

# **Wire forming control system**

## **User Manual**

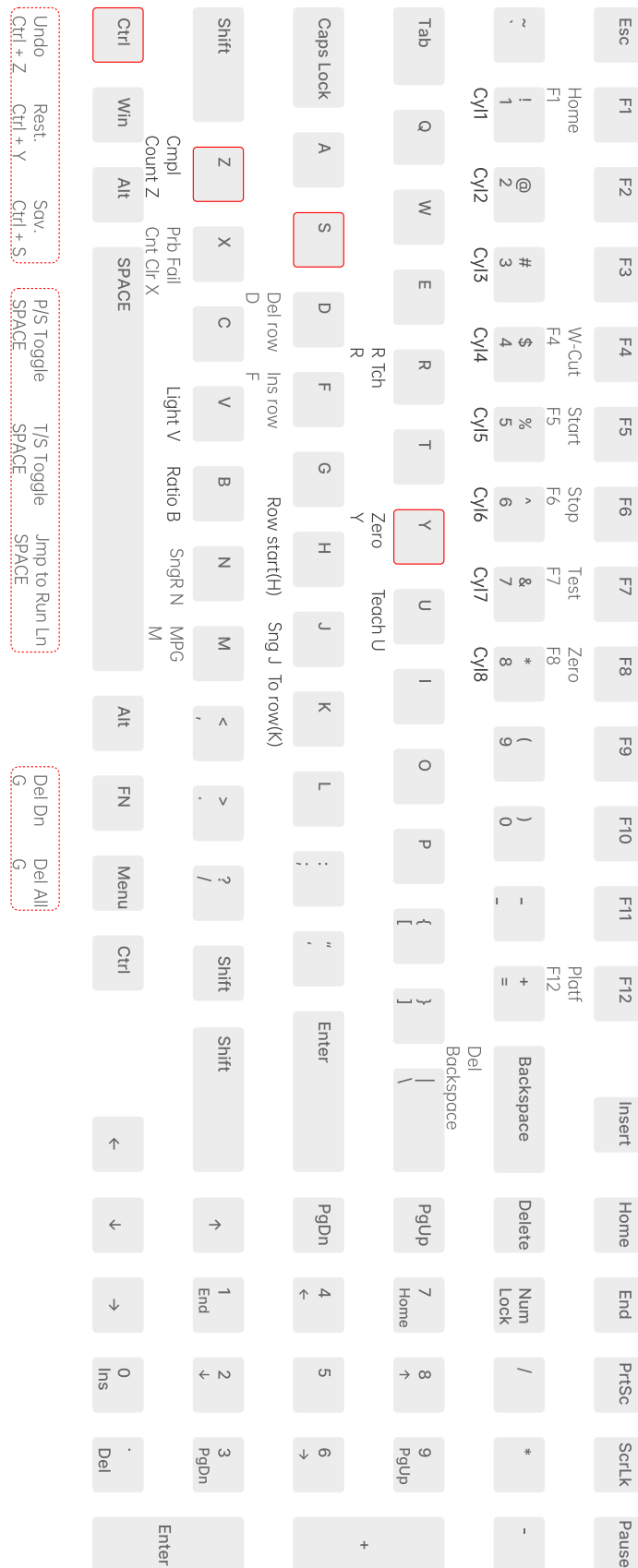
**V2.4**

(Applicable to SMC5016、SMC5008、SMC50E、SMC5014S series)

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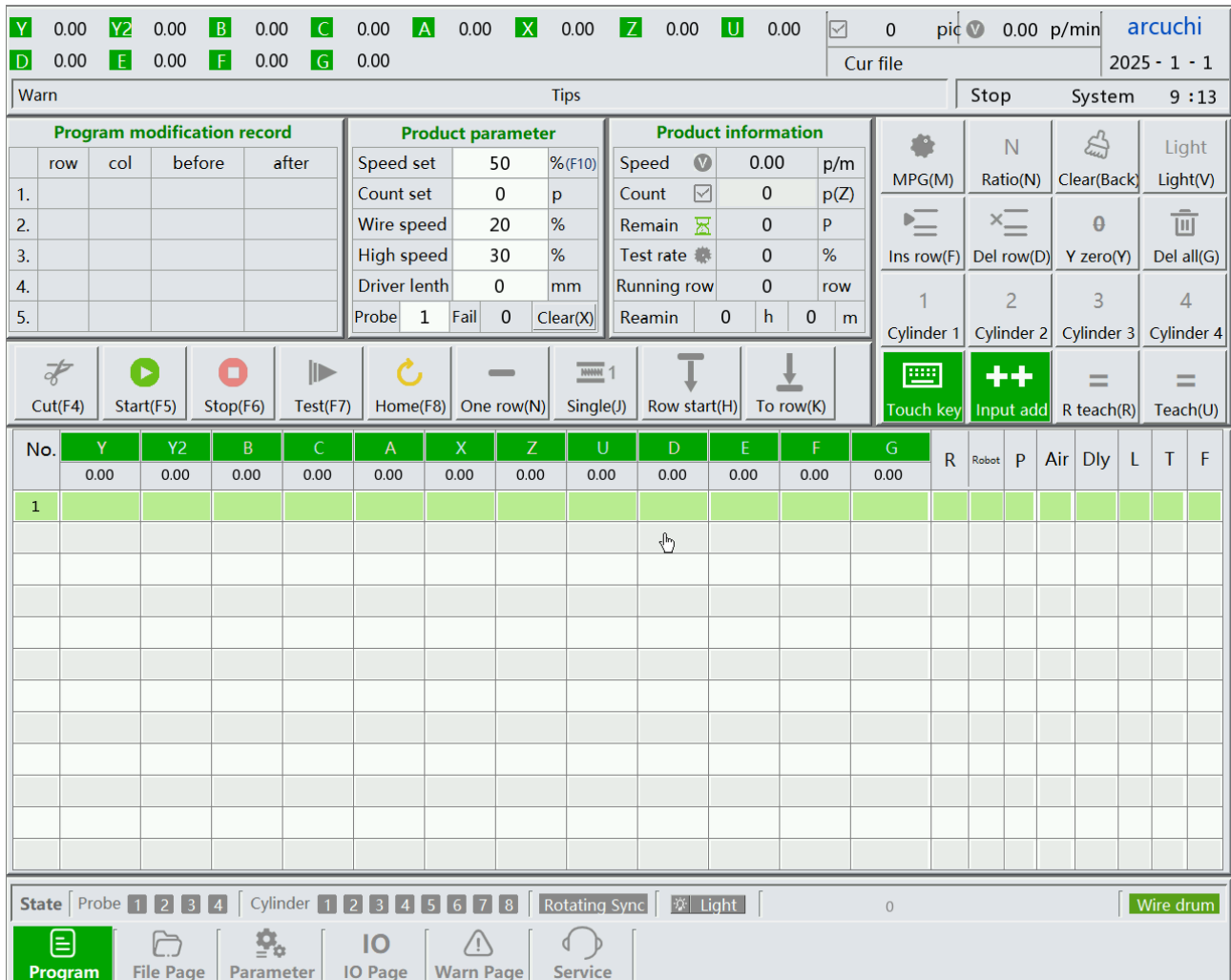
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## 1. Instructions for key operation



## 2.Operator interface

### 1.1 Programming page



The screenshot displays the 'Programming page' of the Wire Forming Control System. The interface is divided into several functional areas:

- Top Status Bar:** Displays axis positions (Y, Y2, B, C, A, X, Z, U) and status indicators like 'Warn', 'Tips', 'Stop', and 'System'.
- Program modification record:** A table with columns 'row', 'col', 'before', and 'after' for tracking changes.
- Product parameter:** A table for setting parameters such as Speed set (50), Count set (0), Wire speed (20), High speed (30), and Driver length (0).
- Product information:** A table for monitoring production data like Speed (0.00 p/m), Count (0 p(Z)), Remain (0 p), Test rate (0 %), Running row (0 row), and Reamin (0 h 0 m).
- Control Buttons:** Includes buttons for Cut(F4), Start(F5), Stop(F6), Test(F7), Home(F8), One row(N), Single(J), Row start(H), To row(K), Touch key, Input add, R teach(R), and Teach(U).
- Programming Table:** A large grid with columns for axes (Y, Y2, B, C, A, X, Z, U, D, E, F, G) and other parameters (R, Robot, P, Air, Dly, L, T, F). The first row is highlighted in green.
- Bottom Bar:** Contains tabs for State, Probe, Cylinder, Rotating Sync, Light, and Wire drum, along with navigation buttons for Program, File Page, Parameter, IO Page, Warn Page, and Service.

(1) **Program modification record:** When you edit the programming table, this area will record the corresponding rows and columns, and the values before/after the modification will be made.

(2) **Top area:** This area displays the basic status of the machine, such as axis status (position), machine alarm information, machine production information, files used by the machine, equipment operation status information, and so on.

(3) **Product parameter:**

- ① **Speed set:** The running speed of the equipment during production is 1~100%.
- ② **Count set:** The quantity of the equipment is produced, and when the quantity is reached, the equipment stops running.
- ③ **Wire speed:** The rotation speed of the wire frame during the production of the equipment is 1~100%.


- ④ **High speed:** When the wire frame pull rod is pulled up, the rotation speed of the wire frame is 1~100%.
- ⑤ **Driver lenth:** When the length of the Y axis is greater than this set value, the wire frame will rotate. This function does not work when set to 0.
- ⑥ **Probe:** The maximum number of probe failures allowed.
- ⑦ **Fail:** Probe failed count.
- ⑧ **Clear(X):** Zeroing out the probe failed count.

#### (4) Product information:

- ① **Speed:** The speed of the production of the product by the equipment, pieces/min.
- ② **Count:** The quantity that the device has produced.
- ③ **Remain:** Total Production - Completed = Remaining Pieces.
- ④ **Test rate:** The operating speed of the device during commissioning.
- ⑤ **Running row:** The row to which the current program (the program in the table) is executed.
- ⑥ **Reamin:** The time it takes to produce the remaining product.

