lnc robot

Welding instruction manual

2019/12/02

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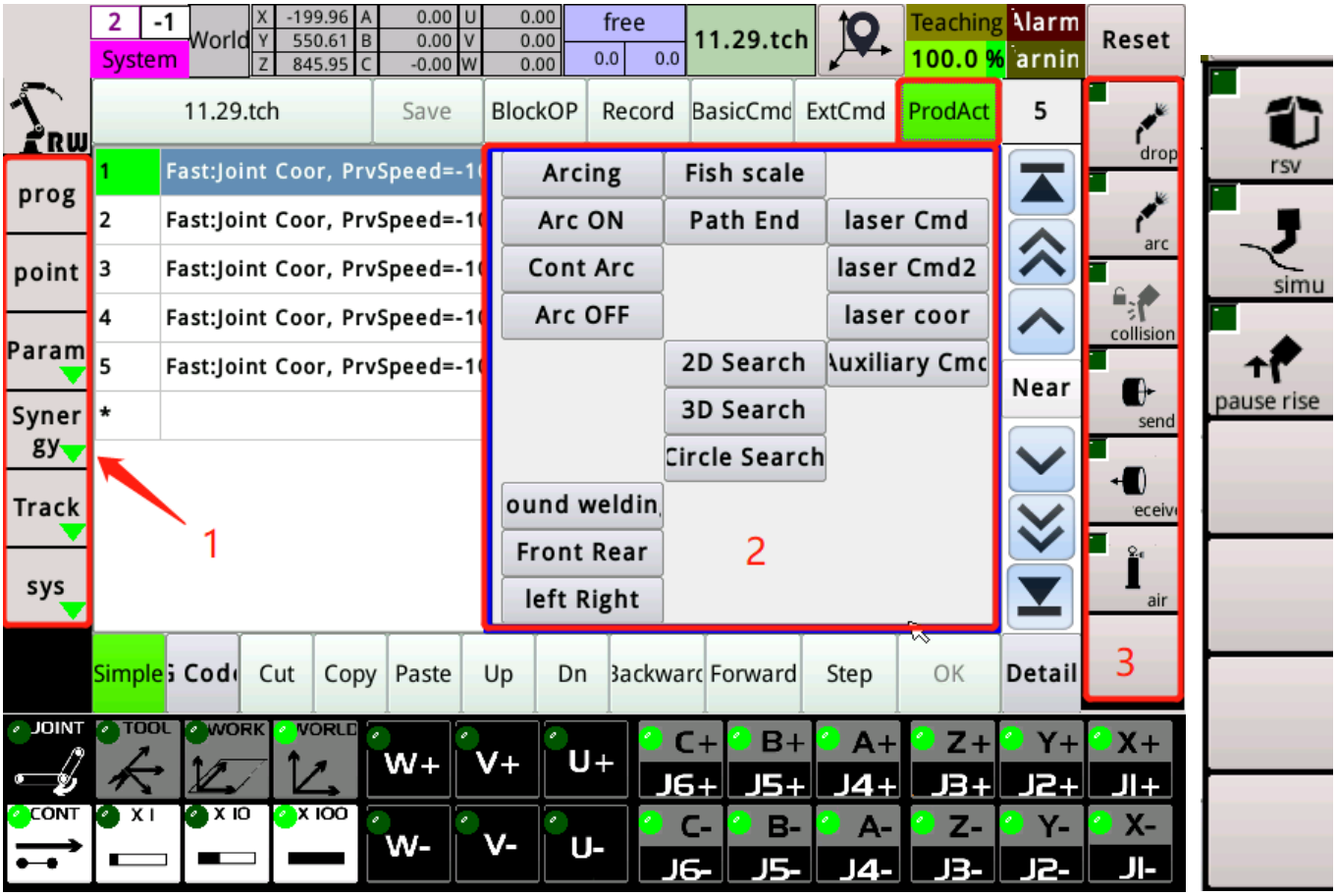
1 Introduction to welding interface



1.1 page enter button

Parameters: Welding parameter debugging page.

Collaboration: Collaborative calibration page.

Tracking: Laser welding seam tracking setting and calibration page.

1.2 Welding related program page

The welding-related program instructions are in the application process page.

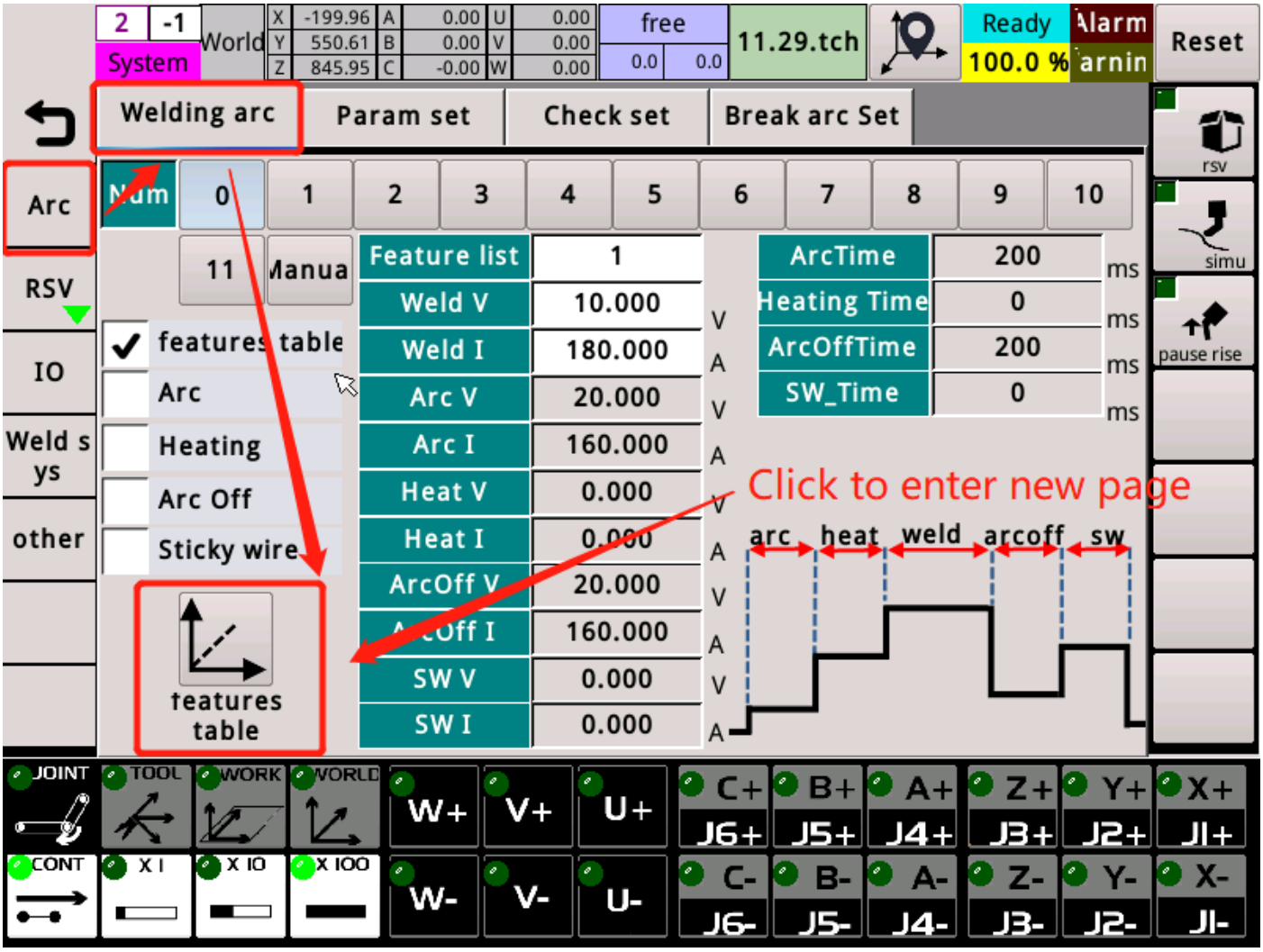
1.3 Shortcut Button

Some push-button switches commonly used during welding operations.

2 Introduction of welding parameters

2.1 Arc welding

2.1.1 Arc welding-welding arc timing



Group number: Each group can set the welding current and voltage parameters, etc. After the setting is completed, when the arc start command is called in the program, different group numbers are set according to different current and voltage requirements.

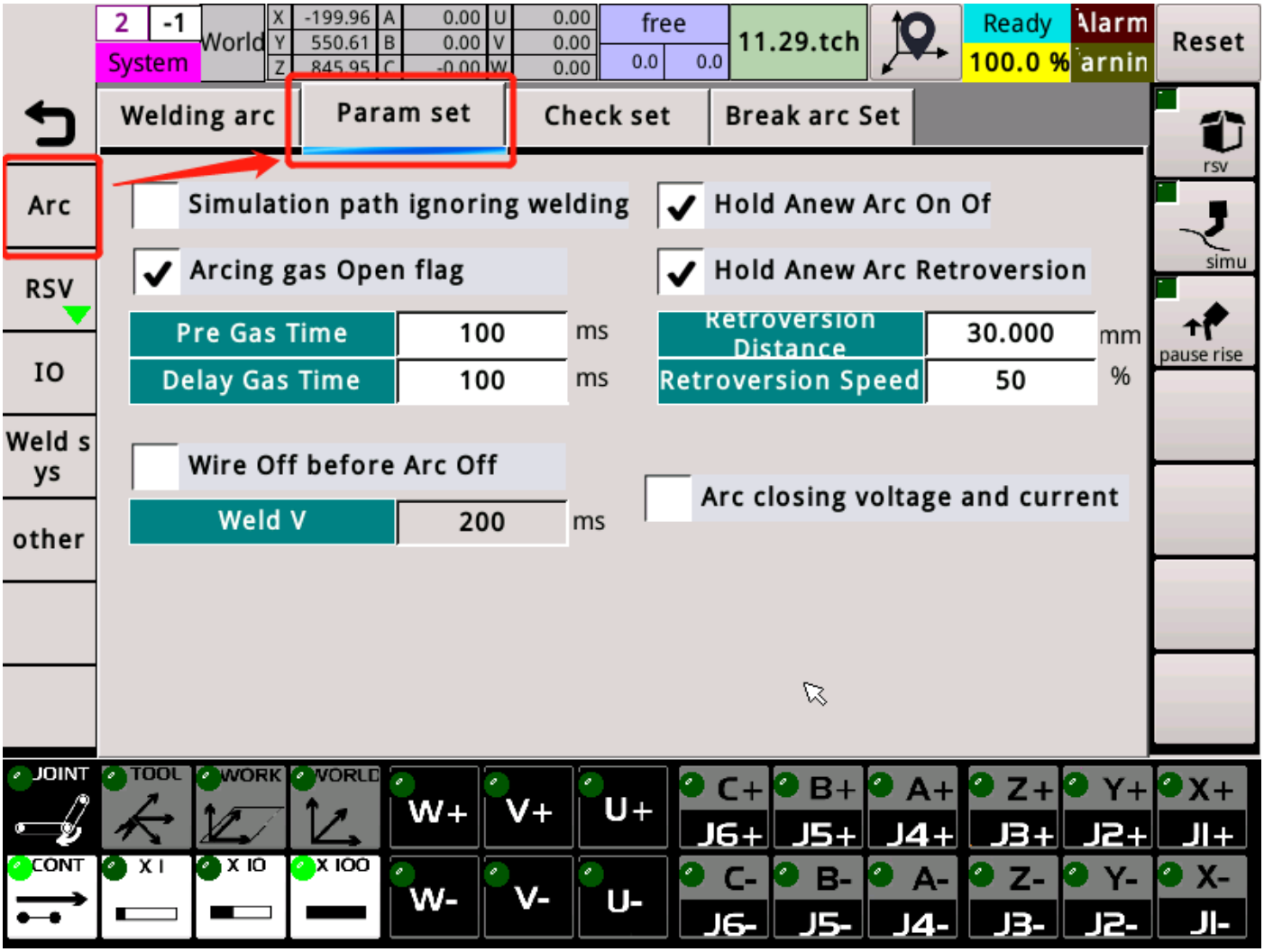
Welding characteristics table: Different welding machine characteristic

curve tables are different, and there will be one yuan and a difference. When using, this item must be checked, and the characteristic table number to be used is filled in the characteristic table number on the right. (Uncheck, you cannot fill in the value)

Arc starting, arc closing, heating, anti-stick wire: After ticking, parameters such as current voltage value and time can be set (selectable ticking is used, arc starting and arc ending are more commonly used)

Characteristics table: Click to enter the characteristics table page (for details, please refer to the chapter on welding characteristics table debugging method)

2.1.2 Arc welding-parameter setting



Ignore arc welding on simulated paths: When the program is run automatically, if there are welding instructions such as arc starting and arc closing in the program, ignoring these instructions will not actually weld, only the path will be run dry.

Arc Start Gas Flag: After ticking this item, you can set the time to advance gas and delay gas during welding.

Arc closing and wire removal: After ticking this item, you can set the time of wire winding at the end of welding.

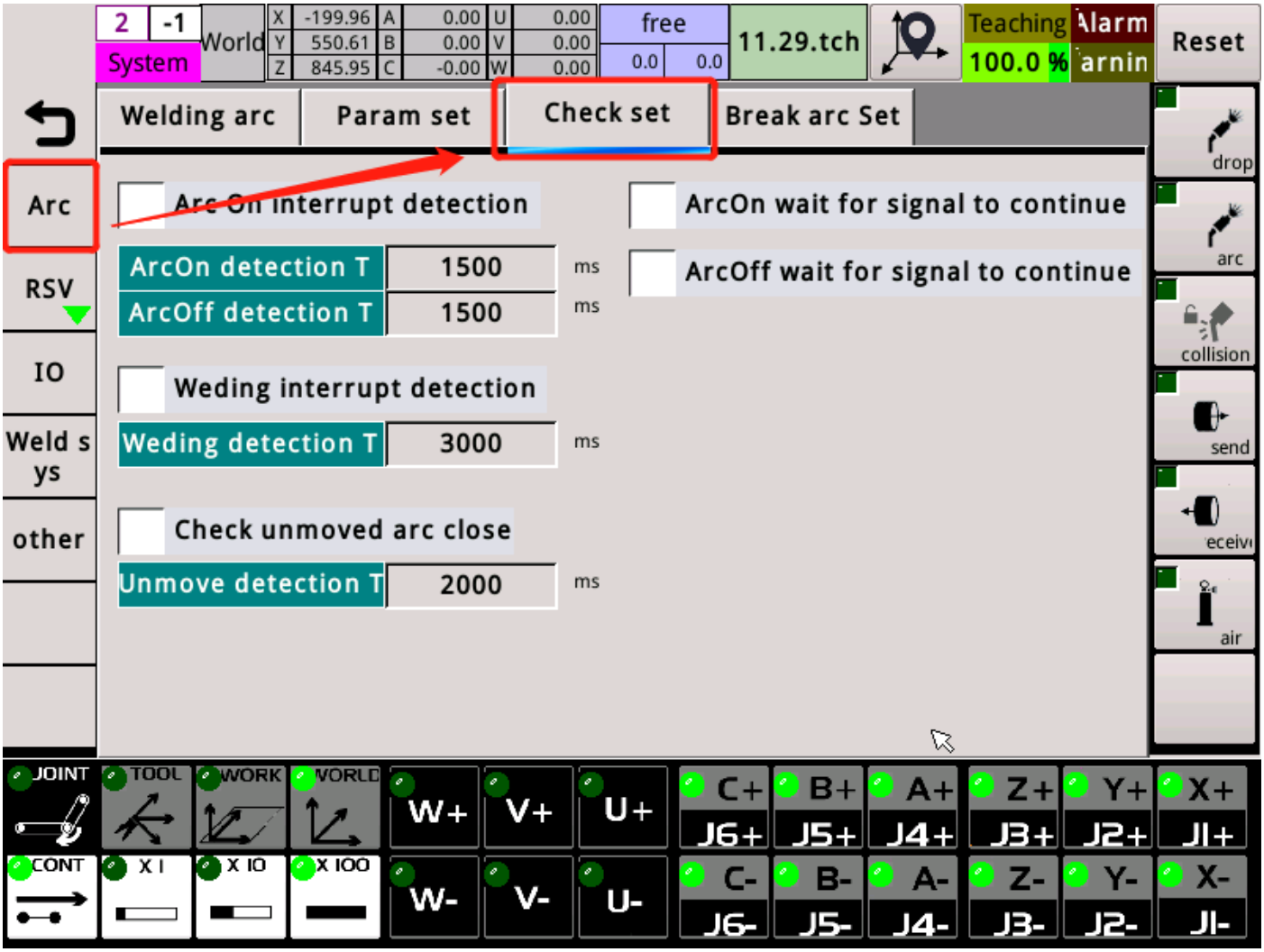
Pause, restart, and close arc: After ticking, turn on the pause and restart, and close arc function. After turning on, when the program is

paused during the welding process, press the start button again, and the robot will return to the set path along the original path according to the set back speed Back off the distance and restart welding.

Pause restart arc rewind: Set the retraction distance and retraction speed (based on welding speed) as a percentage.

Arc closing voltage and current hold data: When this option is checked, the welding machine panel will display the current and voltage values at the time of arc closing when the arc is closed.

2.1.3 Arc Welding-Detection Settings



Arc detection time: the time from when the controller sends out the arcing signal to the system receiving the arcing success from the welding machine! If the system does not receive the arcing success within this time, the system will issue an arcing failure alarm!

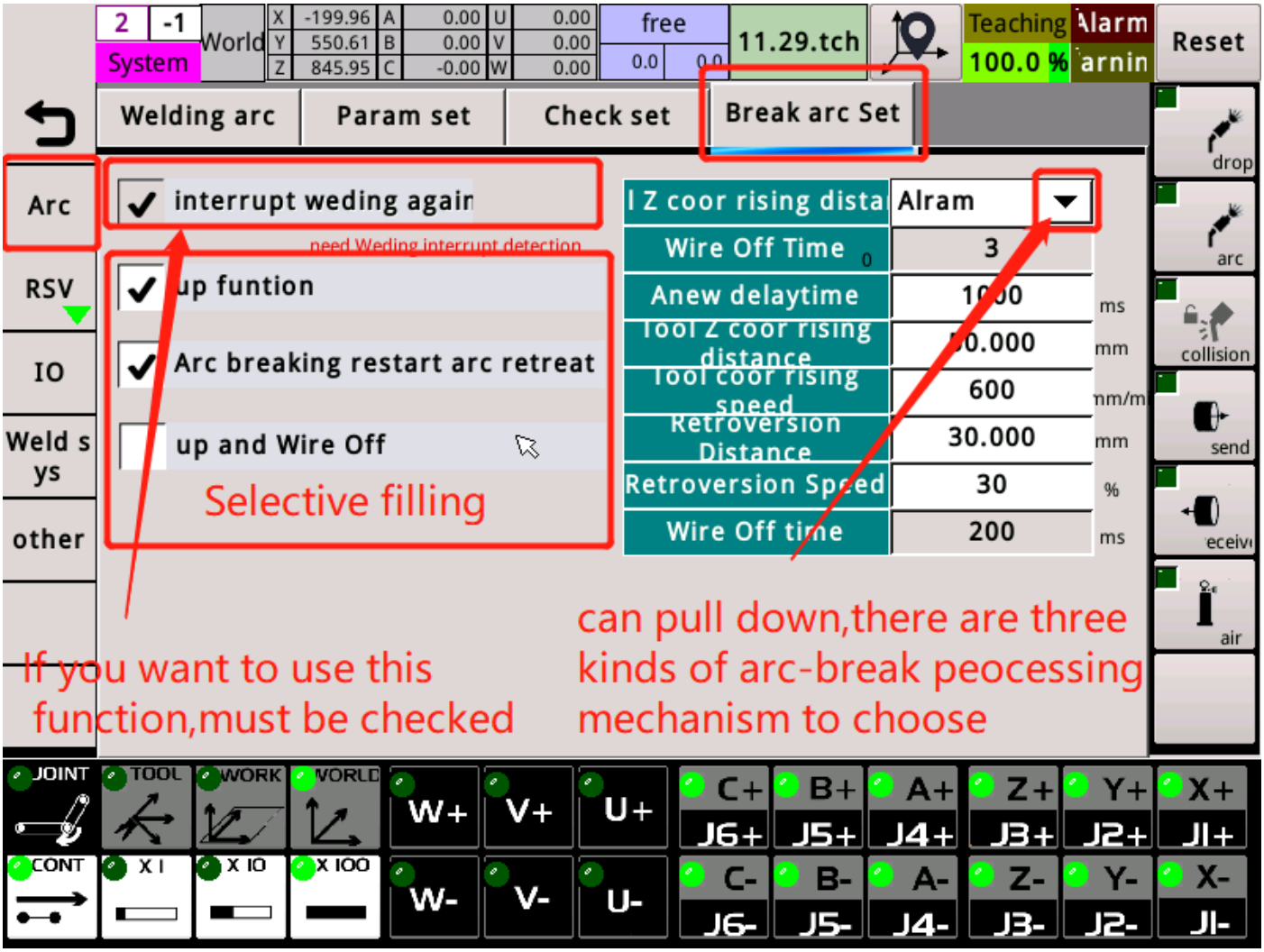
Arc detection time: The time when the controller disconnects the arc start signal after the controller issues the arc end command! If the arc start success signal persists, the system triggers the arc end failure!

Welding interruption detection time: After the arc start is successful, the system does not issue an arc end command during this period, but due to external reasons, the arc start success signal is disconnected for more than the set time, the system will trigger the signal detection error during welding!

Arc start waiting for welding signal to continue: After arc start failure, continue to wait for welding signal before acting!

Arc closing waiting for welding signal to continue: After arc failure, continue to wait for welding signal before acting!

2.1.4 Arc Welding-Arc Break Setting



This page can be set during the welding process, the system handles the arc breaking mechanism after the arc breaking due to some occasional external factors (clogging, poor line contact, interference, etc.). Currently there are 3 processing methods.

Welding interrupted arc restart arc: To activate the arc restart mechanism, this item must be checked.

Lifting function: After ticking this item, you can set the lifting distance mm and speed mm / min of the tool coordinate Z on the right.

Rollback function: After this check, you can set the distance mm and the welding speed percentage after the arc break on the right.

Rewind after lifting: After this item is checked, you can set the number of seconds for rewinding.

1、 Alarm: After the arc is broken, the system directly pops up an alarm pop-up box to prompt the alarm. At this time, the program can only be restarted after resetting.

2、 Auto-restart: You can set the number of restarts and restart delay time. After the arc is interrupted, the robot will perform a lifting in the z direction of the tool, and then descend and retreat to the set distance (if the lifting and retract functions are not checked, there is no The above action), try to start the arc again, and after this cycle is reached the set number of arc starts, an alarm will be prompted.

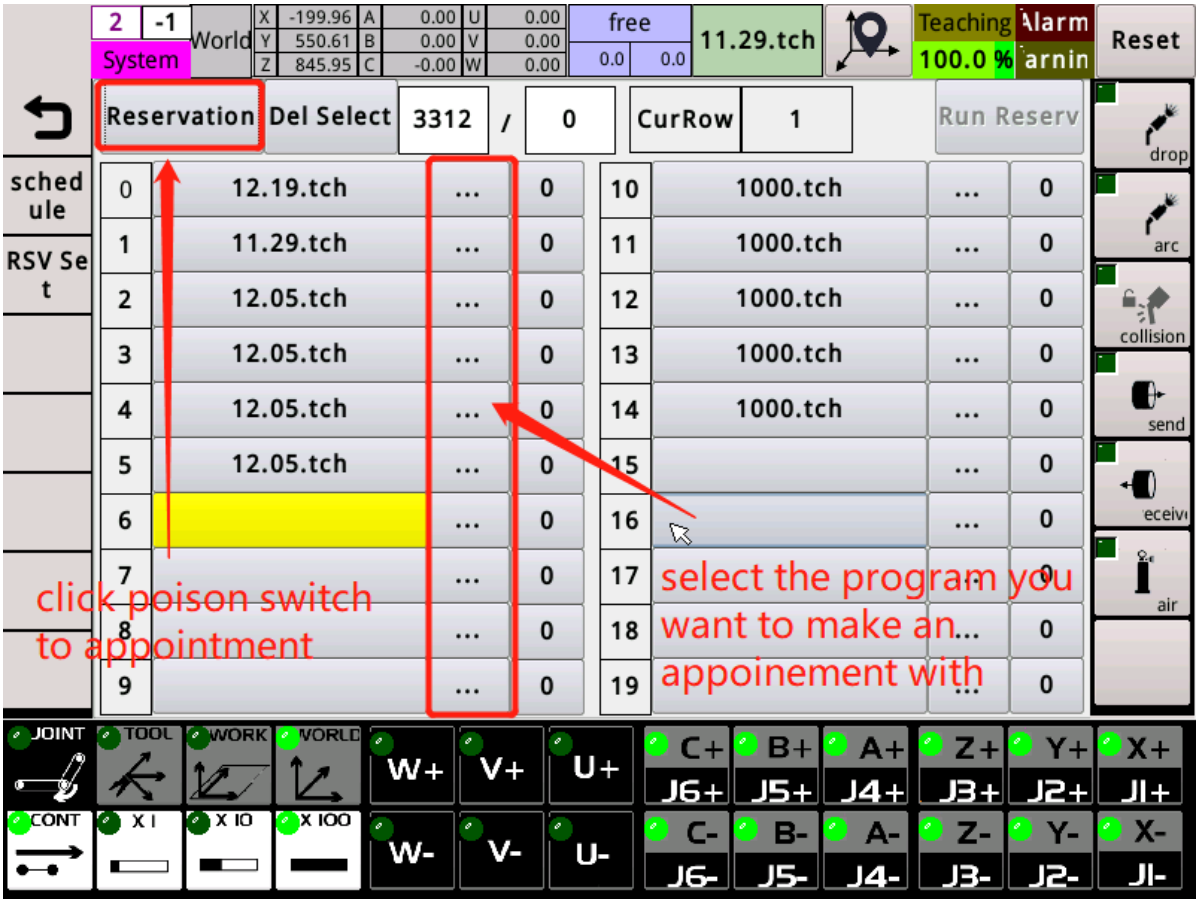
3、 Exclude start connection: This action is similar to automatic arc restart, the difference is that after the arc break is raised, the system will prompt a warning at this time, the program is in a paused state. After investigating the cause of the arc break, after pressing the start button, the robot will lower and back. Try to restart the arc.

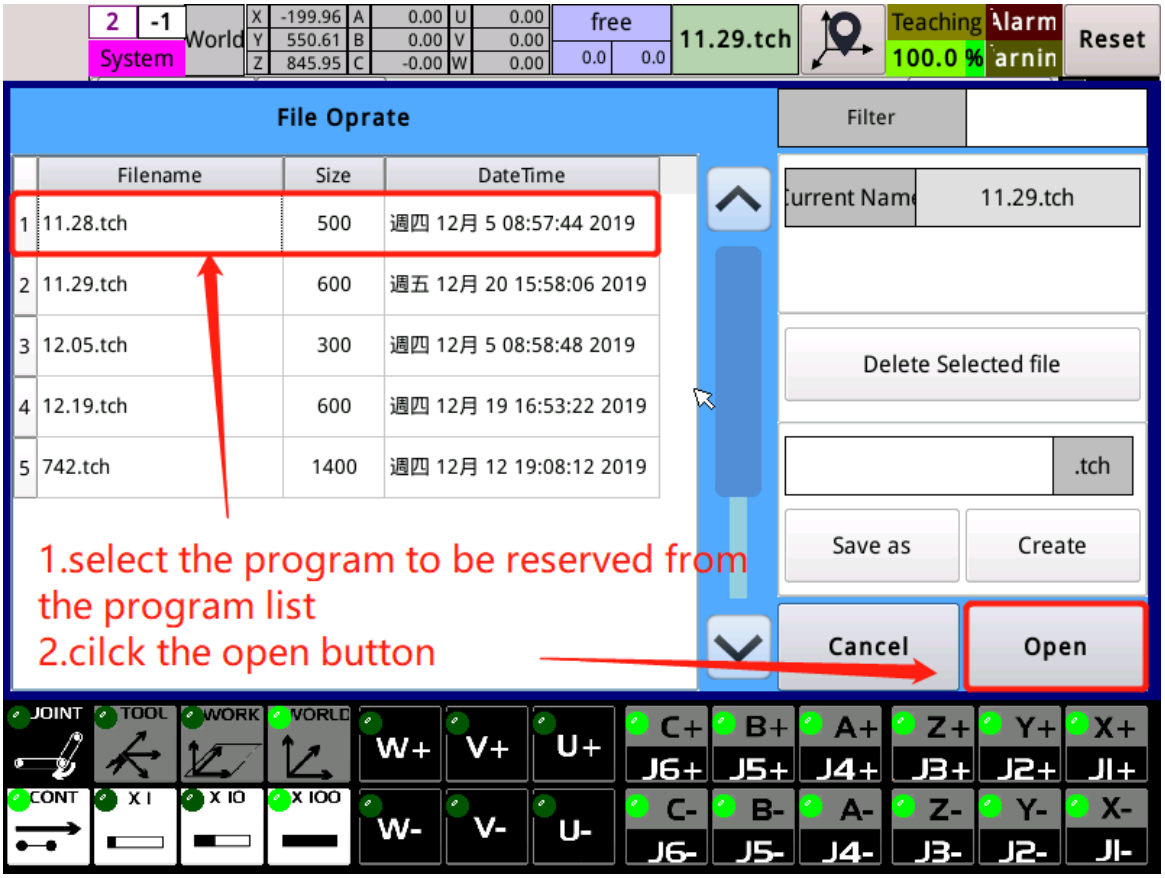
Note: After the arc is interrupted, when the system prompts a red warning, only the reset will clear the alarm, and the program will also end at this time. You can only manually start from the beginning or start from this. When the yellow pause is prompted, the program is currently paused. After finishing the cause of arc break, do not press reset or end, just press

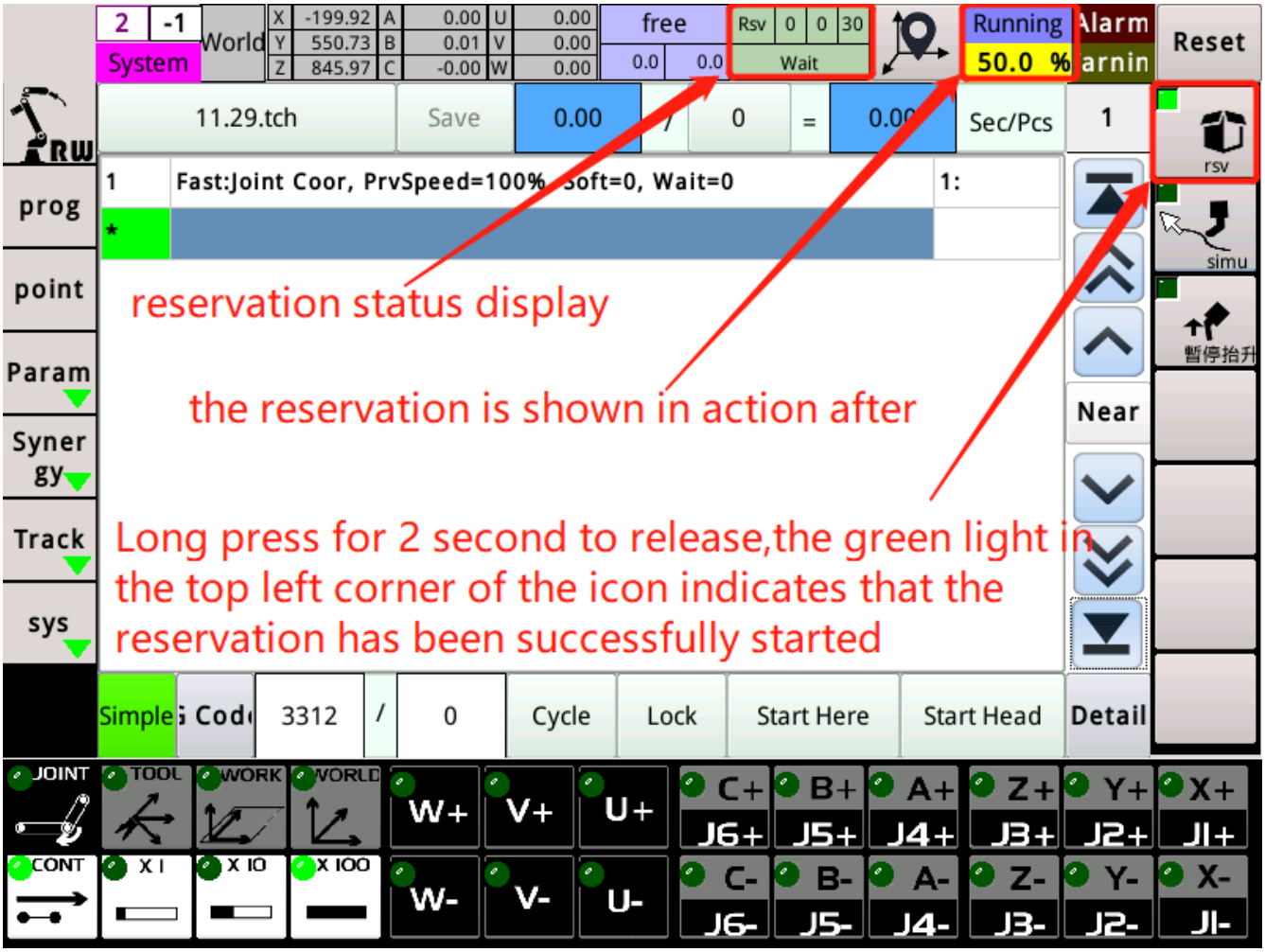
the start button to continue welding.

2.2 Appointment

2.2.1 Appointment-Appointment Schedule







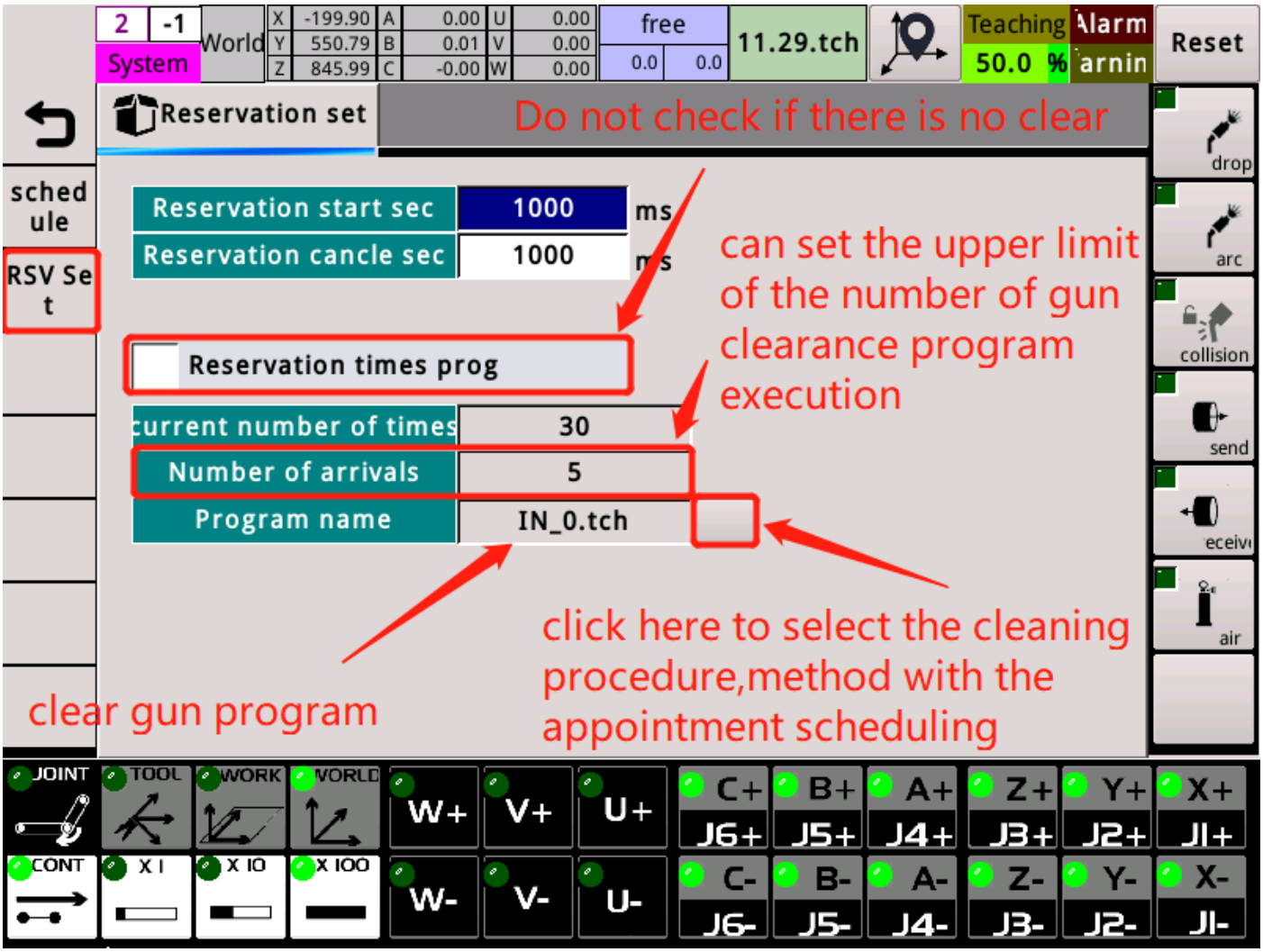
total number of reservation programs

waiting for the scheduled program list

current booking list number

the status of the reservation or the name of the peogram currently being executed by the reservation

2.2.2 Appointment-Appointment Setting



Number of seconds to start the appointment box: When making an appointment, long press the start button on the appointment box to meet the set number of startup seconds before the appointment can be successfully scheduled. It is recommended to set 1 to 2 seconds to prevent workers from accidentally touching it.

Reservation Box Cancellation Seconds: When an appointment is made to a program, but this program has not been executed, you can press and hold the start button to cancel the appointment of this program.

How to use appointments

1、 Make a reservation procedure to be used.

2、 In the appointment schedule, add the program to be scheduled to the list.

3、 Set the relevant parameters of the appointment.

4、 Switch the Teach Pendant to automatic mode, press and hold the start appointment button on the right for about 2 seconds to loosen, and the light on the button turns green to indicate that the startup appointment was successful.

5、 Press and hold the appointment box start button corresponding to the program you want to run to start the appointment program.

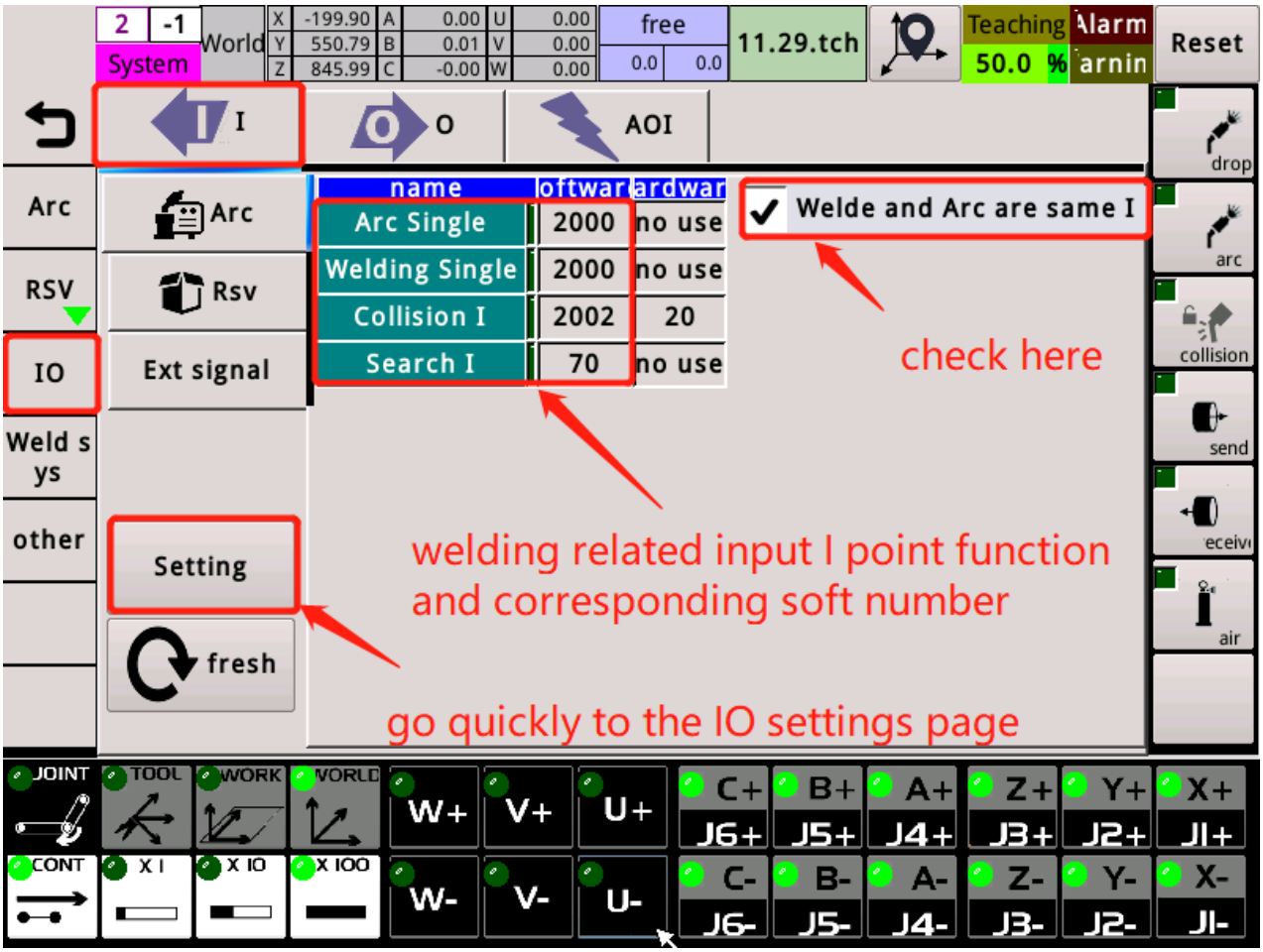
6、 While the appointment program is being executed, you can press and hold the start button of the other appointment box to make a reservation for that program. After the currently running appointment program ends, it will directly execute the program just reserved. (Only one program can be queued. (If you make a reservation for a queued program, go to another program, it will cut in, and cancel the program you just reserved)

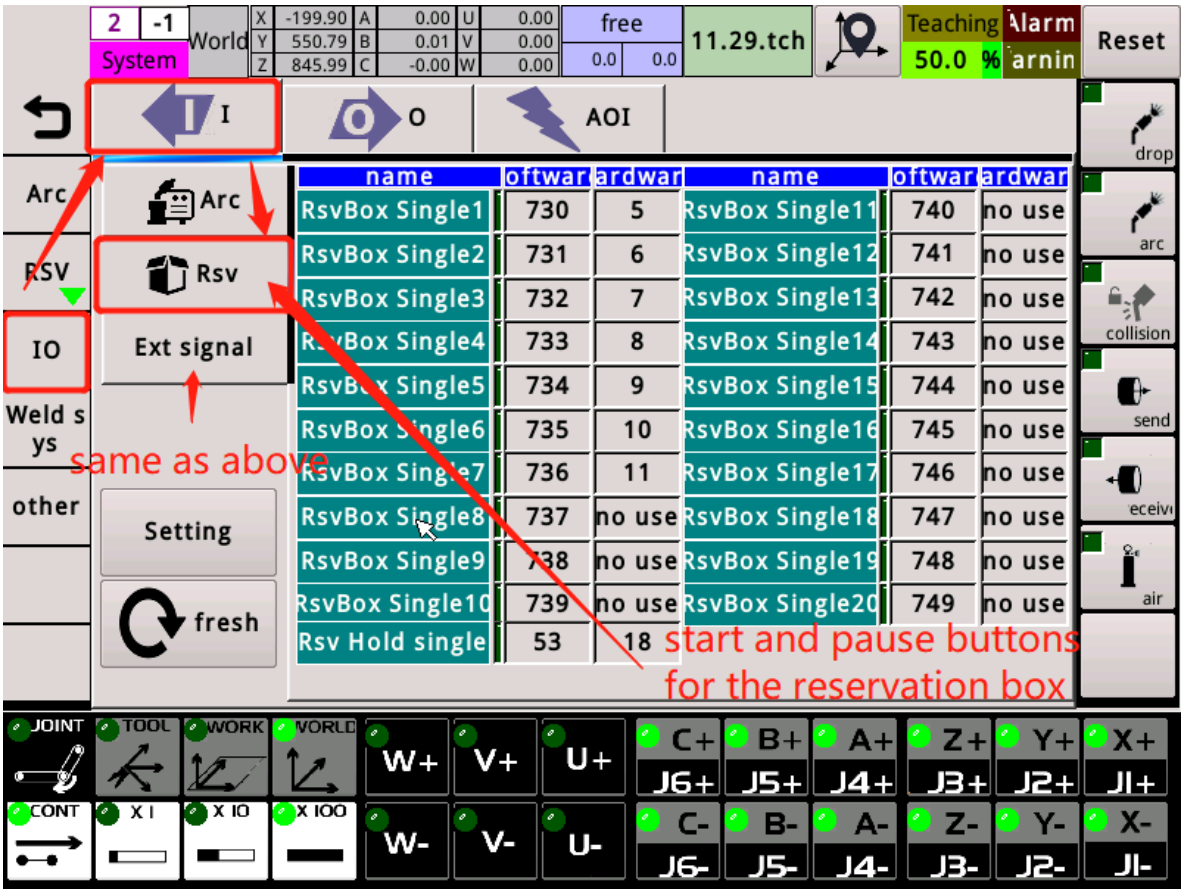
7、 The pause button on the appointment box can pause the appointment procedure, and then press the start button to continue the procedure.

