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JITRI INTELLIGENT MANUFACTURING

IIMT-Portable MIG Welding Workstation Manual v0.2



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Jiangsu Jitri Intelligent Manufacturing Technology Institute Co., Ltd.

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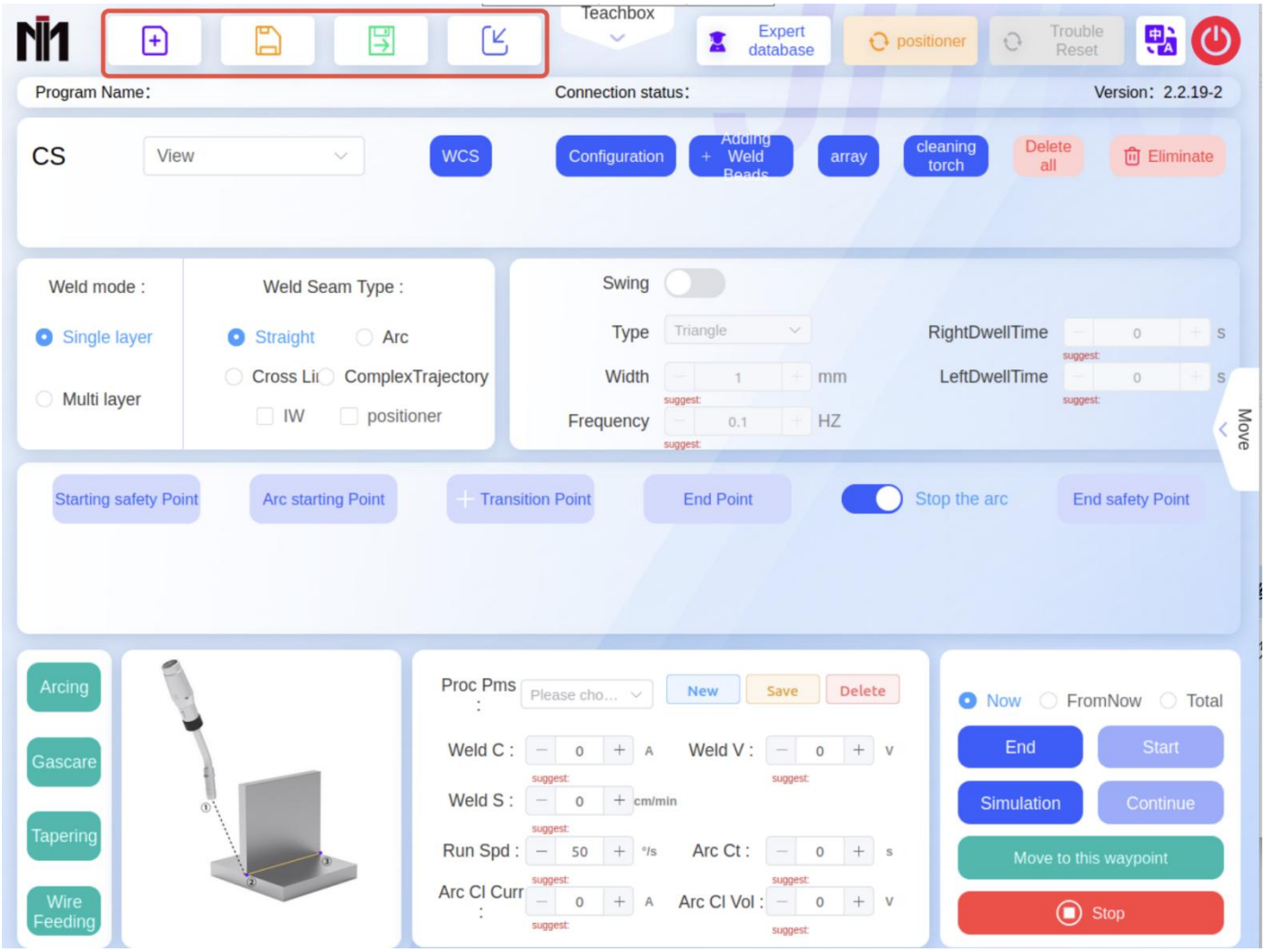
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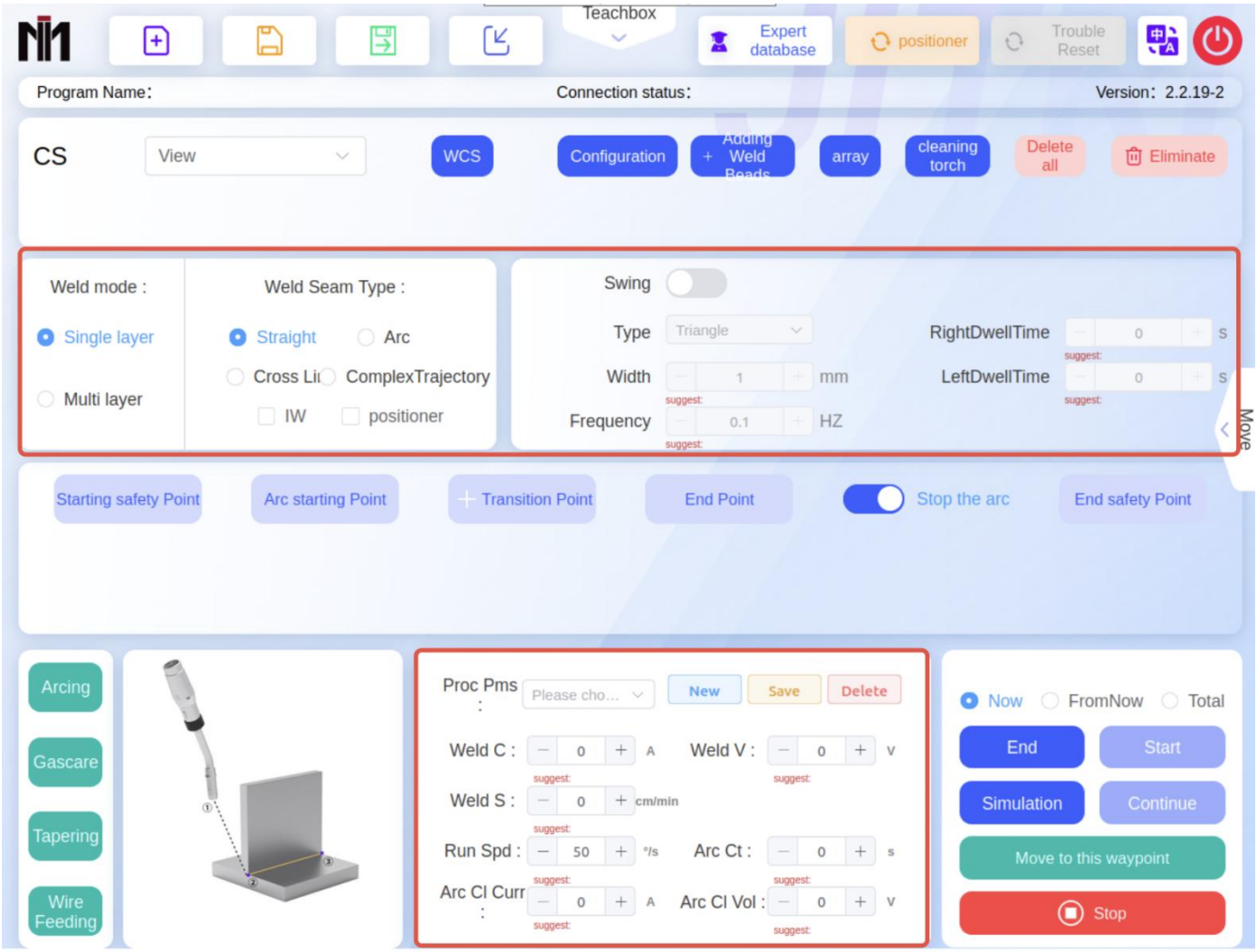
1.1 Process Document Management

The functions of this module are "New","Save","Save As" and "Import",which are used to save and call process files.



1.2 Welding parameter setting

This module is divided into "welding mode","weld type","weaving welding setting" and " welding process parameter setting". In this module, welding parameters can be quickly set. The parameters can be determined according to the actual welding requirements or directly imported from the expert library (the imported values are for reference only).



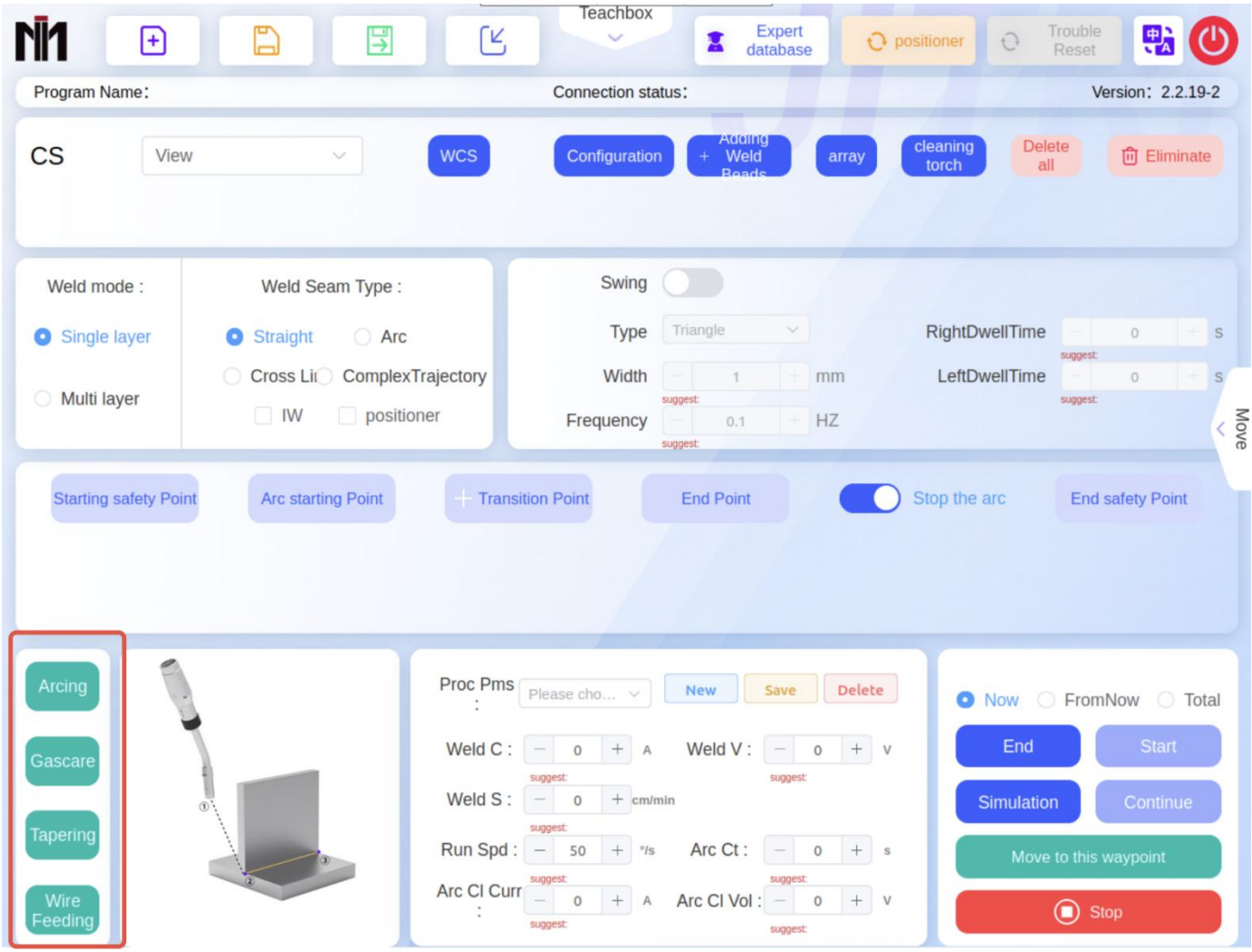
1.3 Welding point setting

This module is used to select points for welding trajectory. Generally, a straight weld is determined by four points (starting safety point, arc starting point, arc closing point, and ending safety point). The waypoints will flash as a reminder. The recorded waypoints are green, and the unrecorded waypoints are light blue. After selecting a waypoint, you can click the selected waypoint again to record it. You can also record points using the blue button at the end of the robotic arm.



1.4 Welding machine operation module

This module is mainly used for direct operation of the welding machine, and can realize the functions of "arc starting", "gas detection", "wire withdrawal" and "wire feeding".



1.5 Welding operation module

This module is mainly used to operate the weld beads with recorded points.

. End programming:Send the edited waypoints to the program tree and automatically generate the welding program.

. Simulation:Send the edited waypoints to the program tree and automatically generate the welding simulation program (excluding the welding arc start signal,which is used to check the welding trajectory).

. Start:Generate the welding program axis.Click this button to start welding (or simulation).When there is no welding program,the button cannot be pressed.

. Continue\Pause:Used to continue\pause the welding program during the running of the welding program.

. Move to this waypoint:After selecting the waypoint,click this button to control the robot arm to move from the current position to the selected waypoint position through joint movement.

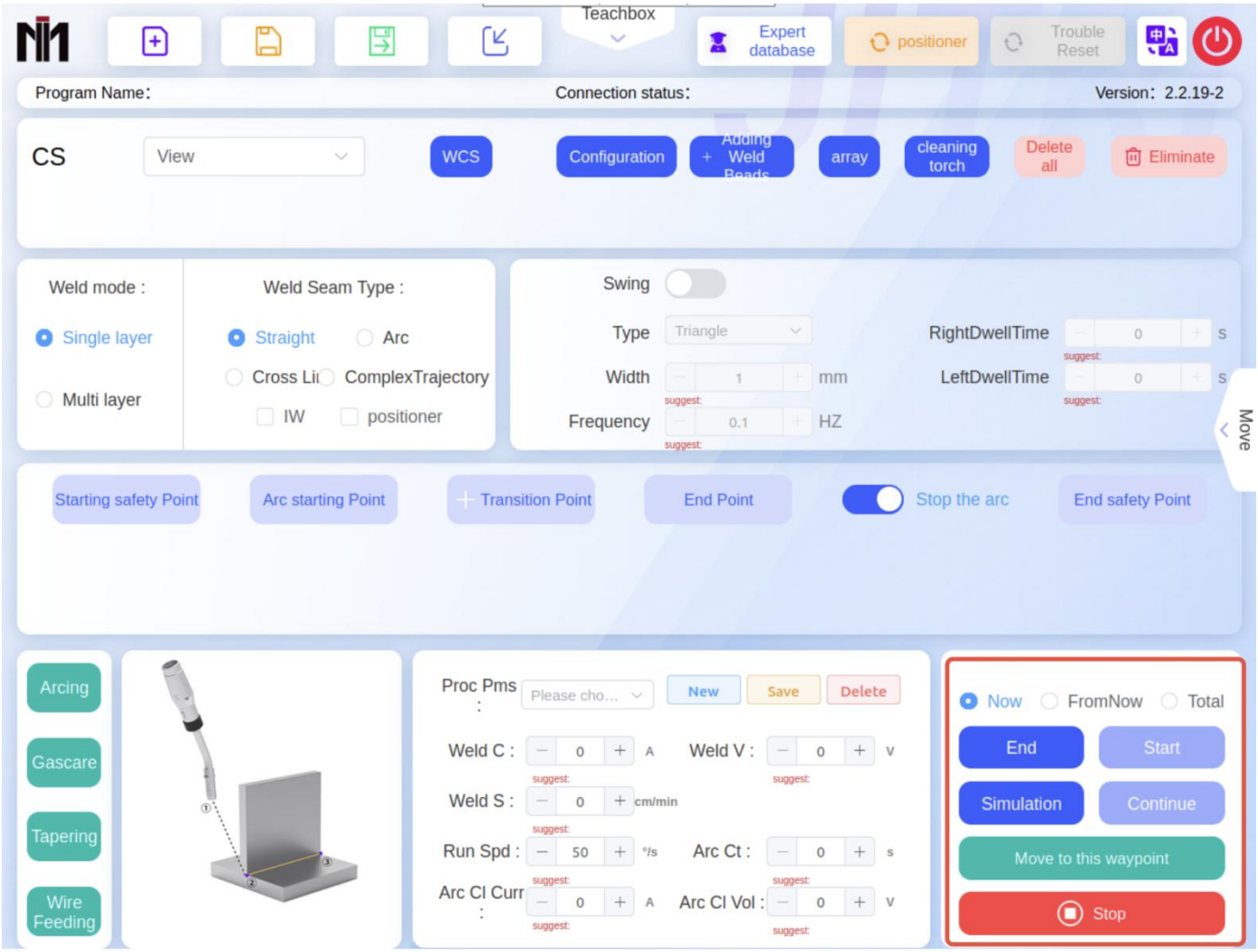
. Stop:Used to stop the welding program during the running of the welding program.Unlike pausing, it cannot be continued after stopping.

In this module,you can choose to send the weld bead object,as shown in the figure.

. Select "Current" to send the currently selected weld bead to the program tree.

. If you select "From now on",all welds after the selected weld (including this weld) will be sent to the program tree, and the welding program will be automatically generated. When running, the robot will weld all the sent welds at once.

. If you select "All", all welds will be sent and the welding program will be generated.

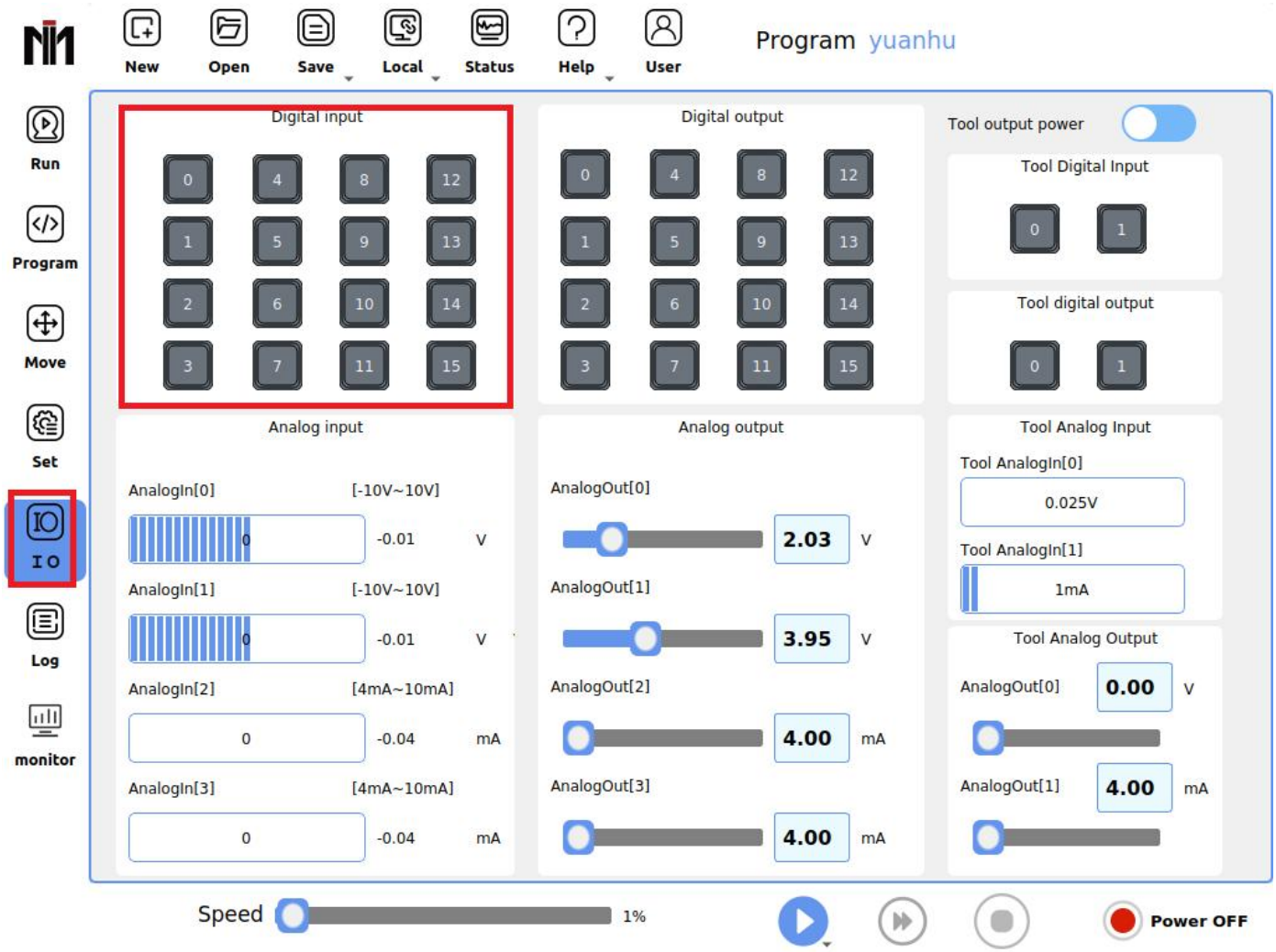


2. Welding IO Description

Click "Return to Teaching Pendant" - "IO" to enter the IO interface. The IO signals used in welding are described as follows:

2.1 Digital Input

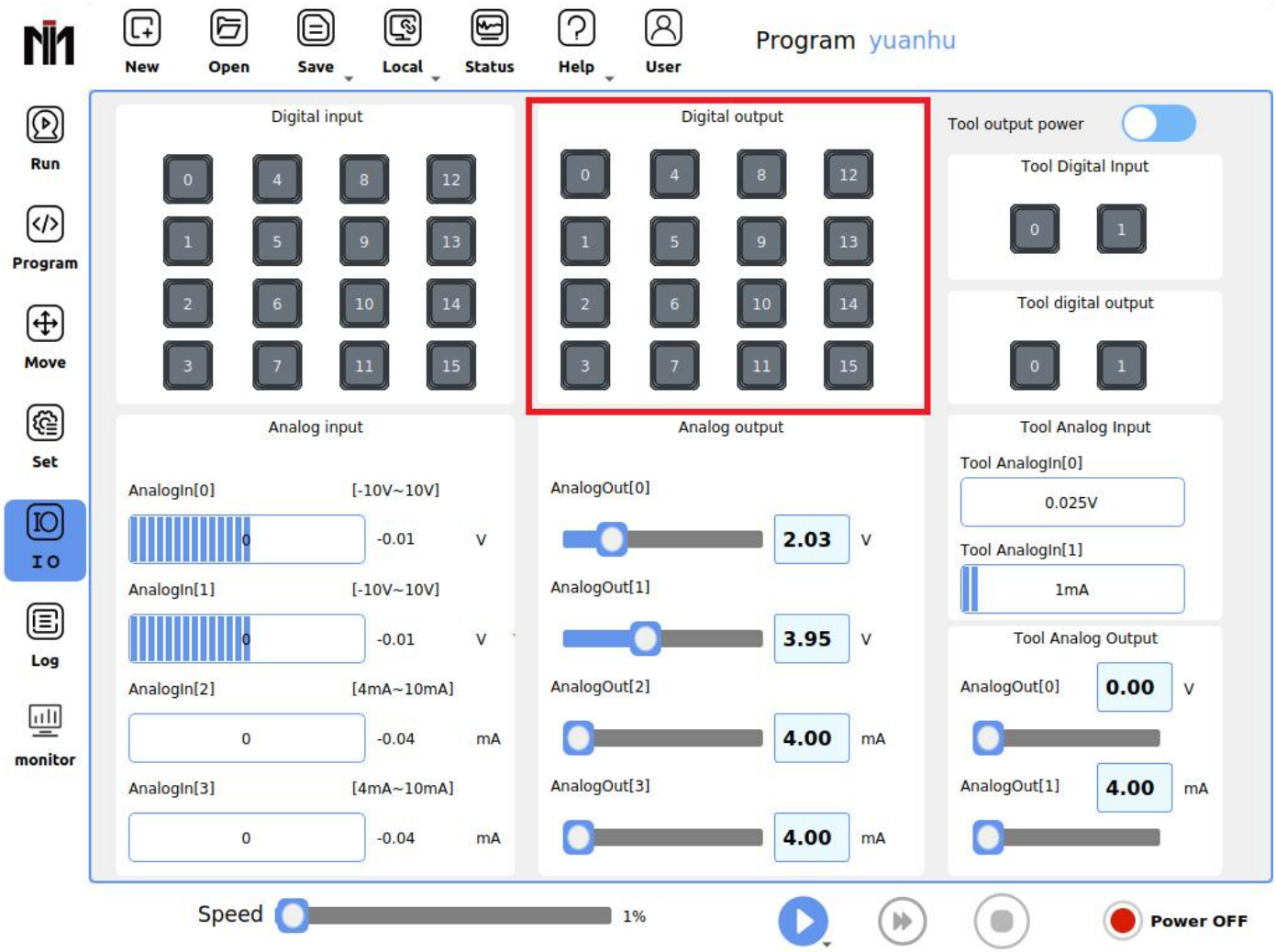
Arc start success signal DI[4] :This signal is used to detect whether the arc is successfully started. When executing the welding start command, an arc start signal is required. If the arc fails to start, the welding process will stop.



2.2 Digital Output

- Inching wire feeding signal DO[0]:Controls the wire feeder to feed wire.
- Gas detection signal DO[1]:During gas detection, the system will send a gas detection signal to the welder, and the gas pump will deliver high-pressure gas.
- Arc starting signal DO[2]:When preparing to start the arc, the system will send a welding signal to the welder.
- Inching wire retraction signal DO[3]:Controls the wire feeder to retract wire.
- Cleaning gun reamer rotation DO[9]:Controls the rotation of the cleaning gun reamer.
- Cleaning gun stroke DO[10]:High level controls the cleaning gun stroke upward, and low level controls the cleaning gun stroke downward.
- Cleaning gun clamping cylinder DO[11]:High level controls the cleaning gun clamping cylinder to open, and low level controls the cleaning gun clamping cylinder to close.

Note: Controlling the welding machine through this interface IO is equivalent to controlling the welding machine operation module of the welding process package.



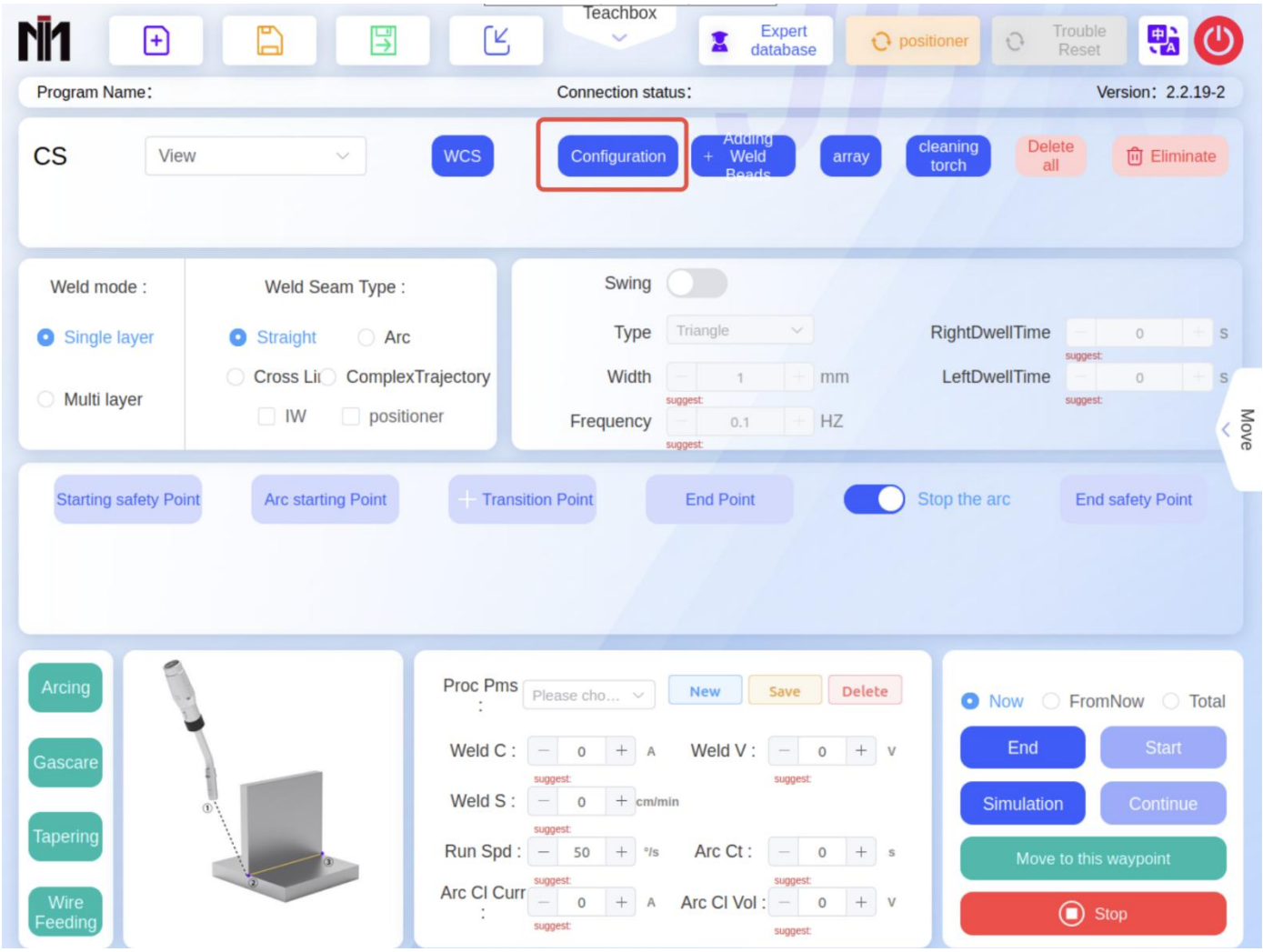
2.3 Analog Output

Welding voltage signal AO[0] :The input signal of the simulated welding machine voltage. Welding current signal AO[1] :The input signal of the simulated welding machine current.

3. Welding machine configuration

Before using the welding process package, you need to configure the welding machine. Click "Configure" to modify it. The relevant steps are as follows:

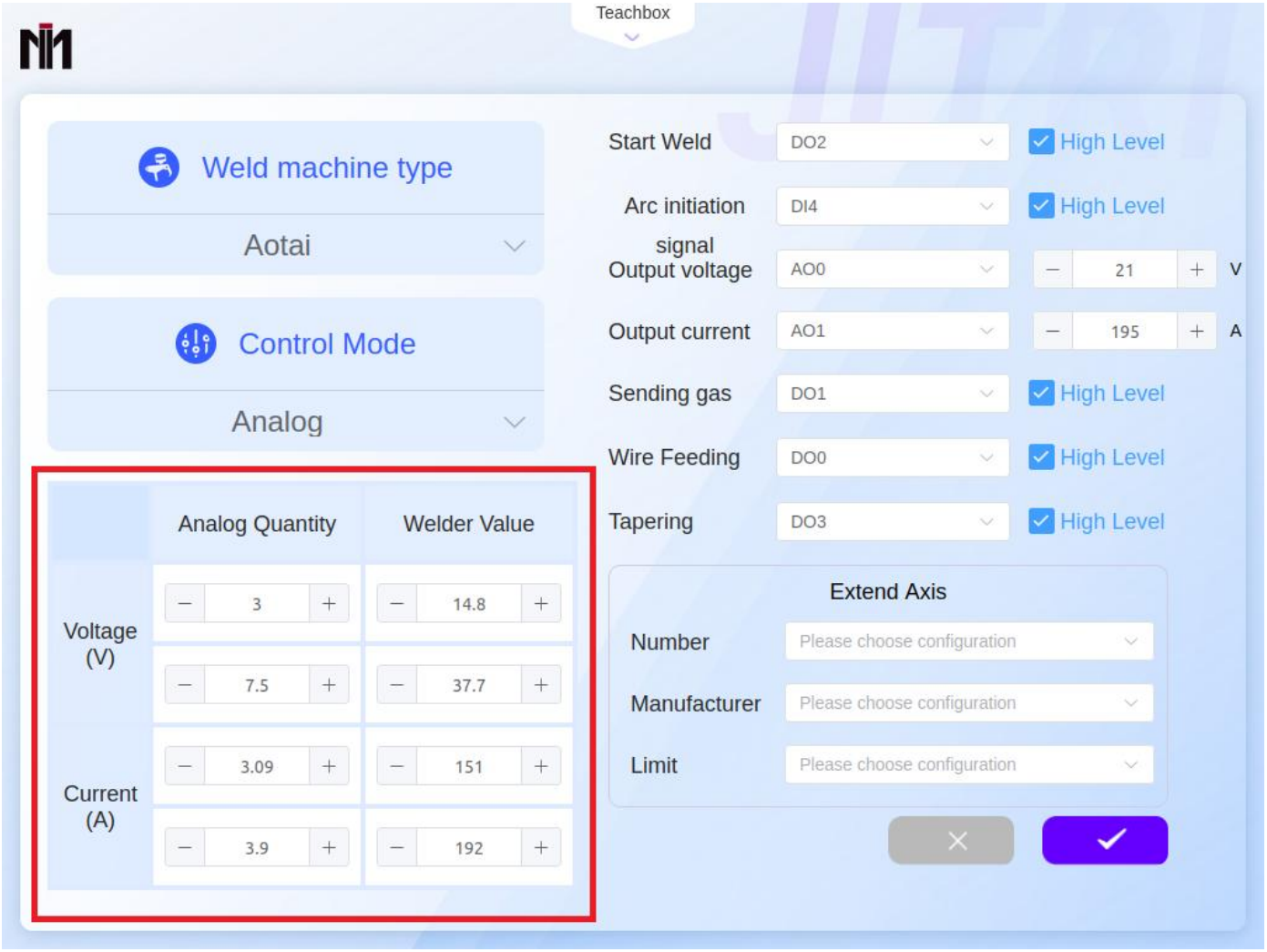
. Click "Configuration" to enter the welding machine configuration page



. Select the welding machine type according to the brand of the welding machine used. The default is "AOTAI" and the default control mode is "Analog".

. Modify the configuration parameters according to the analog value and welding machine value.

Both the voltage value and the current value need to be configured with two sets of corresponding values and the two sets of values should be the maximum and minimum values used in the welding scene as much as possible. For example, the robot analog output AO[0] = 3 V, observe the welding machine panel, the welding voltage is 14.8V, then the minimum value of the voltage analog value is 3, and the minimum value of the welding machine value is 14.8.



. After all four groups of numbers are filled in and checked, click  Save to complete the configuration.

Note: Different welding machines have different corresponding configuration values. You need to check to avoid welding current and voltage mismatch during the first welding.

4. Welding operation instructions

4.1 Description of welding parameters

4.1.1 Weaving welding settings

· The integrated pendulum welding supports five weaving welding trajectories: Triangle weaving welding, crescent weaving welding, trapezoidal weaving welding, sinusoidal weaving welding, Vertical triangle welding.

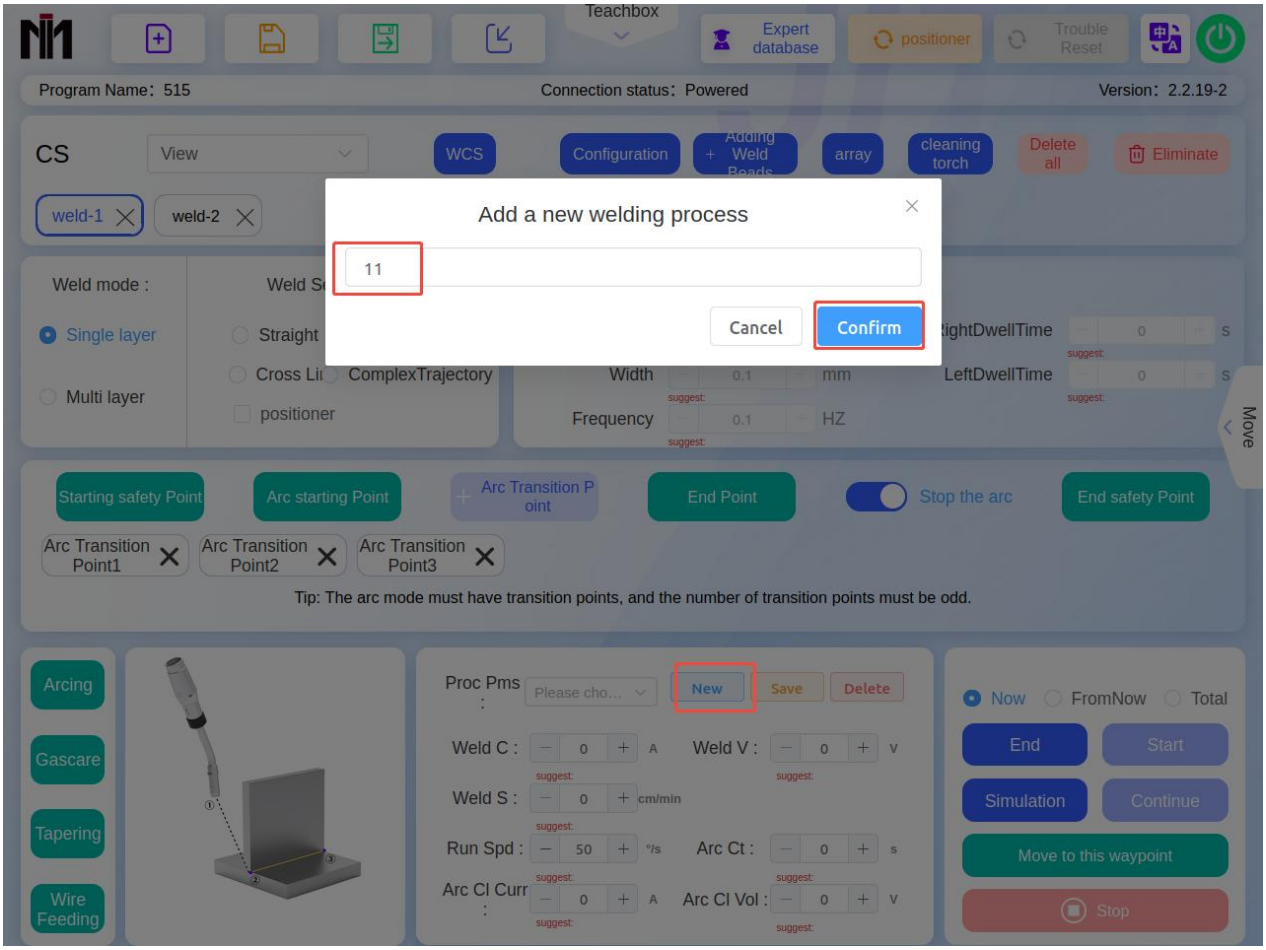
· Parameters such as swing width, swing frequency, left and right dwell time are adjustable. Reference parameters are provided in the system expert library, but they need to be adjusted according to the actual needs of the industrial site.

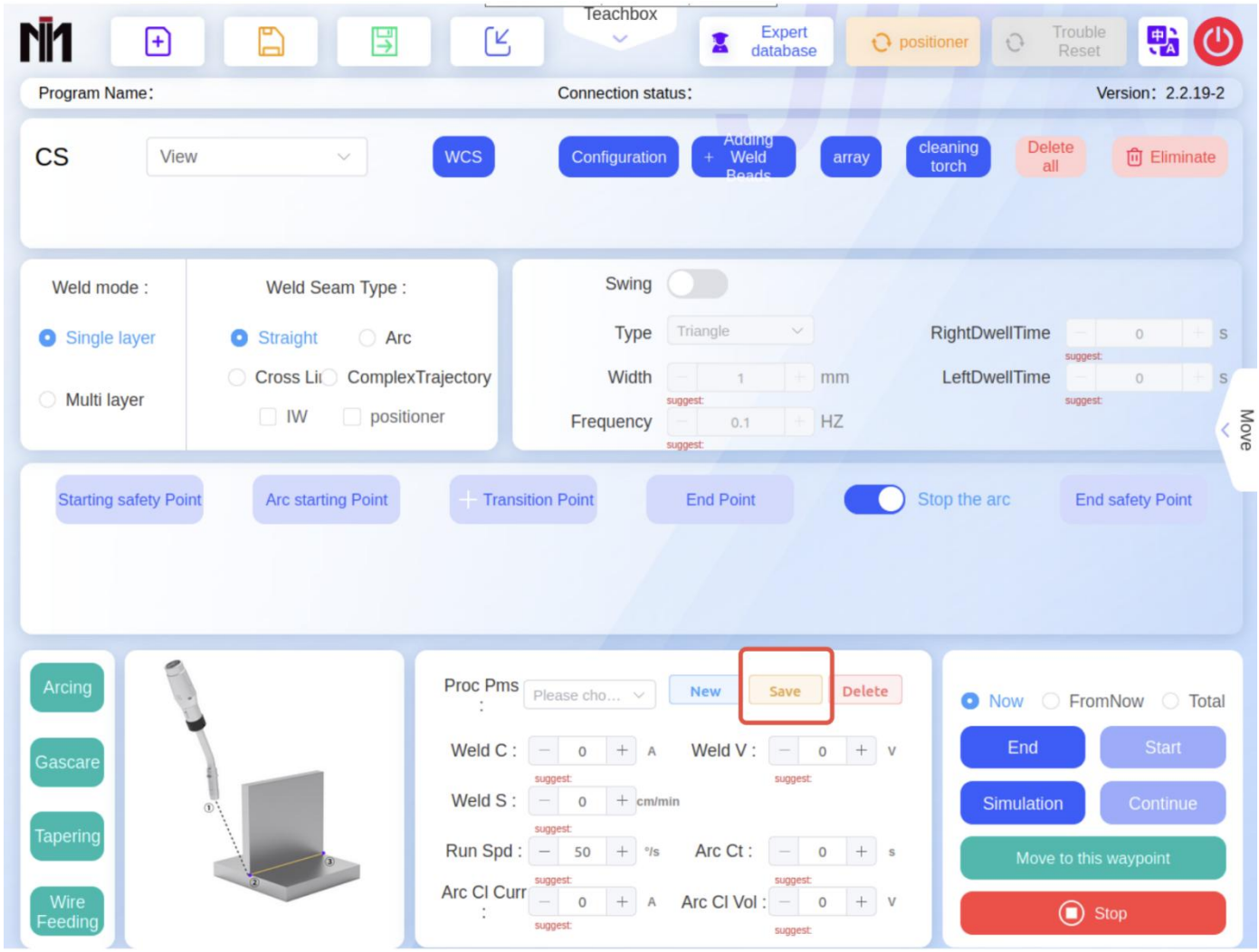
Note: Arc welding is not supported.

