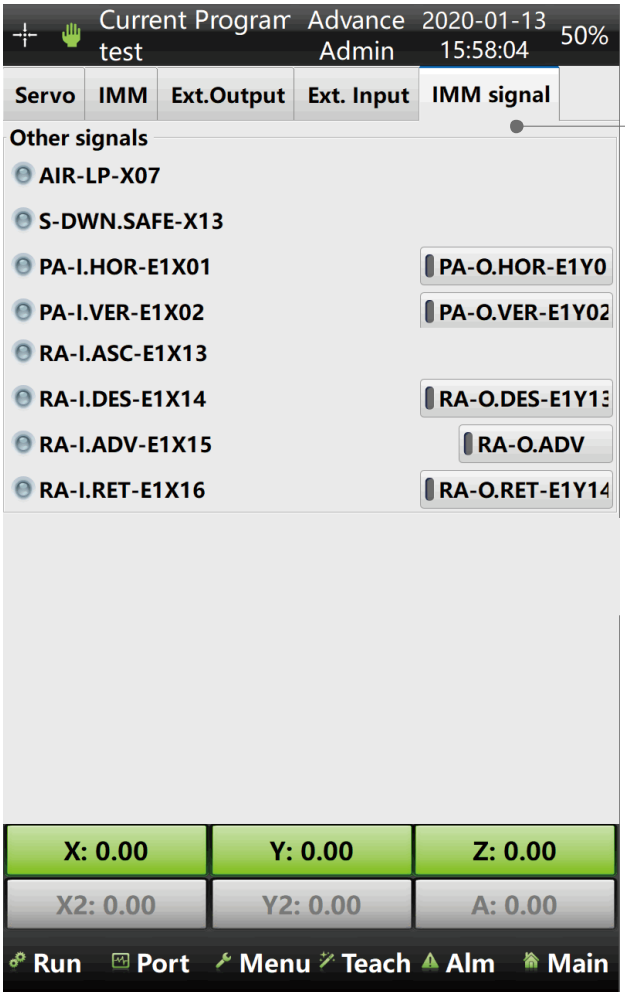
Check input signal from IMM

Switch the output signal on/off. (Check mold close)



Output signal: Up to 4 expanded I/O board. Click here to switch

Grey icon – no connection



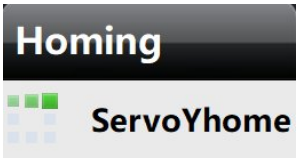
Robot signal: Main arm cylinder, second arm I/O monitoring and manual operating

Note: Port interface might be different by different system settings.

6.1 Servo Axis Operation Description

System homing

After the servo adjustment and the trial operation, press the  or the Homing button to start searching for the Home position.

If the system is on manual mode, press the Homing button on the top left corner to back to home position with this 

showing on the screen.

Pressing the “Emergency Stop” button that is colored in red on the upper cover of

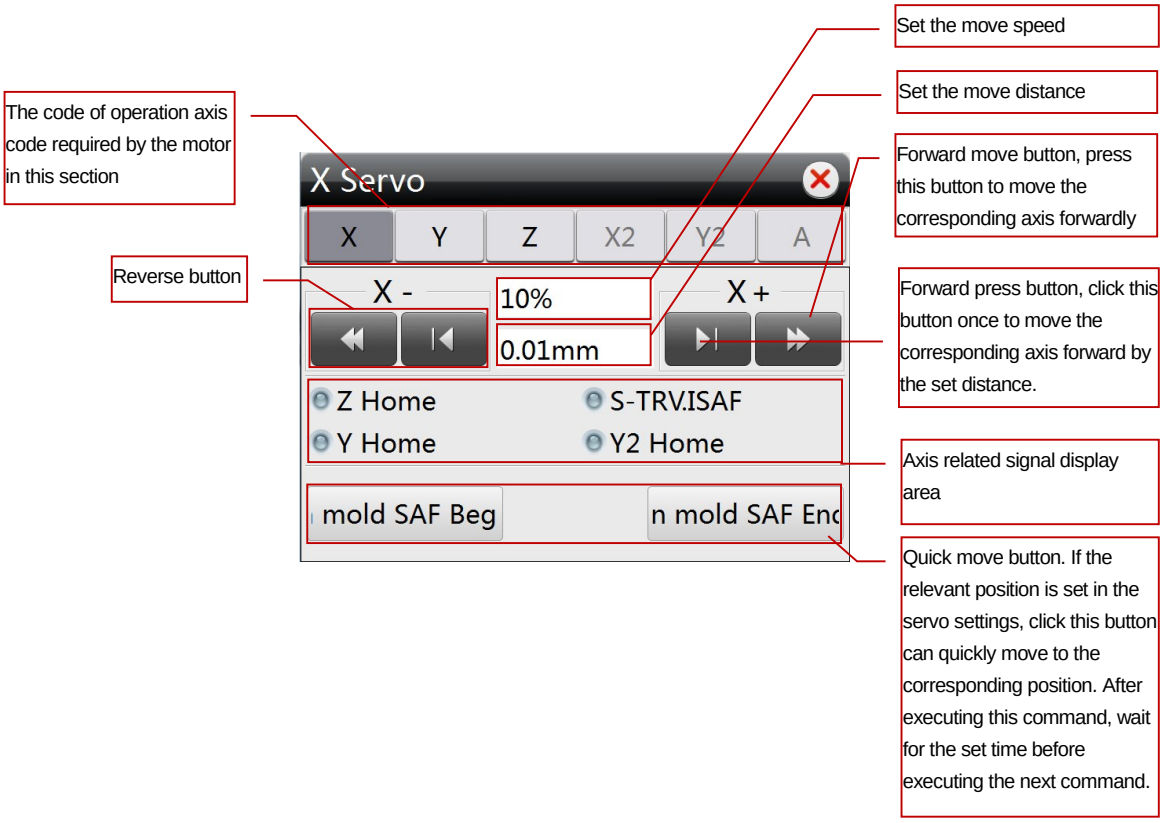
the controller will stop Homing operation immediately.

Servo manual operation

Servo manual operation by two methods as below:

1. In the manual mode, press the button on the right side of the operator to move the corresponding axis. The correspondence between the buttons has been explained in Chapter 2 and here it is omitted.

2. In the manual mode, click on the display area of any axis at the screen bottom to enter the operation screen. In this screen, it not only can shift by manual, but also enter the fixed distance shift and check corresponding signals.

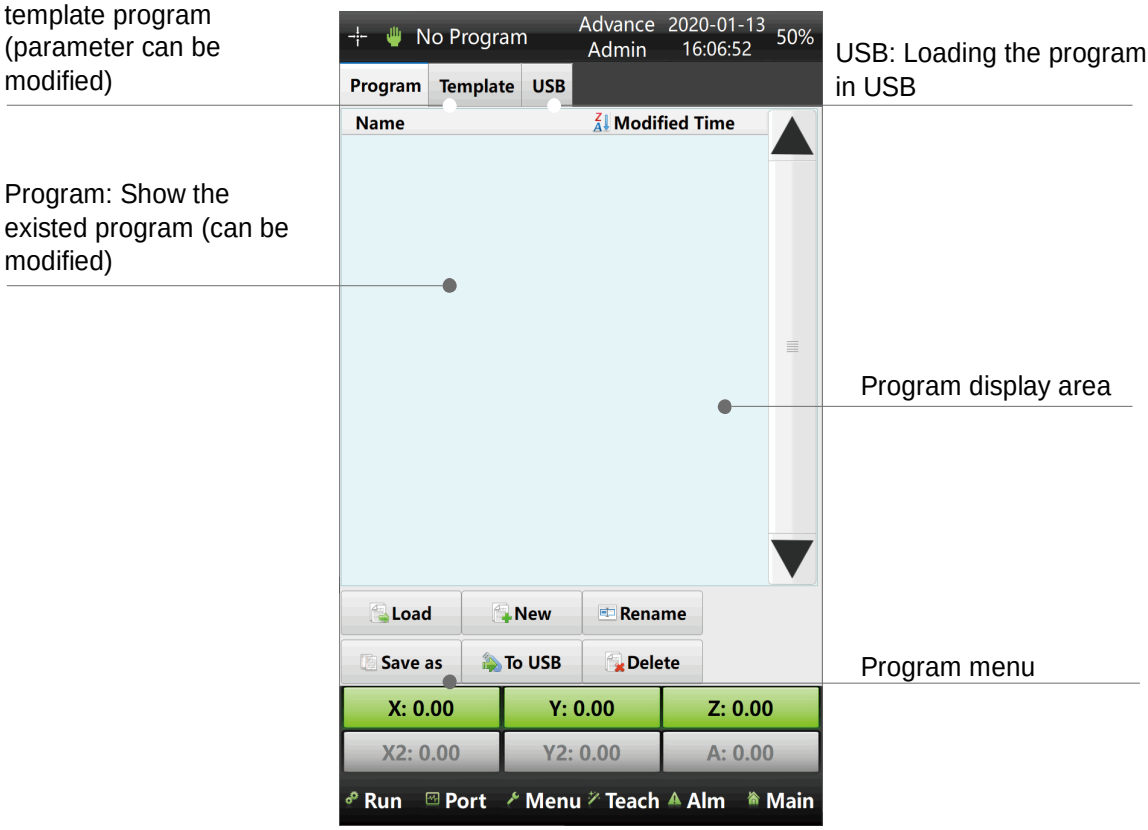


Note: To operate the robot manually, Homing before operating is necessary.

If the movement of any servo axis is required when it's yet to manage homing, operate in the "Adjustment" function.

7. Program

7.1 Program Management Page



Click on the program name (displayed as “no program loaded” when without the program) to enter the program management interface.

By clicking the “New” button will pop out this keypad where you can name a new program. (here we take “test” as example). This  button is known as “Capitals Lock” to switch capital letters, and this one  is the “Enter”, both of these 2 buttons  are “Delete”. When entering, please click on the blank space in the dialog box first. Only when the cursor flashers can the input be valid.

After the creation, there will be the program in the directory, as shown in the picture below:

Operation menu of other programs:

Rename: Select the program to be renamed. Click the rename, it will pop up a dialog box to name the program, and just input the name you wanted.

Save As: Select the program you want to save and click the save as, it will pop up a dialog box to name the program, and input the name you wanted.

Export to USB drive: Select the program you want to export, click on Export to USB drive. It will pop up a dialog box to name the program, and enter the name you wanted. After successful export, switch to the USB drive directory to check the program exported.

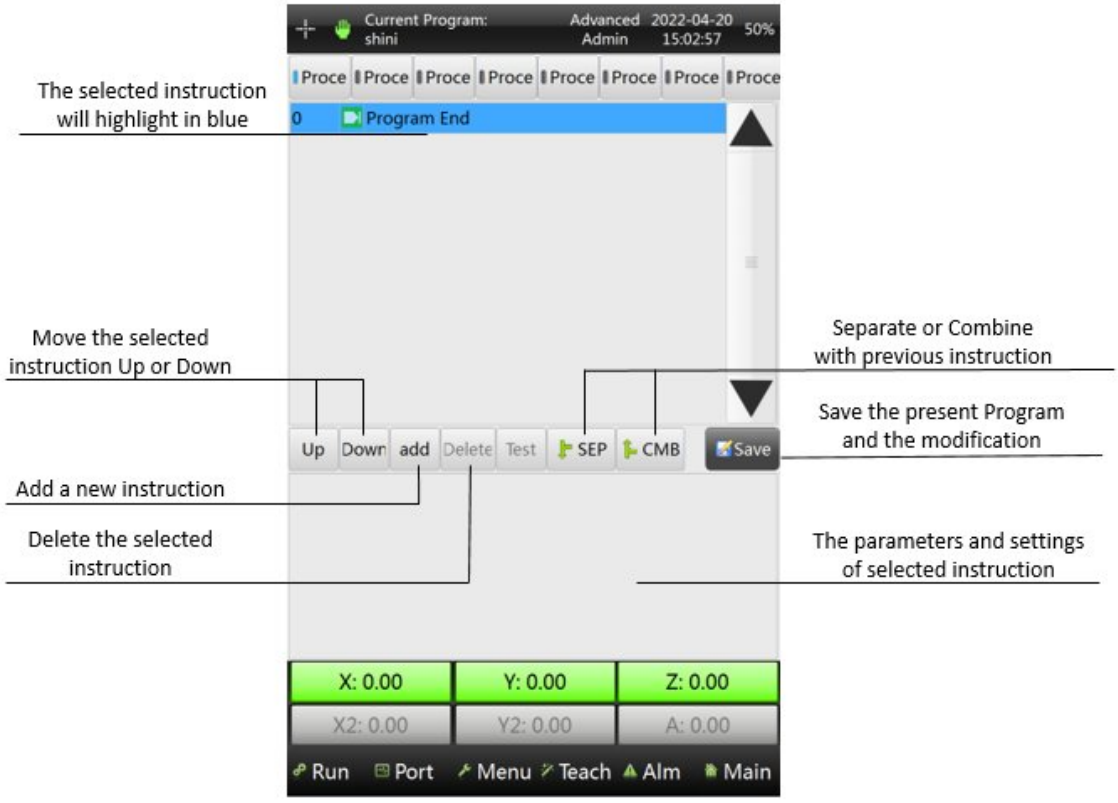
Delete: Select the program to be deleted, click delete and delete program. It can't delete the program has been loaded.

The operations on the other two interfaces are the same. Please be noted that in the USB drive directory, if there's a program in the USB drive, but no display, it

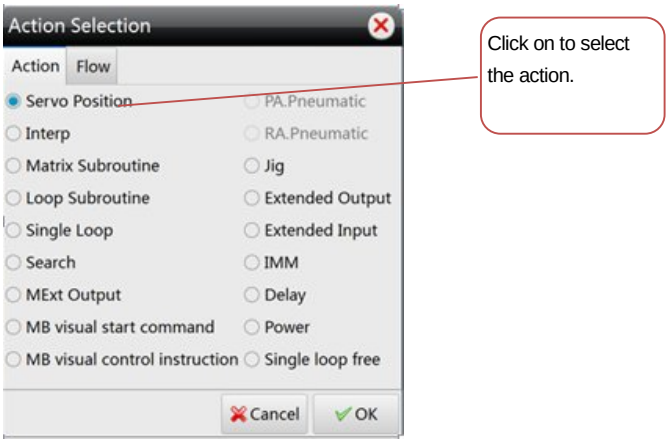
can click on refresh. If there's no need to use U drive, click to pop up the USB drive first, and then remove it.

7.2 Teach Program

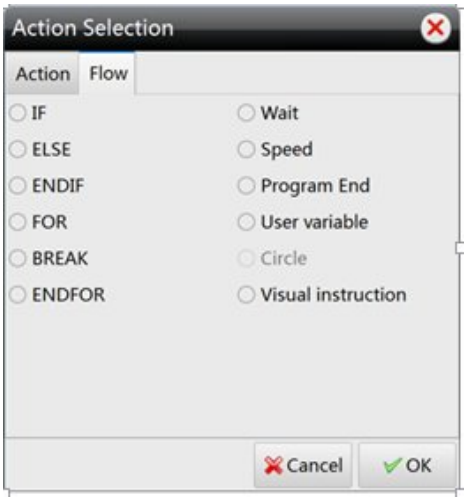
Enter the teach interface



Add instruction / command

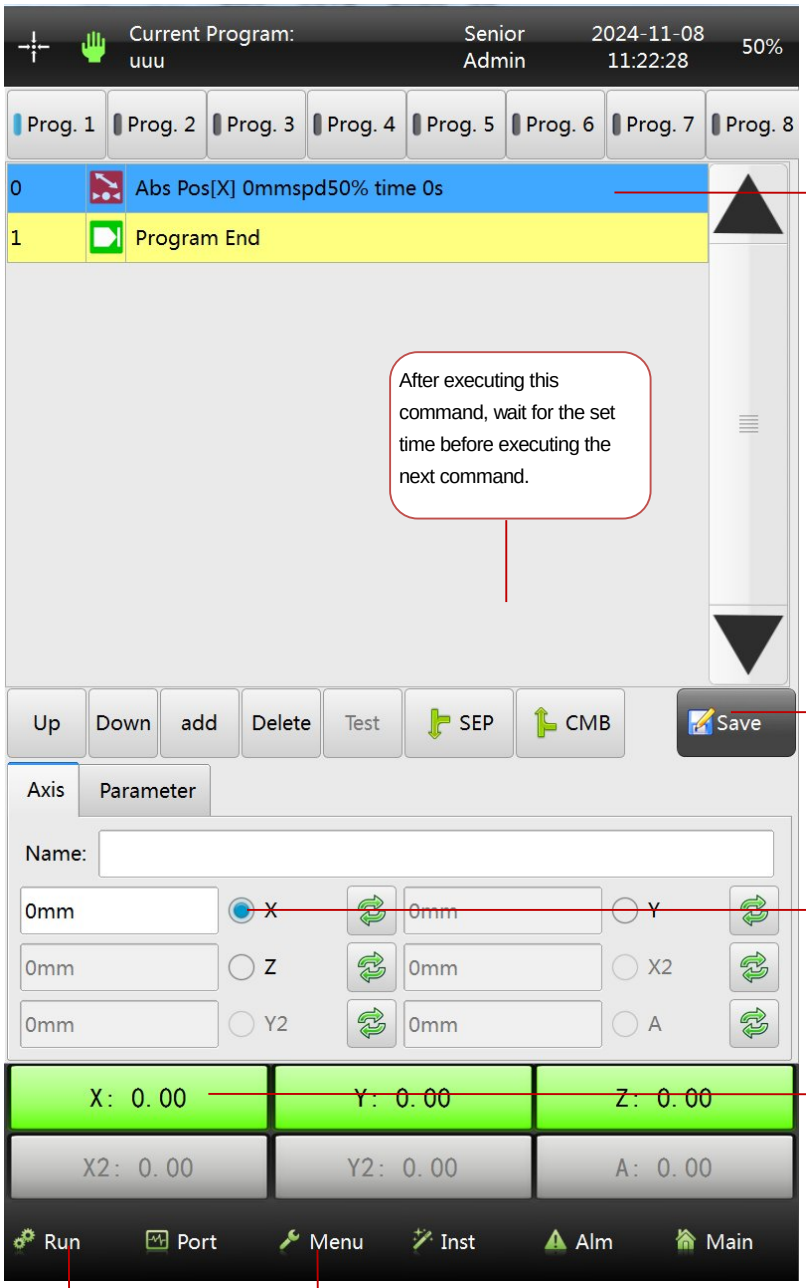


Click add  , the “Action Selection” menu page as shown below:



Select an instruction/command then Click 

to confirm adding the new instruction / command as shown below:



Absolute positioning: Refer to the stroke traveled relative to the O posotion.