2.3 Welding

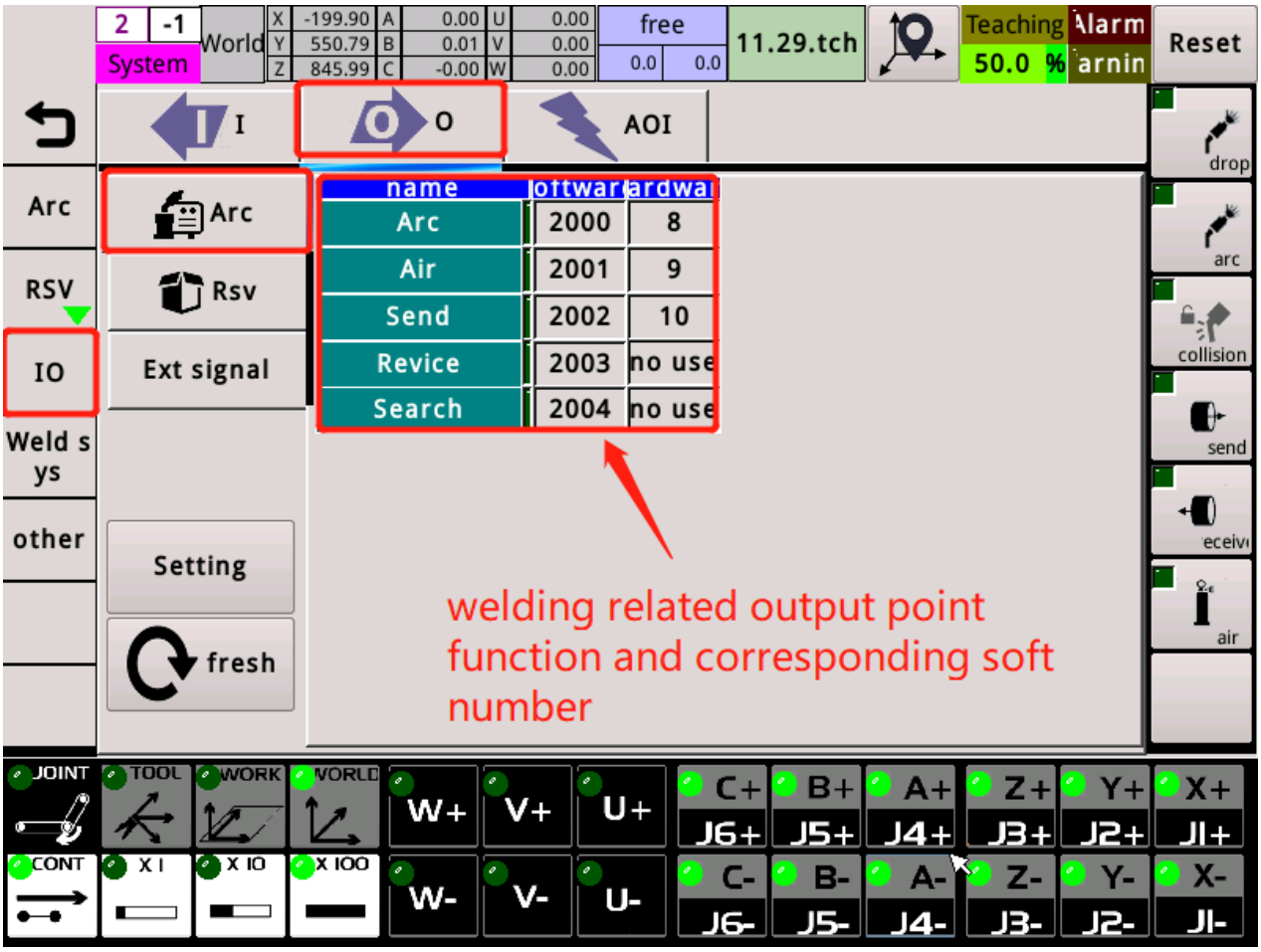
2.3.1 Welding io-point i

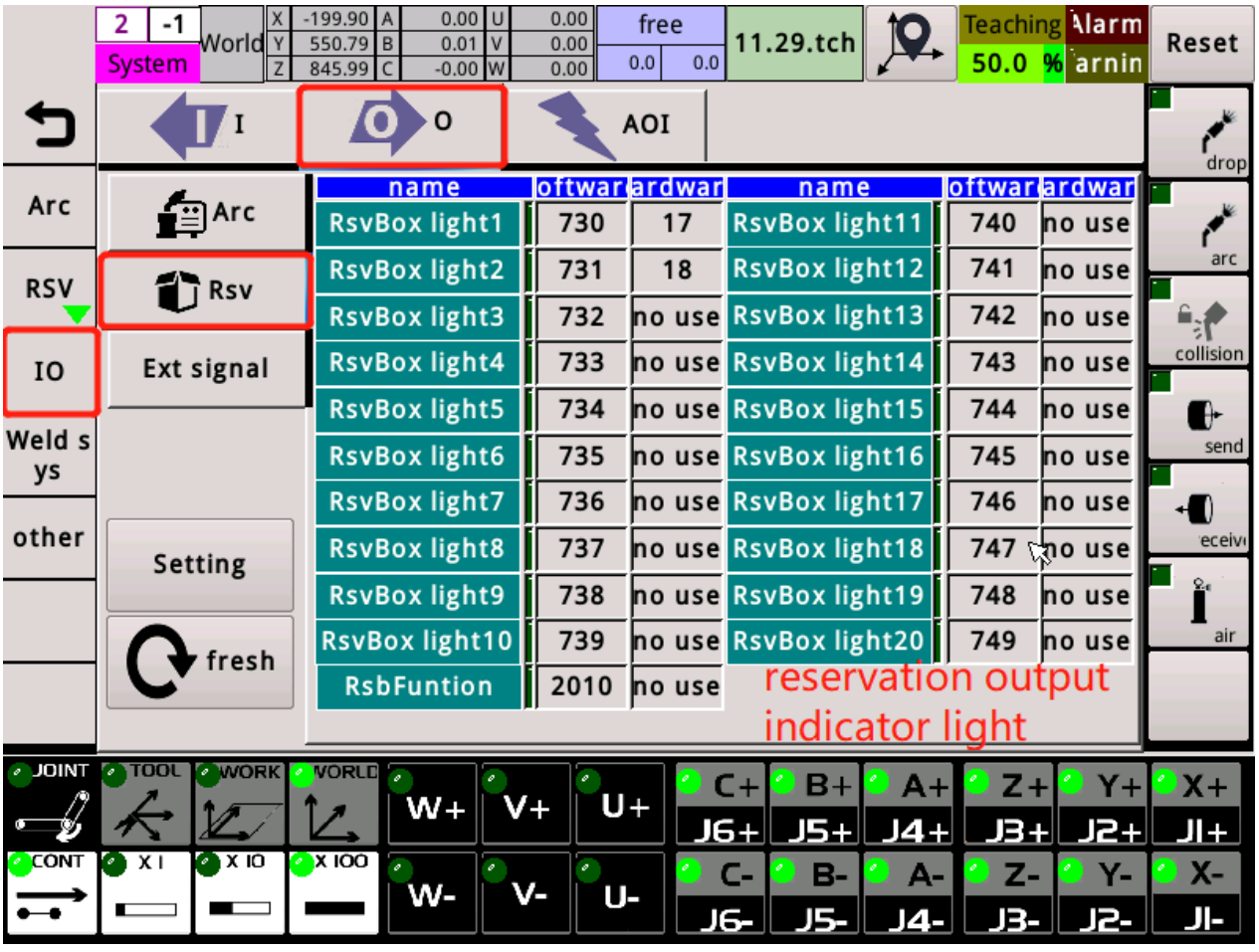
The system has planned the functions commonly used for welding and their corresponding soft numbers.When using them, you only need to set them in io and write the soft numbers corresponding to the functions in accordance with the hard numbers of the actual wiring.



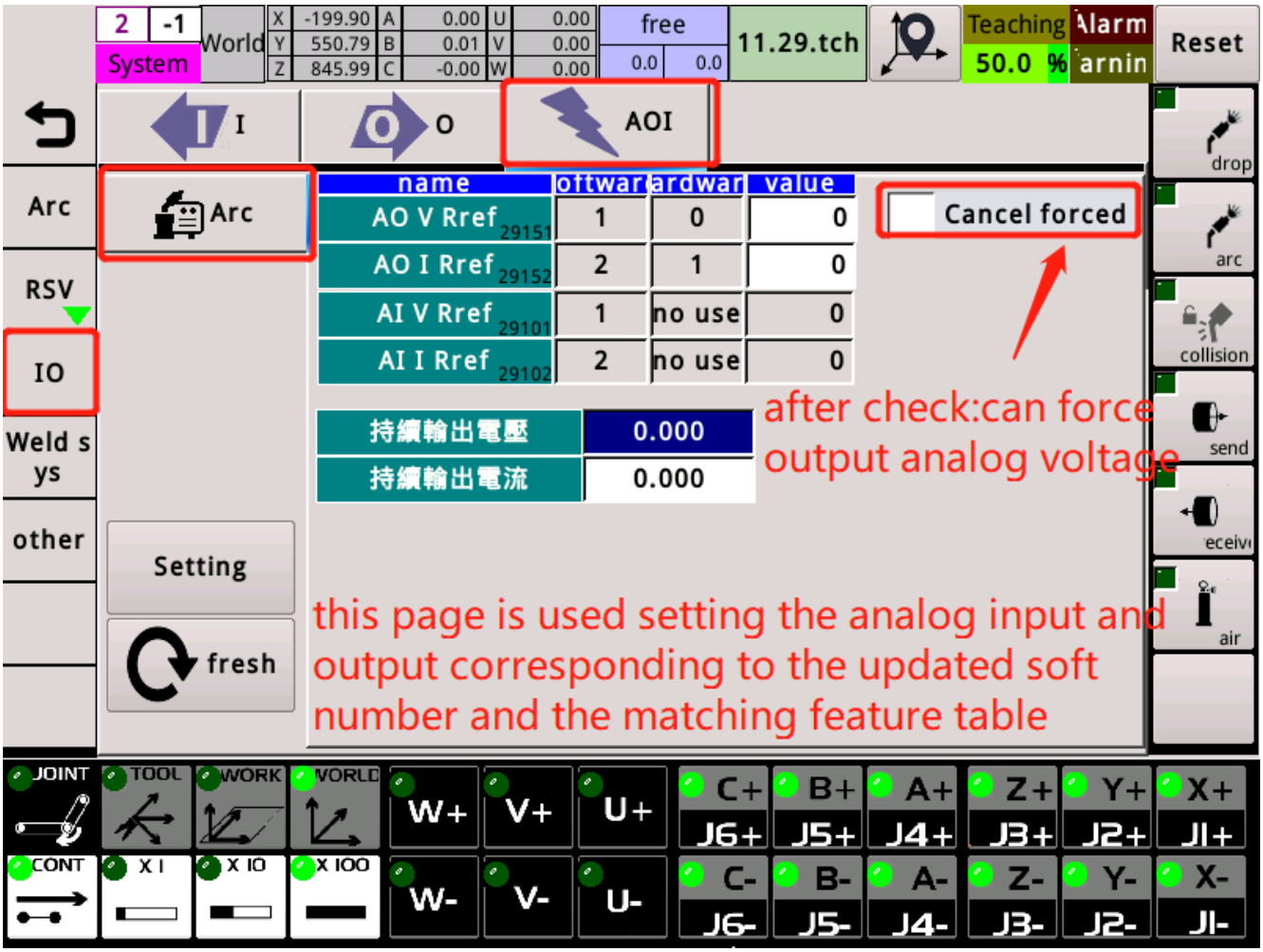


2.3.2 Welding io-o point



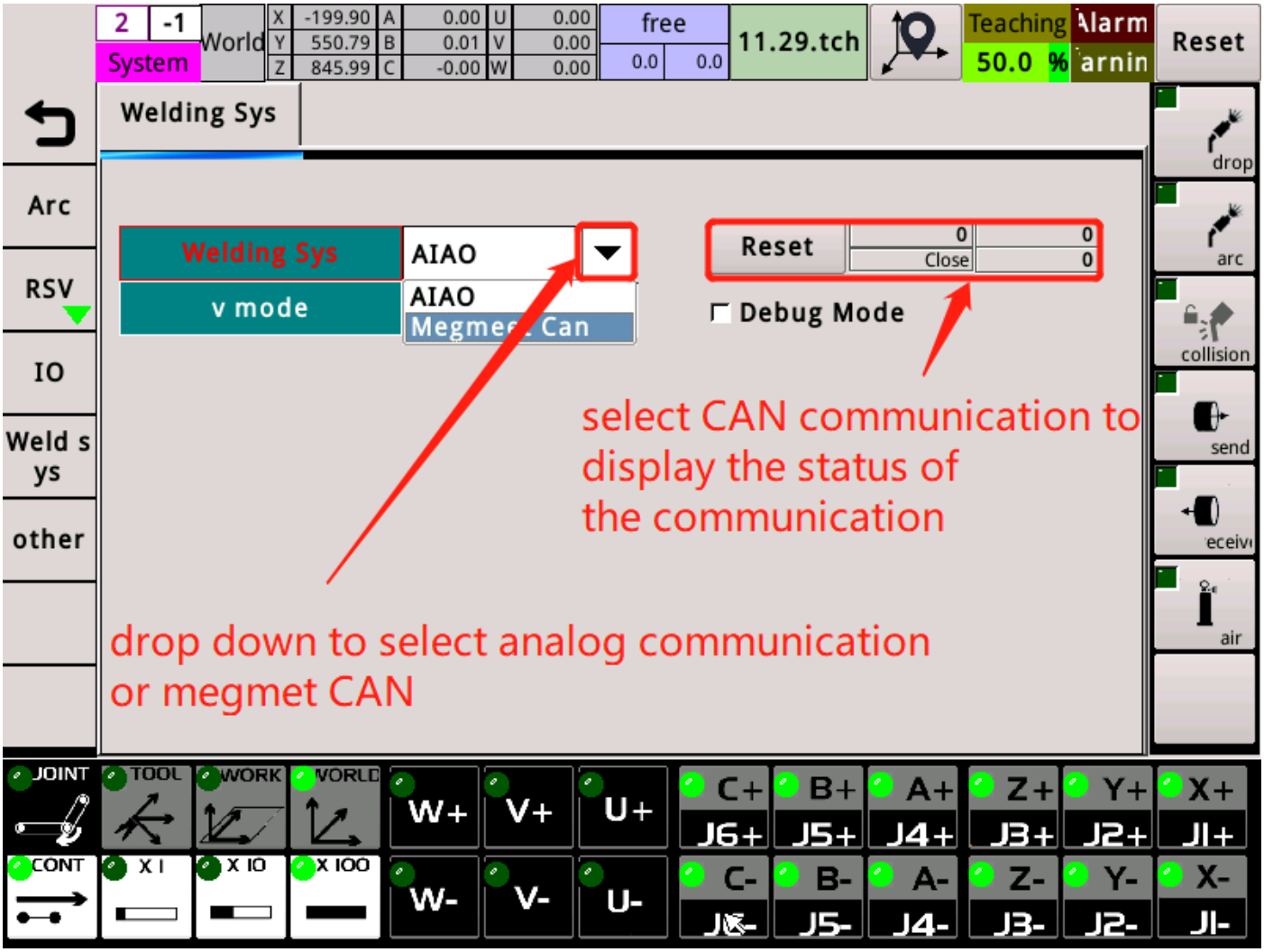


2.3.3 Welding io-aoi



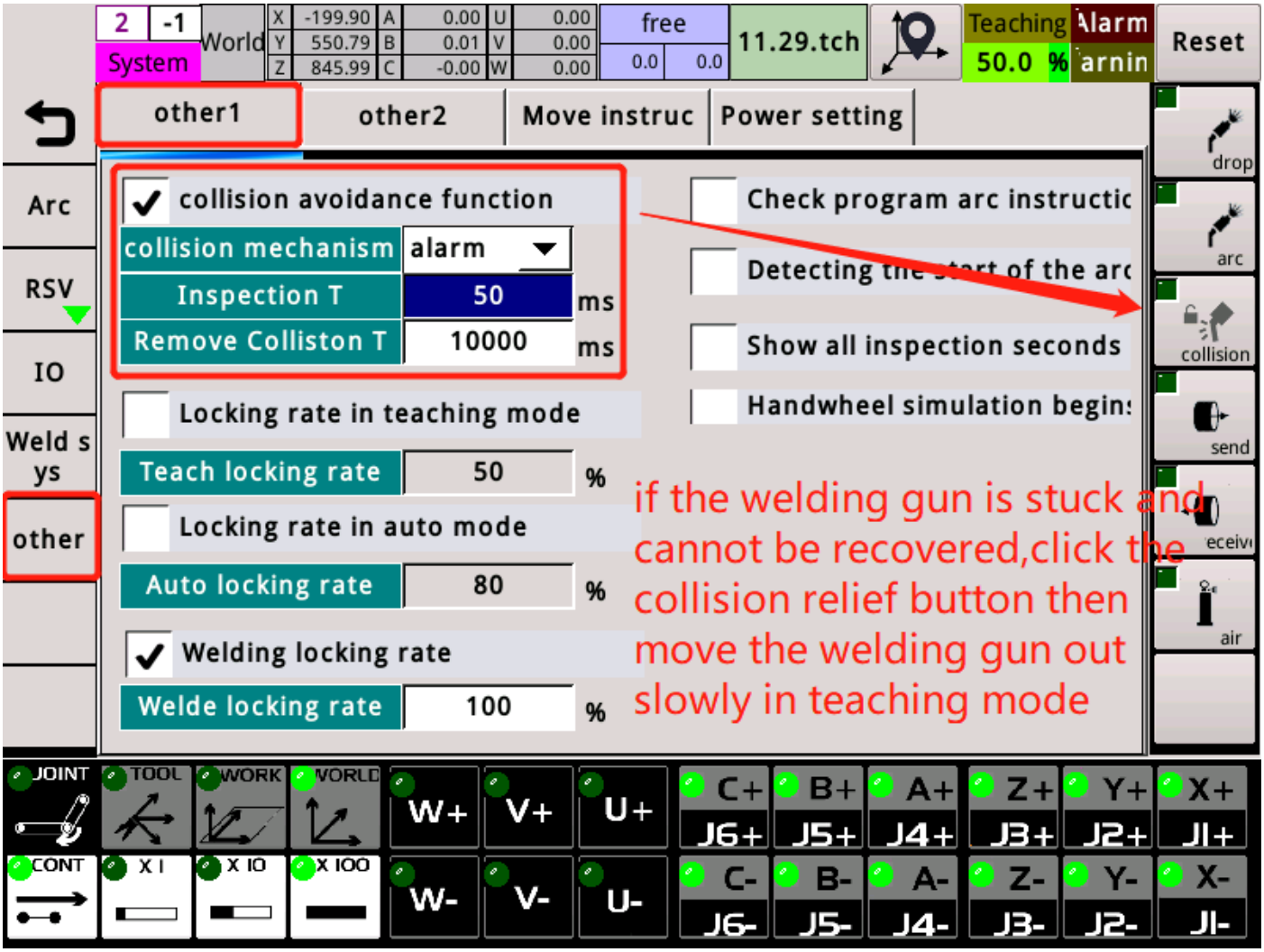
This page is used to set the analog current and voltage and the corresponding soft number. This page is needed to match the characteristic table. (For details, please refer to Chapter 5 Matching Table of Characteristic Table)

2.4 Welding device



2.5 Other

2.5.1 Others-Others 1



External anti-collision function: Set the processing mechanism when the welding gun collides, inspection time and alarm release time.

Welding gun collision release alarm time: When the welding gun collides, sometimes the welding gun cannot be reset, causing the system to keep alarming and unable to operate the machine to move away. In teaching mode, click the collision release button, the alarm will be temporarily shielded during this time, Remove the welding torch manually.

Lock rate in teach mode: The speed is fixed at the set value during teach

mode operation.

Lock rate in automatic mode: When running the program in automatic mode, the speed is fixed at the set value.

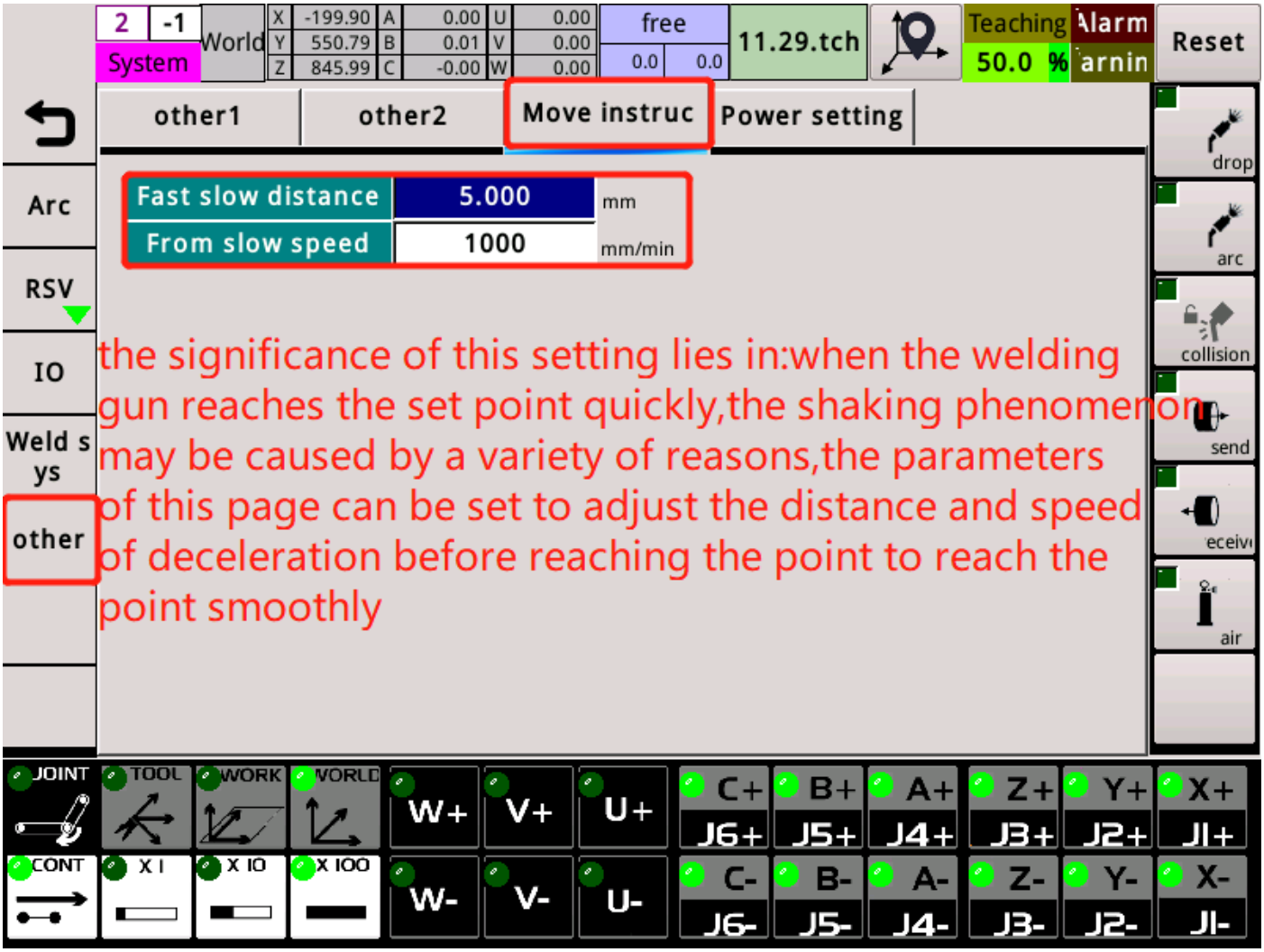
Lock rate under welding path: When the automatic mode is running, the welding path is fixed at the set value.

Check the start and end commands of the program: When it is running automatically, it will first check if there are any start and end commands in the program. If not, it will alarm.

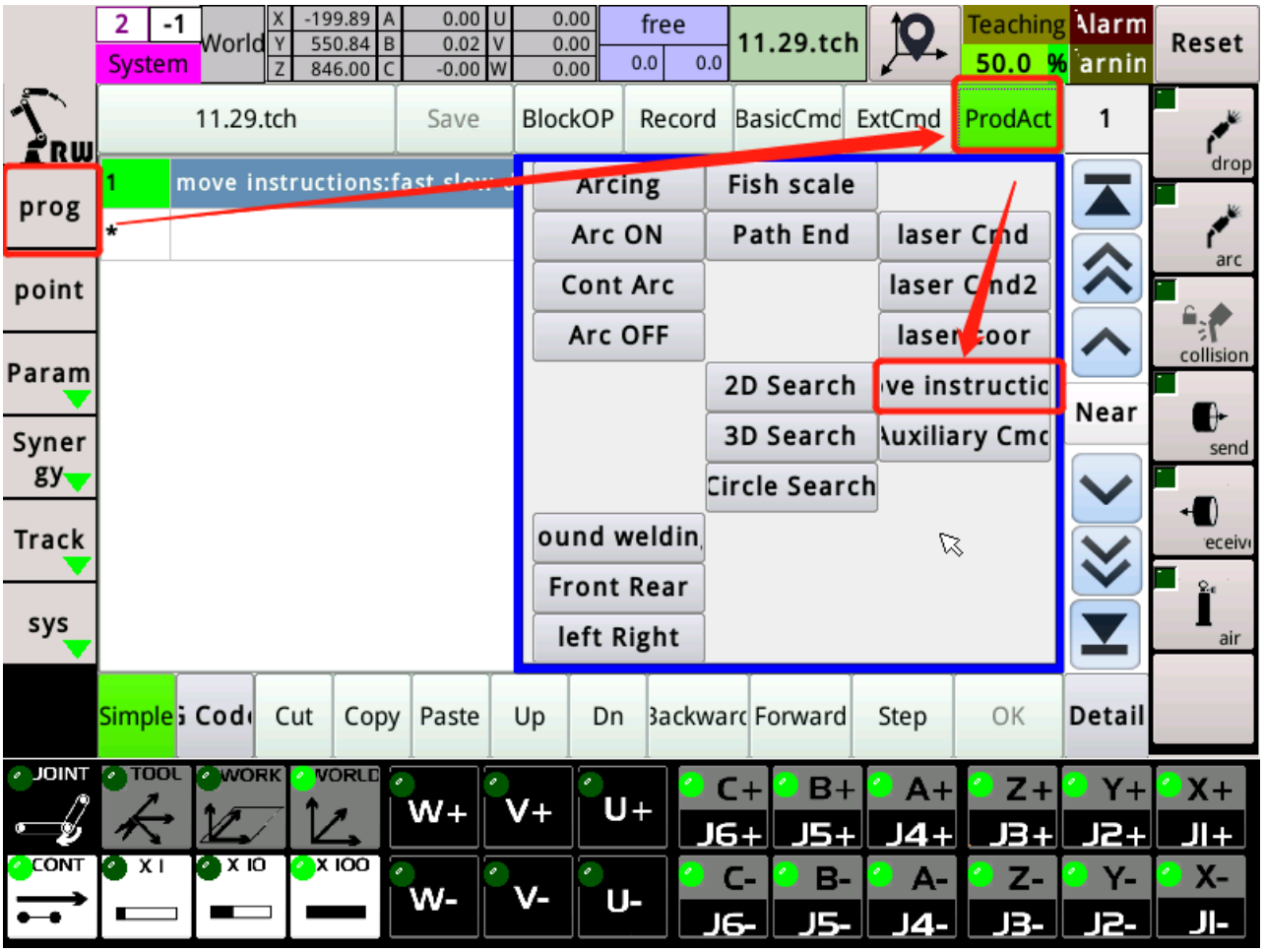
This process detects the arc start command: When this is started, it will check whether the subsequent program has an arc start command. If not, it will give an alarm.

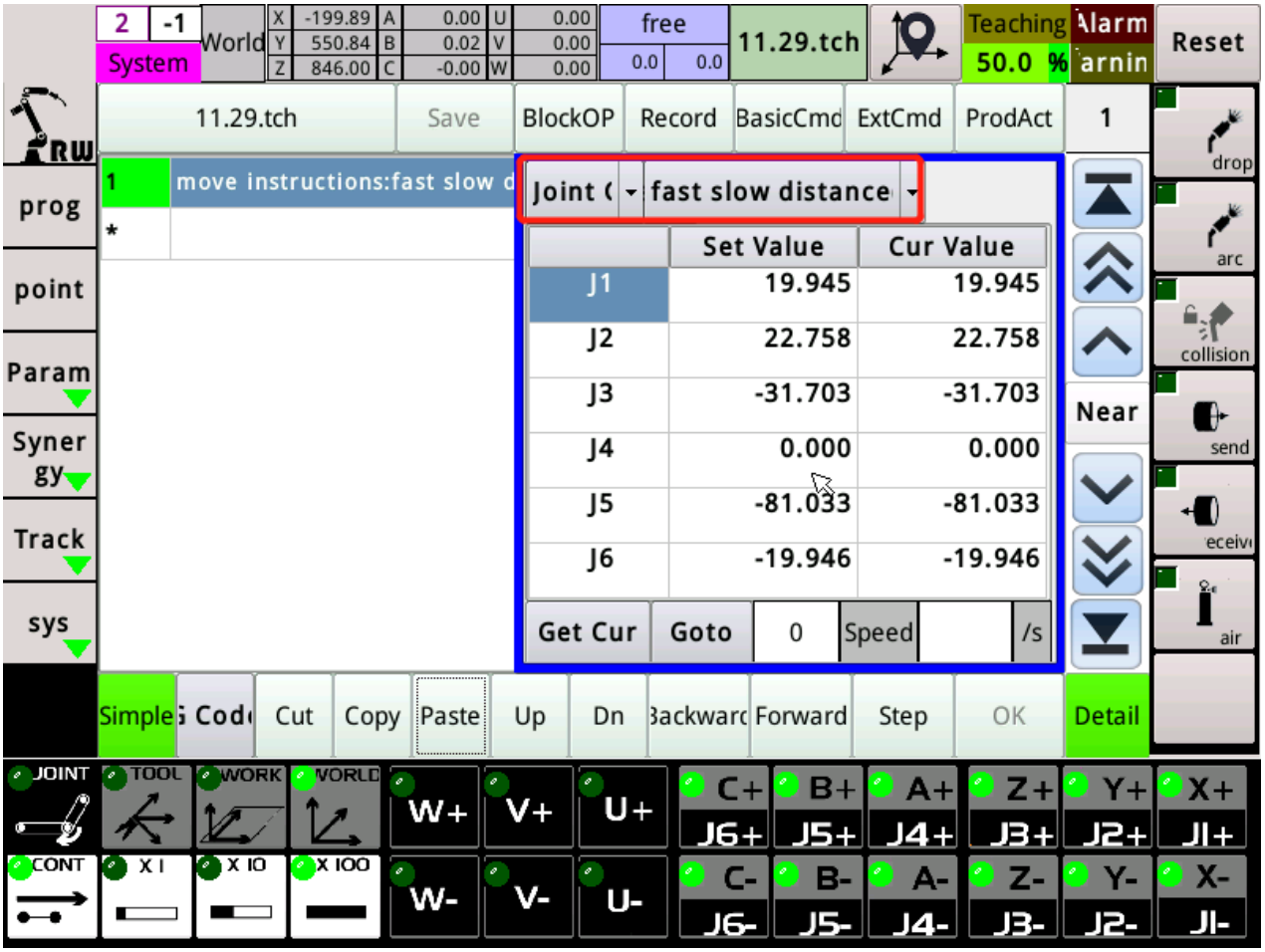
Display inspection seconds: Shows how long the alarm release time and inspection time on the left are.

2.5.2 Others-move instructions

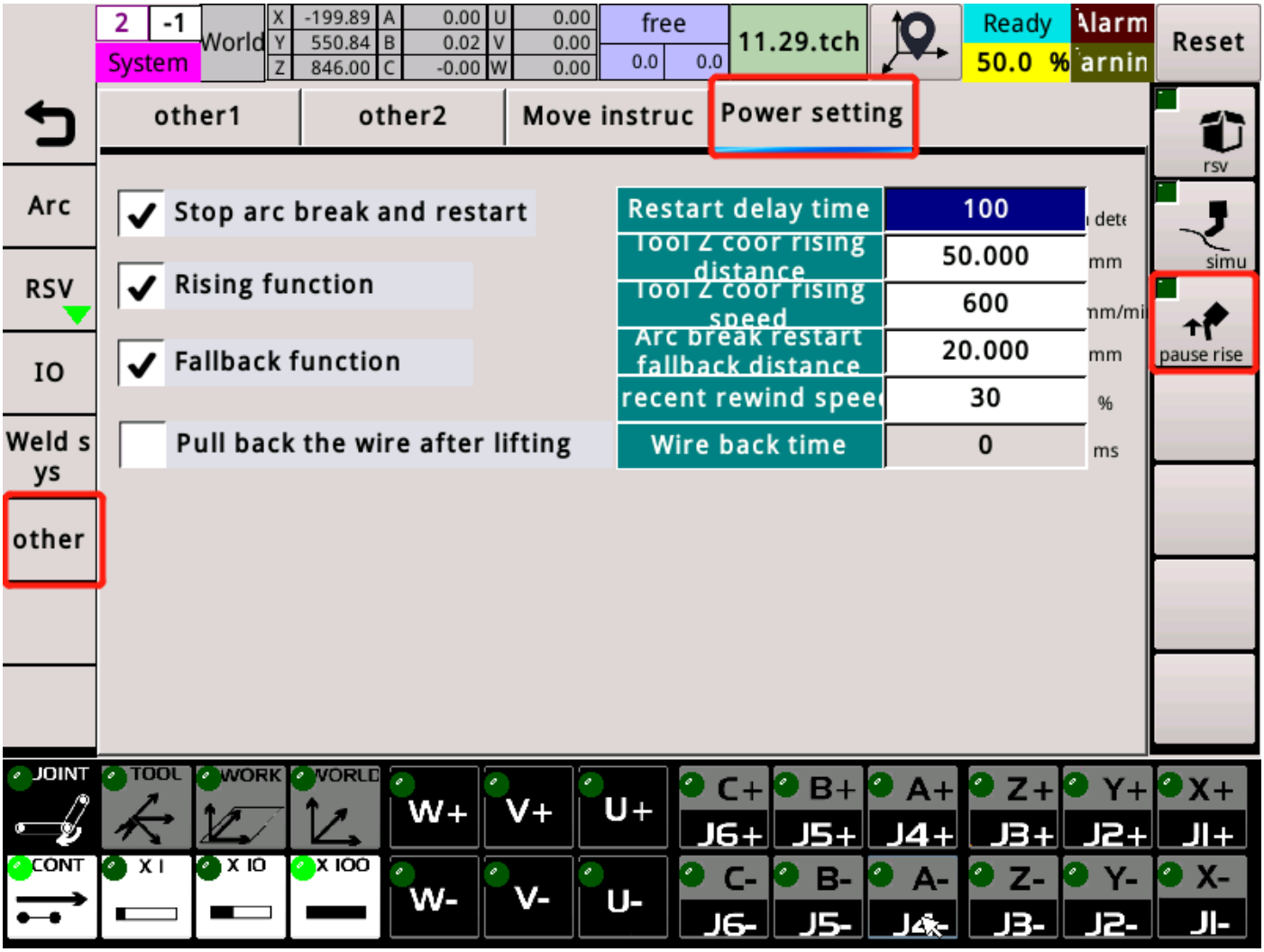


Because this fast instruction operation mode is used in some cases and not in most cases, the application process of programming instructions on the program page-move instructions-fast instructions (including slow distance). You can follow the figure below Go find this instruction.


2
-1
World
System
X -199.89
Y 550.84
Z 846.00
A 0.00
B 0.02
C -0.00
U 0.00
V 0.00
W 0.00
free
0.0
0.0
11.29.tch
Teaching
50.0 %
Alarm
arnin
Reset
11.29.tch
Save
BlockOP
Record
BasicCmd
ExtCmd
ProdAct
1
RW
prog
point
Param
Syner gy
Track
sys
move instructions:fast slow
Arcing
Fish scale
Arc ON
Path End
laser Cmd
Cont Arc
laser Cmd2
Arc OFF
laser coor
2D Search
ve instructic
3D Search
Auxiliary Cmc
Circle Search
ound weldin
Front Rear
left Right
Near
drop
arc
collision
send
eceiv
air
Simple
Code
Cut
Copy
Paste
Up
Dn
Backward
Forward
Step
OK
Detail
JOINT
TOOL
WORK
WORLD
CONT
X 1
X 10
X 100
W+
V+
U+
W-
V-
U-
C+
B+
A+
Z+
Y+
X+
J6+
J5+
J4+
J3+
J2+
J1+
C-
B-
A-
Z-
Y-
X-
J6-
J5-
J4-
J3-
J2-
J1-


2
-1
World
System
X -199.89
Y 550.84
Z 846.00
A 0.00
B 0.02
C -0.00
U 0.00
V 0.00
W 0.00
free
0.0
0.0
11.29.tch
Teaching
50.0 %
Alarm
arnin
Reset
11.29.tch
Save
BlockOP
Record
BasicCmd
ExtCmd
ProdAct
1
RW
prog
point
Param
Syner gy
Track
sys
move instructions:fast slow
Joint (
fast slow distance
Set Value
Cur Value
J1
19.945
19.945
J2
22.758
22.758
J3
-31.703
-31.703
J4
0.000
0.000
J5
-81.033
-81.033
J6
-19.946
-19.946
Get Cur
Goto
0
Speed
/s
Near
drop
arc
collision
send
eceiv
air
Simple
Code
Cut
Copy
Paste
Up
Dn
Backward
Forward
Step
OK
Detail
JOINT
TOOL
WORK
WORLD
CONT
X 1
X 10
X 100
W+
V+
U+
W-
V-
U-
C+
B+
A+
Z+
Y+
X+
J6+
J5+
J4+
J3+
J2+
J1+
C-
B-
A-
Z-
Y-
X-
J6-
J5-
J4-
J3-
J2-
J1-

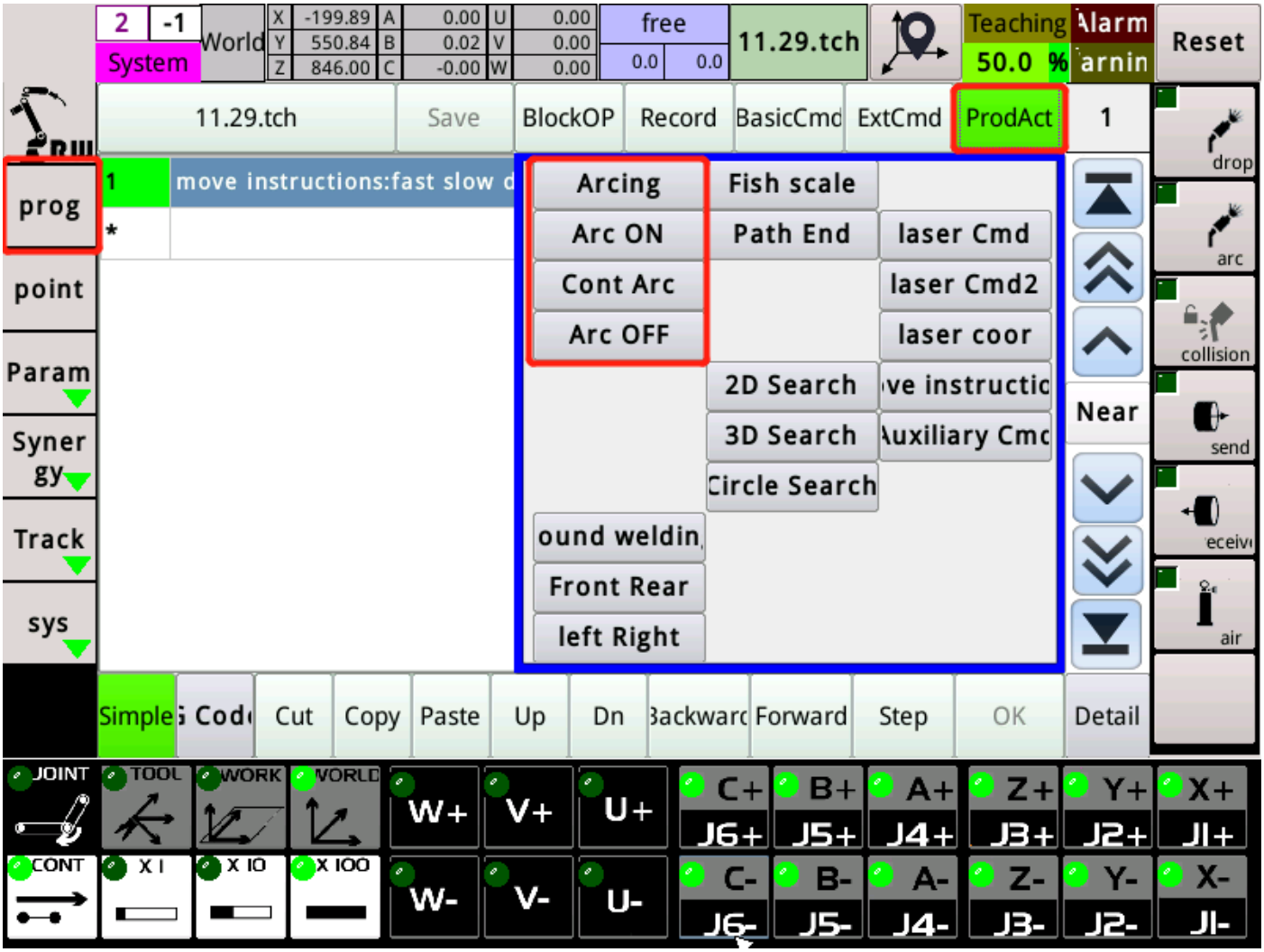
2.5.3 Others-Suspended Lift

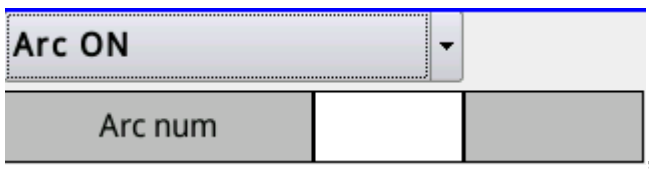


This function is used to pause when welding is halfway during the welding process. When observing the welding effect, first set the parameters on this page (for the meaning of the parameters, refer to the parameters on the arc welding-arc setting page). Pressing the pause and raise button on the right will pause the program, then lift and back. After pressing again, the welding gun will come down to continue welding.

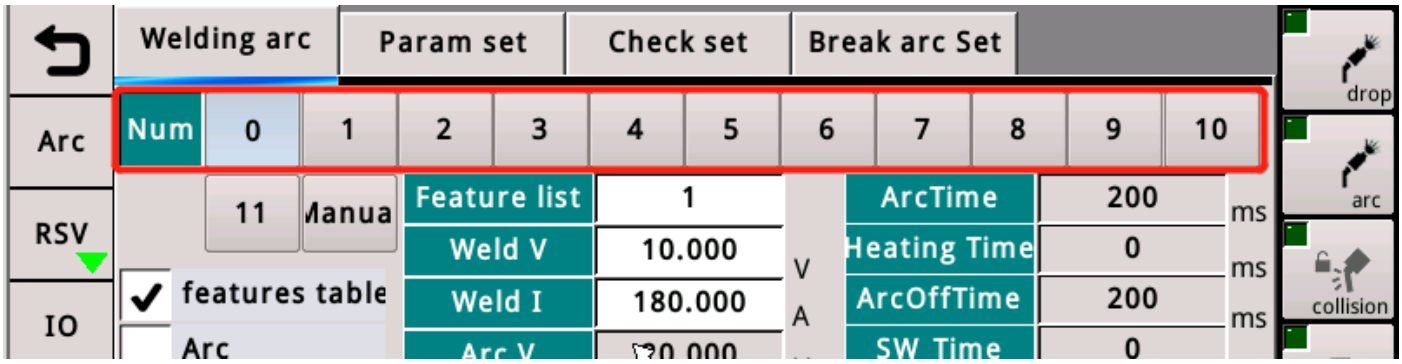
3 Welding instructions and program examples

3.1 Arc start instruction





Arc starting: , added at the arc starting point, outputting an arc starting signal to the welding machine, and can set the welding arc number (corresponds to the group number in the parameter page-arc welding page-arc welding sequence page)



Arc closing: Turn off the arc starting signal and add the arc ending command at the end of welding.

Spot welding:

Arc num		
spot weldingTime		ms

sets the arc number and welding time.

Arc change:

Arc num		
V		V
I		I

immediately changes the current and voltage according to the actual input.