4.1.2 Welding process parameter setting

. After configuring the voltage and current of the welding machine, you can edit the current and voltage during welding in the welding parameter setting module - process parameter setting, including:welding current, welding voltage, welding speed (this speed is the actual welding speed, running in Cartesian coordinates), running speed (this speed is the robot arm idling speed, not the welding speed, running in joint coordinates), arc ending time, arc ending current, arc ending voltage.

. The welding process parameters can be saved and can be called after saving.



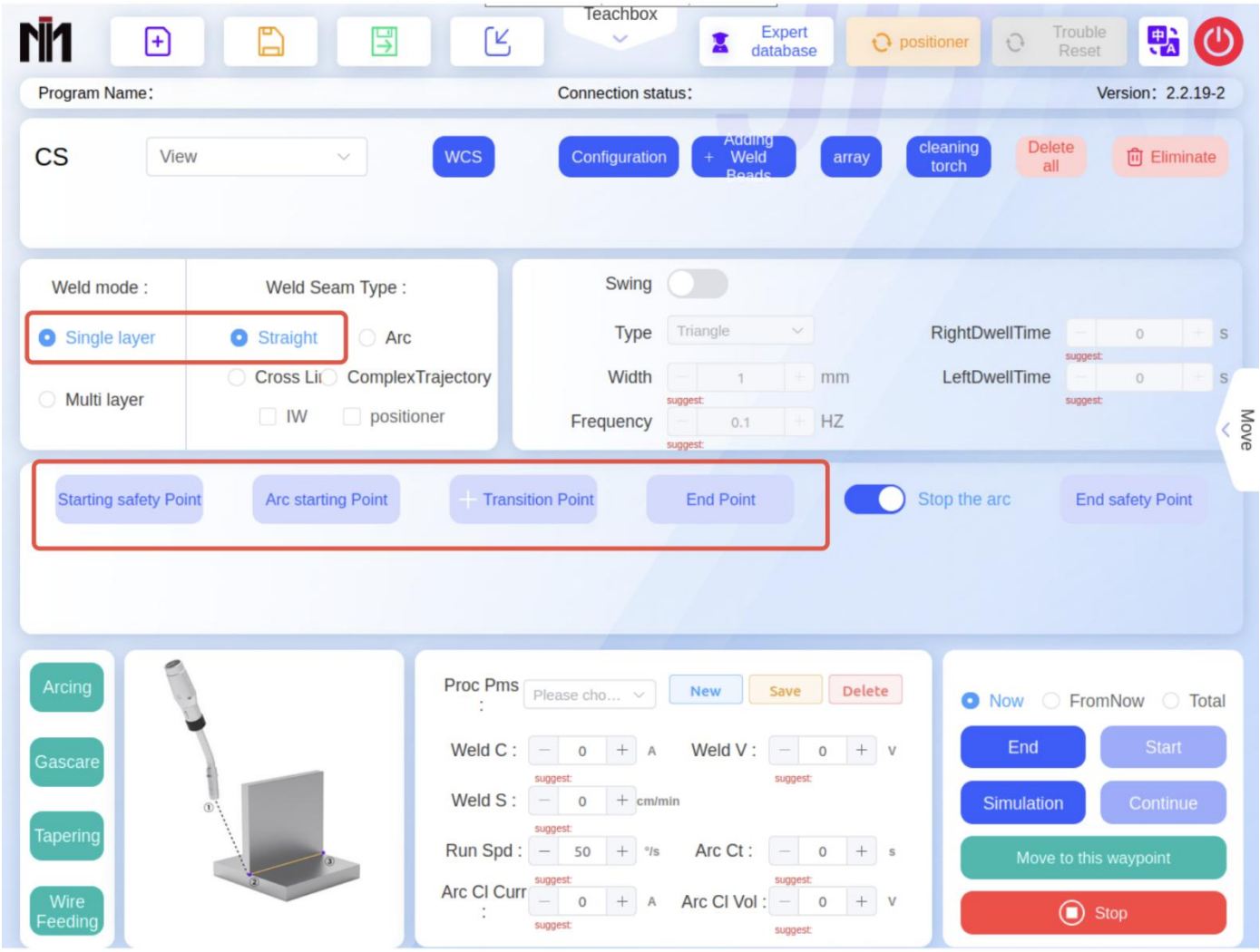


4.2 Single-layer single-lane

4.2.1 Straight line trajectory

The straight line trajectory is determined by four points, namely "starting safety point", "arc starting point", "arc ending point" and "end safety point". The "arc starting point" and "arc ending point" are the starting and ending points of the straight weld. The positions of the "starting safety point" and "ending safety point" are not fixed. Ensure that the weld moves from the starting safety point to the arc starting point and from the arc ending point to the ending safety point. During the movement, the robot arm does not collide with itself or the working environment.

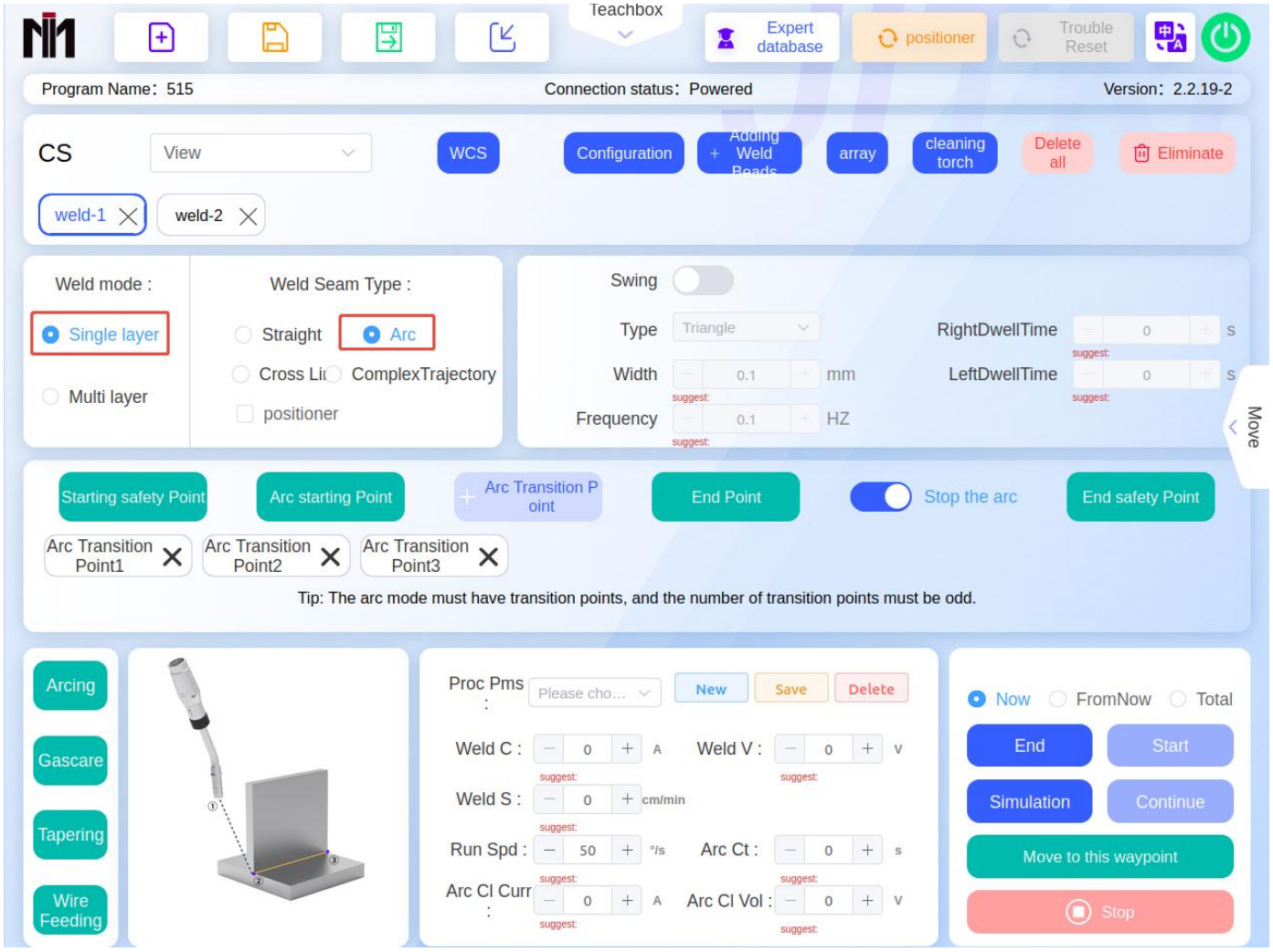
When the straight weld is too long, you can add transition points appropriately, the transition point is a point on the straight weld, to avoid deviations in the straight line trajectory caused by the robot's own accuracy problems. The picture shows a straight line trajectory with two transition points added.

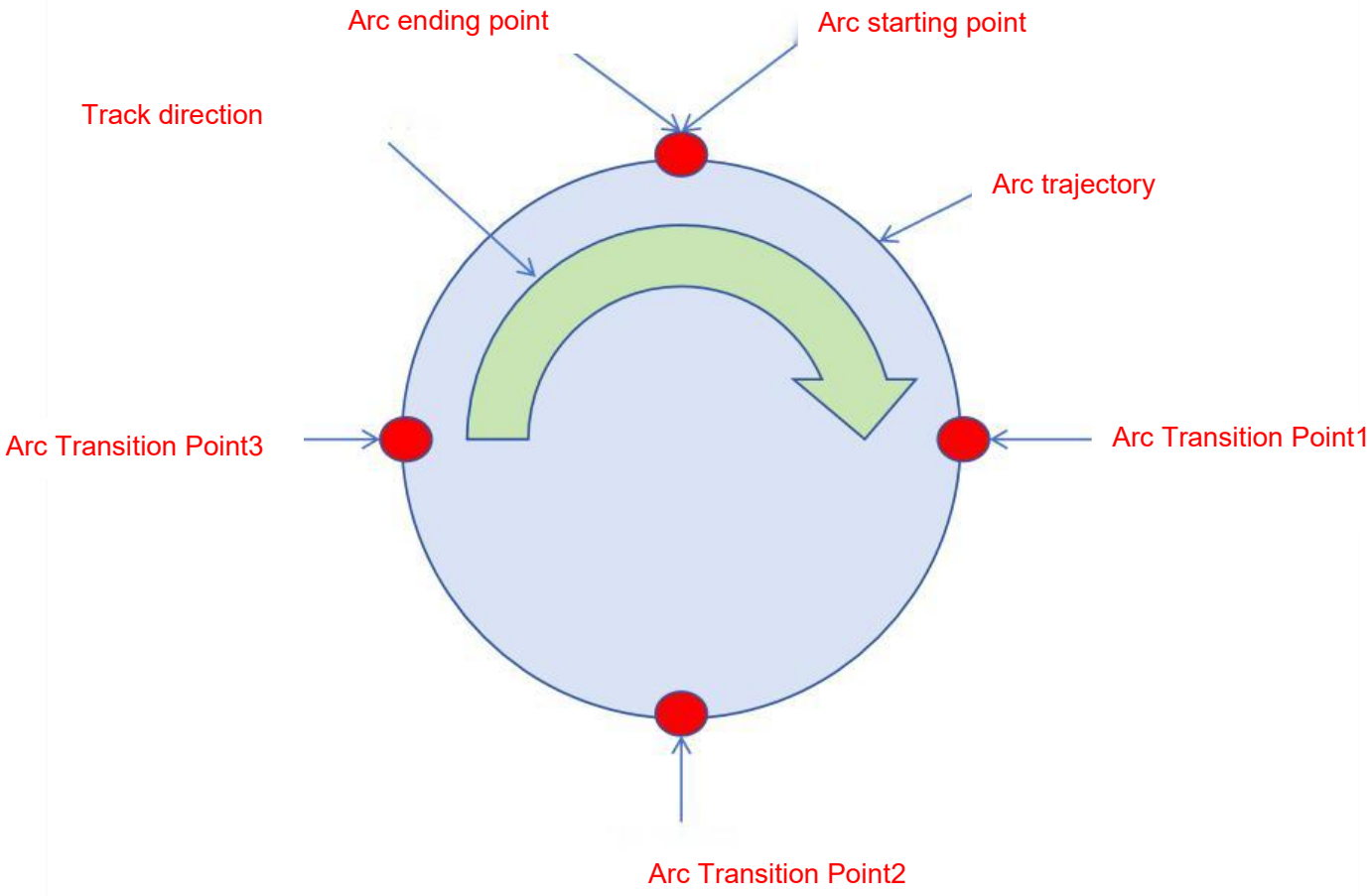


4.2.2 Arc trajectory

. For a full circle:The definitions of the “starting safety point” and “ending safety point” are the same as those of a straight weld;the “arc starting point” and three “transition points” are located at the four equal points on the circle;the spatial coordinates of the “arc ending point” are the same as those of the “arc starting point”,but the joint coordinates are different.

The figure shows the arc trajectory and point selection diagram. The arc ending point can be extended along the trajectory by an appropriate distance to cover the arc starting point, ensuring that no welding interface is left at the end of welding.


Teachbox
Expert database
positioner
Trouble Reset
Program Name：515
Connection status：Powered
Version：2.2.19-2
CS
View
WCS
Configuration
Adding Weld Beads
array
cleaning torch
Delete all
Eliminate
weld-1
weld-2
Weld mode :
Single layer
Multi layer
Weld Seam Type :
Straight
Arc
Cross Li
ComplexTrajectory
positioner
Swing
Type
Triangle
Width
mm
Frequency
HZ
RightDwellTime
LeftDwellTime
s
suggest:
Move
Starting safety Point
Arc starting Point
Arc Transition Point
End Point
Stop the arc
End safety Point
Arc Transition Point1
Arc Transition Point2
Arc Transition Point3
Tip: The arc mode must have transition points, and the number of transition points must be odd.
Arcing
Gascare
Tapering
Wire Feeding
Proc Pms :
Please cho...
New
Save
Delete
Weld C :
A
Weld V :
V
Weld S :
cm/min
Run Spd :
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Arc Ct :
Arc Cl Curr :
Arc Cl Vol :
Now
FromNow
Total
End
Start
Simulation
Continue
Move to this waypoint
Stop

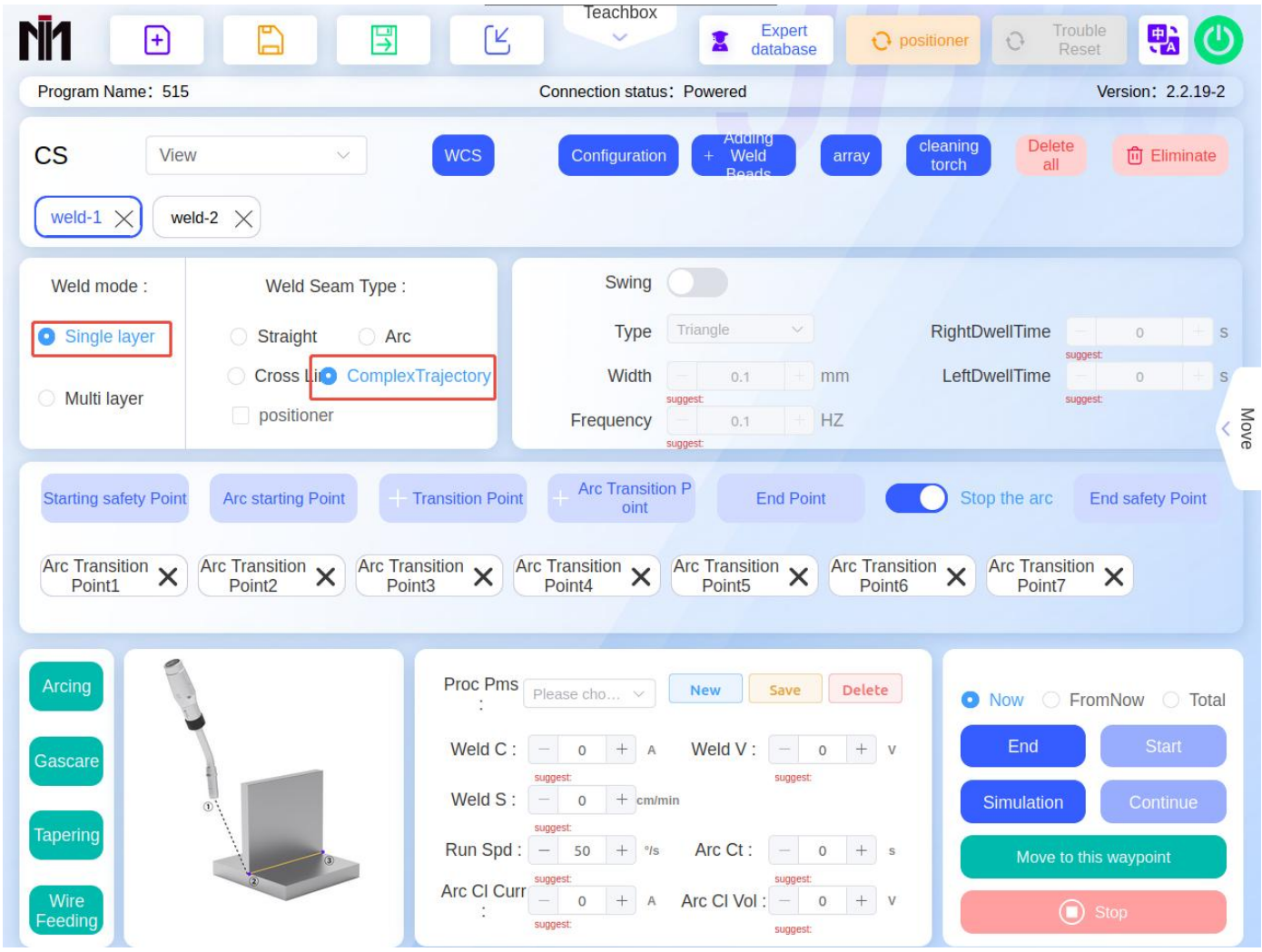

Arc ending point
Arc starting point
Track direction
Arc trajectory
Arc Transition Point3
Arc Transition Point1
Arc Transition Point2

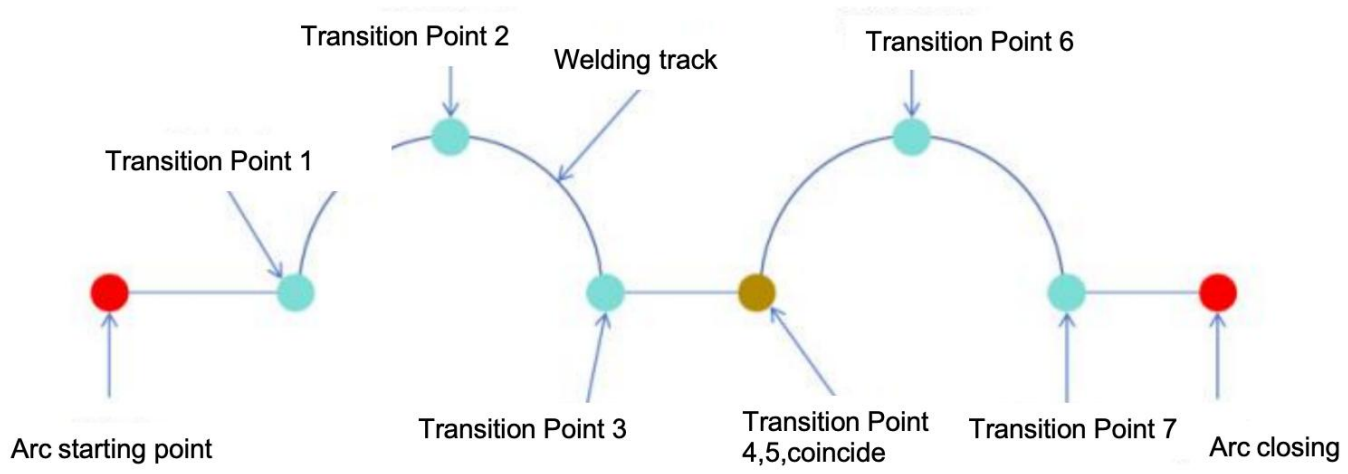
. For arcs:The definitions of “starting safety point” and “ending safety point” are the same as those for straight welds. “Arc starting point” and “arc ending point” are the starting point and end point of the arc trajectory respectively. You only need to add an “arc transition point”.