After executing this command, wait for the set time before executing the next command.

Save button: After setting the parameters, if it needs to switch to another interface, click here to save first, and then return to continue teaching.

Click on the circle before the corresponding axis name to select the axis, where black is optional and gray is not available.

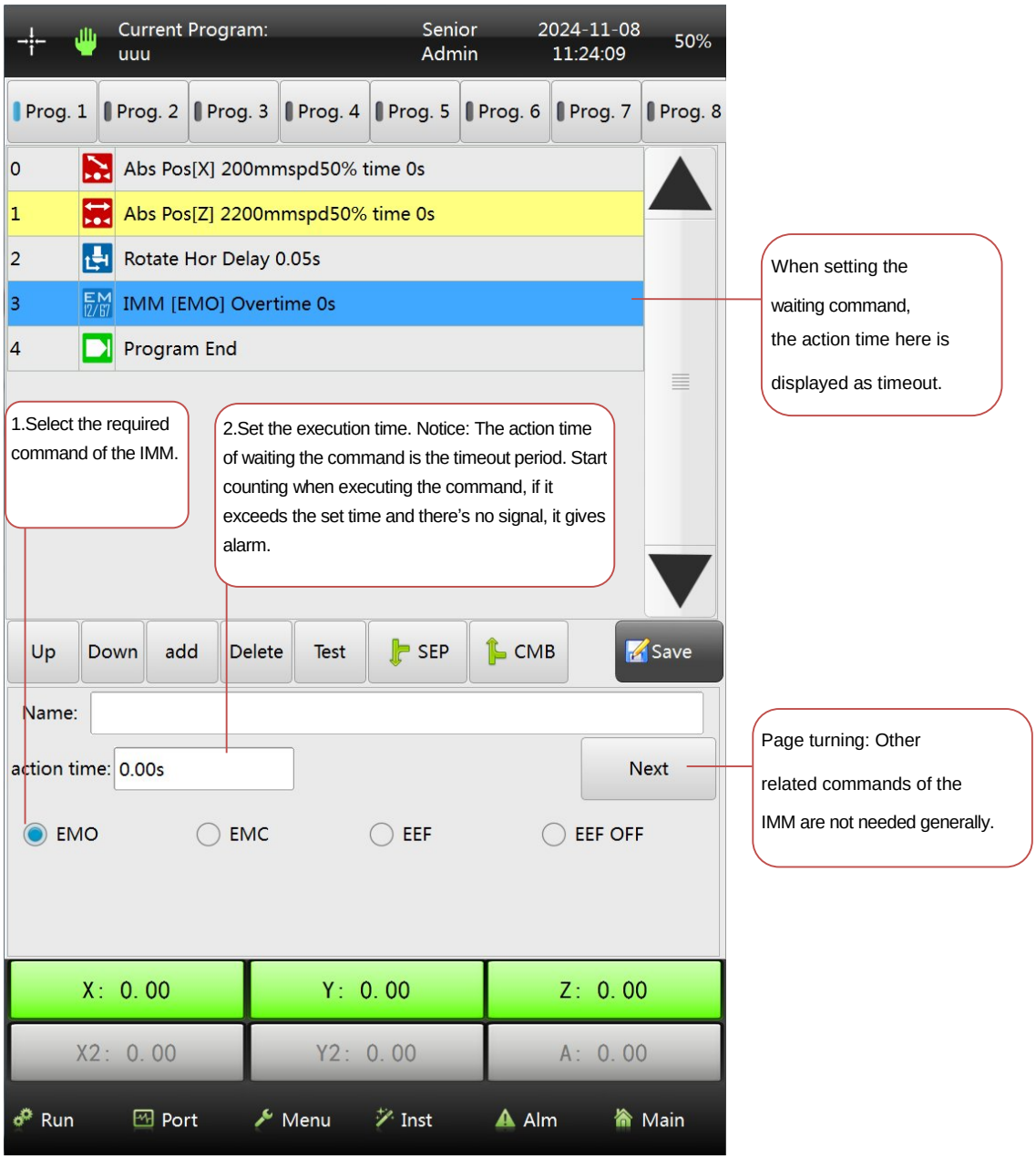
The stroke taken by this command is to manually adjust the X-axis position to the required position, read the value from the coordinate, and then write it here.

Command speed: When selecting the X axis, the maximum speed from the start point to the end.

Relative: If it is selected, the actual position taken by this command is the current position of the X-axis + the position taken by the command.

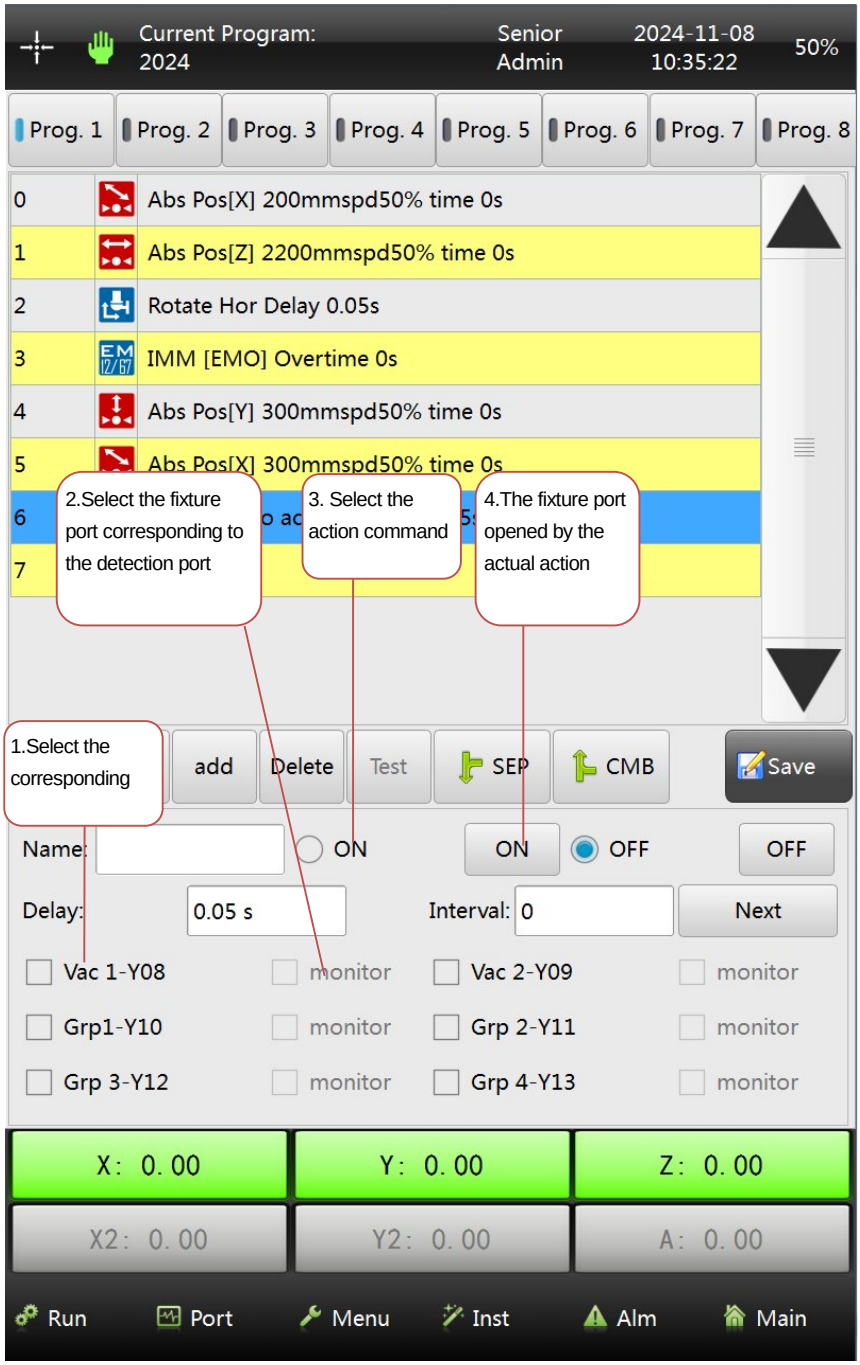
Then add the horizontal X axis instruction as the previous way.

Adding the Main Arm pneumatic flipping cylinder instruction: Click the “ADD” button then select the “PA. Pneumatic” instruction and click the “OK”.



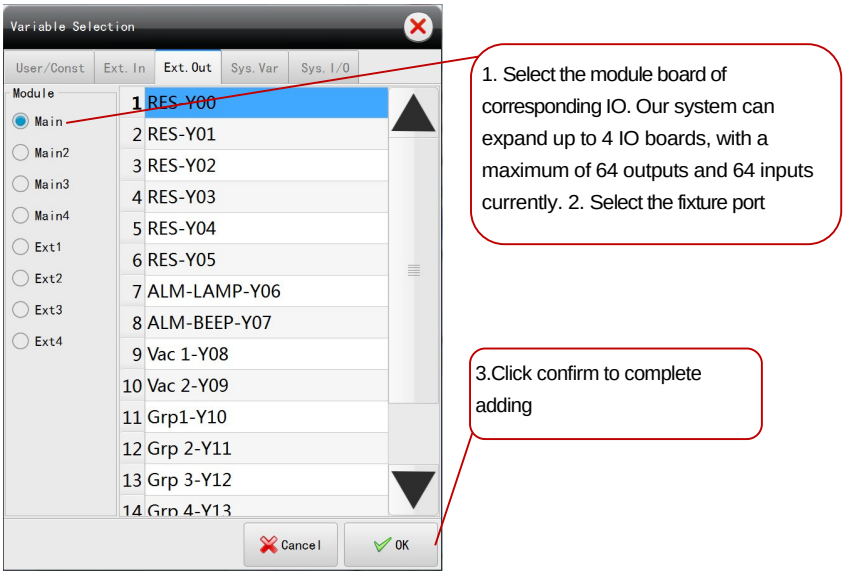
Add the IMM command, as below:

Continue adding the arm down and then the crosswise forward command. The fixture instructions are as follows:



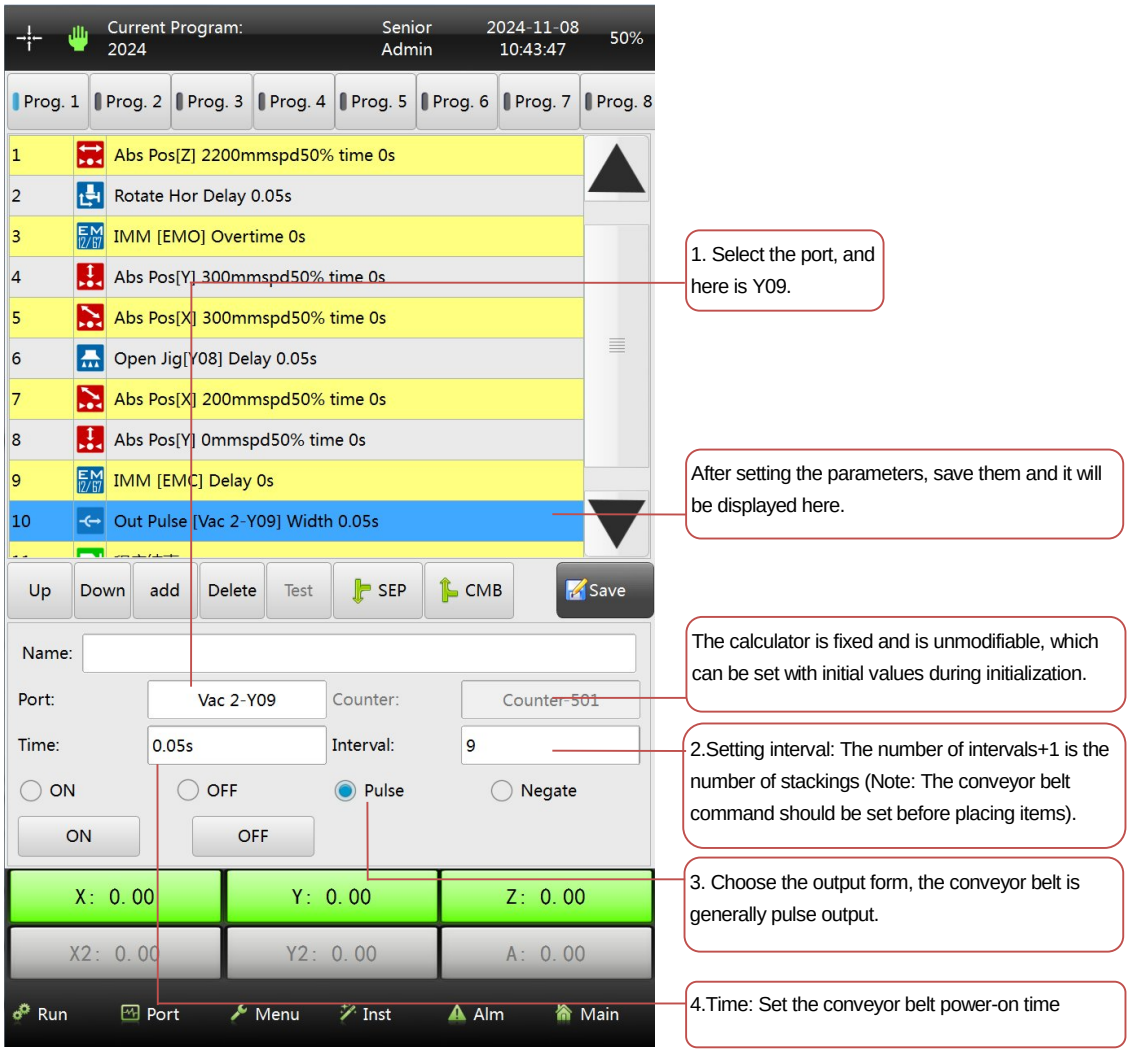
Note: If it doesn't need detection, teach separate fixture output command from the extended output.

The port interface is as follows:



After adding the fixture, then retreat, raise the main arm, allow the IMM to close the mould, and keep the main arm horizontal.

Add an extended output to control the conveyor belt (To prevent objects on current position of the conveyor belt, let the conveyor belt go to one station first, so the command should be given before placing the product).

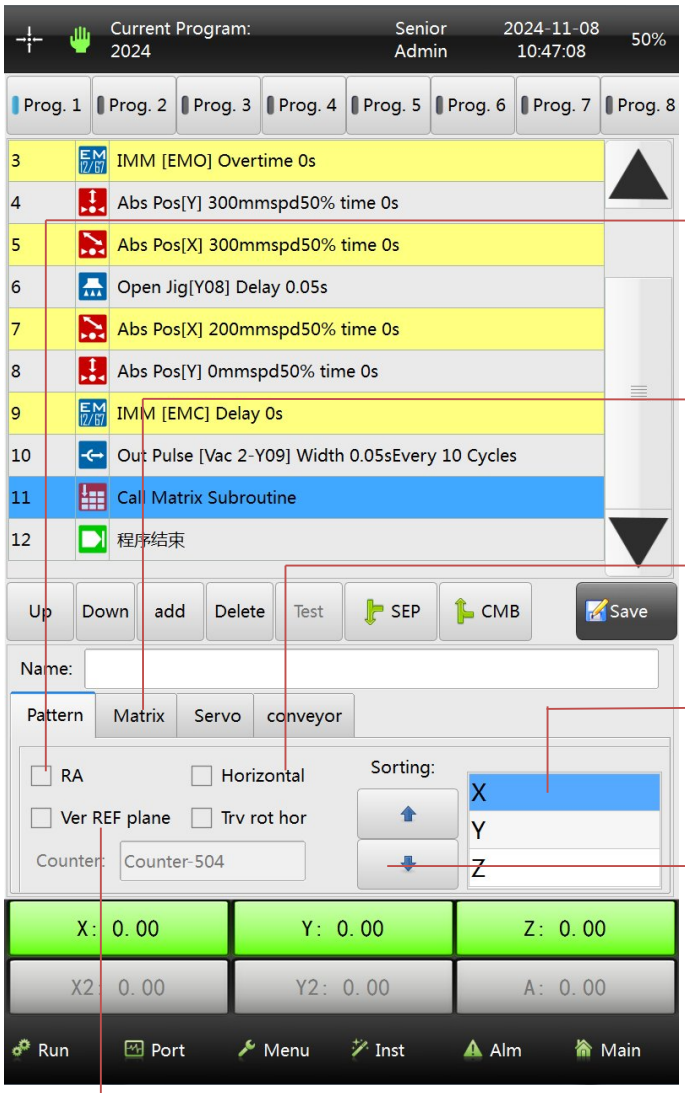


Note: The opening and closing operations are same as the fixture command. Reverse: When executing the command, reverse the output status of the expansion port.

Switch from closed to open, and from open to closed.

Interval: The first cycle is the output, and the interval is how many cycles before the next output.

The “Palletizing” (Matrix) function as shown below:



1.Choose which arm to stack, and the default is main arm to stack when not selecting.