Gradual change of arc:

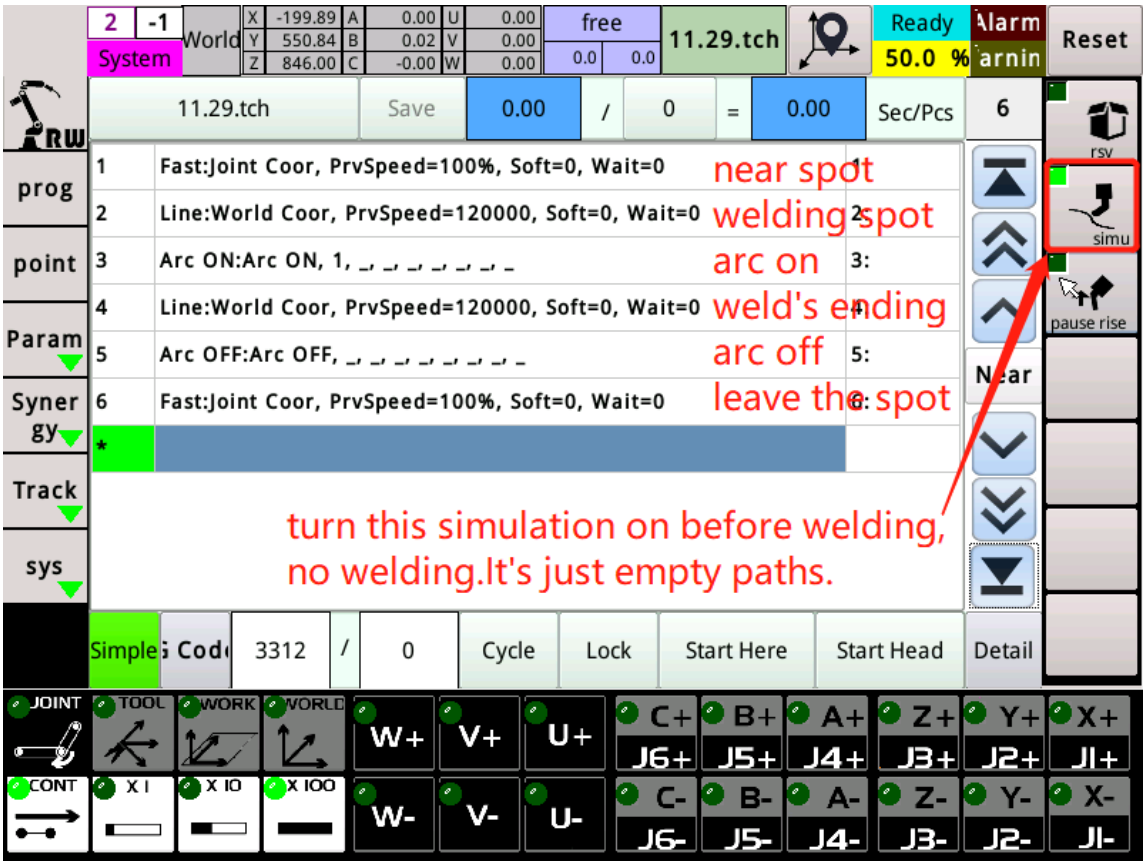
Arc num	0	
V	12	V
I	120	I

changes from the arc current voltage to the set current voltage

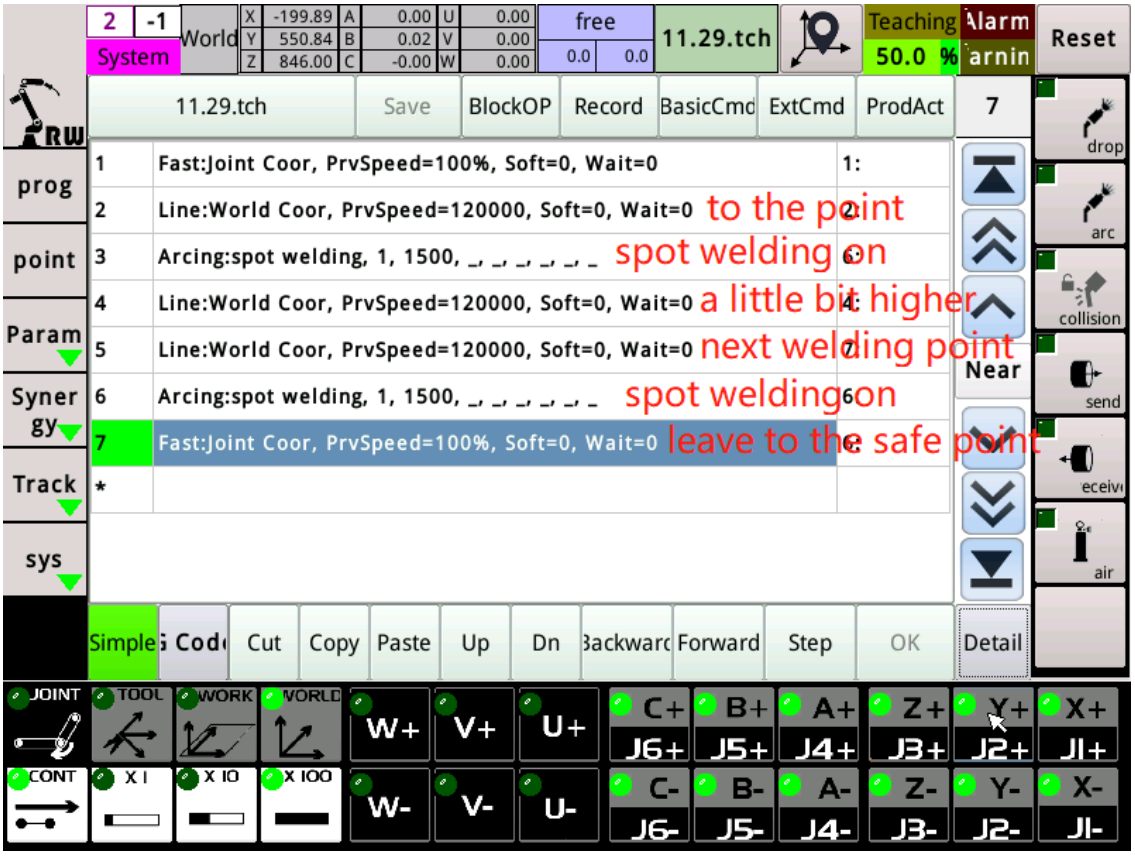
Continue arc start: Continue the last arc start setting value.

3.2 Examples of welding procedures

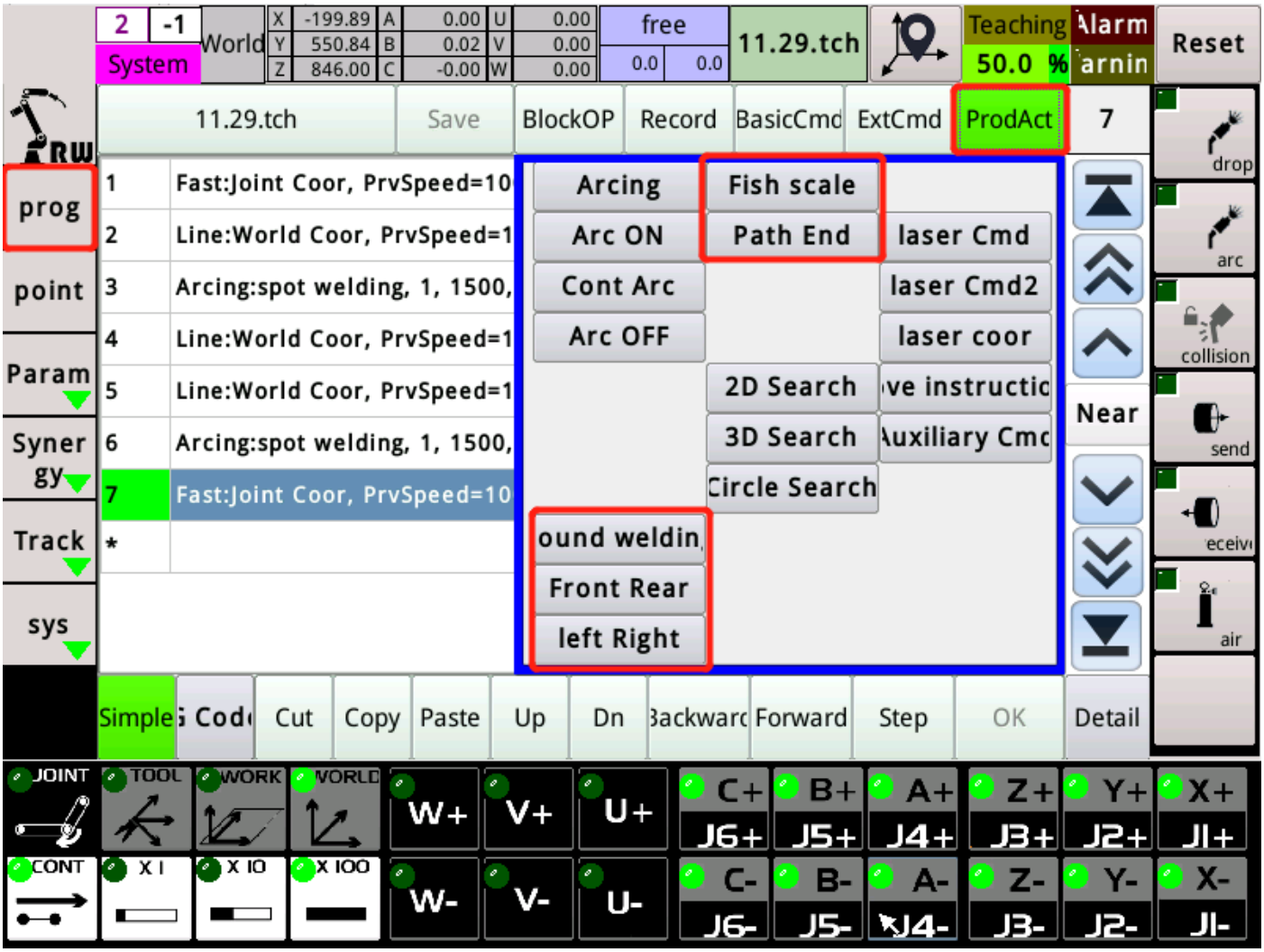
3.2.1 Arc welding and arc welding



3.2.2 Spot welding



3.3 Oscillation welding and fish scale welding



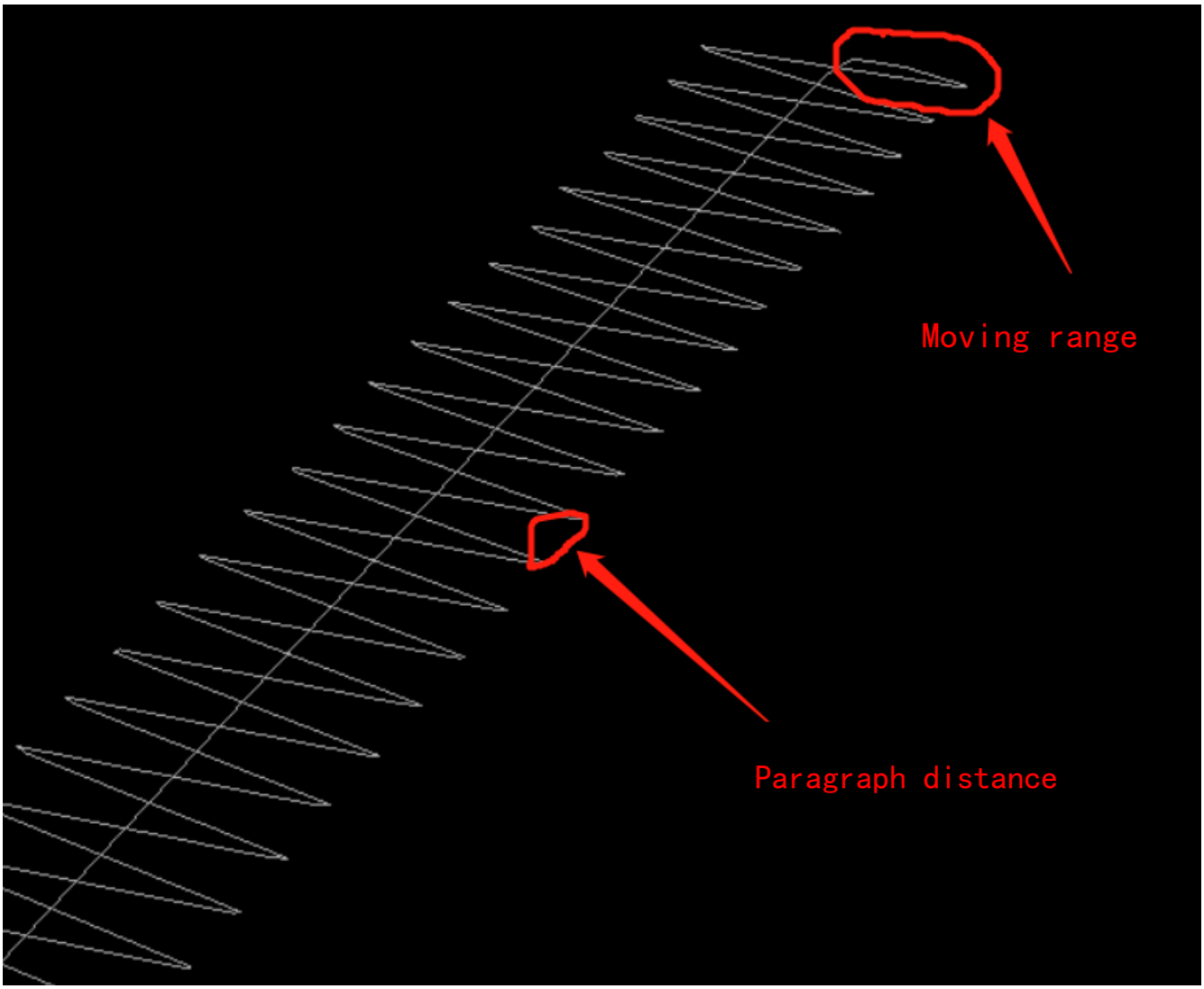
Coordinate system:Path		
Moving range	5	mm
Moving distance	3	mm
Speed		mm/s
Corner Delay	100	ms

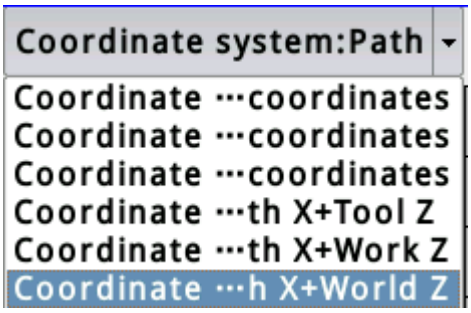
Range of movement: the amplitude of the left and right swing during swing welding.

Paragraph distance: the period or frequency of the swing during swing welding.

Corner delay: the dwell time from swing welding to the corner.

The speed of the swing welding does not need to be set.The speed is determined by the speed of the straight line in the swing welding path.



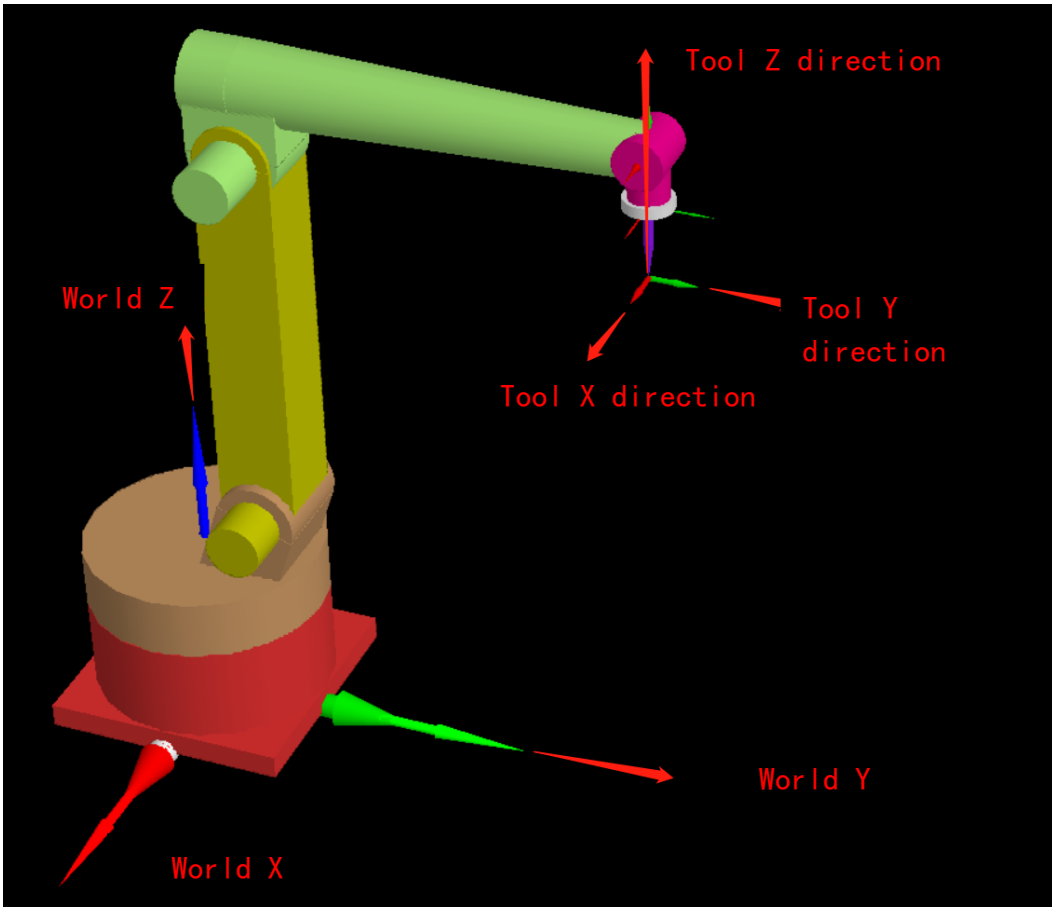


Changing coordinate system: There are 6 ways of changing, two of which are path x + tool z and path x + world z. To understand these six changing coordinate systems, you need to understand three coordinate systems (world coordinate system, working coordinate). What are the meanings of `` system and tool coordinate system ''? I am proficient in mastering 6 kinds of changing attitudes and can quickly teach the ideal welding effect in

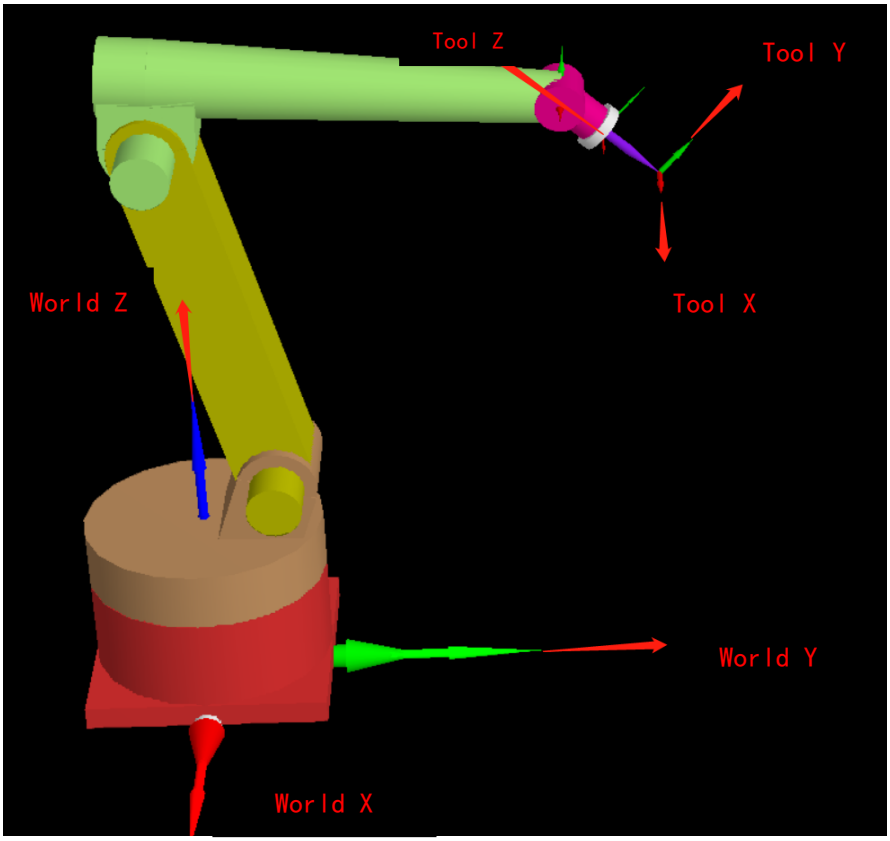
programming. The following focuses on the path x + world z and the path x + tool z.

First understand the tool coordinates and world coordinate directions.

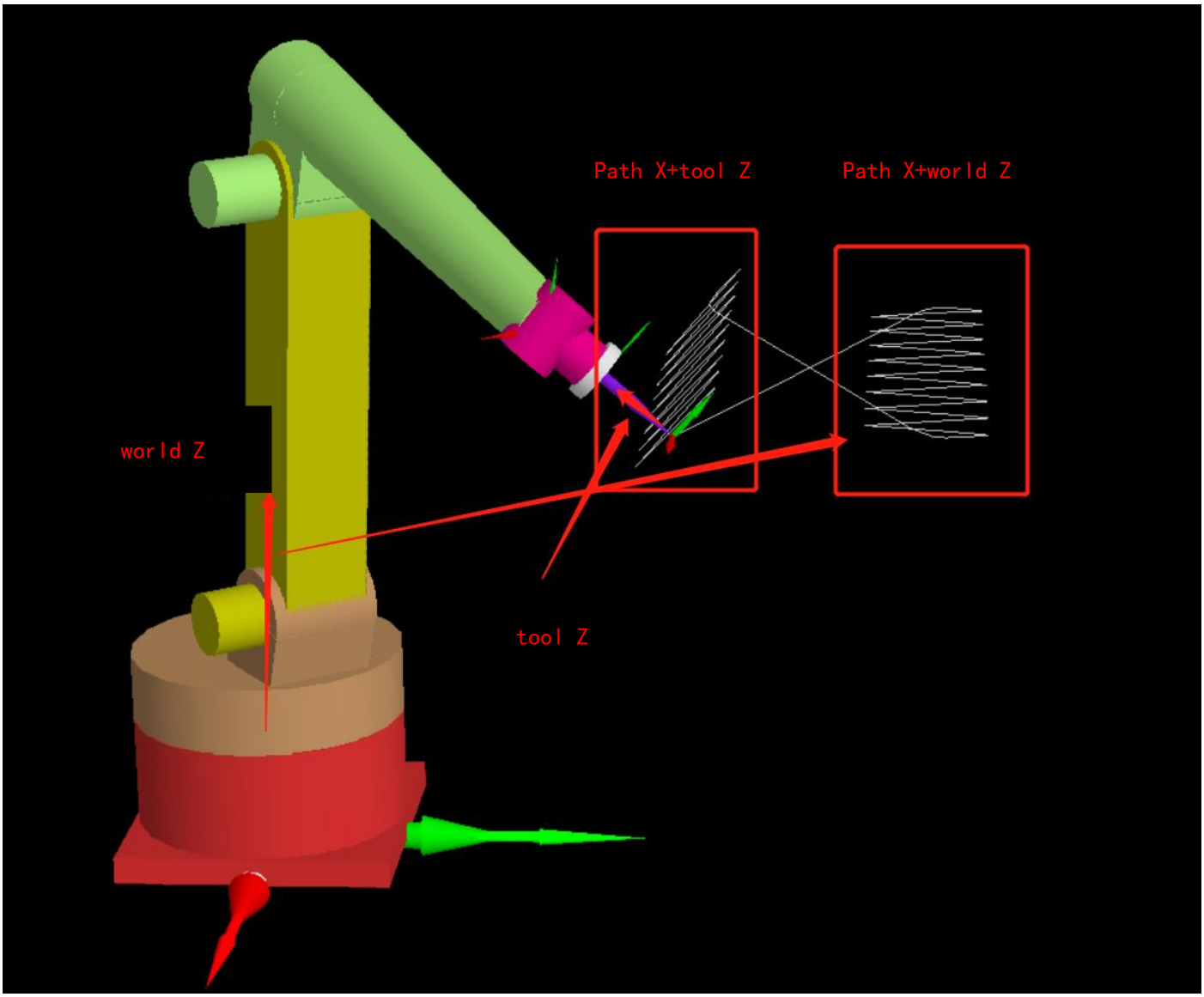
When at the calibration point, the coordinate directions are as follows:



Coordinate direction after changing attitude:

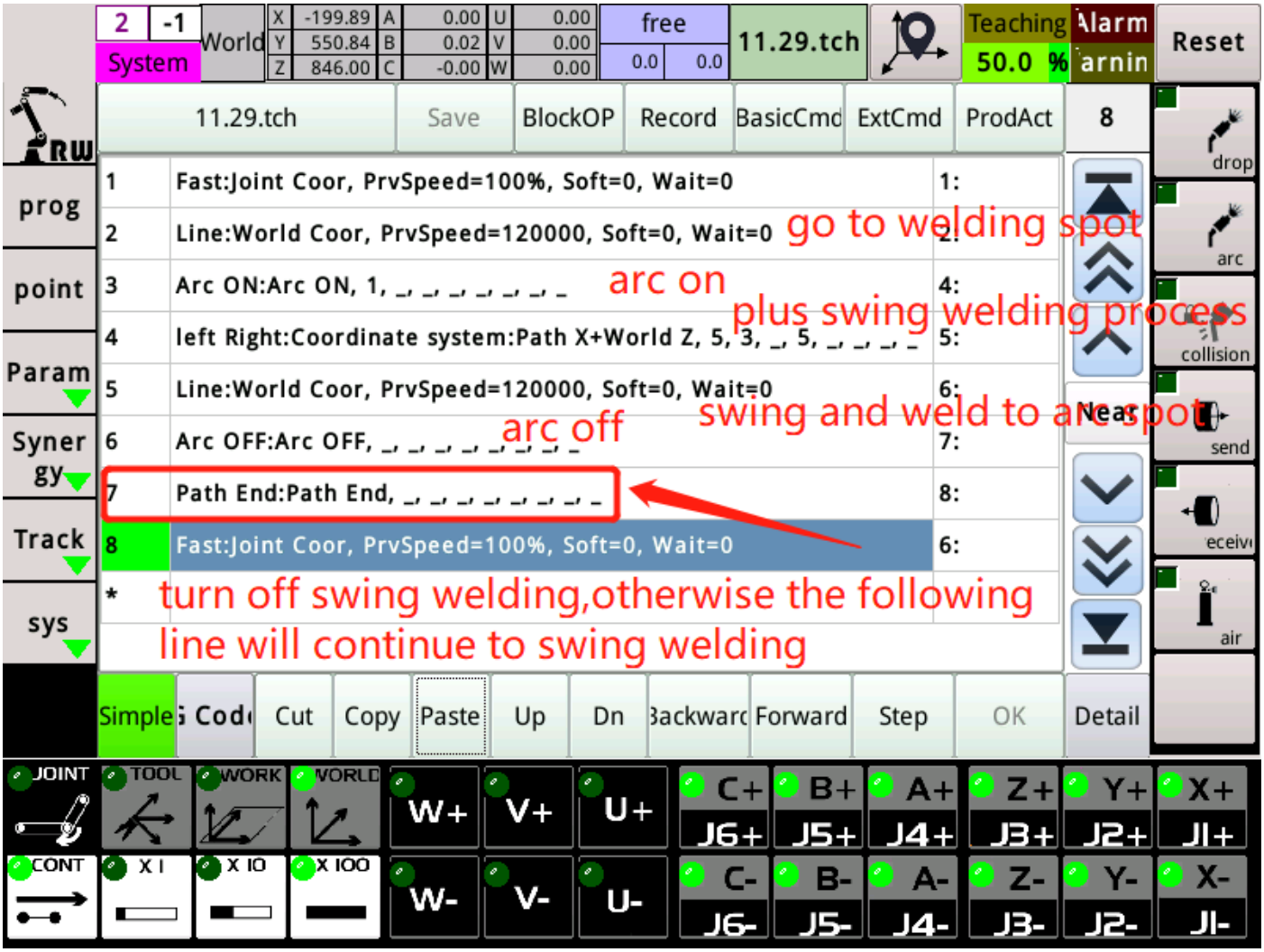


Let's compare the effects of the two paths in this attitude:



Therefore, it can be seen that these two swing welding methods are based on the taught trajectory to swing left and right, and the angle of swing is perpendicular to the z direction of the selected coordinate system.

3.4 Oscillation Programming Example



3.5 Fish Welding

Fish scale_0		
Arc num	1	
Weld T	500	ms
Moving distance	3	mm
Speed	100	mm/s
Delay T		ms

Fish scale_1		
Arc num	1	
Weld T	500	ms
Arc Count	20	
Speed	100	mm/s
Delay T		ms

Welding arc number: The group number of the current and voltage called during welding.

Welding time: the time of spot welding during fish scale welding.

Paragraph distance: the distance between every two spot welding points (equivalent to the period or frequency)

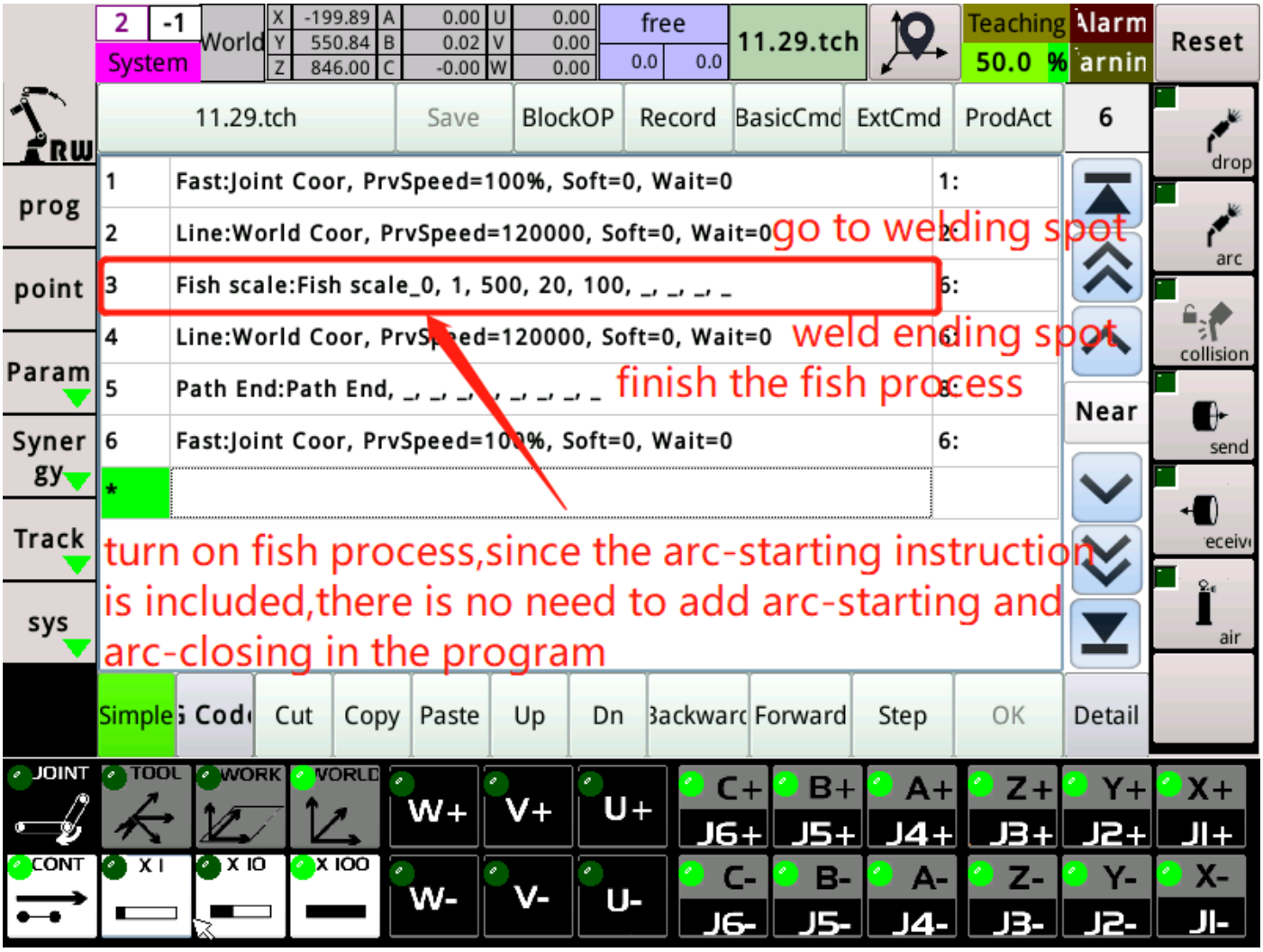
Arcing times: how many spot weldings this welding path has in total (not commonly used, generally using paragraph distance)

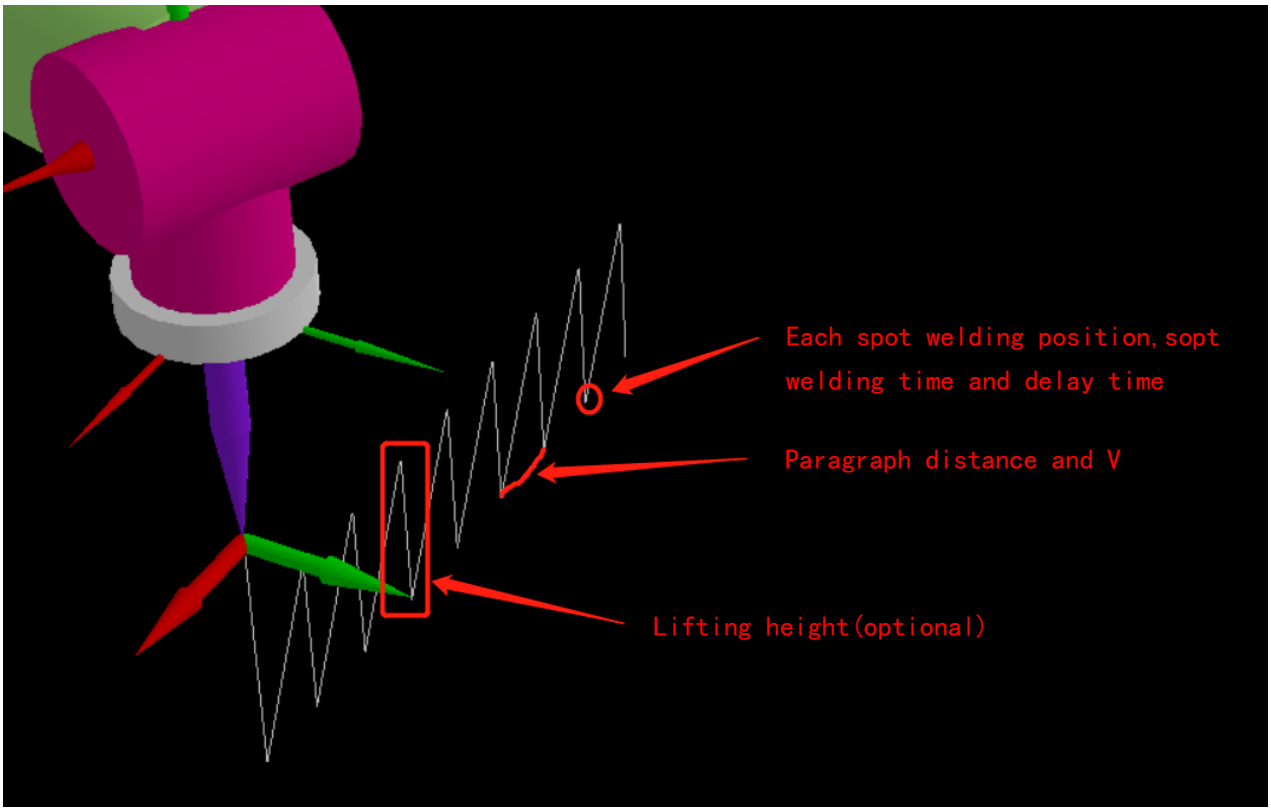
Speed: The speed of moving between every two spot welding spots.

Delay time: when reaching each welding point, how long will it delay before starting arc welding (not commonly used)

Tool lifting height: after each spot welding point is welded, the distance lifted in the tool z direction, and then straight to the next spot welding point (not commonly used).

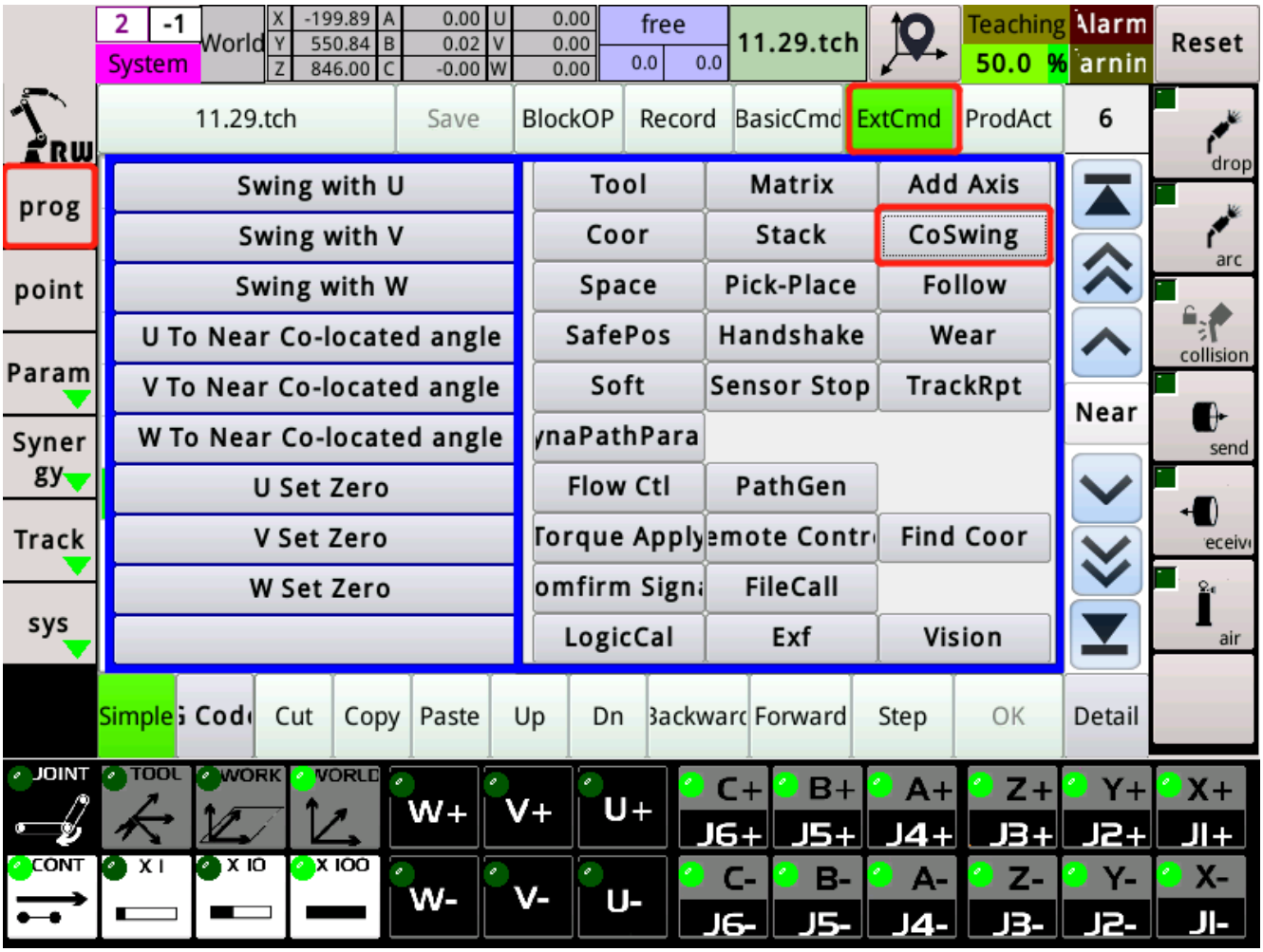
3.6 Fish Scale Welding Procedure Example

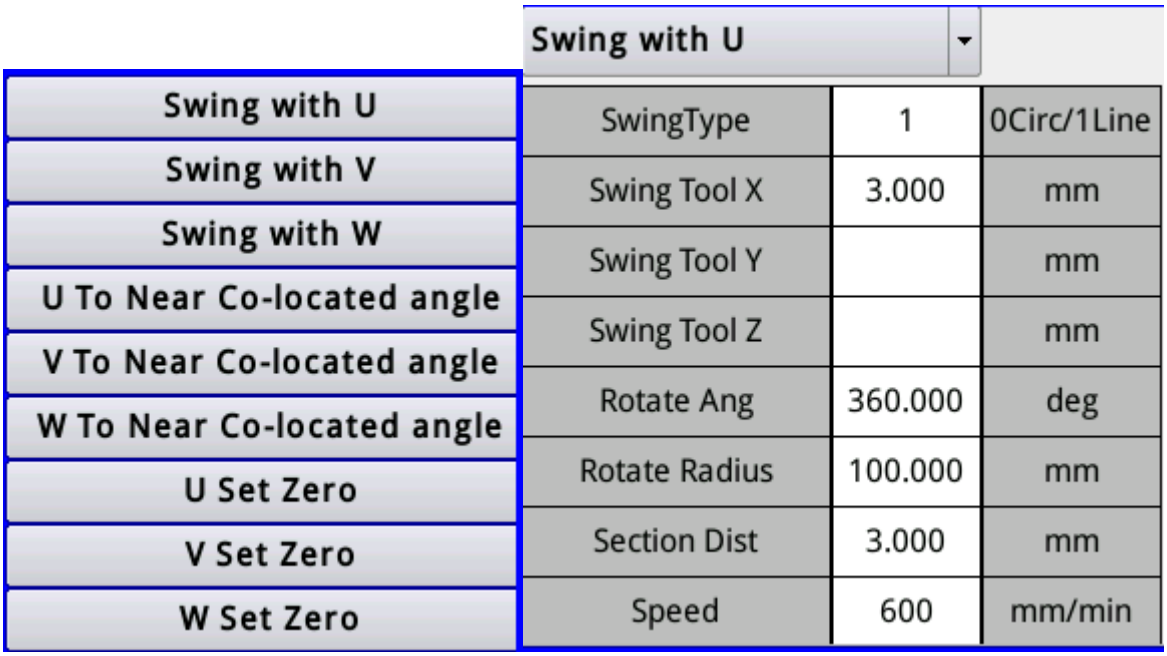




3.7 Coordinated swing welding

Coordinated swing welding: used with additional axes. When the additional shaft is rotated, the end of the robot is fixed at one point for swing welding.





Swing method: Let 0 be the circle swing welding, and let 1 be the back and forth straight swing welding.

Swing vector tool x / y / z: The distance to swing in three directions of the tool coordinate system xyz. (Adjust according to the actual situation)

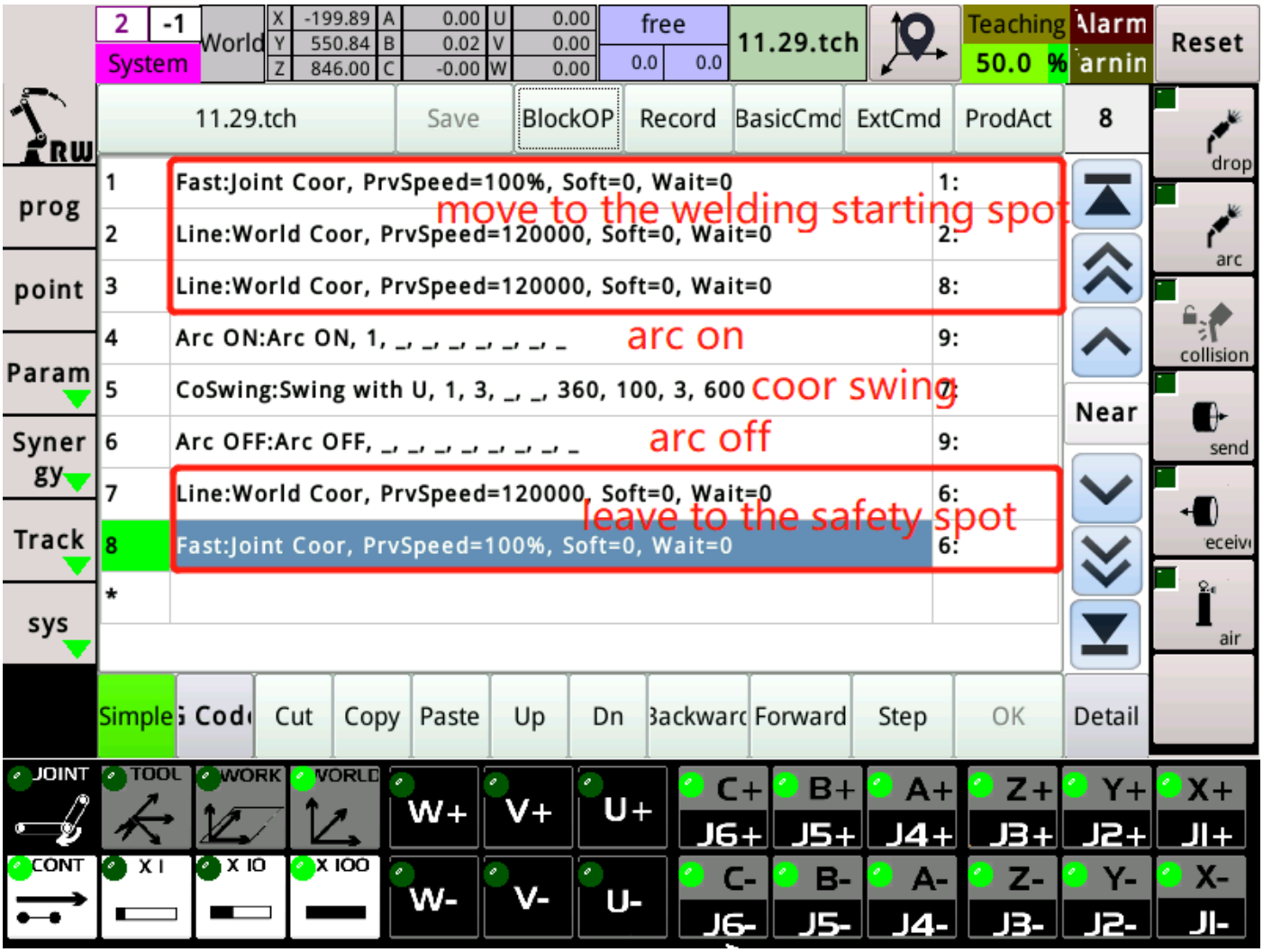
Turning radius: The radius of the workpiece to be welded.