Tip:The arc mode must have arc transition points, and the number of arc transition points must be an odd number.

4.2.3 Complex trajectories

When the welding trajectory is a combination of straight lines and arcs, a complex trajectory is required, and the definition of each waypoint is the same as that of the straight line trajectory and the arc trajectory. When the trajectory is a combination of straight line – arc – straight line – arc – straight line, the schematic diagram of complex trajectory point selection is as follows:





4.3 Multi-layer and multi-pass

· Collected multi-layer and multi-pass instructions:

Integrates multi-layer and multi-pass welding programming technology, no need to actively build a complex workpiece coordinate system. No matter what kind of workpiece you are facing, you only need to execute the same. The same point selection operation for each weld can accurately determine the offset direction of the weld, achieving efficient and convenient welding programming.

4.3.1 Multi-layer and multi- pass angle description

There are two key angles that affect the effect of multi-layer and multi-pass welding, and the relevant definitions are as follows:

· Welding direction: A direction vector pointing from the arc starting point to the arc ending point.

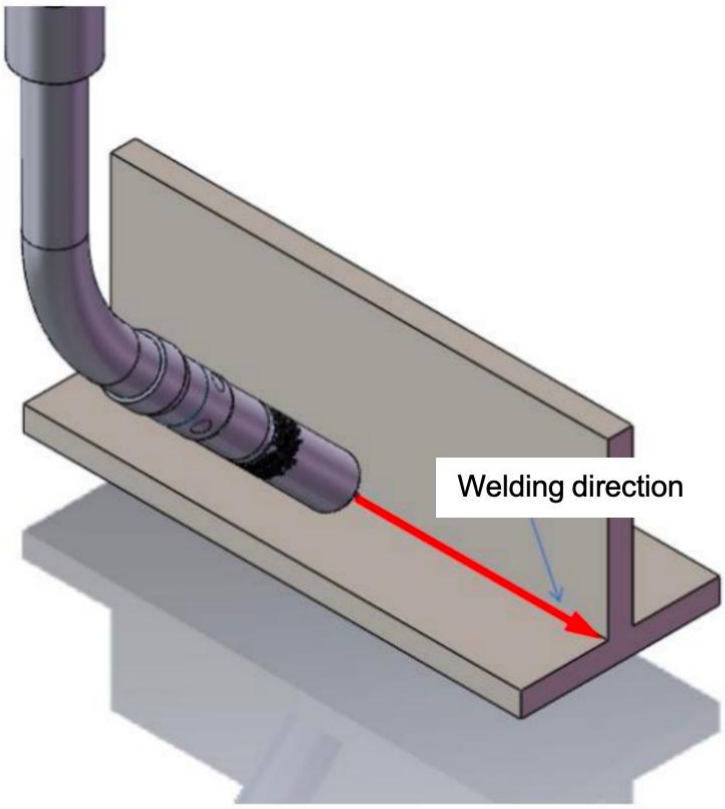
· Welding angle:The angle formed between the two workpieces that form a fillet weld, the default value is 90° .

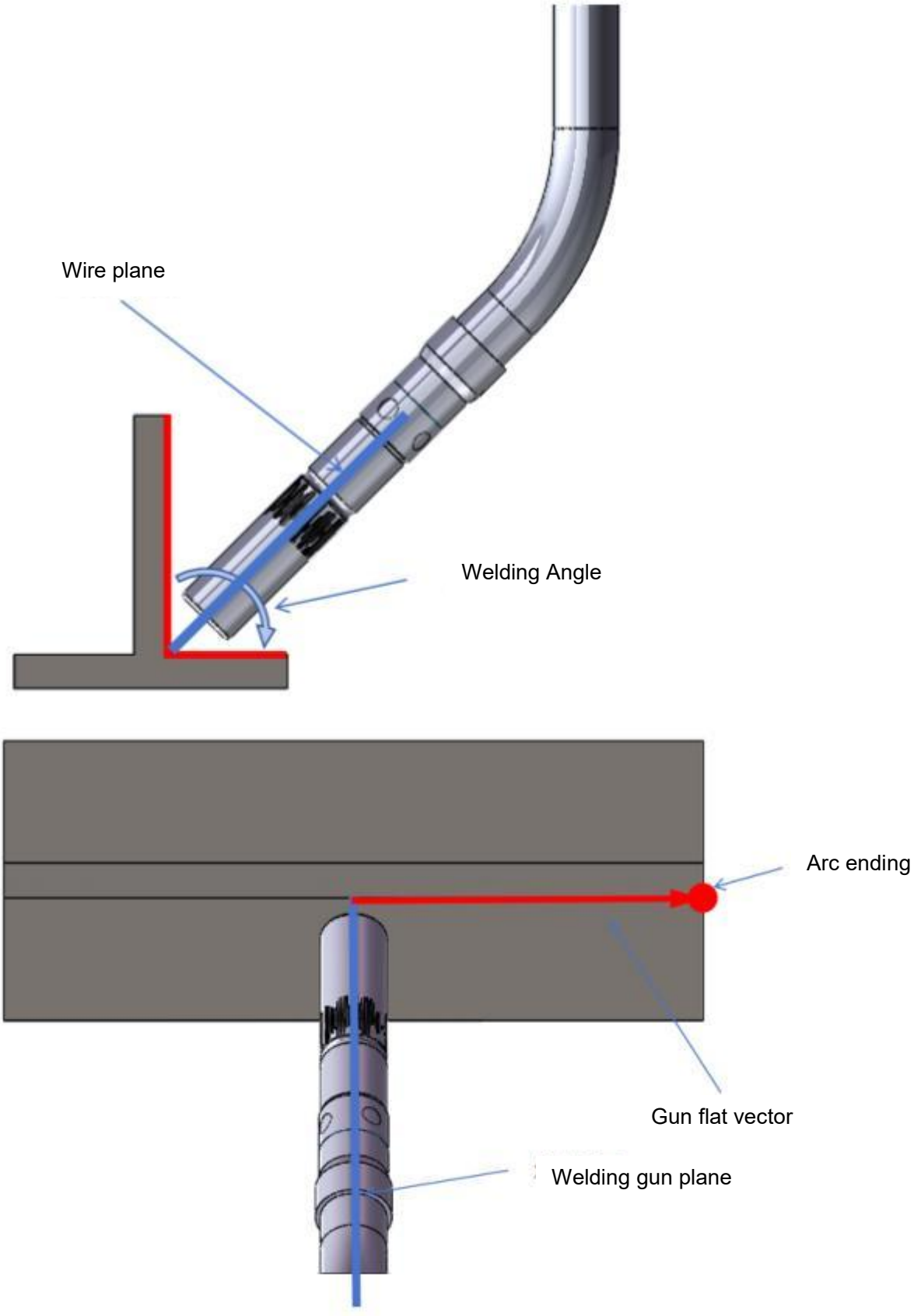
· Welding gun plane:the symmetry plane of the welding gun, the normal vector of which points to the arc ending point.

· Welding wire plane:The plane passing through the straight line of the welding wire and perpendicular to the welding gun plane.

· Push angle:The angle between the welding direction and the normal vector of the welding gun plane, ranging from -90° to 90° .When the welding direction coincides with the normal vector of the welding gun plane, the push angle is 0° , when the welding wire points to the welding direction + , otherwise - .

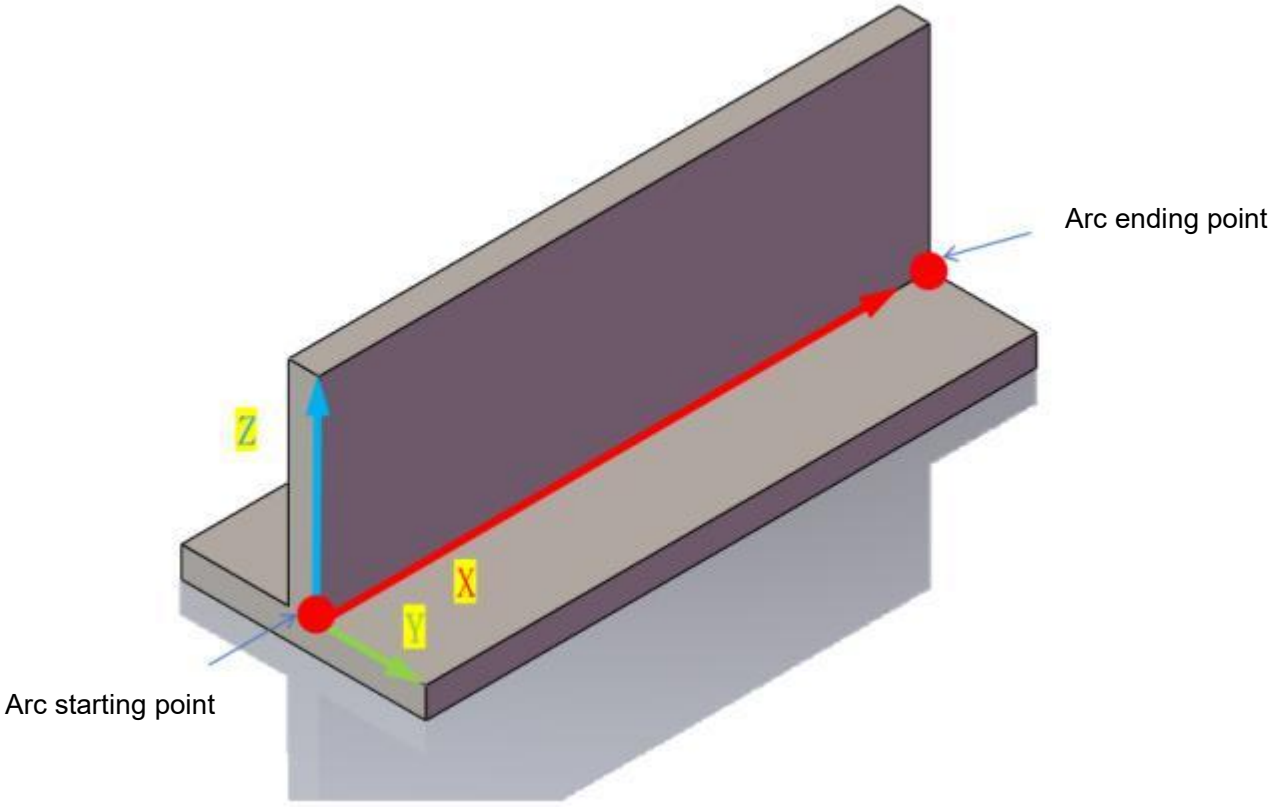
. Tilt angle:The angle between the welding wire plane and the bisector of the welding angle ranges from -45° to 45° .When the angle between the welding wire plane and the bisector of the welding angle coincides, the inclination angle is 0° .The counterclockwise rotation of the welding wire plane around the welding direction is +, and the counterclockwise rotation is -. The schematic diagram is as follows:





4.3.2 Multi-layer and multi-channel operation instructions

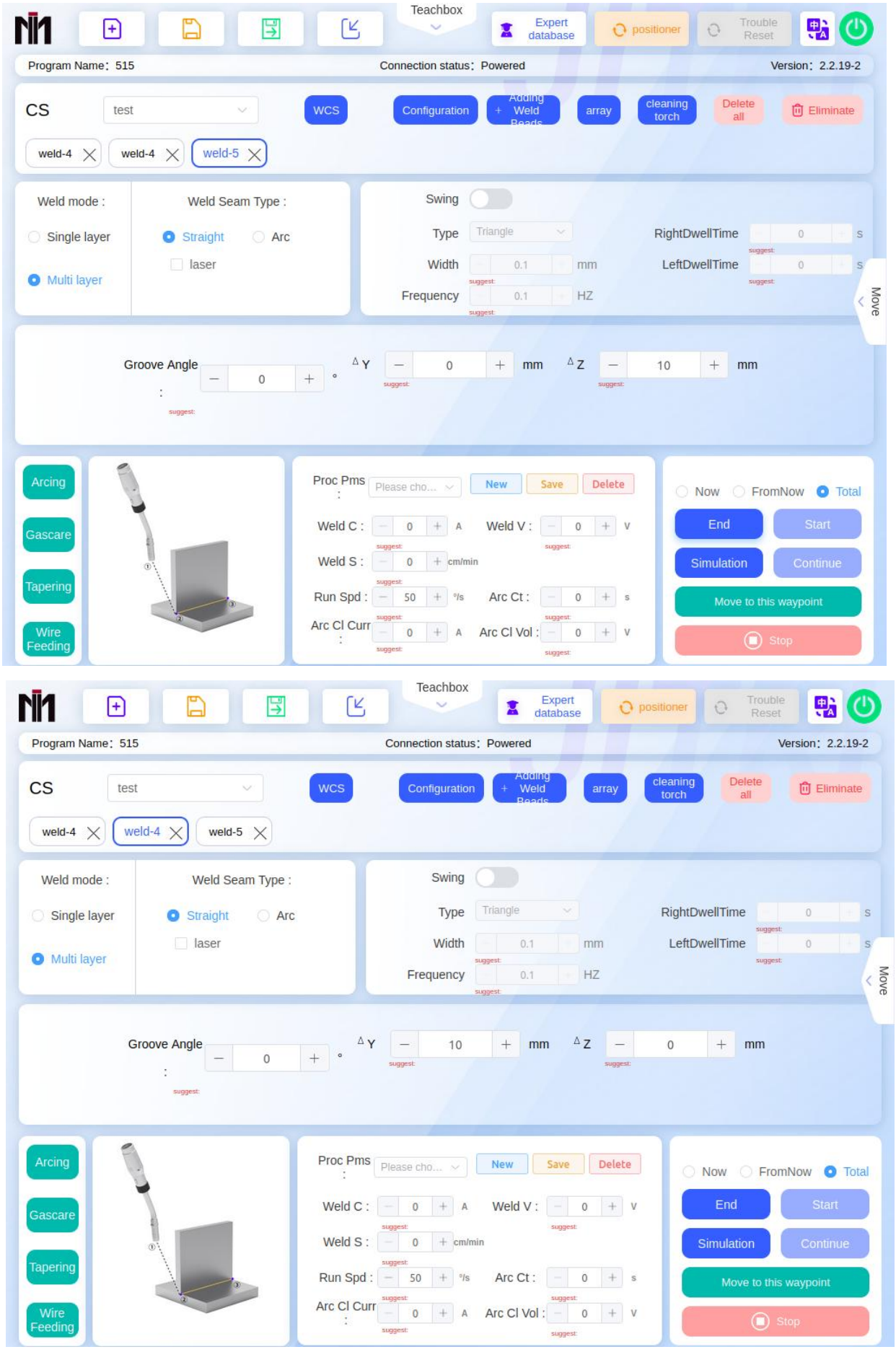
- Select "Multi-layer Multi-pass" for welding mode, and select points in the single-layer single-pass method. After the first pass is completed, the workpiece coordinate system will be automatically generated. The schematic diagram of the generated workpiece coordinate system is as follows:



In general, when selecting points, please make sure the inclination angle is as close to 0° as possible, too large a deviation may cause errors in the offset direction of multiple layers and multiple channels, the push angle tolerance is large, allowing one Deviation.

. Add an offset weld, define it according to the workpiece coordinate system, and fill in the desired offset value at the corresponding position. As shown in the figure, the position of the second weld is offset by 10mm along the positive direction of the Y axis of the workpiece coordinate system based on the first weld, and the position of the third weld is offset by 10mm along the positive direction of the Z axis of the workpiece coordinate system based on the first weld.

.



Select " All " in the weld operation module, and select " Simulation " first. After the program is successfully sent, check whether the offset is correct. After confirmation, select Click “ End Programming” to start welding.

5. Gun Cleaning Station

5.1 Introduction to the gun cleaning station function

The welding gun cleaning station is a device used to clean the welding gun of the welding robot. It can effectively remove the spatter, welding wire residue, oxide and other impurities on the welding gun. Quality, thereby improving welding quality and stability. Its main functions include:

· Clean impurities:The gun cleaning station can clean the spatter inside the gas shield of the welding gun, ensuring long-term unobstructed gas flow, effectively blocking air from entering the welding area, protecting the welding pool, and improving weld quality.

· Clean the dust on the conductive nozzle:It can effectively clean the dust generated by welding smoke on the conductive nozzle.

· Clear the gas outlet holes: Clean the protective gas outlet holes on the connecting pipe to maintain gas circulation.

· Spray anti-splash agent:Spray high-temperature resistant anti-blocking agent on the protective cover to reduce the adhesion of welding slag to the holster and gun nozzle and increase durability.

· Cutting welding wire: During the welding process, the gun cleaning station can cut longer welding wire.

· Automatic gun cleaning:The gun cleaning station can automatically complete the gun cleaning process without manual operation, the gun cleaning time is short, and the system availability is high.

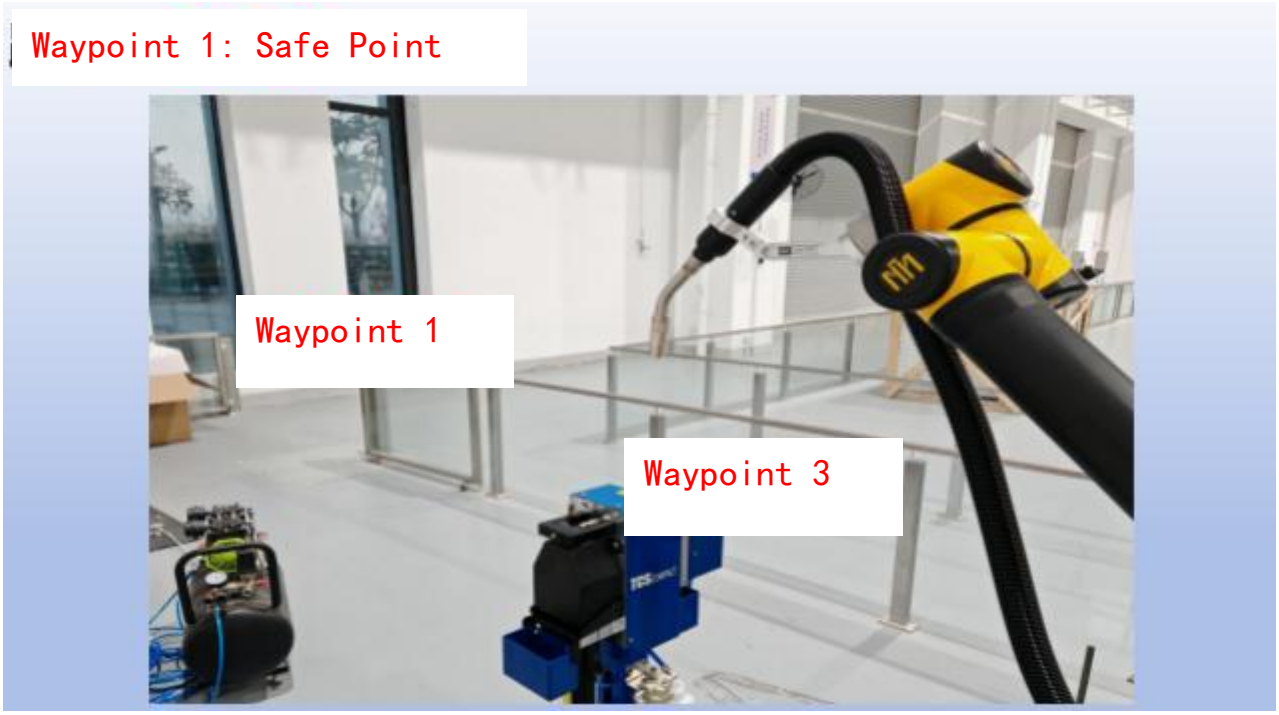
· Remove hard-to-remove spatter:It can remove hard-to-remove spatter and prevent quality problems caused by contamination during welding.

5.2 Gun cleaning station operation instructions

. Click "Clean Gun" to enter the editing page of the gun clearing program. The gun cleaning station program contains 10 waypoints, namely:"Safety Point", "Prepare for Cutting Point " ," Wire cutting point" , "Wire cutting end point" , "Prepare gun cleaning point" , "Gun cleaning point" , "End gun cleaning point" , "Prepare gun cleaning liquid point" , "Gun cleaning liquid spray point" , "End spray gun fluid point " .