#### (5) Device Control:

- ① **Cut(F4):** Press the button to pop up the trimming dialog box, and then press the spacebar to perform the trimming action. In the dialog box, you can set parameters such as cutter position, feed length, speed, etc. If the thread is in the state of handwheel before trimming, the wire feeding action will not be performed before cutting, and the cutting action will be performed directly.
- ② **Start(F5):** Press the button in the state of no alarm, and the device will enter the automatic operation state.

 Before turning on the device, pay attention to whether the external environment is safe.

- ③ **Stop(F6):** When a button is pressed in automatic operation, the machine finishes producing the current product and then switches to a stop state. When the button is pressed when it is reset to zero or in the handwheel state, the system immediately switches to the stop state.
- ④ **Test(F7):** Test run the program in test mode to check whether the program is correct; The machining speed can be controlled in real time by means of a debug knob.

- ⑤ **Home(F8):** Axis Reset button, when the button is pressed, the axis number display area above the program table area will display the axis reset button, you can select a single axis to zero, or all axes to zero as needed.
- ⑥ **One row(N):** Runs according to the rows selected by the table area cursor.
- ⑦ **Single(J):** Perform the procedure written in the table once.
- ⑧ **Row start(H):** If you run according to the row selected by the cursor in the table area, for example, if you select row 2, the program will run from line 2 until the end of the program.
- ⑨ **To row(K):** If you run according to the row selected by the cursor in the table area, for example, if you select row 6 (assuming you have 8 lines of program), then the program will stop running after running row 6.

**(6) Operation button area:**

- ① **MPG(M):** Press the button, the system will switch to the handwheel state, when the cursor is on any axis, you can use the handwheel to control; The handwheel operation is invalid when it is in the automatic running state.
- ② **Ratio(B):** When the button is pressed, the distance of the single-grid axis of the handwheel will be amplified according to the magnification set by the system.
- ③ **Clear(Back):** Clear the data in the cell (programming table) selected by the cursor.
- ④ **Light(V):** Turn on the device lights; Output the corresponding I/O signal (illuminator).
- ⑤ **Ins row(F):** Inserts a blank line above the line where the cursor is located.
- ⑥ **Del row(D):** Delete the line where the cursor is located.
- ⑦ **Y zero(Y):** Clears the current coordinate position of the Y-axis.
- ⑧ **Dw del(G):** The default value is "Full Deletion", and in the full deletion state, all programming data in the table will be cleared. If you want to change the parameter to Delete Down, you need to configure the deletion mode Parameters page->Other parameters2->Full deletion mode->below the current rows". In this state, the data for the cursor's row and all rows below is deleted.
- ⑨ **Cylinder 1/2/3/4:** The manual control button of the cylinder is invalid in the automatic operation state.
- ⑩ **Touch key:** Touch the keyboard switch.
- ⑪ **Input add:** Turn on this button to add up the programming tables. If the accumulation is invalid, or the switch is not turned on, but the accumulation is still valid; Notice that on

the System Parameters page, the Accumulation Selection mode for each axis is configured correctly.

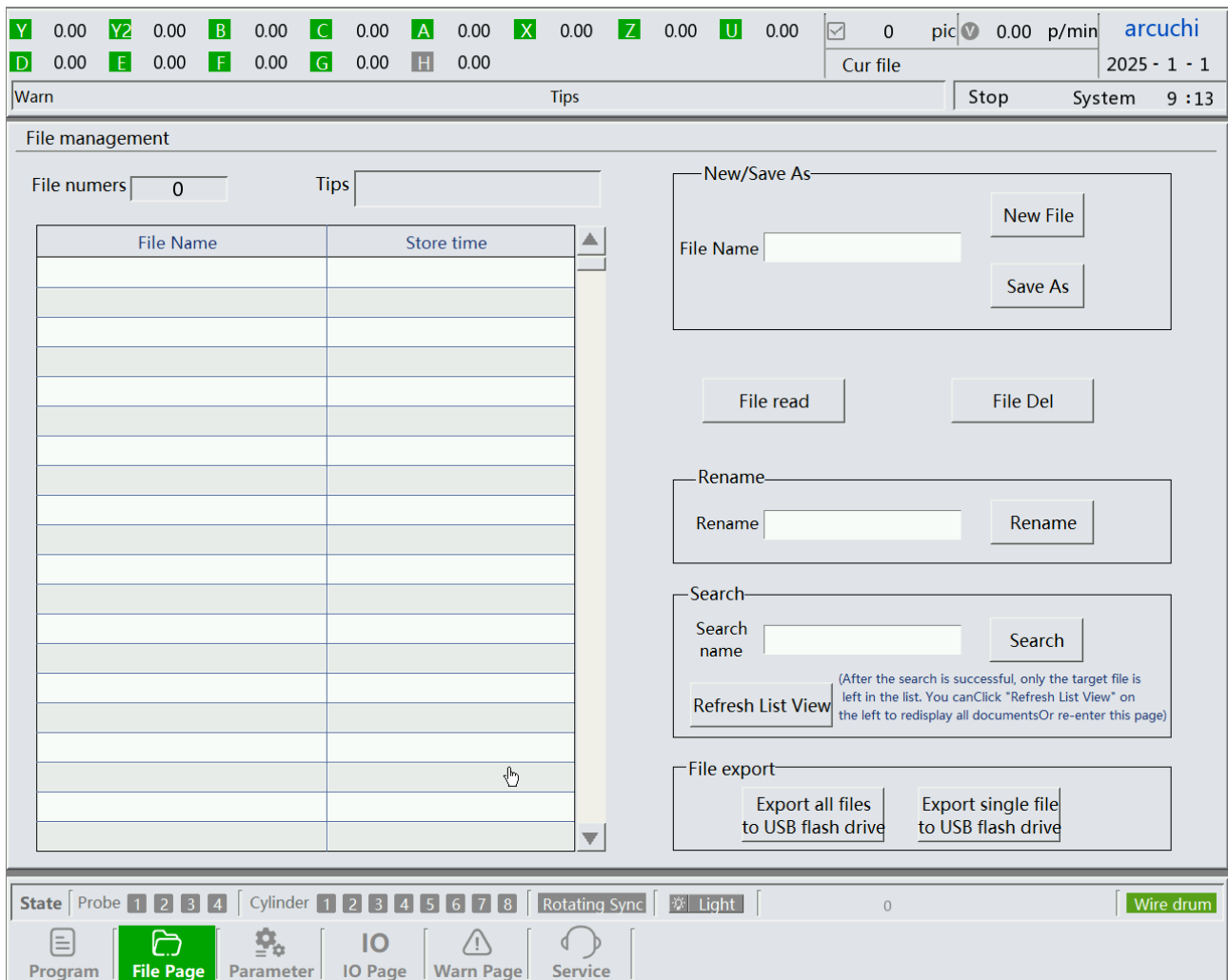
⑫ **R teach(R)**: In handwheel mode, pressing the teach will teach fill all axes in the cursor row.

⑬ **Teach(U)**: In handwheel mode, teach fill the cell where the cursor is located.

#### (7) Programming Forms:

- ① **Y/B/C...**: The axis name is displayed and the axis switch control, and the coordinates of this axis are displayed below the name.
- ② **R**: Set the speed of a single line, and if this is not set, then it will be run according to the "running speed".
- ③ **P**: The current line detects the probe number.
- ④ **Air**: Control the specified cylinder number to open or close; A positive number opens the cylinder, and a negative number closes the cylinder.
- ⑤ **Dly**: After the execution of the program, the time for the next line of the program to be executed is delayed.
- ⑥ **L**: Enter 1 to indicate the start of the cycle, and in the Number of times in the same row column, enter the number of times the cycle needs to be cycled, and enter 9 to indicate the end of the cycle.
- ⑦ **T**: Number of cycles.
- ⑧ **F**: It is often used to mark the function of this section of the program, so as to facilitate the reading of the program; You can freely enter 0~999.


## 1.2 File storage page



- (1) **File numbers:** All saved program files in the device.
- (2) **File Name:** The file identifier of the data stored by the user. Storage Period: The time when the file is stored.
- (3) **New File/Save As:** Enter the name of the file you want to create/save in the input box on the left, and select the button on the right as needed to complete the creation or save the program file.
- (4) **File read:** Select the file you want to read in the file list on the left, and then press the "Read File" button to read the file.
- (5) **File Del:** Select the file you want to delete in the file list on the left, and then press the "Delete File" button to delete the file.



- (6) **Rename:** Select the file to be renamed in the file list on the left, enter a new name in the input box, and click the "Rename" button to complete the file renaming operation.
- (7) **Search:** Enter the name of the file you want to search in the input box, and then press the "Search" button to search for the file you need.

 Note: After the search is successful, the file list will only show the searched files, if you need to re-display all files, click the "Refresh File List" button.