5. After setting, click on matrix and set the relevant parameters.

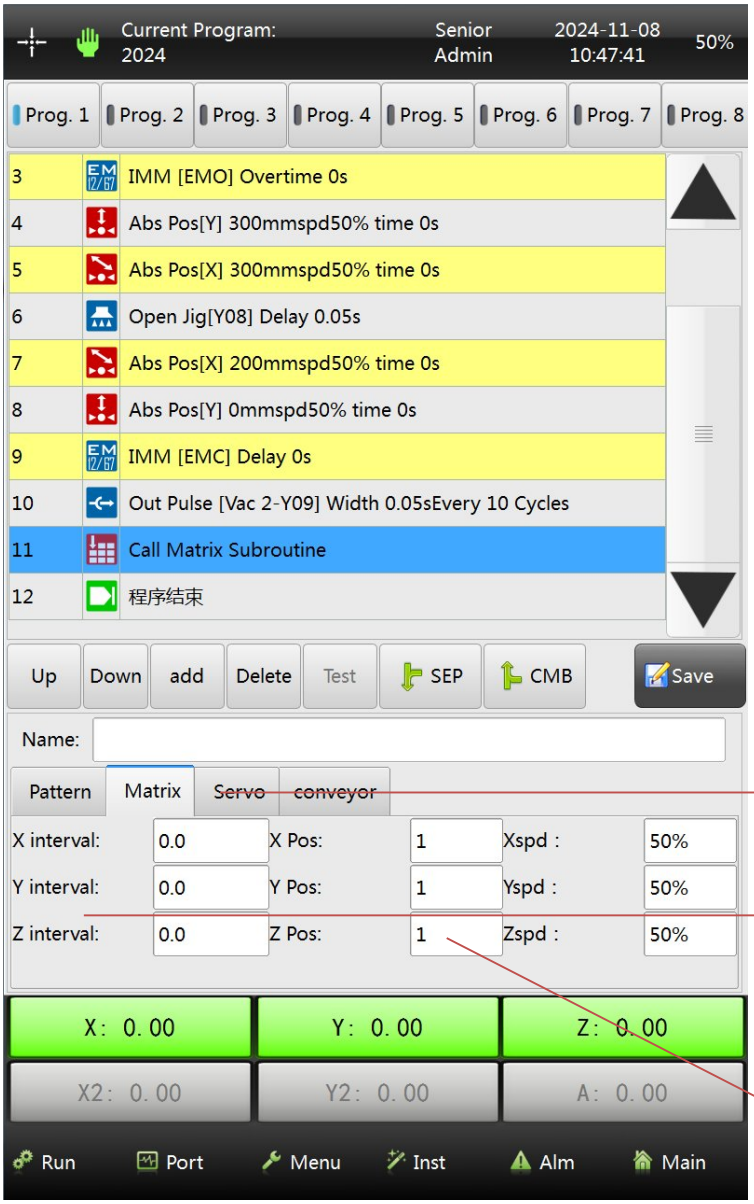
2. Set the flipping cylinder status when stacking, and the default is the previous state in the program.

4.1. Select the priority of stacking axis needs to be adjusted.

4. Set the stacking direction.

4.2.Click here to choose to move up and down. The higher the position, the higher the priority for stacking and moving down.

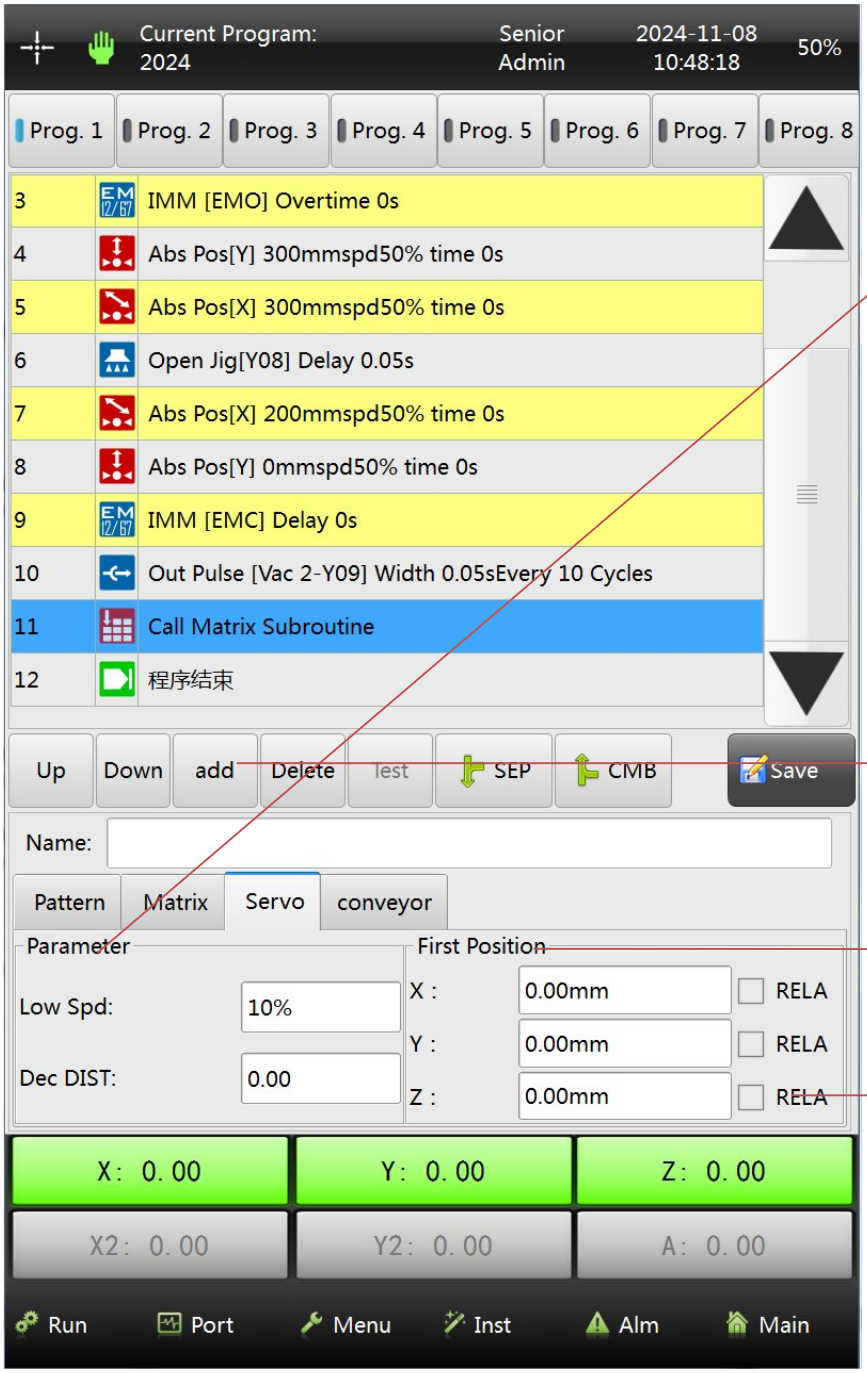
3.Set the order of servo axis actions during stacking; The vertical base level is generally the Z-Y-X for embedded parts. The default is the horizontal base level Z-X-Y.



3. After setting, click on the servo and set the relevant parameters.

1. Set the spacing between the products on X, Y, Z direction and the center point.

2. Set the number of products stacked in the X, Y and Z directions.



1. Set the servo related parameters.

3. Continue adding commands after setting.

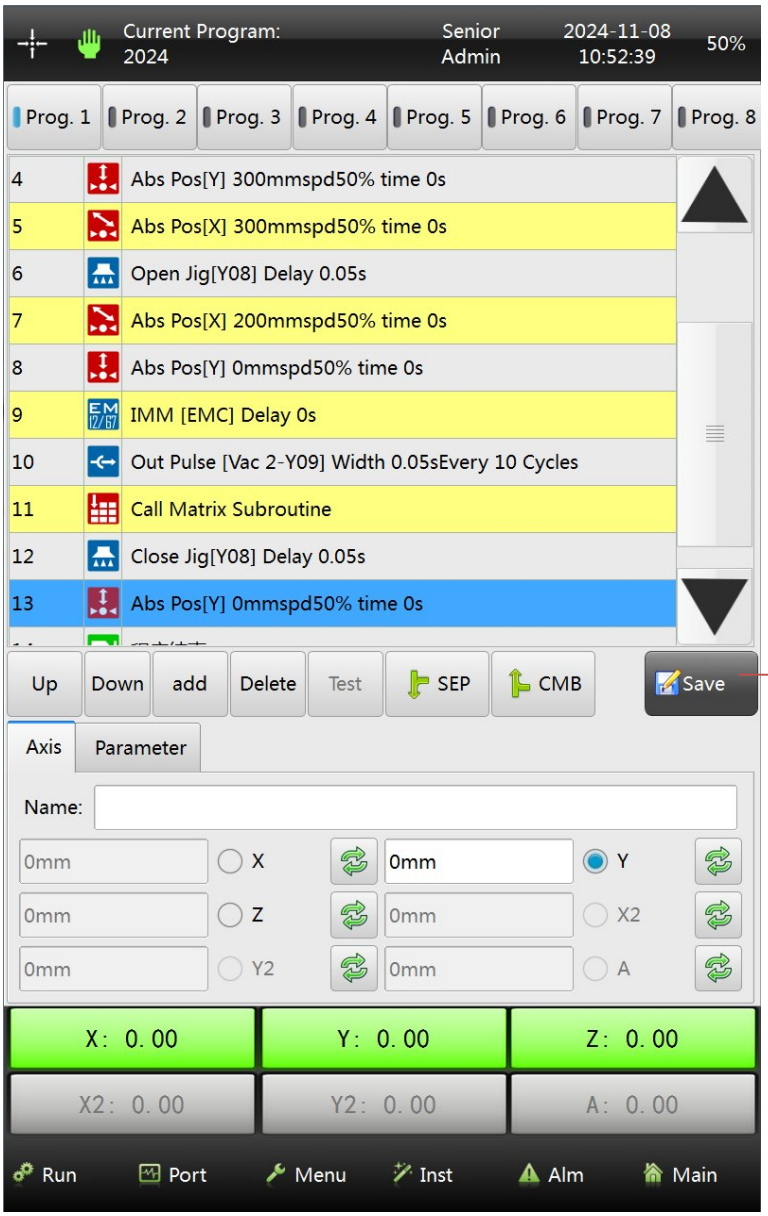
2.Set the start position of the stack.

Relative: is current position of the relative servo and the value

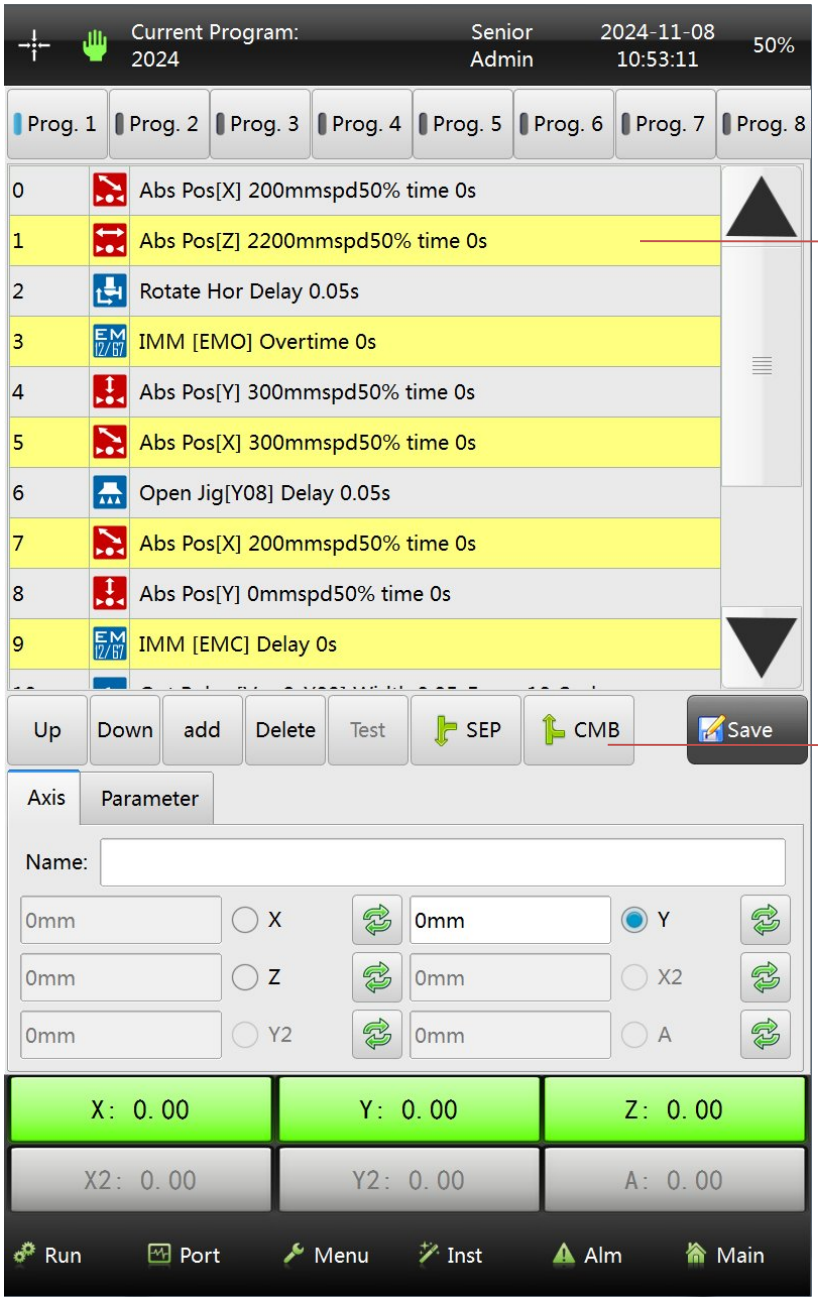
of the run parameters.

Note: Loop positioning instruction.

Continue to add the fixture release command and the main arm goes up, then the program has been taught as follows:



After teaching, click the save button at the end, or it can click Save every time you teach.

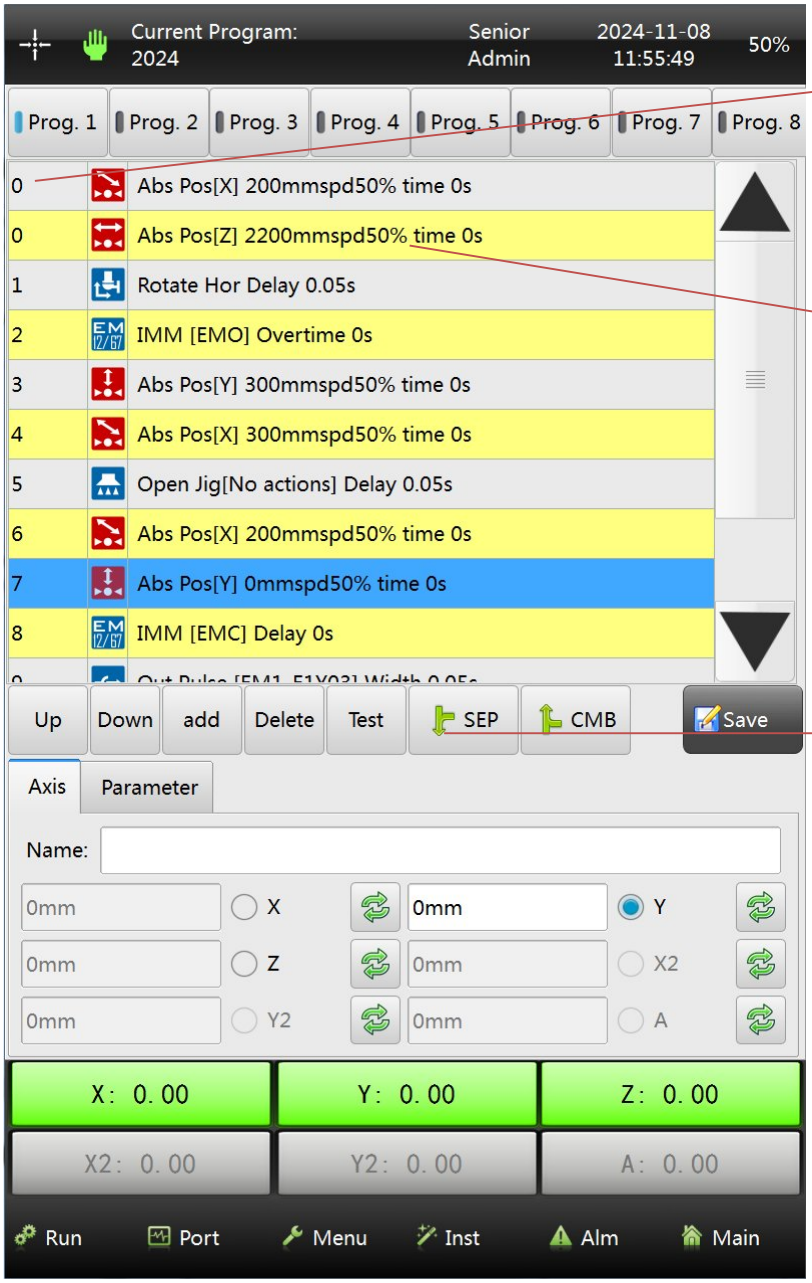


1.Select the command that needs to be combined with the last command.

2. Click combine

Combine and Separate the instructions

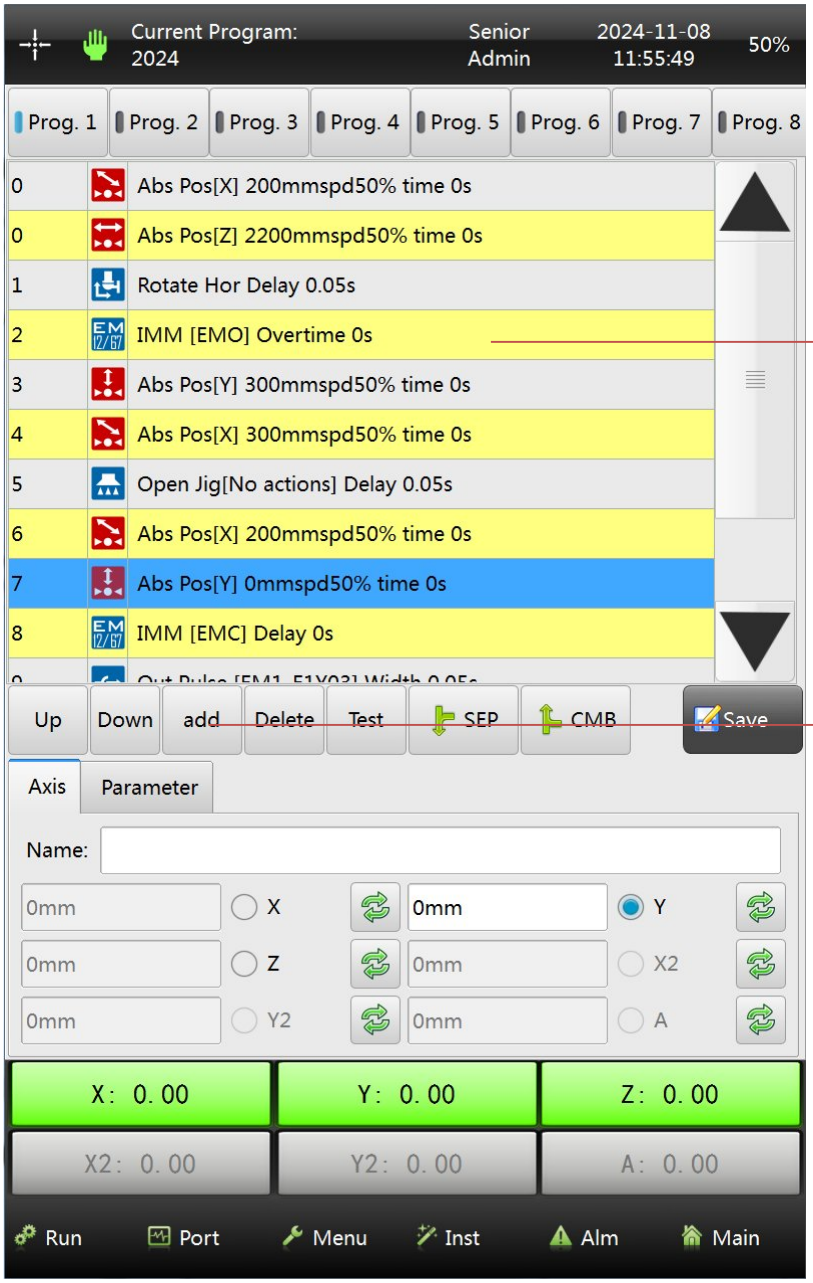
After the combination, it displays as follows:



After combination, the order number of program steps are the same, and it starts when executing the program.