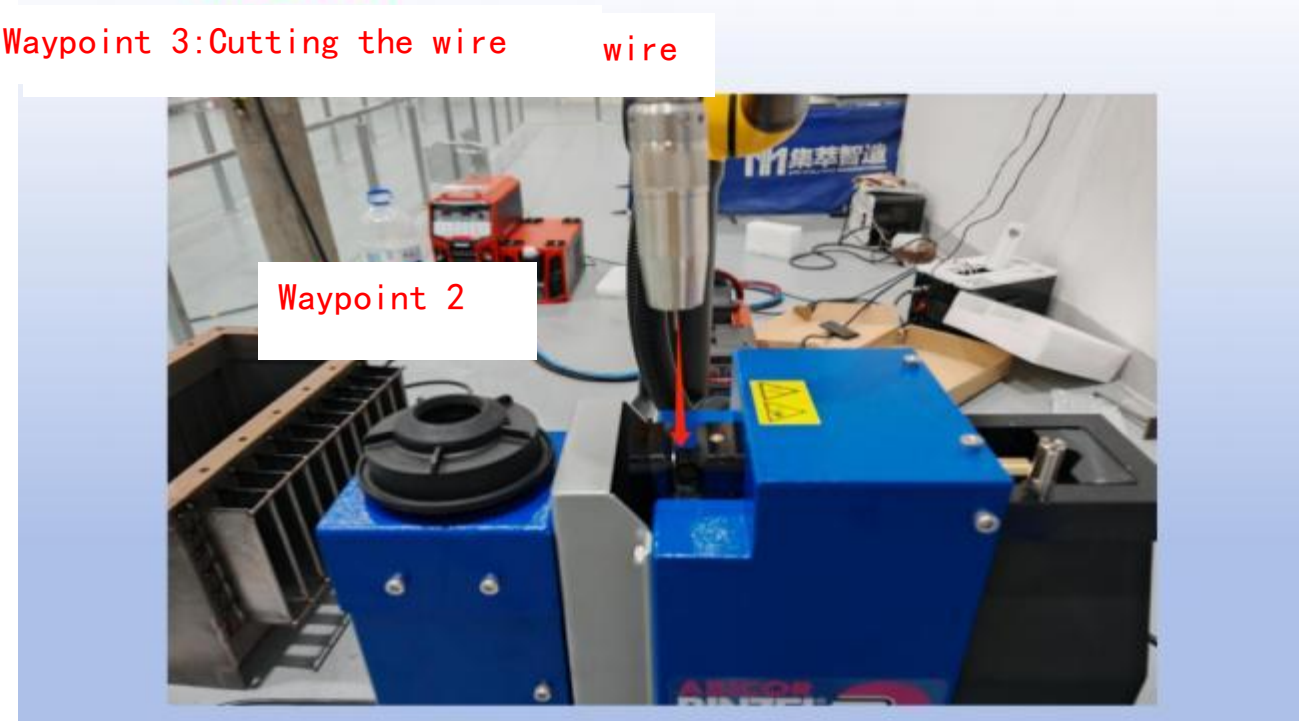
. "Safety point" :Ensure that the robot arm does not collide with itself and the working environment during the movement from the safety point to the arc starting point and the arc ending point to the end safety point .

Waypoint 1: Safe Point



· "Prepare for cutting point" , "Cutting point" , "End cutting point" :"Prepare for cutting point" , "End cutting point" is the same as the "wire cutting point" ,which is located above the wire cutting point. The welding gun needs to be extended into the wire cutting point.

Waypoint 3:Cutting the wire wire

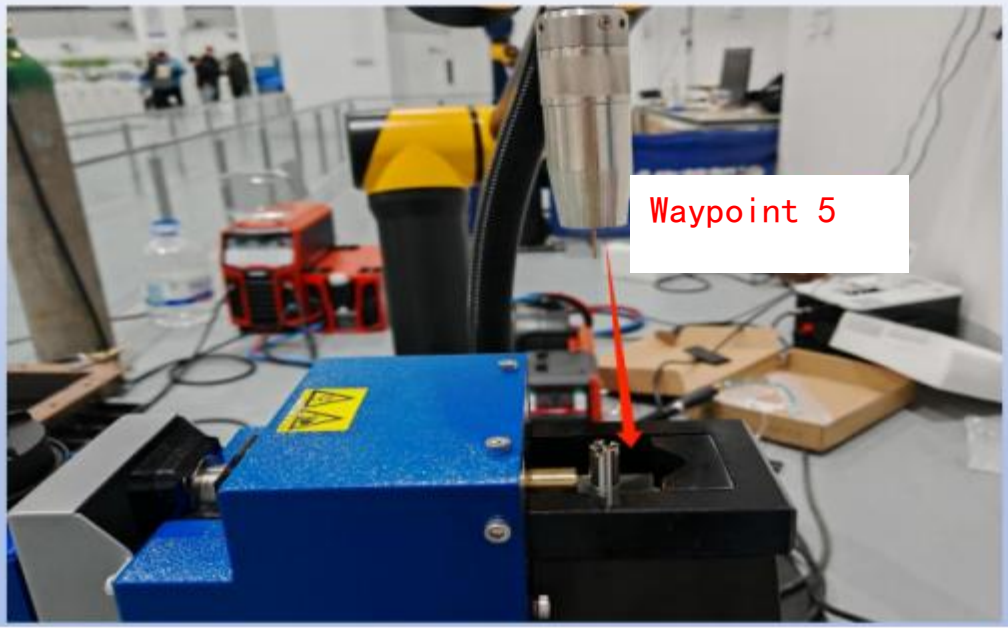


Waypoint 4:End of wire

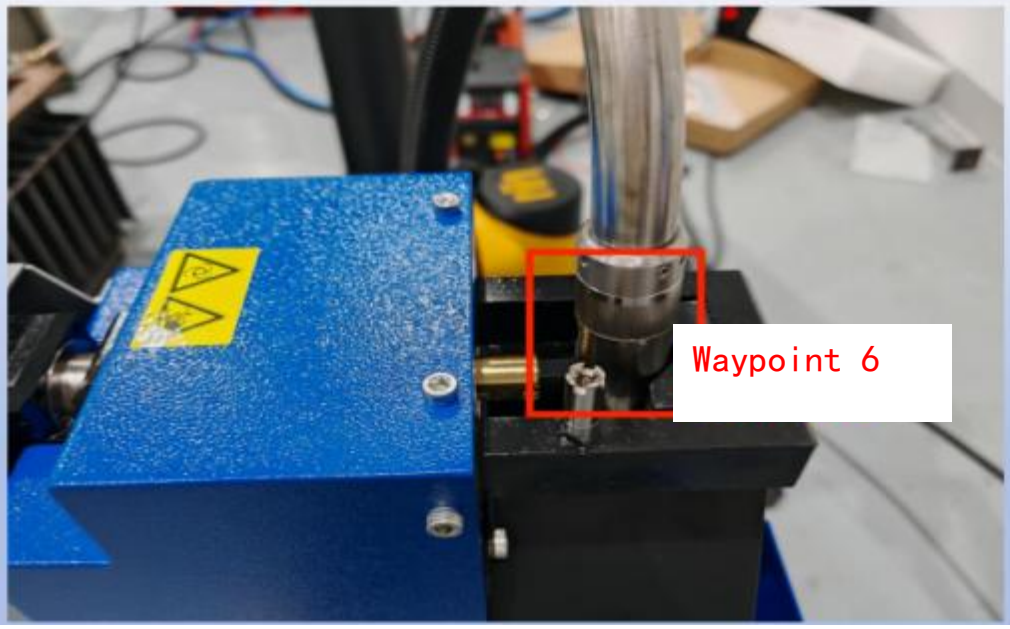


- "Prepare for cleaning gun point" , "Cleaning gun point" , "End cleaning gun point" : "Prepare for gun cleaning point" and "End gun cleaning point" are the same, located above the gun cleaning place. The "gun cleaning point" requires the welding gun to be extended into the gun cleaning place.

Waypoint 5:Prepare to clean the gun



Waypoint 6:Cleaning the gun



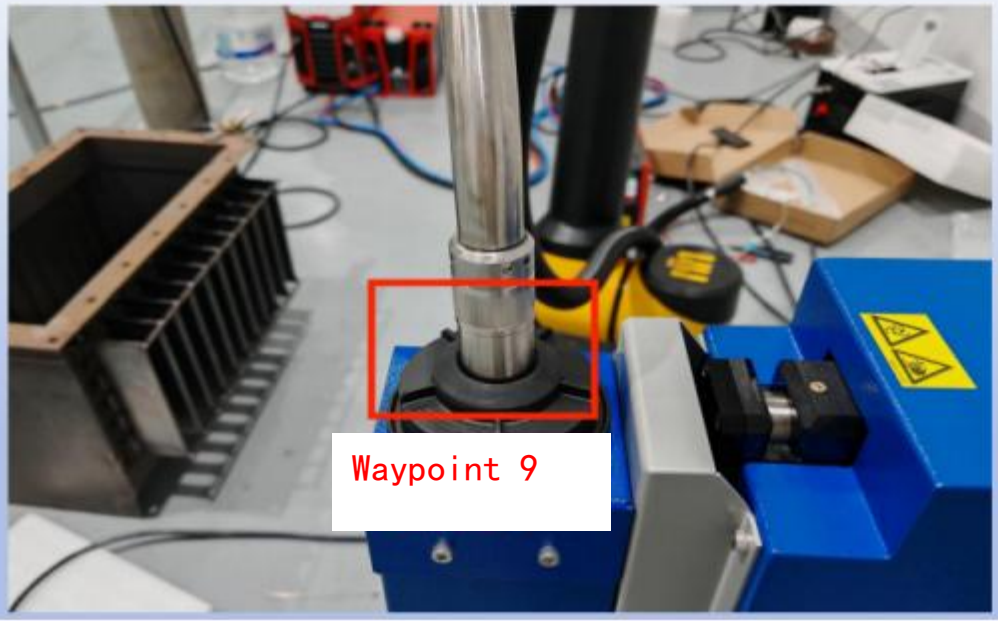
Waypoint 7:End of gun cleaning



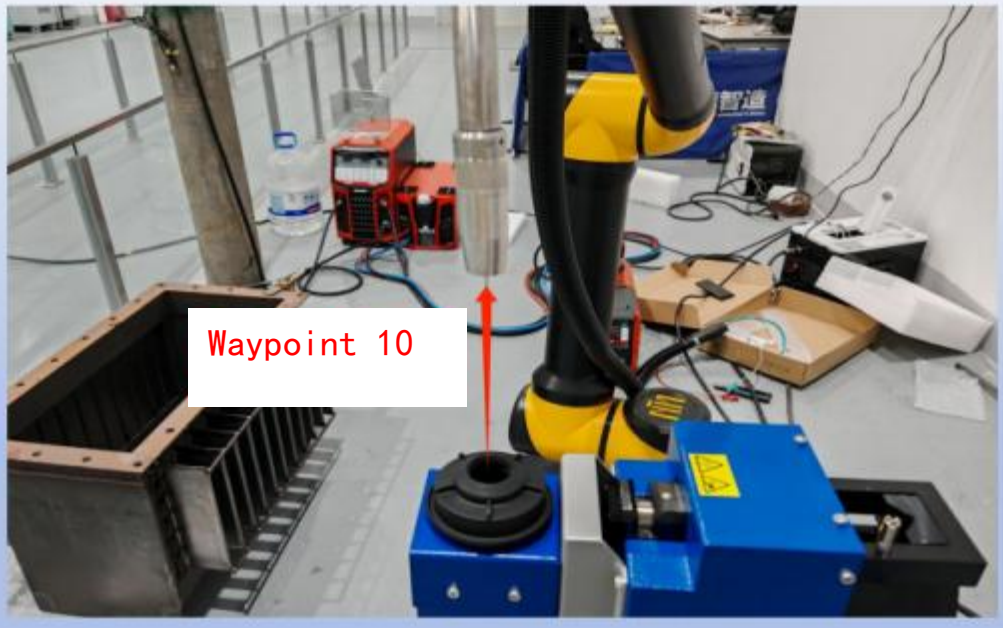
- "Prepare to spray gun liquid point" , "Spray gun liquid point" , "End spray gun liquid point " :"Prepare for spraying gun liquid point" and "End spraying gun liquid point" are the same,position Above the gun cleaning point,the "spray gun cleaning fluid point" requires the welding gun to be extended into the gun cleaning point.



Waypoint 9:Spraying gun cleaning fluid



Waypoint 10:Finish spraying gun fluid



6. Array function

6.1 Array Function Introduction

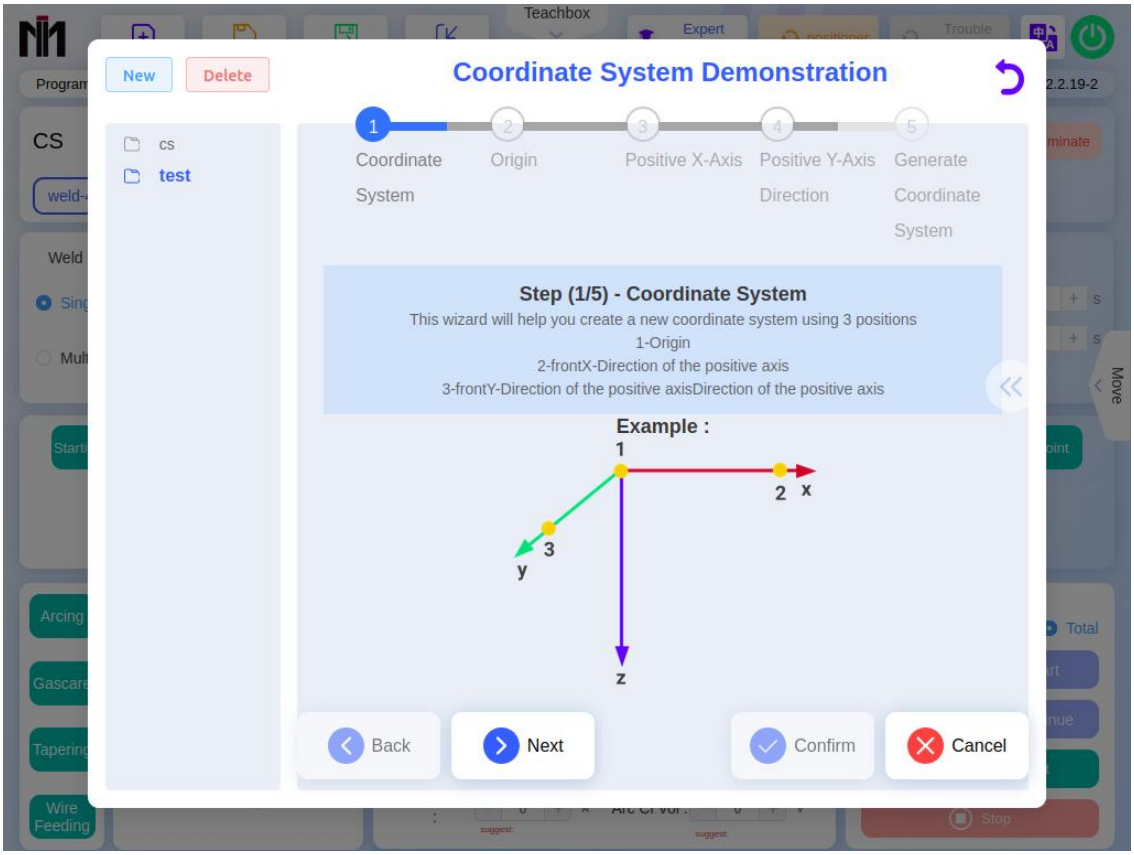
In the process of robot welding, when there are multiple identical welds on the same workpiece, use "array" to improve welding efficiency and simplify programming process. The array function has the following advantages:

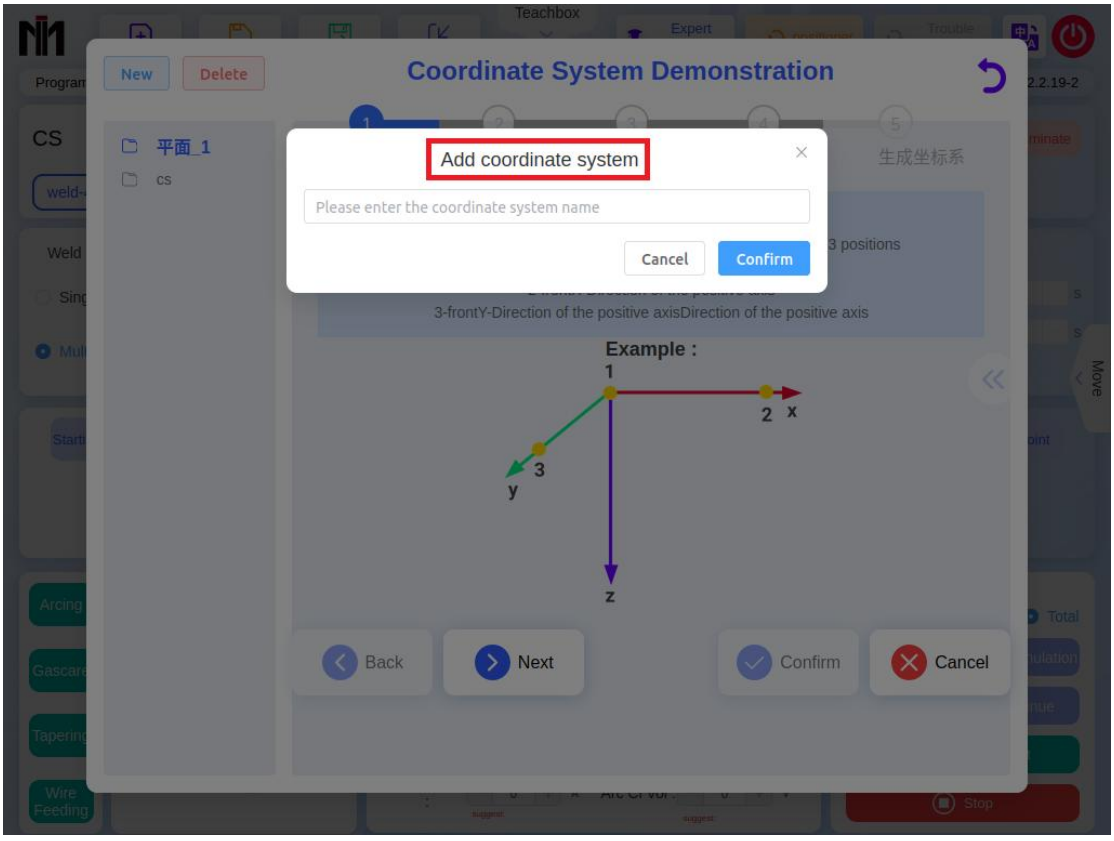
- Efficient programming:Only the first weld needs to be programmed in detail, and the subsequent weld programs can be quickly generated through offsets, greatly reducing programming Time and workload.
- High consistency:The welding paths and parameters of all welds are generated based on the same program, ensuring the consistency of welding quality and reducing human errors.
- Strong flexibility:Users can flexibly set the offset according to the actual layout of the workpiece to adapt to welds with different spacing and directions.

