Robot Manual (7 Inches)

Date: May, 2022

Version: Ver.A (English)

Contents

1. Operating Instruction

1.1 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 mold 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.

1.2 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 will continue the running mode.

Note: Before stopping auto running, please stop IMM first. Before starting auto running, please start IMM first.

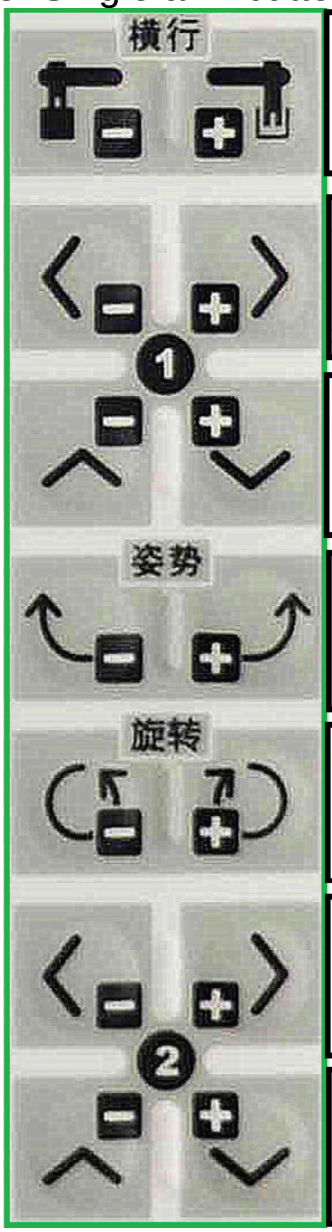
1.3 Stop 

- 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.

1.4 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.

1.5 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

1.6 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

2. Main page

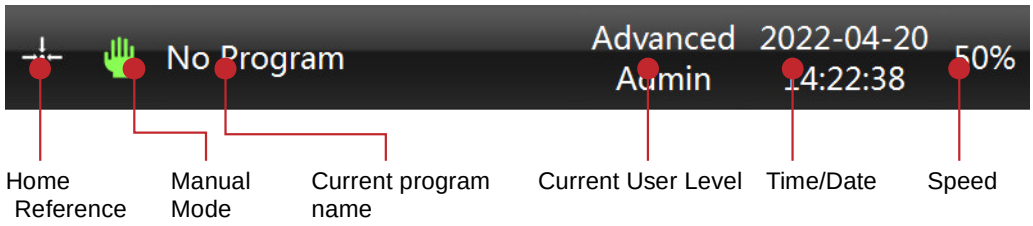
2.1 Main Screen

Power on, the system into main page as below picture:

The system is having consistent screen layouts for each function set and there are basic operating status and functions displayed on the screen for easier user reference and operation. Takes the main page for example to introduce the basic screen layout as below. After turning on the robot, it will enter the main page automatically as below:

1) Current State Bar: Show main system states such as Homing, Auto/Manual, program name, current user level, date/time, and speed.
2) Alarm Message Bar: Show the latest alarm message.
3) Servo Position： Show the present position of each servo and can enter the servo control page by clicking any servo axis button.
4) Function Menu：Enter the function and setup page by clicking this button.

2.2 Current State bar



1) Servo Homing status icon: Show whether the servo Home position (Reference position) is positioned.

	No home position: Power on and the servo motor yet to reset home position.
	Home position: The servo motor had reset the home position.

2) Operation mode icon: Show present operation mode.

	Manual mode: Manual operation is allowed under the present system condition.
	Auto stand-by mode: Allow to operate in Auto, One cycle running and Single-step running mode.
	Auto mode: Run the present program automatically.
	One cycle running: Run the present program by a cycle only.
	Single-step running: Run the present program by a step only.

3) **Current Program Name:** Show the current program name. Click the "Current Program" will lead to the program management page.

4) **Time / Date：Press the Time / Date** can adjust the present Time / Date.

5) **Overall Speed%：** The actual running speed of each axis is "Overall Speed" multiplies "Running Speed" (at the servo position setting of Teach Program).

6) Current User：Current user level display here. There are 4 user levels which are: Operator, Advanced Operator, Administrator and Advanced Administrator. Click here will enter user management page for selecting user level (see user level chapter for details).

2.3 "Function button" at the bottom of screen

Run	**Program Running Page** Here you can check current program running situation and perform Auto Run, Single Cycle, Single Step operation .
Port	**Port Monitoring page** Monitoring the port state of the system and able to manual operation of ports when in manual mode

	**Function Menu page** Including system parameters, servo parameters, user interface and other settings.
	**Teach Porgam page** Conduct instructional program operations, including teaching new programs and modifying current program parameters.
	**Alarm page** Current and recent alarm details to facilitate analysis the cause of the alarm and error.
	**Main page** Return to Main page from each function page.

2.4 User Management

1) **(1) Operator：** The system default user level which doesn't need password and only perform basic operation such as Homing, Auto Run and I/O Monitoring …
2) **(2) Advanced operator：** Advanced operator password (changeable) is necessary and provide extra manual operation and select the program for running…
3) **(3) Administrator：** Administrator password (changeable) is necessary and provide almost all operation other than limited by the system supplier.
4) **(4) Advanced administrator：** An Advanced administrator password is necessary to log in and perform all operations, including system recovery and software update/upgrade… It should be only for the system provider.

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	×	×	√	√
system parameter	×	×	√	√
signal configuration	×	×	√	√
reset system parameter	×	×	√	√
servo safety parameter	×	×	√	√

servo machine parameter	×	×	√	√
user interface	×	×	√	√
machine position operate	×	×	√	√
Manufacturer management	×	×	×	√
system update	×	×	×	√

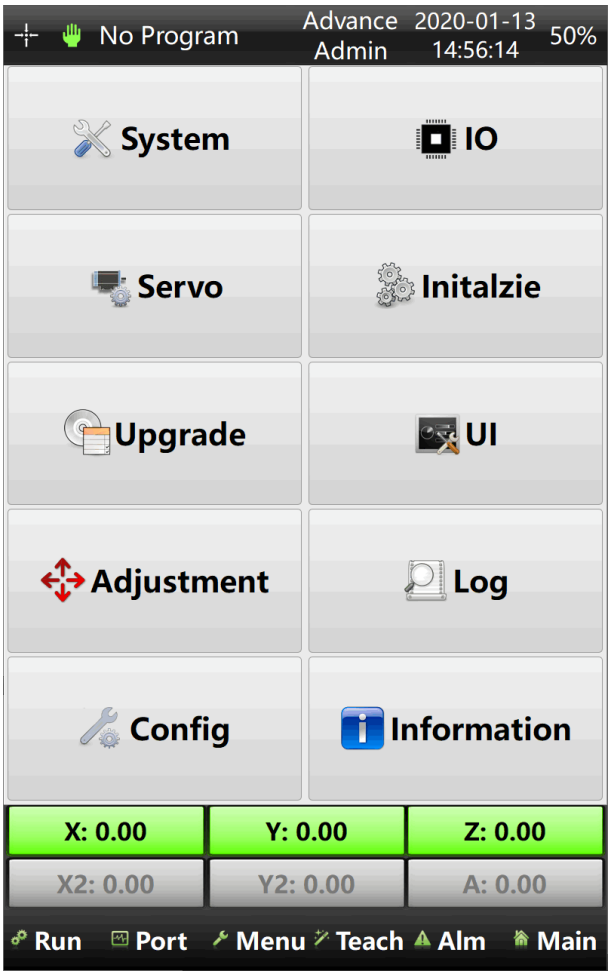
Advanced operator password is **11111111**

Administrator password is **22222222**

Advanced Administrator level permission and password are only for the use of SHINI and SHINI's partners and agents.

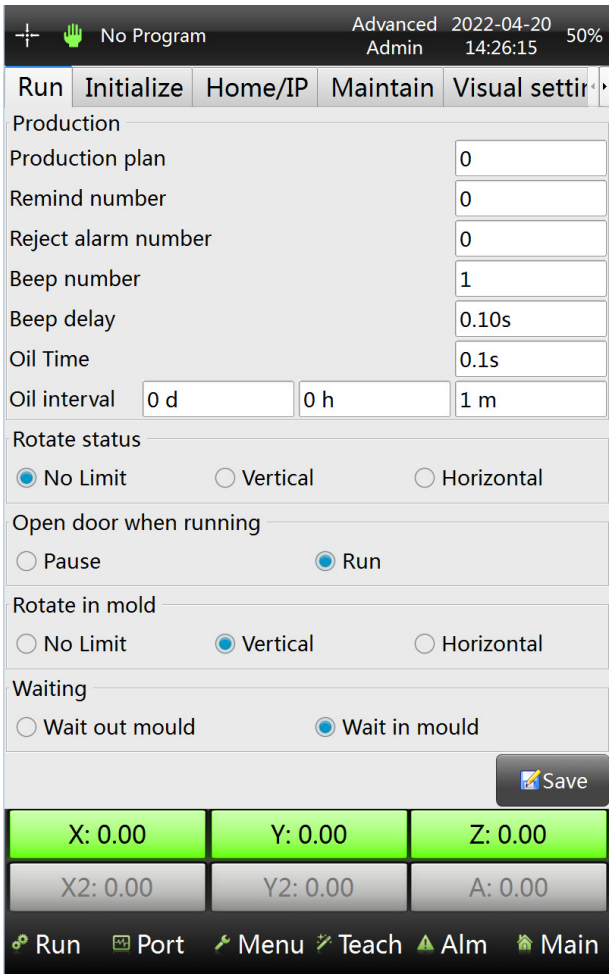
3. Function Menu Page

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:



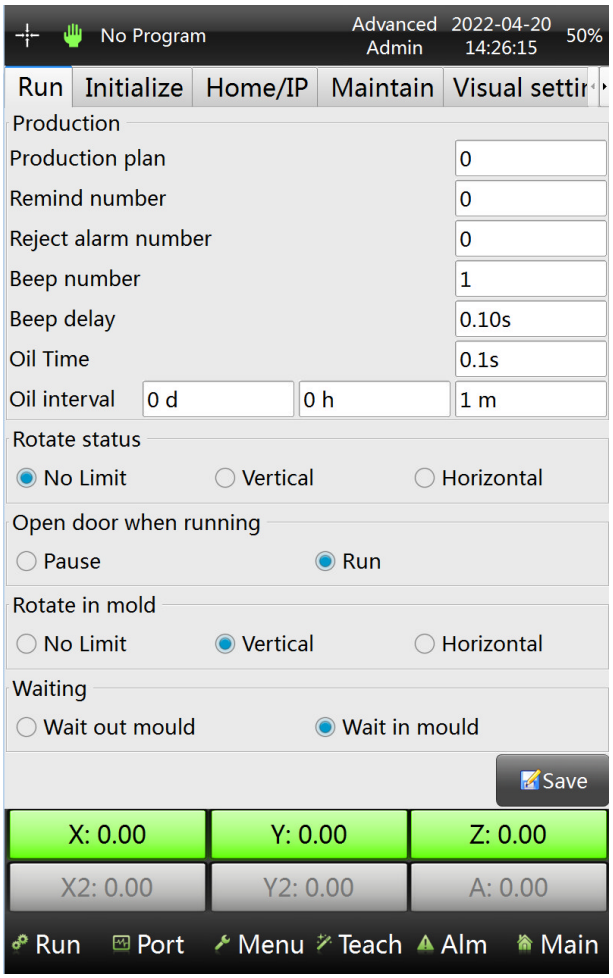
3.1 System Setup

System parameter includes: Run、Initialized、Home position/IP, and Maintain. Touch “System” button to get into setting page of those functions.



3.1.1 Run Parameter

Pressing the “Run” page button at the upper of the screen on the system setup page:



1) Production management:
   - **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.
   - **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.

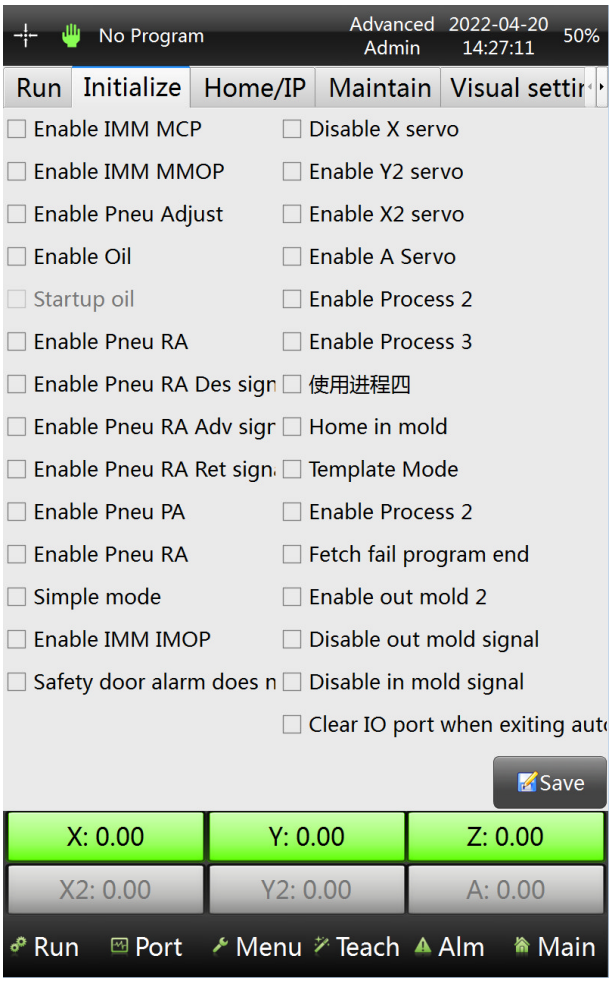
- **Reject Alarm number**：To set an accumulated quantity of reject (defective products), when it achieves the quantity of reject the system sounds an alarm to remind you that the quantity of reject (defective products) is surpassing. Set the value of the “Reject Alarm number” as “0” to turn off this function.
- **Beep number**：To set the number of beep sounds by the beeper when the system alarms.
- **Beep delay:** To set the time length of beep sounds by the beeper when the system alarms each time.
- **Oil time:** Set the greasing time.
- **Oil interval:** Set the time of greasing interval.

2) 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.

3) **Open door when running**：When opening the injection molding machine safety door will stop running temporally or keep running when the robot is running auto mode.
4) **Rotate in mold**：Allow the end of arm tool (pneumatic flipping cylinder) of the main arm to rotate in the mold area or not.
5) **Waiting:** The robot will wait for the mold opening in the mold area or not. Standby position is in the mold area or not. Waiting: In mold or out mold.

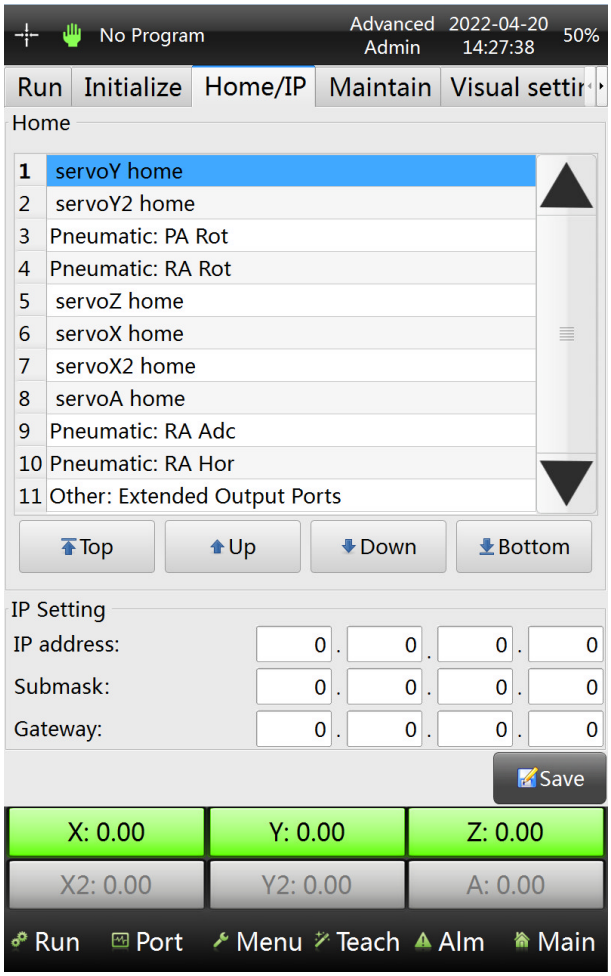
3.1.2 Initialize

Pressing the “Initialize” page button on the system setup page: This page is able to set part of the detection signals, enable or disable the pneumatic sub-arm and create process 2 and 3, check below photo:


No Program
Advanced Admin
2022-04-20 14:27:11
50%
Run
Initialize
Home/IP
Maintain
Visual settir
Enable IMM MCP
Enable IMM MMOP
Enable Pneu Adjust
Enable Oil
Startup oil
Enable Pneu RA
Enable Pneu RA Des sign
Enable Pneu RA Adv sigr
Enable Pneu RA Ret sign
Enable Pneu PA
Enable Pneu RA
Simple mode
Enable IMM IMOP
Safety door alarm does n
Disable X servo
Enable Y2 servo
Enable X2 servo
Enable A Servo
Enable Process 2
Enable Process 3
使用进程四
Home in mold
Template Mode
Enable Process 2
Fetch fail program end
Enable out mold 2
Disable out mold signal
Disable in mold signal
Clear IO port when exiting aut
Save
X: 0.00
Y: 0.00
Z: 0.00
X2: 0.00
Y2: 0.00
A: 0.00
Run
Port
Menu
Teach
Alm
Main