1. Select the program command that need to be decomposed.

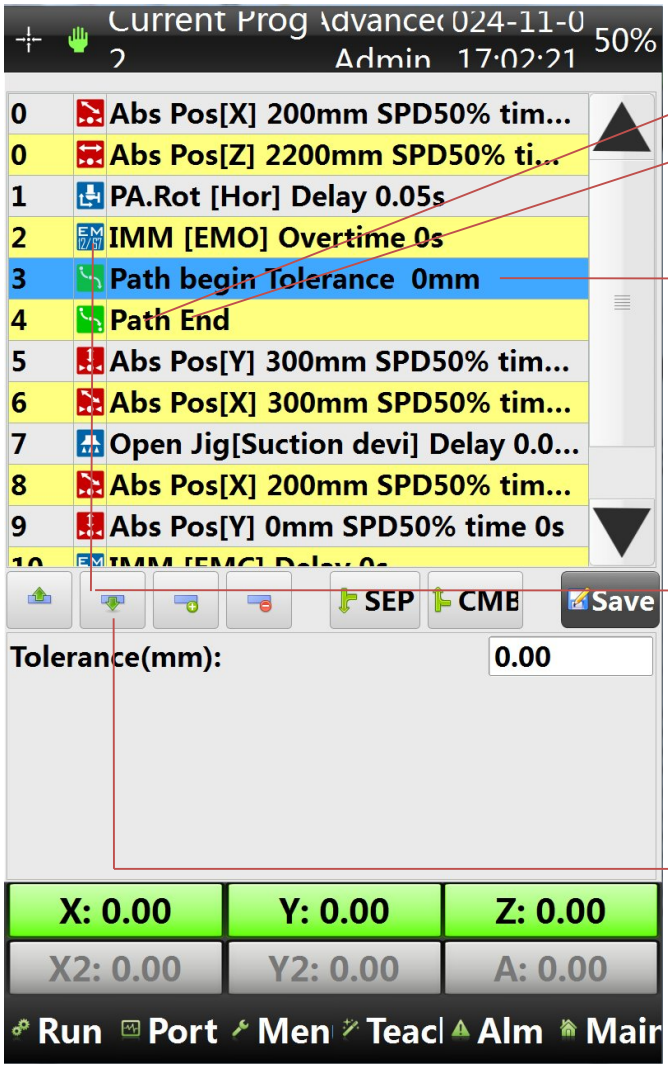
2. Click on the decomposed button, and the program will return to its original state before being combined.



1.The new command in the figure will be added below the currently selected command.

2.Click "Add" to enter the command selection screen, and select the continuous path to start.

Continuous path instruction introduction:



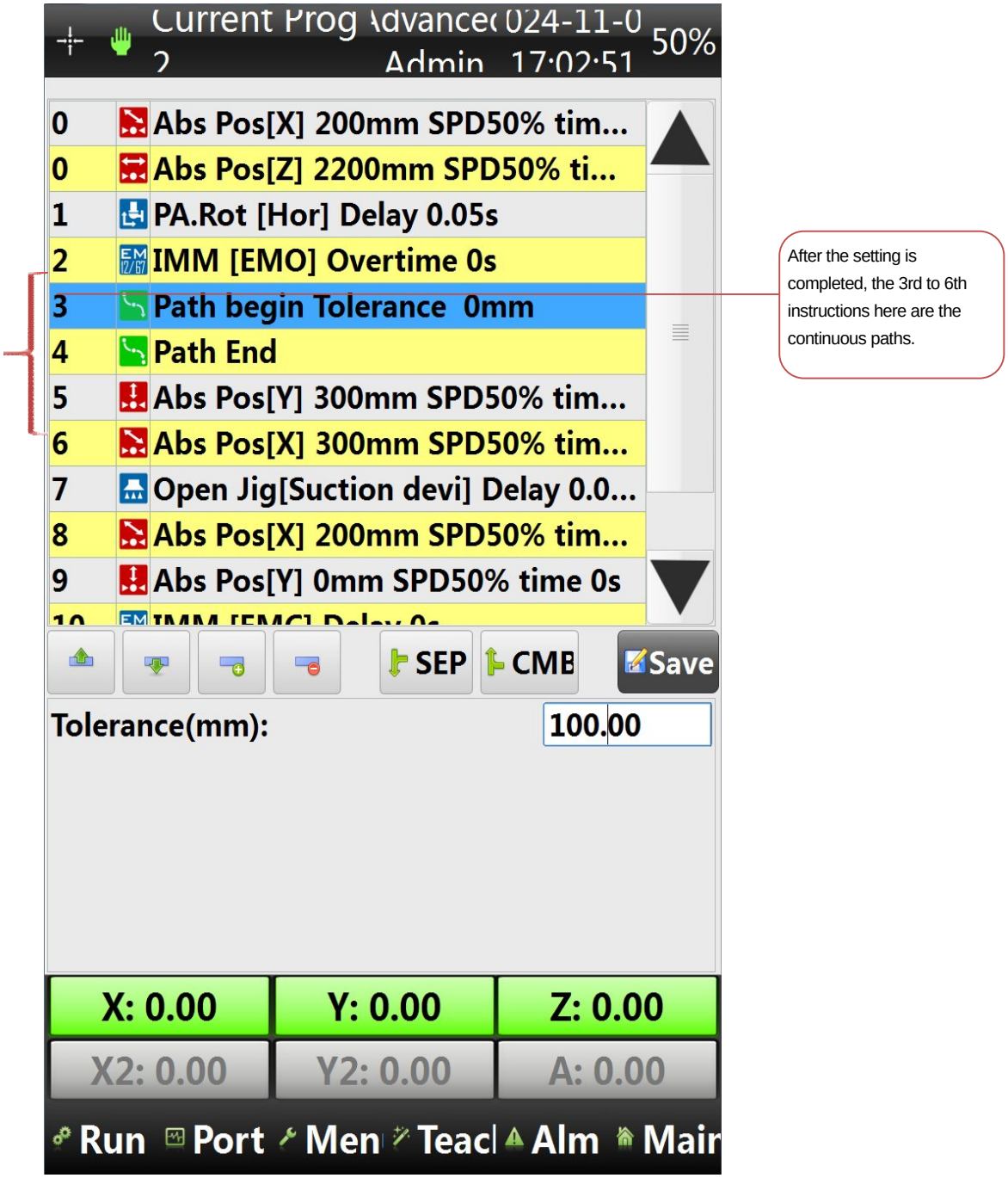
After adding the command, it displays the start and end of the continuous path.

1.Click to select to patth end.

Tolerance: The next command sets the distance in advance to start execution.

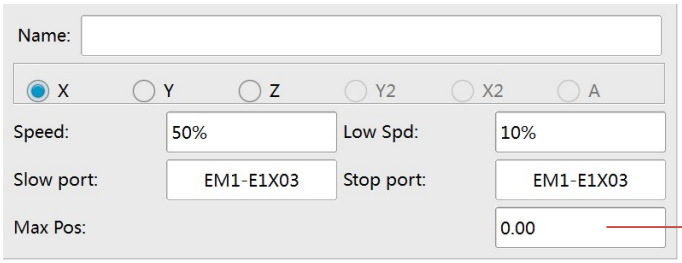
Continuous path usage: Generally, if it wants to shorten the in mould time, just let the main arm descend to a certain distance and start crosswise. For example, if it goes up and down 300mm here, when it reaches 200mm, let the crosswise start. Here, it can set the tolerance to 100mm,
Just move the continuous path end to below the command of absolute positioning X300mm.

2.Click the down button twice.



After the setting is completed, the 3rd to 6th instructions here are the continuous paths.

"Search" instruction: On the single axis, within the range of distance from the last position by the program to the max. searching position that has been set. If the robot arm finds a signal of deceleration then the servo reduces its speed; if it finds a signal of stop running then the servo stop running.

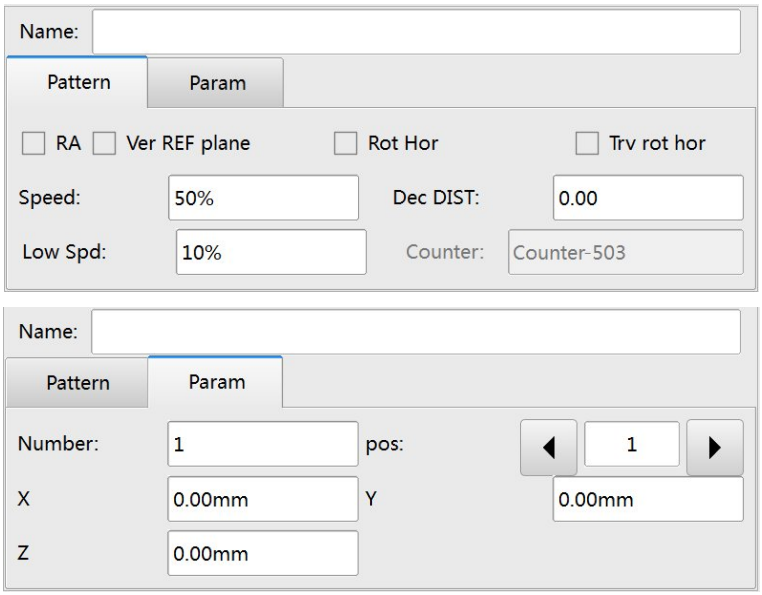


When the Y-axis detects the set port signal during the downward, it will execute the corresponding action, If no signal is detected, it will execute to 600 m and stop.

Speed: It is the speed at which the servo doesn't detect the deceleration or stop signal. If not using the deceleration port, it's not recommended to set the servo speed too high. Low speed refers to the servo speed for adjustment after detecting the deceleration port.

"Single Loop" positioning: loop positioning instruction of single axis.

The servo can be stacked in any single axial direction. Click on the coordinate display area at the first position, which pops up a numerical input box where you can input the required position.The parameter interface can set the number of positioning points, and the frequency of each point (It can be seen as the number of layers every position). The usage of run speed, interval, counter, and matrix positioning is the same.



IF，ELSE，and ENDIF conditional instruction：These 3 commands usually are used together in the program when it is running in the branch program.

“IF”: If the variable [ ] valid（IF determination of condition）

The condition for determination is included in the brackets [ ] .

{It’s available for variable, input, output, ……system variable, system I/O**}**

{ } Which includes in curly brackets is the detail of execution due to the condition is valid.

“ELSE”: If the variable is NOT valid

{ } Which includes in curly brackets is the detail of execution if the condition is not valid.

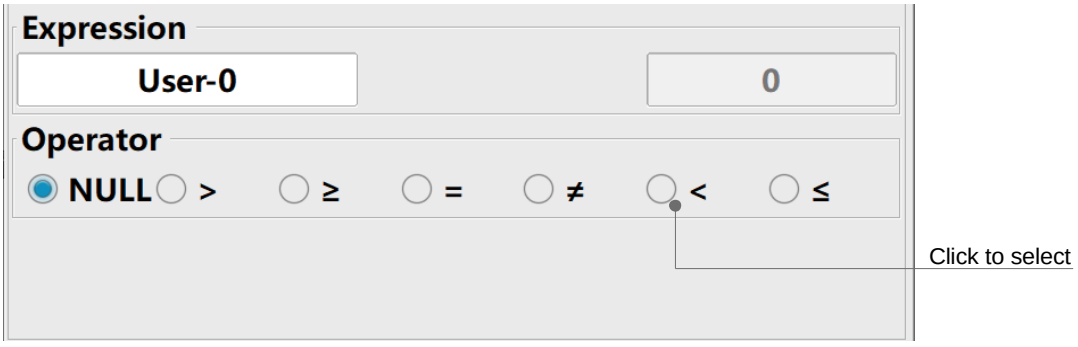
“ENDIF”: The end of conditional instruction.

It will have an “ENDIF” since there is an “IF” was been inserted.

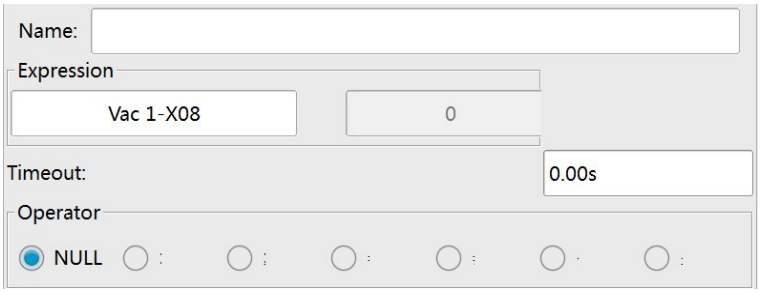
The “IF” condition as shown below：

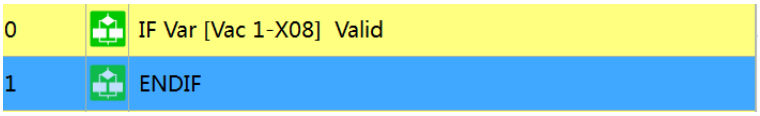
Click this 

button at the Expression row to select an available variable interface: **user variable, input, output, system variable, system I/O** (Same as selecting port). Selecting “NULL” at the Operator row means to determine whether the condition in the bracket [ ] is valid. Select then click the mathematical symbol, and the second box at the Expression row will be selectable, there are **User Constant, User Variable, System Variable can be selected and set.**



The screen is as below:





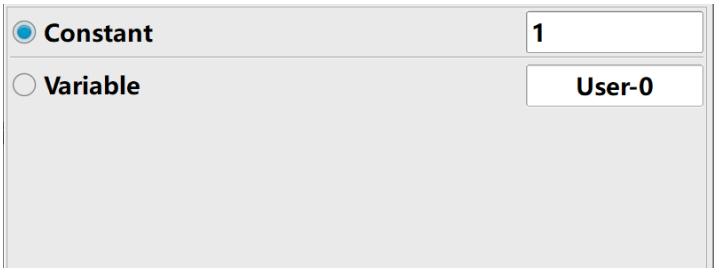
To set to do something when part suction is successful, you can add necessary actions between steps 9 and 10, which will only be executed when it has sucked the product. If no product is sucked, it will jump directly to the instruction right after the end command of the conditional loop.

FOR: Loop Control, **BREAK:** Loop Escape, **ENDFOR:** Loop end：Use them when there are some operations or instructions that have to execute repeatedly as shown below:

“FOR” Loop Instruction: The instruction of “”**FOR ( ) times**”” is repeat ( ) times, the value in the brackets can be constant or variable.

“Break” Loop Instruction:（Loop Break / Escape instruction）// Loop Break instruction work with the instruction of determination of condition, end the Loop if the set condition was satisfied.

Which includes in curly brackets { } is the content of the Loop instruction.



“Wait” instruction: The signal port is allowed to change and select at the box of the “Signal” row. **Signal invalid:** Determine whether to wait for a valid or invalid signal.

Timeout: It is the setting of waiting for overtime, input the value of “0” as infinitely waiting. The robot will alarm when the set time is due and the set time is more than “0”.

Wait for variable valid: Valid when the variable is “1” and invalid when it is “0”.

“Speed” instruction：It can adjust the speed of the servo axis. Usually works with conditional determined Instruction which is able to shift the speed of the selected servo axis when the condition is satisfied.

“Program End” instruction：End the program and return to the first instruction of the present program. Usually works with conditional determined instruction, stop the program when the set condition is satisfied.

“User Variable” instruction：For the “User Variable” execute the solo mathematical calculation.

“ + ” Plus - The User Variable plus the Operand then save the result as User Variable.

“X“ Multiply - Multiply the User Variable by the Operand then save the result as User Variable.

“ − ” Minus - Subtracts the Operand from User Variable then save the result as User Variable.

“÷” Divide – Divides the User Variable by the Operand then save the result as User Variable.

“ = ” Equal - Make the User Variable equal to the Operand.

“ % ” Remainder - Divide the User Variable by the Operand then save the remainder as the User Variable.

Remarks:

Instructions do not allow to exist in the combined instructions:

1. All the Conditional Instruction (includes IF, ELSE, ENDIF, FOR, BREAK and ENDFOR).

2. “Loop Subroutine” and “Single Loop” instructions.

3. “Wait” and “Program End” instructions.

4. Unable to activate the Subroutine.

5. “Matrix Subroutine” instruction.