## 1.3 Parameters page

Y	0.00	Y2	0.00	B	0.00	C	0.00	A	0.00	X	0.00	Z	0.00	U	0.00	0 pic	0.00 p/min	arcuchi					
D	0.00	E	0.00	F	0.00	G	0.00	H	0.00					Cur file		2025 - 1 - 1							
Warn										Tips										Stop		System 9 : 13	

参数设置

Product information			Product information			Wire frame parameters		
Product	0	piece	Speed	50	%	Broken dly	[0 is invalid]	1.0 S
Completed cnt	0	(Z) piece	Robot 1 output time	0.5	S	Winding dly	[0 is invalid]	2.0 S
Remainder cnt	0	piece	Robot 1 detect time	180	S	Feed speed	20	%
Remainder hous	0	h	Robot 2 output time	0.5	S	High speed	30	%
Remainder min	0	min	Robot 2 detect time	180	S	Dirver length	0	mm
Product speed	0.00	p/min	Loop add Y-length	0.00		Wire drum run dir	Forward	
Percentage completed	0.00	%	Loop add Y-line	0		Inch mode	Feed Inch	

Other para			Other para2		
Hyd cut forward dly	2.00	S	Cylinder hold	OFF	
Hyd cut back dly	2.00	S	Screen brightness	Brightness 5	
Safety door detection	ON		Y Theoretical length	200.0	Y calc molecule
Screen time	0	min	Y Actual lenth	200.0	
Screen page	0		<b>Follow-para be modified only with manager</b>		
Time	9 : 13 : 53		Y enable Ext-Encode	OFF	
Shut off cylinders when returning	No		Delete all mode	Delete all	
Air pressure detection	OFF		Clear data requi-res confirmation	OFF	
Cylinder mode	Multi-col		Delete row requi-res confirmation	ON	
			Mul-Circle value	circle+angle	

More para

Wire drum Forward

Wire drum Reversal

Statistics

Maintenance

Manual Air

Gear ratio

Remote

Upgrade

Sys Para

// Servo reset

Servo On


Servo Off

State Probe 1 2 3 4 Cylinder 1 2 3 4 5 6 7 8 Rotating Sync Light 0 Wire drum

Program File Page **Parameter** IO Page Warn Page Service

### (1) Product information:

- ① **Speed:** The running speed of the equipment during production is 1~100%.
- ② **Robot 1/2 output time:** When the robot is used, the duration of the IO point output of the robot.
- ③ **Robot 1/2 detect time:** When the robot is inspected, the time of the IO input signal "1/2 of the robot is completed" is detected. When 0 is set, the "manipulator 1/2 complete" signal is not detected.
- ④ **Loop add Y-length:** Assuming a step size of 100, each cycle will add 100 to the previous feed.
- ⑤ **Loop add Y-line:** The number of the line that the loop accumulates to execute.

 **Note:** The above loop is added up and is only valid when looping, if both the step size and the line number are 0, this function is invalid.

**(2) Wire frame parameters:**

- ① **Broken dly:** When the input signal on the I/O page is disconnected abnormally, the time (anti-shake) of the signal is detected with a delay after the signal is received.
- ② **Winding dly:** When the input signal on the I/O page is abnormal, the time (anti-shake) of the signal is detected with a delay after the signal is received.
- ③ **Feed speed:** The rotation speed of the wire frame during the production of the equipment is 1~100%.
- ④ **High speed:** When the wire frame pull rod is pulled up, the rotation speed of the wire frame is 1~100%.
- ⑤ **Dirver length:** When the length of the Y axis is greater than this set value, the wire frame will rotate. This function does not work when set to 0.
- ⑥ **Wire drum run dir:** Selection of the direction of rotation when the wire frame is running.
- ⑦ **Inch mode:** There are two modes to choose from for this option; Wire inching: When using the handwheel, only the inching of the Y axis can be controlled; Cursor Inch: When using the handwheel, the sizing of the cursor axis is controlled according to the column selected by the cursor (programming page).

**(3) Other para:**

- ① **Hyd cut forward dly:** Indicates the delay time before performing the hydraulic shear action.
- ② **Hyd cut back dly:** Indicates the delay time before performing the hydraulic shear retreat action.
- ③ **Safety door detection:** Whether to detect the safety gate IO input signal.
- ④ **Screensaver mode:** You can set four screensaver modes: System Default, Black Screen, Home Screen, and Dynamic Image.
- ⑤ **Dynamic screensaver time:** When "Screensaver Mode" is set to "Dynamic Image", the time to enter the dynamic image interface after the screen is not operated.
- ⑥ **Screen time:** When "Screensaver Mode" is selected as "Black Screen", the time to enter this black screen interface after the screen is inactive.
- ⑦ **Time:** Displays the current system time, which cannot be modified if no permission is obtained.

**(4) Other para2:**

- ① **Cylinder hold:** When this function is turned on, the cylinder will remain open after beating a product.
- ② **Air pressure detection:** When this check is enabled, the input signal on the IO page will be detected as "insufficient air pressure", and if there is a signal, the device will stop running.
- ③ **Y Theoretical length:** The Y-axis is written as the feed length.
- ④ **Y Actual length:** The actual feed length of the device.
- ⑤ **Encoders are used for the feed spools:** The Y-axis uses the control options of the encoder, and the specific encoder parameters need to be modified on page 3 of the system.
- ⑥ **Delete all mode:** Please see the "Programming Page" - > explanation of Down-Down/Delete All (G).
- ⑦ **Clear data requires confirmation:** After this function is enabled, a pop-up window will prompt you when you perform the "Clear" operation on the programming table.
- ⑧ **Delete row requires confirmation:** After this function is enabled, a pop-up window will be displayed when you perform the "Delete Row" operation on the programming table.

(5) **Other para 3:**



- ① **Cylinder OFF when homing:** When performing the full-axis zeroing action, the control cylinder is closed along with the zeroing action.
- ② **Screen brightness:** Control the brightness of the display, the higher the value, the brighter the screen.
- ③ **Mul-Circle value:** For example, 2150.00 is 150.00° for 2 circles, and the data is not cleared when it goes to 360°, and the forward one digit is displayed as a circle, and each time it returns to zero, it can be selected back to zero according to the zero mode.
- ④ **Servo reset:** Restore the servo to its initial state.
- ⑤ **Servo On:** The drive circuit of the servo motor is activated by the control signal, so that the motor enters the state of ready operation.
- ⑥ **Servo Off:** The drive signal of the servo motor is cut off, and the motor enters a free state (no torque output).

(6) **Cylinder mode:**

- ① **Multi-col:** A single line of the programming table can open multiple cylinders at the same time. For example, cylinder number 12 means that cylinder No. 1 and No. 2 are opened at the same time, and -12 means that cylinder No. 1 and No. 2 are closed at the same time. 9 indicates hydraulic shears. The multi-row cylinder mode only supports up to 8 cylinders.
- ② **Single-col:** Only one cylinder can be turned on and off in a single row of the programming table. For example: 12 means to open the No. 12 cylinder, -12 means to close the No. 12 cylinder. 0 indicates hydraulic shears. Up to 20 cylinders can be supported in a single row. When the number of cylinders used is greater than 8, please use the single-row cylinder mode!

## (7) More para:

More para		
Lubrication time	000000.00	S
Lubrication Interval	0000000.0	H
Lubrication enable	Off ▼	
Pro. speed mode	p/min ▼	
Input left and right step sizes	000.00	
Input up and down step sizes	000.00	
Teach mode	Line teach ▼	
Probe Speed [0 is invalid]	000000.00	mm/s
Probe Axis	Y2 ▼	Reboot
Probe Axis Stop	All Axis ▼	Reboot

// Servo reset
 Servo On
 Servo Off

- ① **Lubrication time:** Set the time for lubricating the machinery.
- ② **Lubrication Interval:** Set the time between lubrication machines.
- ③ **Lubrication enable:** Turn lubrication on or off.
- ④ **Pro. speed mode:** Set the output to pieces/min or seconds/piece.
- ⑤ **Input left and right step sizes:** Sets the value of the left and right arrow keys to increase or decrease.
- ⑥ **Input up and down step sizes:** Sets the value of the up and down arrow keys to increase or decrease.
- ⑦ **Teach mode:** Set up a coaching mode (available for regular customers).
- ⑧ **Probe Speed:** Set the probe speed to a maximum of 321.5 and set 0 to not take effect.
- ⑨ **Probe Axis:** Select the probe for the corresponding axis.
- ⑩ **Probe Axis Stop:** Set the probe stop mode to Standard or all axes.

## 1.4 System upgrade page

Y 0.00	Y2 0.00	B 0.00	C 0.00	A 0.00	X 0.00	Z 0.00	U 0.00	<input checked="" type="checkbox"/> 0 pic	V 0.00 p/min	arcuchi
D 0.00	E 0.00	F 0.00	G 0.00	H 0.00	Cur file		2025 - 1 - 1			
Warn					Tips					Stop System 9 : 14

### Upgrade instructions

Search Graphic Files

Search System Files

Search Complete machine program

Automatic backup complete machine program

0 page

1. Copy the upgrade file to the root directory of the USB flash drive

2. If there are drawing files, system files, complete machine program file in the upgrade file. Click the corresponding search button. After all loads are completed, power off and restart.

3. Complete machine program backup can backup the current complete machine program. Automatic backup complete machine program can automatically backup the current machine program when upgrading complete machine program.

Search operation file

Load 1

Load 2

Load 3

Load 4

Load 5

Load 6

### Machine message

Startup time: 0 h 2 min  
Production time: 0 h 0 min  
Debugging time: 0 h 2 min  
Manufacturer: arcuchi  
Date: 2025 year 1 moth 1 day  
Used: 0 year 0 moth 0 day

File size

0

File Message

Loaded

0

File num

0

File type

### HMI version

IMG Ver:	2023 / 4 / 11	9 : 4 : 35
DRW Ver:	2024 / 11 / 21	11 : 27 : 54
USR Ver:	2025 / 4 / 12	18 : 5 : 53
LIB Ver:	2023 / 6 / 28	18 : 1 : 30
CSR Ver:	2024 / 9 / 19	9 : 0 : 42
FNT Ver:	0 0 0	0 0 0

### Controller version

BIO Ver:	2023 / 5 / 31	7 : 53 : 14
IMG Ver:	2025 / 4 / 12	17 : 43 : 39
FPG Ver:	2023 / 7 / 28	17 : 32 : 0
LAD Ver:	0 / 0 / 0	0 : 0 : 0
Software Ver:	Wirebend 5016/1	Customer number: 397
Host SN:	1770 0000 0000 0000	0

Communication mode

Network port

Time zone

China-Beijing

System decode

System para import

System para export

en-US

Error R54: 61462

code R55: 209

State

Probe 1 2 3 4

Cylinder 1 2 3 4 5 6 7 8

Rotating Sync

Light

0

Wire drum

Program

File Page

Parameter

IO Page

Warn Page

Service

### (1) How to upgrade:

- ① Insert the USB flash drive into the USB port on the back of the screen, and select the button you want to click according to the file type you want to upgrade.
- ② Search Graphics File (Screen) Search for the main system file (SMC host).
- ③ According to the name displayed on the left, press the corresponding load button to display a confirmation pop-up window, click OK to upgrade.
- ④ Pull out the USB flash drive, power off and reboot to complete the upgrade.