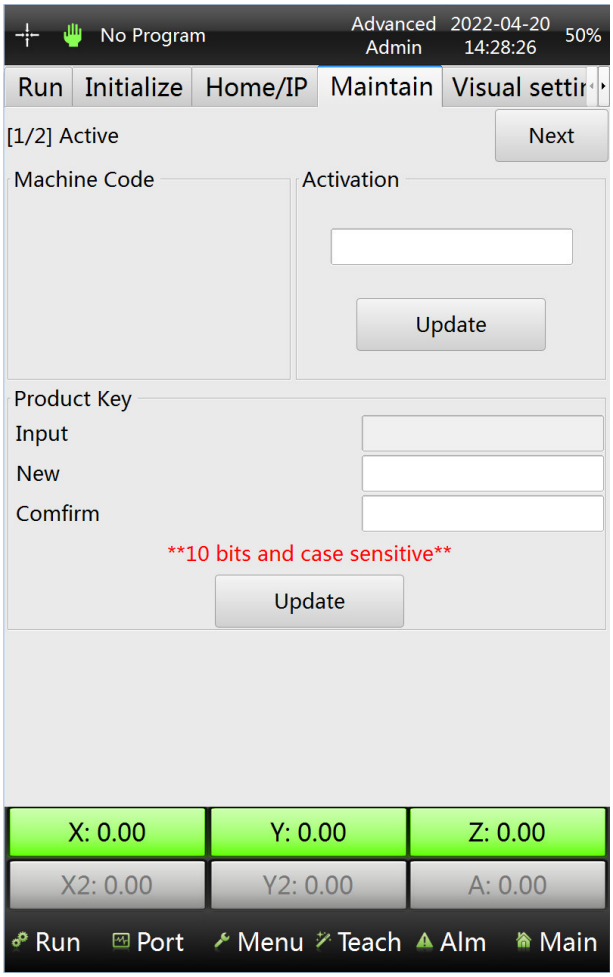
3.1.3 Home / IP Page

Pressing “Home / IP” page button on the system setup page, homing sequence of each axis and the IP address of the robot are available to modify on this page, shown below:



3.1.4 Maintain Page

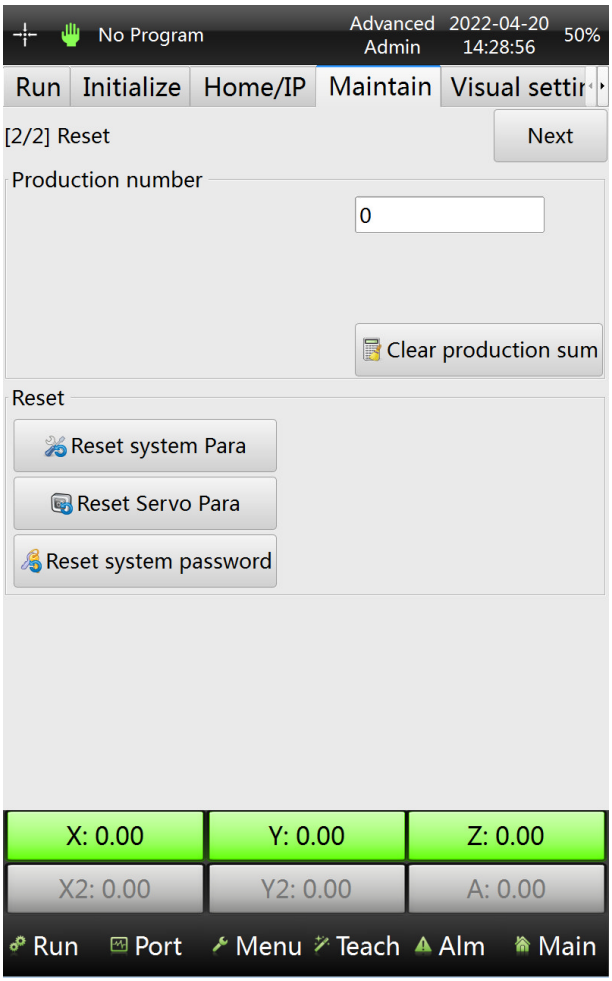
Pressing the “Maintain” page button on the system setup page as shown below:



System Maintain: Setting maintaining time through software. The system will alarm when the time is due.

Machine Code: Each robot has its machine code. Enter the machine code to generate the new activated code then re-activate the robot if needed.

System maintains page 2：

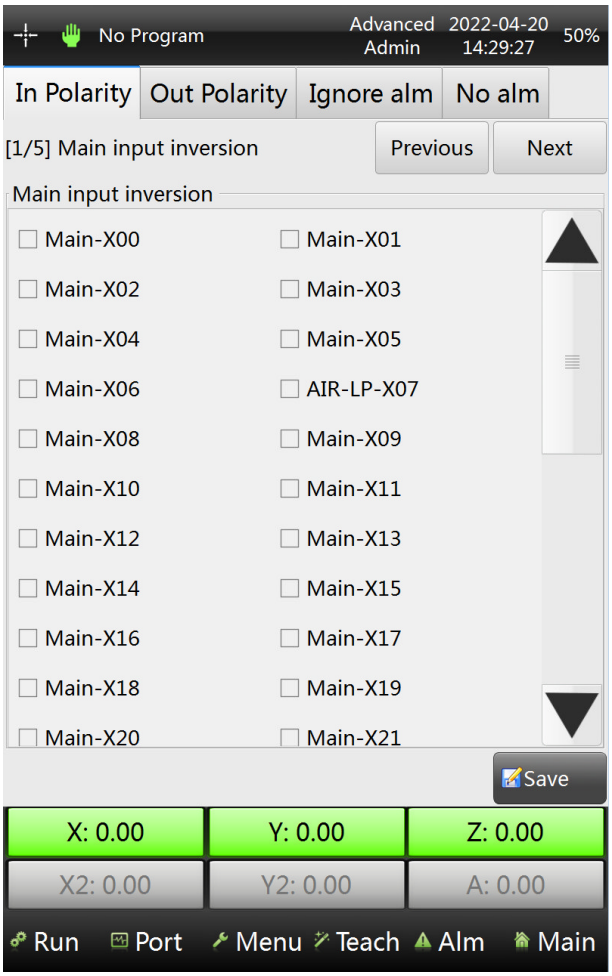


Production Number: Maintain the robot according to actual production quantities, the robot will sound an alarm and pause production to remind you to maintain the robot due to the production quantities being achieved. Press “Clear production sum” to continue production.

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

3.2 I/0 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:



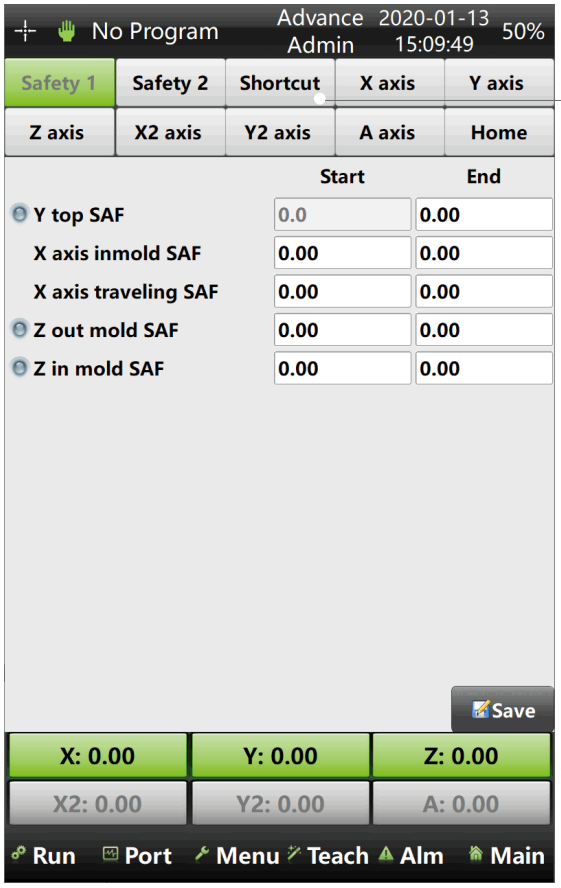
Input / Output Polarity Reversion: Normally (not select the particular input polarity) the signal is valid when it gets the particular signal input. An input polarity inversion is to reverse the validation of the particular signal, by selecting the particular input polarity the signal is valid when no signal is received. For example, the robot will get the detection signal (signal valid) of the robot got the product when it gets the signal from the suction cup through the digital display pressure switch (minus value of pressure which highlights in red). However, selecting this input polarity inversion, the signal is valid if the robot doesn't get any product, and it's invalid when the robot got the product.

Ignore the Alarm： Switch on the particular I/O port to let the IMM continue production by opening and closing the safety door or click continue the auto-running when the robot alarm about that port (make sure the robot is under safety condition). However, if not switch on that particular I/O port, stop production and checking are necessary.

No Alarm: Ignore the alarm when the robot is within the mold area. The robot will stop immediately at the present position (in the mold area) when the alarm occurred if not switch on this function which is the default setting. If switch on this function, the robot will stop and alarm when the arm rose and just before sending the enable mold close signal.

3.3 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.

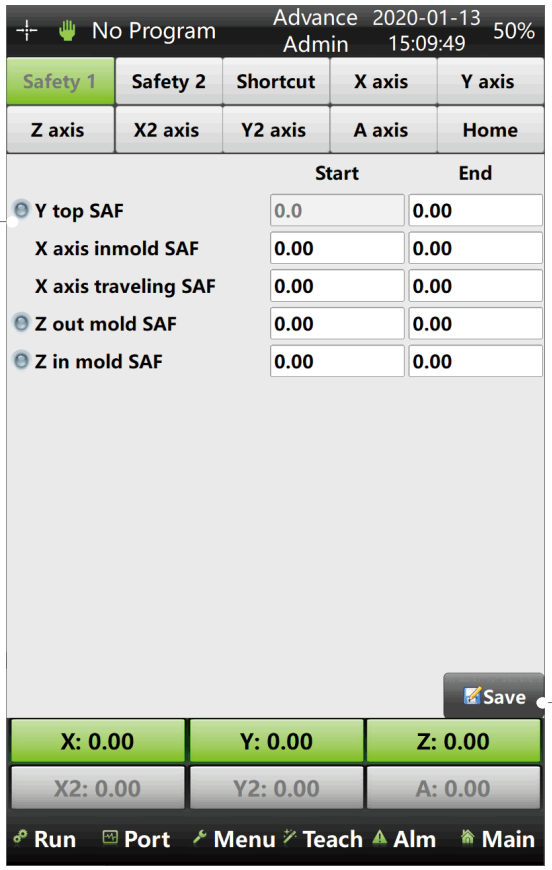


Safety, Shortcut needs to be set after going to referencePressing related axis to set position

3.3.1 Safety Area Page

Pressing the “Safety 1 or 2” page button on the Servo Setup page: The following picture display “Safety 1” setup page:

When set Y axis safety, up limit must be on, position is 0, and end position should be MAX. X axis doesn't need safety signal to set. Z axis is the same as Y axis.



Save the current setting parameter

1) **Y top SAF:** It's the Y axis top safety area over the mold. The safety area that allows the arm to go down while the arm is within the mold area and without an EMO (Enable Mold Open) signal. In other words, the robot will give the EMC when the arm goes up into the Y axis top safety area. Must receive a signal from the Y axis top proximity sensor and then set this safety area. The start point of the safety area must be “0” but the endpoint is different from different IMM and mold. So the original SHINI ST3/5 robot's endpoint of Y top SAF is” zero” to prevent the arm hit the customer’s mold. If you want to modify it to minimize the cycle time, you have to run and check it manually to get the max safety distance from Y=0 to the mold.
2) **X in mold SAF:** The safety area that allows the arm to move without worry hitting the mold and it doesn’t need any signal from proximity sensor to set it.
3) **X axis traveling safety area:** To set the X axis main arm safety area while traversing.
4) **Z out mold SAF:** The safety area that allows the arm goes down outside the mold area.
5) **Z in mold SAF:** The safety area that allows the arm goes down within the mold area.

6) **Home Offset:** Auto adjusts the servo's actual stop position after homing, which uses for correcting the actual home position.
7) **Home wait:** Set the standby position after homing

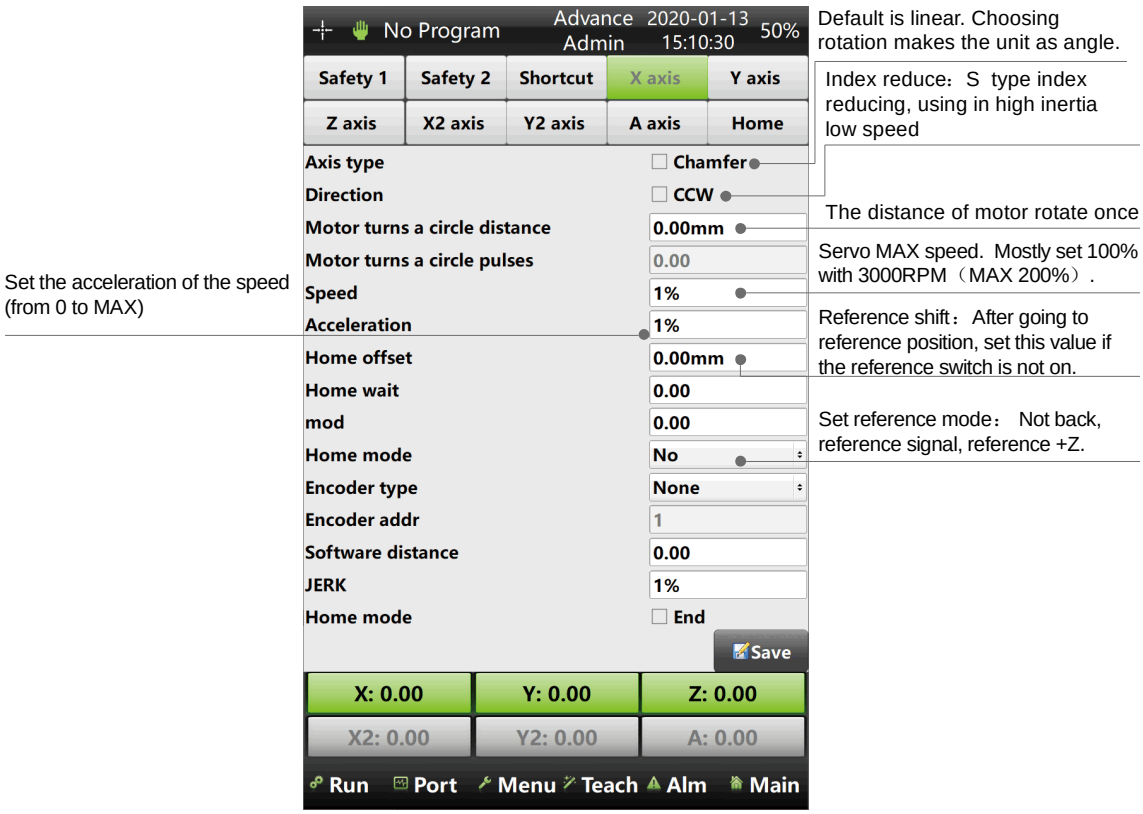
3.3.2 Shortcut

Set shortcut of each axis for directly moving to that position.

Shortcut (Quick positioning): Set the quick positioning position, easy to manually control the servo, and quickly positioned to the designated location. Set up from the corresponding servo axis coordinates by clicking the sync button to renew the input box, you can also click on the input box pop-up digital keypad and directly enter the coordinate value.

3.3.3 Servo Machine Parameter

Set parameter of each axis as shown below:

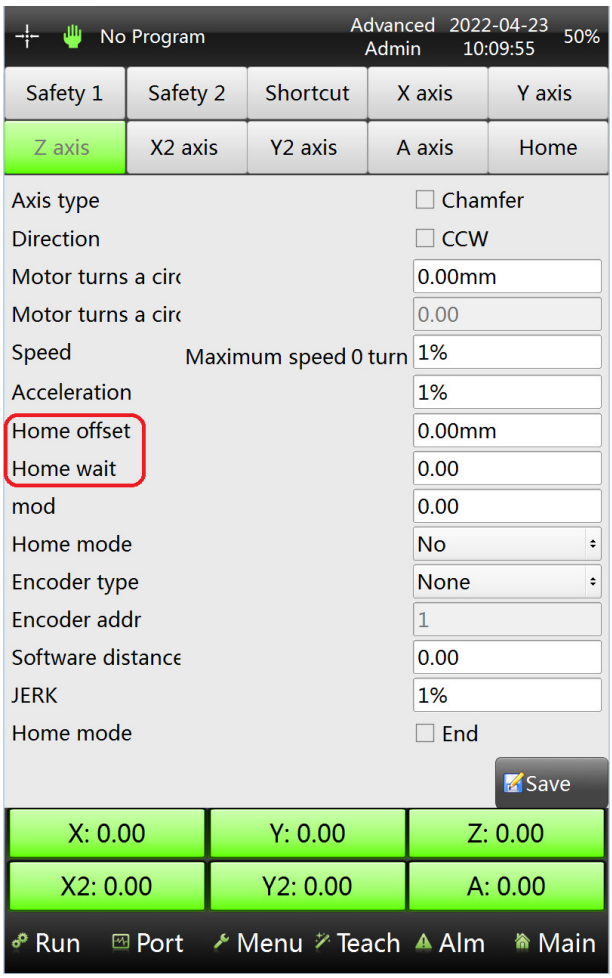


1) **Axis type:** The setting of whether the servo axis is used for rotation or linear way. Mark the box of “Chamfer” to use for rotation running and the servo axis value displays in angle units, otherwise, not to mark the box of “Chamfer” to use for linear running and the servo axis value displays in linear units.
2) **Direction:** The motor running way, CW as Clockwise; CCW as Counter Clockwise.