Rotation angle: the rotation angle of the rotation axis during cooperative swing welding.

Paragraph distance: The same as the paragraph distance of swing welding described above.

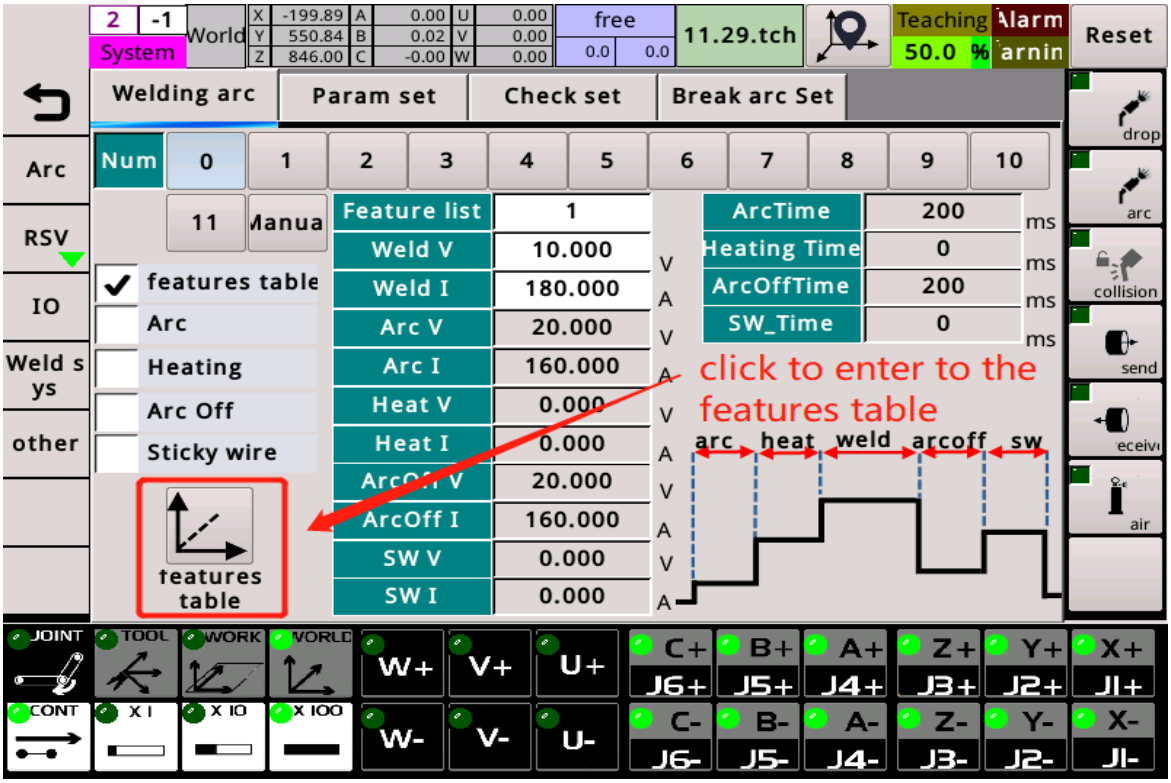
Speed: The speed of welding. (The system will calculate the distance moved during welding according to the rotation radius and rotation angle)

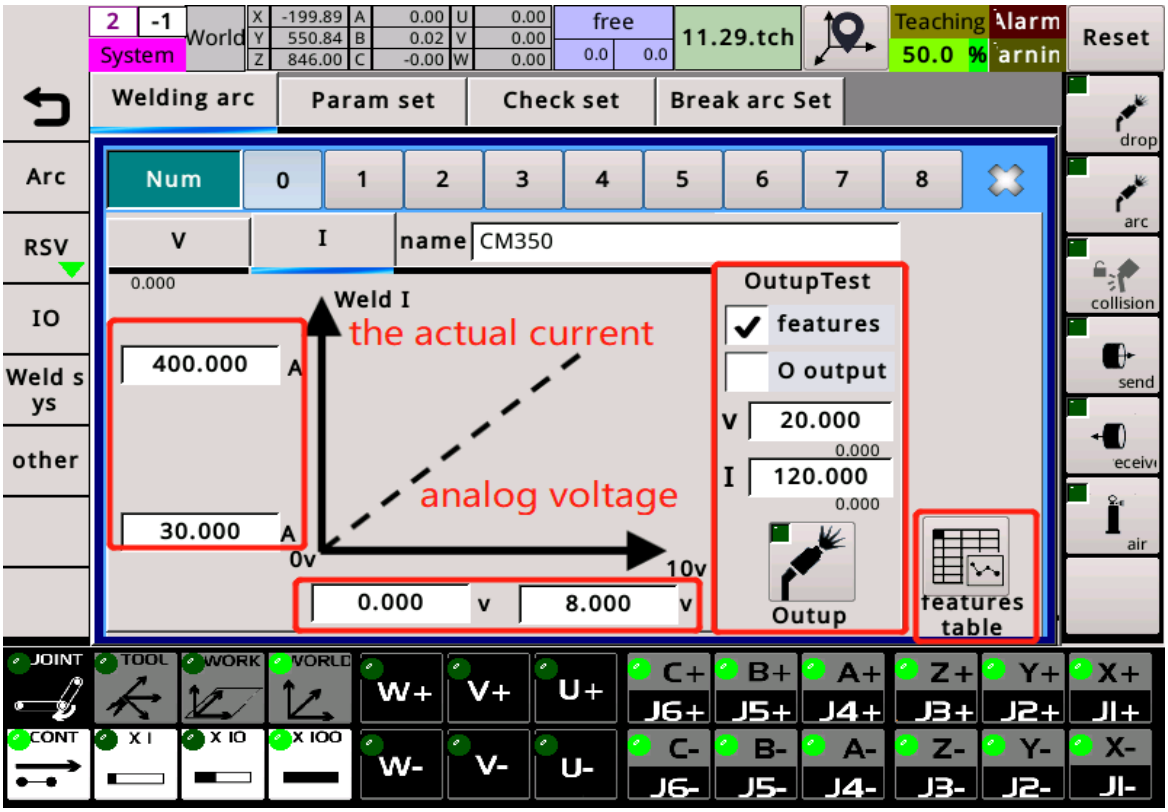
Program example:



4 Matching of welding characteristic curve table

4.1 Introduction to the feature table interface





Test output: This function is used to check whether the matching welding characteristic curve table is accurate. The specific operation is as follows:

1) Select the number of the welding characteristics table you want to test above

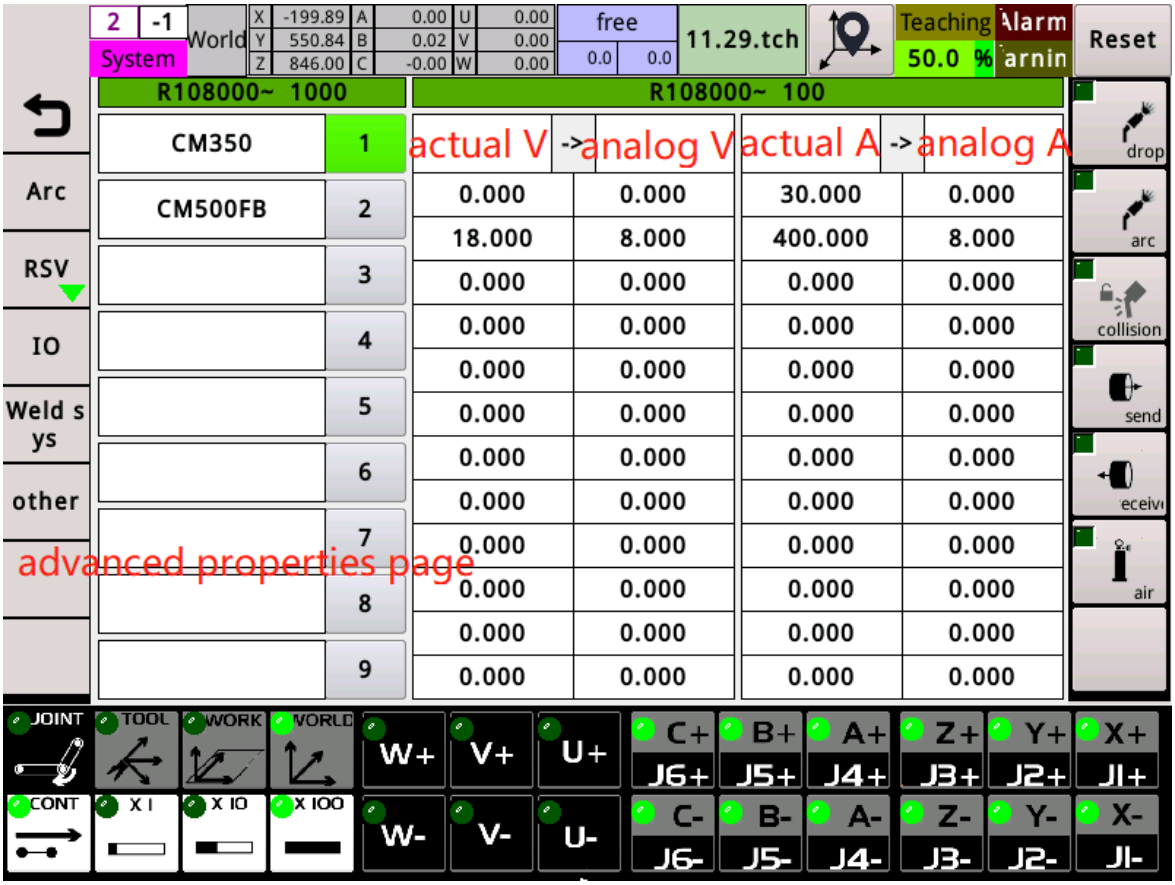
2) Tick the property sheet

3) Enter the actual desired current and voltage

4) Press and hold the output icon below, and the system will output the corresponding analog voltage to the welding side according to the input current voltage value and characteristic table, and the welding machine panel will output the actual current voltage according to the received analog voltage. Compare the value entered on the system with the actual value displayed on the welding machine panel to determine whether the welding characteristic table is accurate. If the output icon is loosened, the system will not output the analog voltage.

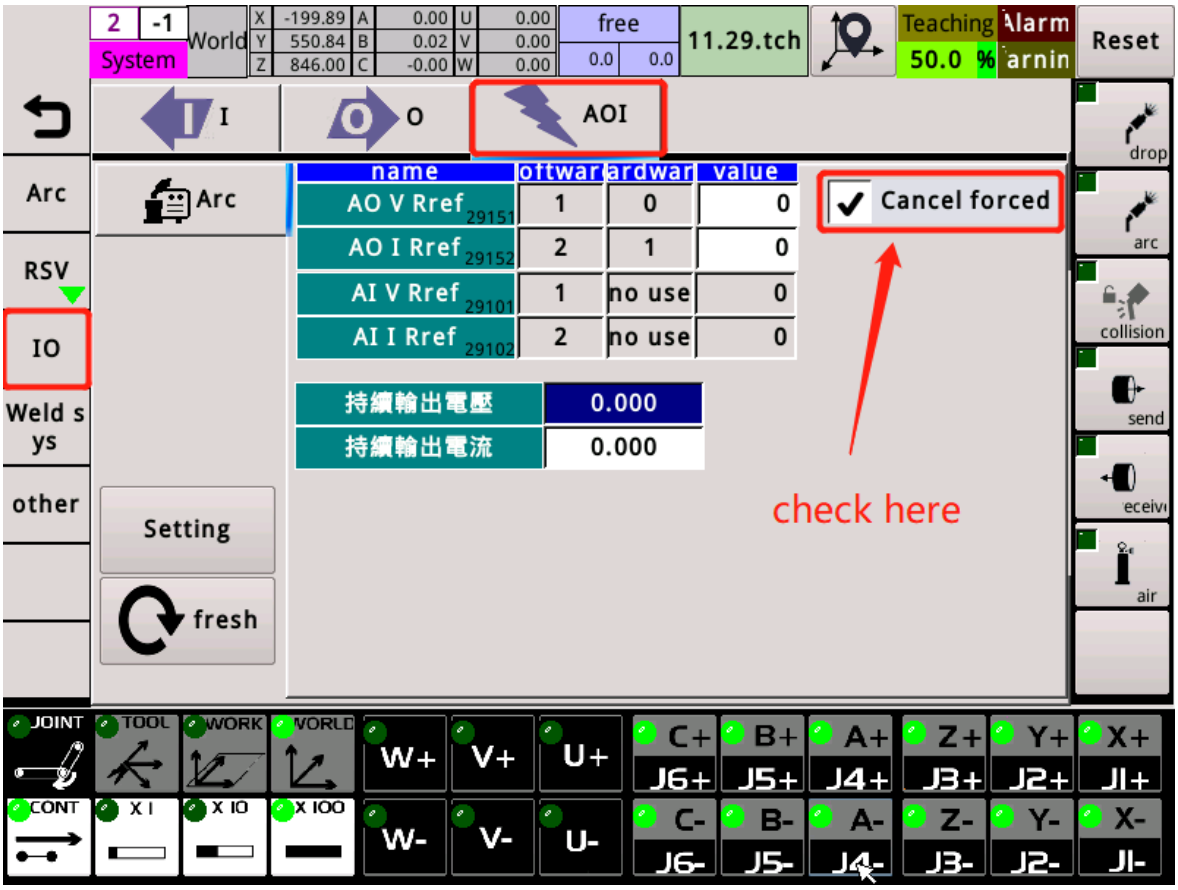
5) If the arc start output is checked, when the output icon is held down, in addition to the analog voltage output, the arc start signal will also be output, and the welder will start the arc.

Advanced characteristic table: Click this button to enter the advanced characteristic table page.This page can subdivide the characteristic table, and the current and voltage are more accurate when used.

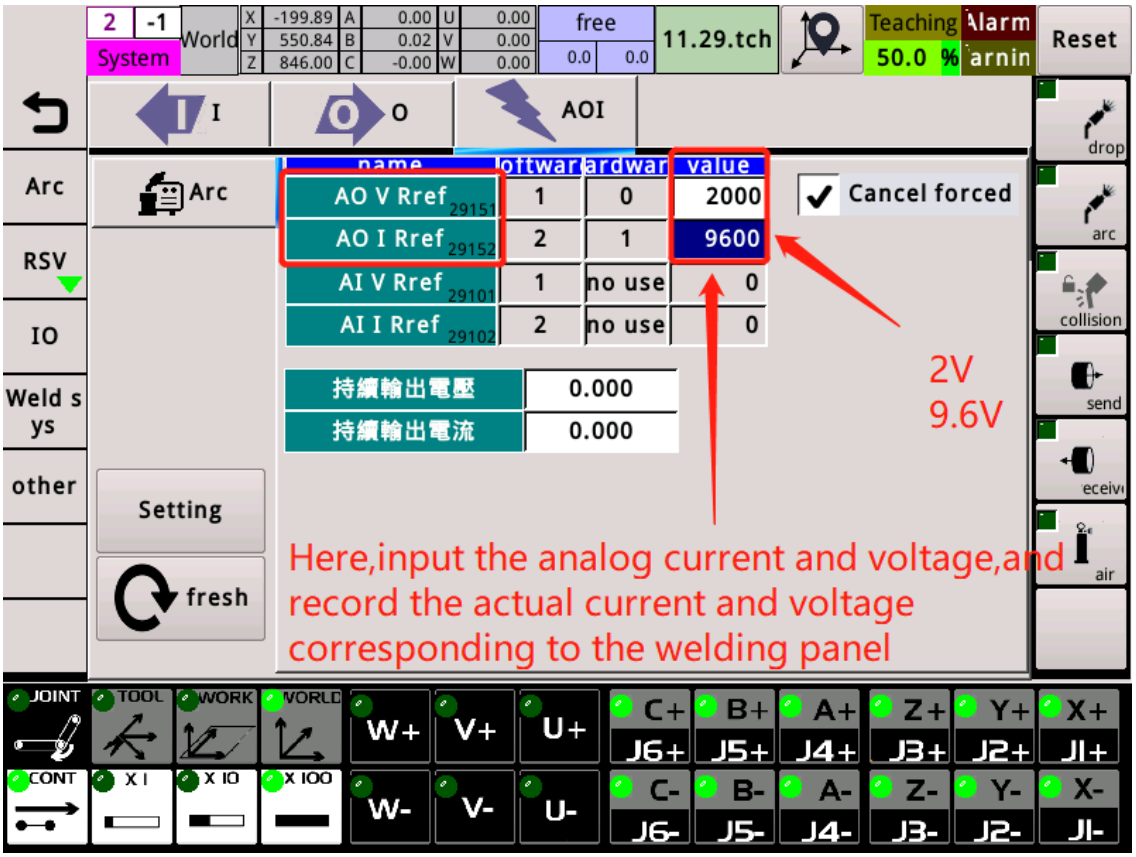


4.2 Welding characteristics table matching method

1. Enter the welding io page, aoi page.



2. Input the analog voltage to match the current and voltage



4.3 Welding mode selection

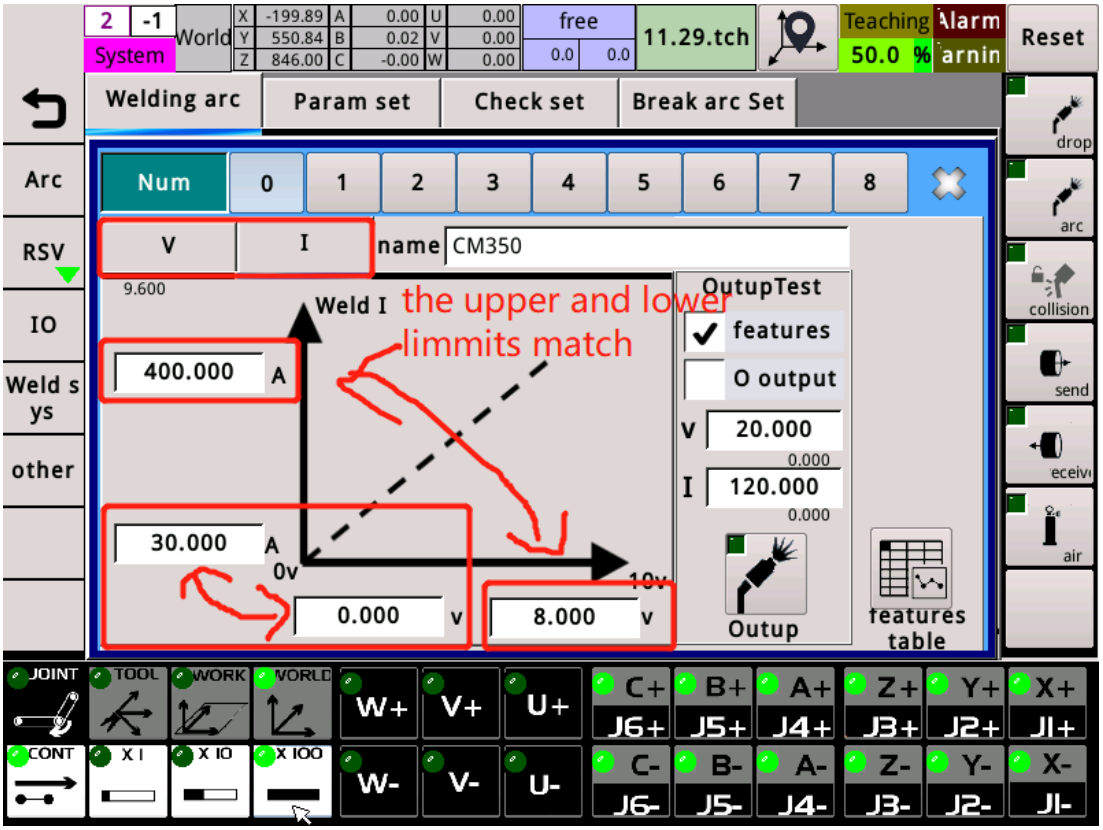
4.3.1 Unary

If you set one yuan, first set the welder to unary mode, and then record the upper and lower limits of the analog voltage and the actual current and voltage. Note: You need to set the upper limit for the model of the welder.

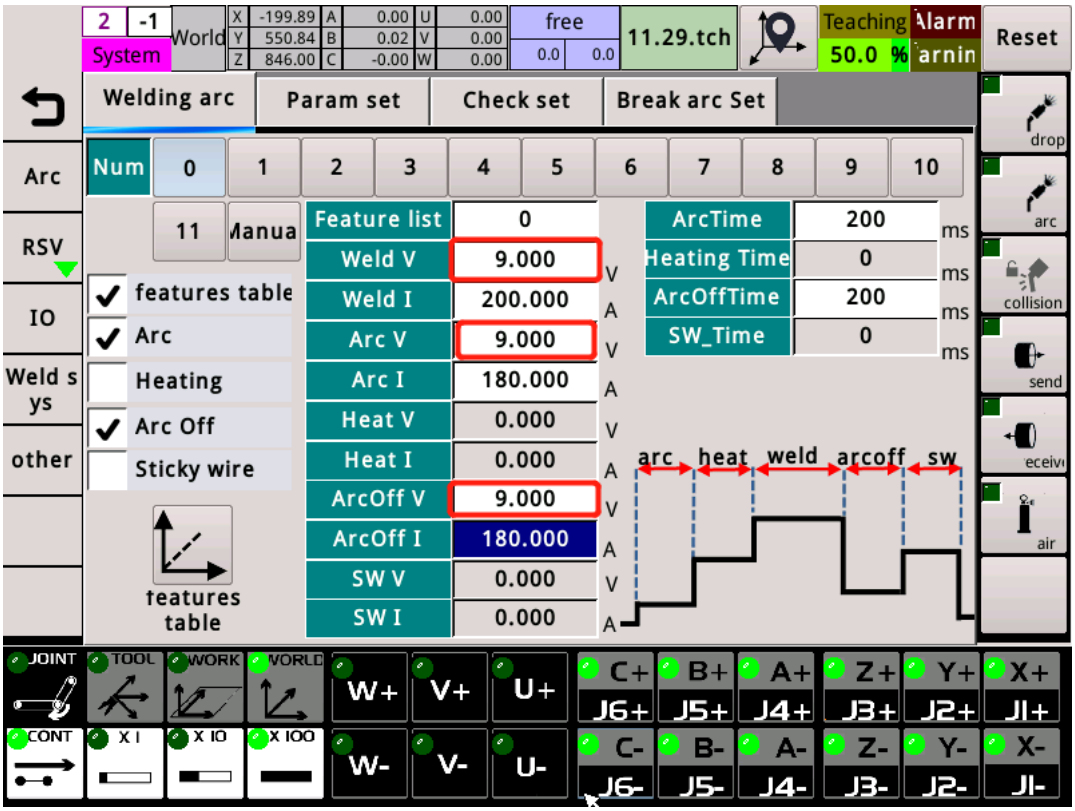
Lower limit value: The actual current voltage value corresponding to the analog voltage is recorded.

Upper limit: For example, the upper limit of the current of the welding machine is 400a. At this time, the 10v analog voltage welding machine displays 400a, and the 8v welding machine also displays 400a. Then, the 8v analog voltage should record the actual current of 400a at this time. The

characteristic table is relatively accurate.

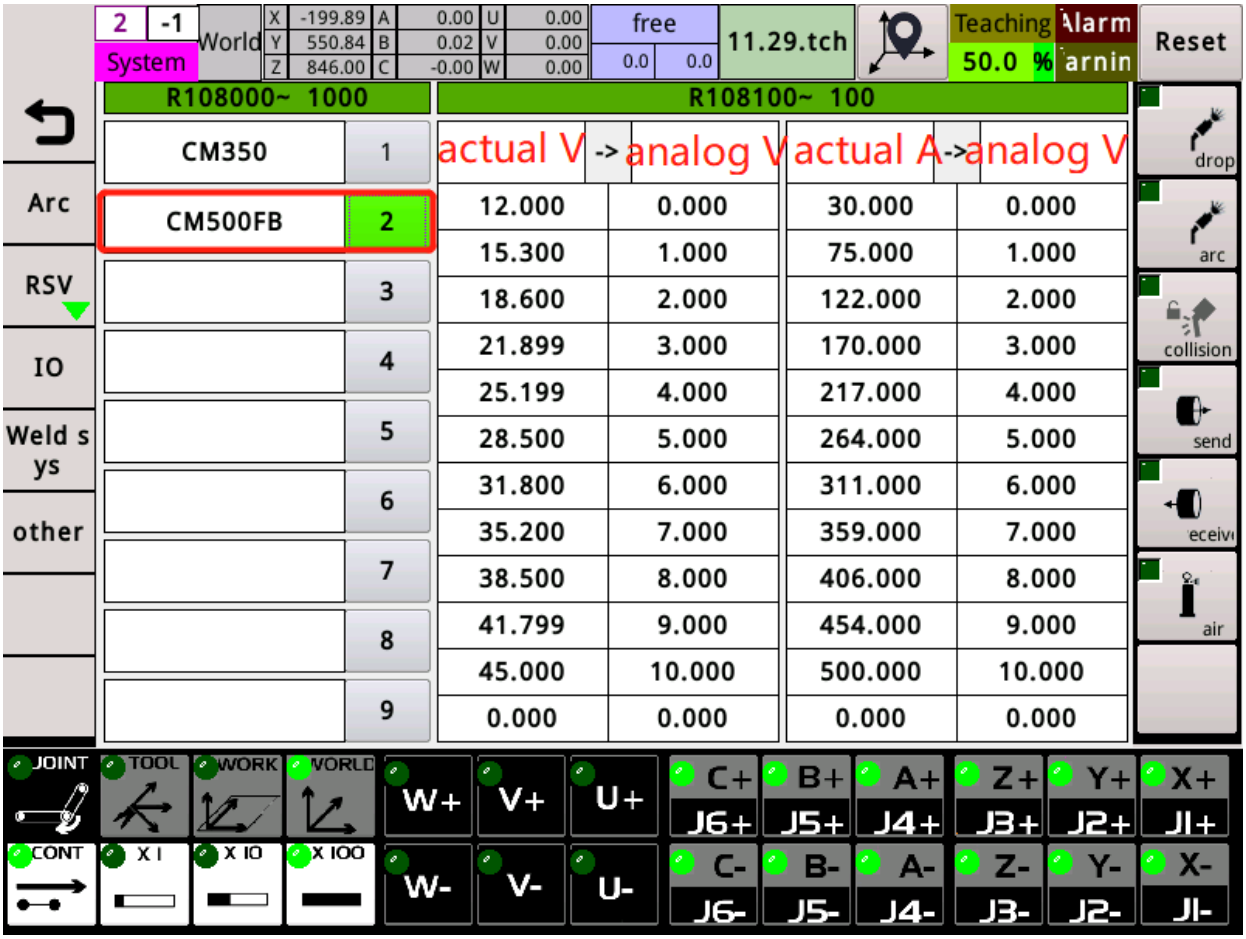


When used, the voltage is filled with a reference intermediate voltage, and the current is filled according to actual needs.

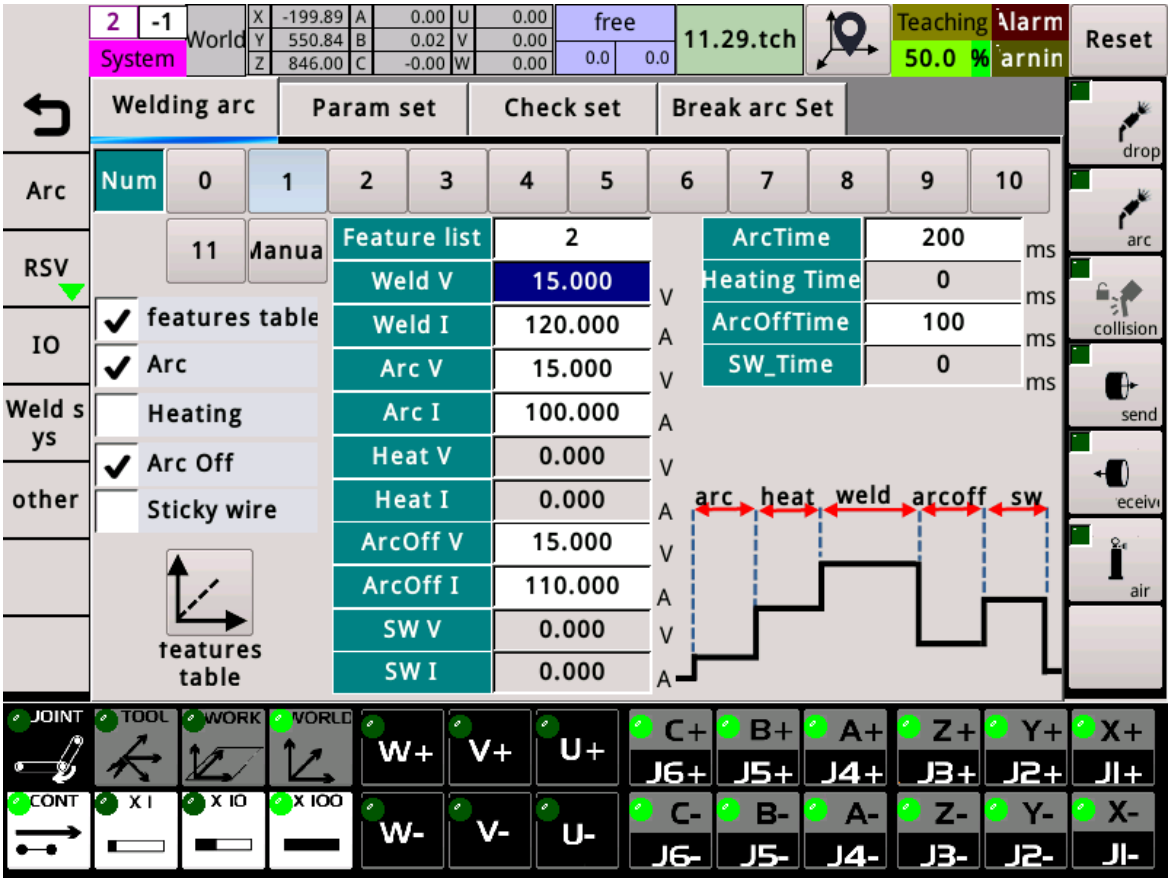


4.3.2 respectively

The separate mode is to subdivide the welding characteristic table by setting several sets of analog voltages and actual current voltages to make the current and voltage values more accurate during welding.



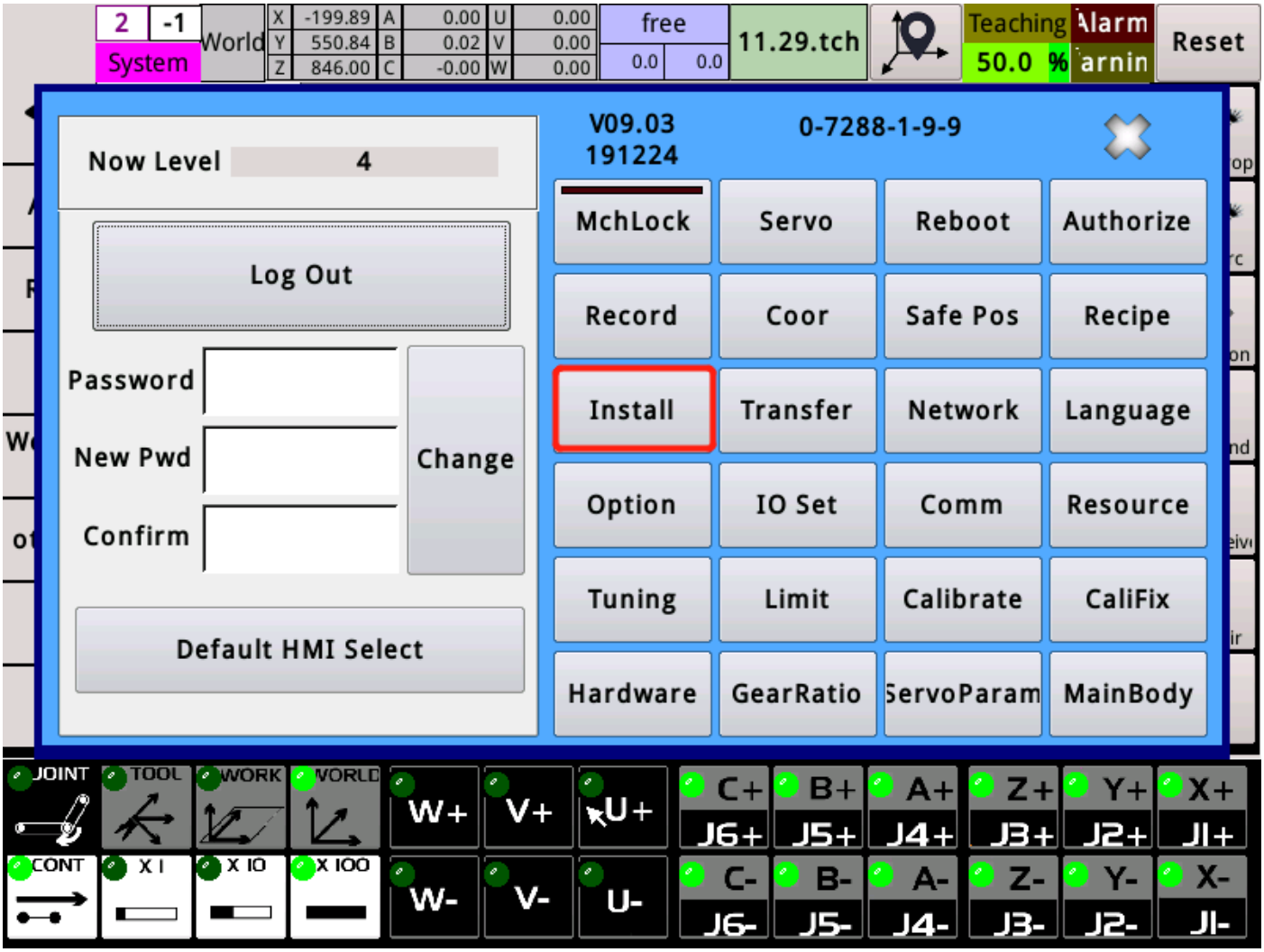
When using, fill in the current and voltage according to actual needs.

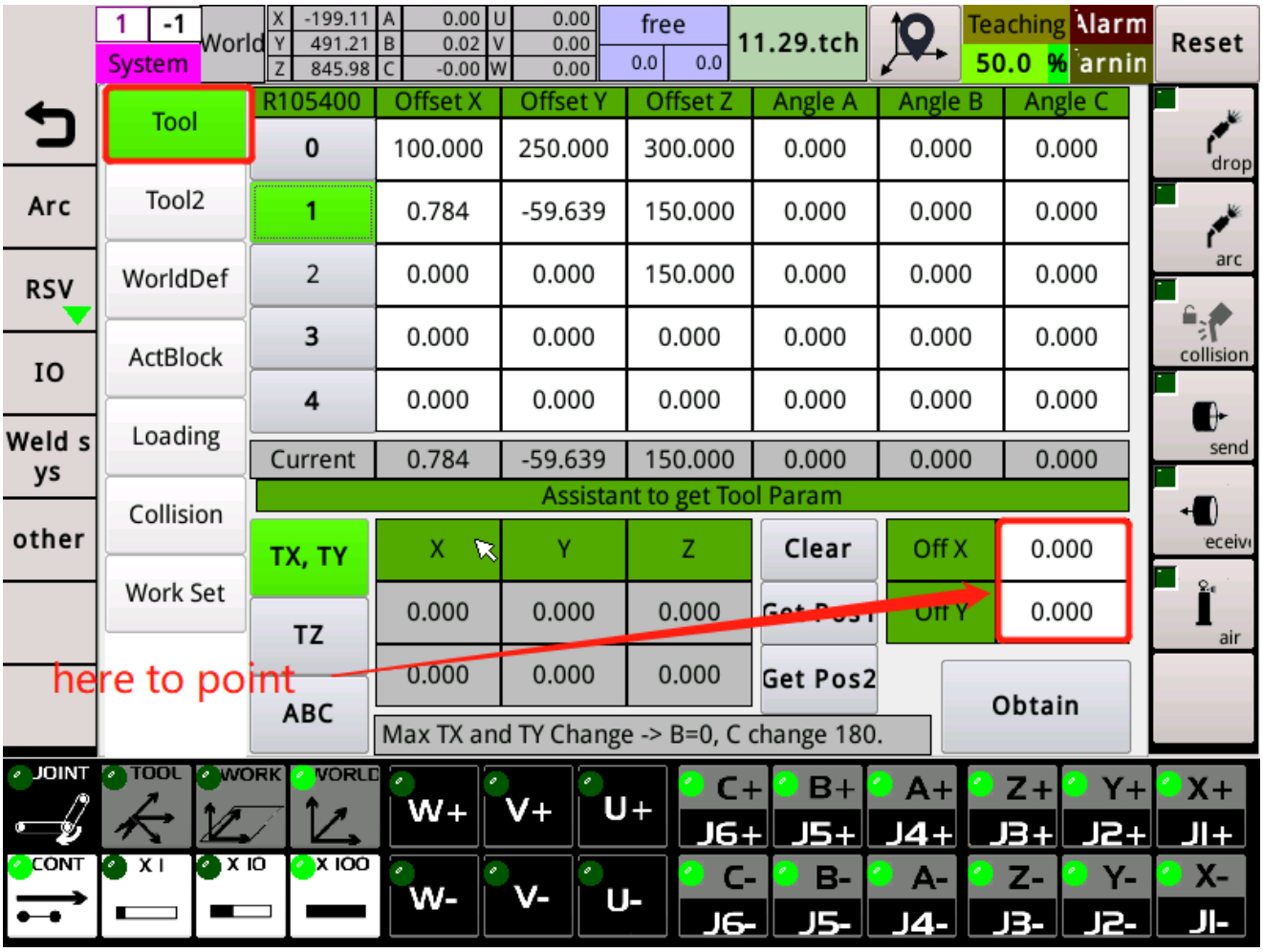


After setting the welding characteristic table, in the welding io page, the cancellation force is written to cancel. When using, which group of welding characteristic table is called, the unary and separate mode of welding must also be selected correctly.

5 Tool calibration and origin calibration

5.1 Tool Calibration





The coordinates of the robot represent the spatial position and attitude of the tip point of the end tool, but the tool will be out of the robot Installed, so there must be parameters to be used to specify the position and direction of the end tool tip, called tool parameters.

The system provides four sets of tool parameters, and each set of parameters contains six items, including offset X, offset Y and offset Z The relative position between the tool tip and the flange surface is described. Angle A, Angle B and Angle C describe the direction of the tip.

1、 click on the tool number 0~14 for calibration, example 1.

2、 Click on the items to be corrected TX, TY, press on Clear.

3、 The robot moves to approximately the right of the pose, while

externally mounting a cusp, after alignment according to Get Pos1.

4、 The external cusp doesn't move, the world coordinates turn C about 90 or 180 degrees, and then XYZ moves so that the tool cusp is aligned with the external cusp, press on Get Pos2.

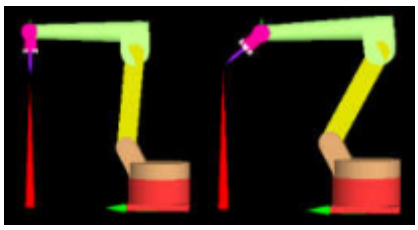
5、 Press on Obtain, Off X 0.000, Off Y 0.000, will be values.

6、 Click to the numbers of Off X 0.000, Off Y 0.000, you can add the error to the tool parameters.

7、 Click on the items to be corrected TZ, perss on Clear.

8、 The robot in the two positions as shown on the right, after pointing to the sharp point, press respectively Get Pos1 and Get Pos2.

9、 Press on Obtain, Off Z 0.000 will be values.



10、 Click to the number of Off Z 0.000, you can add the error to the tool parameters.

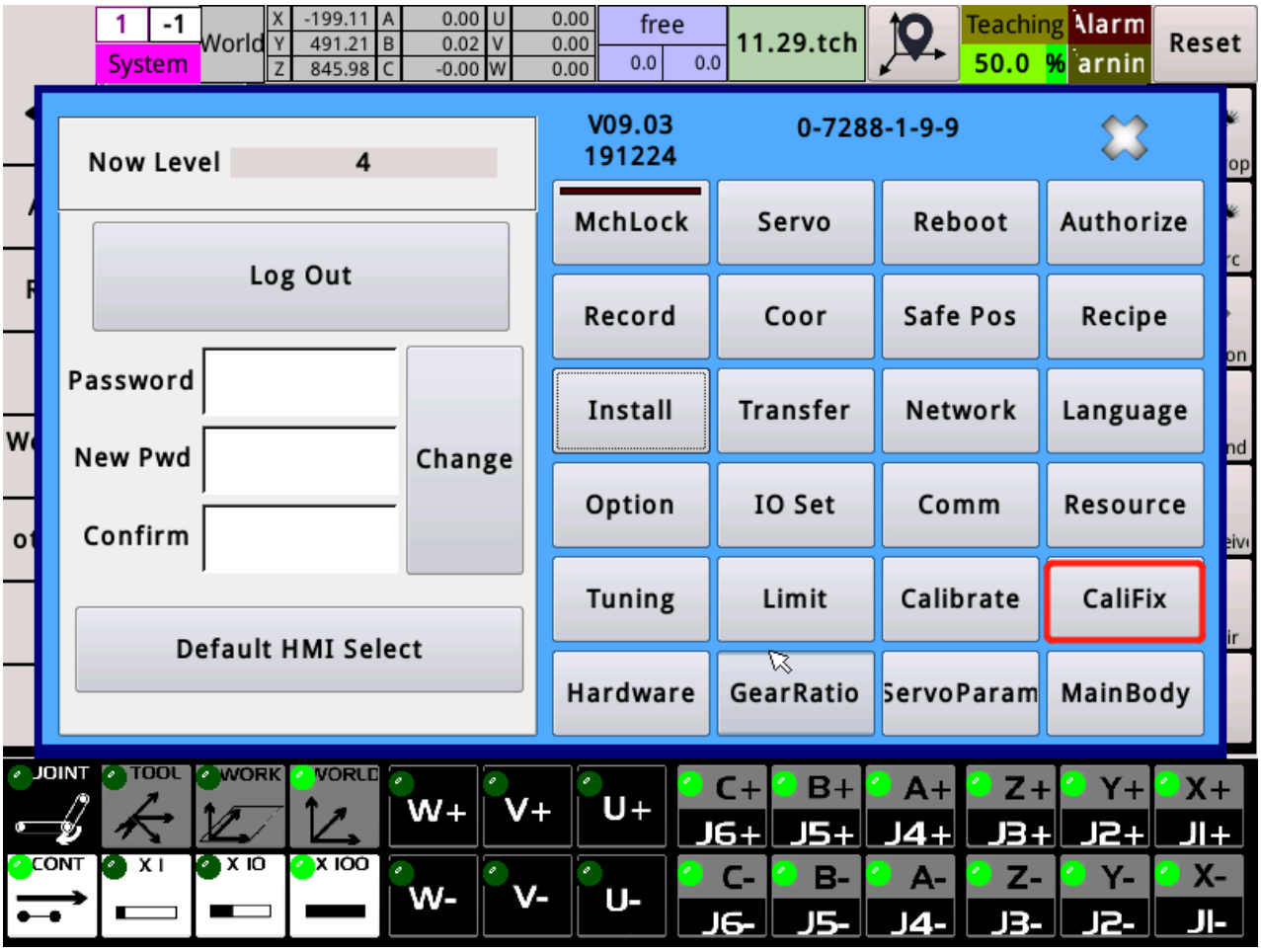
11、 If the direction of the tool tip is not parallel to the axis of the sixth axis, and the tool Angle needs to be set, please first set the tool Angle A, Angle B and Angle C to 0.