(2) **Search Graphic Files:** Used to search for display programs in a USB flash drive.

(3) **Search System Files:** Used to search for host programs in a USB flash drive.

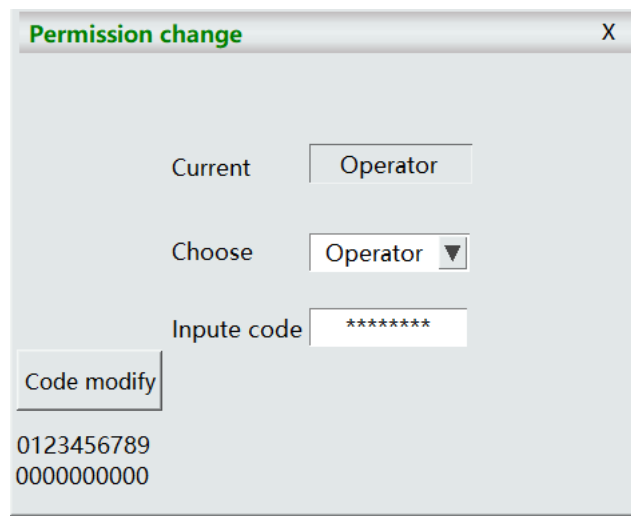
(4) **Search operation file:** It is used to search for process files saved to a USB flash drive.

(5) **Communication mode:** You can choose one of the two communication methods of network port and RS422, and the system adopts network port communication mode.

- (6) **Time zone:** There are four time zones to choose from: Greenwich, Berlin, India, and Beijing.
- (7) **System decode:** Click the system decryption button to manually enter the decryption page in advance.
- (8) **System para import:** Import the file "system.sy" in the arcuchi folder of the USB flash drive to the system.
- (9) **How to import:**
  - ① After clicking "System Parameter Import", a pop-up window will prompt, click Confirm. Select the corresponding file, click Load to complete the import, and after the import is successful, there will be a prompt "Import System Parameters Completed".
  - ② System parameter export: Export system parameters to the arcuchi folder in the USB flash drive (no arcuchi will be automatically created), and name it "system.". sy"; Note that if there is already "systemSY" file, which will be overwritten.
- (10) **Language switching:** Language switching is possible.
- (11) **"Page 0":** When there are many Chinese files on the USB flash drive, the middle list does not display all the files, you can use this parameter to switch the page to display the remaining files.



## 1.5 Permissions feature page



### (1) Function details:

- ① Default operator, no password required to log in.
- ② Permission level: system vendor> administrator> operator.
- ③ Default password for administrators: 11111111 (8 1s).

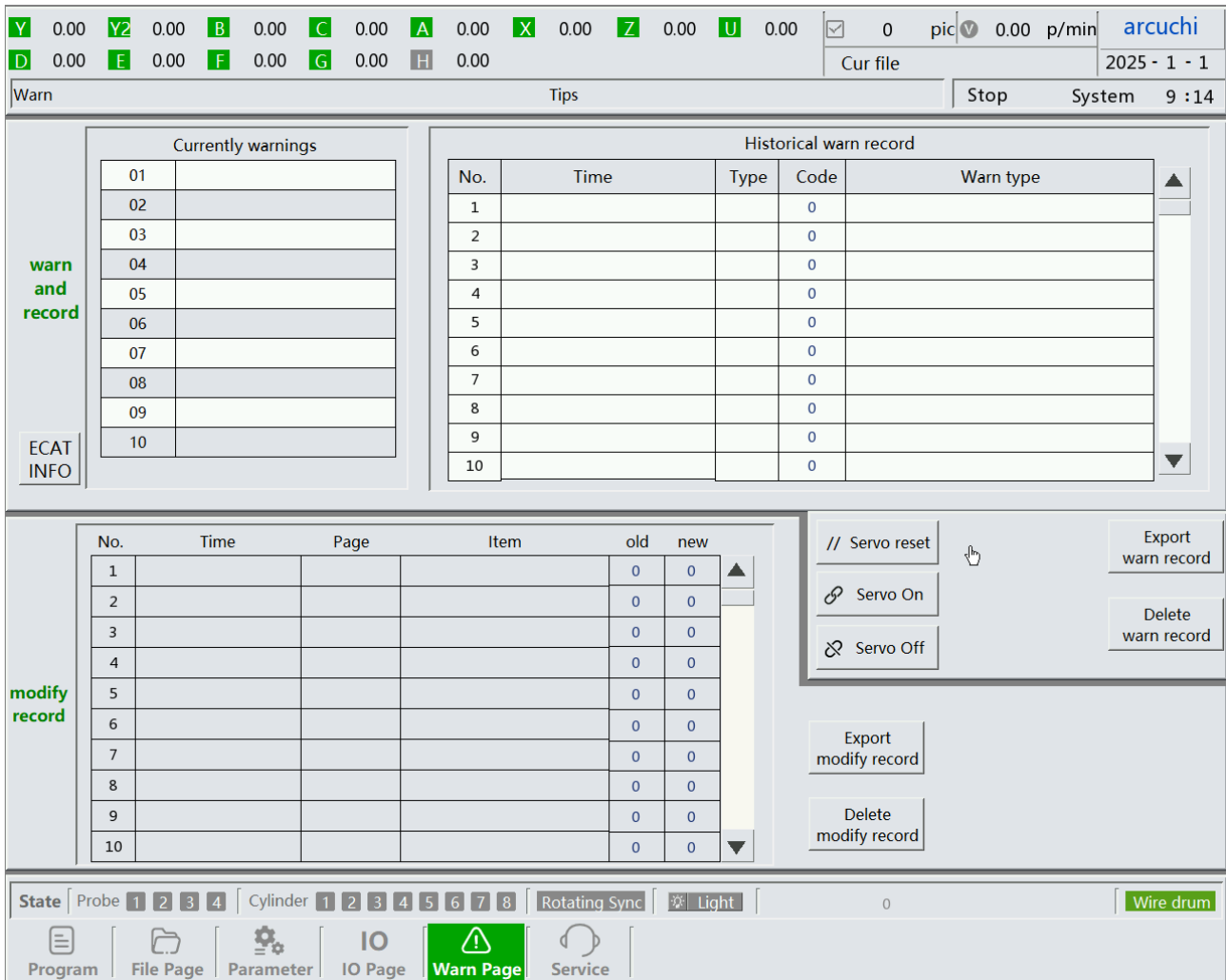
### (2) Login Steps:

- ① Select the appropriate permission, such as Administrator.
- ② Enter your password.
- ③ Click Sign in.

### (3) About changing the password:

- ① Click Change Password at the bottom left of the window, select the corresponding permission, enter the current password, and then enter the new password, and confirm.
- ② Low privileges cannot modify passwords with high privileges, for example, operators cannot change administrators' passwords.

## 1.6 Infotip page



The screenshot displays the 'Warn' and 'modify record' sections of the infotip page. The 'Warn' section includes a 'Currently warnings' table with 10 rows and a 'Historical warn record' table with 10 rows. The 'modify record' section includes a table with 10 rows and columns for No., Time, Page, Item, old, and new. The bottom status bar shows various system parameters and a 'Warn Page' button.

(1) **Existing alarms:** Displays existing alarms, and a maximum of 10 alarms can be displayed at the same time.

(2) **Historical alarm records:**

- ① Historical alarms are displayed by serial number, occurrence time, type (severity), number, and alarm type. You can select the drop-down bar on the right to view more historical alarms.
- ② Alarm record export: After inserting the USB flash drive, click the "Alarm Record Export" button to export all alarm records.
- ③ Delete Alarm Records: Click the Delete Alarm Records button to delete all alarm records in the table.