3) **Motor turns a circle distance:** The distance of a circle that the motor ran. It's the setting of the stroke when the motor runs a circle.
4) **Motor turns a circle pulses:** The pulses required by the motor to rotate a circle is 5000.
5) **Speed:** Set the maximum speed of each servo axis from 1% to the fastest of 100%.

   Actual manual speed = running speed*global speed*manual setting speed.

   Auto speed = running speed*global speed*command setting speed
6) **Acceleration:** Set the acceleration value of each servo axis from 1% to the maximum of 100%.



7) **Home Offset:** Auto adjusts the servo's actual stop position after homing, which uses for correcting the actual home position.
8) **Home wait:** Set the standby position after homing.
9) **Home mode:** Here have three kinds of homing mode

   "No" as not returning home, then the system won't have to find the home position.

"Home + Z": The system will establish coordinates with reference to the signal of the Z axis.

"Home Signal": The system will establish coordinates with reference to the signal of the home position.

10) **Software distance:** The setting of the maximum distance of each servo axis that allows to run. The "Software distance" limits the maximum travel distance during Auto / Manual operation.
The ST5 robot's X and X2 axes don't have this, but the ST3 robot's X axis does have.
11) **Encoder type:** The selection of encoder. The setting of the encoder communication way for the absolute coder. "No" refer to the non-absolute encoder.
12) **X and X2 Home distance (ST5 only):** The distance between the X and the X2 home position. In other words, the minimum safety interval between the X and the X2 axis to prevent them hit each other.
13) **Encoder Addr:** The encoder address and the settings of the servo communication.

Note: When you are setting servo mechanical parameters. Meanwhile, beware of the servo speed not to exceed the rated speed of the servo so as to cause accidents!

3.3.4 Home

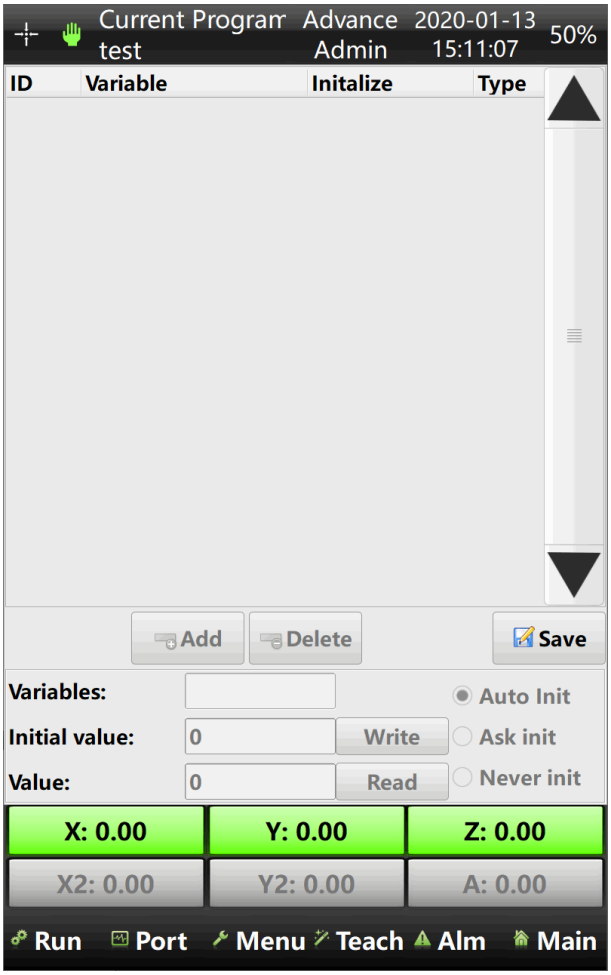
Here on this page is able to set the robot's Homing speed and the zero point settings of the absolute value servo.

Fast spd: The setting of the minimum speed of homing from the minimum of 1% to the maximum of 10%.

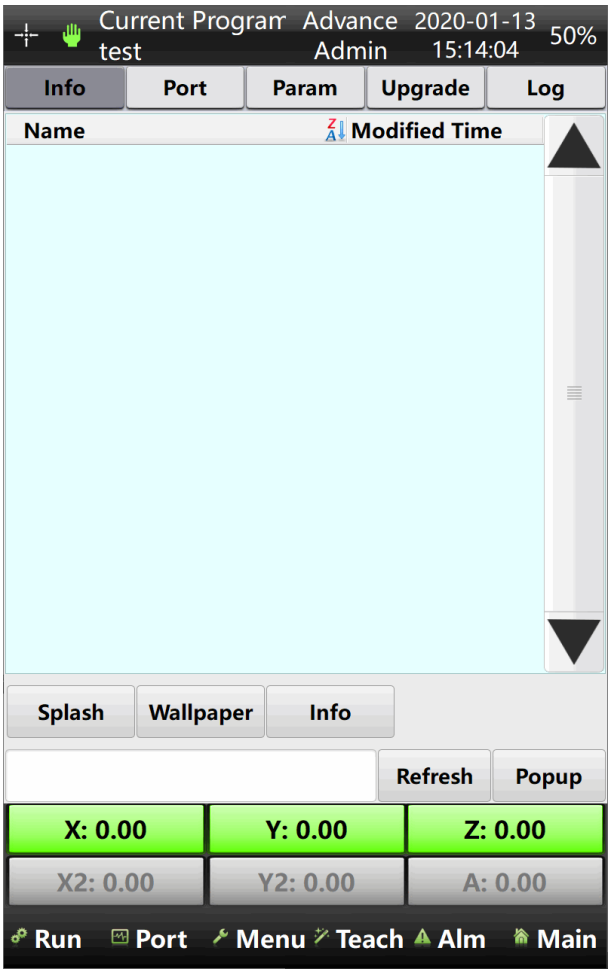
Absolute encoder, please check the absolute encoder manual for relative settings.

3.4 Initialize

Check the current value and initialized mode of the variables.



3.5 Upgrade Page



Info: Includes startup screen, standby screen and manufacturer information which is able to import through a USB.

Refresh: Insert a USB and then click the "Refresh" button to find the ideal picture and load it.

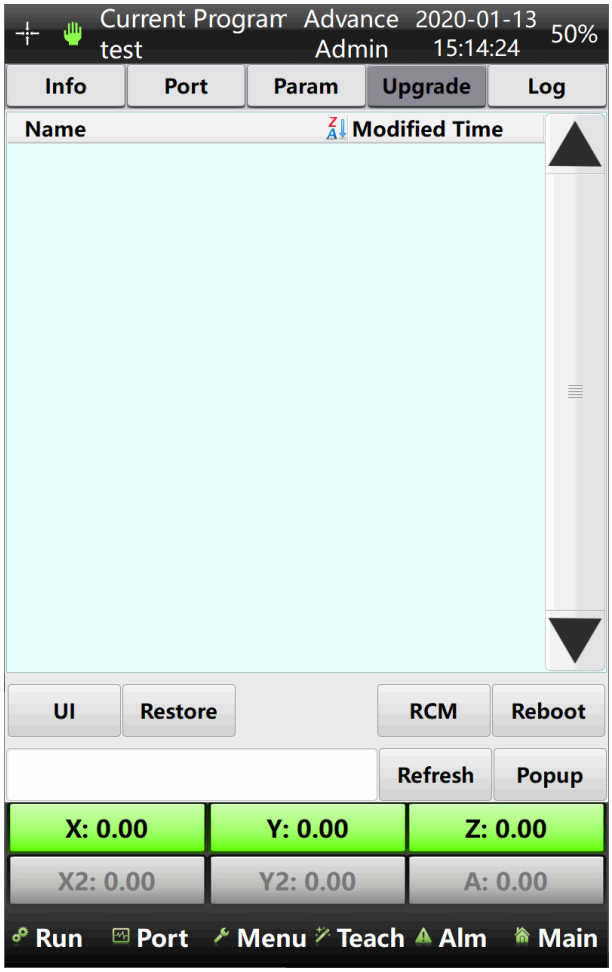
Port: Port information from USB and rename the port.

Param: Load or get the parameter information from the controller through USB.

USB format is “Fat 32”, USB 2.0 and less than16GB.

3.5.1 Software Upgrade

Software update function requires the “Advanced Administrator” user level to do it. This function allows to transfer system parameter and servo parameter to USB, also can transfer parameters from USB to controller which is convenient for setting large sets of unified robot by specification robot parameter.



Upgrade: Software upgrade, through USB to upgrade controller’s software and main board software.

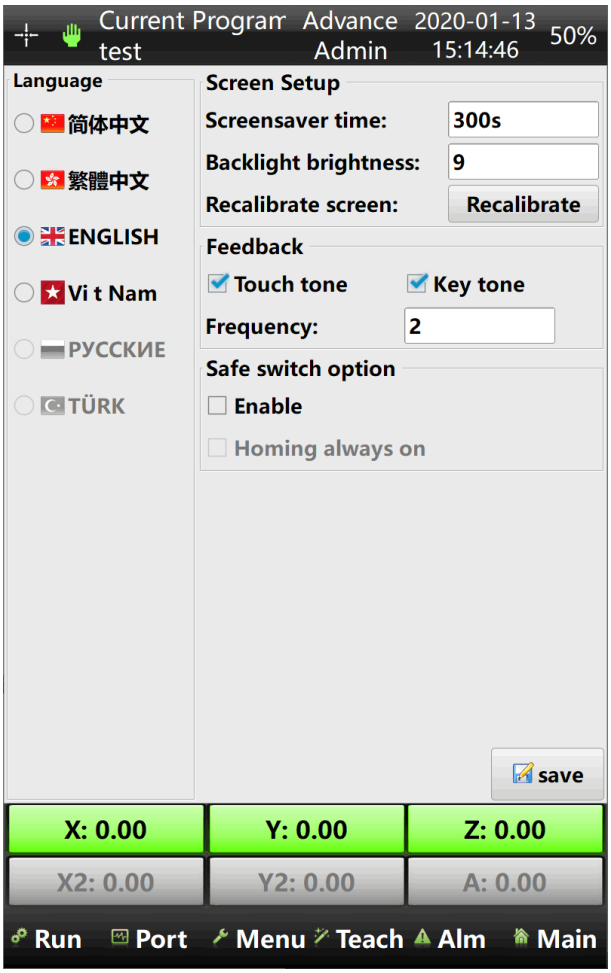
Restore: The “Restore” allows to return to the previous software version and only one time.

System Log: Transfer system logs to USB or eliminate the system log...

3.6 UI Setup Page

User Interface setup page allows to change language, the screen saver time, recalibrate the touch screen, and touch tone on this page

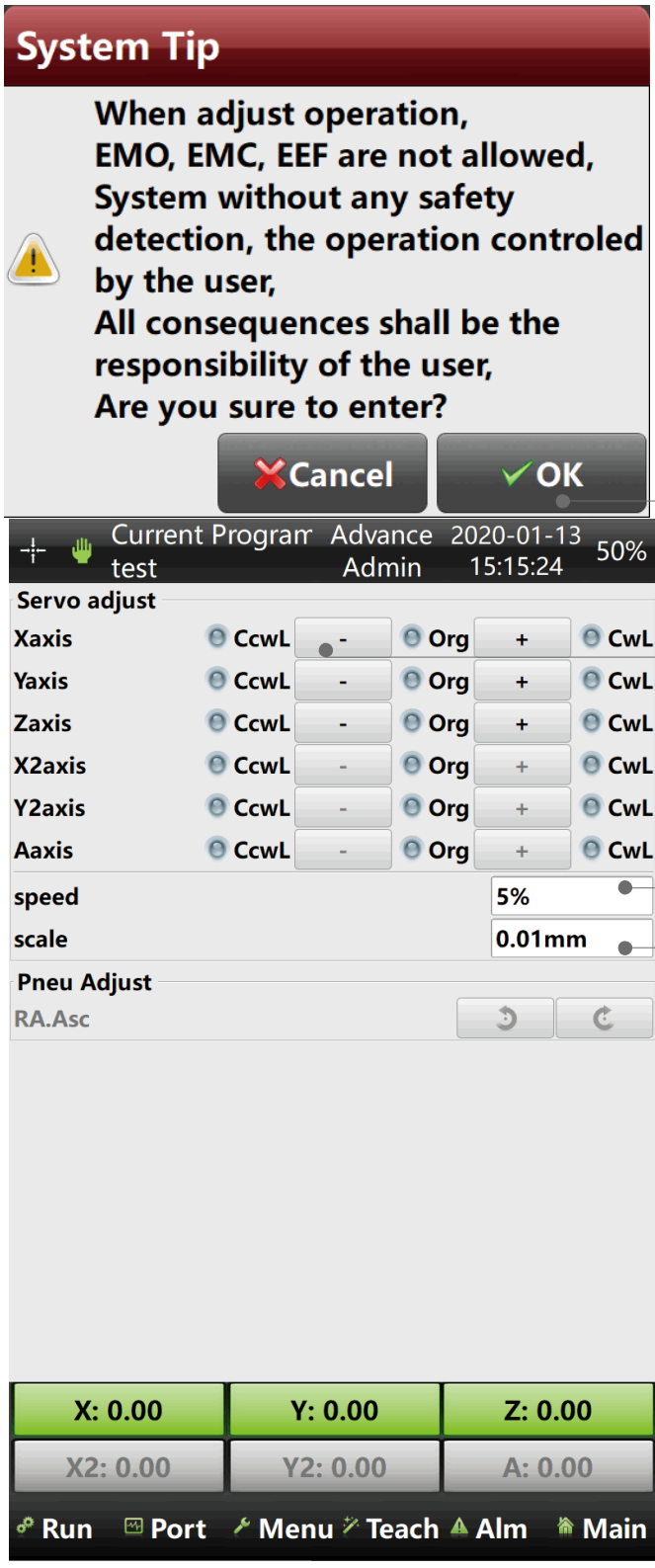
Safety switch: the settings of using the safety switch or not and long pressing when homing or not



3.7 Adjustment Page

Some alarms will restrain manual operation to move the robot, go to this page to move the robot if needed. (No limit in this command)

Adjustment: This function allows adjusting the servo axis position at a low speed. Without being homing in the “Adjustment” operation, it won’t activate any safety restrictions when positioning, however, the limit (proximity sensor) is still valid. After homing, it allows adjusting the position between the home position and the maximum stroke.



Press to enter

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

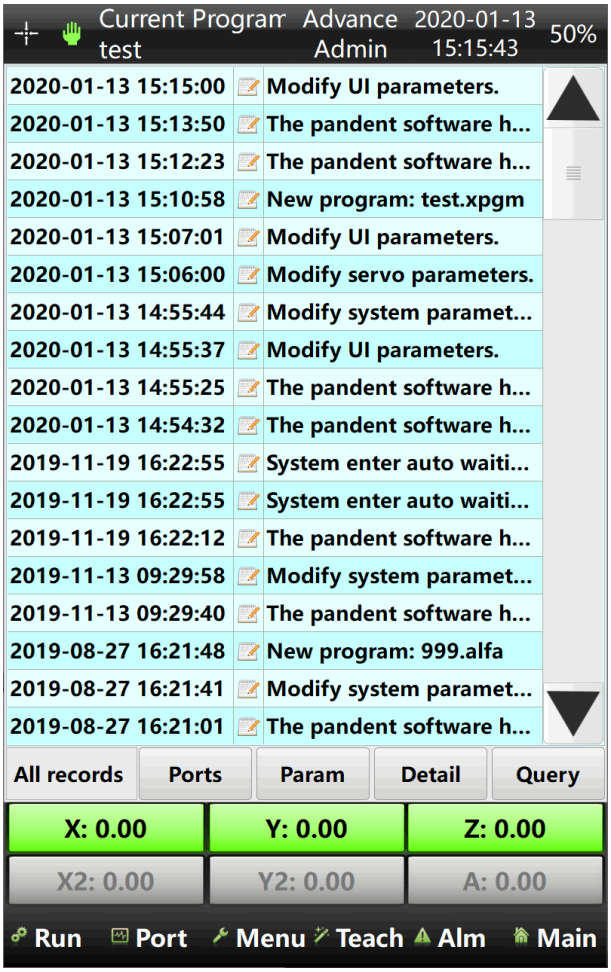
Reference speed

Distance per pressing

3.8 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.