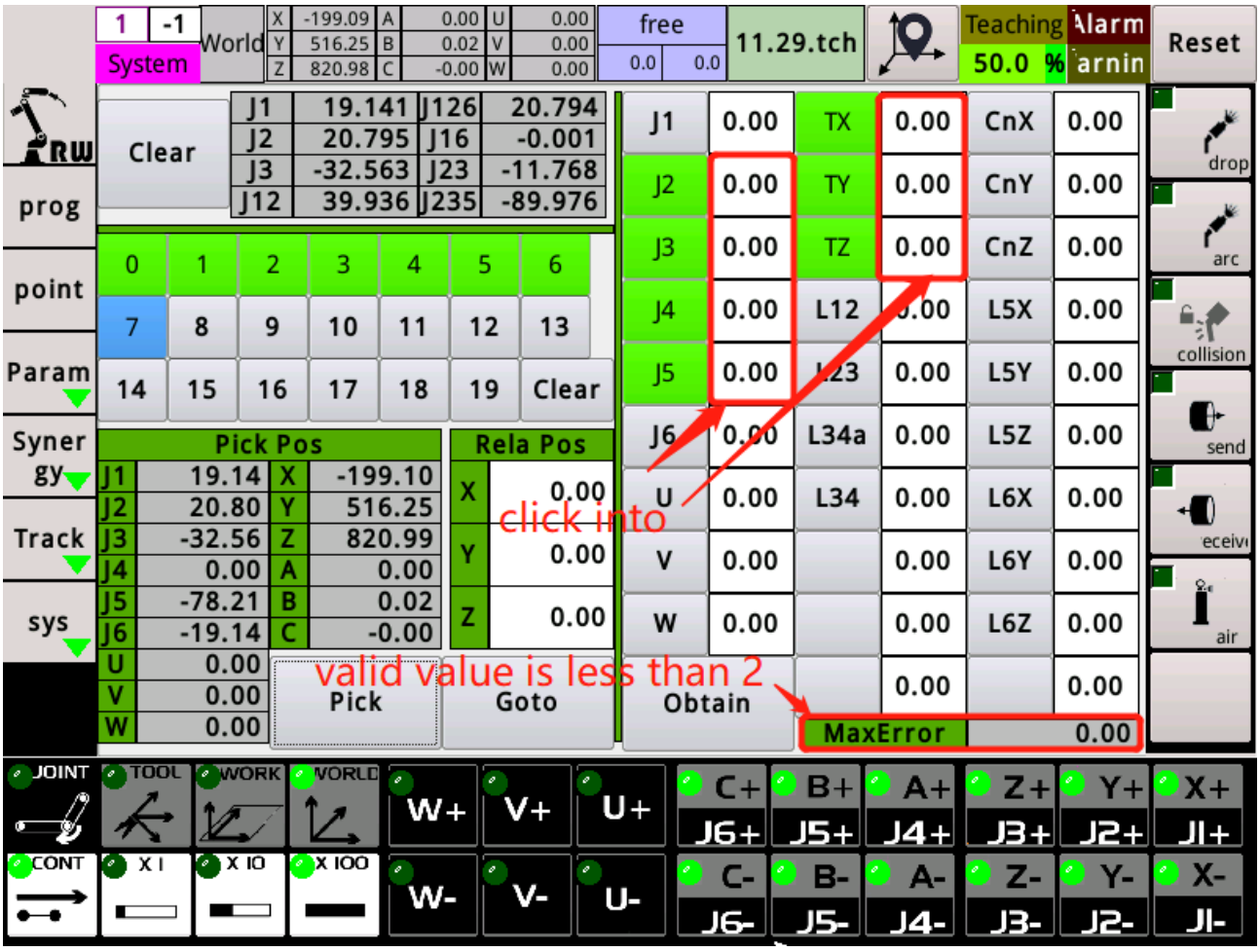
12、 Click on the items to be corrected ABC.

13、 Rotate the direction of the tool tip so that the tool is aligned with the direction of the world coordinates.

14、 Press on Obtain, the system will automatically substitute the values of Angle A, Angle B and Angle C.

5.2 Origin (tcp) correction


1
-1
World
System
X -199.11
Y 491.21
Z 845.98
A 0.00
B 0.02
C -0.00
U 0.00
V 0.00
W 0.00
free
0.0 0.0
11.29.tch
Teaching
50.0 %
Alarm
arnin
Reset
Now Level 4
Log Out
Password
New Pwd
Confirm
Change
Default HMI Select
V09.03
191224
0-7288-1-9-9
MchLock
Servo
Reboot
Authorize
Record
Coor
Safe Pos
Recipe
Install
Transfer
Network
Language
Option
IO Set
Comm
Resource
Tuning
Limit
Calibrate
CaliFix
Hardware
GearRatio
ServoParam
MainBody
JOINT
TOOL
WORK
WORLD
CONT
X 1
X 10
X 100
W+
V+
U+
W-
V-
U-
C+ J6+
B+ J5+
A+ J4+
Z+ J3+
Y+ J2+
X+ J1+
C- J6-
B- J5-
A- J4-
Z- J3-
Y- J2-
X- J1-


1
-1
World
System
X -199.09
Y 516.25
Z 820.98
A 0.00
B 0.02
C -0.00
U 0.00
V 0.00
W 0.00
free
0.0 0.0
11.29.tch
Teaching
50.0 %
Alarm
arnin
Reset
RW
prog
point
Param
Syner gy
Track
sys
Clear
J1 19.141 J126 20.794
J2 20.795 J16 -0.001
J3 -32.563 J23 -11.768
J12 39.936 J235 -89.976
0 1 2 3 4 5 6
7 8 9 10 11 12 13
14 15 16 17 18 19 Clear
Pick Pos
J1 19.14 X -199.10
J2 20.80 Y 516.25
J3 -32.56 Z 820.99
J4 0.00 A 0.00
J5 -78.21 B 0.02
J6 -19.14 C -0.00
U 0.00
V 0.00
W 0.00
Rela Pos
X 0.00
Y 0.00
Z 0.00
Pick
Goto
Obtain
J1 0.00 TX 0.00 CnX 0.00
J2 0.00 TY 0.00 CnY 0.00
J3 0.00 TZ 0.00 CnZ 0.00
J4 0.00 L12 0.00 L5X 0.00
J5 0.00 L23 0.00 L5Y 0.00
J6 0.00 L34a 0.00 L5Z 0.00
U 0.00 L34 0.00 L6X 0.00
V 0.00 0.00 L6Y 0.00
W 0.00 0.00 L6Z 0.00
0.00 0.00
MaxError 0.00
click into
valid value is less than 2
drop
arc
collision
send
eceiv
air
JOINT
TOOL
WORK
WORLD
CONT
X 1
X 10
X 100
W+
V+
U+
W-
V-
U-
C+ J6+
B+ J5+
A+ J4+
Z+ J3+
Y+ J2+
X+ J1+
C- J6-
B- J5-
A- J4-
Z- J3-
Y- J2-
X- J1-

Origin correction step

1. Press "clear" to clear the original school information

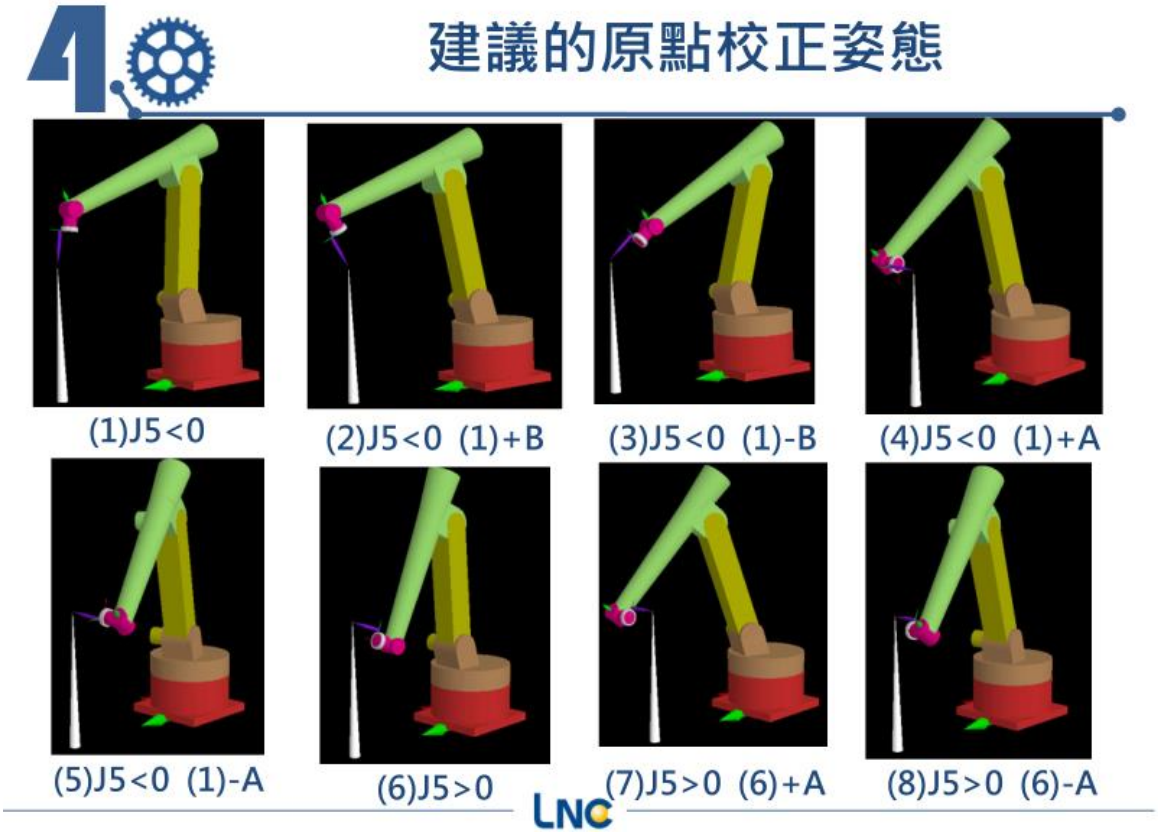
2. Take any 8~10 points with big attitude change and press "take" after alignment.

3. Select J2~J5, TX, TY and TZ as the items to be calculated, and then calculate the deviations and "maximum errors".

4. If the value of "maximum error" is greater than 2, the system may have the wrong deceleration ratio or the wrong size of the mechanism. The results are also meaningless, skipping the next steps.

5. Click on the error field in order to bring the error value into the system

6. The pressure release stop allows the change value to take effect



6 Calibration and use of external cooperative axes

6.1 Collaborative calibration

6.1.1 Architecture of External Coordinated Axis

Outer co-axial axis takes into account six axial possibilities

21.WorkCoorX
22.WorkCoorY
23.WorkCoorZ
24.WorkCoorA
25.WorkCoorB
26.WorkCoorC

You can choose up to three of them to combine to build an external collaborative axis

Axis Setting		
	Usage	AxisID
U	25	7
V	26	8
W	0	0

The external coordinate axis is set on a base coordinate in space, and if there is (use 21, 22, 23) movement, it first moves according to the corresponding axial coordinate, and then sequentially moves a (use 24 around the z axis)) Rotation, rotate b (use 25 around the x-axis) and c (use 26 around the z-axis). The position and attitude after the final movement and rotation are the origin of the working coordinate system.

Before the actual operation, the main key is to find the base

coordinates and the size of the mechanism between the abc axes. This is also the main item that must be corrected.

Base Pos			
X	100.044	A	0.000
Y	885.175	B	0.005
Z	592.185	C	0.019

Dimension		
	BX	-101.590
	BY	11.138
	BZ	108.927

Because the external coordinated axis calibration is performed through the robot's sharp point, the origin of the robot must be calibrated before the calibration, to ensure that the robot's sharp point is trustworthy, so that the corrected coordinated axis information will be available. trust.

6.1.2 External coordinated axis correction method

After the purpose is selected according to the actual mechanism, there will be a maximum of three rotation axis calibrations. The order of calibration is b information (c information (a information) . The three tabs will be enabled according to the selected axis.

Rotation calibration

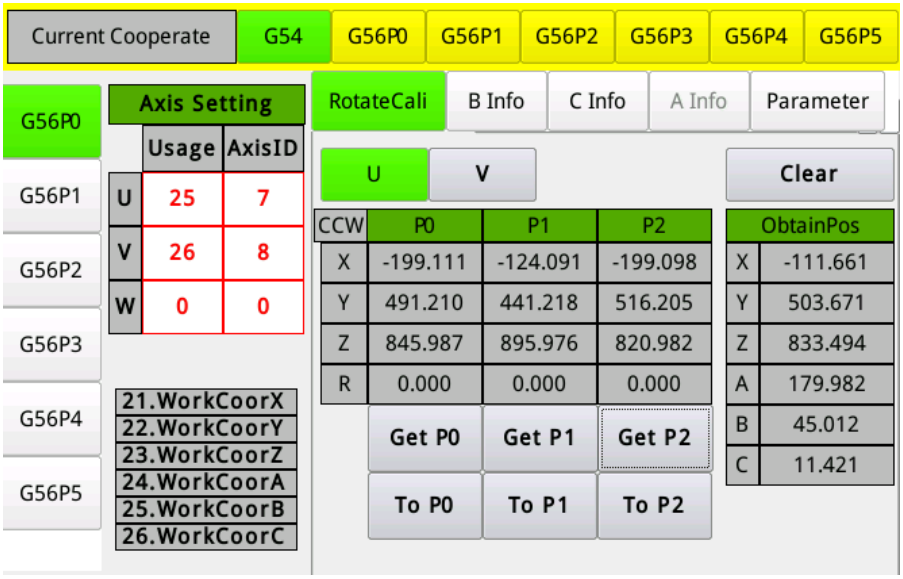
The rotation calibration is based on a point marked on the rotary table as the basis for alignment. When the rotation axis is rotated to three different angles, the pointed point of the robot is used to align

the marked point and obtain its coordinate value. As a basis for calculating the rotated coordinate system.

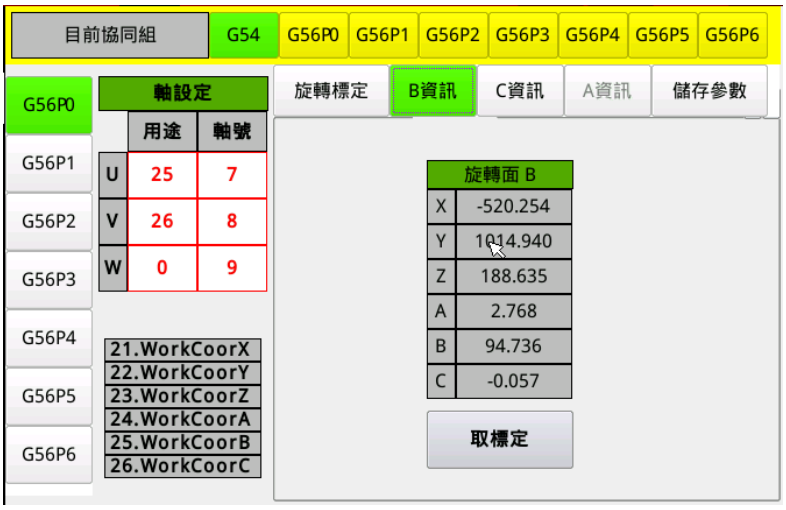
Note that the three points p0, p1, and p2 must conform to the counterclockwise (ccw) rotation order (the right-hand rule, looking from the position of the thumb to the rotation surface), so that the system will not calculate the wrong direction.

bInformation calibration

First on the rotation calibration page, select the additional axis (uvw) corresponding to b, and then take three points in the counterclockwise rotation direction

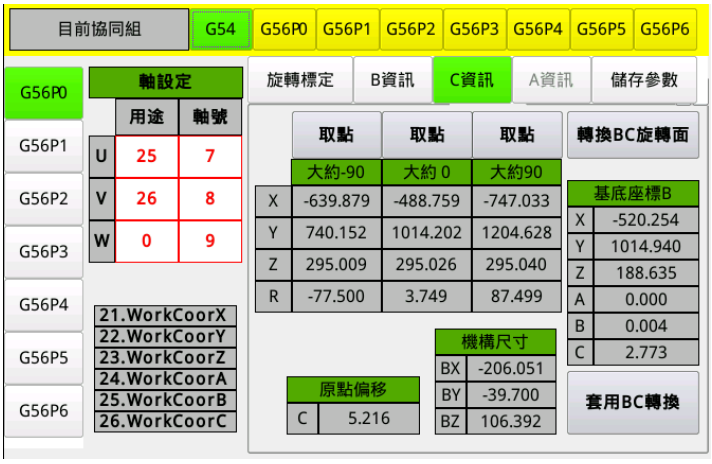


Then switch to the b information page, and press the `` take calibration '' key to bring in the result of the just rotated calibration. If the external collaboration includes c, this information will also be brought into the base coordinate b of the c information page for subsequent bc For conversion.

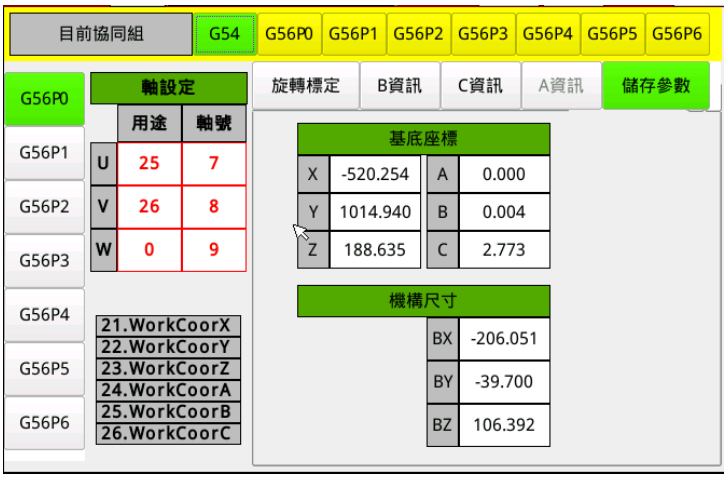


c information calibration

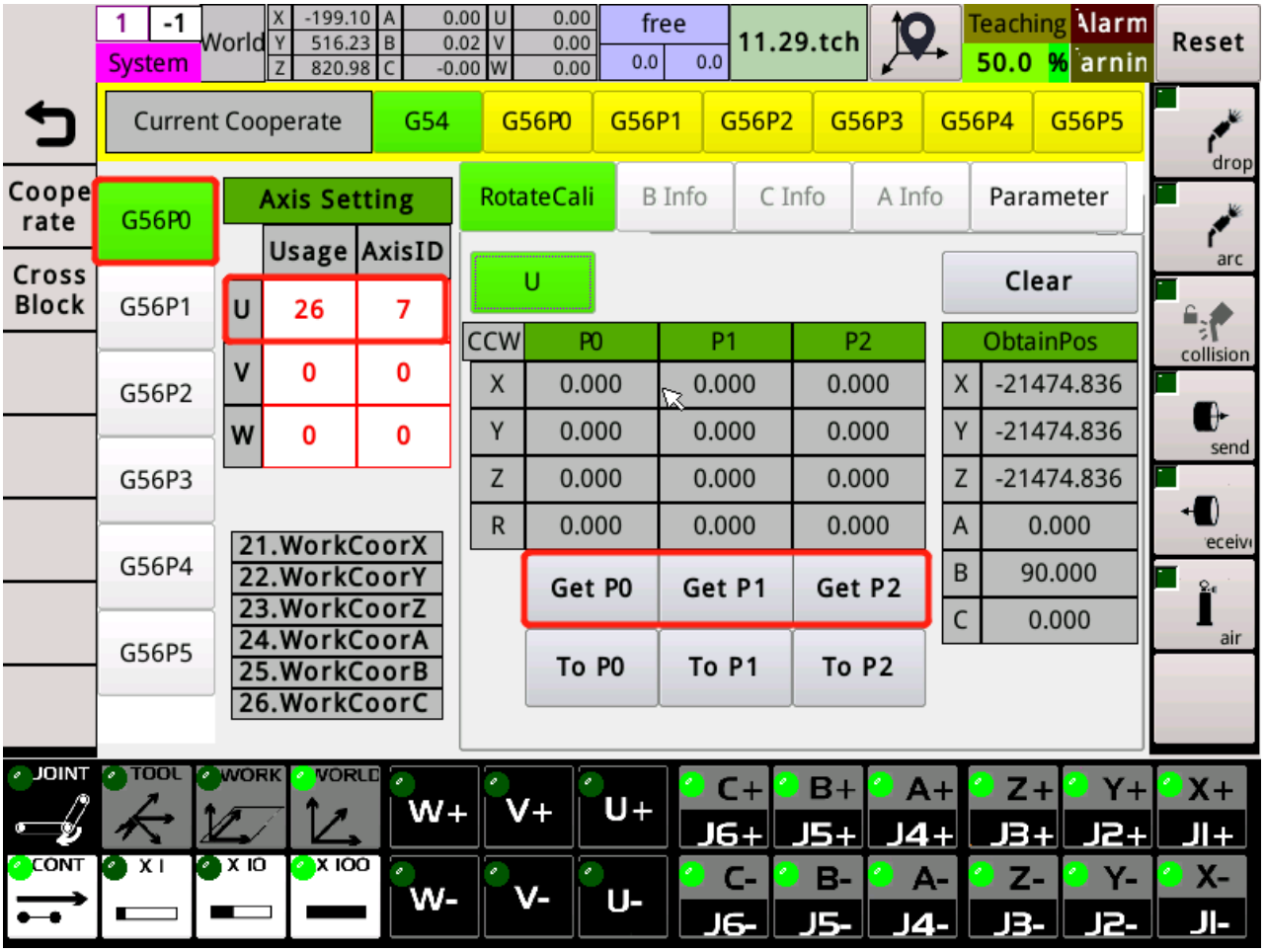
First turn the b axis to 0 degrees, cut to the c information page, and take three points in the counterclockwise rotation direction. The three points should preferably span 180 degrees to reduce errors.



After taking three points, press `` Convert bc rotation plane '', the system will re-correct the direction of the base coordinate b according to the z-axis direction of the c rotation plane, and calculate the origin offset of the c rotation plane (the The position of the sharp point is the 0-degree position) and the relative size relationship between the b-axis and the c-axis.



6.1.3 Calibration method when single external axis cooperates


1
-1
System
World
X -199.10
Y 516.23
Z 820.98
A 0.00
B 0.02
C -0.00
U 0.00
V 0.00
W 0.00
free
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11.29.tch
Teaching
Alarm
50.0 %
arnin
Reset
Current Cooperate
G54
G56P0
G56P1
G56P2
G56P3
G56P4
G56P5
Coope rate
Cross Block
G56P0
G56P1
G56P2
G56P3
G56P4
G56P5
Axis Setting
Usage
AxisID
U 26 7
V 0 0
W 0 0
21.WorkCoorX
22.WorkCoorY
23.WorkCoorZ
24.WorkCoorA
25.WorkCoorB
26.WorkCoorC
RotateCali
B Info
C Info
A Info
Parameter
U
Clear
CCW
P0
P1
P2
X 0.000 0.000 0.000
Y 0.000 0.000 0.000
Z 0.000 0.000 0.000
R 0.000 0.000 0.000
Get P0
Get P1
Get P2
To P0
To P1
To P2
ObtainPos
X -21474.836
Y -21474.836
Z -21474.836
A 0.000
B 90.000
C 0.000
drop
arc
collision
send
eceiv
air
JOINT
TOOL
WORK
WORLD
CONT
X 1
X 10
X 100
W+
V+
U+
W-
V-
U-
C+ J6+
B+ J5+
A+ J4+
Z+ J3+
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X+ J1+
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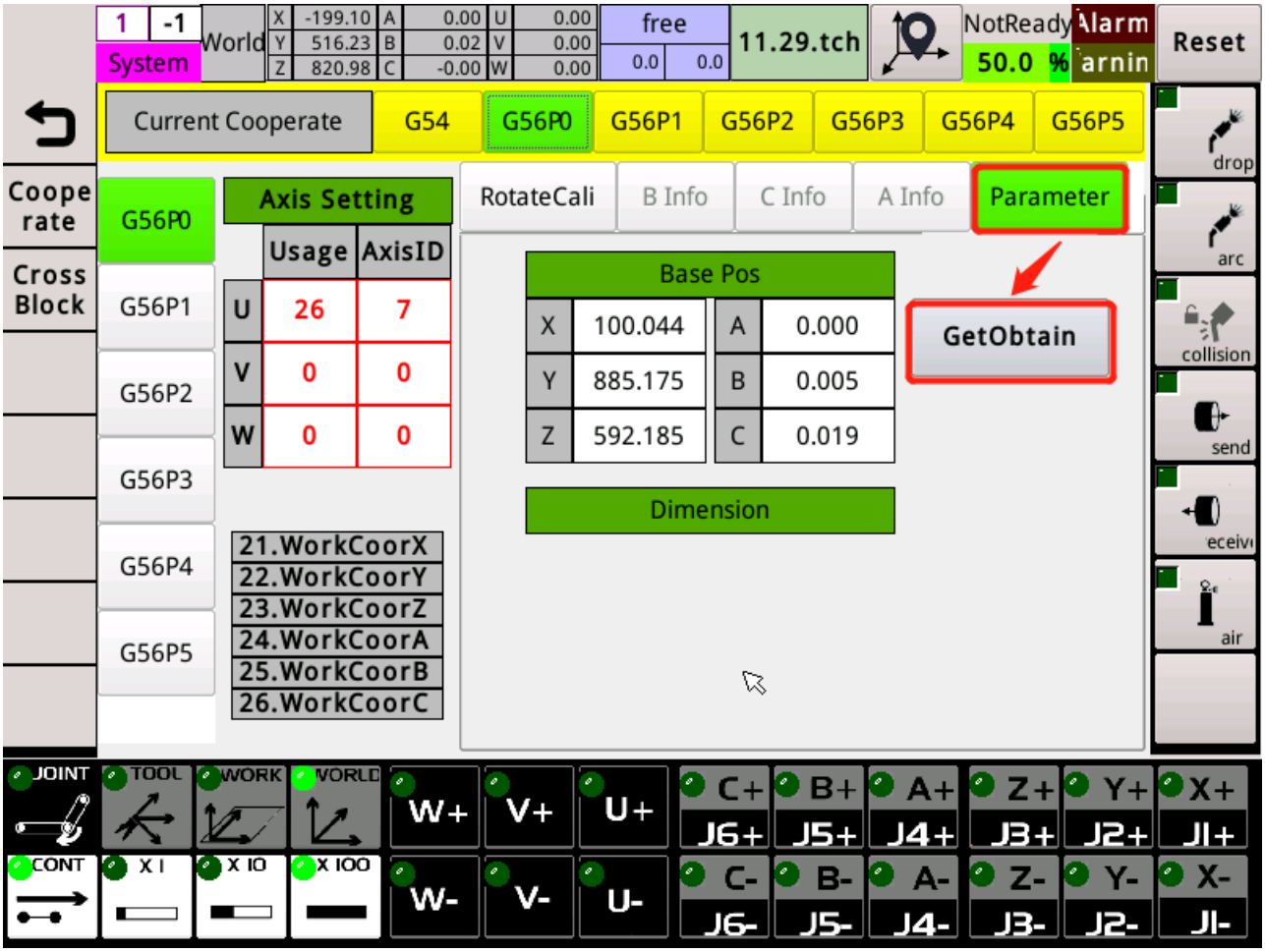
B- J5-
A- J4-
Z- J3-
Y- J2-
X- J1-


1
-1
System
World
X -199.10
Y 516.23
Z 820.98
A 0.00
B 0.02
C -0.00
U 0.00
V 0.00
W 0.00
free
0.0
0.0
11.29.tch
NotReady
Alarm
50.0 %
arnin
Reset
Current Cooperate
G54
G56P0
G56P1
G56P2
G56P3
G56P4
G56P5
Coope rate
Cross Block
G56P0
G56P1
G56P2
G56P3
G56P4
G56P5
Axis Setting
Usage
AxisID
U 26 7
V 0 0
W 0 0
21.WorkCoorX
22.WorkCoorY
23.WorkCoorZ
24.WorkCoorA
25.WorkCoorB
26.WorkCoorC
RotateCali
B Info
C Info
A Info
Parameter
Base Pos
X 100.044
Y 885.175
Z 592.185
A 0.000
B 0.005
C 0.019
GetObtain
Dimension
drop
arc
collision
send
eceiv
air
JOINT
TOOL
WORK
WORLD
CONT
X 1
X 10
X 100
W+
V+
U+
W-
V-
U-
C+ J6+
B+ J5+
A+ J4+
Z+ J3+
Y+ J2+
X+ J1+
C- J6-
B- J5-
A- J4-
Z- J3-
Y- J2-
X- J1-

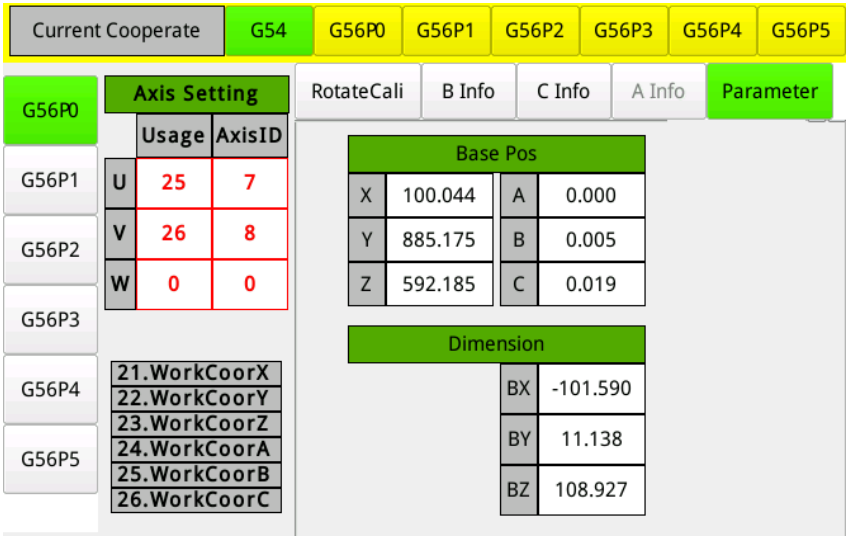
1) Single external shaft use set 26

2) Select the coordinate system as g56 p0

3) Take 3 points on the rotation calibration page, refer to the coordinated calibration method for the two external axes above

4) On the storage parameter page, click on the calibration

6.2 Using collaborative functions

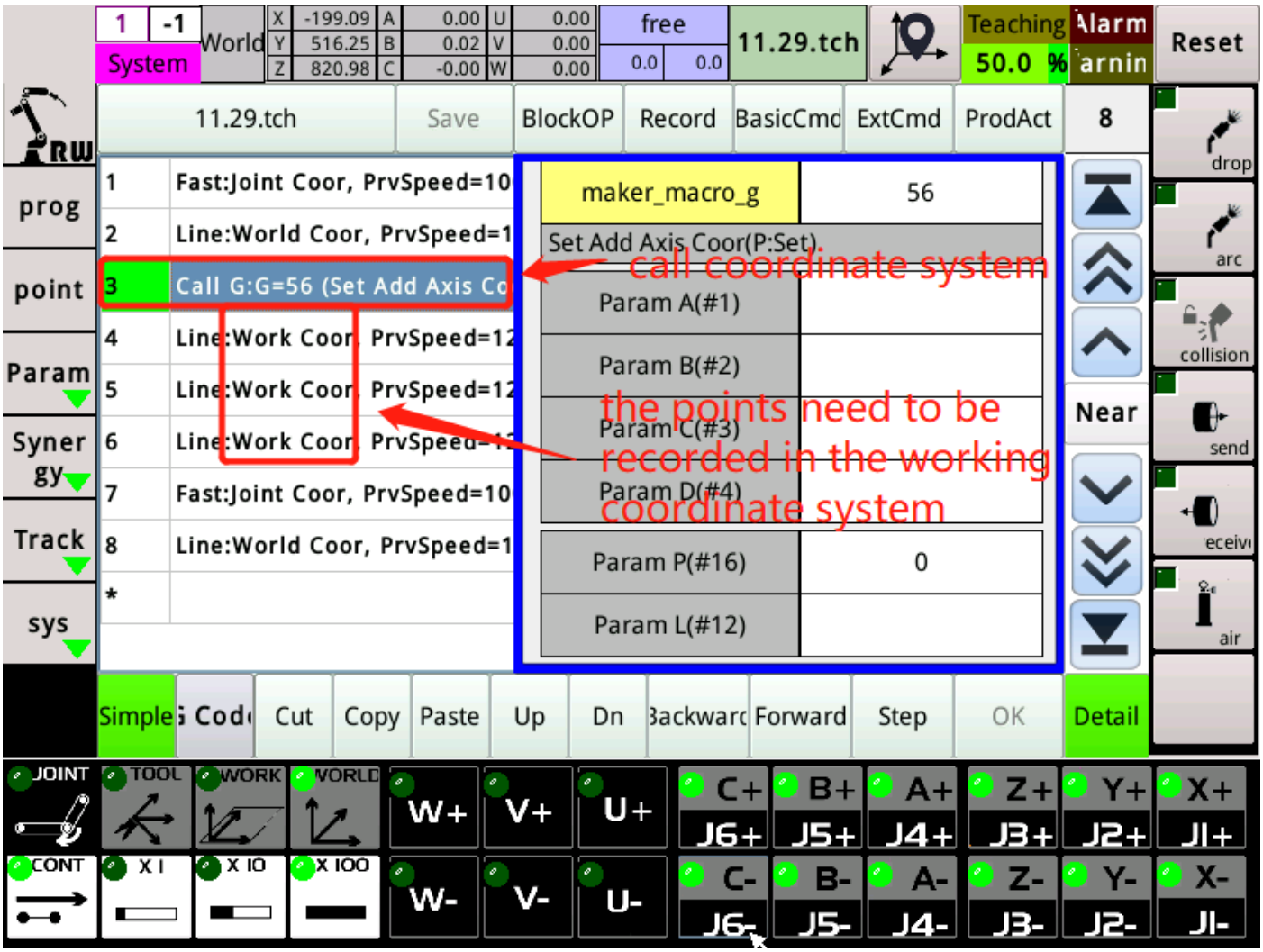


Click on the current collaboration group as g56p0. When operating in working coordinates, you can achieve cooperative action.

If you need to switch the coordinate system during the automatic operation, you also need to issue the g56p0 instruction.

Note: there will be synergistic effects only when working coordinates

6.2.1 Program example

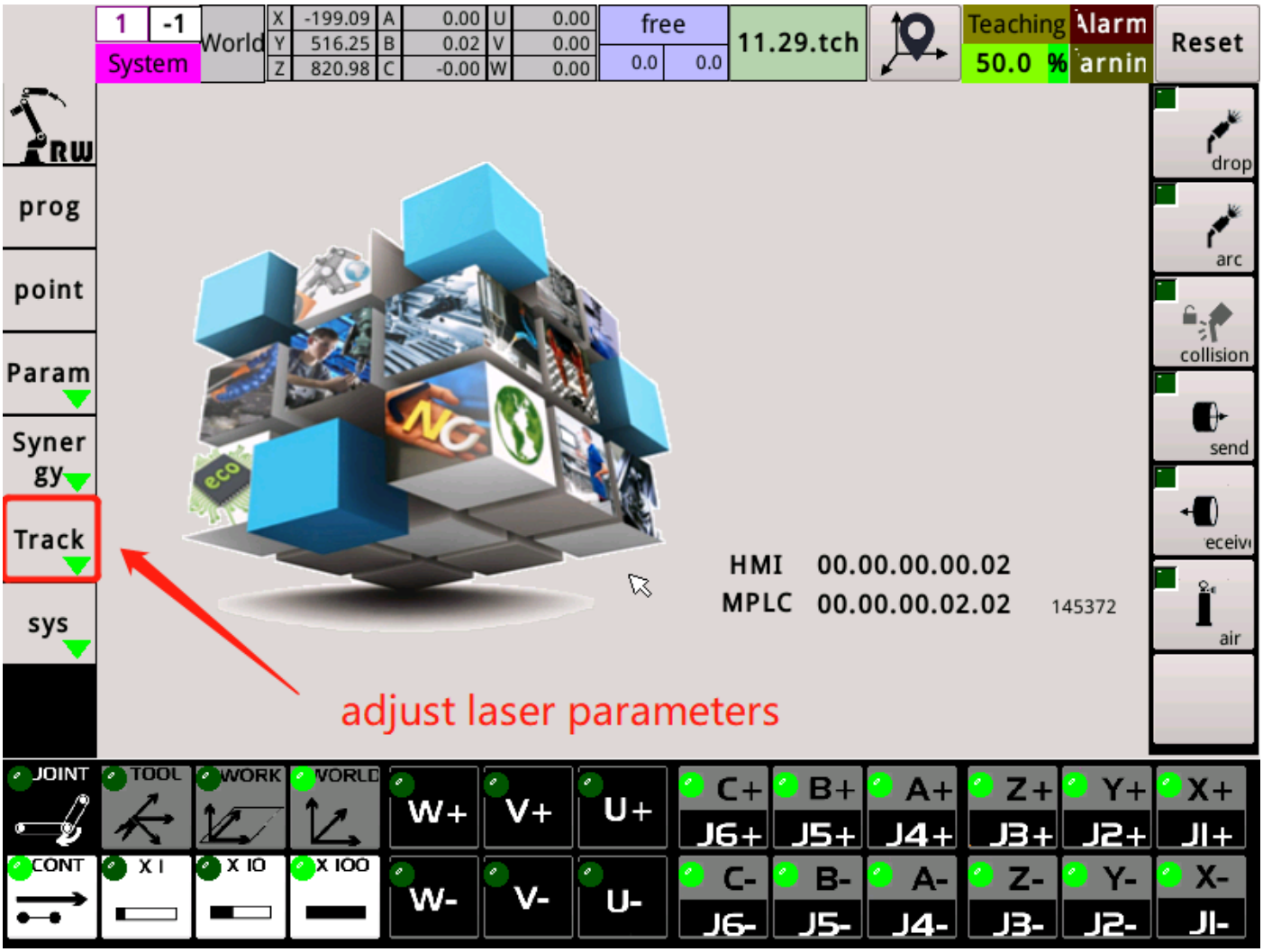


7 Instructions for welding seam tracking and positioning

7.1 Laser tracking

7.1.1 Tracking Setting Page Introduction

1. The option to adjust the laser parameters will only appear when the operation level is adjusted to the machine factory and above.



2. Tracking settings page

This part is the command sent to the laser by the system.

Laser enable: Click the "Switch" button to switch the laser on and off. When the digital display is 10 and the green light is on, the laser is successfully turned on.

Start tracker and close tracker: Click the "Settings" button at the back. Control the tracker on and off. The status shown in the figure

indicates that the tracker was successfully opened.

Finding weld seam tracking: After clicking the "Set" button at the back, this parameter will have a continuously accumulated count, indicating that the system will successfully receive the weld seam data. When it is not turned on, the tracker can scan the weld seam in time. Edge will not receive any data!

Weld Bead Style: This parameter is used to manually find the weld seam. According to different welds on the workpiece, the system control tracker switches to the corresponding weld seam parameters to ensure that accurate data can be scanned. Enter the corresponding number in the digital input field , Click the setting button at the back.The number in the number field becomes the number to be switched, indicating that the setting is successful.

搜索状态	0
左右偏差值	0
高度偏差值	0

This part is the data sent by the laser to the

1.The laser is successfully enabled 2.The tracker is turned on 3.The tracking weld is turned on

The system will successfully receive the data given by the tracker if the above three conditions are met !!!

Search status: When the laser does not scan the weld or receives data, the digital display box will display the number "0"; when the weld is scanned, the number "255" will be displayed.

Left and right deviation value: The searched weld position is based on the left and right values of the origin of the tracker coordinate system.

Height deviation value: The searched weld position is based on the value of the height above and below the origin of the tracker coordinate system.

Tracking point is always switched: Click this button, the left light is on to indicate that it is successfully turned on. At this time, if a weld is scanned, there will be a value in the red box. The meaning of this

value is that the weld scanned by the laser at this time The position of the point is the coordinates of the robot's world x / y / z.

One of the functions of this function: After calibration with the laser, you can verify whether the calibration result is accurate.

Verification method: first scan a weld point with a laser, mark this point, and record the world x / y / z value displayed in the red frame at this time; then move the tcp point of the robot to the marked point and record At this time, the robot's world xyz coordinate value is compared; the closer the two sets of coordinate values are, the closer the value is, the more accurate the calibration is.

偏移座标R		乘数
有	23988	
XR	23989	0.100
YR	0	0.000
ZR	23990	-0.100
AR	0	0.000
BR	0	0.000
CR	0	0.000

搜索状态	0
左右偏差值	0
高度偏差值	0

Please enter the same value as the box!

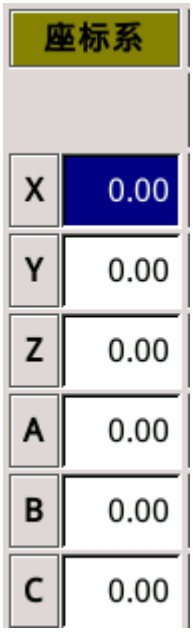
Offset coordinate r: indicates that the offset value read by the tracker is stored in the corresponding r value register of the system.

Multiplier: The left and right height deviation value in the box on the right, multiplied by the value in the multiplier, which is the actual

distance. (Here the multiplier is set according to the idea)

Can verify the accuracy of the data given to the system when the laser scans the weld !!!

Verification method: first let the laser scan to a welding point and record the deviation value at the time. Subtract the deviation value and multiply it by the multiplier to see if it is equal to the fixed distance of the movement. If it is not equal, please adjust the parameters of the camera to ensure that the weld point scanned is stable and effective.



The meaning of this coordinate coefficient value: After the tracker is installed, the relative position and attitude of its reference position and the robot's tcp point.

7.1.2 Preparation before use

1、 Tool preparation: one switch and two shielded network cables.

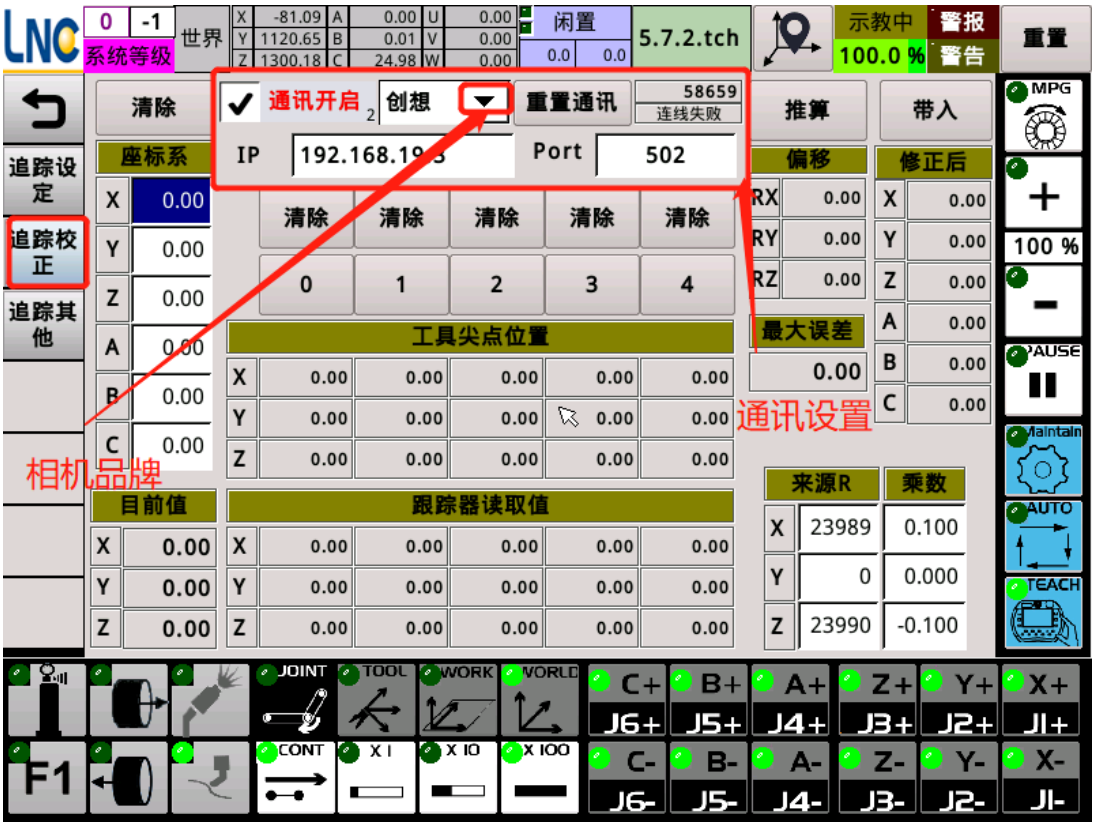
2、 One end of a network cable is plugged into the switch, and the other end is plugged into the Ethernet port on the system side. The same applies to the camera side.

3、 Ask relevant personnel to install the camera and adjust the corresponding parameters on the camera side.

4、 After doing the above work, you can debug the relevant parameters on the system side!

7.1.3 Communication and calibration

1.Set up communication



1) Turn on communication

2) Select the corresponding camera brand

3) Set the IP to 192.168.19.3 and the port number Port to 502. At the same time, set the IP and port number of the camera to the same as on the

system.

4) Then restart the system and tracker.

5) After restarting, go to this page again and observe that the number box on the right of the online reset has been continuously accumulating, and the connection is successfully displayed below the number.

6) At this point, you need to check whether the real connection is successful:

2. Parameter setting

Refer to the following figure for the parameter setting !!!

Refer to Chapter 2 to set related parameters and open related buttons !!!