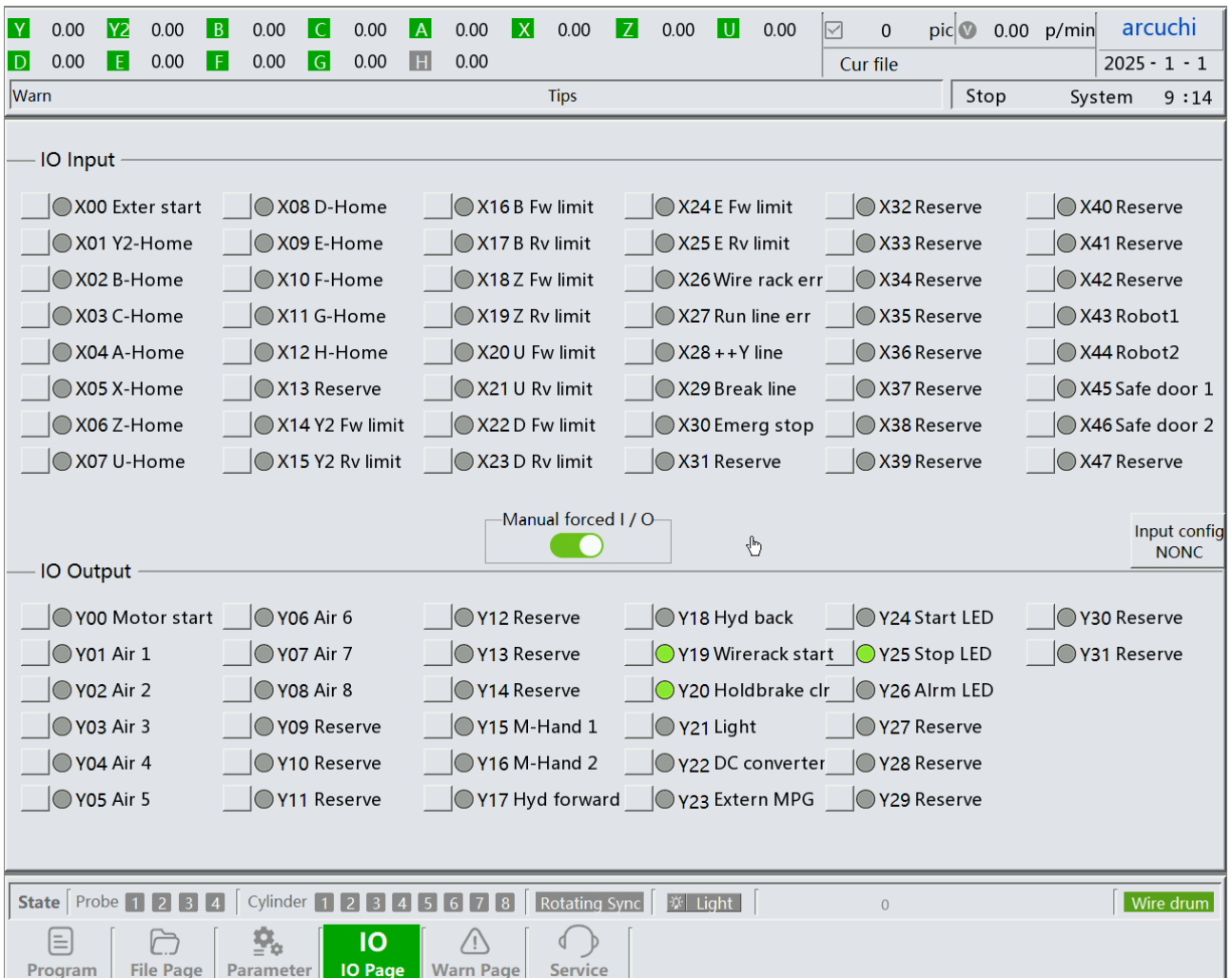
(3) **Modify the record:**

- ① The modification record is displayed in the form of serial number, modification time, modification page, modification item, original value, and modification value. You can select

the drop-down bar on the right to view more modification records;

- ② Export modify record: When the functional USB flash drive is inserted into the USB port of the screen, click the "Modify Record Export" button to export all the change records;
- ③ Delete modify record: Click the "Delete Modification History" button to delete all modification records in the table.

## 1.7 IO page



The screenshot displays the IO Page interface. At the top, there are status indicators for various axes (Y, Y2, B, C, A, X, Z, U) and their positions (0.00). Below this, there are sections for IO Input and IO Output. Each section contains a grid of signals with status indicators (green for on, gray for off). A 'Manual forced I/O' toggle switch is located in the center, currently set to 'ON' (green). To the right of the switch is an 'Input config' button. The bottom navigation bar shows 'IO Page' as the active tab, with other tabs like 'Program', 'File Page', 'Parameter', 'Warn Page', and 'Service' visible.

- (1) Displays the input and output signals.
- (2) (Administrator and above permissions can be operated) Manually force input and output: Click to select to manually force input and output on/off. When the switch is green, it means that the switch is turned on, and at this time, the input/output operation can be forced to each IO point on the interface; A gray color indicates that the switch is off.
- (3) (Administrator and above permissions can be operated) input configuration normally open and normally closed: click this button to enter the normally open/normally closed configuration page, and you can configure a total of 48 input points from X00 to X47; Click Back to return to the IO page.
- (4) (Administrator and above permissions can be operated) Click Specify IO to make custom assignments.

### 3. Programming instructions

#### 2.1 Programming examples

No.	Y	0	...	D	R	P	Air	Dly	L	T	F
0	50						1	5			
1	100	50			50	1					
2	150								1	2	
3	200	50					2				
4	250						-2		9		
5	300										
6											
7											
8											

Let's explain this example in the order of the program line:

- (1) The Y-axis moves 50, opens the cylinder 1, and executes the next program after a delay of 5 seconds.
- (2) At 50% speed, the Y-axis moves 50, and the 0-axis moves 50; Detection probe 1.
- (3) The Y-axis moves 50, and the cycle is opened, and the 2nd to 4th row is cycled twice.
- (4) The Y-axis movement 50 opens the No. 2 cylinder.
- (5) The Y-axis movement 50, close the No. 2 cylinder, mark the end of the cycle, and execute the next line of the program after 2 cycles.
- (6) The Y-axis movement is 50, and the program ends.

## 2.2 Instructions for two-level recycling

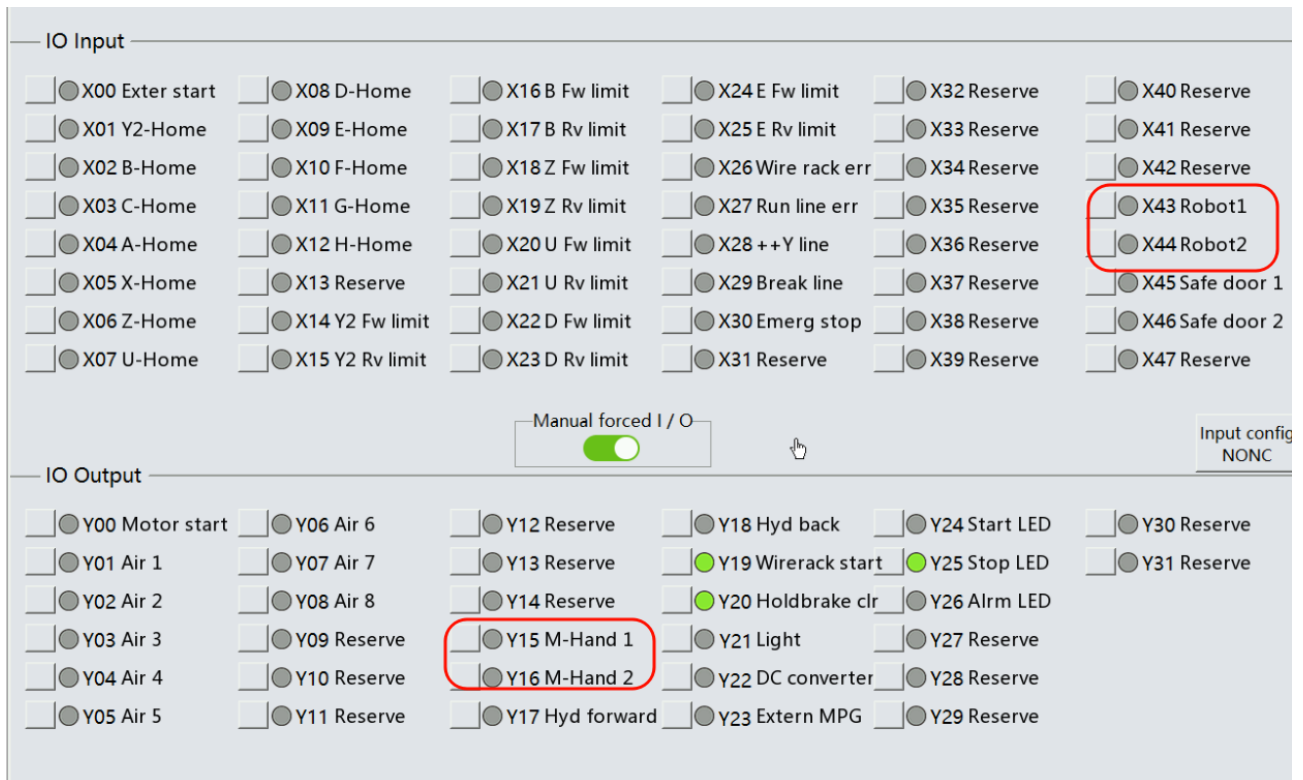
No.	Y	X1	X2	X3	X4	X5	X6	.....	R	P	Air	Dly	L	T
0													1	5
1														
2													1	6
3														
4													9	
5														
6													9	

- (1) The two-stage cycle is divided into an outer loop and an inner loop, in which 1 represents the beginning and 9 represents the end.
- (2) The outer loop executes the value of 0-6 rows, where 2-4 is the inner loop. When the outer loop is executed to 2 lines, the inner loop is executed, and the inner loop 2-4 is executed 6 times and then continues to execute 5-6 rows, then the outer loop is +1. Repeat this step until the end of the outer bypass 5 times.

## 2.3 The use of manipulators

(1) First, set the X input point and Y output point corresponding to the IO page, for example:

"Robot \* complete" and "Robot \*".