6. Operand is unavailable.

7. Search and Delay instruction.

8. Allows only one "Absolute Servo Position" instruction for every single servo axis (X, Y, Z, A, B, C).

9. Unable to rotate the “Pneumatic Flipping Cylinder” more than 1 time.

10. The Sub Arm doesn’t allow to run horizontal and vertical twice each.

11. Not allows 2 Extended Output to control the same output object.

12. Not allows 2 Extended Input to control the same Input object.

13. Extended I/O (or EOAT tools) is unable to control the same Input / Output.

14. Can’t execute the mathematical calculation.

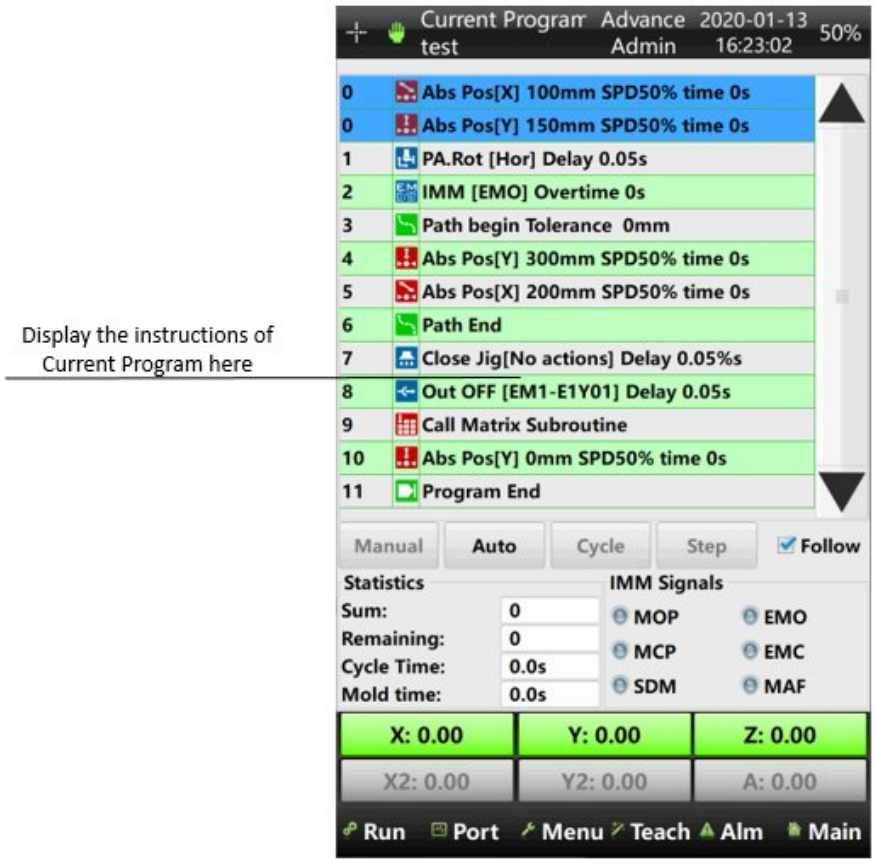
15. Can’t have 2 EMO (Enable Mold Open) in a same combination of instructions.

16. Surpassing 30 instructions running at the same time is not allowed.

“Interp” instruction: Servo axes synchronize. Allow to run or stop more than 1 servo axis in the same time.

7.3 Program Running

Click the “RUN” button at the left bottom of the screen and run the loaded program by Manual, Auto Running, Single Cycle, Single Step as shown below:



The program run screen is as follows:

1) Current program command list: Display the command list of current program loaded by the system.
2) Statistics: Display the related Statistical information in the Auto Running condition.
3) Sum: The number of products has been produced (picked up).
4) Remaining: The number of products that still need to produce according to the "Production Plan" of the “System Setup”.
5) Cycle Time：The time of one producing cycle when Auto Running mode.
6) Mould Time：It's the time that since the Mould Opened signal was received to the Enable Mould Close is given.
7) IMM Signals: Showing the signals came from IMM for customers to get the information.

EMO: Enable Mold Open

EMC: Enable Mold Close

MAF: Mold Area Free (Safety)

MOP: Mould Opened Position

MCP: Mould Closed Position

SDM: Safety Door or Devices

8) **Manual:** Manual mode. When the system is in the Auto Standby condition, clicking the “Manual” button can switch to Manual mode, however, when the system is in Auto Running mode, clicking the “Manual” button will stop Auto Running and transfer to Auto Standby.
9) **Auto:** Auto Running mode. Whether the system is in the Manual or Auto Standby condition, clicking the “Auto” button can switch to Auto Running mode.
10) **Cycle:** Single Cycle. In the Auto Standby condition, the program will run one cycle only and then stop.
11) **Step:** Single Step. In the Auto Standby condition, the program will run one step of present instruction only and then stop.
12) **Follow:** Select to follow. When the system is in automatic running mode, the program command list selection will change as per current program’s running status.

8. Alarm

8.1 Alarm Interface

When the robot alarm, the system will transfer to the alarm interface as shown below:

8.2 Alarm Information

Table 8-1: Alarm Information List

Code	Alarm Information	Solutions
[000]	No prompts or alarms.	
[001]	Invalid action of main arm.	Delete that instruction and add a new one. If it still alarms, please contact SHINI agent and salesman in the city, territory, or country where you are.
[002]	Invalid action of IMM.	Delete that instruction and add a new one. If it still alarms, please contact SHINI agent and salesman in the city, territory, or country where you are.
[003]	Invalid IF condition.	Delete that instruction and add a new one. If it still

		alarms, please contact SHINI agent and salesman in the city, territory, or country where you are.
[004]	Invalid system running type.	Delete that instruction and add a new one. If it still alarms, please contact SHINI agent and salesman in the city, territory, or country where you are.
[005]	Invalid system status.	Delete that instruction and add a new one. If it still alarms, please contact SHINI agent and salesman in the city, territory, or country where you are.
[006]	Invalid parameters of instruction.	Delete that instruction and add a new one. If it still alarms, please contact SHINI agent and salesman in the city, territory, or country where you are.
[007]	Invalid instruction.	Delete that instruction and add a new one. If it still alarms, please contact SHINI agent and salesman in the city, territory, or country where you are.
[008]	Extended styles	Delete that instruction and add a new one. If it still alarms, please contact SHINI agent and salesman in the city, territory, or country where you are.
[009]	Invalid program number.	Delete that instruction and add a new one. If it still alarms, please contact SHINI agent and salesman in the city, territory, or country where you are.
[010]	FOR instruction unpaired, no ENDFOR	Cycle start instruction in the program, there must be corresponding cycle start instruction. Check the program, and add corresponding end instructions or delete unnecessary start instructions.
[011]	FOR instruction unpaired, no FOR	Cycle start instruction in the program, there must be corresponding cycle start instruction. Check the program, and add corresponding end instructions or delete unnecessary start instructions.
[012]	IF instruction unpaired, no ENDIF	Cycle start instruction in the program, there must be corresponding cycle start instruction. Check the program, and add corresponding end instructions or delete unnecessary start instructions.
[013]	No end command in program	There must be an end instruction in the program.

		Check the current program and add a “Program End” (in the Action selection page) instruction to it.
[014]	More than 30 instructions in combine action.	Check the combined instructions of the program and remove some unnecessary instructions to make the number of combined instructions less than 30 lines.
[015]	Combination instruction format error, combination end is missing.	Only the “Combine Start” instruction within a set of combined instructions, but no “Combined End” instruction.
[016]	System variables are read-only that can’t be written.	The system variable is a read-only variable and cannot be re-write.
[017]	The user variable number exceeds the range, and valid numbers are within 0 ~ 255.	Check whether the User Variable exceeds the range from 0 to 255.
[018]	No IMM auto signal.	Check whether there’s a signal on the port monitor page of the controller. If there isn’t, check whether there’s DC 24V voltage at the two “AUTO terminals” of the “CN1 terminals block” on the mainboard. If it doesn’t have, then, check the wiring.
[019]	Safety door no signal.	Check if there’s a signal on the port monitor page of the controller. If there isn’t, check whether there’s the DC 24V voltage at the two “SDM terminals” of the “CN1 terminals block” on the mainboard. If it doesn’t have, then check the wiring.
[020]	Medium plate mould no signal.	Check if there is a signal on the port monitor page of the controller. If there isn’t, check whether the DC 0V voltage at the “MID terminals” of the “CN2 terminals block” on the mainboard. If it doesn’t have, then check the wiring.
[021]	The production plan has completed.	Planned production quantity is reached. Please check it.
[022]	The sum of rejects exceed standard.	Defective products quantity alarm, please check the mold.
[023]	System is not in manual mode, cannot change the current program。	Please switch to manual mode before modifying the program.

[024]	System in manual mode or error, cannot change the auto mode	Please handle and cancel the alarm then switch to auto-run mode.
[025]	System is error, cannot change the current mode.	Please handle and cancel the alarm then switch to Auto-Run mode.
[026]	System is running, cannot change the current mode.	Please handle and cancel the alarm then operate it again.
[027]	Forbid mould close when the vertical position of sub arm out of safety area.	Please check whether the vertical sub-arm is within the safe area. If it isn't, please move it to the safe area and then close the mould. If it is, check the sub-arm safety area signal where may have a problem and the proximity sensor.
[028]	Forbid mould close if vertical position of main arm out of safe area.	Please check whether the vertical main-arm is within the safe area. If it isn't, please move it to the safe area and then close the mould. If it is, check the main-arm vertical safety area signal.
[029]	The system setup do not allow rotate action inside mould.	Please operate the robot correctly. If it has to flip within the mold area, please allow “Rotate in mold” in the System Setup of Menu.
[030]	Cannot enter auto status when main arm home signal is not on.	Please manually move the main arm Y axis to a safe area or return to the Home position and then switch to Auto-Run mode.
[031]	Cannot enter auto status when sub arm home signal is not on.	Please manually move the robot arm to a safe area or return to the Home position and then switch to Auto-Run mode.
[032]	No program is loaded, please load the program.	Please click on the program name in the title bar to enter the program interface and create or load a program.
[033]	Expanded input signal missing.	Please check if there is a signal on the extended input port.
[034]	Current setting main arm cylinder must be vertical to go in auto mode.	Please check the main arm pneumatic flipping cylinder and rotate it to vertical or change the setting of "Rotate Status" on the "Run" branch page of the “System Setup” page.
[035]	Current setting main arm cylinder must be	Please check the main arm pneumatic flipping cylinder

	horizontal to go in auto mode.	and rotate it to vertical or change the setting of "Rotate Status" on the "Run" branch page of the “System Setup” page.
[036]	No servo homing operation (Start up without homing)	Please return to the Home position before further operating.
[037]	Z axis travelling is not safe, and the main arm is not in the upper position.	Please check if the main arm is within the safe area or not. If it isn’t, please move it to the safe area before traversing (Z axis). If it was, check the main arm safety area signal where may have a problem and the proximity sensor.
[038]	Z axis travelling is not safe, and the sub arm is not in the upper position.	Please check if the sub arm is within the safe area or not. If it isn’t, please move it to the safe area before traversing (Z axis). If it was, check the sub arm safety area signal where may have a problem and the proximity sensor.
[039]	Robot arm not in crosswise safety area, cannot execute the command	Robot horizontal (X axis) running exceeds the inside mould safety area.
[040]		
[041]	No “mould open” signal, forbid sub-arm vertical movement.	Check if the IMM’s mould opened to the position. If it was, check whether the DC 24V voltage at the two “MOP terminals” of the “CN1 terminals block” on the mainboard.
[042]	No “medium mould open” signal, forbid sub-arm vertical movement.	Check if the IMM’s middle mould opened to the position. If it was, check whether the DC 0V voltage at the “MID terminals” of “CN2 terminals block” on the mainboard.
[043]	No “mould open” signal, forbid main arm vertical movement.	Check if the IMM’s mould opened to the position. If it was, check whether the DC 24V voltage at the two “MOP terminals” of the “CN1 terminals block” on the mainboard.
[044]	No “medium mould open” signal, forbid main arm vertical movement.	Check if the IMM’s middle mould opened to the position. If it was, check whether the DC 0V voltage at the “MID terminals” of “CN2 terminals block” on the mainboard.

[045]	The vertical movement of main arm is not safe as the horizontal axis is not in safe area.	Confirm whether current position of traverse axis is in safe area before starting the vertical movement of sub arm.
[046]	The vertical movement of sub arm is not safe as the horizontal axis is not in safe area.	Confirm whether current position of traverse axis is in safe area before starting the vertical movement of sub arm.
[047]	The crosswise movement of main arm is not safe and the in mould exceeds the safe area.	Confirm whether current position of crosswise axis is in safe area.
[048]	During axis safety area setting, multiple axes moving is not allowed.	Not allow 2 or more axes moving at the same time when adjusting the servo safety area.
[049]	The Y axis servo of sub arm is not at the origin position, and the system can't enter automatic status.	Please check if the sub-arm is at the home position. If it isn't, manually move it to the home position then switch to auto-run mode. If it was, check the sub-arm's "ORG terminal" of the "SCN4" port on the mainboard and check if the signal is normal or not.
[050]	The system needs maintenance, please contact the manufacturer.	Please contact SHINI agent and salesman in your city, territory, or country, meanwhile, provide them with the product key and machine code to get the activate code of your ST3/5.
[051]		
[052]	System cannot go in auto mode without selecting current program.	Please click the "Current Program" at the upper left corner of the screen and load an existing program by clicking or create a new one by clicking "New". Load a program then switch to Auto Run mode.
[053]	Robot in auto mode, other command cannot be executed	Please stop the Auto Run mode then do the other operation.
[054]	System program command error.	Please contact SHINI agent and salesman in the city, territory, or country where you are.
[055]	System current program cannot be deleted.	Cannot delete the currently loaded program.
[056]	The safety door is open, and suspend the system auto running. Please check the	Please check whether the safety door signal is missing.

	system's relevant parameter settings.	
[057]	System working condition error.	Please contact the manufacturer.
[058]	When the main arm cylinder is horizontal, forbid the main arm descend inside the mould; Please check the system's relevant parameter settings.	Please enter system settings. After it sets the cylinder inside the mould to allowed, run it again.
[059]	Main arm crosswise stroke exceeds the software distance.	Current command exceeds the software stroke limit , please check the program.
[060]	The main arm vertical position exceeds the software stroke limit.	Current command exceeds the software stroke limit , please check the program.
[061]	The horizontal position exceeds the software stroke limit.	Current command exceeds the software stroke limit , please check the program.
[062]	The sub arm vertical position exceeds the software stroke limit.	Current command exceeds the software stroke limit , please check the program.
[063]	The sub arm crosswise position exceeds the software stroke limit.	Current command exceeds the software stroke limit , please check the program.
[064]	Extended axis position exceeds the software stroke limit.	Current command exceeds the software stroke limit , please check the program.
[065]	Traverse movement is within the safe area in mould, but the in mould signal is not on.	Please check if the inside the mould safety area proximity sensor of the traverse Z axis is malfunctioning or not. If it works normally, please check the servo safety area setting on the "Servo Setup" page to check if the area is within the signal sensing range.
[066]	Traverse movement is within the safe area in mould, but the in mould signal is not on.	Please check whether the outside of the mould safety area signal of the traverse Z axis is working normally. If it works normally, please check the servo safety area setting on the "Servo Setup" page to check if the area is within the signal sensing range.
[067]	Traverse axis not in safety area. Sub arm crosswise movement is not safe.	Please run the sub arm within the safety area of the traverse Z axis.
[068]	Traverse axis not in safety area, main arm	Please run the sub arm within the safety area of the

	crosswise movement is not safe.	traverse Z axis.
[069]	The main arm vertical movement is within standby safe area of upper unit, but no signal.	Please check whether there's a fault in the standby safety area signal of the main arm's Y axis. If it works normally, please check the servo safety area setting on the "Servo Setup" page to check if the area is within the signal sensing range.
[070]	The sub arm vertical movement is within standby safe area, but the standby signal is not on.	Please check whether the sub arm vertical axis home signal is normal. If it is, please check whether the vertical safety area setting range of sub arm is within sensed signal range.
[071]	The matrix positioning subroutine or cycle positioning subprogram index is invalid.	Delete the current program and create a new one and rewrite it. If the problem remains, please contact SHINI agent and salesman in the city, territory, or country where you are.
[072]	Invalid loop positioning points setting.	Please check whether the loop positioning setting is normal. If not, please contact the manufacturer.
[073]	The number of products produced automatically has reached the set value of reminding.	The production quantity has reached the set value of reminding.
[074]	In combination instructions, conditional instructions can't be embedded.	Instructions with the same condition cannot run simultaneously in a combination.
[075]	Main arm flip cylinder at horizontal position but horizontal position signal not on.	Check whether there's 0V input at the X1 port of CN1 on the IO board. If not, check the robot.
[076]	Main arm flip cylinder at horizontal position but vertical position signal not on.	Check the wiring at the X1 port of CN1 terminals on the IO board. If not, check the robot.
[077]	Main arm flip cylinder is vertical but vertical position signal not on.	Check the wiring at the X2 port of CN1 terminals on the IO board. If not, check the robot.
[078]	Main arm flip cylinder is vertical but horizontal position signal not on.	Check the wiring at the X2 port of CN1 terminals on the IO board. If not, check the robot.
[079]	Main arm crosswise axis servo alarm, please check the servo drive.	Check the alarm code of the crosswise servo drive.
[080]	The main arm crosswise axis has got no	Check the ready signal of the crosswise servo

	ready signal.	connecting the mainboard drive.
[081]	No crosswise axis servo positioning completion signal of main arm.	Check the crosswise servo positioning completion signal connecting the mainboard drive.
[082]	Main arm vertical servo axis alarm, please check the servo drive.	Check the alarm code shown on the main arm (vertical Y axis) servo driver and do troubleshooting.
[083]	Main arm vertical servo axis no on position signal.	Check the servo driver's ready signal between the mainboard and the main arm (vertical Y axis).
[084]	Waiting for mould open overtime.	The waiting time is due but it still no the "mould opened" signal. Please check if IMM has any problems. Or if the waiting time is not necessary then set the waiting time as 0 (no need to wait and alarm) to avoid the alarm.
[085]	Main arm traverse servo axis alarm, please check the servo drive.	Check the alarm code of the traverse arm (Z axis) servo driver and do troubleshooting.
[086]	Main arm traverse servo axis no on position signal.	Check the servo driver's ready signal between the mainboard and the traverse arm (Z axis) servo.
[087]		
[088]	Second arm vertical servo axis alarm, please check the servo drive.	Check the alarm code shown on the sub arm (vertical Y2 axis) servo driver and do troubleshooting.
[089]	Sub arm vertical servo axis no on signal.	Check the servo driver's ready signal between the mainboard and the sub arm (vertical Y2 axis).
[090]	Second arm vertical servo axis no on position signal.	Check the servo positioned signal connected the mainboard to the sub-arm (Y2 axis) servo driver.
[091]	Second arm crosswise servo axis alarm, please check the servo drive.	Check the alarm code shown on the sub-arm crosswise (X2 axis) servo driver and do troubleshooting.
[092]	Second arm crosswise servo axis not on position.	Check the servo ready signal connected the mainboard to the sub-arm crosswise (X2 axis) servo driver.
[093]	Second arm crosswise servo axis no on position signal.	Check the servo positioned signal that connected the mainboard to the sub-arm crosswise (X2 axis) servo driver.
[094]	Expanded servo axis alarm, please check	Check the alarm code shown on the extended axis