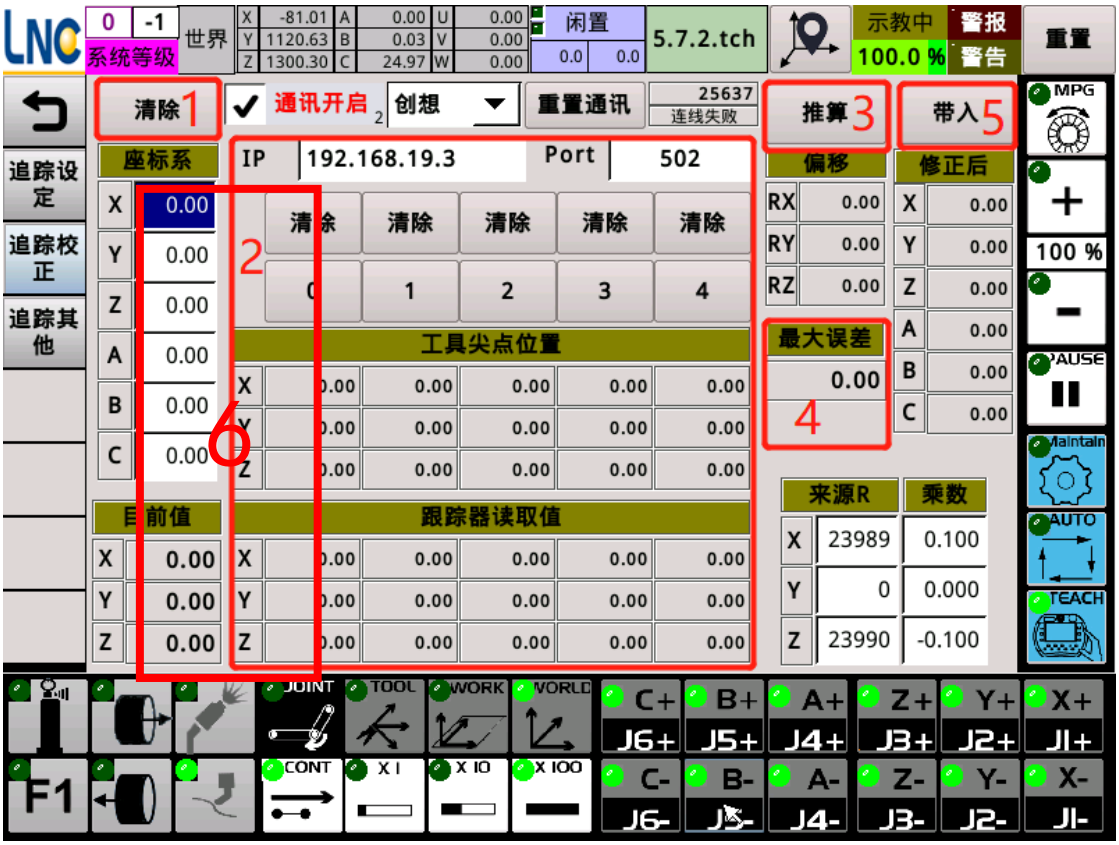
After the communication and parameter settings are completed, please verify it according to the second chapter. The left and right and height deviation values given by the tracker to the camera are equal to the actual distance !!!

7.1.4 Laser Calibration

Significance of calibration: The welding point scanned by the laser can be directly converted to the world coordinates on the system side.

Before calibration, tool calibration and origin calibration are needed!

(For tool calibration and origin calibration, please refer to Chapter 5)



1) Click Clear first to clear the previously calibrated data.

2) Take 5 calibration points. When taking these 5 points, please pay attention: when taking the points, ensure that the laser can scan the stable and effective welding point.

Point 1: Take a workpiece, take a point on its welding seam, mark it; move the robot, align the robot's sharp point to the marked point, and ensure that the laser can scan the welding seam, and wait for the left and right and height deviation values to stabilize After that, click the button "0", at this time, the coordinates of the tool tip and the tracker reading value will be recorded.

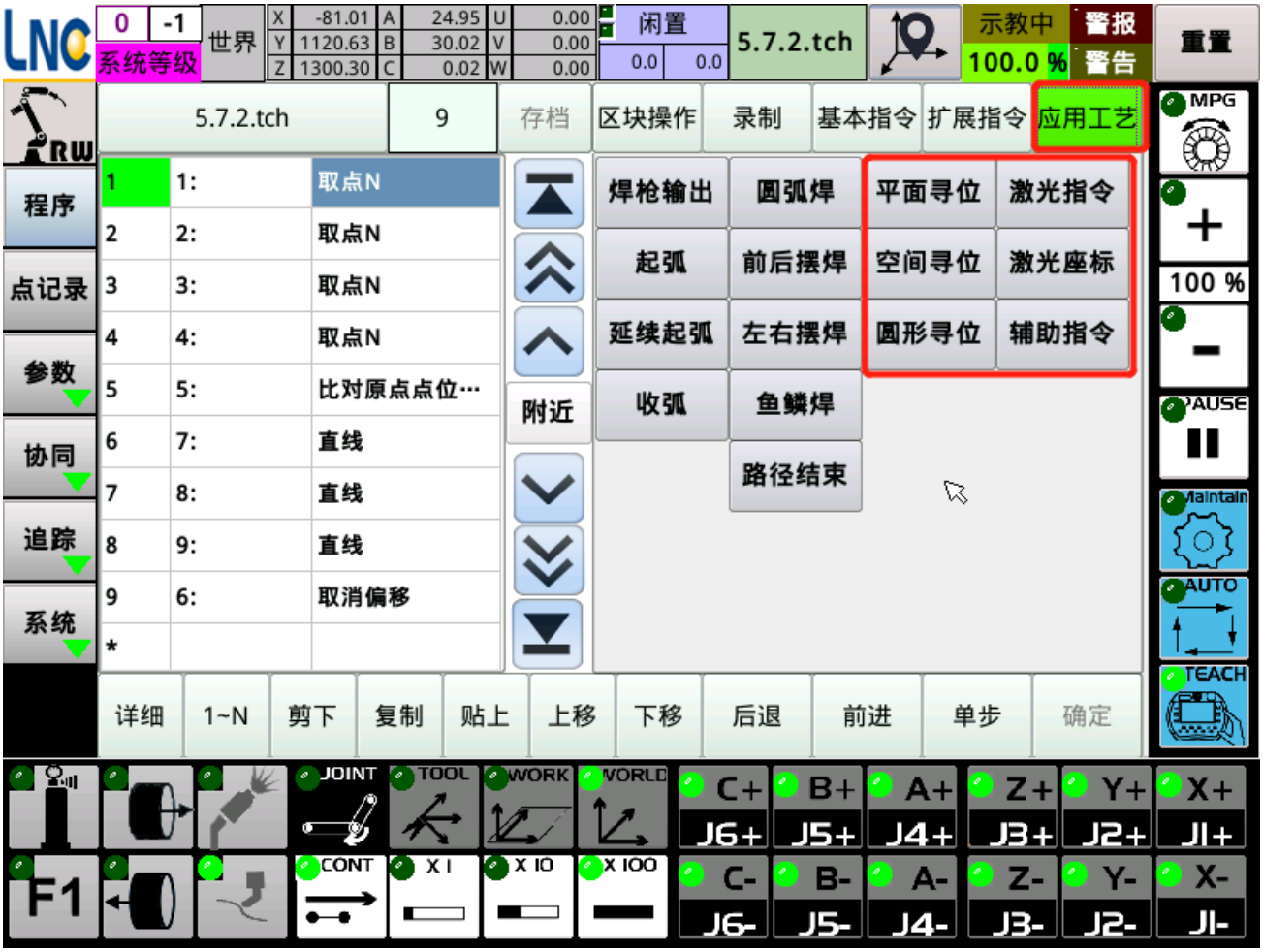
Point 2--4: The mobile robot enables the laser to scan to the marked point, and the robot's sharp points are located at the upper left, lower left, upper right, and lower right of the marked point. When the

deviation value stabilizes, click the 1-4 button to record the coordinate value. .

3) Click the "Calculate" button, the maximum error will be calculated; and the coordinate value of "corrected" will appear numerically.
4) The maximum error is within 1 to meet the requirements.
5) After the error meets the requirements, click the "Bring In" button to bring the "corrected" coordinate value into the 6th "Coordinate System".

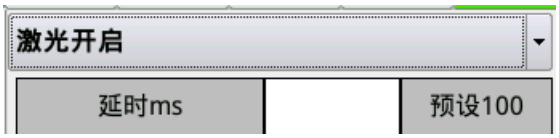
The method of checking the calibration results is mentioned above and will be mentioned below.

7.1.5 Program Introduction

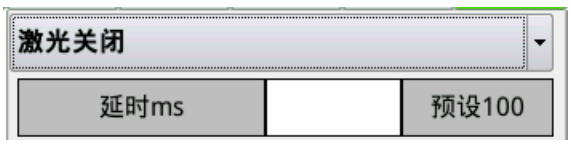


Laser command:

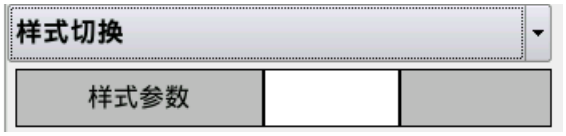
Laser coordinates:



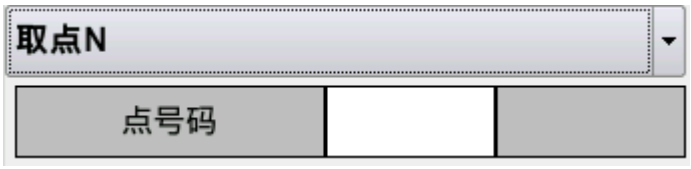
: Turn on the laser and tracker. You can set the delay time after turning on, the preset is 100ms.



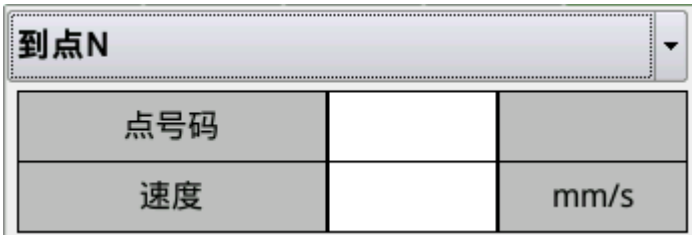
: Turn off the laser and tracker. You can set the delay time after turning off, the preset is 100ms.



: Set different parameter styles of the weld in advance according to the laser side, and call the weld style according to the weld before scanning.



: Record the positions of the welds scanned by the laser, and fill in the corresponding numbers, up to 100 groups.



: The point recorded before reaching, and set the arrival speed at the same time.

: Move linearly from point 1 to point 2. The number behind the point corresponds to the number of the point. Attitude is the same. There are up to 10 groups of attitudes, which will be described below. Attitude 1 corresponds to the attitude of point 1. There is no representative point. The attitude of bit 1 is the attitude at the time of taking points. Please ignore the following units and display

errors!

: Points 1, 2, and 3 function as circular arcs. The order is equivalent to straight lines, midpoints, and 3d arcs. The attitude is the same as above. The span is preset to 0, which is a circular arc formed by three points. When the degree is set, it indicates the angle that this arc can move.

Start the tracker (on arrival): After reaching the specified position, turn on the laser first, and then turn on the tracker.

Turn off the tracker (before moving): turn off the tracker, then turn off the laser, and then move to the specified position.

Detection trajectory: Move from the robot's current position to this point. During the movement, if the laser detects a weld, it will go to the weld point at a speed 3 times the current command; if no weld is detected up to this point, it will Prompt alarm cannot find weld.

Straight-line tracking: switch to tracking bead mode, and then detect if there is still a bead signal at regular intervals, if any, convert its

detected position to world coordinates, and then calculate the distance from the target point, Compare it with the distance from the target point that was detected last time. If it becomes larger, it means that it has started to move away from the target point. When the bead signal cannot be checked or it starts to move away from the target point, end the tracking trajectory, if not, Move to the converted world coordinates.

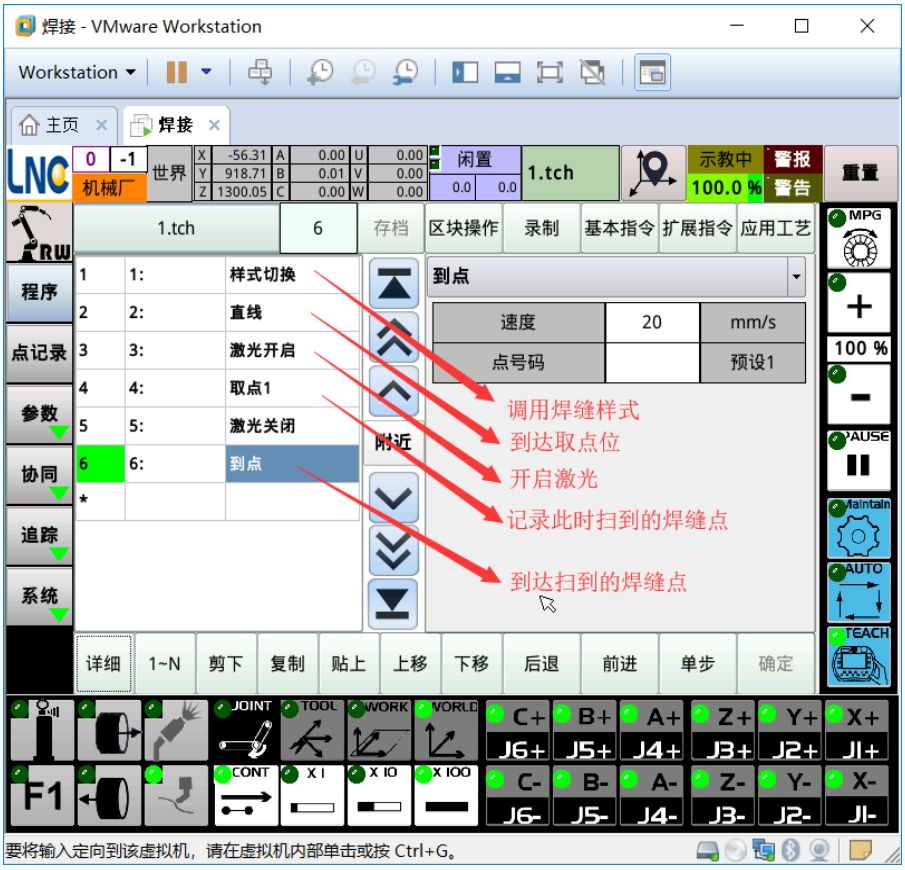
Arc tracking midpoint: When detecting the arc trajectory in real time, take any point in this arc to record the position and attitude.

Arc tracking: When detecting the arc trajectory in real time, go to the end position and attitude of the arc.

Attitude login (up to 10 points): When performing two-point straight line or three-point arc, you can call the abc coordinate value of this instruction to its corresponding attitude. In the program, it will not run to the position of this instruction, it will only call Its abc coordinates.

7.1.6 Laser Program Example

Example 1: Calibration result verification procedure.When taking point 1, the weld spot scanned by the laser is marked.The closer the position to the point is, the more accurate the calibration is.



Example 2: Two-point positioning. Take two points respectively, record the welds scanned, and then move in a straight line with two points.

Example 3: Two-point positioning (attitude setting). Move linearly with the attitude of the attitude registration point, but will not move to the attitude registration point!

1	1:	样式切换
2	2:	直线
3	3:	激光开启
4	4:	取点1
5	5:	激光关闭
6	6:	直线
7	7:	激光开启
8	8:	取点2
9	9:	激光关闭
10	10:	快速

Example 4: Three-point arc: Take three points as the starting point, midpoint, and end point of an arc to form an arc.

1	1:	样式切换
2	2:	直线
3	3:	激光开启
4	4:	取点1
5	5:	激光关闭
6	6:	直线
7	7:	激光开启
8	8:	取点2
9	9:	激光关闭
10	10:	直线

Example 5: Real-time tracking with fixed attitude.

Example 6: Real-time tracking with variable attitude.


变姿态路径中任意一点
跟踪的终点位置
附近
6.4.tch
8
存档
区块操作
录制
基本指令
扩展指令
应用工艺
程序
点记录
参数
协同
追踪
系统
1 7: 快速
2 1: 启动跟踪器(到…
3 2: 探测轨迹
4 5: 起弧
5 7: 圆弧跟踪中点
6 8: 圆弧跟踪
7 6: 收弧
8 4: 关闭跟踪器(移…
详细
1~N
剪下
复制
贴上
上移
下移
后退
前进
单步
确定
MPG
100 %
AUTO
TEACH
JOINT
TOOL
WORK
WORLD
CONT
X 1
X 10
X 100
C+ B+ A+ Z+ Y+ X+
J6+ J5+ J4+ J3+ J2+ J1+
C- B- A- Z- Y- X-
J6- J5- J4- J3- J2- J1-
F1

7.1.7 Introduction to Flip Laser Tracking with External Axis

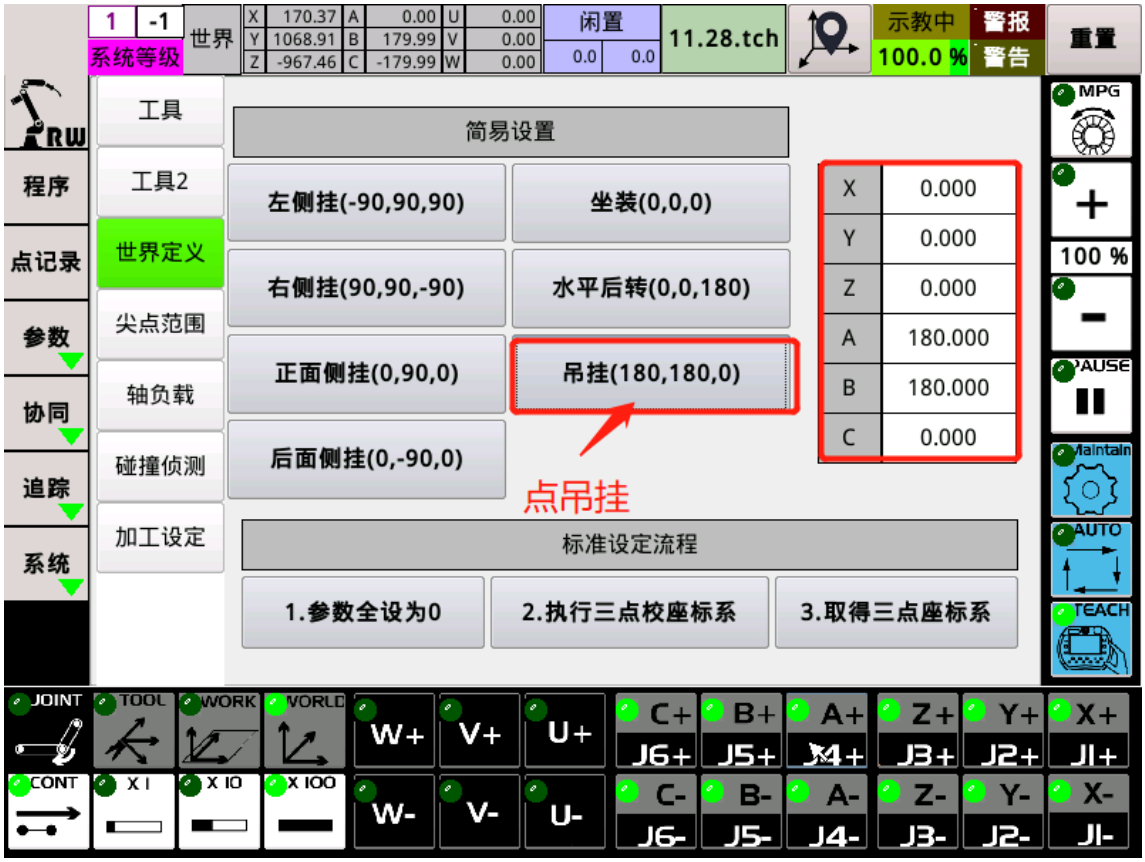
Instructions:

1、 It is recommended to perform tool calibration and origin calibration before installation to ensure that the TCP accuracy of the robot is within the controllable range, and then flip the robot upside down. If it is done after flipping up due to TCP, The operation will be troublesome, so it is recommended to do the calibration before flipping.

2、 After flipping, set the robot to flip on the system. Because the direction of the world coordinates will change after the robot is flipped, you need to set the flip, so that the direction of the world coordinates after flip It is the same as the formal dress, it is easier to teach, and it won't take long for the direction to change. The steps are as follows:

1) Enter the installation application page

2) Go to the world definition page

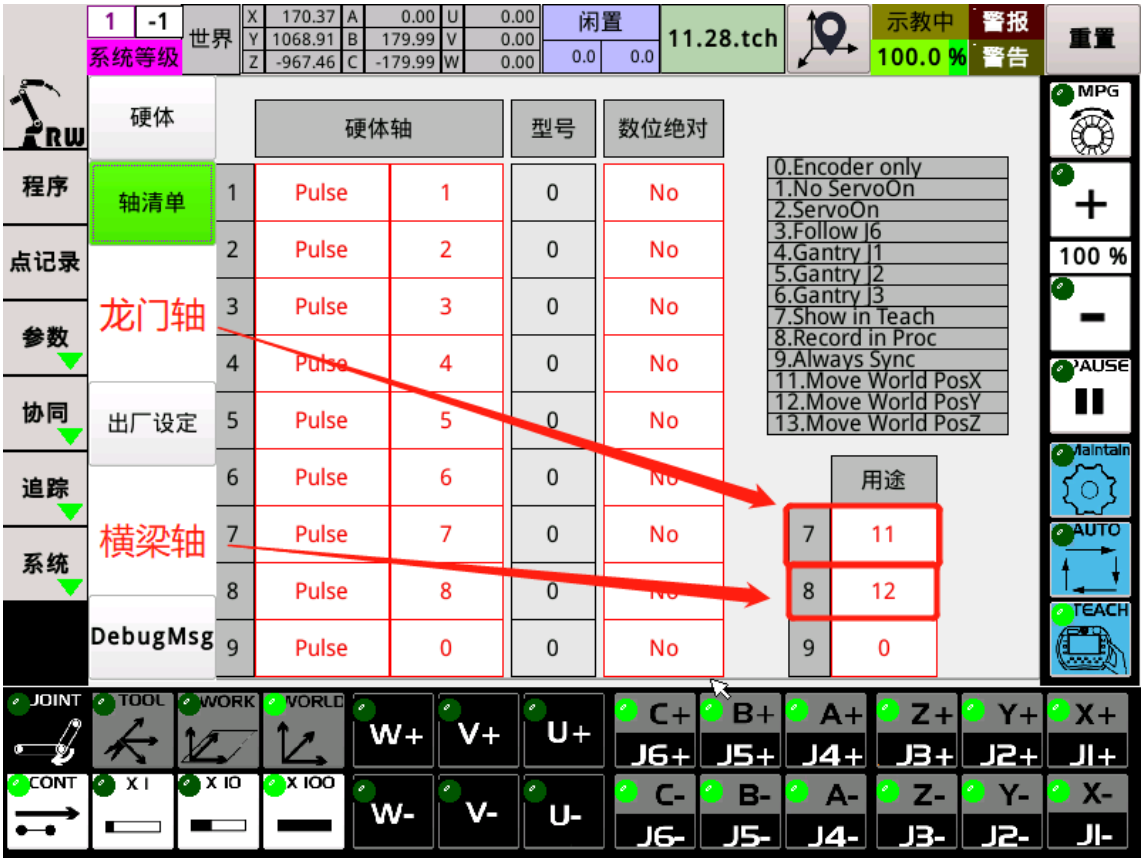


3) Set the correct use of additional axes

Use 11: additional axis coordinated with world coordinate x axis

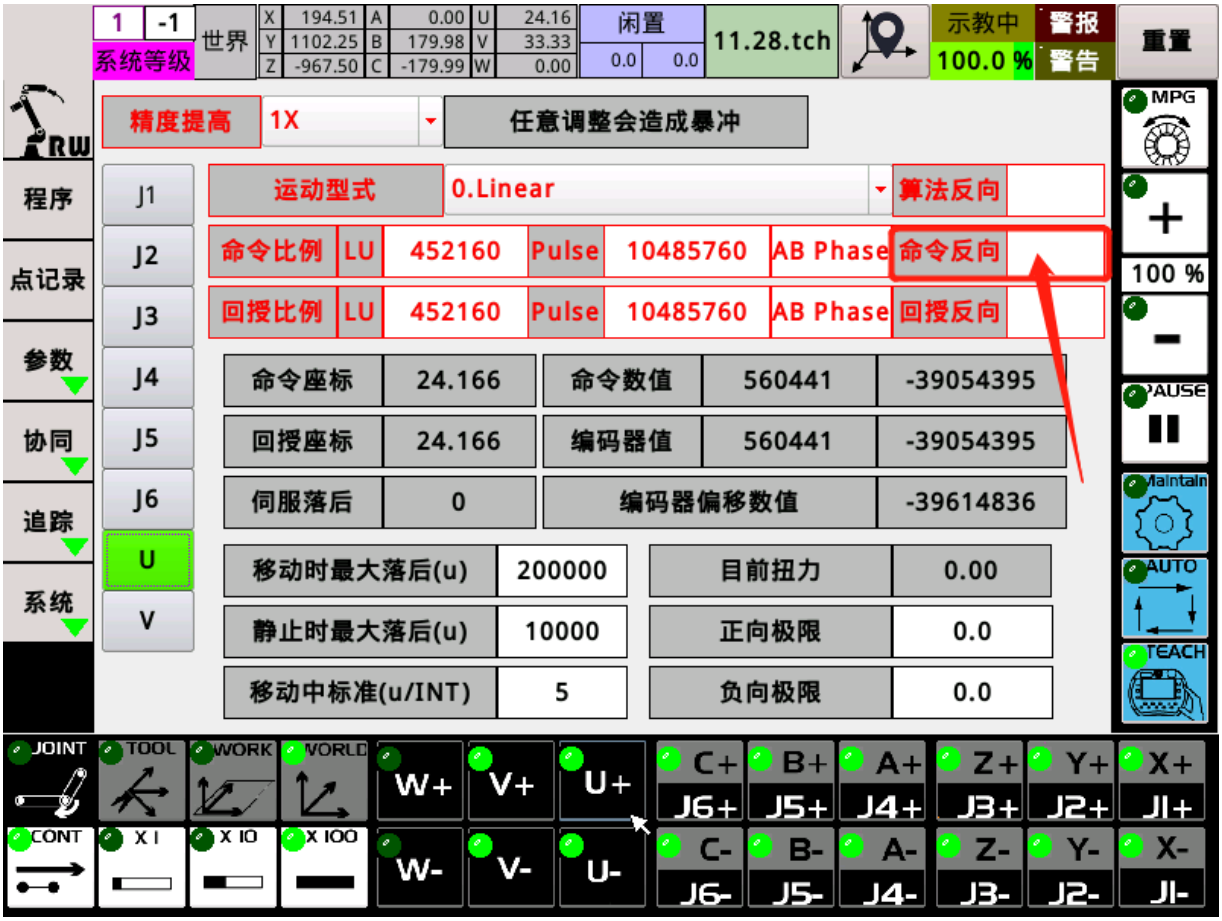
Use 12: additional axis coordinated with world coordinate y-axis

As shown in the figure above, at the position of the calibration point of the robot, the direction of the gantry travel is consistent with the world coordinate x direction, then the purpose of the gantry axis is set to 11. The direction of the additional axis on the gantry beam is consistent with the world coordinate y direction. The purpose is 12.



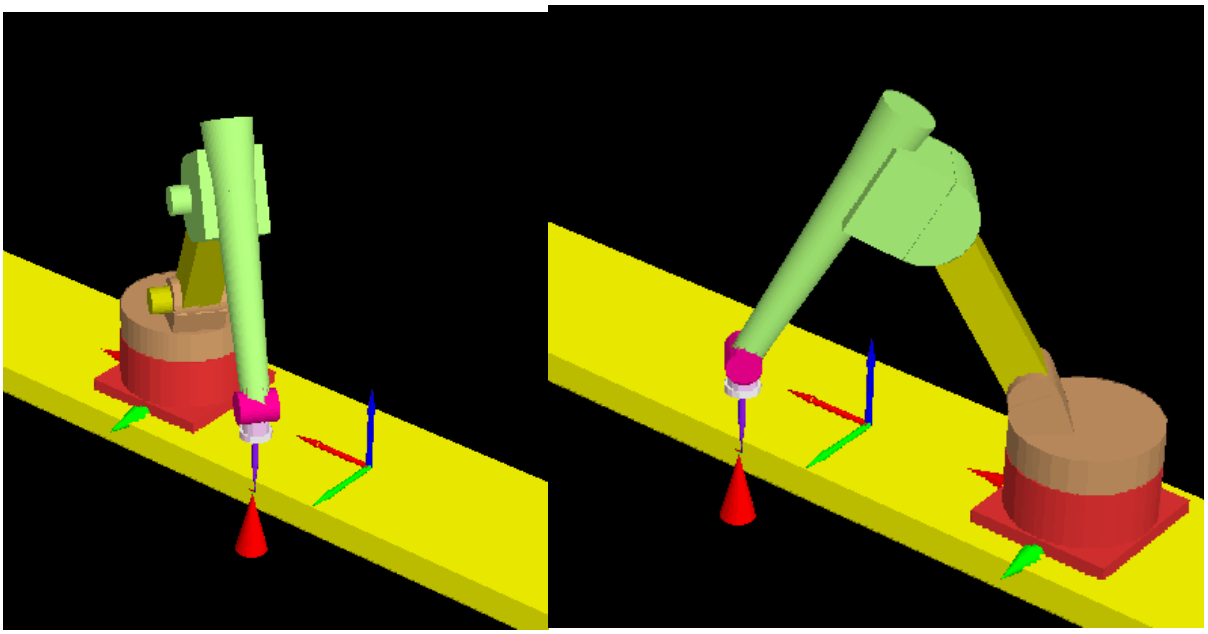
4) Set the rotation direction of the additional axis

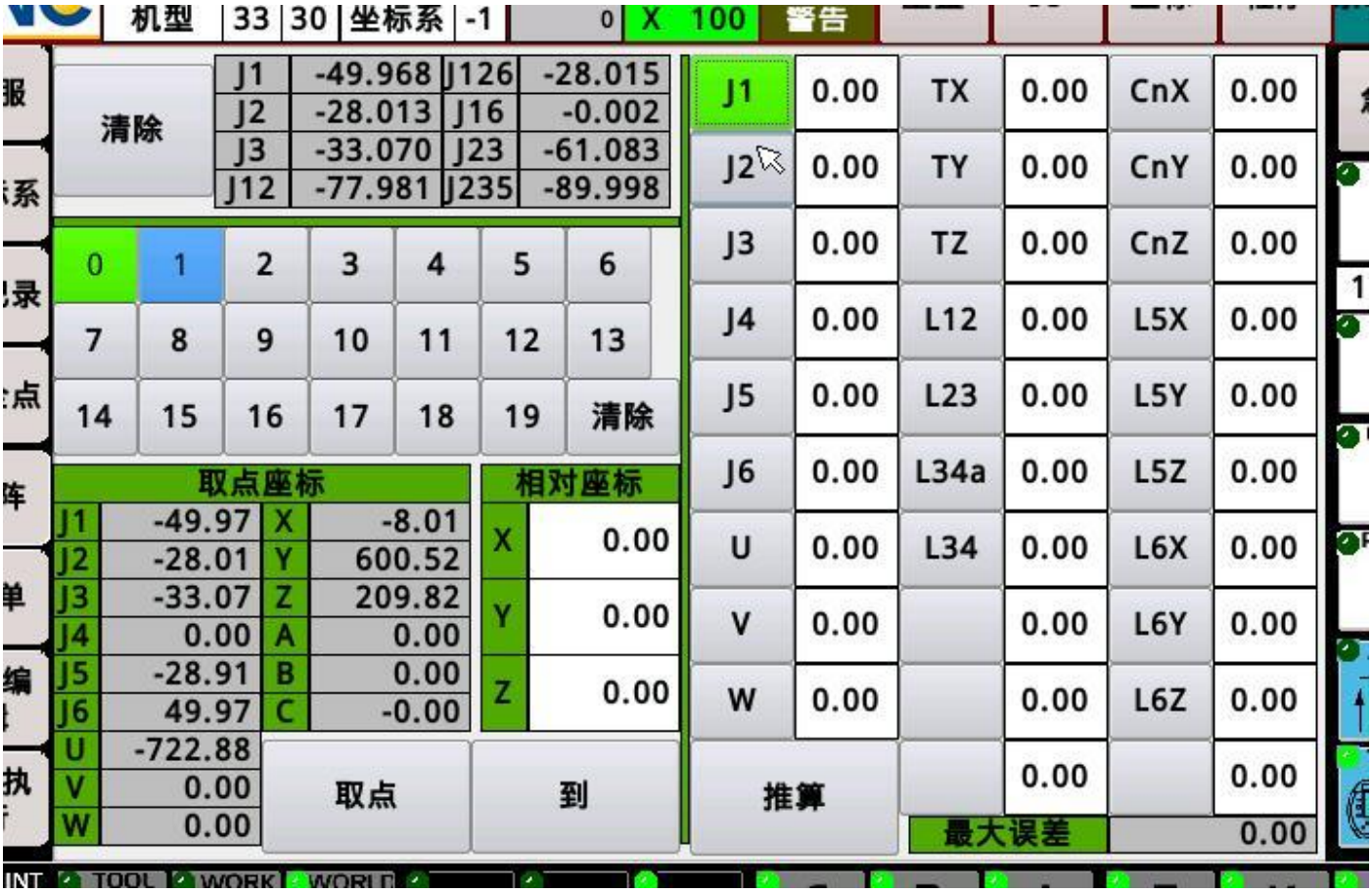
Consistent with the world coordinate direction, it also includes the direction of rotation must be consistent. It is necessary to verify that the direction of travel of the additional axis is consistent with the direction of the world coordinate. For example: the gantry axis moves in the positive direction. It is the same direction, that means correct, otherwise you need to reverse the axis command. Invert the command reverse parameter and restart to take effect.



5) Verify synergy

Take a fixed point, align the robot tcp (torch tip) with the fixed point, then switch the coordinates to world coordinates, move the u / v axis of the robot, and observe whether the two pointed points are always together. If in Together, it means that the coordination is very accurate. If there are more movements, the more the two sharp points deviate, it means that the synergy effect is not working, and a collaborative correction is required. The correction method is as follows:





As shown in the figure, take a sharp point and fix it. Move the additional axis parallel to the world coordinate x, then adjust the world coordinate xyz, align the tip of the welding torch with the sharp point. Then adjust the origin page and take the point 0. Then move the additional

axis Move in the opposite direction, adjust the world coordinate xyz, and then align the tip of the welding gun with the sharp point, take point 1. Then the point is calculated, and the error is within 3, which can be brought into use and the emergency stop takes effect.

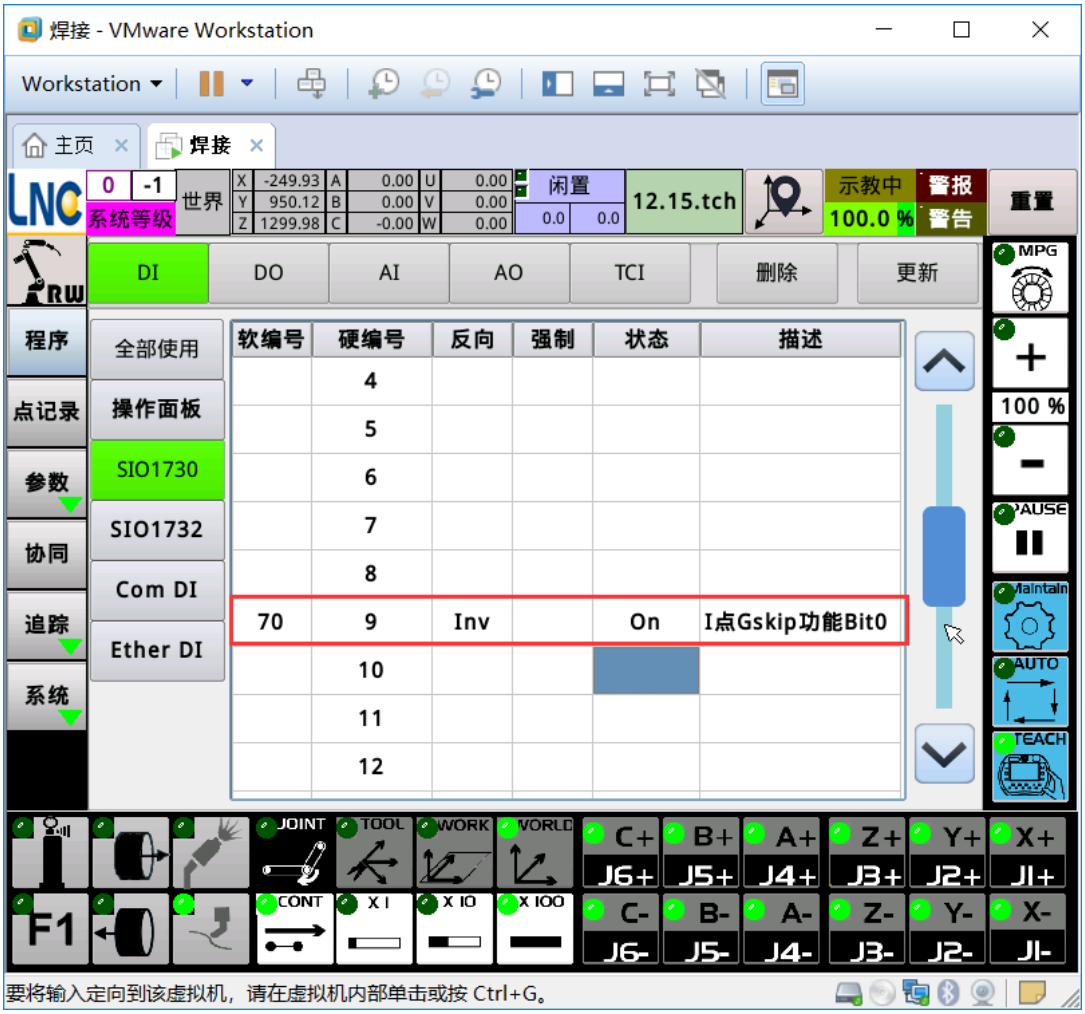
Then verify the synergy effect again. If it is not correct, correct it again. After many corrections, there is no major improvement. You must find the cause from other channels.

6) The rest of the operation is the same as normal laser tracking programming.

7.2 Contact positioning

7.2.1 Preparatory work before contact positioning

A signal output point is required on the welding machine. Generally, the welding machine monitors the change in the current value of the welding wire to the surface of the workpiece. Connect this output point on the welding machine to the input point on the system i / o board. In the settings, fill in the corresponding soft numbers as follows:



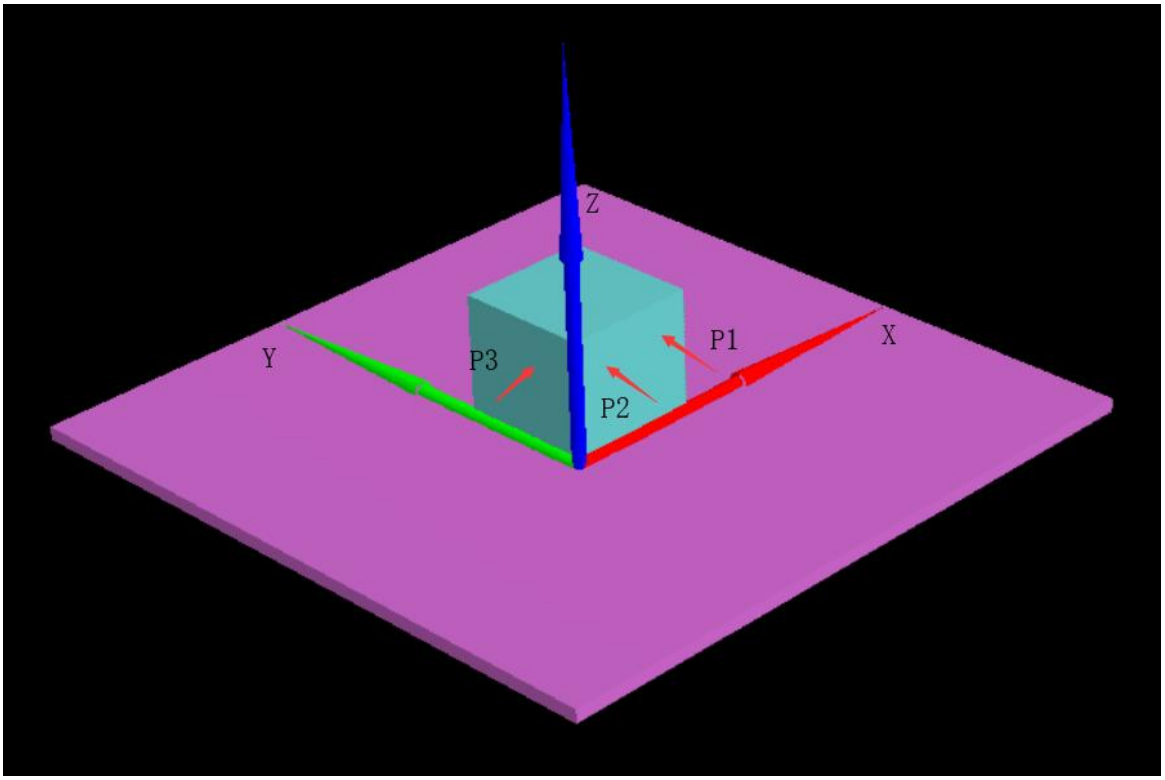
Make sure that the signal is off when it is not in contact with the workpiece, and it will turn on when it is in contact. The tester is a welding machine of the Model 350 Megmeet, you need to reverse this i point signal.

7.2.2 Bit Instruction Introduction

There are currently three types of positioning instructions, namely planar positioning, spatial positioning, and circular positioning, which will be introduced one by one below.


焊接 - VMware Workstation
Workstation
主页
焊接
系统等级
世界
闲置
PMXW.tch
示教中
警报
100.0 %
警告
重置
PMXW.tch
14
存档
区块操作
录制
基本指令
扩展指令
应用工艺
程序
点记录
参数
协同
追踪
系统
座标系
快速
I點尋找P1(與…
I點尋找P2(與…
I點尋找P3
尋位平面偏移
焊槍輸出
圓弧焊
平面尋位
激光指令
起弧
前後擺焊
空間尋位
輔助指令
延續起弧
左右擺焊
圓形尋位
收弧
魚鱗焊
路徑結束
附近
詳細
1~N
剪下
复制
貼上
上移
下移
后退
前进
单步
确定
MPG
100 %
PAUSE
Maintain
AUTO
TEACH
JOINT
TOOL
WORK
WORLD
CONT
F1
要将输入定向到该虚拟机，请在虚拟机内部单击或按 Ctrl+G。

Plane positioning



I點尋找P1(與P2同方向)
I點尋找P2(與P1同方向)
I點尋找P3
激光尋找P1(與P2同方向)
激光尋找P2(與P1同方向)
激光尋找P3
尋位平面偏移
取消尋位偏移

I點尋找P1(與P2同方向)

方向與最大位移X		mm
方向與最大位移Y	300	mm
方向與最大位移Z		mm
尋點速度	10	mm/s

1	1:	座标系
2	2:	快速
3	3:	I點尋找P1(與…
4	4:	快速
5	5:	I點尋找P2(與…
6	6:	快速
7	7:	快速
8	8:	I點尋找P3
9	9:	快速
10	10:	尋位平面偏移

尋位平面偏移

交點工作座標X		mm
交點工作座標Y		mm

6	6:	快速
7	7:	快速
8	8:	I點尋找P3
9	9:	快速
10	10:	尋位平面偏移
11	11:	直线
12	12:	直线
13	13:	直线
14	14:	直线
*		

In order to better understand the principle, here we build a model and explain it with a program example.

(1) First, you need to establish a working coordinate system, and the working coordinate system is shown in the above figure (the direction is indicated). When programming, we need to call this coordinate system in the first step, and the subsequent points are recorded using the working coordinate system. .

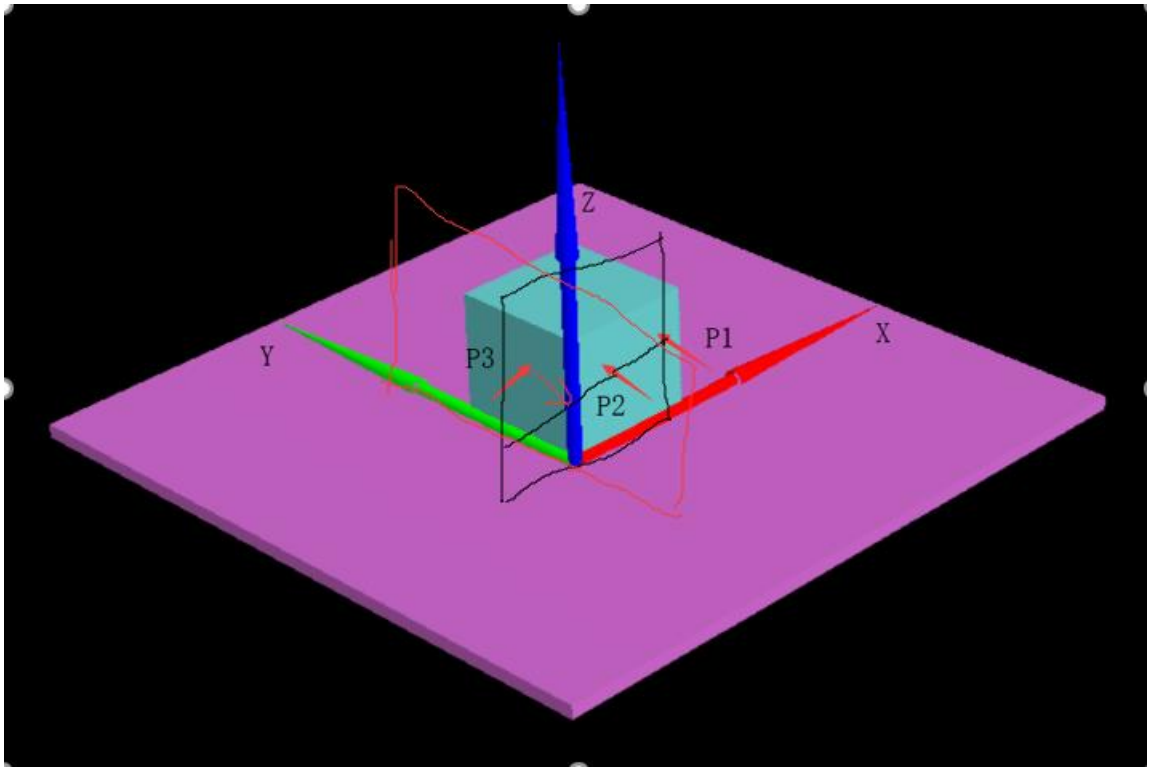
(2) After that, 3 points need to be taken, p1, p2, and p3. The direction and position of the three points are shown in the figure above.