**IO Input**

<input type="checkbox"/> X00 Exter start	<input type="checkbox"/> X08 D-Home	<input type="checkbox"/> X16 B Fw limit	<input type="checkbox"/> X24 E Fw limit	<input type="checkbox"/> X32 Reserve	<input type="checkbox"/> X40 Reserve
<input type="checkbox"/> X01 Y2-Home	<input type="checkbox"/> X09 E-Home	<input type="checkbox"/> X17 B Rv limit	<input type="checkbox"/> X25 E Rv limit	<input type="checkbox"/> X33 Reserve	<input type="checkbox"/> X41 Reserve
<input type="checkbox"/> X02 B-Home	<input type="checkbox"/> X10 F-Home	<input type="checkbox"/> X18 Z Fw limit	<input type="checkbox"/> X26 Wire rack err	<input type="checkbox"/> X34 Reserve	<input type="checkbox"/> X42 Reserve
<input type="checkbox"/> X03 C-Home	<input type="checkbox"/> X11 G-Home	<input type="checkbox"/> X19 Z Rv limit	<input type="checkbox"/> X27 Run line err	<input type="checkbox"/> X35 Reserve	<input type="checkbox"/> X43 Robot1
<input type="checkbox"/> X04 A-Home	<input type="checkbox"/> X12 H-Home	<input type="checkbox"/> X20 U Fw limit	<input type="checkbox"/> X28 ++Y line	<input type="checkbox"/> X36 Reserve	<input type="checkbox"/> X44 Robot2
<input type="checkbox"/> X05 X-Home	<input type="checkbox"/> X13 Reserve	<input type="checkbox"/> X21 U Rv limit	<input type="checkbox"/> X29 Break line	<input type="checkbox"/> X37 Reserve	<input type="checkbox"/> X45 Safe door 1
<input type="checkbox"/> X06 Z-Home	<input type="checkbox"/> X14 Y2 Fw limit	<input type="checkbox"/> X22 D Fw limit	<input type="checkbox"/> X30 Emerg stop	<input type="checkbox"/> X38 Reserve	<input type="checkbox"/> X46 Safe door 2
<input type="checkbox"/> X07 U-Home	<input type="checkbox"/> X15 Y2 Rv limit	<input type="checkbox"/> X23 D Rv limit	<input type="checkbox"/> X31 Reserve	<input type="checkbox"/> X39 Reserve	<input type="checkbox"/> X47 Reserve

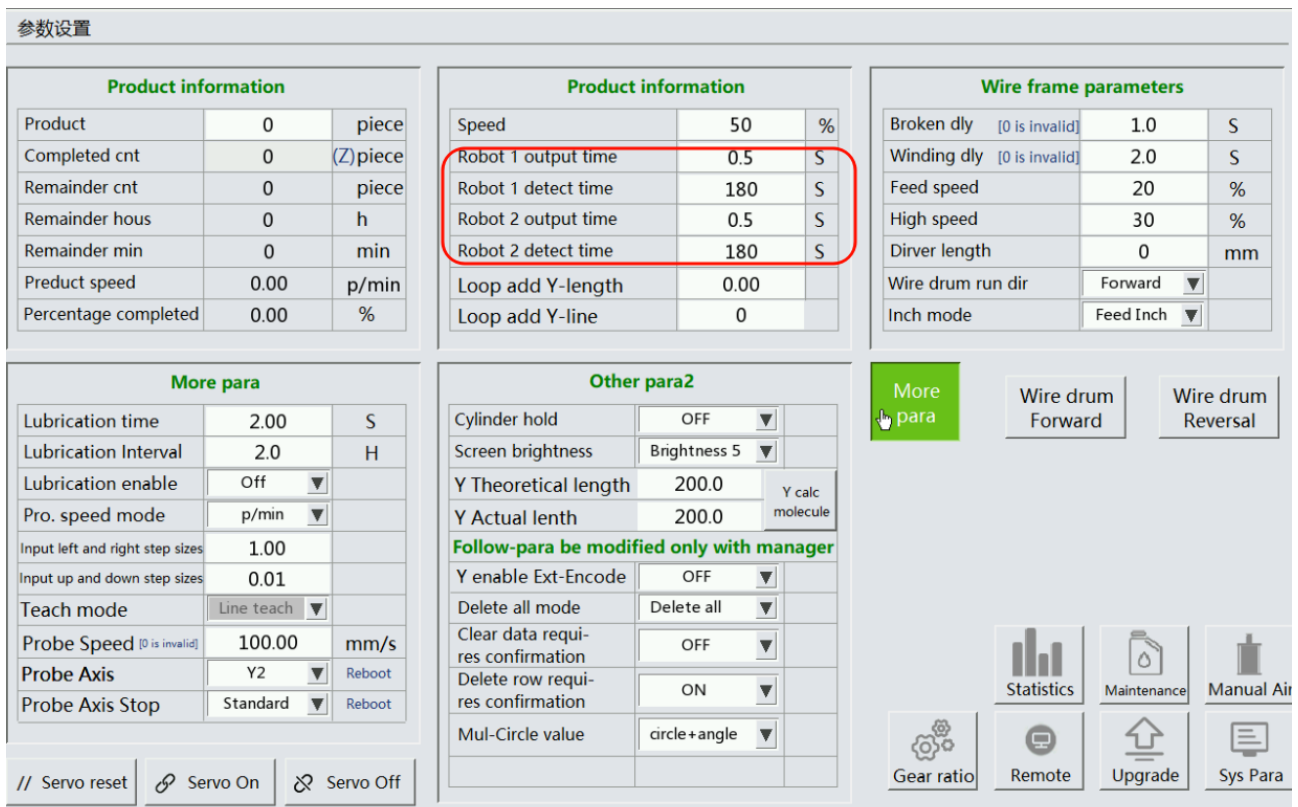
Manual forced I/O ☒

**IO Output**

<input type="checkbox"/> Y00 Motor start	<input type="checkbox"/> Y06 Air 6	<input type="checkbox"/> Y12 Reserve	<input type="checkbox"/> Y18 Hyd back	<input type="checkbox"/> Y24 Start LED	<input type="checkbox"/> Y30 Reserve
<input type="checkbox"/> Y01 Air 1	<input type="checkbox"/> Y07 Air 7	<input type="checkbox"/> Y13 Reserve	<input checked="" type="checkbox"/> Y19 Wirerack start	<input checked="" type="checkbox"/> Y25 Stop LED	<input type="checkbox"/> Y31 Reserve
<input type="checkbox"/> Y02 Air 2	<input type="checkbox"/> Y08 Air 8	<input type="checkbox"/> Y14 Reserve	<input checked="" type="checkbox"/> Y20 Holdbrake clr	<input type="checkbox"/> Y26 Alrm LED	
<input type="checkbox"/> Y03 Air 3	<input type="checkbox"/> Y09 Reserve	<input type="checkbox"/> Y15 M-Hand 1	<input type="checkbox"/> Y21 Light	<input type="checkbox"/> Y27 Reserve	
<input type="checkbox"/> Y04 Air 4	<input type="checkbox"/> Y10 Reserve	<input type="checkbox"/> Y16 M-Hand 2	<input type="checkbox"/> Y22 DC converter	<input type="checkbox"/> Y28 Reserve	
<input type="checkbox"/> Y05 Air 5	<input type="checkbox"/> Y11 Reserve	<input type="checkbox"/> Y17 Hyd forward	<input type="checkbox"/> Y23 Extern MPG	<input type="checkbox"/> Y29 Reserve	

Input config NONC

(2) Enter the parameter page to set the output time and detection time of the manipulator.



**参数设置**

Product information		
Product	0	piece
Completed cnt	0	(Z)piece
Remainder cnt	0	piece
Remainder hous	0	h
Remainder min	0	min
Product speed	0.00	p/min
Percentage completed	0.00	%

Product information		
Speed	50	%
Robot 1 output time	0.5	S
Robot 1 detect time	180	S
Robot 2 output time	0.5	S
Robot 2 detect time	180	S
Loop add Y-length	0.00	
Loop add Y-line	0	

Wire frame parameters		
Broken dly [0 is invalid]	1.0	S
Winding dly [0 is invalid]	2.0	S
Feed speed	20	%
High speed	30	%
Dirver length	0	mm
Wire drum run dir	Forward	
Inch mode	Feed Inch	

More para		
Lubrication time	2.00	S
Lubrication Interval	2.0	H
Lubrication enable	Off	
Pro. speed mode	p/min	
Input left and right step sizes	1.00	
Input up and down step sizes	0.01	
Teach mode	Line teach	
Probe Speed [0 is invalid]	100.00	mm/s
Probe Axis	Y2	Reboot
Probe Axis Stop	Standard	Reboot

Other para2		
Cylinder hold	OFF	
Screen brightness	Brightness 5	
Y Theoretical length	200.0	Y calc molecule
Y Actual lenth	200.0	
Follow-para be modified only with manager		
Y enable Ext-Encode	OFF	
Delete all mode	Delete all	
Clear data requi-res confirmation	OFF	
Delete row requi-res confirmation	ON	
Mul-Circle value	circle+angle	