	the servo drive.	servo driver and do troubleshooting.
[095]	Expanded servo axis no on position.	Check the servo ready signal that connected the mainboard to the extended axis servo driver.
[096]	Expanded servo axis no on position signal.	Check the servo positioned signal that connected the mainboard to the extended axis servo driver.
[097]	IMM emergency stop, please check it.	If the emergency stop of IMM is not activated, check whether it has “DC 0V” at the “ESM” port of the “CN2 terminals block” on the mainboard. If it hasn't, then check the wiring.
[098]	Robot emergency stop, please check it.	Please check if the robot’s emergency stop button has been pressed. Make sure everything is OK and without worrying about safety concerns then release the emergency button to operate the robot.
[099]	Low air pressure, please check it.	If the pressure of the source of compressed air is normal, then check if it has “DC 0V” at the “X7 terminal” of the “CN3 terminals block” on the mainboard. If it doesn’t have, then check the wiring or compressed air tube.
[100]	Second arm in mould and down-going, but no “mould open” signal.	Please check whether the mould opened signal from IMM is consistently giving. It could be signal interrupted or disconnected.
[101]	Second arm in mould and down-going, but no “intermediate mould open” signal.	Please check whether the middle mould signal from IMM is giving consistently. It could be signal interrupted or disconnected.
[102]	Main arm in mould and down-going, but no “mould open” signal.	Please check whether the mold opened signal from IMM is consistently giving. It could be signal interrupted or disconnected.
[103]	Main arm in mould and down-going, but no “intermediate mold open” signal.	Please check whether the middle mould signal from IMM is giving consistently. It could be signal interrupted or disconnected.
[104]	Crosswise servo axis running to forward limit position.	Please check the servo axis position then do the reverse operation by “Adjustment” in the Menu.
[105]	Crosswise servo axis running to	Please check the servo axis position then do the

	backward limit position.	reverse operation by “Adjustment” in the Menu.
[106]	Vertical servo axis running to up limit.	Please check the servo axis position then do the reverse operation by “Adjustment” in the Menu.
[107]	Vertical servo axis running to down limit.	Please check the servo axis position then do the reverse operation by “Adjustment” in the Menu.
[108]	Traverse servo axis running to traverse out limit.	Please check the servo axis position then do the reverse operation by “Adjustment” in the Menu.
[109]	Traverse servo axis running to traverse in limit.	Please check the servo axis position then do the reverse operation by “Adjustment” in the Menu.
[110]	Second arm vertical servo axis running to down limit.	Please check the servo axis position then do the reverse operation by “Adjustment” in the Menu.
[111]	Second arm vertical servo axis running to up limit.	Please check the servo axis position then do the reverse operation by “Adjustment” in the Menu.
[112]	Second arm traverse servo axis running to traverse in limit.	Please check the servo axis position then do the reverse operation by “Adjustment” in the Menu.
[113]	Second arm traverse servo axis running to traverse out limit.	Please check the servo axis position then do the reverse operation by “Adjustment” in the Menu.
[114]	Expanded servo running to positive limit.	Please check the servo axis position then do the reverse operation by “Adjustment” in the Menu.
[115]	Expanded servo running to negative limit.	Please check the servo axis position then do the reverse operation by “Adjustment” in the Menu.
[116]	Main arm Y axis is in original position but signal is missing.	Please check whether the proximity sensor of the main arm (Y1 axis) works normally and whether it has signal input to the “ORG terminal” of the “SCN2 terminals block” on the mainboard.
[117]	Servo positioning over time, please check servo driver parameter.	Check the parameter setting of the servo driver.
[118]	Servo position moving index invalid.	Delete the program and re-teach. If it can’t, please contact the manufacturer.
[119]	IO extension 1 communication error	Please check if the communication cable between the IO board and mainboard is OK or not. If it’s OK, find out what goes wrong with the IO board by exchanging a different connecting port and testing.
[120]	IO extension 2 communication error.	Please check if the communication cable between the

		IO board and mainboard is OK or not. If it's OK, find out what goes wrong with the IO board by exchanging a different connecting port and testing.
[121]	IO extension 3 communication error.	Please check if the communication cable between the IO board and mainboard is OK or not. If it's OK, find out what goes wrong with the IO board by exchanging a different connecting port and testing.
[122]	IO extension 4 communication error.	Please check if the communication cable between the IO board and mainboard is OK or not. If it's OK, find out what goes wrong with the IO board by exchanging a different connecting port and testing.
[123]	Arm cannot go down without out mould safety signal.	Please check the "outside mould safety" sensor is working or not. If it's working well, then check if it has DC 0V input at the "X13 terminal" of the "CN3" terminals block on the mainboard. If it doesn't, please check the wiring.
[124]	Main arm cylinder is vertical, robot can't moving horizontally	Allow it by checking the "Rotate in mould" on the "Run" branch page of the "System Setup" that you can find on "Menu" in the controller if you want.
[125]	Second arm is not in mould X axis safety area, can't proceed.	Please check the safety area setting on the "Servo Setup" that you can find on the "Menu" page in the controller.
[126]	Second arm X axis position is over the safety area in mould.	Please check the safety area setting on the "Servo Setup" that you can find on the "Menu" page in the controller.
[127]	Second arm Y axis is in original position but signal is missing.	Please check whether the proximity sensor of the main arm (Y2 axis) works normally and whether it has signal input to the "ORG terminal" of the "SCN4 terminals block" on the mainboard.
[128]	IMM mould open signal detected , but intermediate plate signal is missing.	Please check the present condition of IMM, then check whether it has "DC 0V" at the "MID terminal" of the "CN2 terminals block" on the mainboard. If it doesn't have, please check the wiring.
[129]	System in auto mode but IMM auto signal	Please check whether it has "DC 24V" at the two

	is missing.	“AUTO terminals” of the “CN1 terminals block” on the mainboard. If it doesn’t have, please check the wiring.
[130]	Position conflict between main arm and second arm.	Please check the program then make sure the horizontal position and interval of the main arm and sub-arm are safe.
[131]	Only enable mould close can be in combination.	
[132]	Arm in mould without mould open signal (out the mould)	Please check the present condition of IMM then check whether it has DC 24V at the two “MOP terminals” of the “CN1 terminals block” on the mainboard. If it doesn’t have, then check the wiring.
[133]	Arm in mould without intermediate plate signal (out of mould standby).	Please check the present condition of IMM then check whether it has DC 0V at the two “MID terminals” of the “CN2 terminals block” on the mainboard. If it doesn’t have, then check the wiring.
[134]	Without mould open signal Z axis is not safe to moving in mould (out mould)	Please check the present condition of IMM then check whether it has DC 24V at the two “MOP terminals” of the “CN1 terminals block” on the mainboard. If it doesn’t have, then check the wiring.
[135]	Without intermediate plate signal Z axis is not safe to moving in mold (out mould).	Please check the present condition of IMM then check whether it has DC 0V at the two “MID terminals” of the “CN2 terminals block” on the mainboard. If it doesn’t have, then check the wiring.
[136]	Invalid second arm operation.	Delete the current program and create a new one and rewrite it. If the problem remains, please contact SHINI agent and salesman in the city, territory, or country where you are.
[137]	Sub-arm down-going, but no signal.	Please check if the pneumatic sub-arm is set to be used and if it’s in running condition. Then check if it has DC 0V input at the “X14 terminal” of the “1 terminals block” on the "I/O board 1". If it doesn’t have, please check the wiring.
[138]	Sub-arm down-going, but with up-going signal.	Please check if the pneumatic sub-arm is set to be used and if it’s in running condition. Then check the

		wiring as well.
[139]	Sub-arm up-going, but no signal.	Please check if the pneumatic sub-arm is set to be used and if it's in running condition. Then check if it has DC 0V input at the "X13 terminal" of the "1 terminals block" on the "I/O board 1". If it doesn't have, please check the wiring.
[140]	Sub-arm up-going, but with down-going signal.	Please check if the pneumatic sub-arm is set to be used and if it's in running condition. Then check the wiring as well.
[141]	Sub arm goes down not in taking position or placing position.	Please confirm current positiono of the robot. The arm can move down only when it is within the safety area.
[142]	No mould open signal of sub arm, and going-down not safe.	Please check the present condition of IMM and check whether it has DC 24V at the two "MOP terminals" of the "CN1 terminals block" on the mainboard. If it doesn't have, then check the wiring and if the Mould Open Position" signal had been interrupted or disconnected.
[143]	No mid plate mould signal in the mould, sub-arm going down not safe.	Please check the present condition of IMM and check whether it has DC 0V at the two "MID terminals" of the "CN2 terminals block" on the mainboard. If it doesn't have, then check the wiring and if the signal had been interrupted or disconnected.
[144]	Sub arm is in the mould without mould open intermediate signal.	Check the middle mould signal of IMM.
[145]	Main arm is in the mould without mould open intermediate signal.	Check the middle mould signal of IMM.
[146]	Too many continuous paths.	The number of "Path" instructions in the program exceeds the system limit.
[147]	Continuous paths across regions may be unsafe.	The path crosses the region.
[148]	Arm continuously going down without mould open signal, maybe safe.	Without the "Mould Opened" signal, it's not safe to allow the robot arm to move down within the mold area.
[149]	Arm continuously going down without	Without the "Mould Opened" signal, it's not safe to

	intermediate plate signal.	allow the robot arm to move down within the mold area.
[150]	No path ending	Please check the program, there must be a corresponding path end instruction at the beginning of a continuous path.
[151]	Invalid activated code.	Please contact SHINI agent and salesman in the city, territory, or country where you are.
[152]	JOG mode can only be switched to manual mode.	Please contact SHINI agent and salesman in the city, territory, or country where you are.
[153]	Valid activated code	Just a system reminder, click to cancel the alarm.
[154]	Cannot use waiting mould open in path.	Can't put the "Wait MOP" (wait for mold open) instruction into the "Path" programming.
[155]	In mould safety and out mould safety are both on.	Please check the current position and situation of robot arm. Then check if it has signal on the "ORG terminal" and "X8 terminal" of "CN3 terminals block" on the main board and wiring.
[156]	Variable manupilation cannot be 0.	The manipulation of the Variable cannot be "0".
[157]	Activated code expired.	Please contact SHINI agent and salesman in the city, territory, or country where you are.
[158]	It is not safe for the arm to go down. The X axis is not in the safe area of the mould.	It is not safe for the arm to go down. X axis is not in the inside mold safety area.
[159]	It is not safe for the arm to go down. The B axis is not in the safe area of the mould.	It is not safe for the arm to go down. B axis is not in the inside mold safety area.
[160]	It is not safe for the arm to go down, and the A-axis is not in the safe area of the mould.	It is not safe for the arm to go down. A axis is not in the inside mold safety area.
[162]	The sub arm is penumatically introduced but the photosensor signal is not on.	Check the air pressure between the valve body and the cylinder, check if the mechanism is stuck, and check if the induction sensor is loose.
[163]	The sub arm is penumatically introduced but the photosensor signal is on.	Check the air pressure between the valve body and the cylinder, check if the mechanism is stuck, and check if the induction sensor is loose.

[164]	The sub arm is penumatically retracted but the photosensor signal is not on.	Check the air pressure between the valve body and the cylinder, check if the mechanism is stuck, and check if the induction sensor is loose.
[165]	The sub arm is penumatically retracted but the photosensor signal is on.	Check the air pressure between the valve body and the cylinder, check if the mechanism is stuck, and check if the induction sensor is loose.
[166]	Communication error of expansion IO board 5.	Please check the communication cable between the IO board and the mainboard. If it is OK, find out what goes wrong with the IO board by exchanging different ports.
[167]	Axis B is not in the safe area of the mold, and the arm is not safe to go down.。	Check the B axis safety area settings and parameters are proper for the current situation or not.
[168]	The C axis is not in the safe area of the mold, and the arm is not safe to go down.	Check the C axis safety area settings and parameters are proper for the current situation or not.
[169]	The Y axis is not in the upper position, arm rotation is not safe.	Check the Y axis upper position proximity sensor is on and its wiring.
[170]	The Y axis is not in the upper position, arm rotation is not safe.	Check if the Y-axis upper safety switch is on and check the wiring of the upper switch circuit.
[171]	The C axis is not in the safe position, and it is not safe for arms to traverse.	Check if the C-axis upper safety switch is on, check the connection of the upper switch circuit, and check the C-axis safety area settings.
[172]	The arm rotation is not safe and cannot exceed the safe area in the mould.	Check the arm flipping/rotating axis safety area settings and parameters.
[173]	The arm rotation is not safe and cannot exceed the safety area in the mould.	Check the arm flipping/rotating axis safety area settings and parameters.
[174]	The C-axis position exceeds the software stroke.	Check the C-axis software travel settings.
[175]	B axis position exceeds software software.	Check the B-axis software travel settings.
[176]	Axis B is not in the safe area, arm traverse is not safe.	Check if the B-axis upper safety switch is on, check the connection of the upper switch circuit, and check the B-axis safety area settings.
[177]	Axis A is not in safe area, arm crossing is not safe.	Check if the B-axis upper safety switch is on, check the connection of the upper switch circuit, and check

		the B-axis safety area settings.
[178]	The axis A is not safe to operate and cannot exceed the safety area in the mould.	Check the A axis safety area settings.
[179]	The X-axis is not in the safe area, and the arms are not safe to cross.	Check the X axis safety area settings.
[180]	The sub arm penumatically rotates in horizontal, but the photosensor is not on.	Check the air pressure between the valve body and the cylinder, check if the mechanism is stuck, and check if the induction sensor is loose.
[181]	The sub arm penumatically rotates in horizontal, but the vertical photosensor is on.	Check and see if the horizontal and vertical sensors of the pneumatic flipping cylinder are connected reversely.
[182]	The sub arm rotates in vertical, but the photosensor is not on.	Check the air pressure from the valve body to the cylinder, check if the mechanism is stuck, and check if the induction sensor is loose.
[183]	The sub arm rotates in vertical, but the horizontal photosensor is on.	Check and see if the horizontal and vertical sensors of pneumatic flipping cylinder connected reversely.
[184]	Absolute value encoder not supported for X axis.	Check if it is the non absolute value servo or if absolute value is not selected.
[185]	Absolute value encoder not supported for Y axis.	Check if it is the non absolute value servo or if absolute value is not selected.
[186]	Absolute value encoder not supported for Z axis.	Check if it is the non absolute value servo or if absolute value is not selected.
[187]	Absolute value encoder not supported for axis C.	Check if it is the non absolute value servo or if absolute value is not selected.
[188]	Absolute value encoder not supported for axis B.	Check if it is the non absolute value servo or if absolute value is not selected.
[189]	Absolute value encoder not supported for axis A.	Check if it is the non absolute value servo or if absolute value is not selected.
[190]	X axis absolute value encoder communication error.	Check the cables between the servo drive and the main control board, and ensure that the communication parameter settings are correct.
[191]	Communication error of Y-axis absolute value encoder.	Check the cables between the servo drive and the main control board, and ensure that the

		communication parameter settings are correct.
[192]	Communication error of Z-axis absolute value encoder.	Check the cables between the servo drive and the main control board, and ensure that the communication parameter settings are correct.
[193]	Communication error of absolute value encoder of axis C.	Check the cables between the servo drive and the main control board, and ensure that the communication parameter settings are correct.
[194]	Communication error of absolute value encoder of axis B.	Check the cables between the servo drive and the main control board, and ensure that the communication parameter settings are correct.
[195]	Communication error of absolute value of encoder of axis A.	Check the cables between the servo drive and the main control board, and ensure that the communication parameter settings are correct.
[196]	Oil filling alarm.	Check if the greasing feedback signal was received or not.
[197]	External safety door opening is suspended.	Check if the external safety door signal was been interrupted or disconnected.
[199]	There is overlap between the safety zone inside and outside the Z-axis die.	The system was run to a certain position but the robot wasn't actually there. Can reset the safety area smaller than before or set the distance or inside mould and outside mould proximity sensor longer then it was before.
[208]	System software is not authorized legally! Pirated software will affect the security and stability of the system. www. sinobot. Com. cn. http://www.shini.com/	Please contact SHINI agent and salesman in the city, territory, or country where you are.
[209]	The traverse is not safe, and the X-axis is not in the safe area of the mould.	Check X axis inside the mould safety area setting.
[210]	Not outside the mould, the rotation level is not safe.	Check the inside mould area main arm pneumatic flipping cylinder setting.
[211]	Battery power down.	Check the mercury battery on the mainboard.
[212]	System power down.	Check the voltage of power input.
[213]	X axis absolute value encoder battery	Check if the encoder battery voltage is normal or not,

	voltage voltage is low.	and check if the wiring correct or not.
[214]	The battery voltage of Y-axis absolute encoder is low.	1.Check the voltage of absolute encoder's battery. 2. Check the wiring is correct or not.
[215]	The battery voltage of Z-axis absolute encoder is low.	1.Check the voltage of absolute encoder's battery. 2.Check the wiring is correct or not.
[216]	The battery voltage of C-axis absolute encoder is low.	1.Check the voltage of absolute encoder's battery. 2.Check the wiring is correct or not.
[217]	The battery voltage of B-axis absolute encoder is low.	1.Check the voltage of absolute encoder's battery. 2.Check the wiring is correct or not.
[218]	The battery voltage of A-axis absolute encoder is low.	1.Check the voltage of absolute encoder's battery. 2.Check the wiring is correct or not.
[220]	The C-axis is not safe and cannot exceed the safety zone when traversing (the traversing is not currently in the safety zone).	Check the settings and parameters of the C axis inside mold and outside mold safety area.
[221]	The B-axis is not safe and can't exceed the safety zone when traversing (the traversing is not currently in the safety zone).	Check the settings and parameters of B axis inside mold and outside mold safety area.
[222]	The A-axis is not safe and can't exceed the safety zone when traversing (the traversing is not currently in the safety zone).	Check the settings and parameters of A axis inside mold and outside mold safety area.
[223]	The X-axis is not safe and cannot exceed the safety zone when traversing (the traversing is not currently in the safety zone).	Check the settings and parameters of X axis inside mould and outside mould safety area.
[255]	System communication error: Controller can't communicate with mainboard,	Check the communication cable that connects the controller and the mainboard.Then, check whether the

	please turn of the system and check the connection.	system software version matches the mainboard.
[300]	Can’t find the file system!	Please contact the manufacturer!
[304]	File system initialization error!	Please contact the manufacturer!