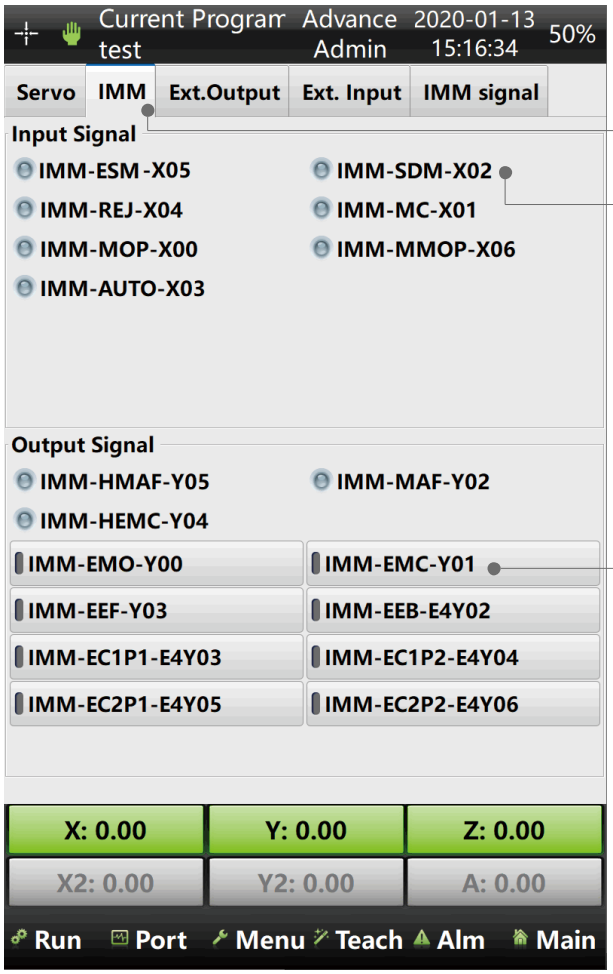
3.9 Configuration

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

4. Port

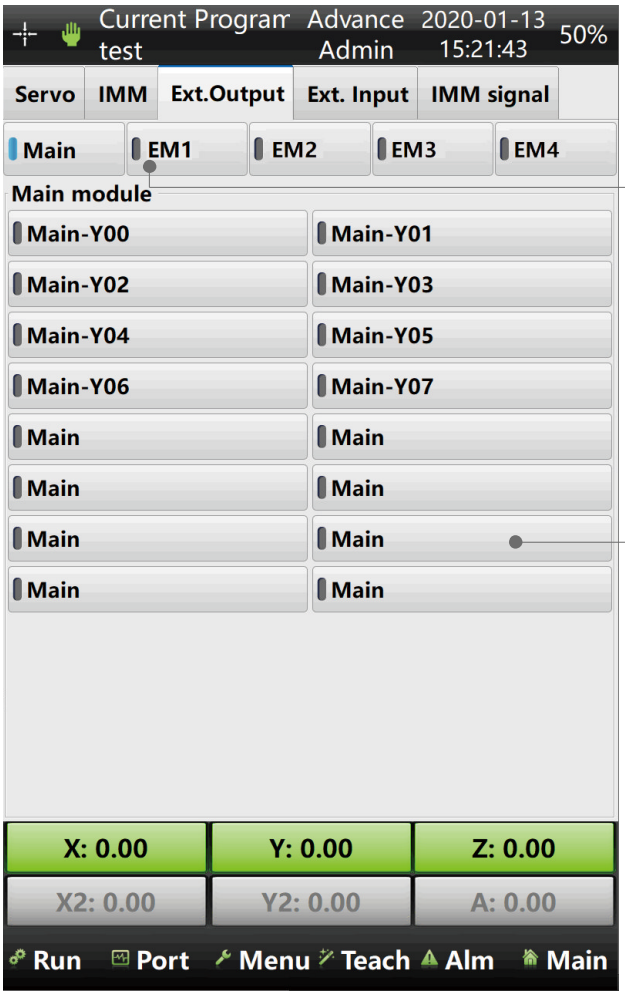
Touch the “Port” page button at the bottom of the function button bar. Check the System I/O signal (Servo signal, IMM signal, Output signal, Input signal, Robot signal) on this page.



Select these pages to check the signal status

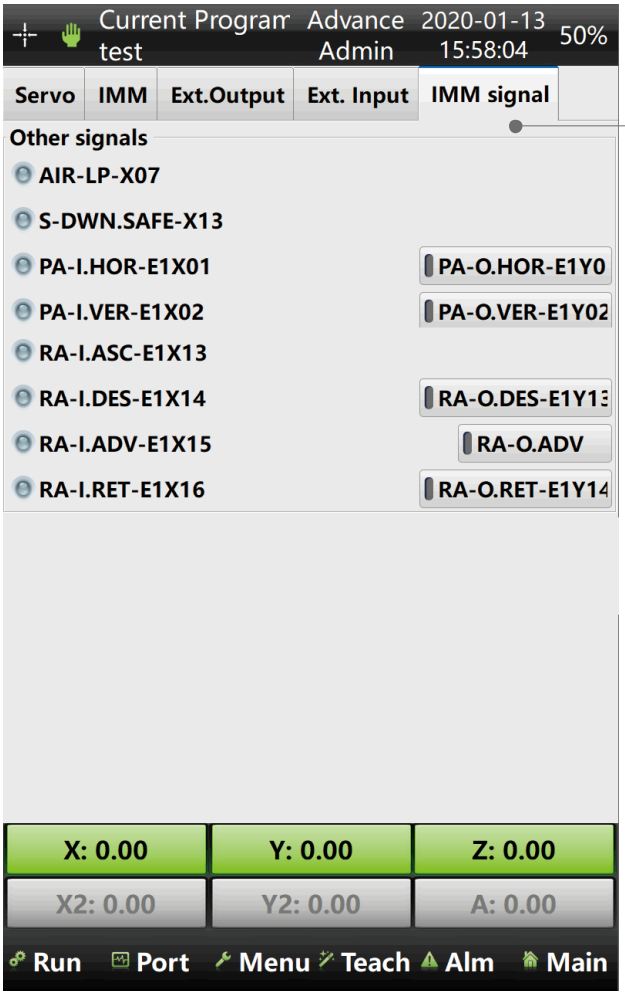
Check input signal from IMM

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



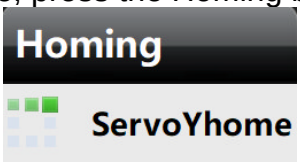
Robot signal: Main arm cylinder, second arm I/O monitoring and manual operating

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

5. Servo Axis Operation Description

5.1 Homing

After the Servo Adjustment and the trial operation after adjustment is safe and has zero problems, touch  or the Homing button to start searching for the Home position.

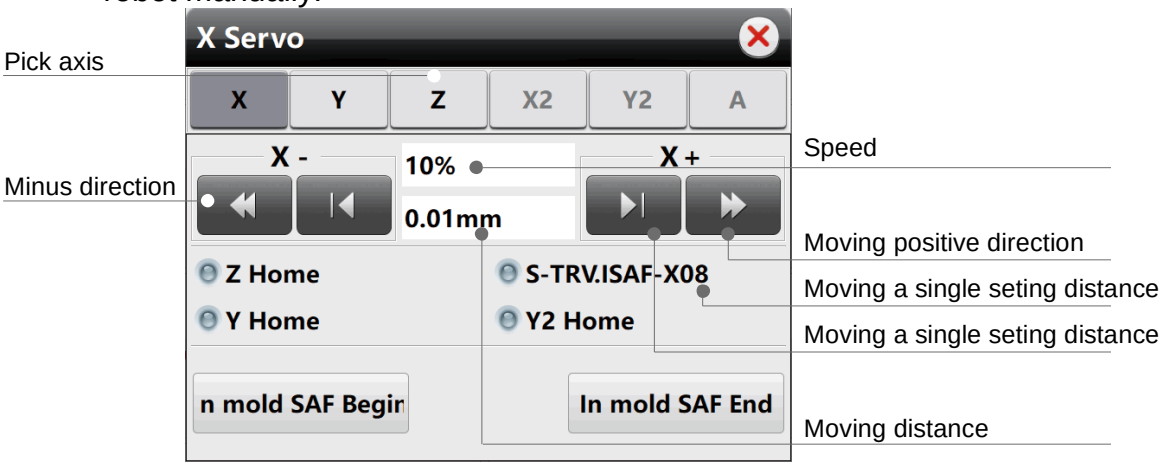
If the system is on manual mode, press the Homing button on the top left corner to back to home position with this 

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.

5.2 Servo Axis Manual Operation

1) Press the button on the right side of the controller's upper cover.
2) In manual mode, touch any servo axis button at the lower of the screen to get into the servo axis operation page to check the signal and to move the robot manually.



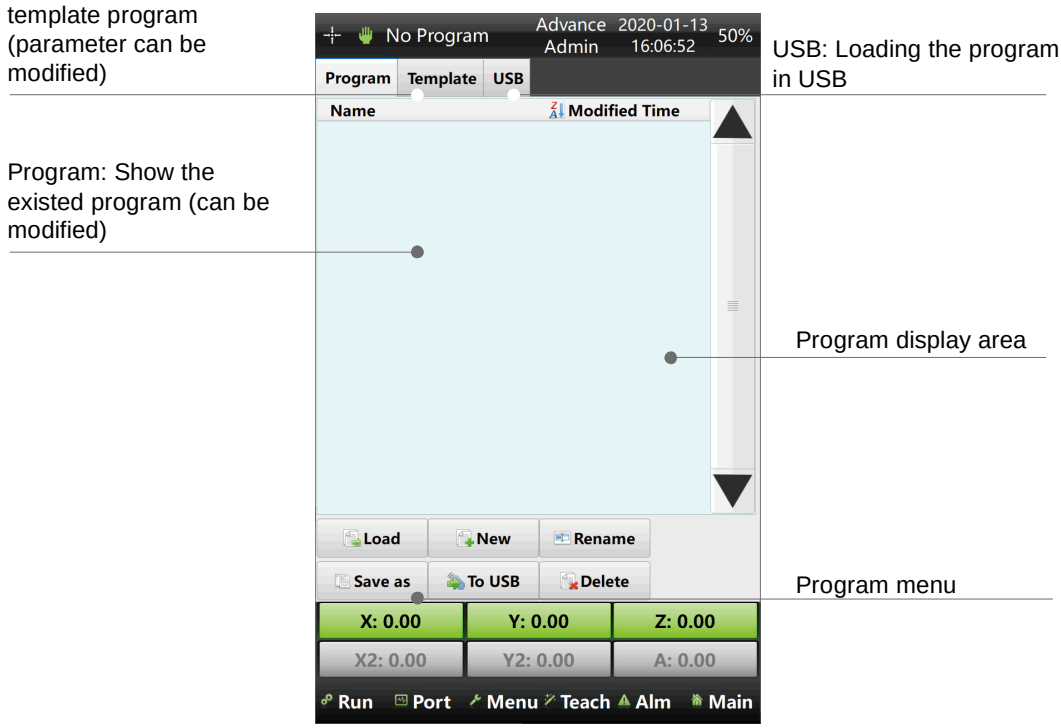
Note: To operate the robot manually, Homing before operating is necessary.

<u>If the movement of any servo axis is required when it’s yet to manage homing, operate in the “Adjustment” function.</u>

6. Program Management

6.1 Program Management page

Click the “Current Program” button on the top of the screen to the program management page.



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”. Then the program will exist on the program management list when it’s created as shown below:

Rename: Rename the selected program.

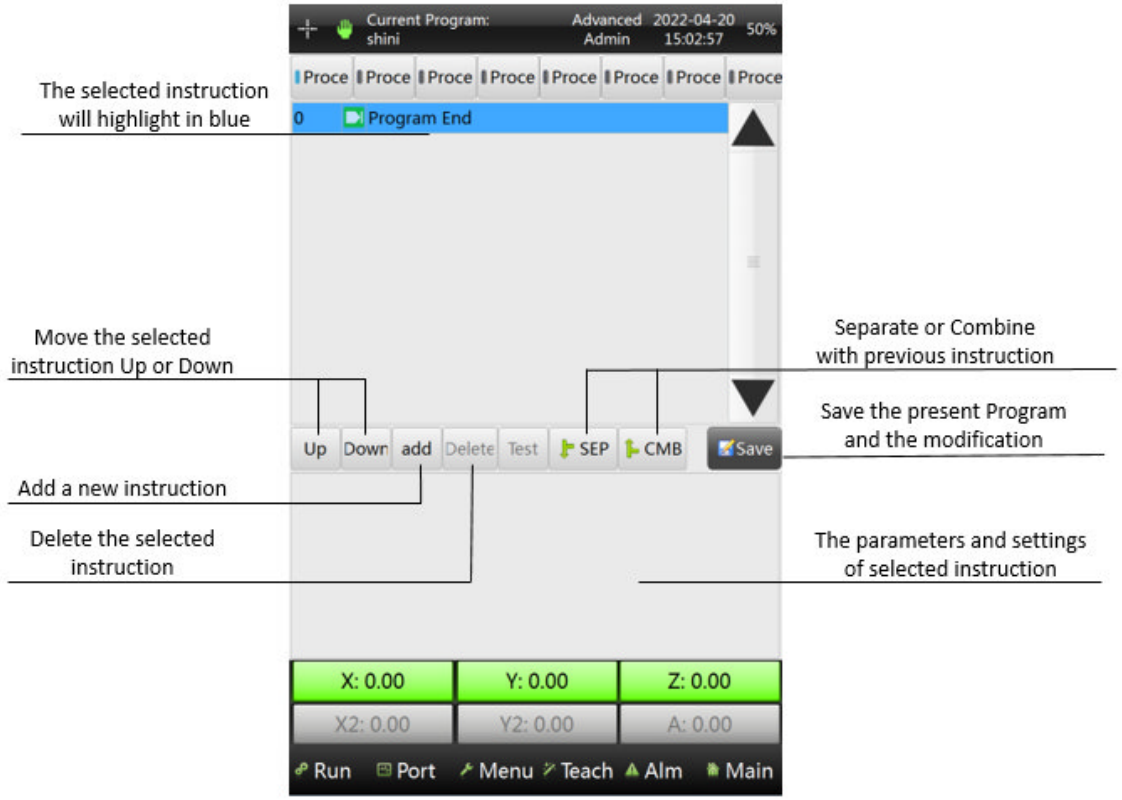
Save: Save the current program.

To USB: Export the selected program to USB.

Delete：Delete the selected program.

6.2 Teach Program

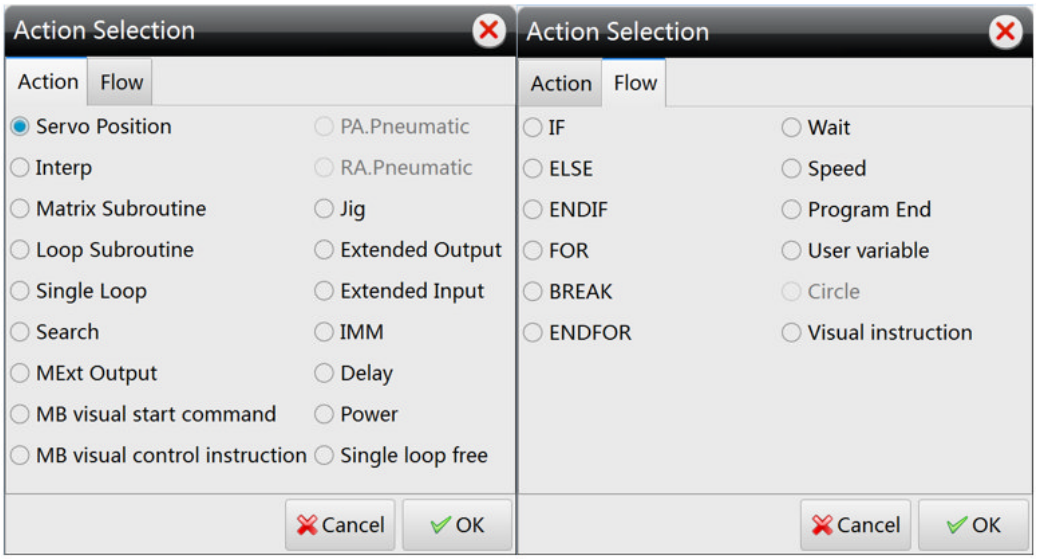
Teach Program, check below picture:



Add instruction / command

Click 

to the “Action Selection” menu page as shown below:

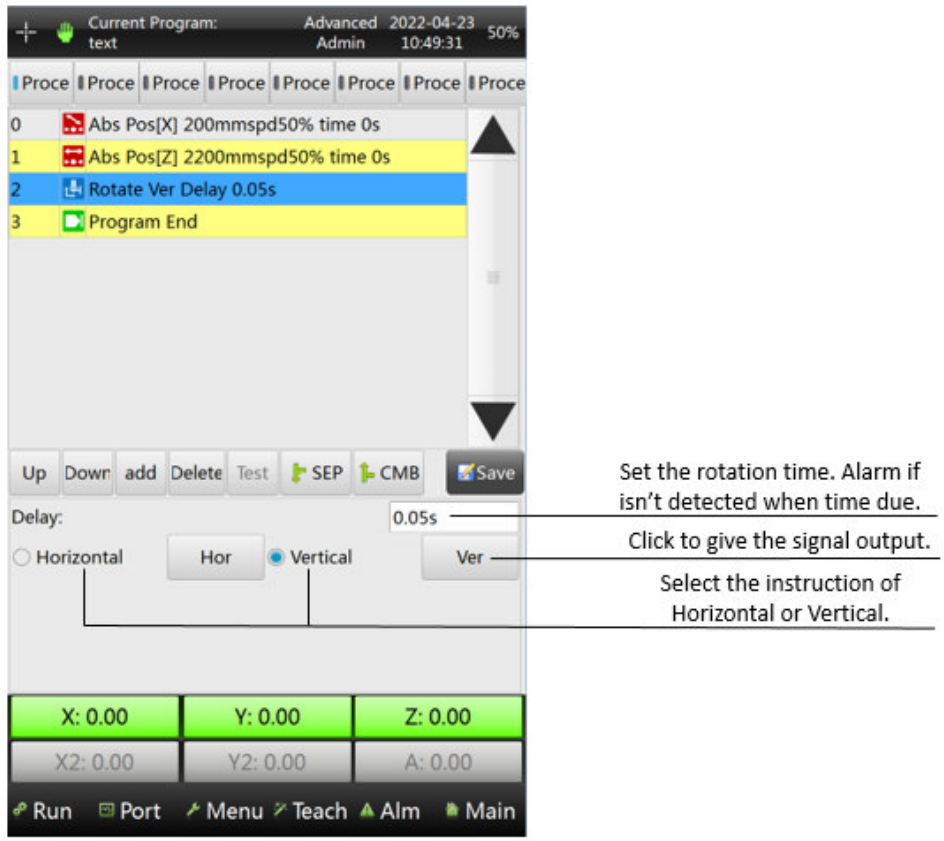


Select an instruction/command then Click 

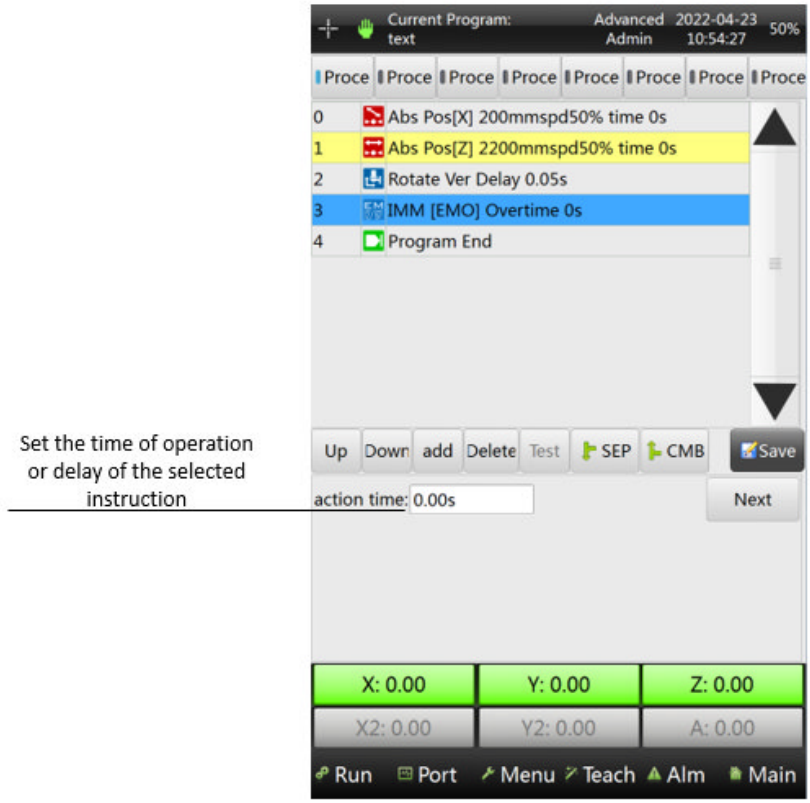
to confirm adding the new instruction / command as shown below:

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

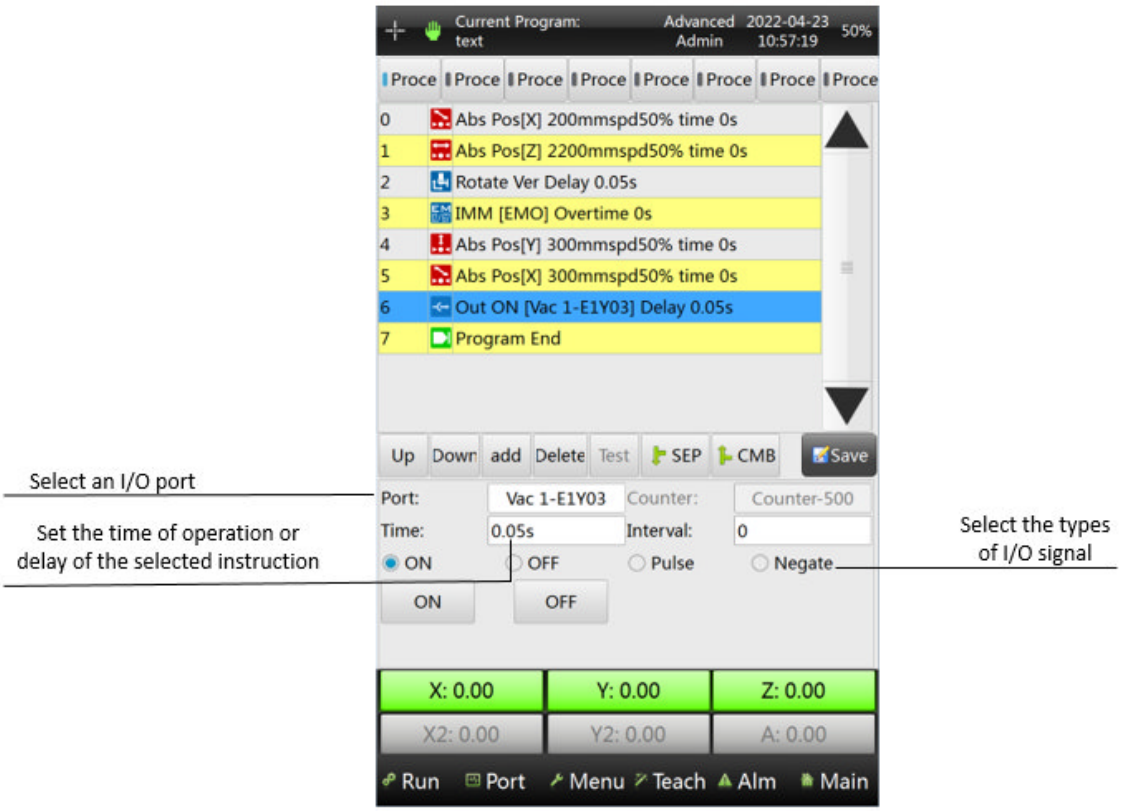
Adding the Main Arm pneumatic flipping cylinder instruction: Click the “ADD” button then select the “PA. Pneumatic” instruction and click the “OK”.



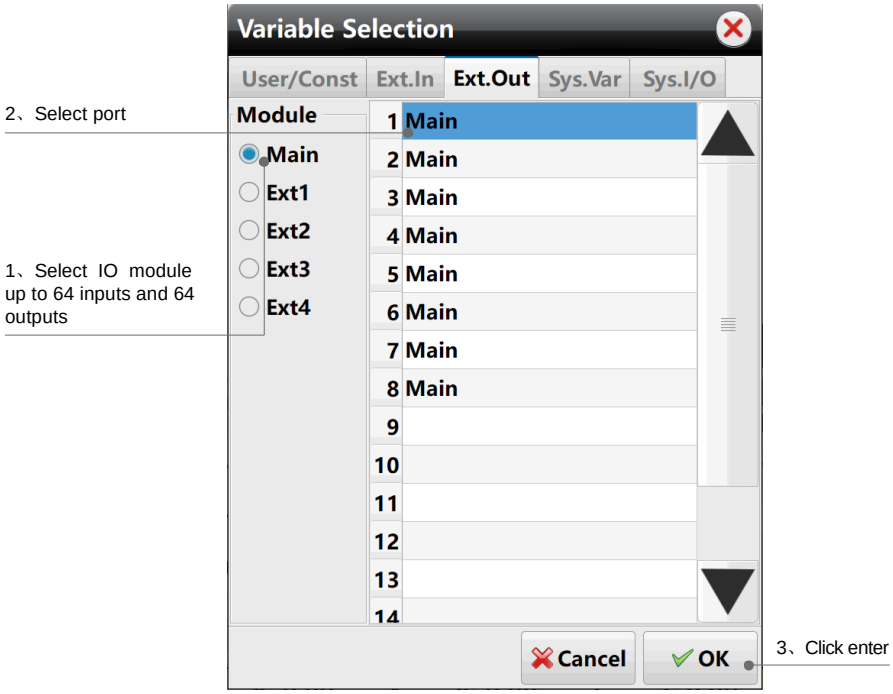
Add the IMM signal instruction to wait for the IMM signal by selecting the “IMM” on the “Action Selection” menu page. Here we select the “EMO” (Enable Mold Open) to let the robot wait for this signal before running the next instruction.



Add a vertical Y axis that goes down and then a horizontal X axis that moves forward which to simulate the robot arm picking the products in the mold. And add an I/O port instruction for the end of the arm tool(EOAT), take the vacuum / suction cup as an example Turn on the vacuum / suction cup (Vac 1-E1Y03) to simulate the robot's tool picking the product through the vacuum by the suction cup.



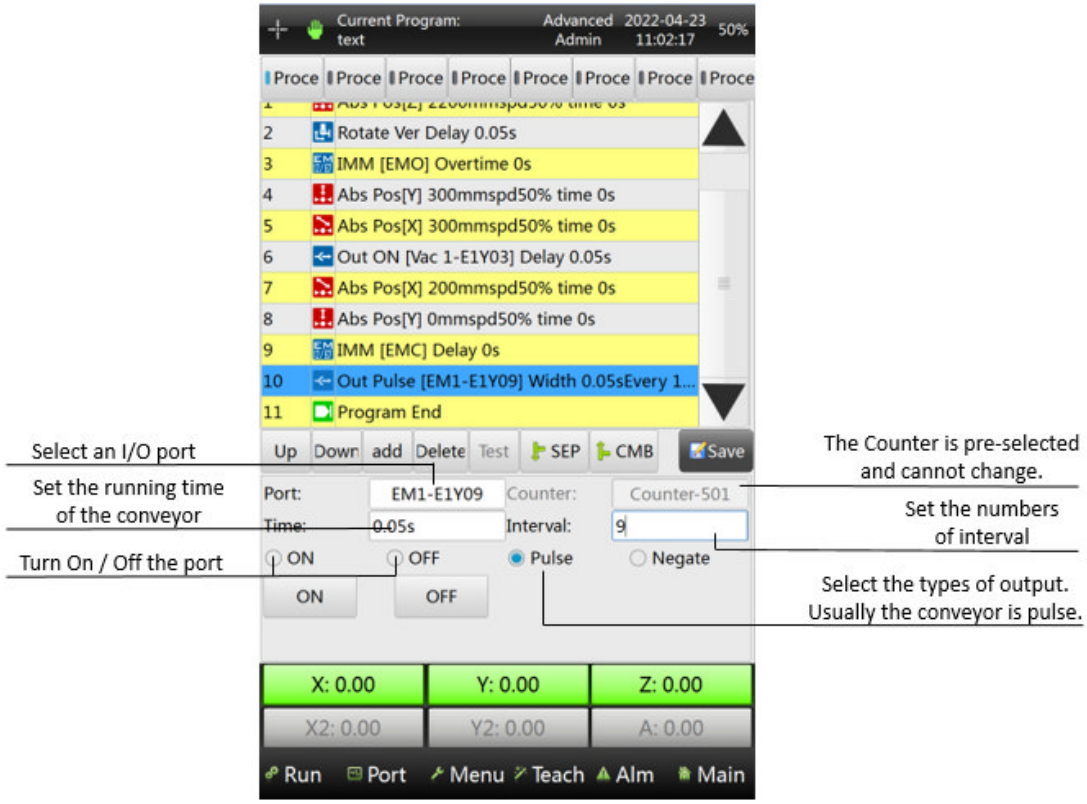
I/O port selection pop-out page



Add horizontal X axis moves backward, vertical Y axis goes up and IMM signal EMC (Enable Mold Close) which to simulate the robot arm get the product and then going out of mold area.

Then check the No.10 instruction below about giving signals to the conveyor.

To stack the product on the conveyor, set an interval to let the robot run a stacking cycle. Take stacking 10 products as an example, set the interval as 9 (Actual amount minus 1). The robot will give the pulse signal to the conveyor every 10 times (9 intervals).



The instruction for the operation of turning On or Off is the same instruction of EOAT.

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

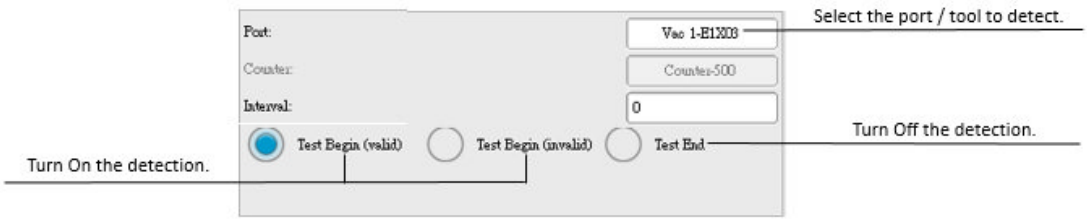
Negate (Reversed Polarity): Reverse the output signal polarity of the present instruction. Switch it On when preselection is Off and switch it Off when preselection is On.

Test Begin / Detection Signal of the EOAT (in the Extended Input Signal)

The detection signal of the EOAT is the use of detecting whether the tool (suction cup, jig, pneumatic cylinder and etc.) works as it should. For example, If the suction cup doesn't get the product or the product was dropped, it will sound an alarm to let you know.

If the detection is required, turn it On this page which you can find in the “Extended Input” instruction on the “Action Selection” menu page by pressing “ADD” button.

If the detection of the tool isn't required, just add an "Extended Output" instruction for the tool operating.

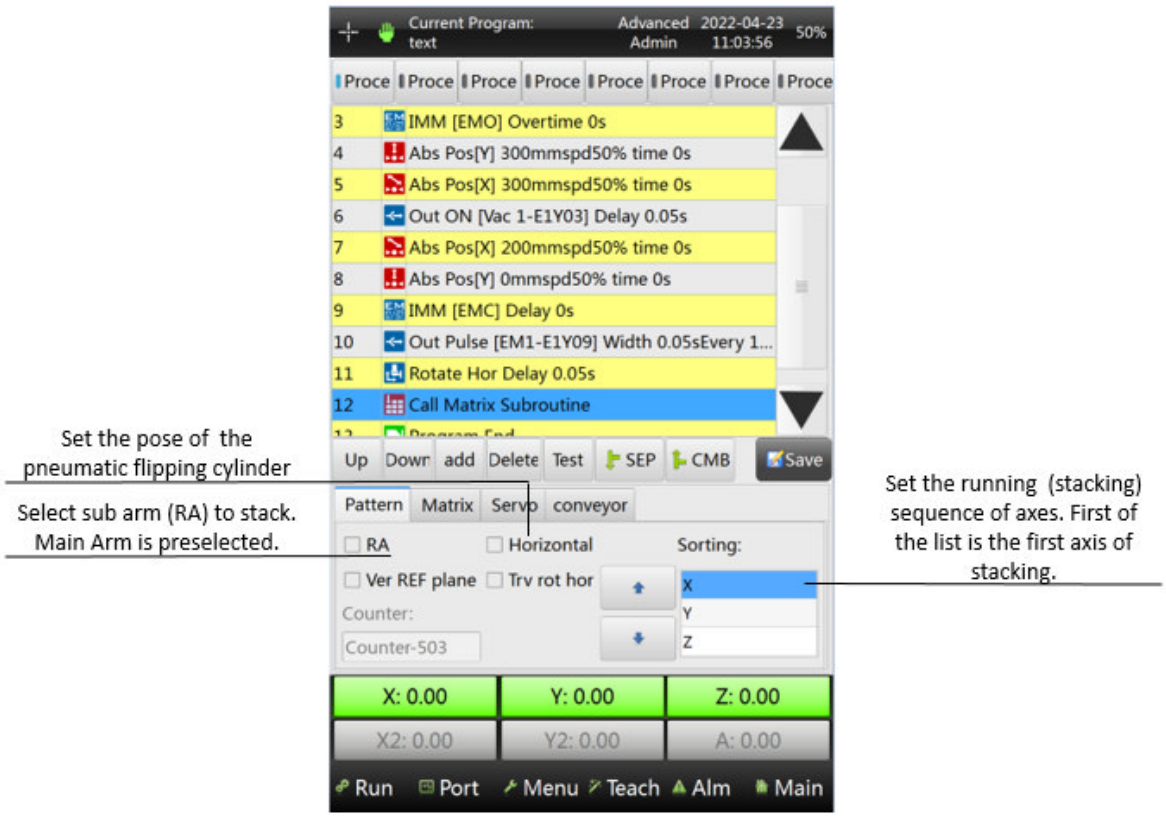


The “Palletizing” (Matrix) function as shown below:

The “Pattern” setting page of “Matrix” instruction.

Ver REF plane: Vertical to the reference plane. Here are the settings of the running sequence of the servo axis when stacking. Vertical to the reference plane is mostly the use of inserting components and which the servo axis sequence is Z -> Y -> X. Horizontal to the reference plane is the preselection in this instruction with the servo axis sequence of Z -> Y -> X which is often the use of the stacking condition.