- Easy to modify: If you need to adjust the welding path or parameters, just modify the program of the first weld and the programs of subsequent welds will be automatically updated. No need to modify each one individually

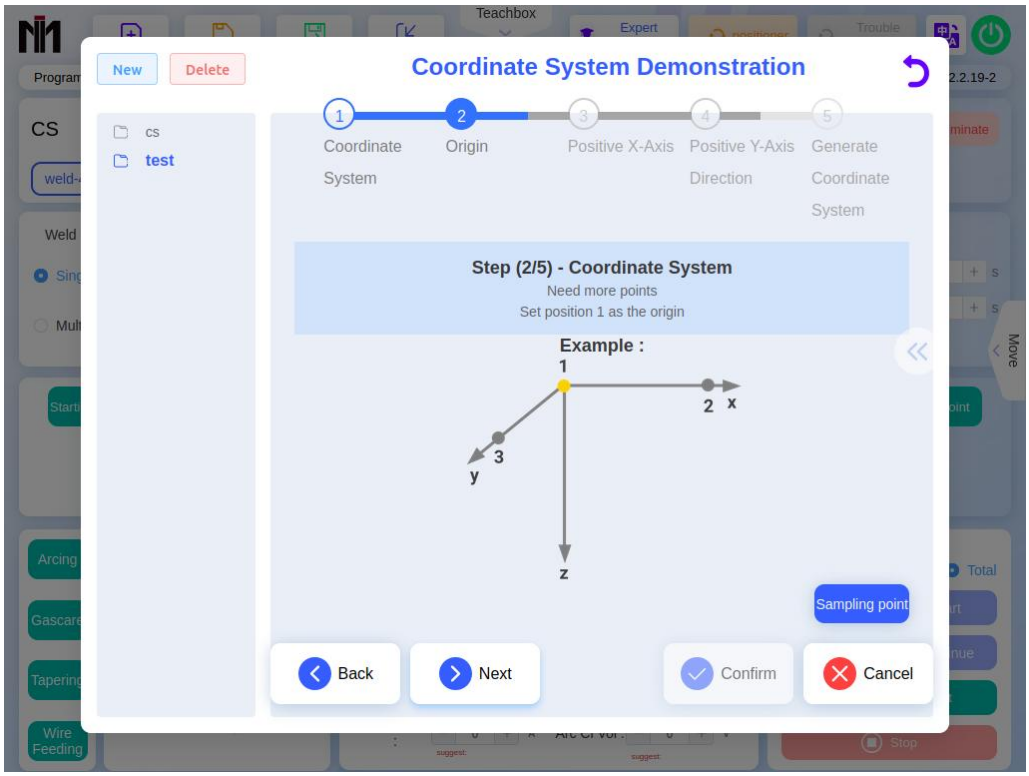
6.2 Workpiece coordinate system teaching

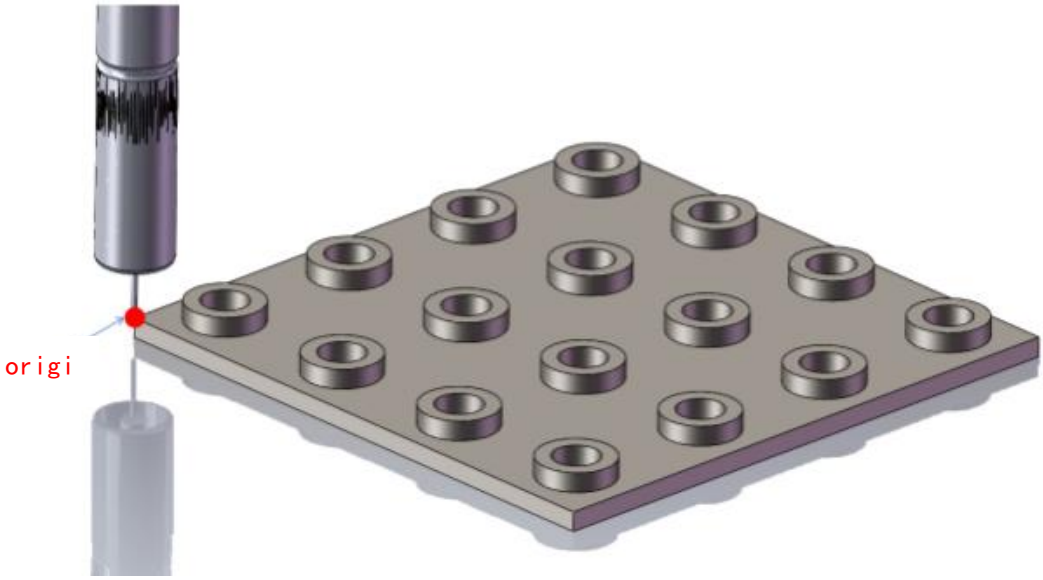
- Step 1: Click "Workpiece Coordinate System" - "New" , add the coordinate system name, click Next, and start teaching the workpiece coordinate system.



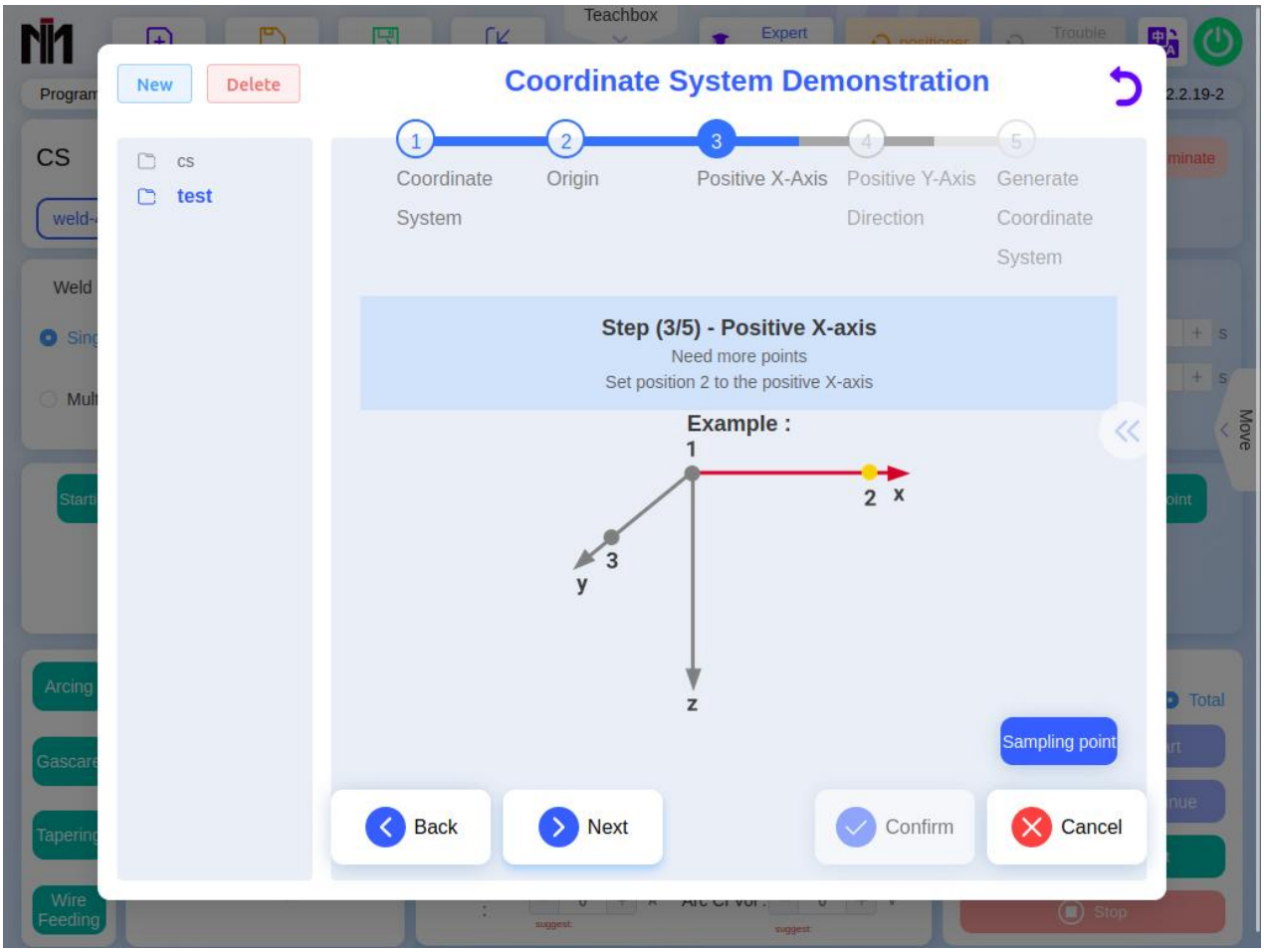


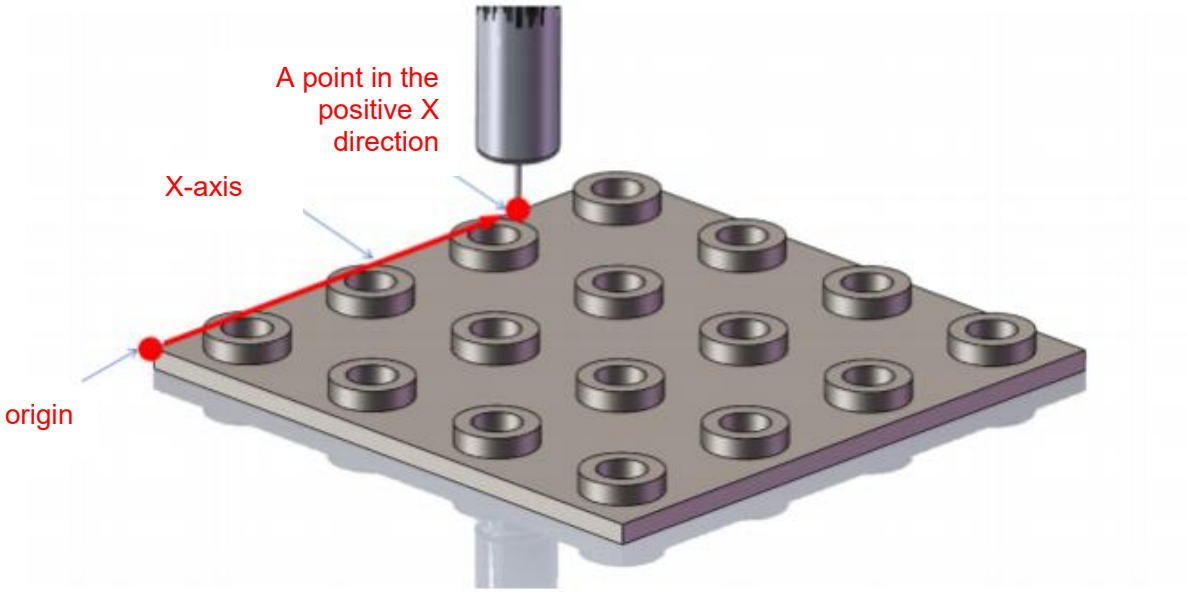
· Step 2 :Teach the origin of the coordinate system,as shown in the figure, move the welding wire to the corner point of the workpiece,click "Select Point" ,and click Next



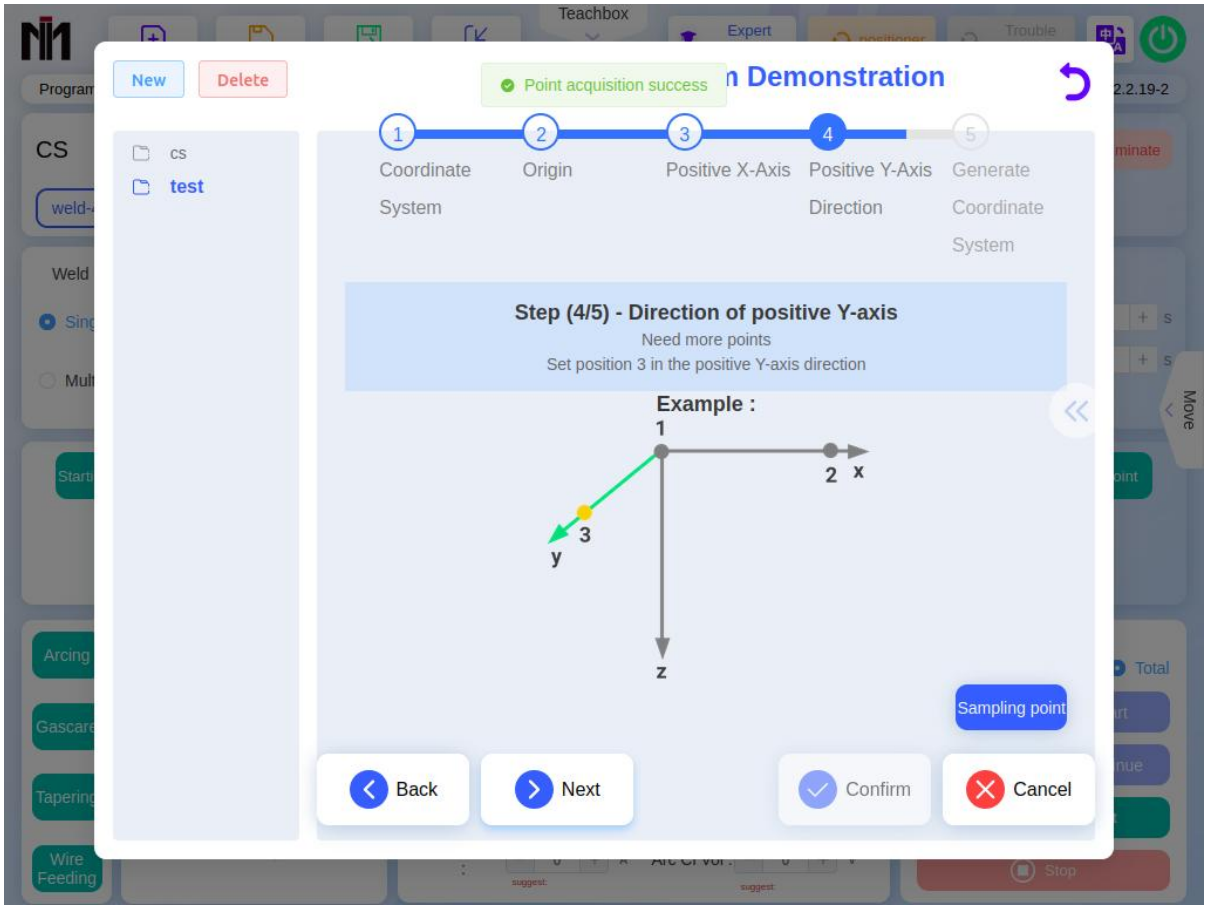


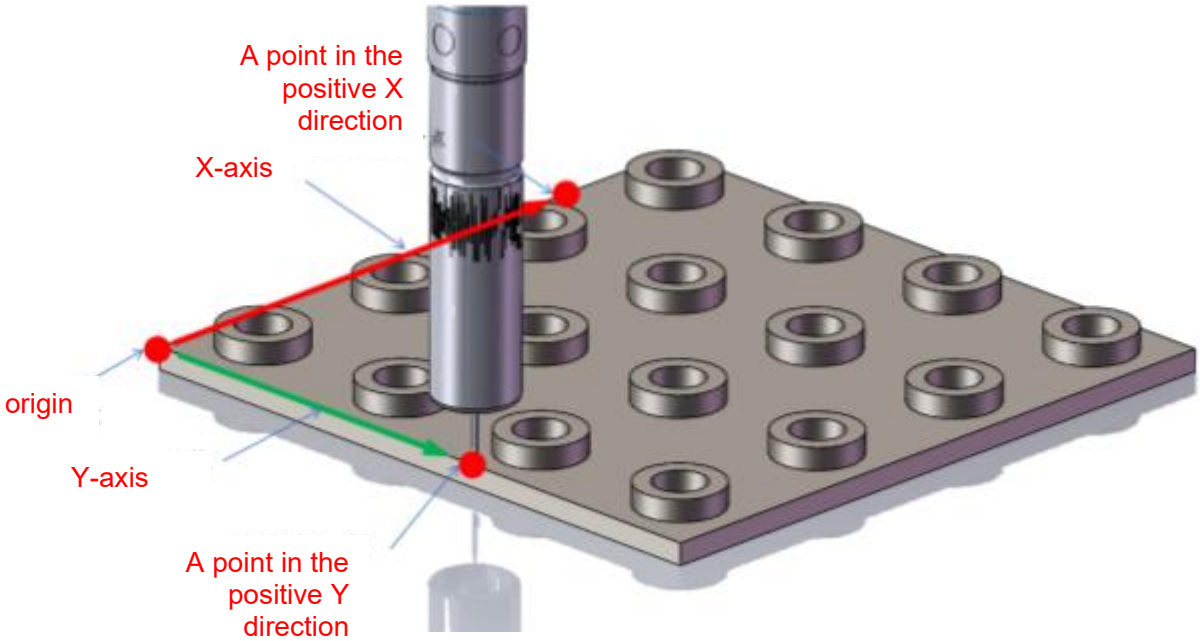
· Step 3 :Teach the positive X- axis direction of the coordinate system, as shown in the figure, move the welding wire any distance along the positive X direction, click "Select Point" , and click Next.



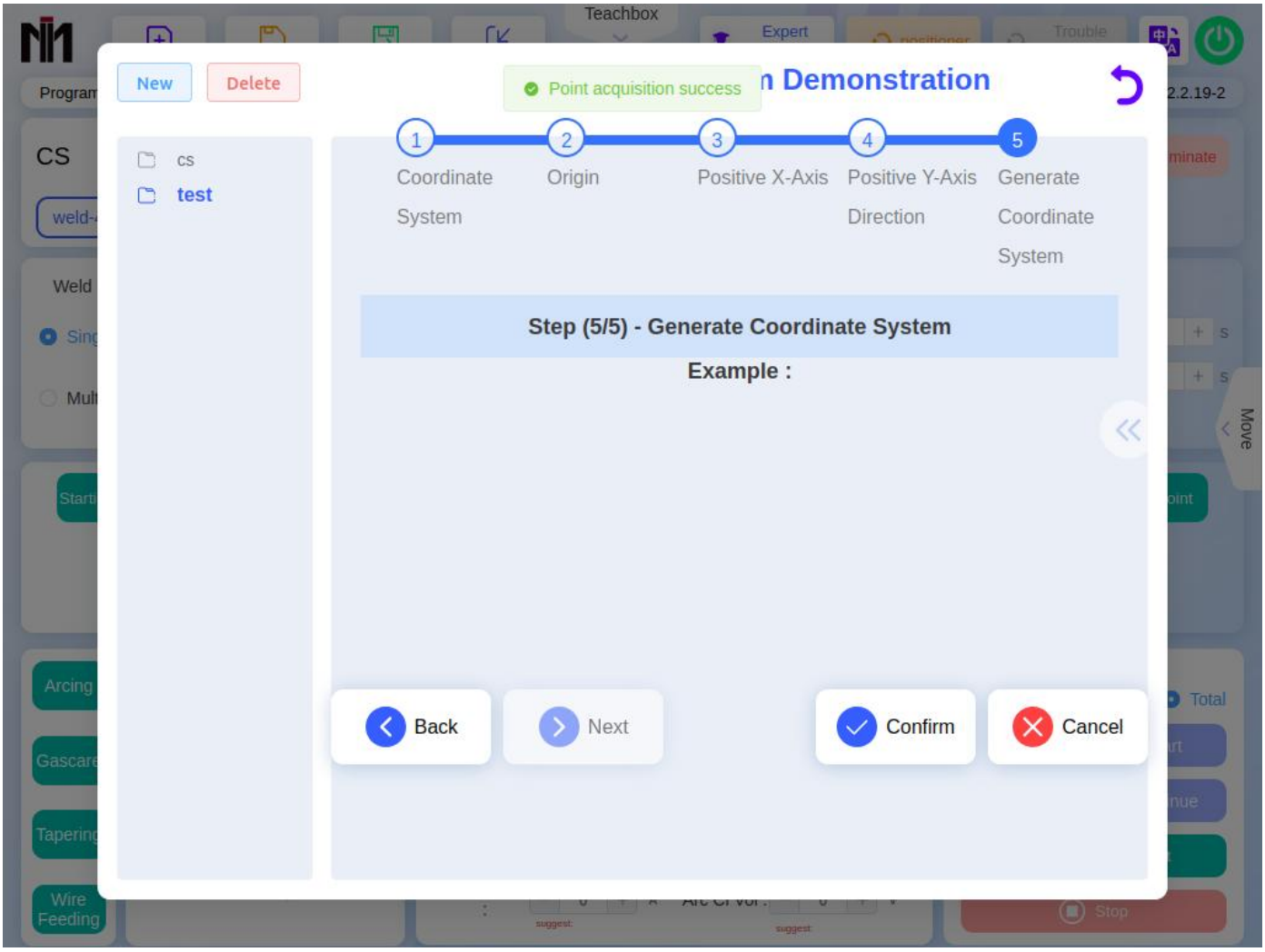


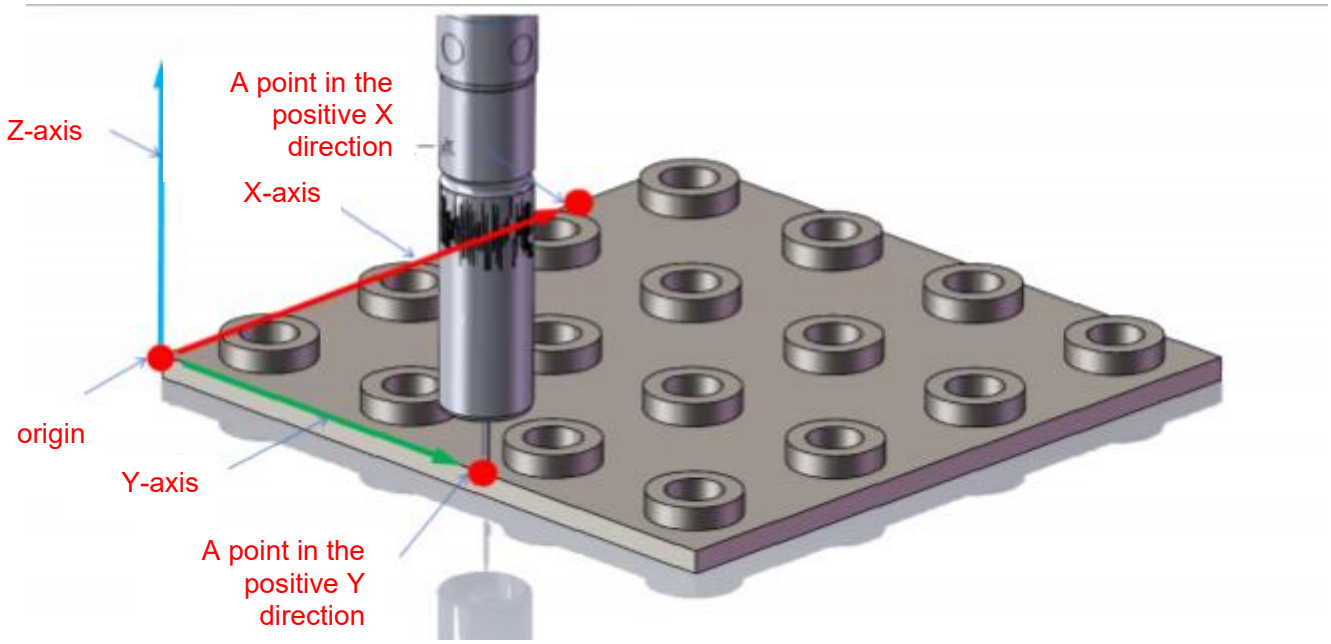
· Step 4 :Teach the positive Y- axis direction of the coordinate system, as shown in the figure, move the welding wire any distance along the positive Y direction, click "Select Point" , and click Next.