9. Drive Alarm Message and Troubleshooting

Code	Meaning	Faults	Solutions
Err 1	Over-speed	When connecting the power supply, it prompts: 1）Circuit fault inside the servo 2）Motor fault	When this fault occurs, check whether the motor encoder cable has good contact at first. If there are new servos or other servos in the machine, it can verify by exchanging. It's probable the motor fault if there's still the failure after replacing the servo.
		In the motor running, it prompts: 1）The input pulse frequency is too high, the acceleration and deceleration time is too short, and the electronic gear ratio is too large. 2) Encoder fault	1) Check the pulse frequency, increase the acceleration and deceleration time, and check if the electronic gear ratio of PA-12.PA-13 is reasonable. 2) Check whether the encoder connection wire is in good contact, replace the encoder wire, replace the servo motor, and check whether related parameters are set properly, such as PA-6 and PA-63 for overshoot.
		When motor starts, it prompts: 1) Large load inertia, and motor encoder zero error. 2）Motor U V W phase lead error, and motor encoder wiring fault.	1）Check whether the load inertia ratio is overshoot, such as (PA-5 PA-6 PA-9 PA-63) and other parameters. 2）Check whether the leads of the motor power cable in phase U V W are sequenced correctly, and it can exchange the positions of U, V, and W phases one by one. Check whether the motor encoder wire connection and sequence are correct. If there's still the problem, it needs to be returned to the factory for repair.
Err 2	Main circuit over-voltage	When connecting the power supply, it prompts: Too high input power voltage and unstable.	Check whether the municipal input power voltage is too high. It can use a multi-meter to measure the AC 750V voltage and check whether the measured voltage fluctuations are normal. For example: The measured voltage is 220V-230V-235V, and it indicates that external network voltage is extremely unstable. Turn on

			the P-UDC in servo db mode to monitor (i.e. 220X1.414=311V, 380V drive is the same as 380X1.414=537V).If the P-UDC value is not within the normal range or exceeds 400V during P-UDC running (380V driver P-UDC exceeds 800V), it will result in the servo inner voltage increase gradually and generate an alarm. If the voltage is from a single phase of three-phase 380V in the control box, it can measure the voltage of the other two phases. Take the phase with the lowest measured voltage as the servo input voltage.
		In the motor running, it prompts: The brake circuit capacity is insufficient, the brake resistor is burnt out, and the servo inner circuit fault.	Check whether the brake resistor has burned out, and replace it with a higher power brake resistor, such as (25Ω, 2000W - 30Ω, 2000W), and it is generally determined as per the on-site load inertia. If it still can't be used after replacement, it's possible that the fault of servo inner resistance. It's recommended to return it to the factory for repair.
Err 3	Main circuit under- voltage	When connecting the power supply, it prompts: 1) Input voltage is too 2) Temporary power failure above 20MS.	Check the servo input power voltage, and it can use a AC 750V multi-meter to measure and check whether the voltage is normal. The municipal power is generally around 210-225V. It's suggested to install the isolation transformer and AC filters. If there's still problem after ascertain above issues, it is possible the fault of servo inner circuit, and it's suggested to return it to the factory for repair.
		During motor running, it prompts: 1) Insufficient power capacity. 2)Radiator overheat;	Check the power supply, such as whether it has been converted by a transformer, and whether the transformer power is sufficient. Insufficient driver power results in radiator overheat.
Err 4	Position deviation	When connecting to the power supply, it prompts: 1) Encoder zero offset.	Readjust the encoder zero point, and if the problem persists, replace the servo motor and driver.

		2) Encoder fault. 3) Circuit board fault.	
		In the motor running, it prompts: 1)The detection range of the set position deviation is too small. 2)Position ratio gain is too small. 3) Insufficient torque. 4) Pulse command too high frequency.	Position out of tolerance inspection range. Check whether the parameters of PA-17 (position deviation inspection range) are set too low. Check whether the parameter of PA-9 (position loop ratio gain) is set too low. If these two parameters are too low, it's necessary to increase the parameter settings for PA-9 and PA-17. Check the load inertia ratio PA-63 can slightly increase this parameter. Check whether the frequency of input pulse command is too high, and reduce the pulse command frequency. Readjust the encoder zero point. If the above faults are resolved and the problem still persists, it's recommended to return to the factory for repair.
Err 5	Overheat	In the motor running, it prompts: 1) Too high drive temp. 2) Circuit board fault.	Check whether the drive temperature is too high and if the fan on the servo is working. Install a cooling and exhaust fan in the control cabinet. If the above checks are correct, it is possible the fault of drive inner circuit, and it's recommended to return it to the factory for repair.
Err 6	Speed amplifier saturation failure	In the motor running, it prompts: 1) Large motor load. 2) The motor is mechanically stuck.	Firstly, reduce the load. If the load has exceeded the drive output power, check whether there is any jamming of motor in the mechanical part. If the above is correct, replace the servo driver and motor with a higher power one.
Err 7	Drive inhibit abnormal	CCW/CW drive inhibit input terminals all break	Check the connection wires of CCW/CW, and they may be loose or disconnected.
Err 8	Position deviation	The motor is mechanically stuck. Abnormal pulse command input.	Check whether there is any jamming of the servo motor in the load's mechanical part.

	counter overflow		Check whether there is interference in the pulse input command, the ground wire is connected properly, and whether the CN1 signal wire of input terminal has a shielding layer. Open the P-CPO in db mode and monitor the current location information. If the numerical difference is too large, there's a possibility of external interference, and it's important to check whether the contact of each ground wire is good.
Err 11	IPM modular fault	When connecting to the power, it prompts: Circuit board fault.	If this alarm occurs after the servo is powered on, it is likely that there is a malfunction inside the servo circuit. It's recommended to return it to the factory for repair.
		In the motor running, it prompts: 1) Low power voltage. 2) Overheat 3) Short circuit between drive U V W phases. 4) Poor grounding. 5) Motor insulation broken. 6) Affected by the influence.	Firstly, check whether the power voltage is normal. It can use an AC 750V multi-meter to measure the servo's power voltage and check whether if it is within a normal range (such as whether 220V power supply is 220V, whether 308V power supply is 380V, etc.). Check whether the motor U V W phase is disconnected or if the terminals are loose without good contact, or if there is the short circuit between the three-phase. Check whether the output port at motor end leads is in contact with the motor housing. Check whether the earth wire is properly grounded. Consider the external interference, it's recommended to add a wire filter or isolation transformer. The signal wire should be separated from the power wire and kept away from interference sources, such as high-power frequency converters. If there's still the problem after above troubleshooting, it's recommended to return to the factory for repair.
Err 13	Overload	When connecting to the power, it	Solution: If this alarm occurs after the servo is

		prompts: Circuit board fault.	powered on, it is likely that there is a fault inside the servo circuit. It's recommended to return to the factory for repair.
		In the motor running, it prompts:1. Running beyond rated torque. 2. Holding brake is open or not. 3. Motor unstable oscillation. There is one phase in 4 U V W phases disconnected. 4. Encoder connection error.	Solution: First, check the holding brake (that is, whether the motor brake is open and whether the wiring is correct.). Check if the loading amount has exceeded the output power of the drive itself, reduce the start stop frequency, and increase the parameters of PA-5, PA-9, and PA-63.（If the fault becomes more obvious after increasing the load, it is likely that the load is over. It's suggested to replace the servo drive and servo motor with higher power or reduce the load）to reduce the acceleration and deceleration time. Check whether the connecting wires of motor phase U V W are loose or disconnected, and check from the motor end to the input port of drive phases U V W one by one. Check whether the motor encoder cable is in good contact. If there's still the problem after above troubleshooting, it's suggested to return to the factory for repair.
Err 14	Braking fault	When connecting to the power, it prompts: brake circuit fault.	It's probably that the customer didn't plug in the brake terminal on the servo drive. If the problem still can't be solved by plugging it in, then there is a problem inside the servo circuit, and it's recommended to return to the factory for repair.
Err 15	Encoder counting fault	In the motor running, it prompts: 1）Encoder broken. 2）The number of encoder wires is incorrect. 3）Encoder connecting wire	Firstly, check whether the earth wire is in good contact and properly grounded. Also, check whether the shielding layer inside the encoder wire is welded to the iron shell on the terminal. If conditions permit, it can replace it with an encoder cable for testing, or exchange the drive to check whether the problem still exists. If the

		error. 4）Poor grounding. Encoder has false Z signal.	problem is with the motor, replace the motor; if it is with the drive, replace the drive.
Err 18	Relay switch fault	When connecting to the power, it prompts: 1. Relay damage	If this alarm occurs after the servo is powered on, it is likely that there is a fault inside the servo circuit. It is suggested to return it to the factory for repair.
Err 19	Brake not open after set delay time	The PA-94 parameter is set too large, and the brake doesn't open when the control pulse arrives.	Check parameter PA-94 and reduce this parameter value.
Err 20	EEPROM error	Servo inner circuit fault.	It needs to replace the drive, and it's suggested to return it to the factory for repair.
Err 21	FPGA Module fault	Servo inner circuit fault.	It needs to replace the drive, and it's suggested to return it to the factory for repair.
Err 23	Current acquisition circuit fault	Servo inner circuit fault.	It needs to replace the drive, and it's suggested to return it to the factory for repair.
Err 29	User torque overload alarm	The PA-30, PA-31 parameters are set inappropriate.	It's necessary to modify these two parameters properly and check whether there is a over load in the mechanical part that exceeds the output capacity of the driver itself.
Err 30	Encoder Z pulse loss	1) Z pulse doesn't exist, encoder is broken. 2) Poor cable connection. 3) Encoder interface circuit fault.	Firstly, check whether the encoder cable is in good contact and whether the shielding layer of the encoder cable is properly grounded. If necessary, replace the encoder cable and try it out. If there's still the problem after above troubleshooting, it's suggested to replace the encoder or return to the factory for repair.
Err 31	Encoder UVW signal error	Encoder UVW signal damaged. Poor cable connection. Encoder Z signal damaged	Firstly, check whether the encoder cable is in good contact and whether the shielding layer of the encoder cable is properly grounded. If necessary, replace the encoder cable and try it

		Encoder interface circuit fault.	out. If there's still the problem after above troubleshooting, it's suggested to replace the encoder or return to the factory for repair.
Err 32	Encoder UVW abnormal signal encoding	Encoder UVW signal damaged. Poor cable connection. Encoder Z signal damaged Encoder interface circuit fault.	Firstly, check whether the encoder cable is in good contact and whether the shielding layer of the encoder cable is properly grounded. If necessary, replace the encoder cable and try it out. If there's still the problem after above troubleshooting, it's suggested to replace the encoder or return to the factory for repair.
Err 33	Wire-saving encoder alarm	It is resulted in the parameter of PA-62 (encoder selection) is set incorrectly.	
Err 34	UVW signal unstable	VW signal unstable	Firstly, check the motor power wire for good contact and whether there is disconnection or looseness. Check whether the feedback of encoder cable UVW signal has good contact. If conditions permit, it can try to replace the power wire or encoder wire. If there's still the problem after above troubleshooting, it's suggested to return to the factory for repair.
Err 36	Abnormal state too long when using wire-saving encoder	Abnormal state too long when using wire-saving encoder.	Firstly, check whether the encoder cable is too long, as it may interfere the signal and encoder signal attenuation. It's suggested to shorten the length of the encoder line and keep away from interference sources, etc. Such as away from the frequency converters, high-frequency lasers, and other equipment.
Err 38	Read and written encoder EEPROM comm. failure	Read and written encoder EEPROM comm. failure	Firstly, check whether the encoder cable is in good contact and if there is any disconnection or looseness. If necessary, replace the encoder cable for testing. If there's still the problem, it's suggested to return to the factory for repair.
Err 39	Motor no	Motor no written parameters	If the alarm reports 39 as soon as it is powered

	written parameters		on, it needs to change the parameter PA-98 to 0, then power off and restart. After restarting, change PA-0 to 385. After confirmation, return to PA-1 and select the motor model (if the motor model is 80-02430). First, select 80, press the SET key to confirm the entry, select 02430, long press the SET key, wait for the number flashing, and then power off and restart.
Err 40	Model not supported	Model not supported	The drive doesn't support this model and it needs to be returned to the factory to match the motor and drive.
Err 41	Need to switch the motor model	Need to switch the motor model	(For example, if the motor model on site is 80-02430), first change PA-0 to 385, then press the SET key twice to return and find PA-1. Press the SET key to enter and find 80. Press the SET key again to enter the next step and find 02430. Then, long press the SET key and wait for the number flashing a few times before releasing it. Power off and restart the servo.
Err 42	AC low input voltage	When running at power OFF state, it prompts: 1) Normal 2)External AC voltage input is too low	Check the servo input power voltage, and it can use an AC 750V multi-meter to measure and check whether the voltage is normal. The municipal power is generally around 210-225V. If the fluctuation is significant, it may be influenced by other devices and unstable voltage of the external network. It's suggested to install the isolation transformer and AC filters. If there's still problem after ascertain above issues, it is possible the fault of servo inner circuit, and it's suggested to return it to the factory for repair.
Err 44	Phase shortage	Phase shortage	Change parameter PA-56 to 1.
Err 47	Too high main circuit voltage when switching on	Fault analysis: External AC voltage input is too high.	Check the servo input power voltage, and it can use an AC 750V multi-meter to measure and check whether the voltage is normal. The municipal power is generally around (210-225V).

		Main circuit fault.	If the fluctuation is significant, it may be influenced by other devices and unstable voltage of the external network. It's suggested to install the isolation transformer and AC filters. If there's still problem after ascertain above issues, it is possible the fault of servo inner circuit, and it's suggested to return it to the factory for repair.
Err 50	Encoder comm. fault	No comm. connected between the drive and encoder.	Check whether the encoder cable is connected properly and if the terminals are loose or disconnected. If necessary, replace the encoder cable and try again. After confirming that there are no errors, power on again. If there's still the problem after above troubleshooting, it's suggested to replace the encoder or return to the factory for repair.
Err 51	Encoder comm. error	After the encoder comm. is connected, there is an interruption and disconnection.	Check whether the encoder cable is connected properly and if the terminals are loose or disconnected. If necessary, replace the encoder cable and try again. After confirming that there are no errors, power on again. If there's still the problem after above troubleshooting, it's suggested to replace the encoder or return to the factory for repair.
Err 52	Encoder battery voltage is low	Alarm for insufficient encoder battery voltage, the information is not lost but it needs to be replaced ASAP.	Replace with a new battery.
Err 53	Encoder battery voltage error alarm	Alarm for wrong encoder battery voltage, the saved information is wrong, and it needs to reset the encoder.	It can clear this alarm, change parameter PA-63 to 1, and then power off and restart. If there's still the problem after powering off and restart, it's suggested to replace the battery as soon as possible.
Err 54	Encoder error	Encoder non-battery alarm, but it	Reset the encoder (power off and restart the

	alarm	needs to reset the encoder.	servo drive).
Err 55	CRC verification error for 5 consecutive times	The CRC validation of the data received by the encoder has been wrong for 5 consecutive times.	Firstly, check whether the encoder cable is in good contact and if the terminals of the encoder cable are firmly inserted. It's suggested to replace it with another encoder wire for testing or exchange the drive for testing. If there's still the problem with the motor, there's may be a problem with the motor encoder, and it needs to be returned to the factory for repair.
Err 56	Too long MODBUS frame error	Fault analysis: Communication protocol mismatch, Affected by external interference.	First, confirm whether the ground wire is in good contact and ensure that the ground wire is properly grounded. Check whether the parameters are set correctly, such as (PA-71-MODBUS address, PA-72-MODBUS comm. baud rate, PA-73-MODBUS communication protocol selection). Check whethre the MODBUS network cable is relatively close to the interference source and it should be connected independently in a cable slot alone (such as the inverter power wire, and the serve motor power wire). Confirm the MODBUS frame length. If there's still the problem after troubleshooting, it's suggested to return to the factory for repair.
Err 57	MODBUS comm. format error	Fault analysis: The comm. parameters are set improper. The comm. address or value is Incorrect.	Firstly, check whether the comm. address parameters are set correctly, such as (PA-71-MODBUS address, PA-72-MODBUS comm. baud rate, PA-73-MODBUS comm. protocol selection). Check whether the network cable is in good condition and try to replace it with a new one. If there's still the problem after troubleshooting, it's suggested to return to the factory for repair.

Err 58	Single-loop position value error	The single-loop position offset saved by the driver exceeds the encoder resolution.	Power off and restart the servo drive.
Err 59	Encoder alarms for CF error	Encoder alarms for CF or errors continuously.	Reset the encoder (power off and restart the servo drive).