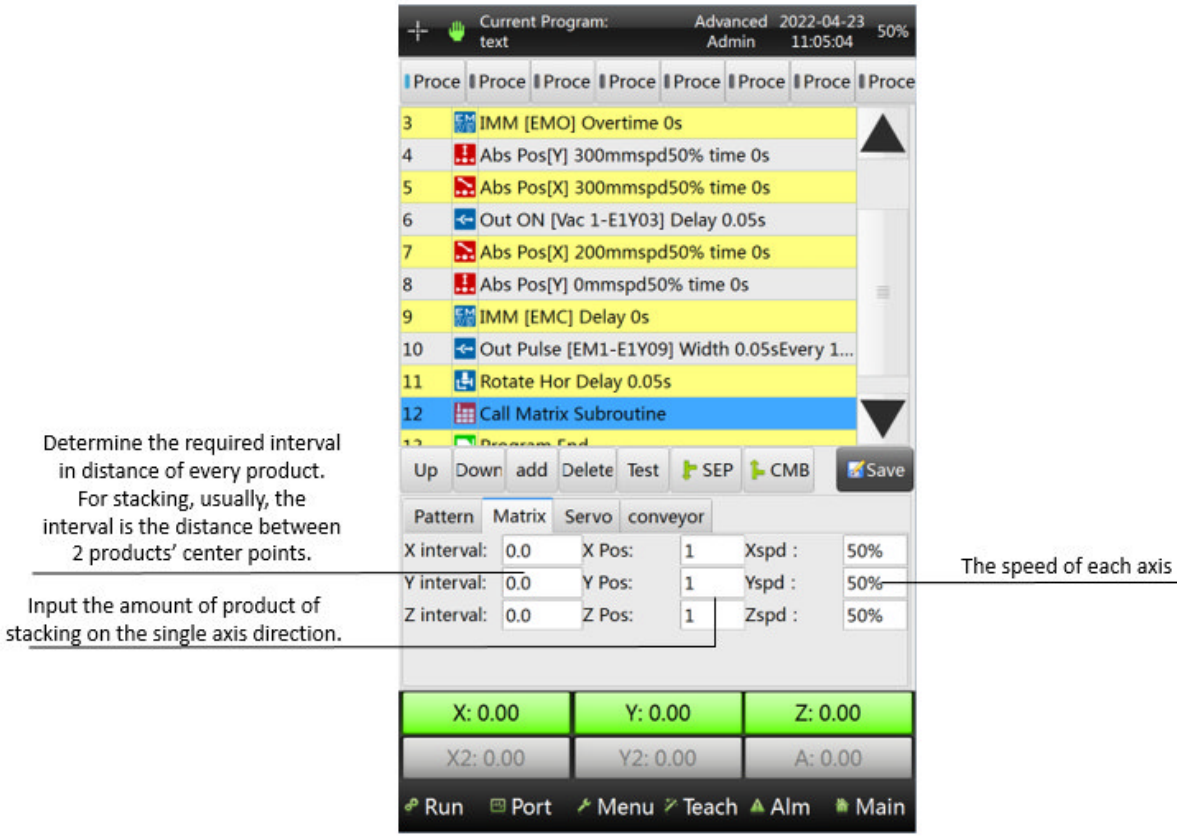
Trv rot hor: Traversing rotate horizontal, the robot allows traversing (moving in Z axis direction) only when the main arm pneumatic flipping cylinder keeps horizontal pose.



The “Matrix” setting page of “Matrix” instruction.

Interval: Determine the required interval in distance of every product and the interval will be the number of products minus 1.

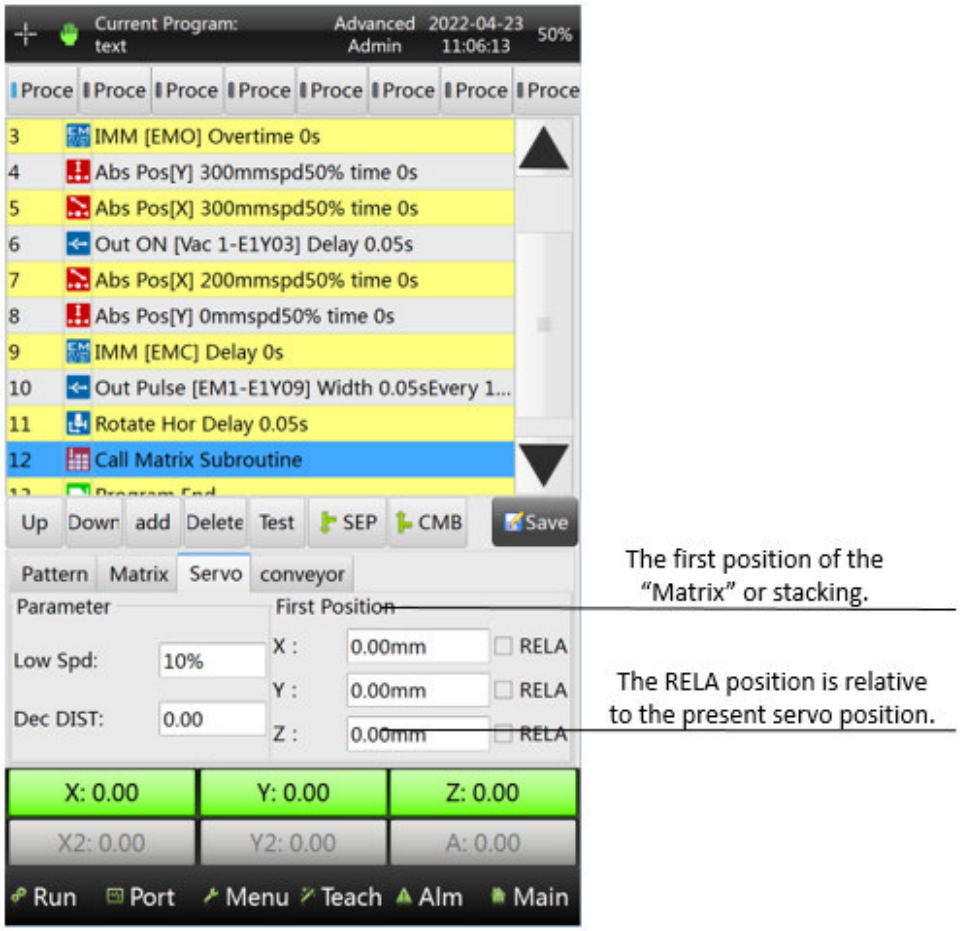
For stacking, usually, the interval is the distance between 2 products’ center points



The “Servo” setting page of “Matrix” instruction.

First Position: Is the first position of the matrix which is likened to the home position.

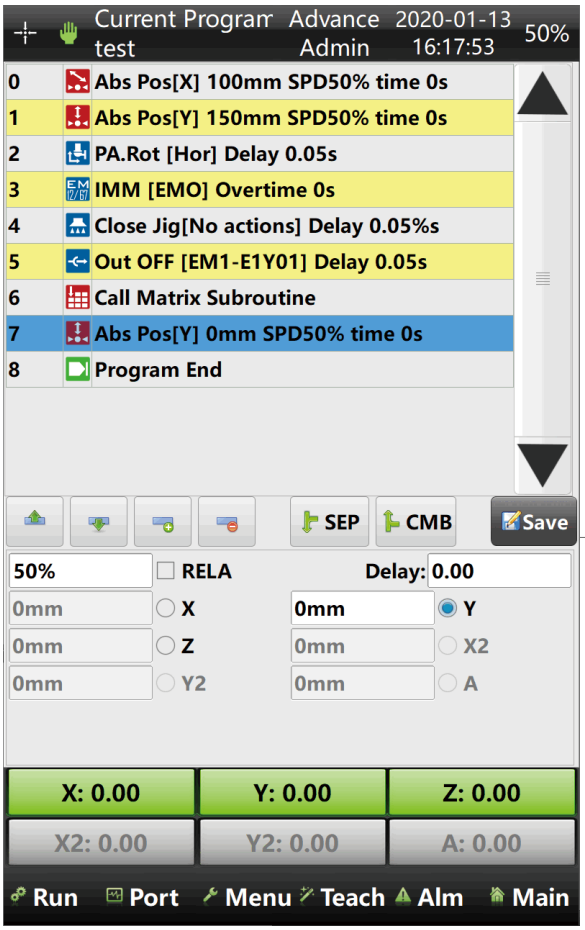
RELA Position: Relative position is relative to the present servo position, the servo will determine the destination position as the present position and extra the value in the parameter.



The first position of the "Matrix" or stacking.

The RELA position is relative to the present servo position.

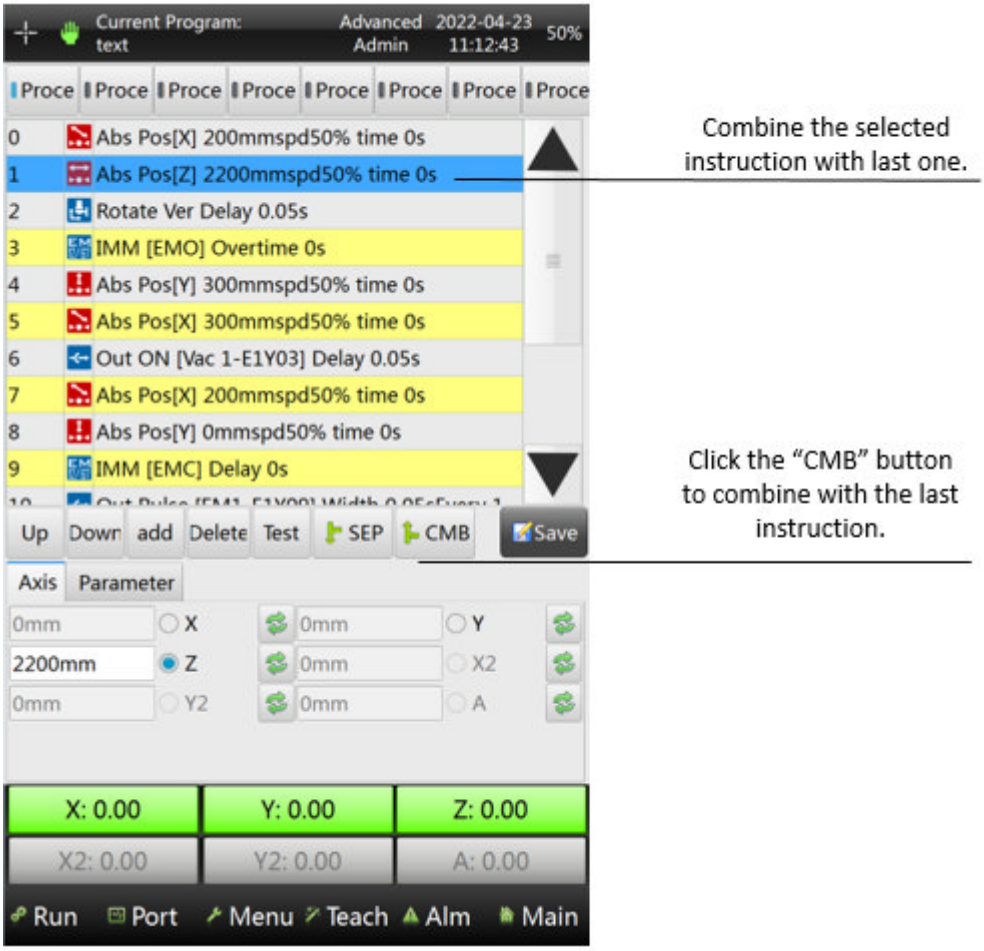
Now finishing the Teach program by clicking the "Save" button.



Finish the programediting then save

Combine and Separate the instructions

Combine: Combine the selected instruction which highlight in blue with the one above it. One time you can only combine one instruction above with the selected one.



Separate: Separate the selected instruction which highlight in blue with others.

Other instruction brief description

"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 finds a signal of deceleration then the servo reduces its speed; if it finds a signal of stop running then the servo stop running.

Speed: Is the running speed when the signal of low speed or stop isn't detected. If the low speed signal is not used, this value is suggested to set as low value. Low speed is the moving speed when low speed is detected.

Low Spd: Is the running speed when the signal of low speed has been detected.

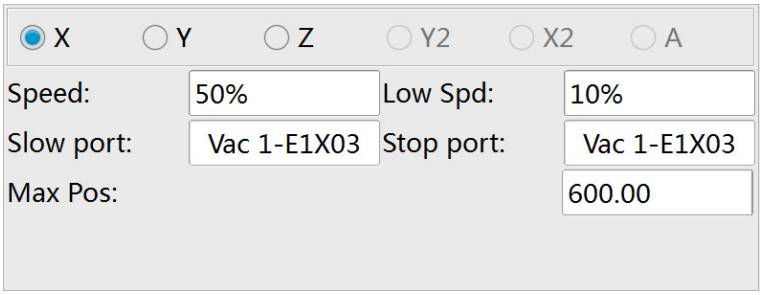
Here set the 600 mm as the max position value, and the X axis servo will manage to do the instruction that has been set if it found the signal.

Slow port: Slow signal port, the set port which will decelerate the running speed of the servo.

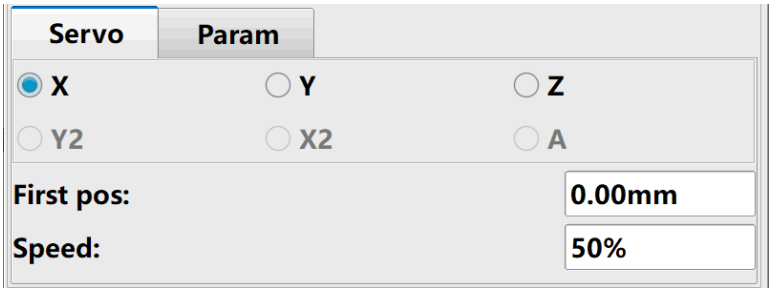
m

Stop port: Stop signal port, the set port to give the stop signal,

If it doesn't get any signal, then it will stop when it reaches the Max Position.



"Single Loop" positioning instruction:



Choose one axis to stack. Enter the position in the blank of first position blank. Number of point and stacking number (level), speed, interval can be set in parameter

page.

Conditional determined Instruction

The second page, "Flow" page, of the "Action Selection" menu page by pressing "ADD" button and pressing the "Flow" page button.

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.

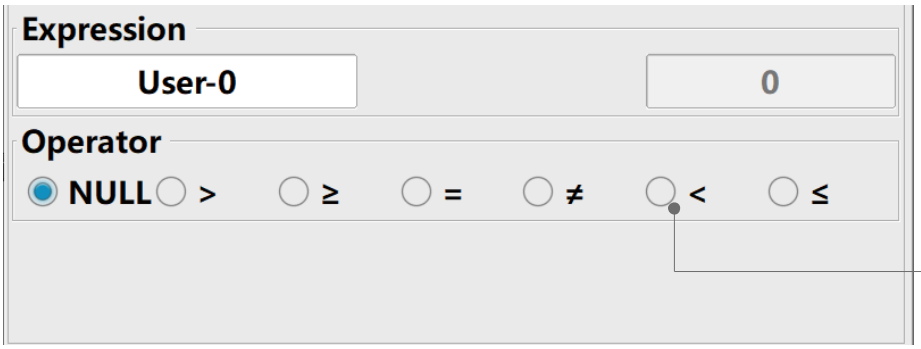
"ELSE": If the variable is NOT valid

{ } 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

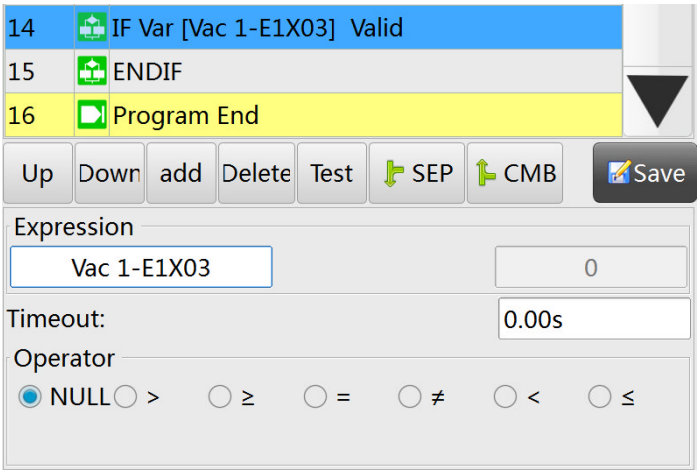


ck this 

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.**

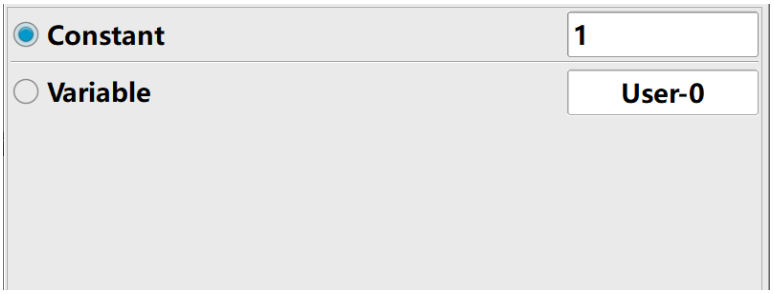


In order to set the instruction to execute when the signal of vacuum is detected, just insert the required instruction between 14 and 15.

In this case, this instruction only executes when the vacuum signal is valid (the suction cup gets the product). It will jump to the instruction behind the "ENDIF" if the vacuum signal is invalid (the suction cup doesn't get the product).

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.

6.2.1.1 Remark

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.