Maximum displacement in the direction: refers to the point of the fast instruction in the program, which moves linearly in a certain direction, and the speed is the speed of the seek point. Note: This displacement direction has positive and negative.

When the welding torch touches the surface of the workpiece, an i-point signal is triggered.At this time, the welding torch returns to the previous fast point by the original path and continues to execute

the next instruction.

After finding 3 points, these 3 points will determine a coordinate system. Because it is a plane positioning, the two points p1 and p2 will form a plane (black plane) parallel to the z axis, and the point p3 is perpendicular to this plane To form a plane (red plane) that is also parallel to the z-axis.



The origin of the working coordinate system found at this time is located on the intersection of the two planes.

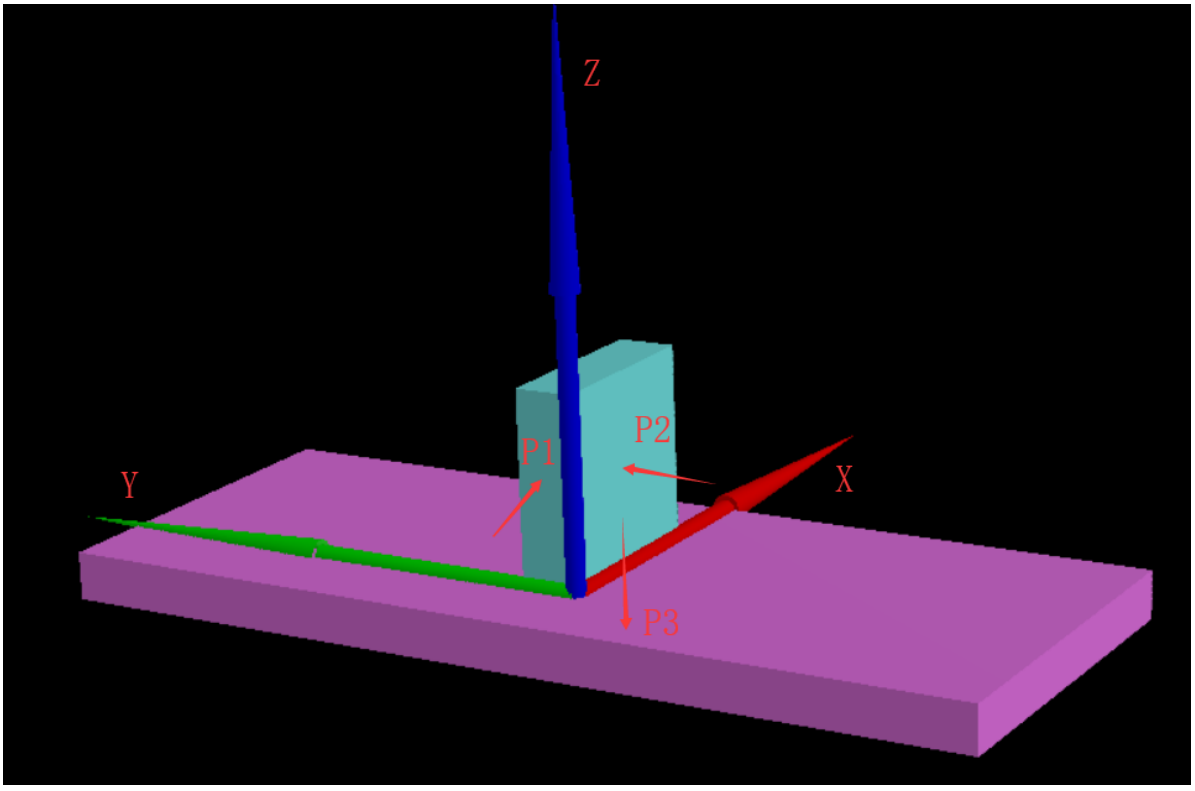
(3) After the three points are determined, the coordinate system must be shifted. The principle is the same as the working coordinate system. The purpose is to shift the originally established working coordinate system to the working coordinate system after positioning. The path that was originally established on the working coordinate system can continue to run the same effect after the workpiece is offset.

Intersection working coordinates: Refers to the origin of the working coordinate system determined by the three points taken, an offset from the x or y direction of the original working coordinate system origin. Measure the offset value and fill it in. In order to ensure the positioning accuracy, when taking the point, make sure that the origin of the offset is on the same side as the origin of the original coordinate system.

(4) After the positioning plane is offset, write a normal machining path.

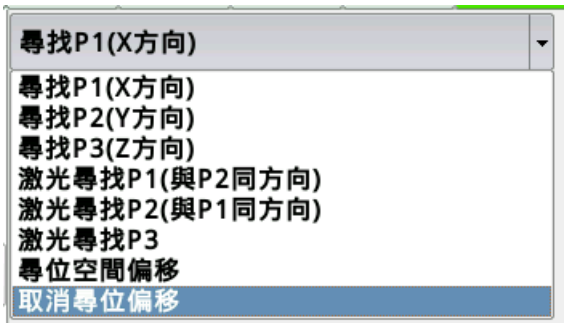
(5) If the next command does not need to use the offset coordinate system, please use the cancel plane offset command.

7.2.3 Spatial and circular positioning



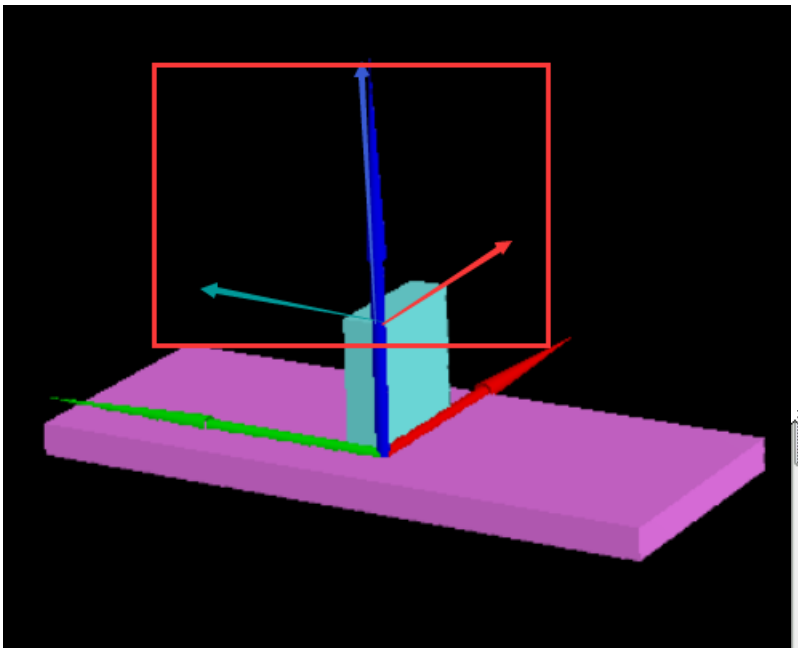
1	1:	座标系
2	2:	快速
3	3:	尋找P1(X方向)
4	4:	快速
5	5:	尋找P2(Y方向)
6	6:	快速
7	7:	尋找P3(Z方向)
8	8:	快速
9	9:	尋位空間偏移
10	10:	直线

5	5:	尋找P2(Y方向)
6	6:	快速
7	7:	尋找P3(Z方向)
8	8:	快速
9	9:	尋位空間偏移
10	10:	直线
11	11:	直线
12	12:	直线
13	13:	直线
*		



The principles of spatial positioning and circular positioning are the same. Both seek three points to determine an offset of the coordinate system.

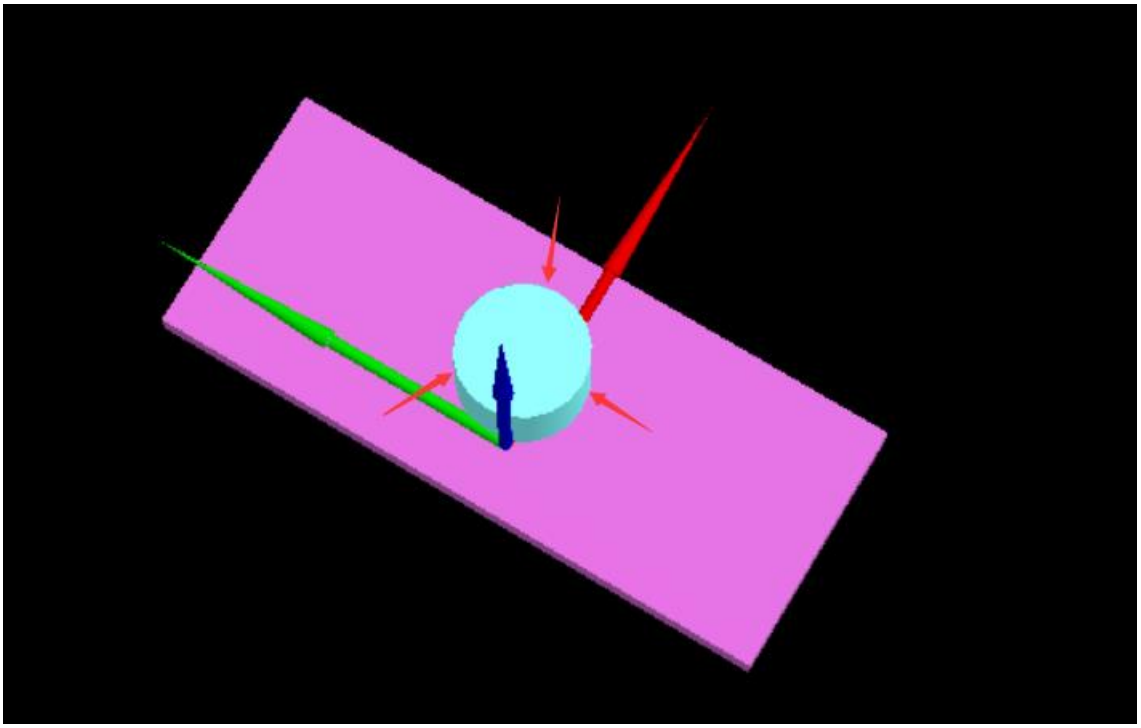
The above picture is an example. After finding points in three directions of xyz, you can determine that the position of an intersection point of the three planes is on the same side as the working coordinate system. In this case, you do not need to fill in any offsets to find the space offset instruction. Sometimes the coordinate system selected is not convenient to take, as shown in the figure below:



空间偏移计算

交点工作坐标X		mm
交点工作坐标Y		mm
交点工作坐标Z	200	mm

At this time, because the intersection of the three points taken is on the bottom plane, you need to fill in the working coordinate offset value of the intersection of z here.

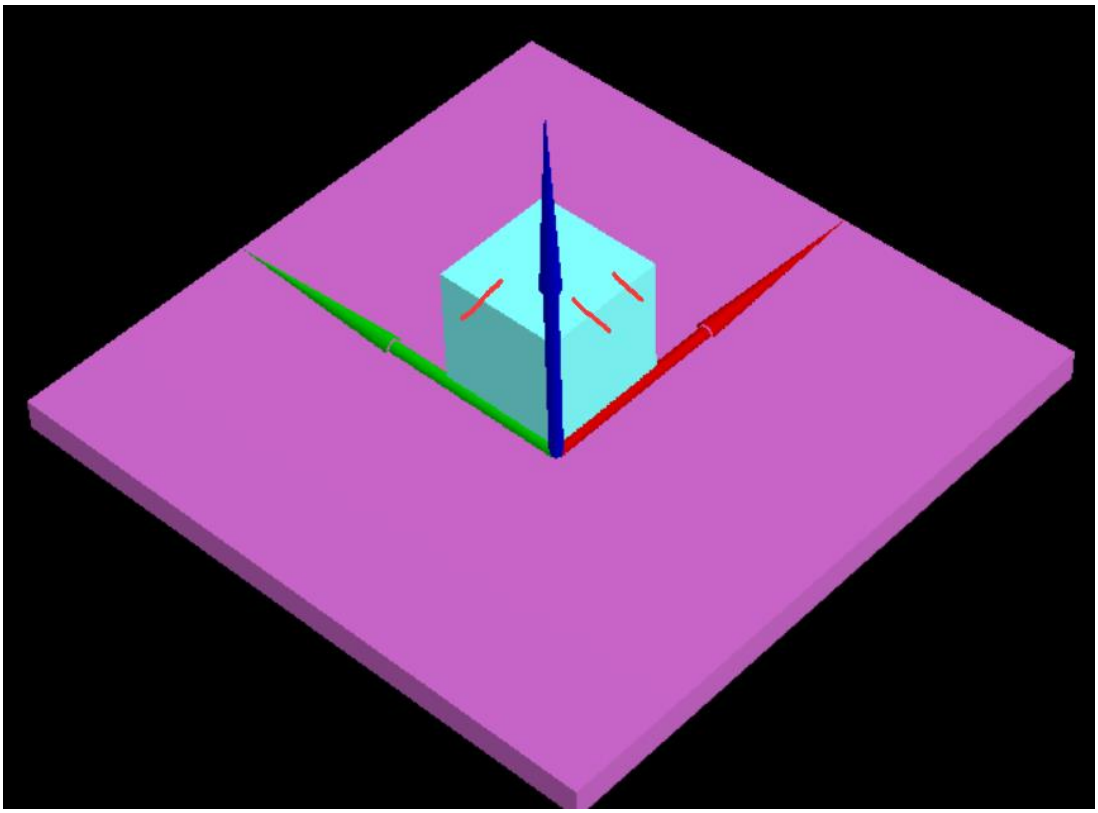


The difference of circular positioning is that the three points determine a circle, and the working coordinate intersection point is the center of the circle. Therefore, when setting the working coordinate offset of the intersection point, the offset value is the cylindrical center to the selected working coordinate. An offset in the xy direction of the origin.

7.3 Laser positioning

7.3.1 Laser Positioning Introduction

Laser positioning is the same as contact positioning.The only difference is that the three points taken by the laser are the points that can be scanned to the weld.



7.3.2 Laser positioning program example

This function is a three-point plane positioning, which is limited to use when the workpiece needs two adjacent right-angled edges. Based on this, an improvement has been made to calculate the accurate offset by finding four points. The method is as follows:

This method requires writing two programs.

The first program: find four points by laser. These four points are the same as the three-point plane positioning principle, except that at three points, the side that takes one point becomes two points.

The second program: also find four points by laser, the order of finding points is the same as the first program, and compare the four points with the four points of the first program to calculate the offset.

When using, run the first program first, record the four reference points, and only need to run it once; then run the second program all as the processing program.

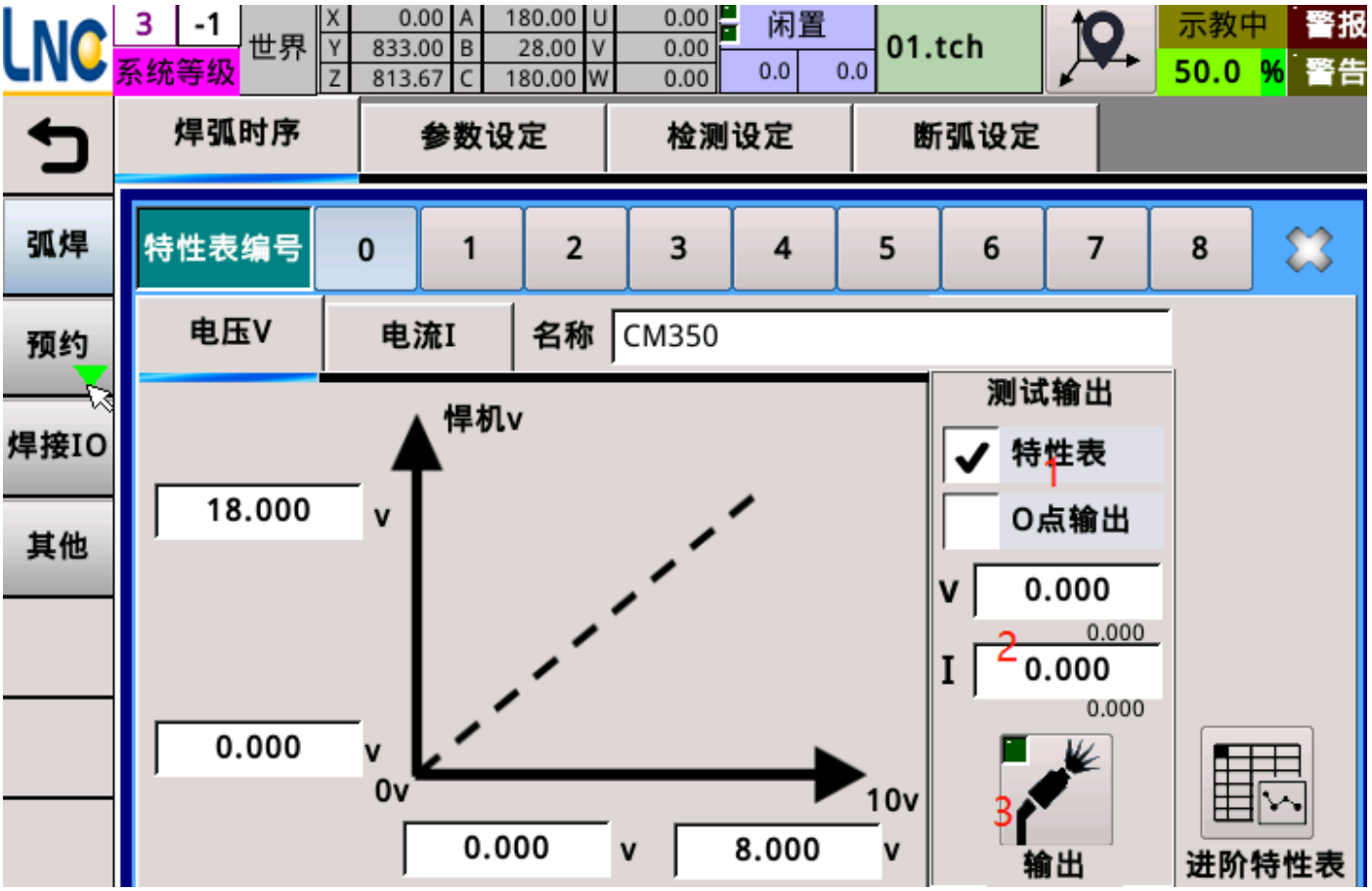
Example: first program

The second program:

8 Appendix

8.1 Characteristic table test

According to the matching of the welding characteristic curve table in Chapter 5, after setting the voltage and current corresponding to the characteristic table, follow the step 123 in the picture, check the characteristic table, enter the actual voltage value after v, and see if the welder panel display is the same. The actual current value depends on whether the display of the welding machine panel is the same; if they are different, you need to test the matching characteristics table yourself or consult the welding machine manufacturer.

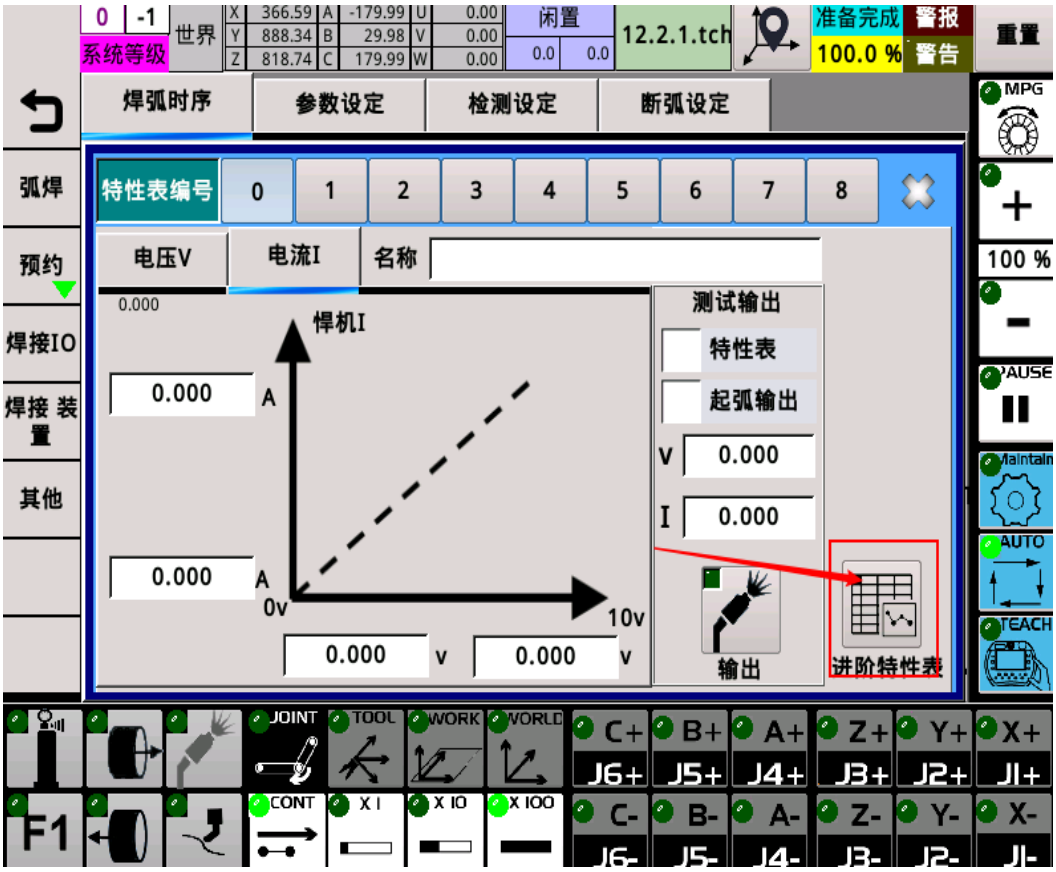


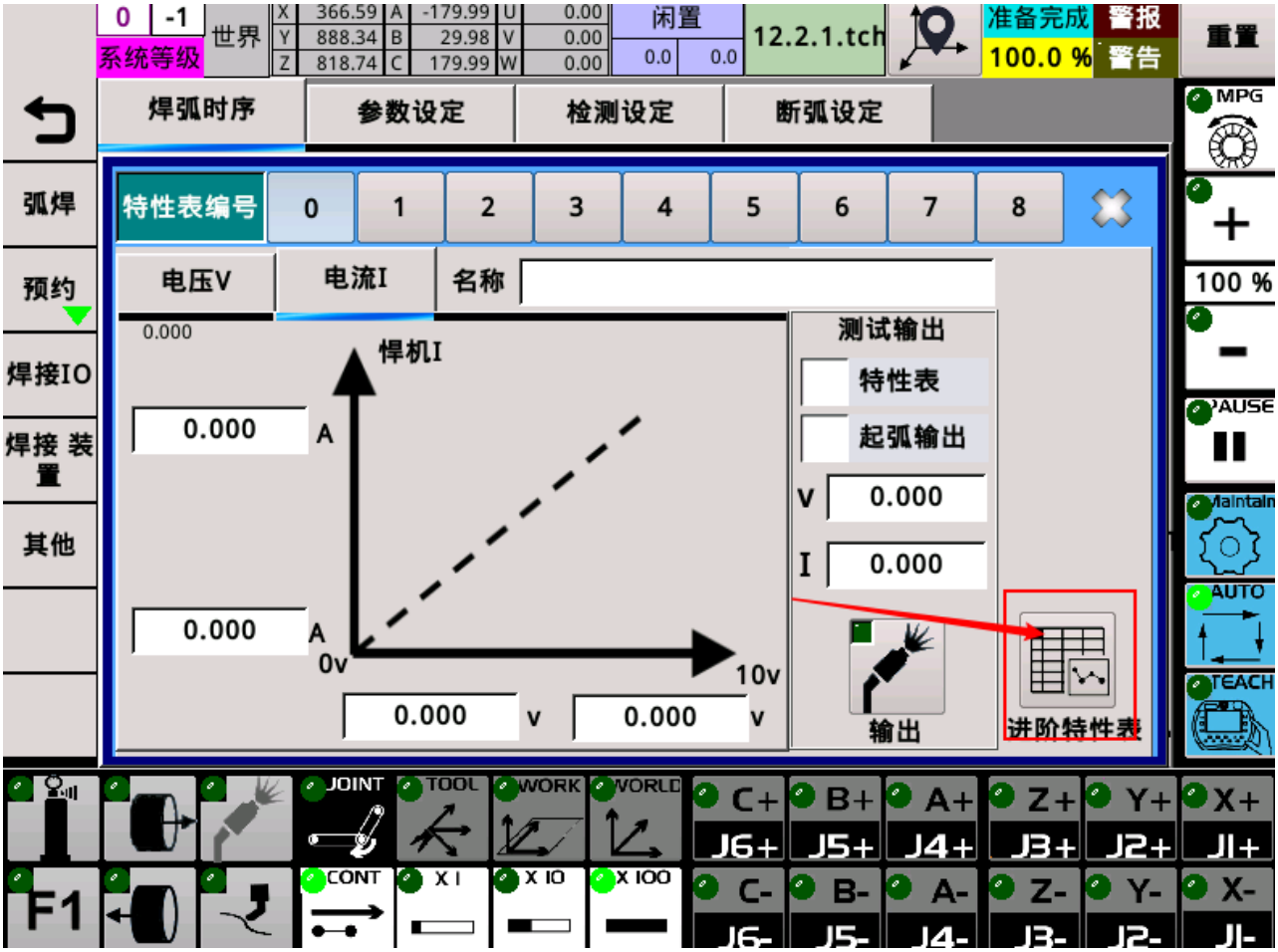
8.2 Characteristics table

8.2.1 McGmite models and Otto 350

焊机型号	输出电压曲线	输出电流曲线	基准电压
麦格米特CM350AR	0~8V 0V~18V	0~8V 30~400A	9V
麦格米特CM500AR	0~10V 0~18V	0~10V 30A~500A	9V
麦格米特PM400F	0~8.8V 0~30V	1.1V~7.3V 60A~400A	
麦格米特PM500	0~10V 0~18V	0~10V 30A~500A	
奥太350	0~10 50V~150	0~10V 0~500A	110V

备注：特殊情况要以实际情况为准，设置电流电压与焊机实际值要相符！

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系统等级
世界
X 366.59
Y 888.34
Z 818.74
A -179.99
B 29.98
C 179.99
U 0.00
V 0.00
W 0.00
闲置
0.0
0.0
12.2.1.tch
准备完成
100.0 %
警报
警告
重置
焊弧时序
参数设定
检测设定
断弧设定
MPG
100 %
PAUSE
Maintain
AUTO
TEACH
弧焊
预约
焊接IO
焊接 装置
其他
特性表编号
0
1
2
3
4
5
6
7
8
电压V
电流I
名称
0.000
悍机I
0.000
A
0.000
A
0v
10v
0.000
v
0.000
v
测试输出
特性表
起弧输出
V
0.000
I
0.000
输出
进阶特性表
JOINT
TOOL
WORK
WORLD
C+
B+
A+
Z+
Y+
X+
J6+
J5+
J4+
J3+
J2+
J1+
F1
CONT
X I
X IO
X IOO
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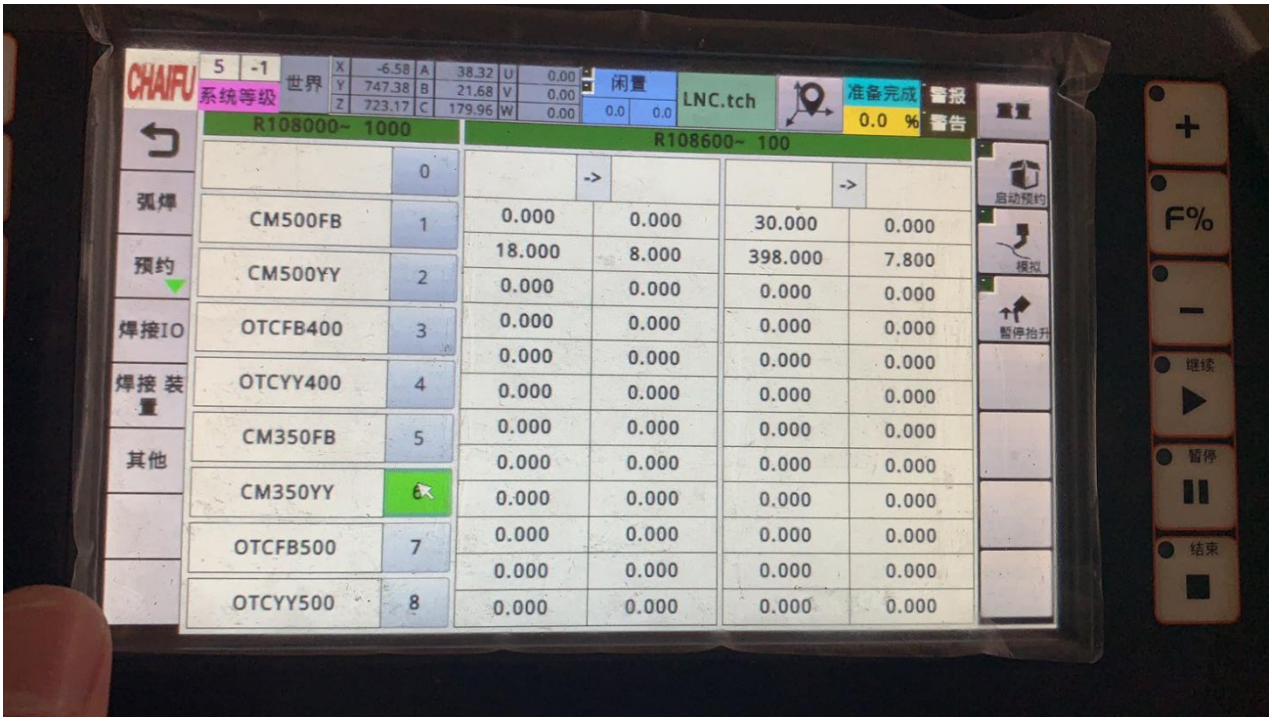
A-
Z-
Y-
X-
J6-
J5-
J4-
J3-
J2-
J1-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5
-1
系统等级
世界
闲置
LNC.tch
准备完成
0.0 %
警报
警告
重置
R108000~ 1000
R108600~ 100
弧焊
预约
焊接IO
焊接 装置
其他
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CM500YY
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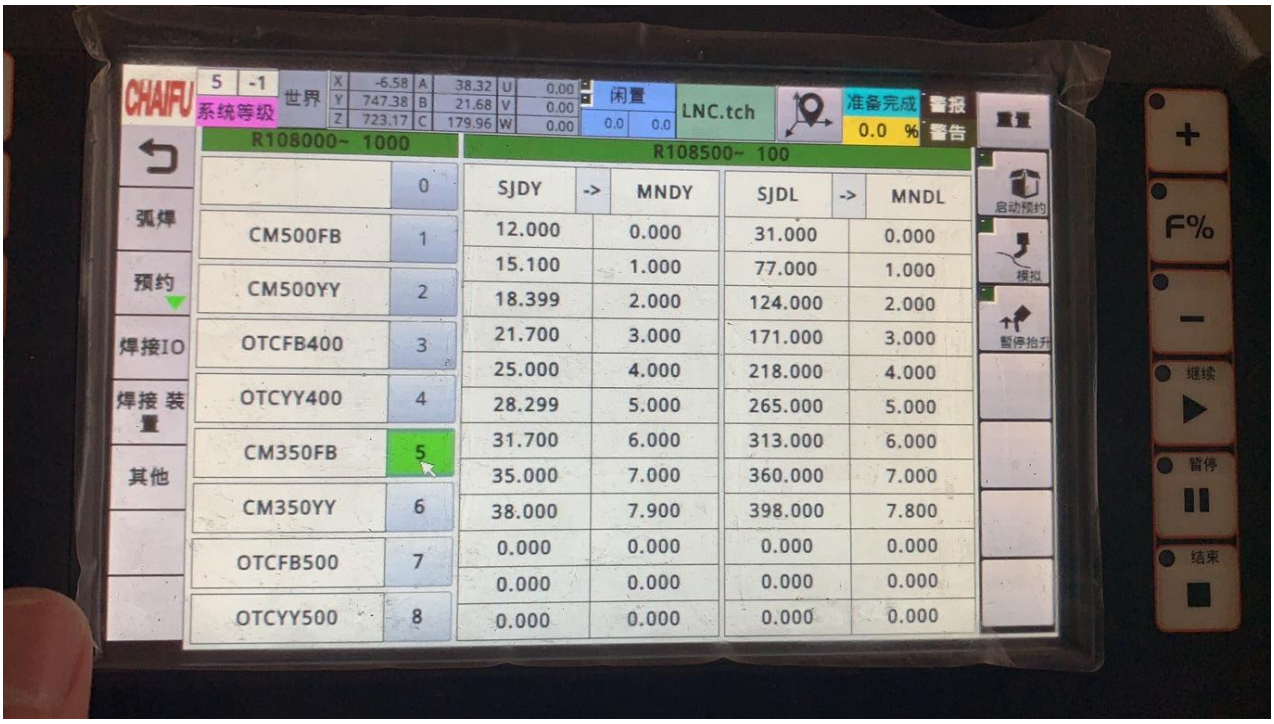
OTCYY400
CM350FB
CM350YY
OTCFB500
OTCYY500
F%
继续
暂停
结束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Y 747.38 B 21.68 V 0.00
Z 723.17 C 179.96 W 0.00
闲置
LNC.tch
准备完成
0.0 %
警报
警告
R108000~ 1000
R108500~ 100
SJDY -> MNDY
SJDL -> MNDL
0
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CM500YY 2 15.100 1.000 77.000 1.000
OTCFB400 3 18.399 2.000 124.000 2.000
OTCYY400 4 21.700 3.000 171.000 3.000
CM350FB 5 25.000 4.000 218.000 4.000
CM350YY 6 28.299 5.000 265.000 5.000
OTCFB500 7 31.700 6.000 313.000 6.000
OTCYY500 8 35.000 7.000 360.000 7.000
38.000 7.900 398.000 7.800
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弧焊
预约
焊接IO
焊接 装置
其他
启动预约
模拟
暂停抬升
继续
暂停
结束
F%


CHAIFU
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系统等级
世界
X -6.58 A 38.32 U 0.00
Y 747.38 B 21.68 V 0.00
Z 723.17 C 179.96 W 0.00
闲置
LNC.tch
准备完成
0.0 %
警报
警告
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R108200~ 100
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OTCYY400 4 0.000 0.000 0.000 0.000
CM350FB 5 0.000 0.000 0.000 0.000
CM350YY 6 0.000 0.000 0.000 0.000
OTCFB500 7 0.000 0.000 0.000 0.000
OTCYY500 8 0.000 0.000 0.000 0.000
0.000 0.000 0.000 0.000
0.000 0.000 0.000 0.000
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焊接IO
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暂停
结束
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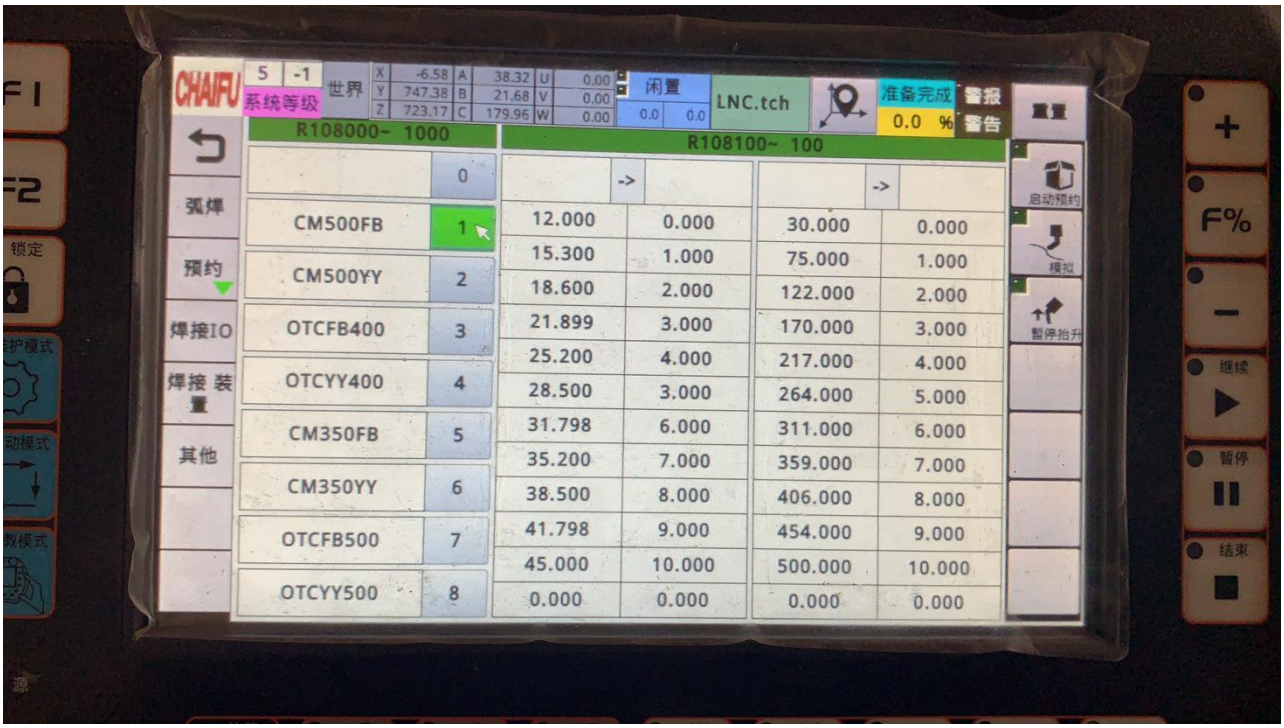
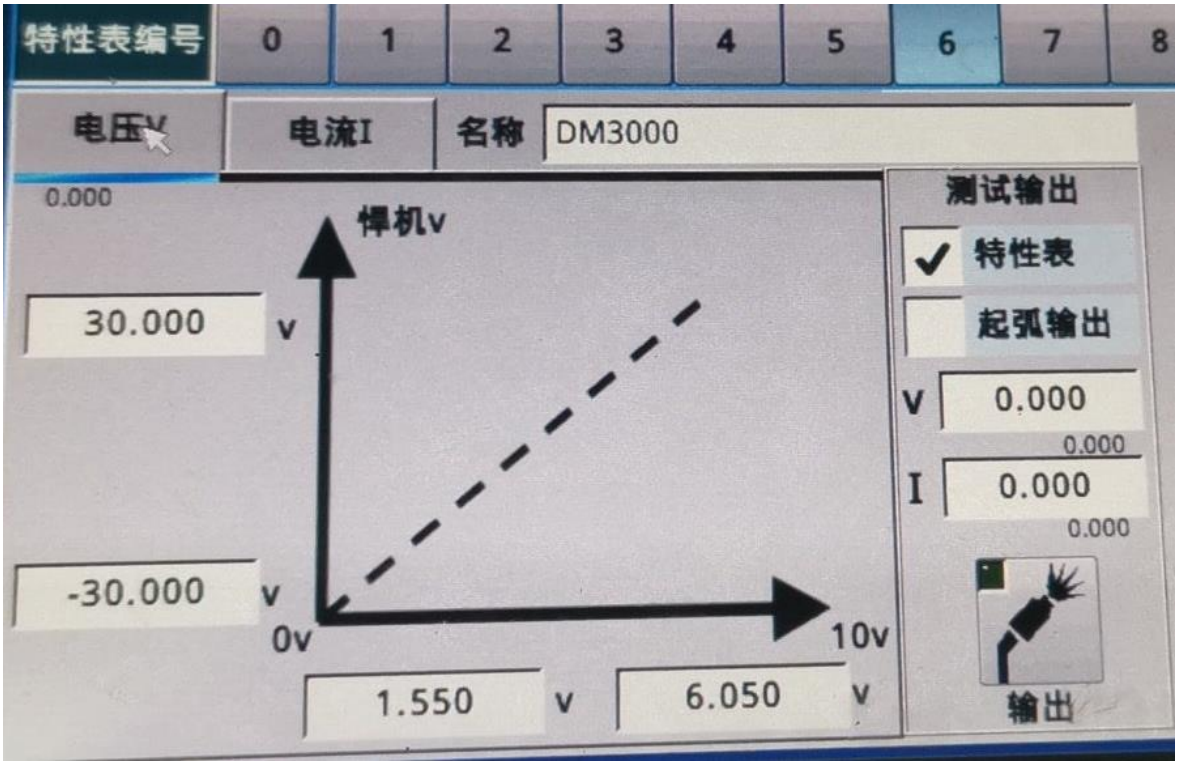
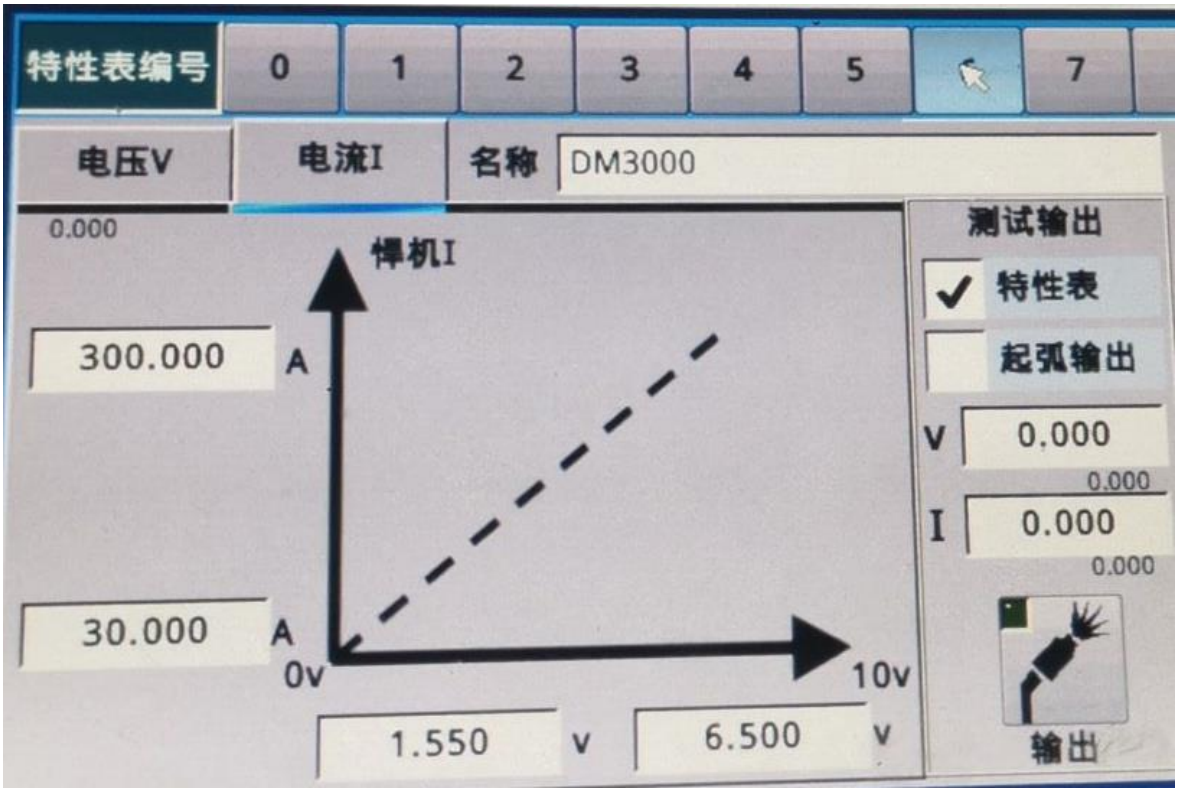
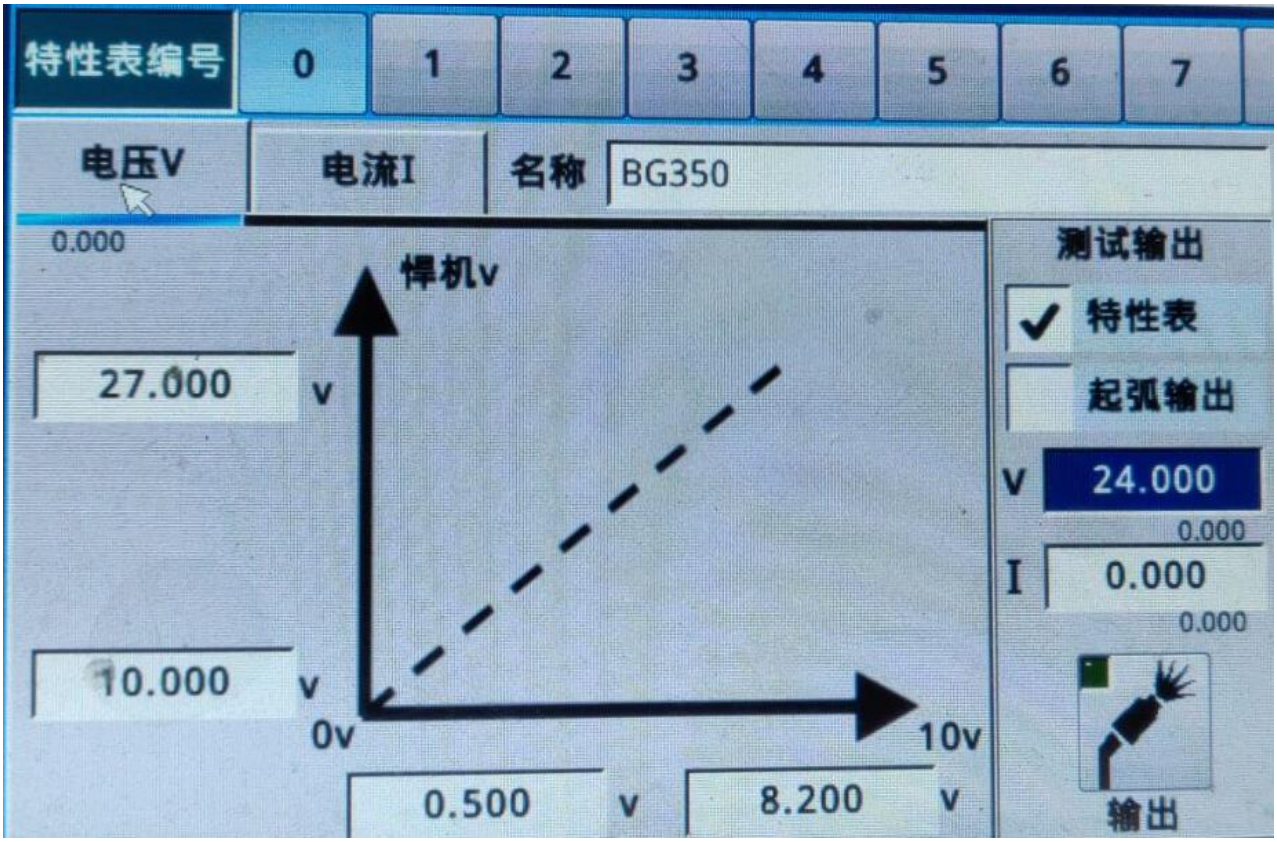