**More para**

Wire drum Forward Wire drum Reversal

Statistics Maintenance Manual Air

Gear ratio Remote Upgrade Sys Para

// Servo reset Servo On Servo Off

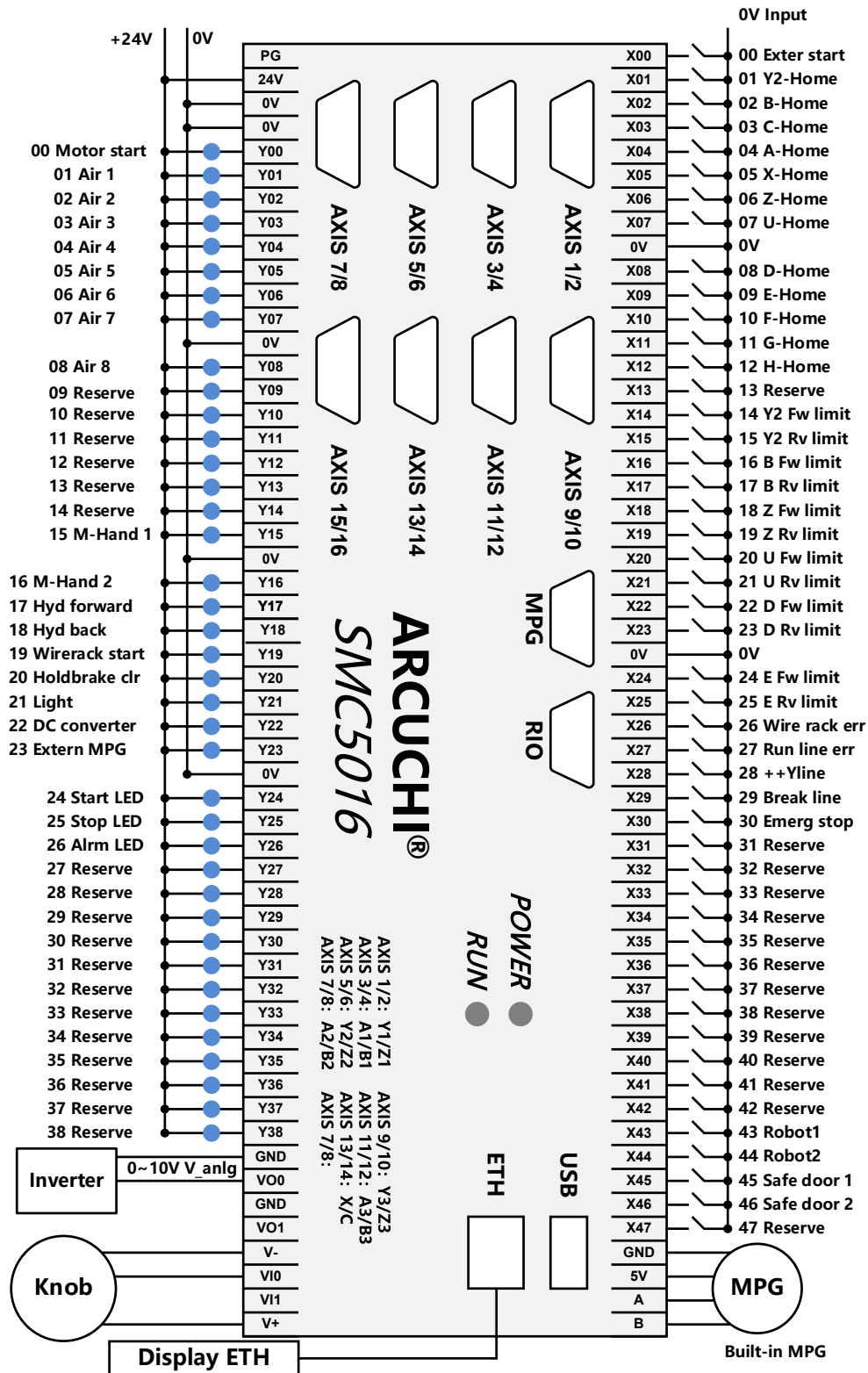
- (3) Return to the programming page, and write the corresponding robot number in the manipulator column of the programming table.
- (4) Instructions for compiling the function number of the manipulator: No. 1~4 represents the corresponding manipulator 1~4, and the next line of code can be executed without waiting for the IO input "manipulator \* complete" signal to write 1~4. Numbers 10, 20, 30, 40 represent the robot start and need to wait for IO input "robot \* complete" signal, the waiting time is determined by the "robot detection time", only the signal is detected within the specified time, the next line of code will be executed. The timeout will alarm "Manipulator \* Waiting Timeout".

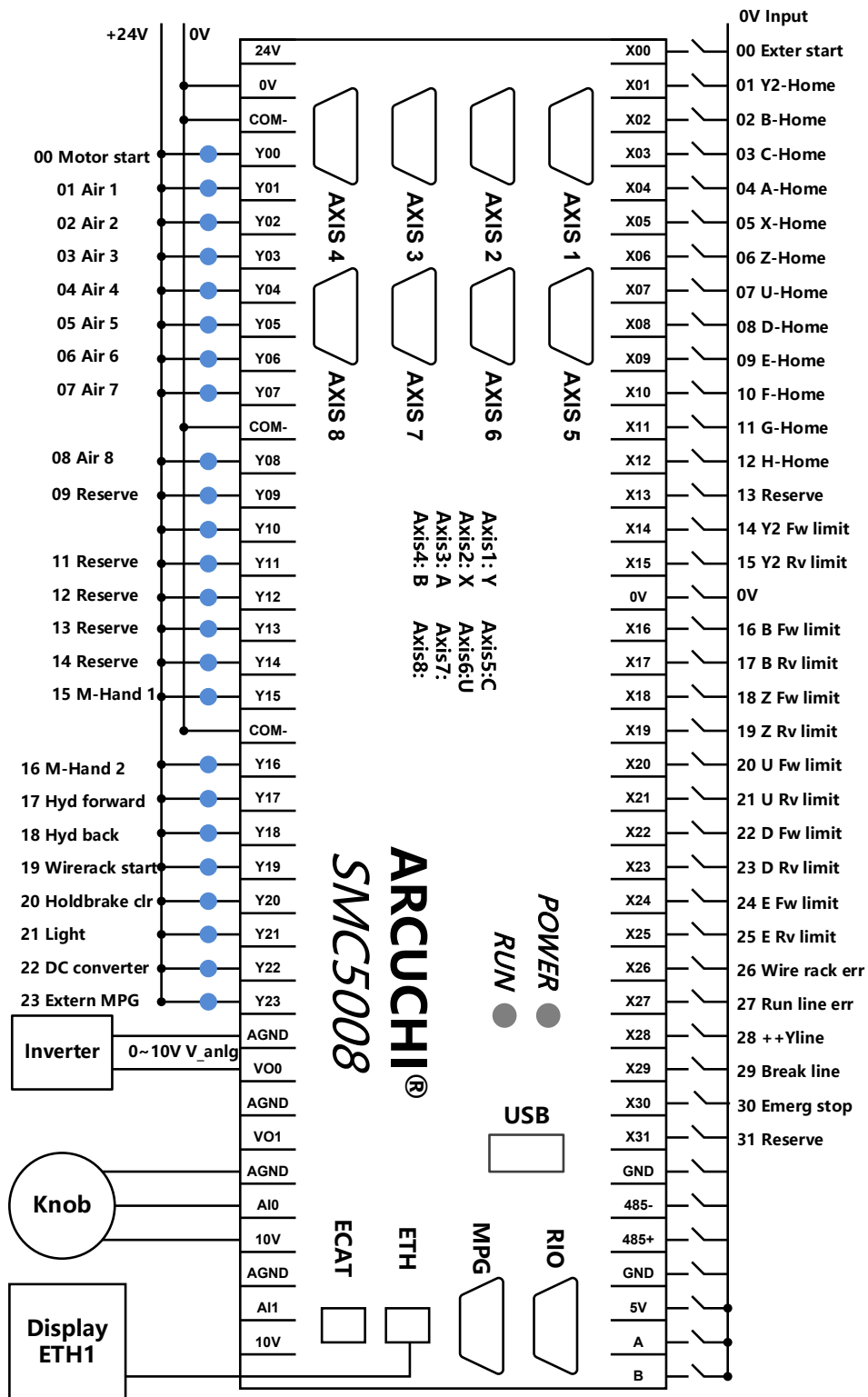
No.	Y	Y2	B	C	A	X	Z	U	D	E	F	G	R	Robot	p	Air	Dly	L	T	F
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
1	10.00													1						
2	20.00													10						
3	30.00													2						
4	40.00													20						
5	50.00													3						
6														30						
7														4						
8														40						