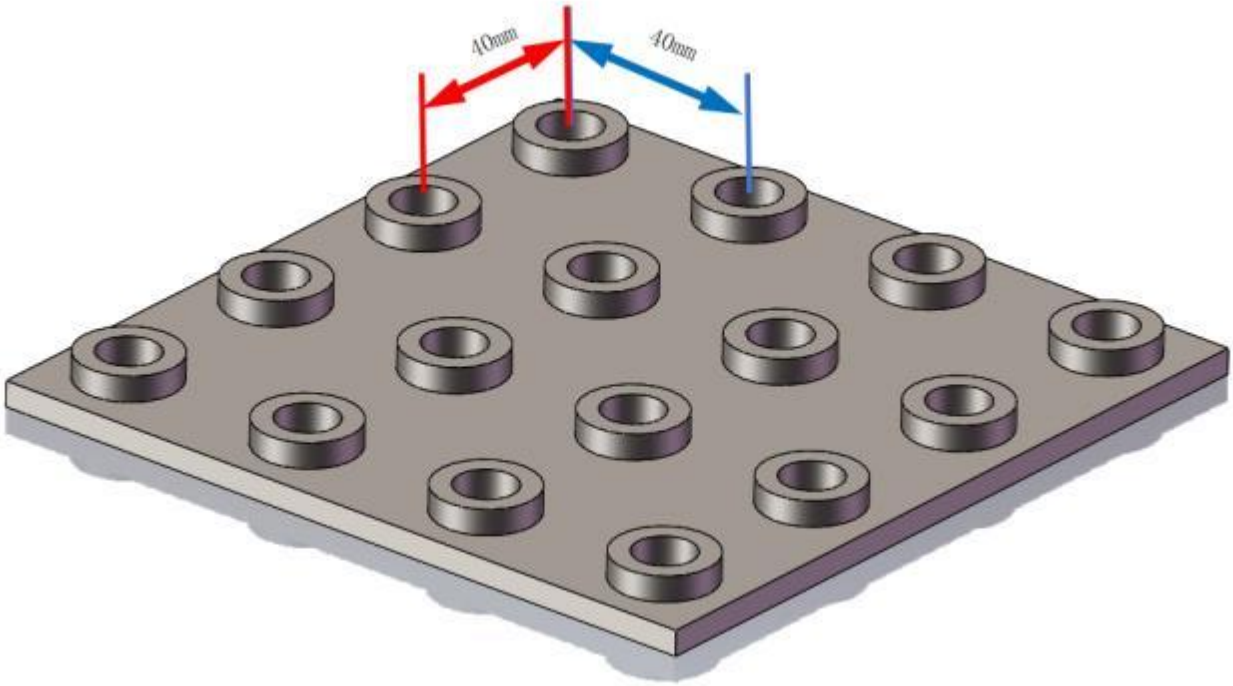
· Step 5:Click "OK" to complete the workpiece coordinate system teaching. The defined coordinate system is shown in the figure.



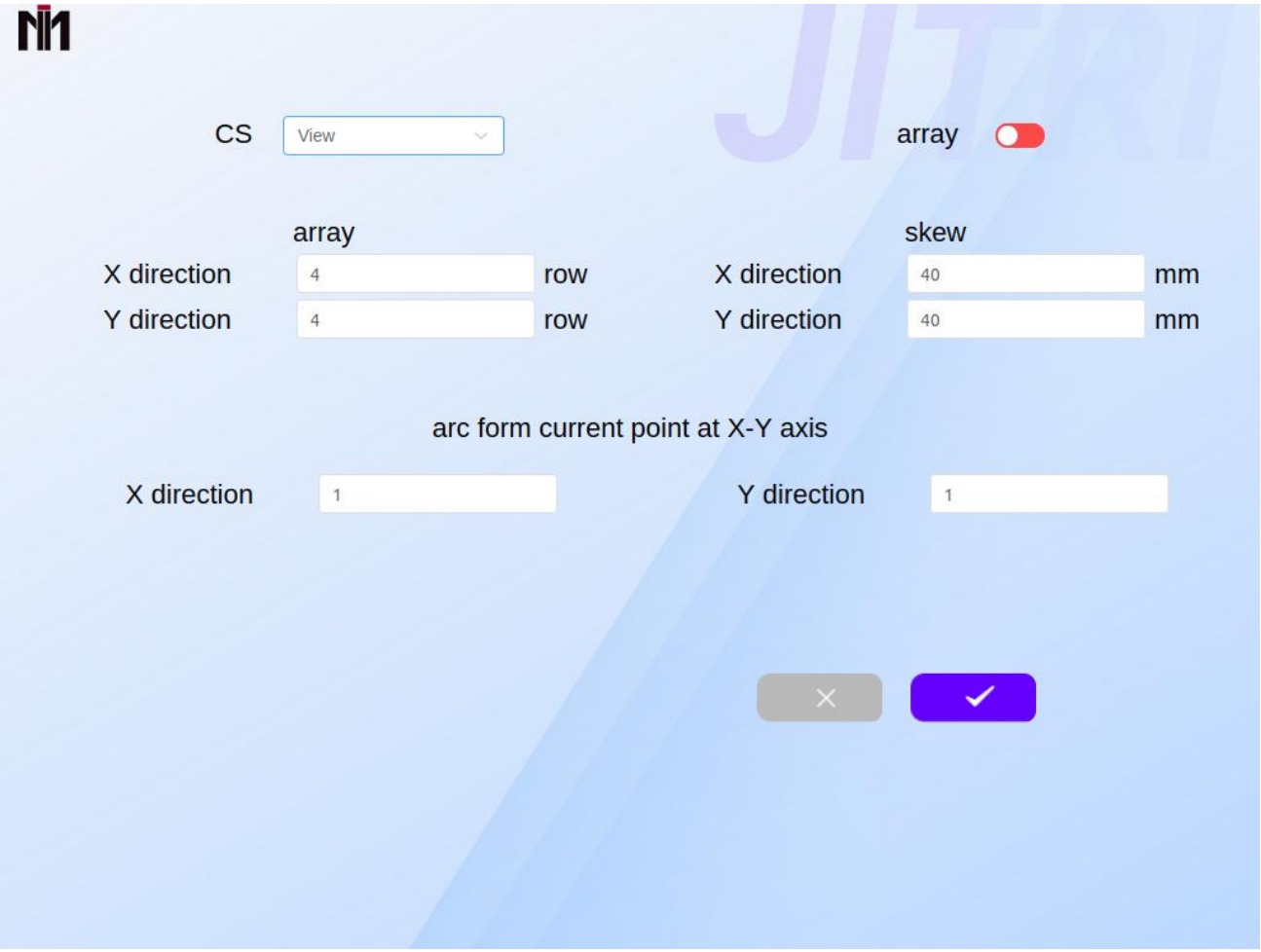


6.3 Array function operation steps

The workpiece to be welded is shown in the figure. Each weld is the same, all are arc welds, and the offset in both directions is 40mm.



- Establish a workpiece coordinate system for the workpiece to be welded. In the workpiece coordinate system, select points for the first weld. For point selection operations, refer to Section 4.2 .
- Click"Array" and select the defined workpiece coordinate system. Take the workpiece in the figure as an example and enter "4" in the X direction, enter "4" in the Y direction, X direction deviation Fill in "40mm" for the displacement, fill in "40mm" in the Y direction.



Click  to save, select "Simulation" and after the program is sent successfully, check whether the offset is correct. After confirmation, select "End Programming" to proceed with welding.

"Weld from the selected X and Y directions" means that the robot arm can choose to start welding from the 1st row in the X direction and the 1st row in the Y direction, or from the 2nd row in the X direction and the 1st row in the Y direction. In this case, the robot arm will not weld the welds in the 1st row in the X direction and the 1st row in the Y direction.

7. External axis coordination

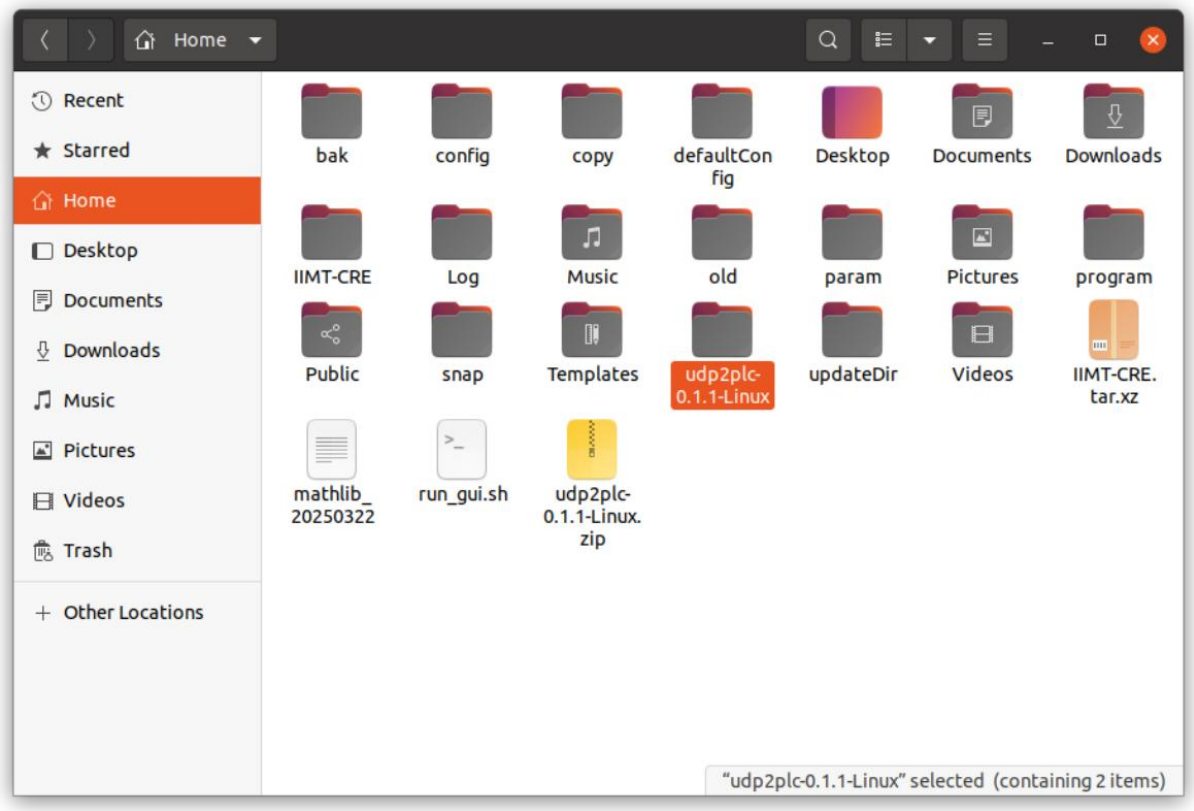
External axis refers to the auxiliary axis system added based on actual work needs in addition to the robot's main axis system. Common types include ground rails, L-type positioners, etc. Among them, the ground rail (also known as the robot's walking axis or the seventh axis) can drive the industrial robot to move along the preset trajectory, significantly improving its use efficiency by expanding the robot's operating radius. It is widely used in automation scenarios such as loading and unloading, welding, and assembly of machine tool workpieces. As a two-axis external axis device, the L-type positioner supports free programming control and can work with the robot to realize the rotation and flipping of the workpiece, providing a more flexible operating angle for robot processing, especially suitable for welding and other working conditions with special requirements for the workpiece posture.

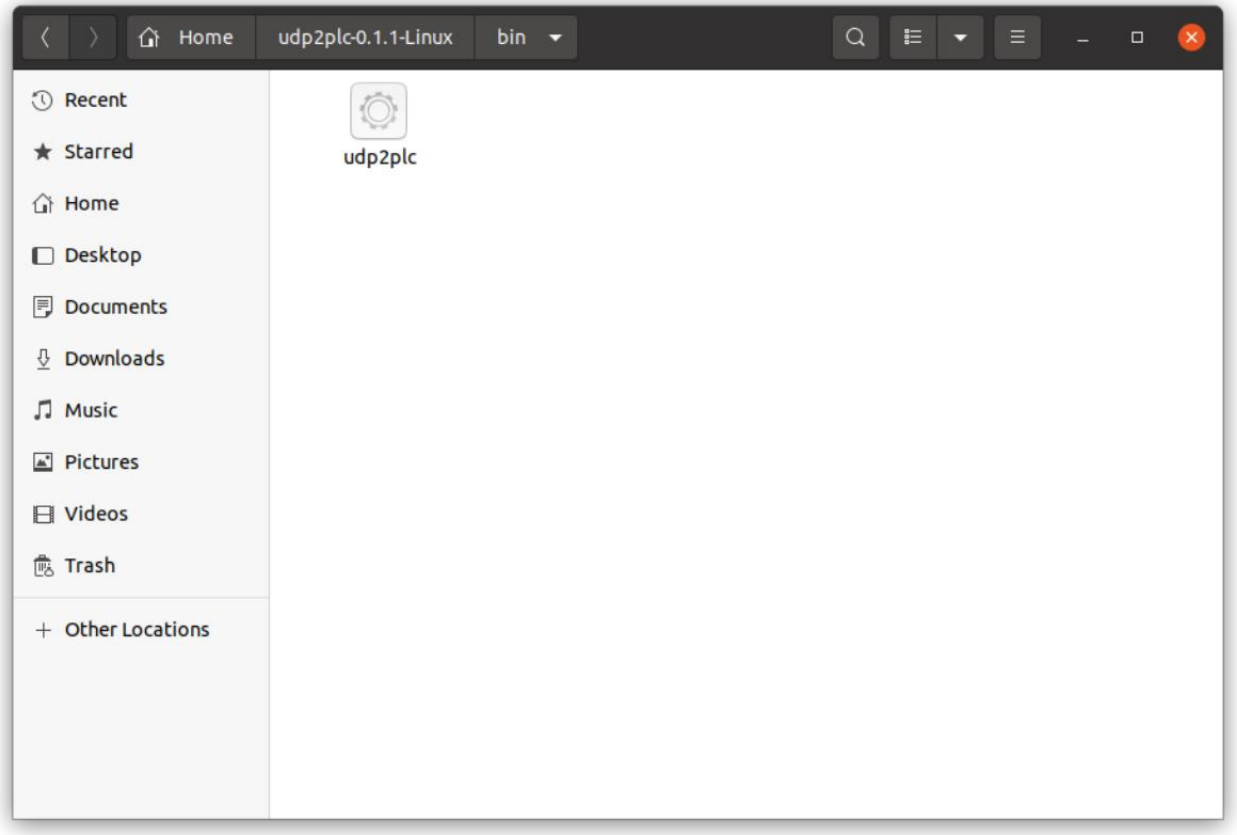
This description will use the L-type positioner welding intersection line as an example to illustrate the external axis coordination function.

7.1 External axis start

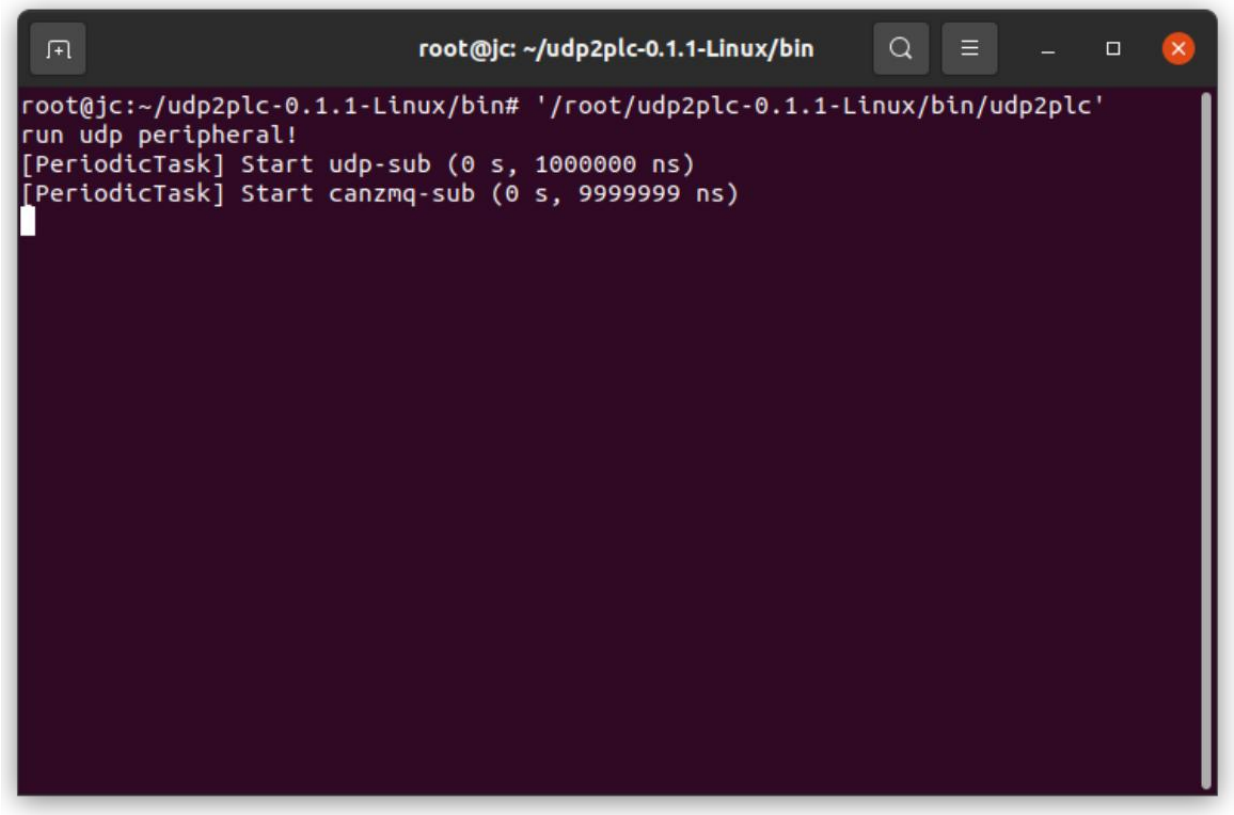
The external axis system of the IIMT portable welding workstation supports the self-start function and can run automatically without additional operation. If it fails to start automatically, you can start the positioner system according to the following steps:

- Return to the Ubuntu system desktop (swipe right from the left side of the screen for Ubuntu 20.04; swipe left with three fingers for Ubuntu 22.04), enter the system folder, and enter the following path "Home/udp2plc-0.1.1-inux/bin". The folder contains the external axis program "udp2plc"