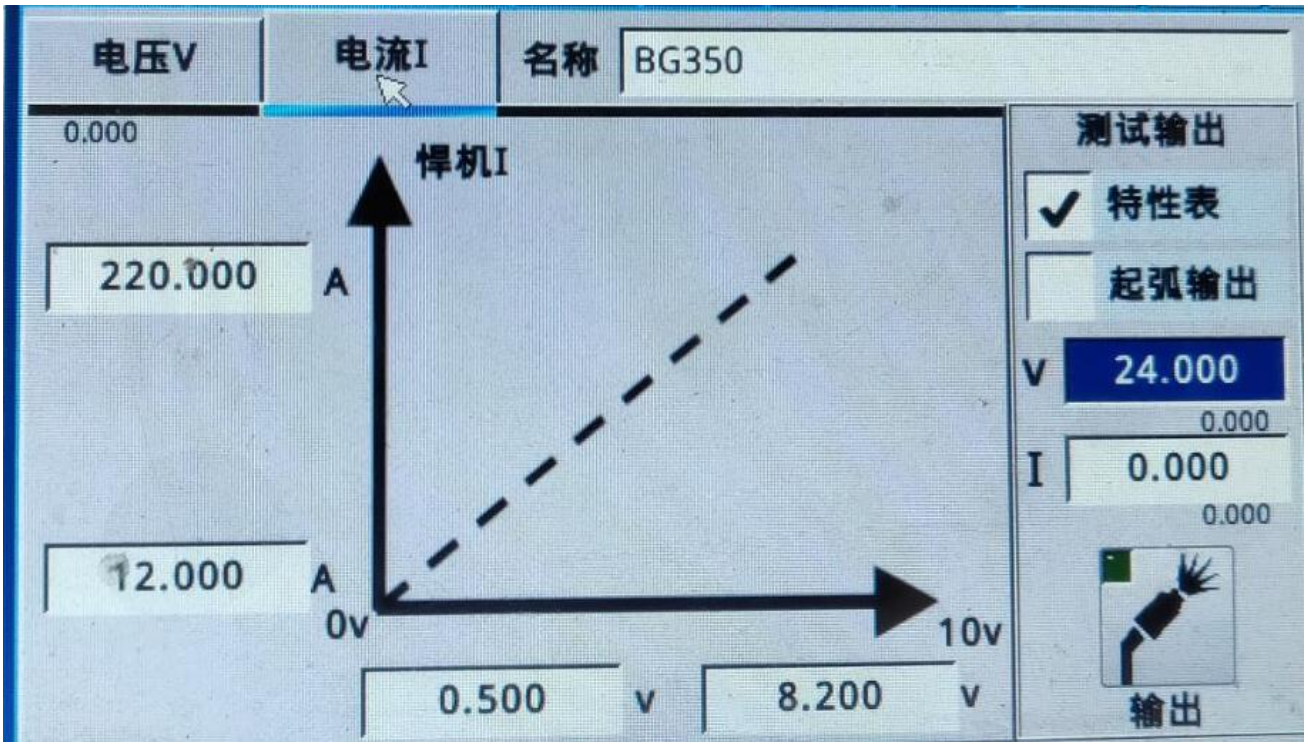
8.2.2 Magmite dm3000





8.2.3 Must High 350





8.2.4 OTC sections

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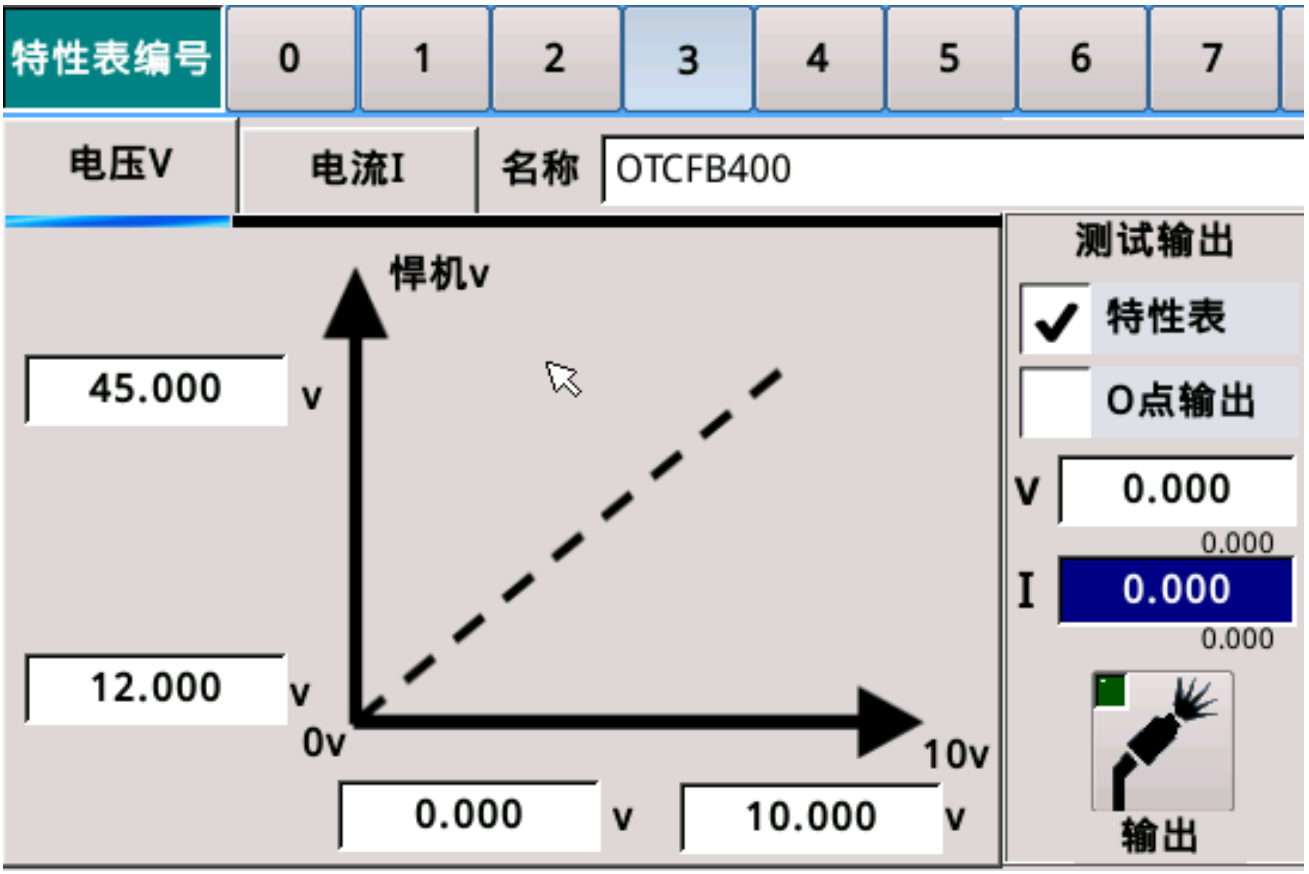

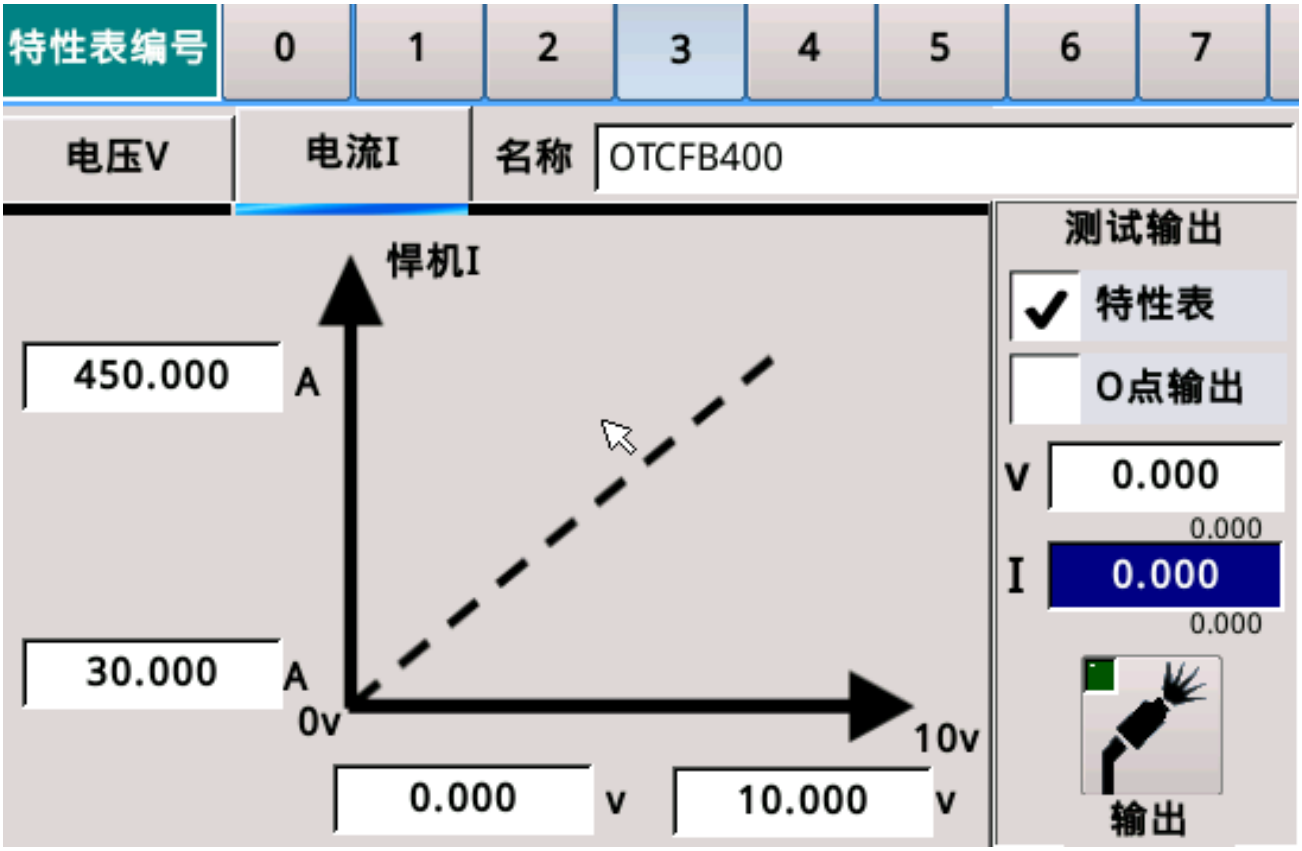
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A
30.000
A
0v
10v
0.000
v
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特性表
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I
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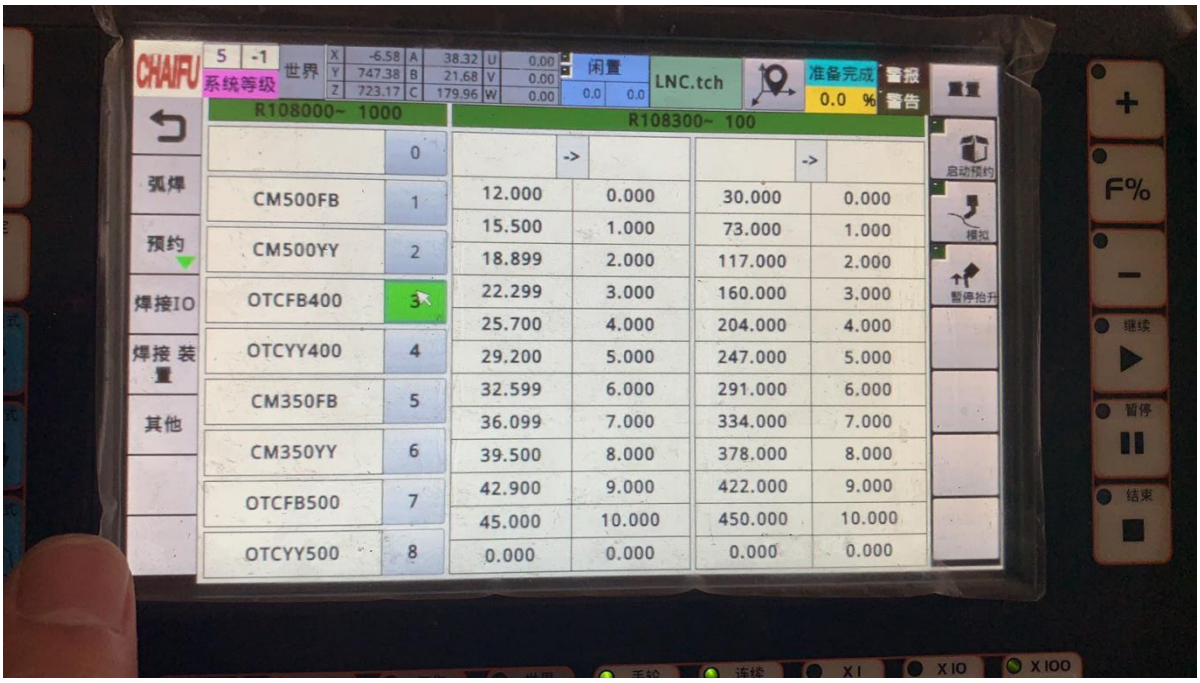
输出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R108300~ 100
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预约
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焊接 装置
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暂停
结束

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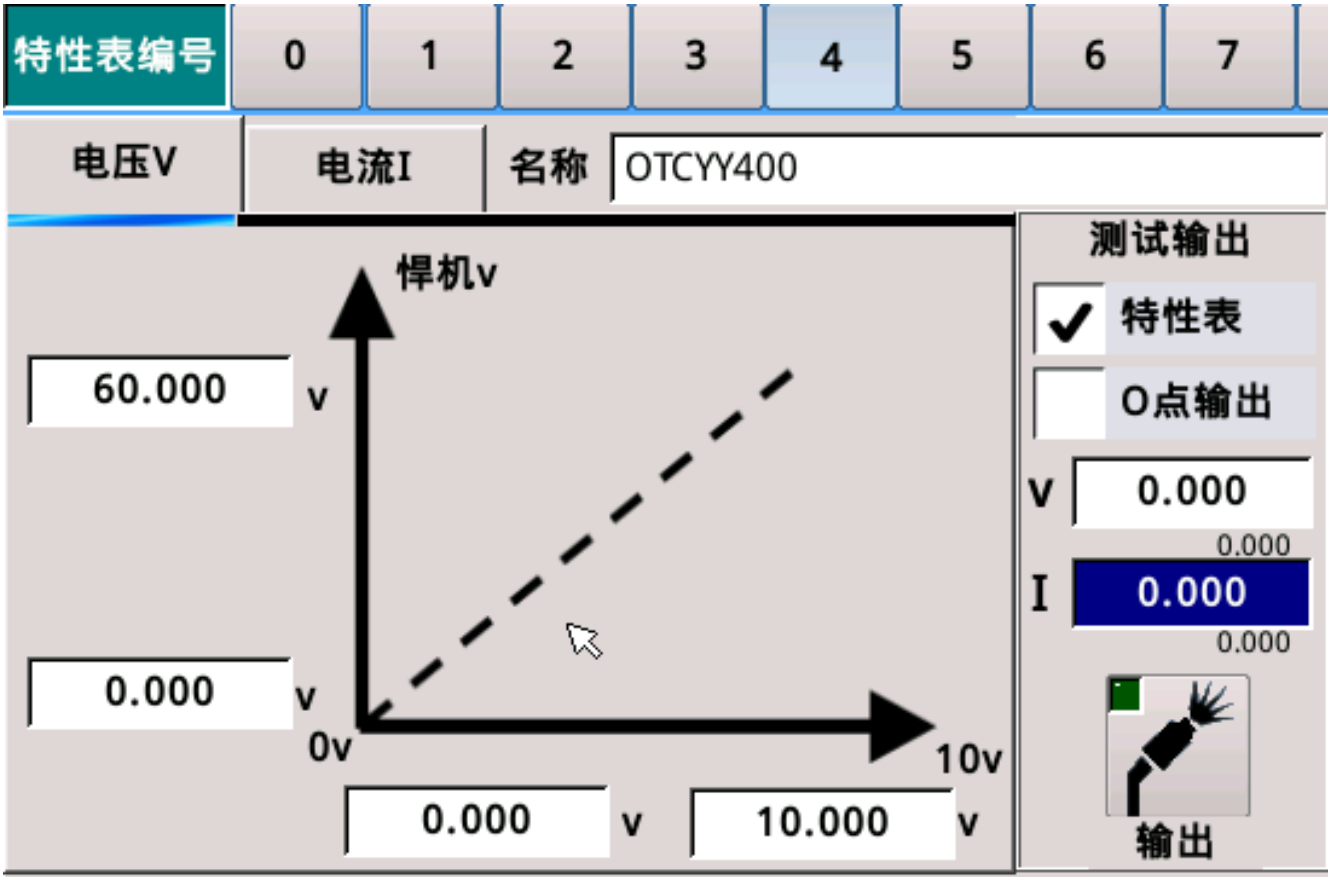
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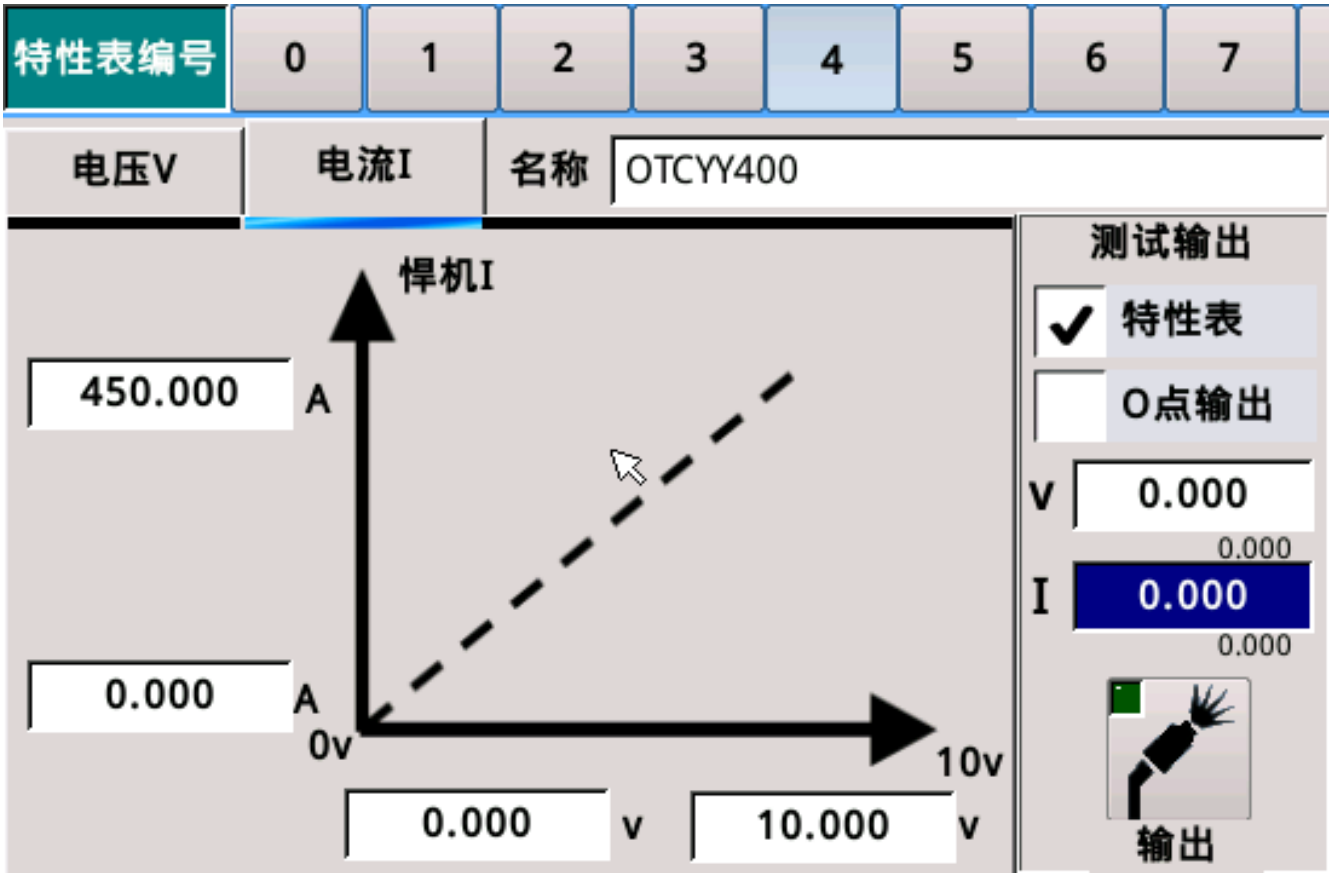
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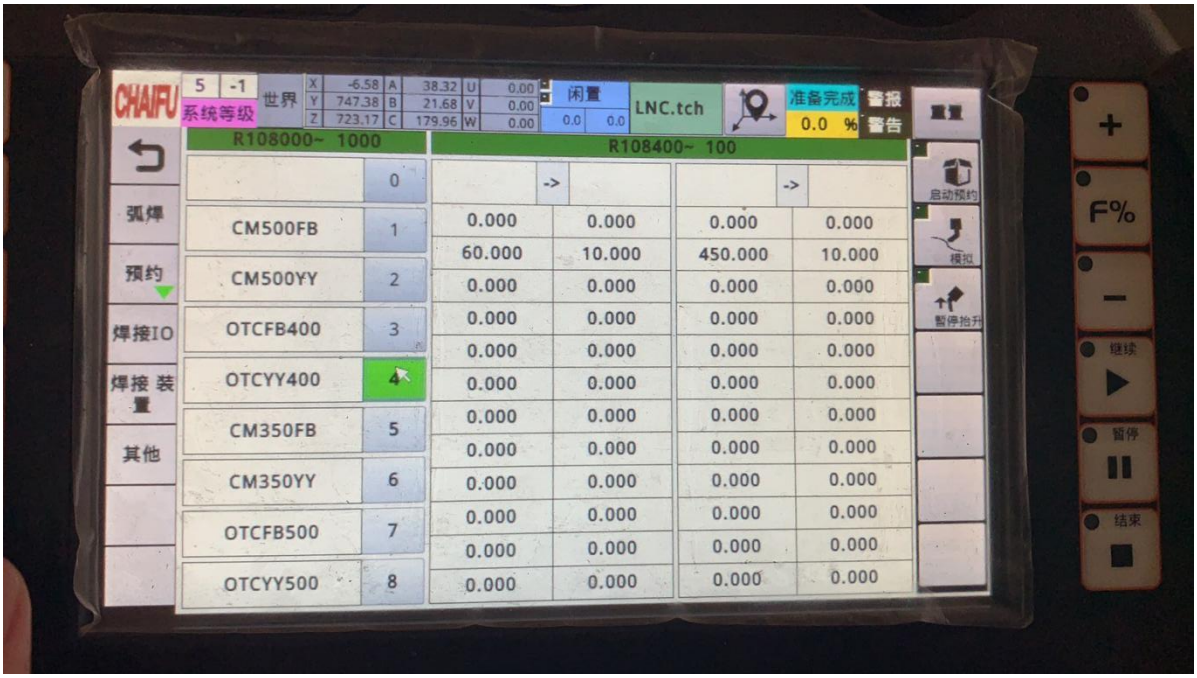
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预约
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焊接 装置
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OTCFB400
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暂停
结束

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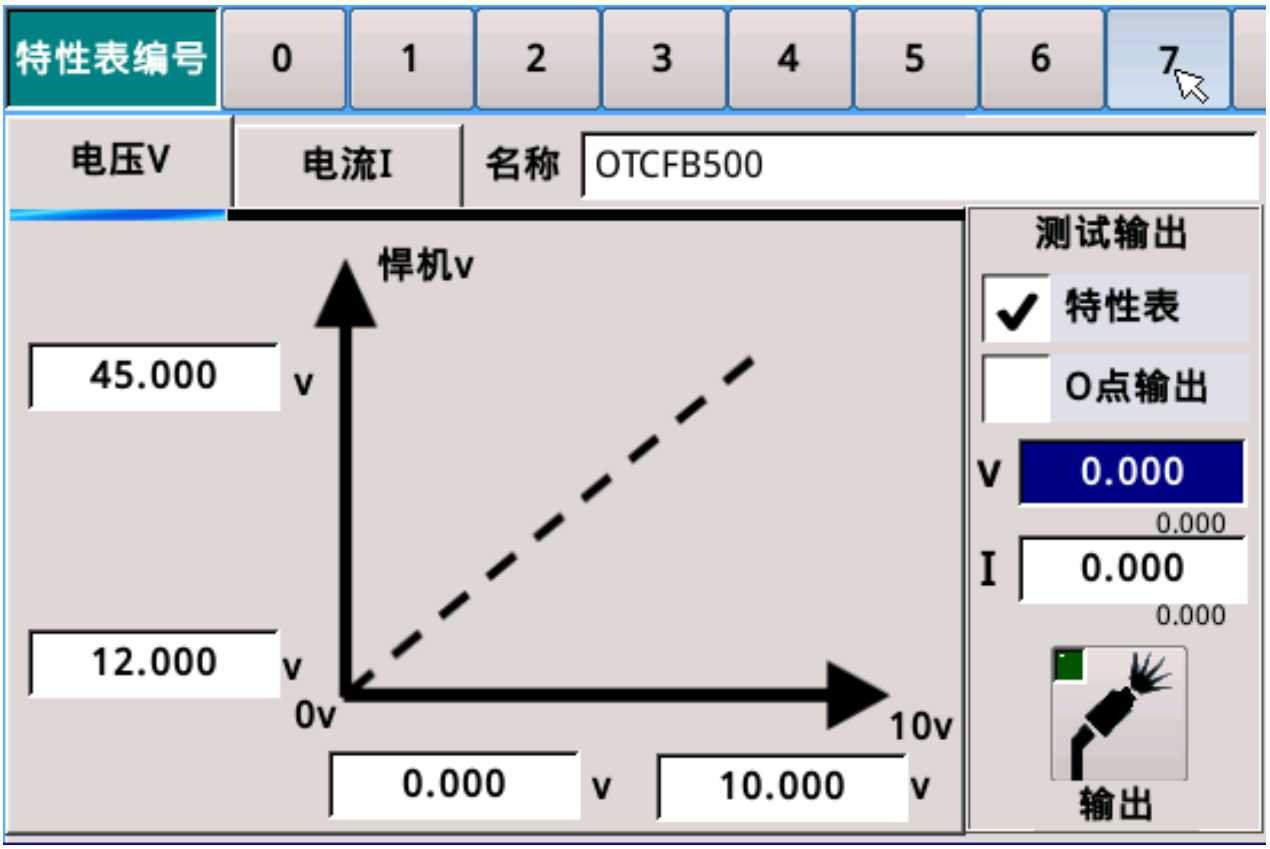
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10v
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特性表
O点输出
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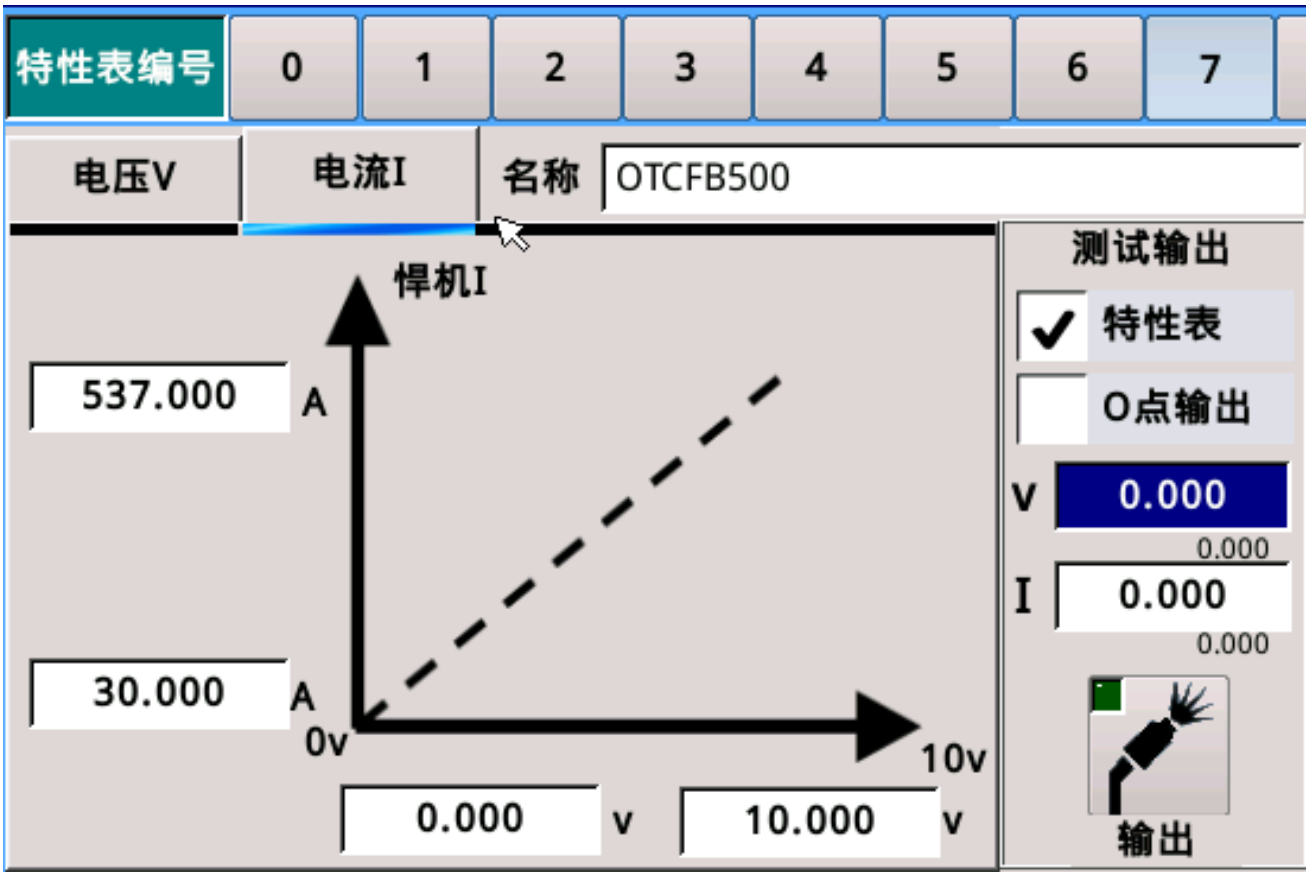
输出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A
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特性表
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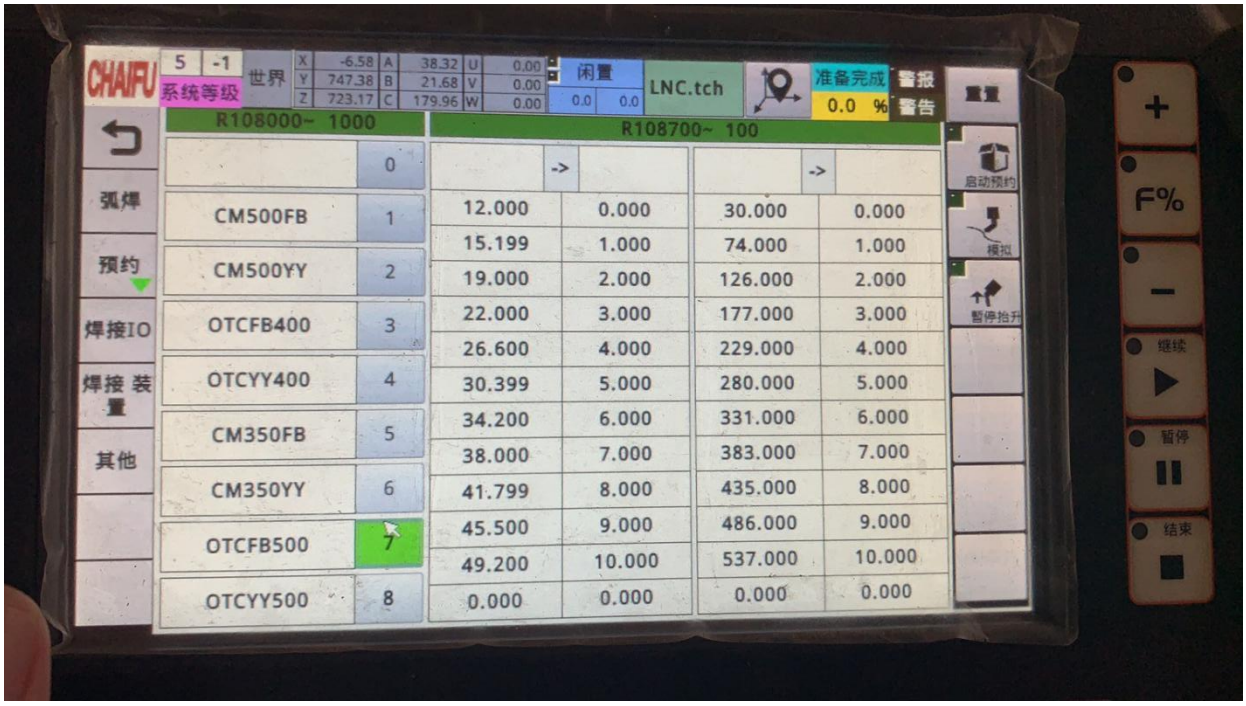
0.000
0.000
输出


CHAIFU
系统等级
世界
闲置
LNC.tch
准备完成
警报
警告
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R108700~ 100
弧焊
预约
焊接IO
焊接 装置
其他
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CM500YY
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OTCYY400
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CM350YY
OTCFB500
OTCYY500
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30.399 5.000 280.000 5.000
34.200 6.000 331.000 6.000
38.000 7.000 383.000 7.000
41.799 8.000 435.000 8.000
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F%
继续
暂停
结束

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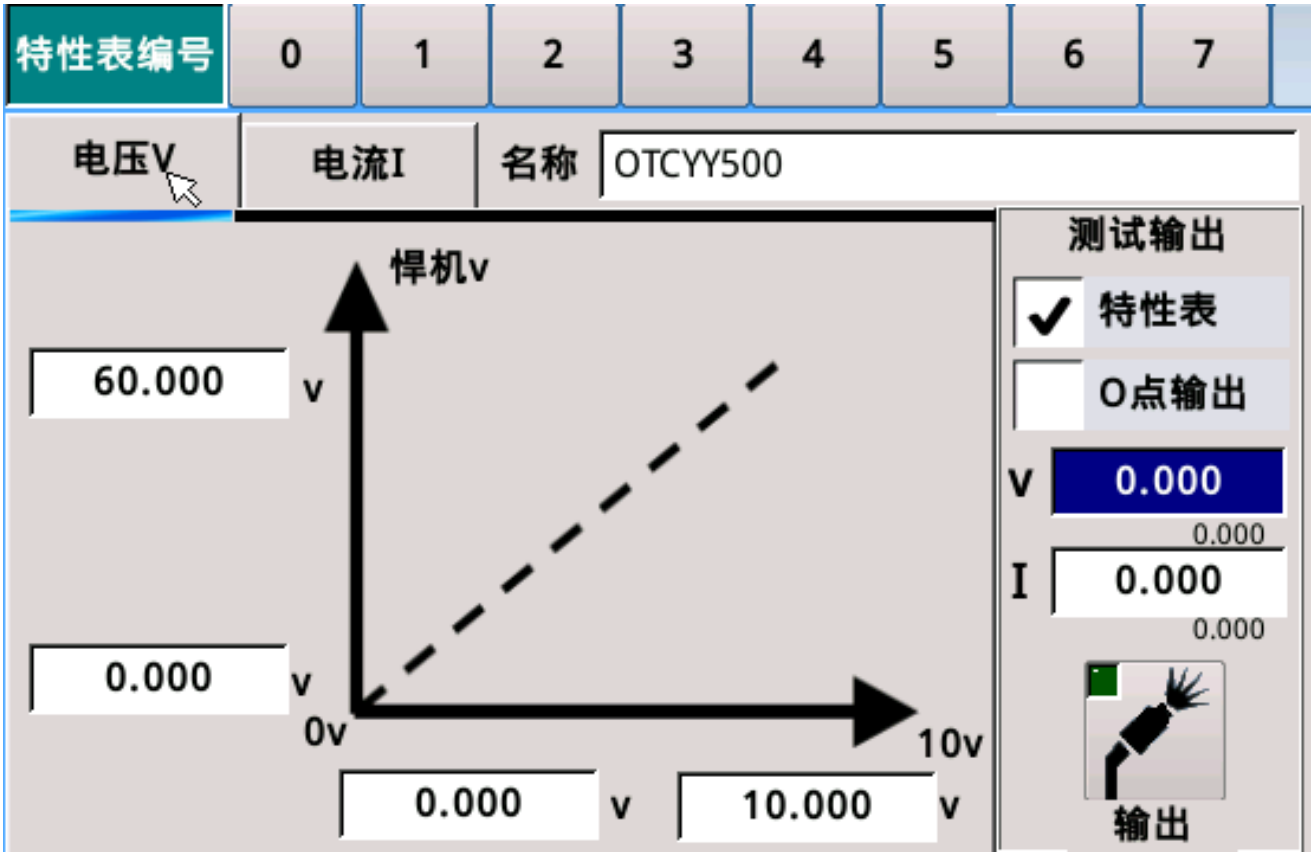
特性表编号
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电流I
名称
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60.000
v
0.000
v
0v
10v
0.000
v
10.000
v
测试输出
特性表
O点输出
V
0.000
0.000
I
0.000
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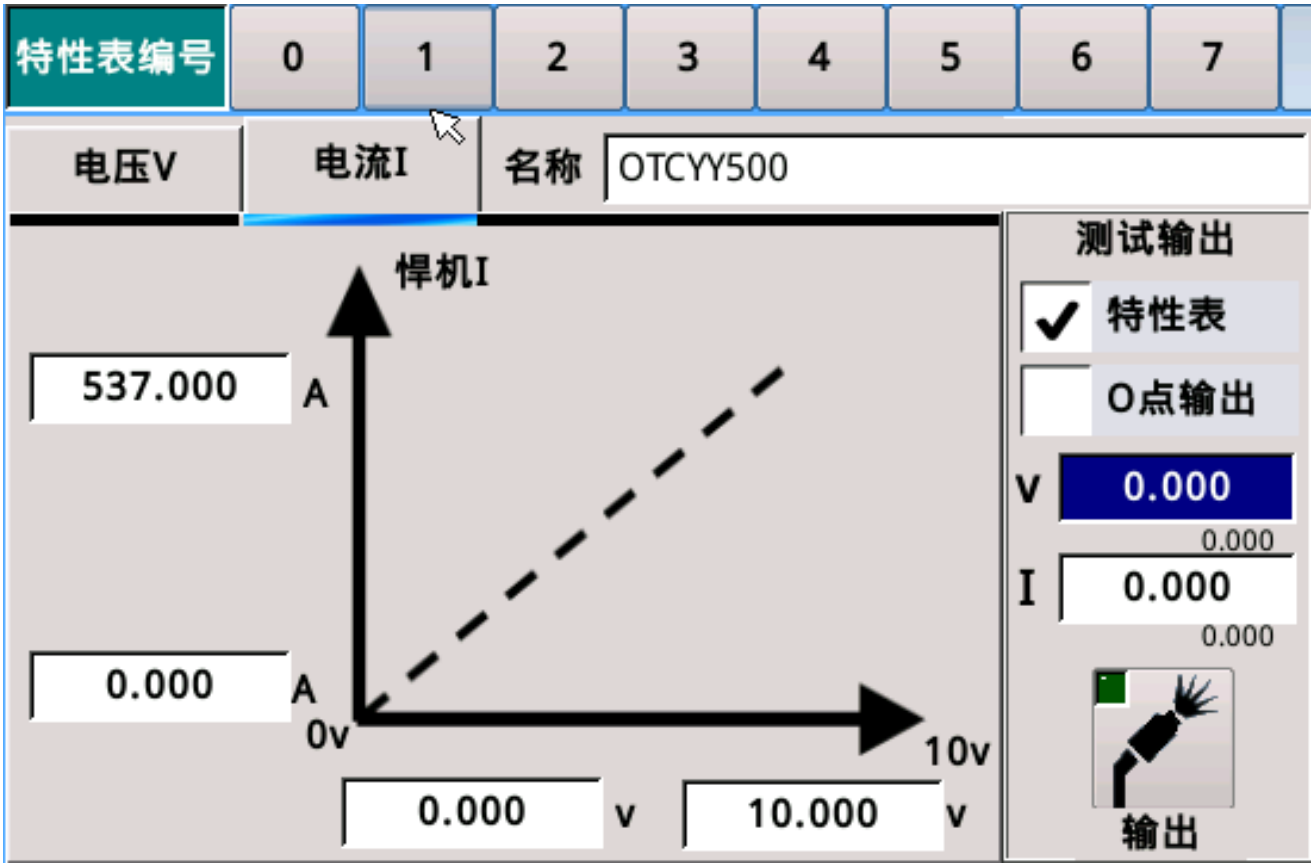
输出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1
2
3
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5
6
7
电压V
电流I
名称
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悍机I
537.000
A
0.000
A
0v
10v
0.000
v
10.000
v
测试输出
特性表
O点输出
V
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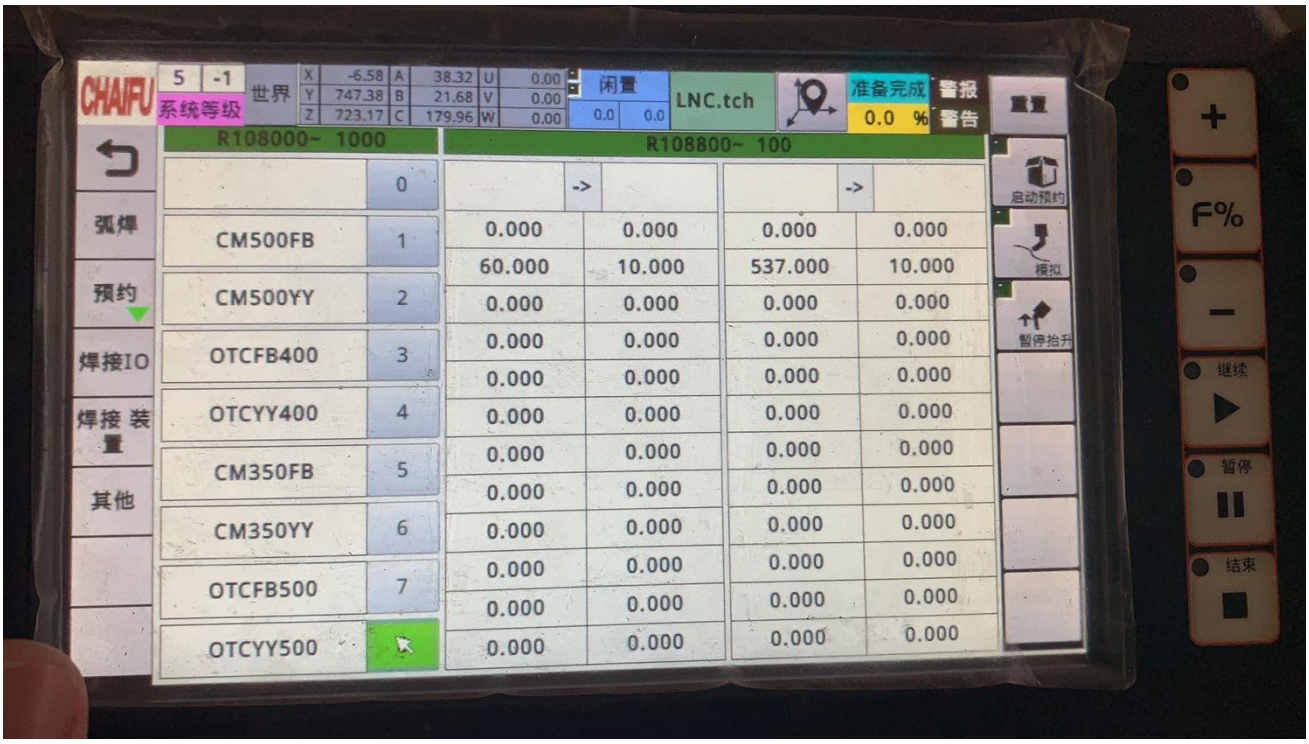
0.000
I
0.000
0.000
输出



Note: The characteristics table of each welding machine is different. Here are some of the ones that Baoyuan has adapted to the field so far. The appendix is for reference only. The actual use is set according to the description in Chapter 5.