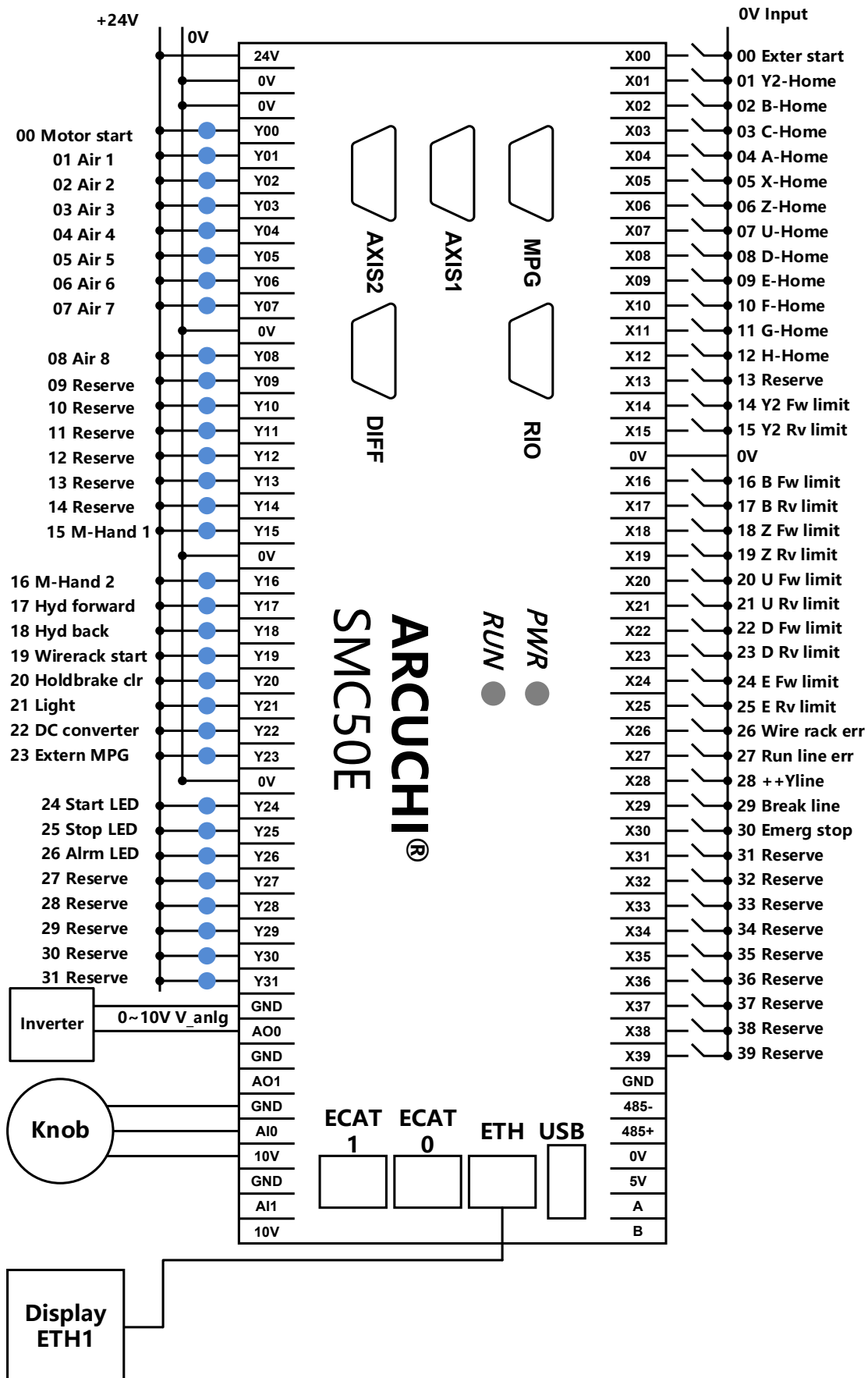


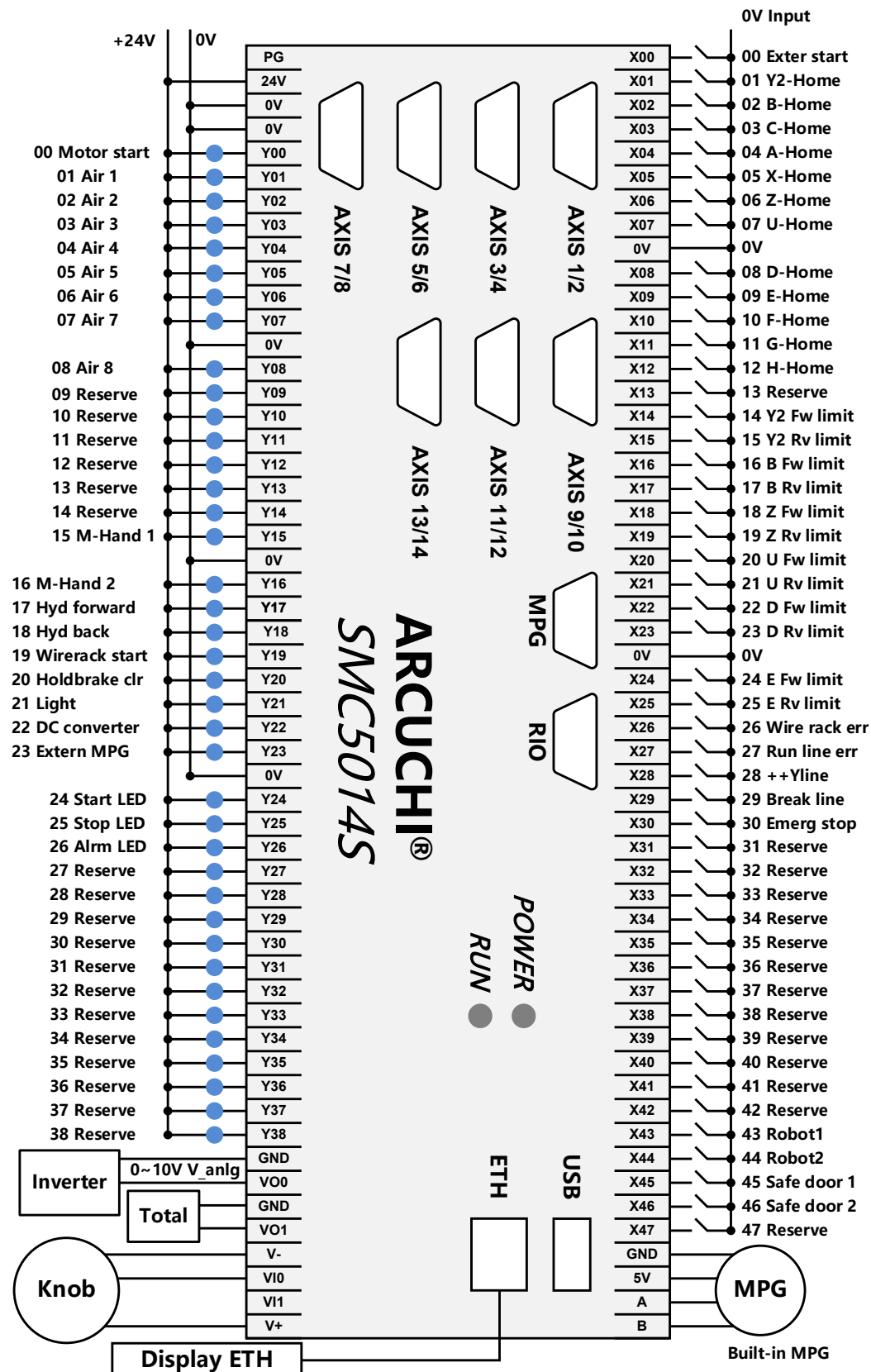
## 4. Electrical connections

### 3.1 Electrical connections(SMC5016、SMC50E、SMC5008、SMC5014S)









### 3.2 Keystroke MPG fig



## 5.Common faults and troubleshooting methods

If the alarm cannot be cleared, see the following common faults and troubleshooting methods.

The following scenarios are in pulse control mode, and bus control mode is not listed for the time being.

(1) **"XX Axis Abnormality"**: The reason is that the system does not detect the signal of the servo drive.

- ① The servo line is not connected to the drive: the servo line is properly connected or the axis is turned off in the system and the alarm is reset;
- ② The servo line is properly connected, and the driver alarm: after clearing the driver alarm (you can contact the supplier for assistance), reset the alarm;
- ③ The servo line is correctly connected, and the drive has no alarm but is not enabled: the driver can be judged to be enabled, which can be viewed through the status display of the driver panel, or the shaft can be freely rotated by external force when it is powered on. Check if the green wire in the plug on the drive side is connected to the driver enable input point, or if the driver internal parameters are incorrect, and the enable input point is not configured to the point of the green line. Correctly solder the enable point of the green wire in the plug or correctly configure the enable point in the driver;
- ④ The servo wire is correctly connected, and the drive is normal: check whether the yellow wire in the plug on the drive side is correctly connected to the driver alarm point, and improve the wire bond if it is incorrect;
- ⑤ You can exchange plugs on the drive side to check and locate, or switch plugs on the host side to check and locate whether it is a problem with the driver, servo line or host;
- ⑥ Contact the supplier.

(2) **"Emergency stop" cannot be eliminated**:The cause is that the emergency stop signal is always present.

- ① Check the emergency stop button on the external handwheel to confirm that the emergency stop button on the handwheel has been popped;
- ② Check the IO page, check the "emergency stop" input signal, if there is a signal input all the time, check whether this signal is incorrect; If there is no signal, check the polarity of the "emergency stop" input signal, and switch to normally open mode if normally closed is

selected.

(3) **"Probe Failure"**: Cause: The number of probe failures is greater than or equal to the number of probes.

- ① The number of times the probe fails to be cleared and the alarm is reset.

(4) **"Count Arrives"**: Cause: The number of completed items is greater than or equal to the set output, and the set output is not equal to 0.

- ① Clear the number of completions and reset alarms.

(5) **"Program Exception"**: Cause: Abnormal execution of programming table data.

- ① Check the programming table data, if it is not normal, modify it; If there is no abnormality, contact the supplier.

(6) **"Wire Frame Abnormal"**: Cause: There is a signal in the input signal of "wire frame abnormal".

- ① Reset the wire frame first, and then reset the system alarm;
- ② Check the IO page, confirm that the input signal of "Abnormal Wire Frame" has been there, and then confirm whether the normally open and normally closed signal of "Abnormal Wire Frame" is configured correctly;
- ③ Check whether the "Wire Frame Abnormal" proximity switch on the wire frame is normal.

(7) **"Abnormal running line"**: The reason is that there is a signal in the input signal of the "running line signal".

- ① Check the IO page to confirm that the input signal of "abnormal running line" has been available, and then confirm whether the normally open and normally closed signal of "abnormal running line" signal is correctly configured.
- ② Check whether the external "abnormal running line" signal is normal.

(8) **"Probe Advance Touch"**: The reason is that the probe signal is already present when the program is run to the probe line.

- ① Modify the programming to avoid probes being detected before they are in the probe line.

(9) **"Positive/Negative Limit Exception"**: Cause: When the axis moves in linear mode, there is a signal at the corresponding limit input point.

- ① If it is a normal phenomenon, there is no need to investigate; Conversely, check the limit signal.

(10) **"Safety Gate Abnormal"**: The reason is that the safety gate function is turned on, and there is no "safety gate" input signal. If the phenomenon is abnormal, you can check the polarity of the

I/O to check whether the NO configuration is correct.

(11) **"Handwheel Expansion Board Communication Abnormal"**: The cause is that the use of the external handwheel has been turned on, and the communication between the external handwheel expansion board and the host is disconnected.

- ① Confirm whether to use the external handwheel, if not, turn off the use of the external handwheel, and reset the alarm;
- ② Check the external handwheel connection;
- ③ Contact the supplier.

(12) **"SRAM Battery Failure"**: The cause is that the battery inside the system is abnormal.

- ① Power on for 10 minutes (battery charging), power off and restart;
- ② Contact the supplier.

(13) **"24V Exception"**: The main power supply is not between 21V and 26V.

- ① Check the input power supply to ensure that the input voltage is between 21V-26V, and the standard voltage is 24V.

(14) **"SRAM abnormal"**: Cause, internal abnormality of the system, contact the supplier.

(15) **"CPU Battery failure"**: The cause is that the battery inside the system is abnormal.

- ① Power on for 10 minutes (battery charging), power off and restart;
- ② Contact the supplier.

**"Initialization Failed"**: Cause, abnormal initialization of the internal program of the system, contact the supplier.

(16) **"Pulse Frequency Anomaly"**: The reason is that the pulse output frequency is too high.

- ① Check the system page denominator to check whether it is too large or abnormal.
- ② Contact the supplier.

(17) **"Host Communication Abnormal"**: Cause: Communication between the host and the display is disconnected.

Check whether the network cable between the host and the screen is loose, in particular, check whether the network port behind the screen is paired correctly, you need to select the "ETH1" port.