10. Absolute Encoder

10.1 Servo motor settings

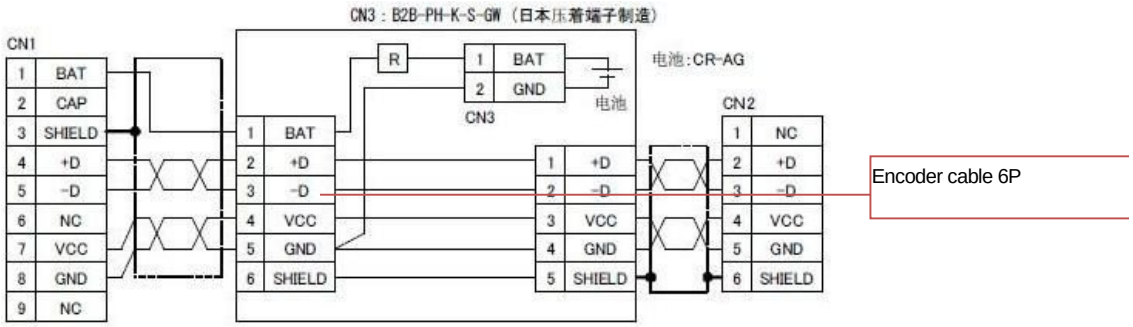
This chapter is about changing the servo parameter, set as absolute encoder system. Switch to RS-485 then set servo connection address, the control system and cable. The HCFA Servo:

Set connection address of P4.0 and the range is "1-32"， The original preselected Default value 1. If here the setting is 1, the address in encoder should be 1 as well. The address should also be set to 1. For the same upper unit control system, the address of absolute encoder cannot be the same for different servos.

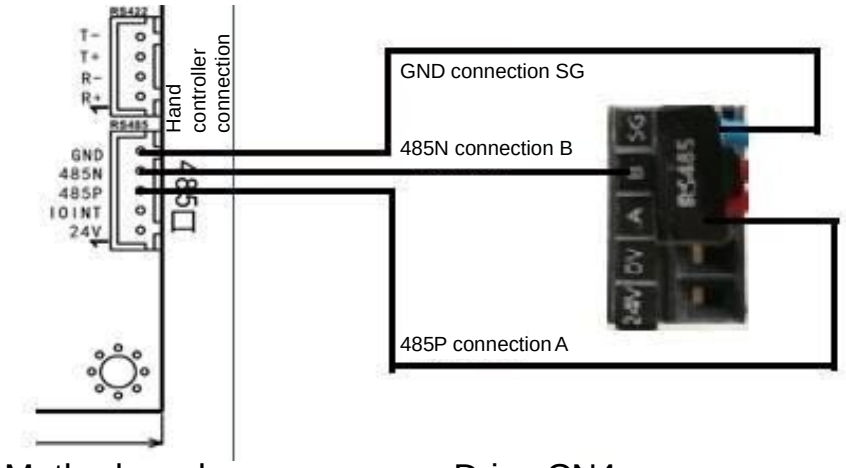
P8.0 set as 1，select the RS-485 non-same time communication

P257.0 set as 1，change to the absolute encoder system.

HCFA Servo 6P Encoder Battery Diagram



HCFA Servo 485 Connection Diagram



Motherboard Drive CN4

Changing the battery:

When the battery power is low, the『low power alarm』appears.

At this time, it's necessary to exchange the battery. Turn on the servo drive control power (24V) before exchanging the battery. If it is processed under the control power (24V) is turned off, lots of data will be lost, mechanical origin should be reset again.

Note: the polarity of the battery must correct.

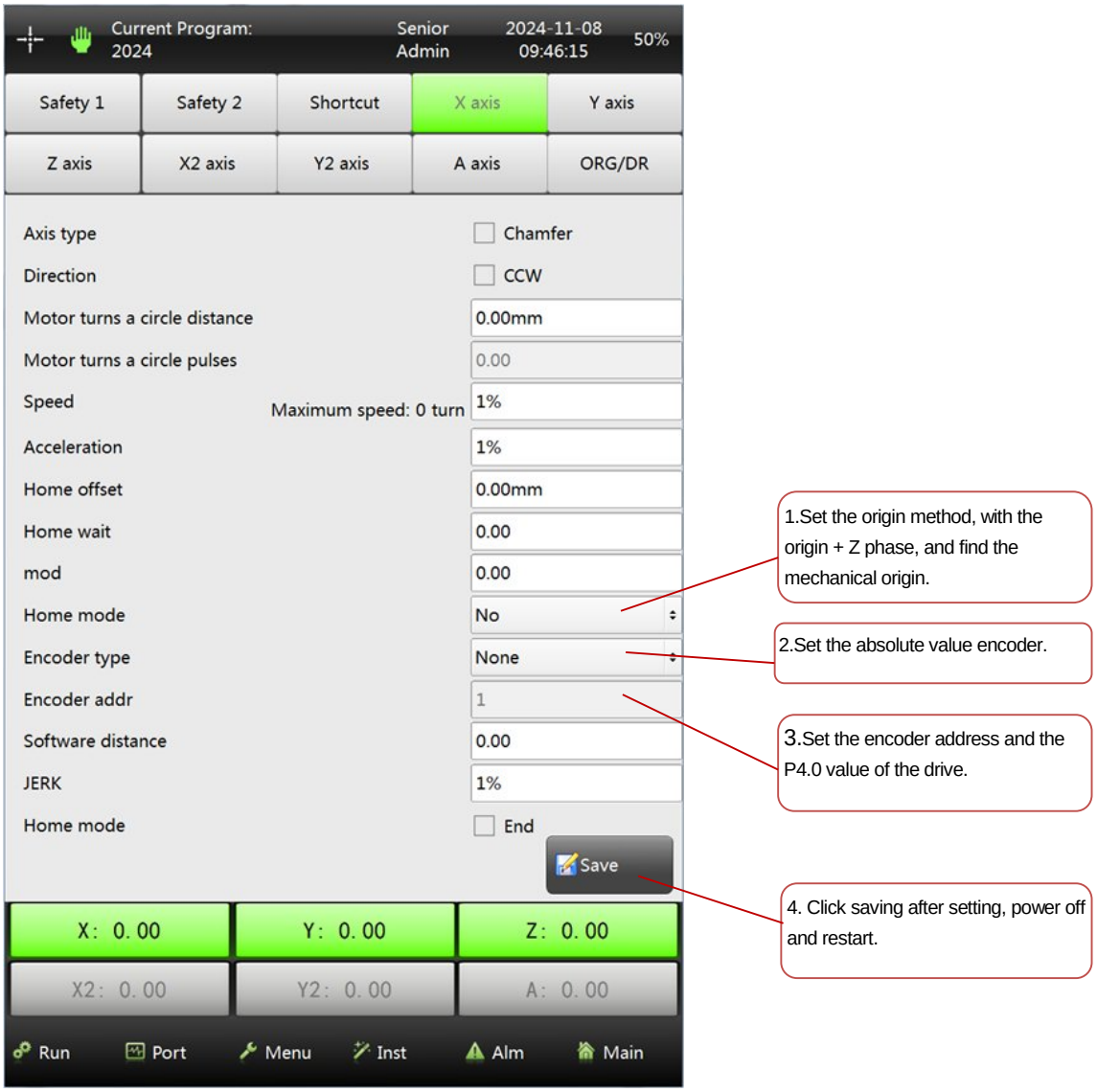
- ***Do not disassemble battery.***
- ***Do not get the battery in a short circuit.***
- ***Do not charge the battery.***

Or it may cause an accident and safety issue.

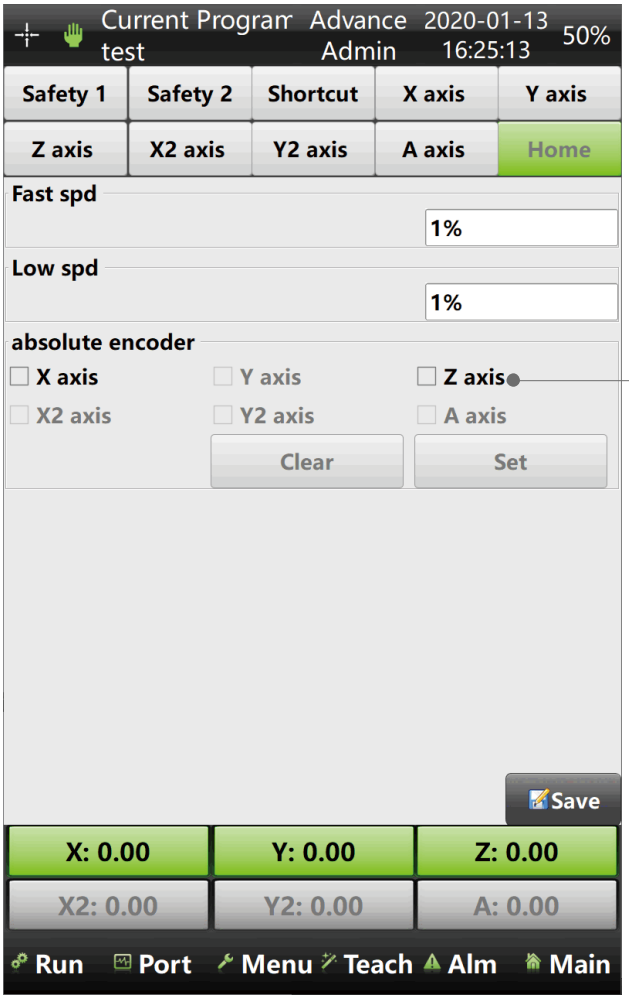
Reboot the servo driver after setting.

10.2 Absolute Encoder Parameter Setting

Turn on the robot and the parameter and signal are normal Login by the “Advance Administrator” level and then go to the “Servo Setup” page and choose absolute system as shown below:

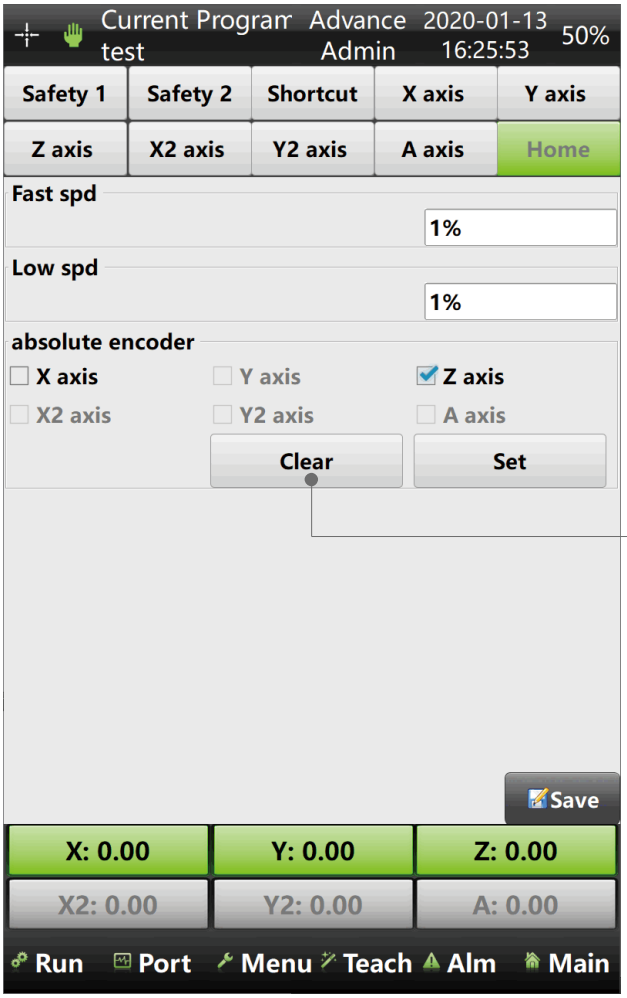


Pressing home position after reboot, enter advance manager password and go to original as shown below:

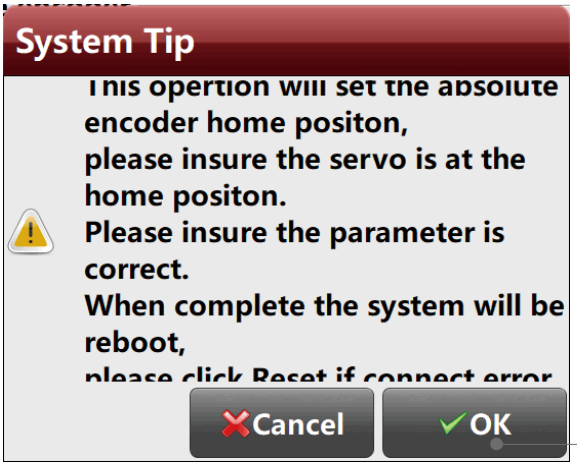


The default Z axis setting is absolute – click the Z axis

Pressing home postion after reboot, enter the advanced administrator password after finding the origin point, and then enter the servo parameter to enter origin option, as shown below:

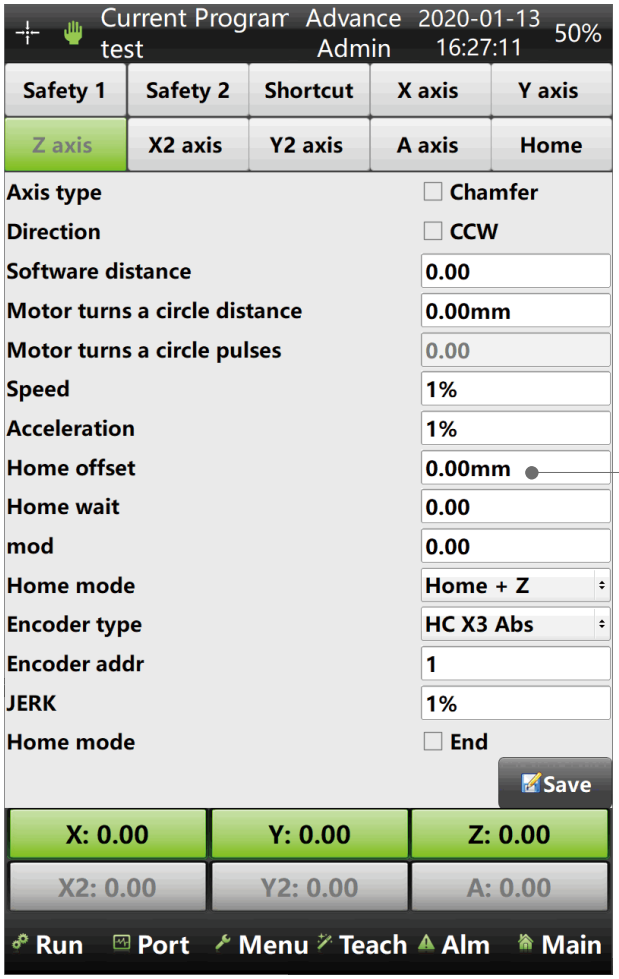


After selecting axis, click and Clear the value of encoder

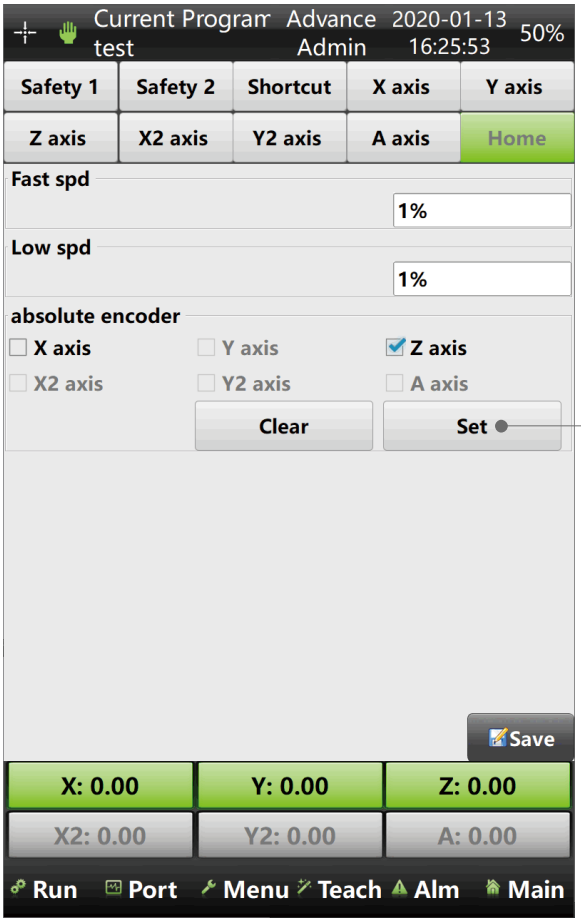


Click here in this window and reboot

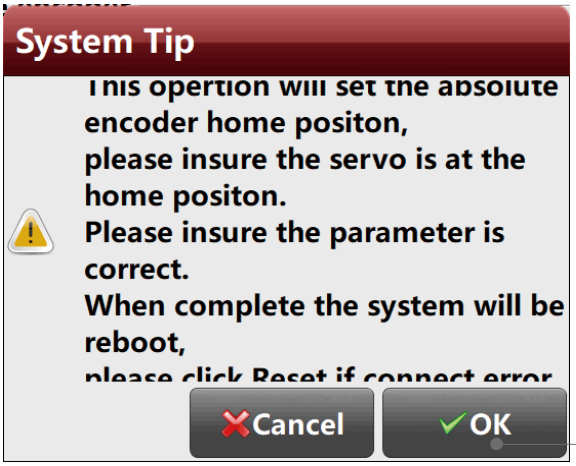
After reset, login by the “Advance Administrator” level and enter the “Servo Setup” page.



Set not to original positior



Set not to original positior



Click here in this window and reboot

The absolute system setting is finished; all the axes will be in the “0” position. Reset if any of them is not at “0” position.

Note: When the encoder Home position is cleared, the servo is off.

11. Maintenance

11.1 General Maintenance

Please check and maintain by the prescribed maintenance intervals. Proper maintenance brings trouble-free for the robot. Proper maintenance is necessary to apply to the warranty policy.

Maintenance should be managed by qualified personnel only.

 Maintenance and responsibility for safety equipment becomes the responsibility of the customer when the robot was accepted.

 Notice, that safety instructions marked with a  must check according to the safety regulations and rules so that full functionality of this equipment will be guaranteed.

11.2 Lubrication

Wipe the old grease upon the bearings, linear guides, and linear sliders with a cleaning cloth, then grease new lubrication oil by using a brush. The grease for all roller bearings are applied to DIN 51825.

11.3 Maintenance

In accordance with the maintenance cycle to make the robot work in the best and safest condition.

Daily Maintenance	Monthly Maintenance	Quarterly Maintenance
1. Keep the robot clean. 2. Air filter regulator draining. 3. Check the pressure of the air supply. 4. Check whether the bolts that fixed the robot and injection moulding machine are tightened. 5. Check whether the set bolts of each travel control block are locked tightly.	1. Use an air blow gun to clean the filter. 2. Check the screws on all parts of the robot, make sure those screws are tightened. 3. Confirm whether the pipeline is broken or disconnected. 4. Check and adjust the operating speed.	1. Add lubrication oil to the axis rail.