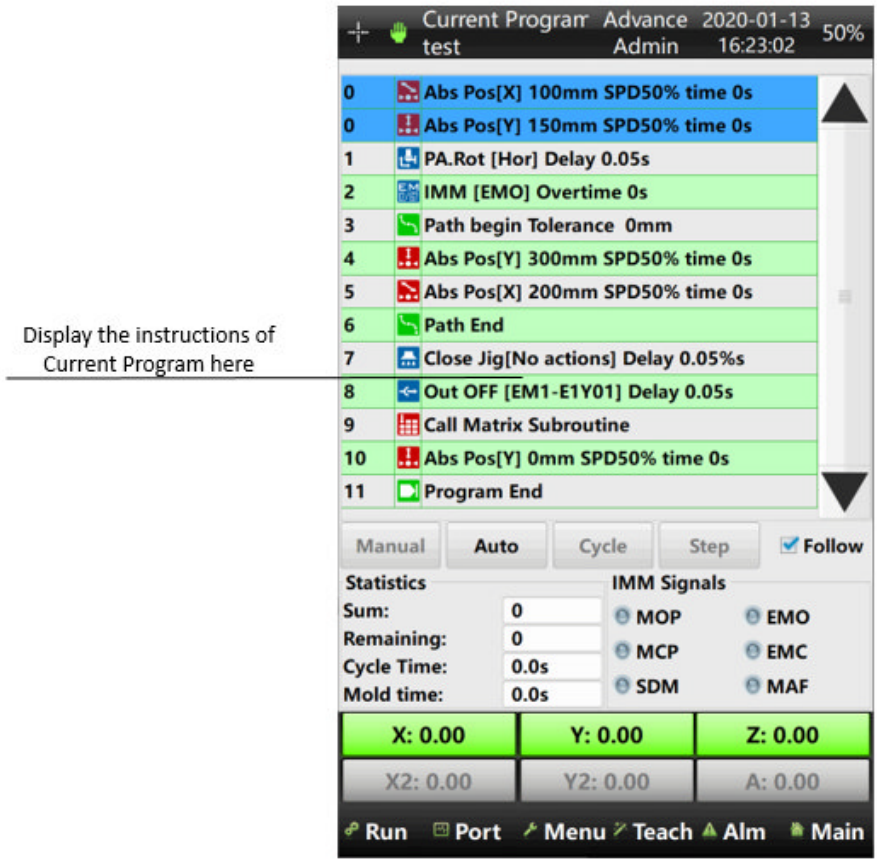
15. Can’t have 2 EMO (Enable Mold Open) in a same combination of instructions.

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.

6.3 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:



1) **Statistics**：Display the related Statistical information in the Auto Running condition.

- **Sum**：The number of products has been produced (picked up).
- **Remaining**：The number of products that still need to produce according to the "Production Plan" of the “System Setup”.
- **Cycle Time**：The time of one producing cycle when Auto Running mode.
- **Mold Time**：It's the time that since the Mold Opened signal was received to the Enable Mold Close is given.

2) **IMM Signals**：Showing the signals came from IMM.

EMO: Enable Mold Open

EMC: Enable Mold Close

MAF: Mold Area Free (Safety)

MOP: Mold Opened Position

MCP: Mold Closed Position

SDM: Safety Door or Devices

3) **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.
4) **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.
5) **Cycle**：Single Cycle. In the Auto Standby condition, the program will run one cycle only and then stop.
6) **Step**：Single Step. In the Auto Standby condition, the program will run one step of present instruction only and then stop.
7) **Follow**：In the Auto Running condition, the instructions list of the program will follow the present program running condition.

6.4 Alarm Interface

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

6.5 Alarm Solution

Alarm Code	Alarm information	Solution`
[000]	No alarm	
[001]	Invalid main arm moving	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 IMM command	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 program command	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	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 command parameter	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 command	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]	Invalid expansion	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 sequence 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]	Cycled command format error -no cycle end	In the program, a “FOR” instruction (loop start) must go with a “ENDFOR” instruction (loop end). Check if there is any extra of “FOR” or lack of “ENDFOR” in the program.

[011]	Cycled command format error -no cycle start	In the program, an “ENDFOR” instruction (loop start) must go with a “FOR” instruction (loop end). Check if there is any extra “ENDFOR” or lack of “FOR” in the program.
[012]	Conditional command format error -no conditional end	In the program, an “IF” instruction (condition start) must go with a “ENDIF” instruction (condition end). Check if there is any extra “IF” or lack of “ENDIF” in the program.
[013]	No end command in program	Check the current program and add a “Program End” (in the Action selection page) instruction to it.
[014]	Command in combined command is over 30	Check the combined instructions of the program and remove some unnecessary instructions to make the number of combined instructions less than 30 lines.
[015]	Combined command format error -no end	Within a set of combined instructions, a “Combine Start” must go with a “Combined End” instruction. Check if there is any extra “Combine Start” or lack of “Combine End” in the program.
[016]	System variable can be read only, not be written	The system variable is a read-only variable and cannot be re-write.
[017]	User variable out of scope, the number must be between 0 -255	Check whether the User Variable exceeds the range from 0 to 255.
[018]	No IMM auto signal.	Check whether there is an “AUTO-X03” signal on the port monitor page of the controller. If there isn’t, check whether the 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]	No IMM safety door signal.	Check if there is an “SDM-X02” signal on the port monitor page of the controller. If there isn’t, check whether 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]	No IMM intermediate plate signal.	Check if there is an “MMOP-X06” signal on the port monitor page of the controller. If there isn’t, check whether the DC 24V voltage at the “MID terminals” of the “CN2 terminals block” on the mainboard. If it doesn’t

		have, then check the wiring.
[021]	Production plan had been finished.	Planned production quantity is reached. Please check it.
[022]	Reject exceed in auto mode.	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]	Disable mold close, sub-arm not in 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 mold. If it is, check the sub-arm safety area signal where may have a problem and the proximity sensor.
[028]	Disable mold close, main arm not in safety 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 mold. If it is, check the sub-arm safety area signal where may have a problem and the proximity sensor.
[029]	Disable rotate, main arm in mold and down-going.	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]	Main arm Y axis is not in original position, cannot run in auto mode	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]	Robot cannot be in auto mode when not in out mold area	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 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”.
[033]	Expanded input signal missing	Please check whether the extended

		input port receives a signal.
[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 horizontal to go in auto mode	Please check the main arm pneumatic flipping cylinder and rotate it to horizontal or change the setting of "Rotate Status" on the "Run" branch page of the “System Setup” page.
[036]	Servo did not go to original position yet	Please return to the Home position before further operating.
[037]	Main arm not in home position, servo axis traverse not safety.	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]	Second arm not in home position, servo axis traverse not safety.	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 mold safety area. Please manually move it to a safe area.
[040]		
[041]	No “mold open” signal, sub-arm cannot down-going.	Check if the IMM’s mold 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. If it doesn’t have, then check the wiring.
[042]	No “medium mold open” signal, sub-arm can not down-going.	Check if the IMM’s middle mold opened to the position. If it was, check whether the DC 0V voltage at the “MID terminals” of “CN2 terminals block” on the mainboard. If it doesn’t have, then check the wiring.
[043]	No “mold open” signal, main arm cannot go down.	Check if the IMM’s mold 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. If it doesn't have, then check the wiring.
[044]	No "medium mold open" signal, main arm cannot go down.	Check if the IMM's middle mold opened to the position. If it was, check whether the DC 0V voltage at the "MID terminals" of "CN2 terminals block" on the mainboard. If it doesn't have, then check the wiring.
[045]	Traverse axis not in safety area, main arm up/down not safety.	Please check the range of the traverse arm (Z axis) safety area and then move up/down the main arm.
[046]	Traverse axis not in safety area, second arm up/down not safety.	Please check the range of the traverse arm (Z axis) safety area and then move up/down the sub arm
[047]	Main arm x axis position is not in mold safety area	Please check the range setting of the inside mold safety area of the horizontal servo (X axis) on the "Servo Setup" page.
[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]	Second arm Y axis is not in original position, cannot run in auto mode	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]	System needs be maintained, please contact local distributor	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]	Robot stop auto running, IMM safety door had been opened. Please check the system setting.	Please check whether the safety door is been opened or the safety door signal is been interrupted.
[057]	System working condition error	Please contact SHINI agent and salesman in the city, territory, or country where you are.
[058]	If main arm rotate vertical, it cannot down inside mold.	Please set the “Rotate in mold” on the “Run” branch page of the “System Setup” page in the “Menu” of the controller before flipping the pneumatic flipping cylinder.
[059]	Main arm crosswise stroke exceed software distance	The current instruction of position exceeds the software limit and please check the program.
[060]	Main arm vertical stroke exceed software distance	The current instruction of position exceeds the software limit and please check the program.
[061]	Main arm robot traverse stroke exceed software distance	The current instruction of position exceeds the software limit and please check the program.
[062]	Second arm vertical stroke exceed software distance	The current instruction of position exceeds the software limit and please check the program.
[063]	Second arm crosswise stroke exceed software distance	The current instruction of position exceeds the software limit and please check the program.
[064]	Expanded axis stroke exceed software distance	The current instruction of position exceeds the software limit and please check the program.
[065]	Robot arm traverse stroke in mold safety area, but no signal.	Please check if the inside the mold 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]	Robot arm traverse stroke outside mold safety area, but no signal	Please check whether the outside of the mold 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, Second arm forward/back not safety	Please run the sub arm within the safety area of the traverse Z axis.
[068]	Traverse axis not in safety area, main arm forward/back not safety	Please run the main arm within the safety area of the traverse Z axis.
[069]	Main arm in up safety area, but no signal.	Please check if the safety area proximity sensor at the top of the main arm is malfunctioning. If it is OK, check the safety area setting on the “Servo Setup” page and check the range of the safety area within the sensing area.
[070]	Second arm in up safety area, but no signal.	Please check if the safety area proximity sensor at the top of the sub arm is malfunctioning. If it is OK, check the safety area setting on the “Servo Setup” page and check the range of the safety area within the sensing area.
[071]	Pallet position command 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.
[082]	Main arm vertical servo axis alarm	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 mold open overtime	The waiting time is due but it still no the "mold 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	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	Check the alarm code shown on the sub arm (vertical Y2 axis) servo driver and do troubleshooting.
[089]	Second arm vertical servo axis not on position	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	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	Check the alarm code shown on the extended axis servo driver and do troubleshooting.
[095]	Expanded servo axis not 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	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 mold and down-going, but no “mold open” signal.	Please check whether the mold opened signal from IMM is consistently giving. It could be signal interrupted or disconnected.
[101]	Second arm in mold and down-going, but no “intermediate mold open” signal.	Please check whether the middle mold signal from IMM is giving consistently. It could be signal interrupted or disconnected.
[102]	Main arm in mold and down-going, but no “mold 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 mold and down-going, but no “intermediate mold open” signal.	Please check whether the middle mold 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 backward limit position.	Please check the servo axis position then do the 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 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.
[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 mold safety signal.	Please check the “outside mold 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 cannot moving horizontally	Allow it by checking the “Rotate in mold” 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 mold X axis safety area, cannot 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 mold	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 mold 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 is missing.	Please check whether it has “DC 24V” at the two “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 mold close can be in combination	
[132]	Arm in mold without mold open signal (out mold)	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 mold without intermediate plate signal (out mold)	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 mold open signal Z axis is not safe to moving in mold (out mold)	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 mold)	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 moving	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 “CN3 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 “CN3 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]	Second arm goes down not in taking position or placing position	Please check whether the present position of the robot arm is within the safety area. The arm can move down only when it is within the safety area.

[142]	Second arm goes down in mold without mold signal	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 Mold Open Position" signal had been interrupted or disconnected.
[143]	Second arm goes down in mold without intermediate signal	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]	Second arm is in the mold without mold open intermediate signal	Check the middle mold signal of IMM.
[145]	Main arm is in the mold without mold open intermediate signal	Check the middle mold signal of IMM.
[146]	Too many Continuous paths	The number of “Path” instructions in the program exceeds the system limit.
[147]	Continuous path cross different area	Change the path or may cause safety concens..
[148]	Arm continuously going down without mold open signal	Without the “Mold Opened” signal, it's not safe to allow the robot arm to move down within the mold area.
[149]	Arm continuously going down without intermediate plate signal	Without the “Mold Opened” and "Middle Mold" signals, it's not safe to allow the robot arm to move down within the mold area.
[150]	No path ending	In the "Path" instruction programming, a “Path Begin” must go with a “Path End”. Please check if there is any extra “Path Begin” or lack of “Path End” in the program.
[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 mold open in path	Can’t put the “Wait MOP” (wait for mold open) instruction into the "Path" programming.

[155]	In mold safety and out mold 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 mold.	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 mold.	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 mold.	It is not safe for the arm to go down. A axis is not in the inside mold safety area.
[162]	The runner arm is penumatically introduced but the electric eye is not bright.	1.Check the air pressure between the solenoid valve and pneumatic cylinder and the proximity sensor.
[163]	The runner arm is penumatically introduced but the electric eye is bright.	1. Check the air pressure between the solenoid valve and pneumatic cylinder and the proximity sensor. 2. Check if the air tube was blocked or any blockage in the tube. 3. Check if the air tube was being blocked by the arm structure.
[164]	The runner arm is penumatic retraction but electric eye is not on.	1. Check the air pressure between the solenoid valve and pneumatic cylinder and the proximity sensor. 2. Check if the air tube was blocked or any blockage in the tube. 3. Check if the air tube was being blocked by the arm structure.
[165]	The runner arm is penumatically retracted but the imported electric eye is bright.	1. Check the air pressure between the solenoid valve and pneumatic cylinder and the proximity sensor. 2. Check if the air tube was blocked or any blockage in the tube. 3. Check if the air tube was been blocked by the arm structure.
[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 the Y axis upper position proximity sensor is on and its wiring.
[171]	The C axis is not in the safe position, and it is not safe for arms to traverse.	1.Check the C axis proximity sensor and its wiring. 2.Check the C axis safety area settings and parameters.
[172]	The arm rotation is not safe and cannot exceed the safe area in the mold.	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 mold.	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 distance” at the “Servo Setup” of the Menu.
[175]	B axis position exceeds software software.	Check the B axis “Software distance” at the “Servo Setup” of the Menu.
[176]	Axis B is not in the safe area, arm traverse is not safe.	1.Check the B axis proximity sensor and its wiring. 2.Check the B axis safety area settings and parameters.
[177]	Axis A is not in safe area, arm crossing is not safe.	1.Check the B axis proximity sensor and its wiring. 2.Check the B axis safety area settings and parameters.
[178]	The axis A is not safe to operate and cannot exceed the safety area in the mold.	Check the A axis safety area settings and parameters is proper for the current situation or not.
[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 and parameters is proper for the current situation or not.
[180]	The runner arm penumatically rotates in horizontal, but the electric eye is not bright.	1. Check the air pressure between the solenoid valve and pneumatic cylinder and the proximity sensor. 2. Check if the air tube was blocked or

		any blockage in the tube. 3. Check if the air tube was been blocked by the arm structure.
[181]	The runner arm penumatically rotates in horizontal, but the vertical electric eye is bright.	Check and see if the horizontal and vertical sensors of the pneumatic flipping cylinder are connected reversely.
[182]	The runner arm rotates in vertical, but the vertical electric eye is not bright.	1. Check the air pressure between the solenoid valve and pneumatic cylinder and the proximity sensor. 2. Check if the air tube was blocked or any blockage in the tube. 3. Check if the air tube was been blocked by the arm structure.
[183]	The runner arm rotates in vertical, but the horizontal electric eye is bright.	Check and see if the horizontal and vertical sensors of pneumatic flipping cylinder connected reversely.
[184]	Absolute value encoder not supported for X axis.	1. Check if the robot was equipped with the non-absolute servo driver and motor. 2.Check if the absolute encoder wasn't been set to use by the "Type" (encoder type) at "Servo Setup" of the Menu.
[185]	Absolute value encoder not supported for Y axis.	1.Check if the robot was equipped with the non-absolute servo driver and motor. 2.Check if the absolute encoder wasn't been set to use by the "Type" (encoder type) at "Servo Setup" of the Menu.
[186]	Absolute value encoder not supported for Z axis.	1.Check if the robot was equipped with the non-absolute servo driver and motor. 2.Check if the absolute encoder wasn't been set to use by the "Type" (encoder type) at "Servo Setup" of the Menu.
[187]	Absolute value encoder not supported for axis C.	1.Check if the robot was equipped with the non-absolute servo driver and motor. 2.Check if the absolute encoder wasn't been set to use by the "Type" (encoder type) at "Servo Setup" of the Menu.
[188]	Absolute value encoder not	1.Check if the robot was equipped

	supported for axis B.	with the non-absolute servo driver and motor. 2.Check if the absolute encoder wasn't been set to use by the "Type" (encoder type) at "Servo Setup" of the Menu.
[189]	Absolute value encoder not supported for axis A.	1.Check if the robot was equipped with the non-absolute servo driver and motor. 2.Check if the absolute encoder wasn't been set to use by the "Type" (encoder type) at "Servo Setup" of the Menu.
[190]	X axis absolute value encoder communication error.	1.Check the communication cable connecting between the servo driver and main board. 2.Check the communication settings and parameters.
[191]	Communication error of Y-axis absolute value encoder.	1.Check the communication cable connecting between the servo driver and main board. 2.Check the communication settings and parameters.
[192]	Communication error of Y-axis absolute value encoder.	1.Check the communication cable connecting between the servo driver and main board. 2.Check the communication settings and parameters.
[193]	Communication error of absolute value encoder of axis C.	1.Check the communication cable connecting between the servo driver and main board. 2.Check the communication settings and parameters.
[194]	Communication error of absolute value encoder of axis B.	1.Check the communication cable connecting between the servo driver and main board. 2.Check the communication settings and parameters.
[195]	Communication error of absolute value of encoder of axis B.	1.Check the communication cable connecting between the servo driver and main board. 2.Check the communication settings and parameters.
[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 mold and outside mold 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.	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 mold.	Check X axis inside the mold safety area setting and the parameters is proper for current situation or not.
[210]	Not outside the mold, the rotation level is not safe.	Check the inside mold 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 voltage voltage is low.	Check if the encoder battery voltage is normal or not, 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 cannot exceed the safety zone when traversing (the traversing is not	Check the settings and parameters of B axis inside mold and outside mold safety area.

	currently in the safety zone).	
[222]	The A-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 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 mold and outside mold safety area.
[255]	System communication error: the operator and the main control module cannot communicate normally. Please shut down the sytem. Then check the communication link is normal.	1.Check the communication cable connecting between the controller and the mainboard. 2.Then check the system software match the main board or not.
[300]	File system not found!	Please contact SHINI agent and salesman in the city, territory, or country where you are.
[304]	File system initialization error!	Please contact SHINI agent and salesman in the city, territory, or country where you are.
[208]	Unauthorized system software. The unauthorized system will affect stability and safety of the system	Please contact SHINI agent and salesman in the city, territory, or country where you are.
[255]	System communication error: Controller cannot communicate with mainboard, please turn of the system and check the connection.	1. Check the communication cable that connects the controller and the mainboard. 2. Then check whether the system software version matches the mainboard.

7. Absolute encoder

7.1 Servo motor settings

This chapter are 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 ：

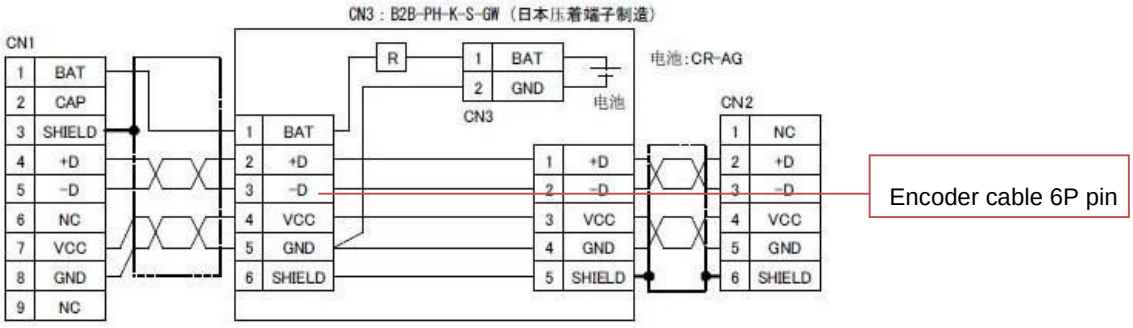
Set connection address of P4.0 and the range is "1-32"， The original preselected Default value 1. If here the setting is 1, the address in encoder should be 1 as well. In the same system， the encoder address should be the same value even though the servo is different.

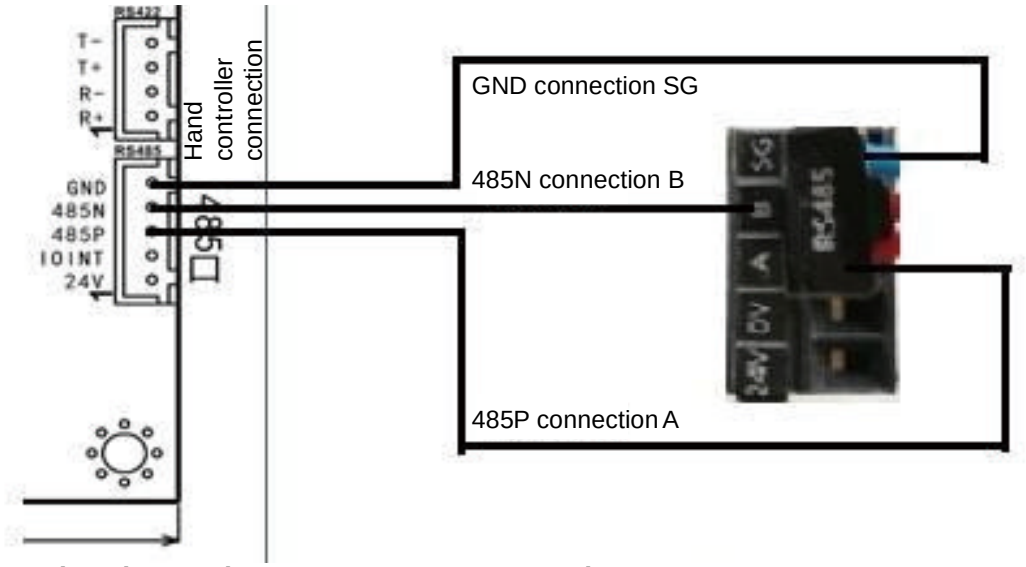
P8.0 set as 1，Select RS-485 non-same time communication

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

HCFA servo 6P Encoder battery diagram

HCFA Servo RS485 connection diagram





Motherboard Drive CN4

7.1.1 Changing the battery

When the low power alarm appears, please change the battery immediately. When changing the encoder battery, the power of the (24V) to the encoder should be turned on or you will lose the Home position setting and have to reset it again.

Note: the polarity of the battery must correct

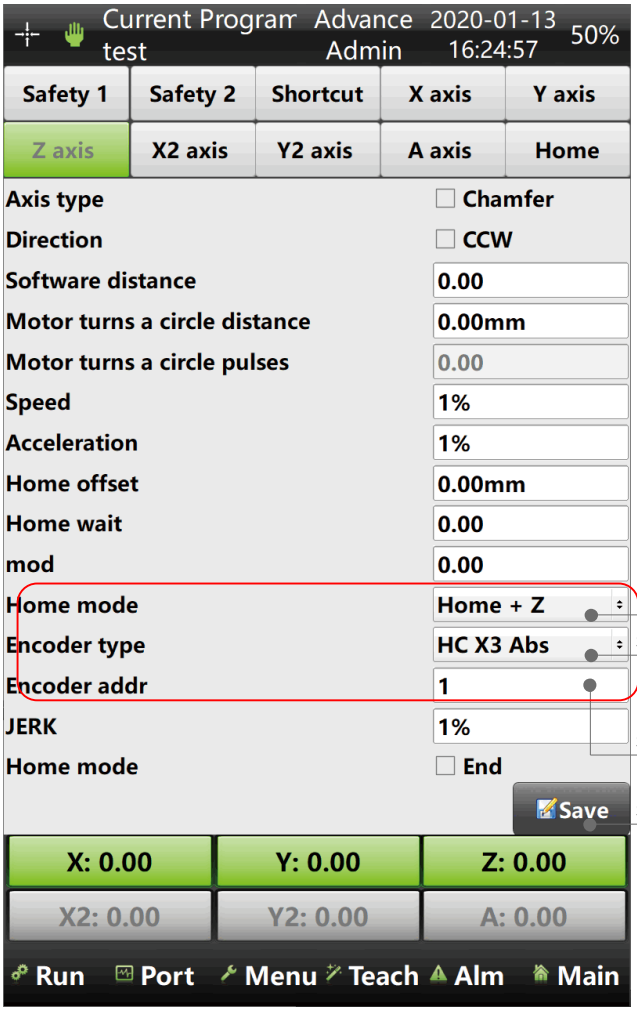
- ***Do not disassemble battery***
- ***Do not get the battery in a short circuit***
- ***Do not charge the battery***

Or it may cause an accident and safety issue.

Reboot the servo driver after setting.

7.2 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:



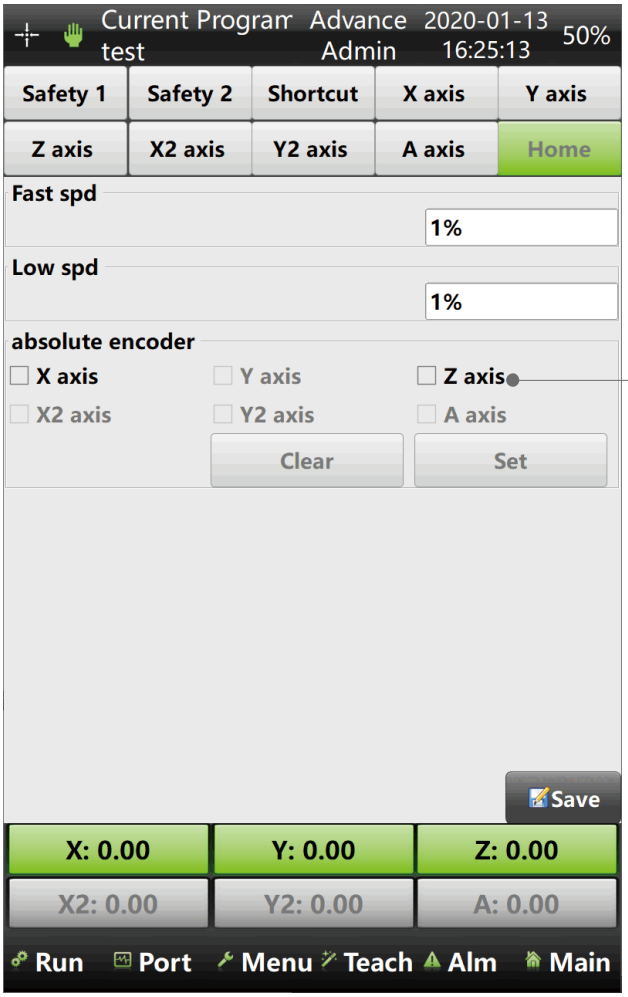
1. Set original position mode, +Z to find it

solving the problem

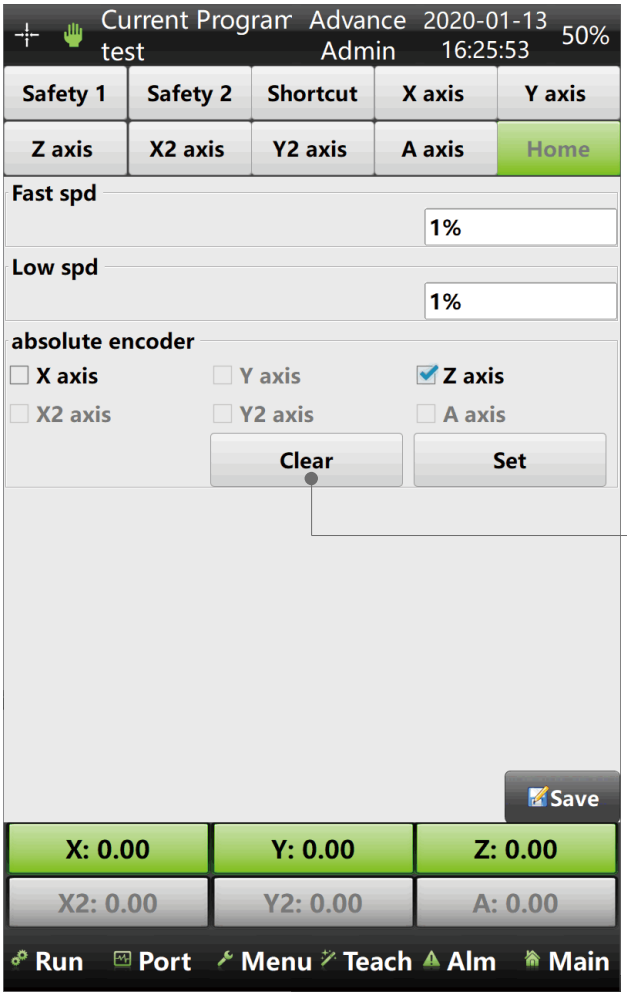
solving the problem

solving the problem

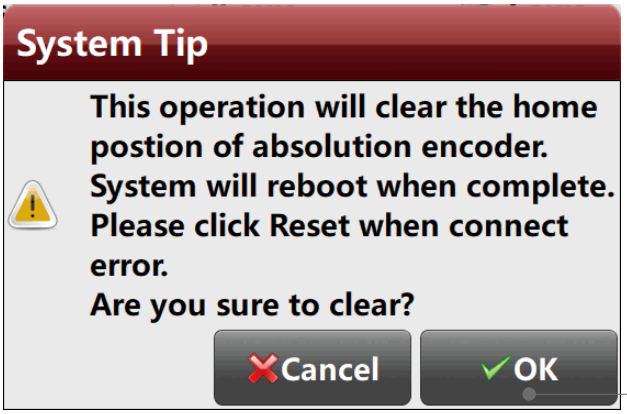
Pressing home position after reboot, enter advance manager password and go to original as shown below:



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

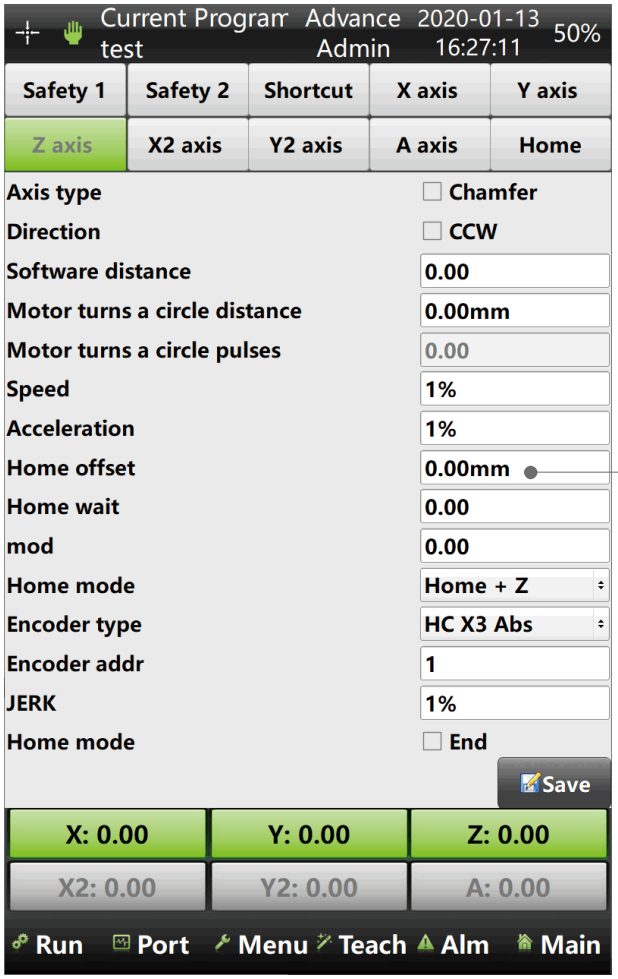


After selecting axis, click and Clear the value of encoder

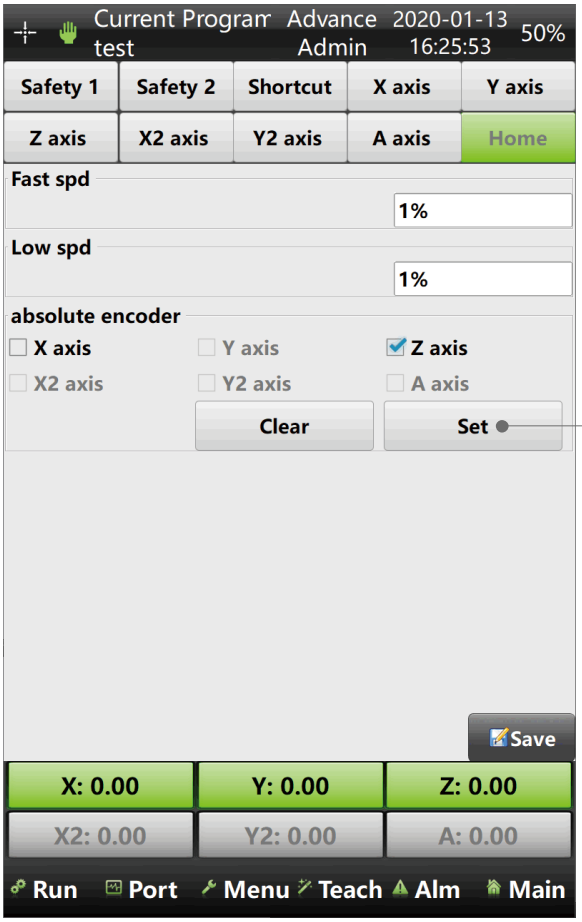


Click here in this window and reboot

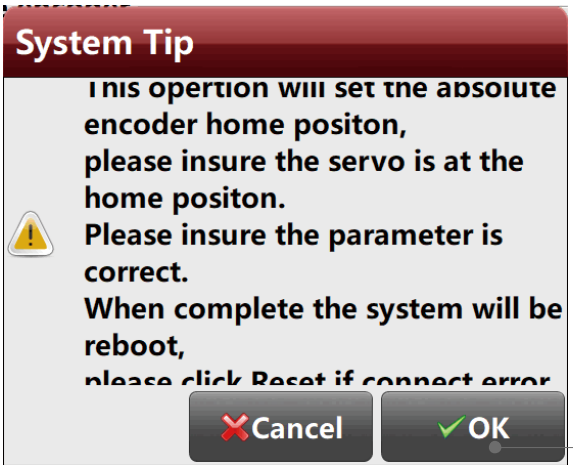
After reset, login by the “Advance Administrator” level and enter the “Servo Setup” page.



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.

8. Maintenance

8.1 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.

8.2 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.Maintenance Cycle

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

Table 8-1：Maintenance Specification

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 molding machine are tightened. 5. Check all the bolts, nuts, washers, spring washers, and screws of the robot and structure. 6. Check all the suction cups, grippers, jigs, EOATs, tools, brackets, and holders working normally or not.	1. Use an air blow gun to clean the air filter regulator, cover, and the surface of the robot. 2. Check the screws on all parts of the robot, make sure those screws are tightened. 3. Check whether the wires and pipelines are in good condition, change them if broken or loosed. 4. Check and adjust the running speed to keep the robot in a well-working condition. 5. Wipe and clean the dust upon the control box.	Add lubrication oil (Require: Add lubrication oil to all moving parts of the machine.)