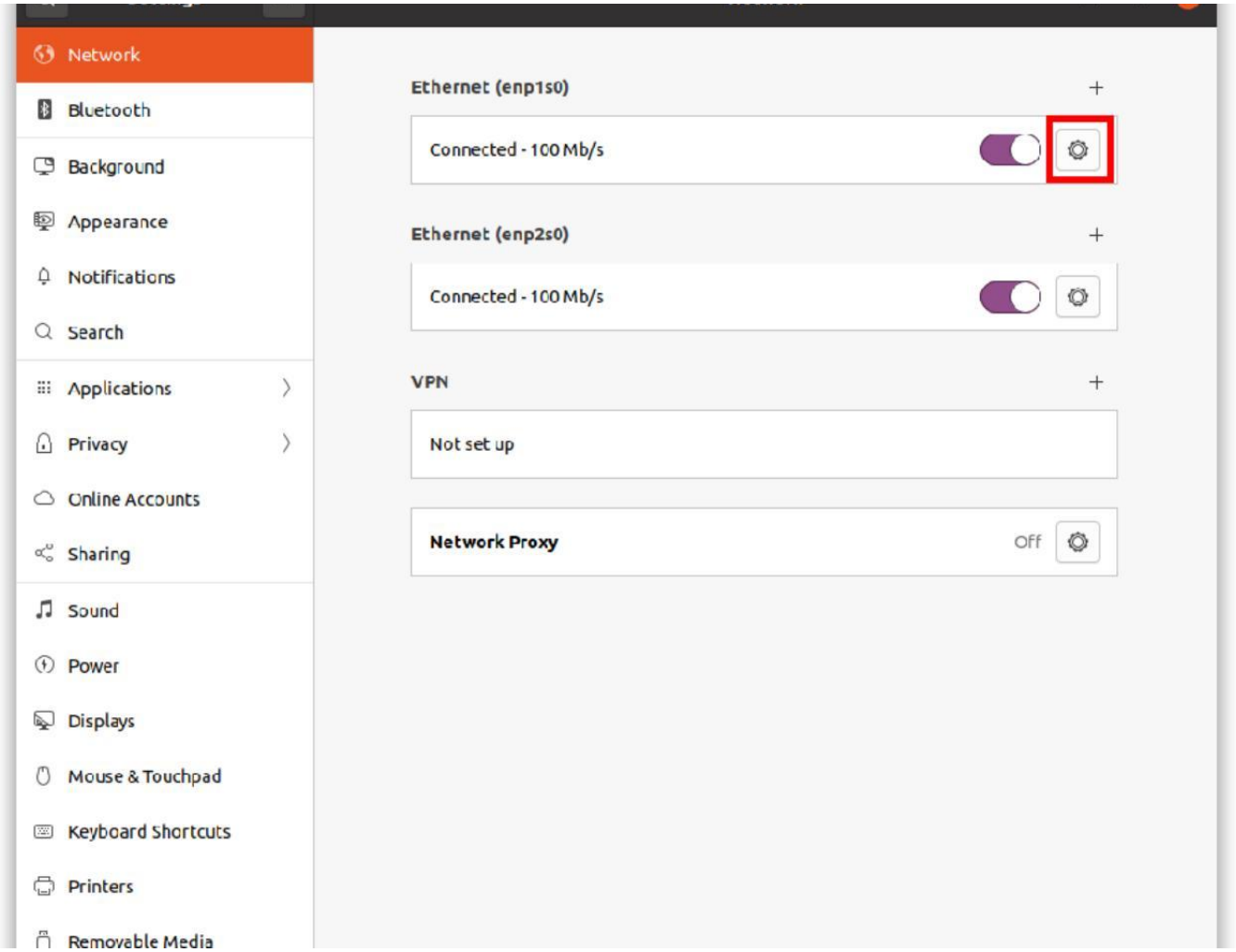


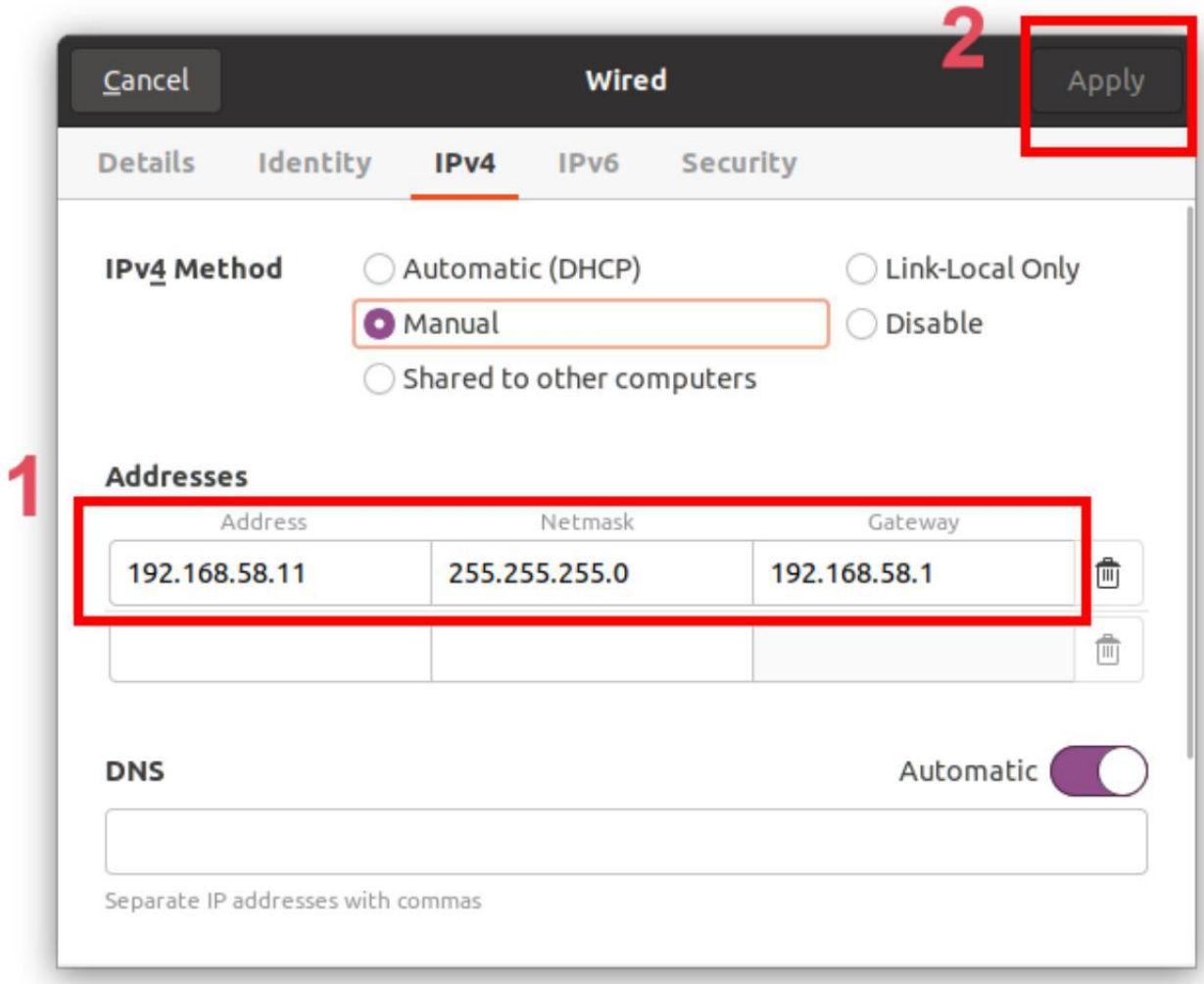
- Long press on a blank area, select "Open in Terminal" in the pop-up dialog box, long press "udp2plc" and drag it into the terminal, slide up from the bottom of the screen to wake up the keyboard, press Enter to execute the external axis program, if successful, the following display will be displayed;



7.2 External axis network configuration

Return to the Ubuntu system desktop and click "Settings-Network". Usually the default network interface is "Ethnet (enp1so)". Change the network IP and the network segment to be the same as the PLC. As shown in the figure, the PLC network segment is 192.168.58.xx. Change the network IP to 192.168.58.11, the subnet mask to 255.255.255.0, and the gateway to 192.168.58.1.

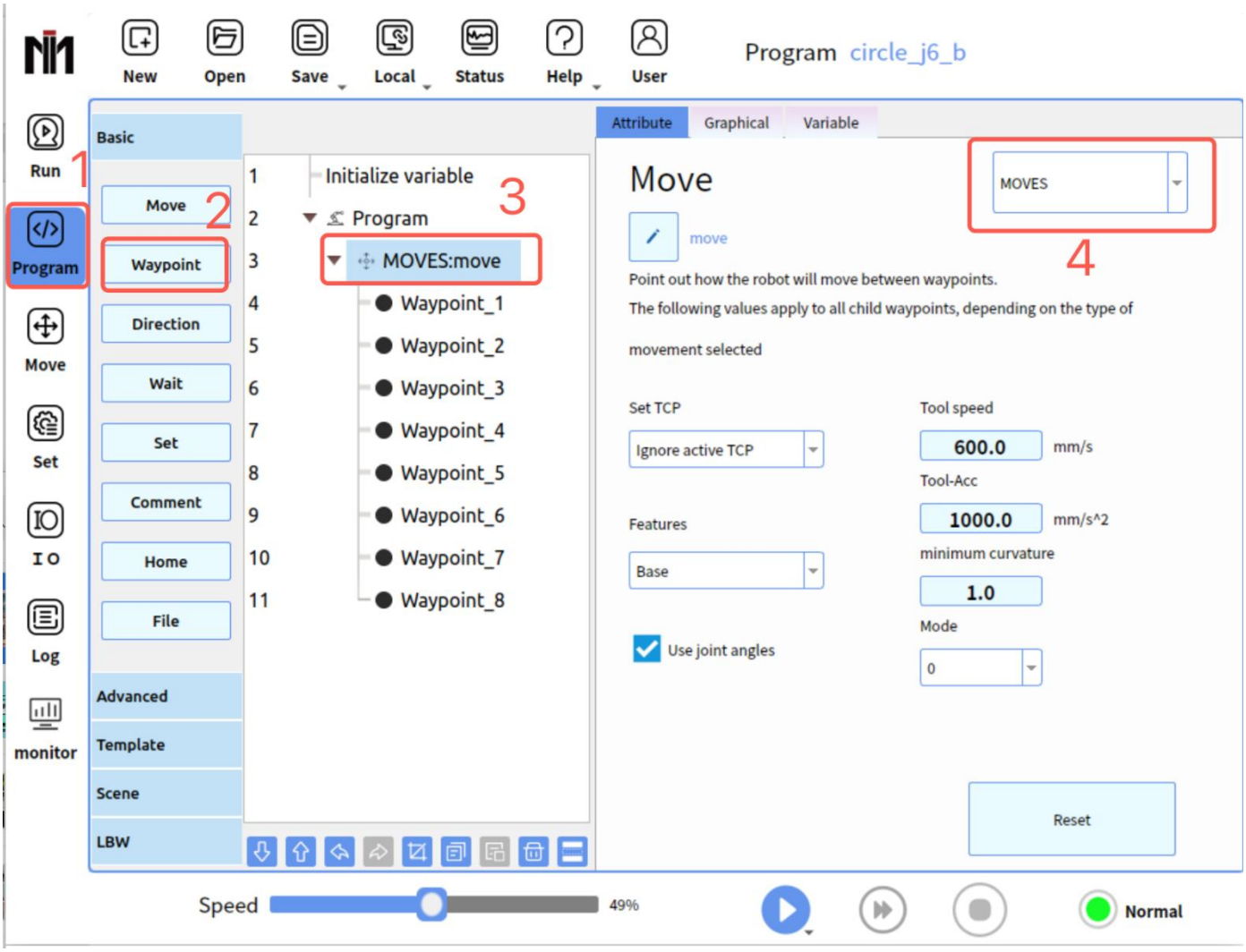

Network
Bluetooth
Background
Appearance
Notifications
Search
Applications
Privacy
Online Accounts
Sharing
Sound
Power
Displays
Mouse & Touchpad
Keyboard Shortcuts
Printers
Removable Media
Ethernet (enp1s0)
Connected - 100 Mb/s
Ethernet (enp2s0)
Connected - 100 Mb/s
VPN
Not set up
Network Proxy
Off

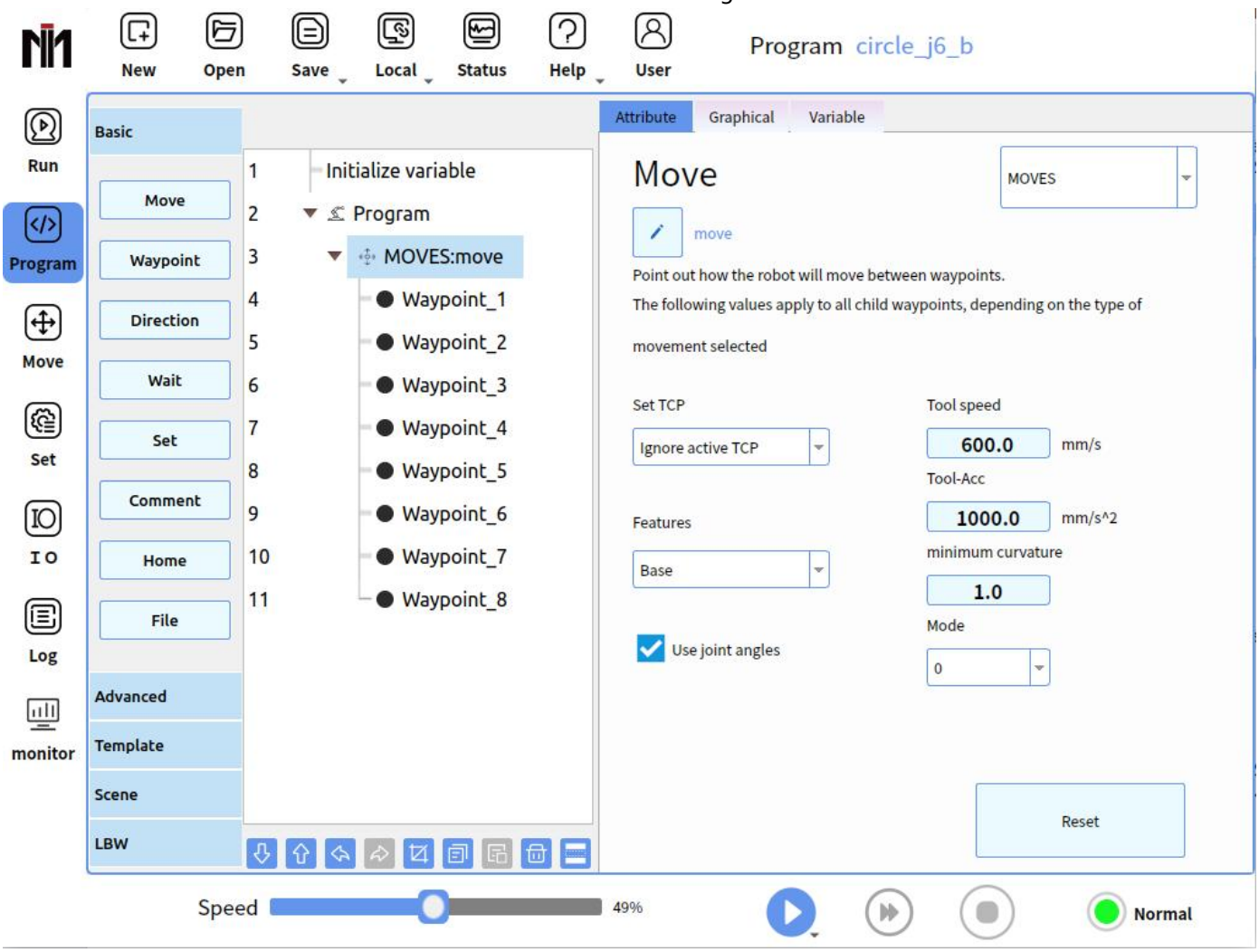


Just click "Apply".

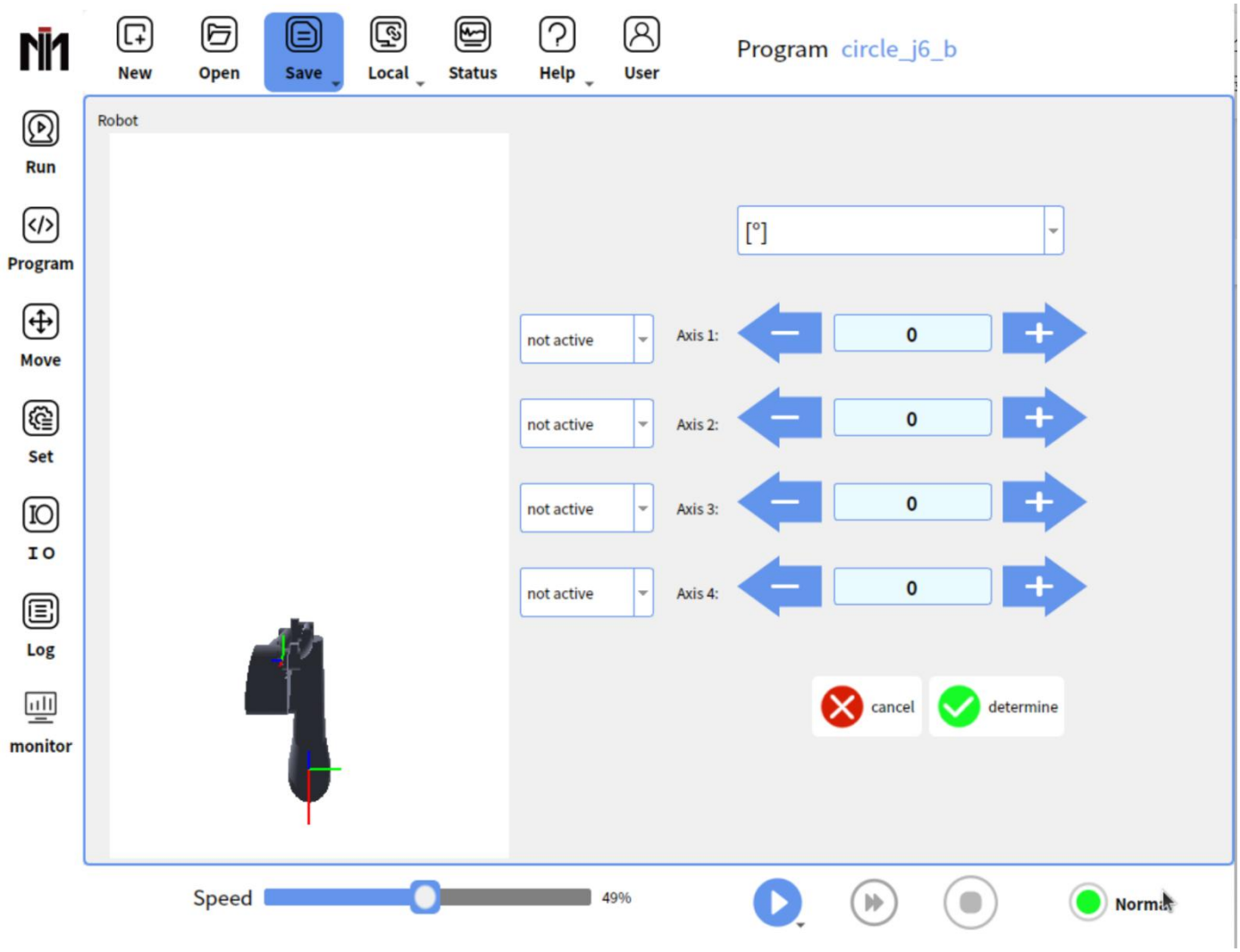
7.3 External axis control

- Return to the robot control interface, select "Program-Basic-Waypoint-MOVEJ", change "MOVEJ" to "MOVES" in the property window, and click "Waypoint" to create a new waypoint;


New
Open
Save
Local
Status
Help
User
Program circle_j6_b
Run
Program
Move
Set
IO
Log
monitor
Basic
Move
Waypoint
Direction
Wait
Set
Comment
Home
File
Advanced
Template
Scene
LBW
1
2
3
4
1 Initialize variable
2 Program
3 MOVES:move
4 Waypoint_1
5 Waypoint_2
6 Waypoint_3
7 Waypoint_4
8 Waypoint_5
9 Waypoint_6
10 Waypoint_7
11 Waypoint_8
Attribute
Graphical
Variable
Move
MOVES
move
Point out how the robot will move between waypoints.
The following values apply to all child waypoints, depending on the type of
movement selected
Set TCP
Ignore active TCP
Tool speed
600.0
mm/s
Tool-Acc
1000.0
mm/s^2
Features
Base
minimum curvature
1.0
Mode
Use joint angles
0
Reset
Speed
49%
Normal


New
Open
Save
Local
Status
Help
User
Program circle_j6_b
Run
Program
Move
Set
IO
Log
monitor
Basic
Move
Waypoint
Direction
Wait
Set
Comment
Home
File
Advanced
Template
Scene
LBW
1 Initialize variable
2 Program
3 MOVES:move
4 Waypoint_1
5 Waypoint_2
6 Waypoint_3
7 Waypoint_4
8 Waypoint_5
9 Waypoint_6
10 Waypoint_7
11 Waypoint_8
Attribute
Graphical
Variable
Move
MOVES
move
Point out how the robot will move between waypoints.
The following values apply to all child waypoints, depending on the type of movement selected
Set TCP
Ignore active TCP
Tool speed
600.0
mm/s
Tool-Acc
1000.0
mm/s^2
Features
Base
minimum curvature
1.0
Mode
Use joint angles
0
Reset
Speed
49%
Normal

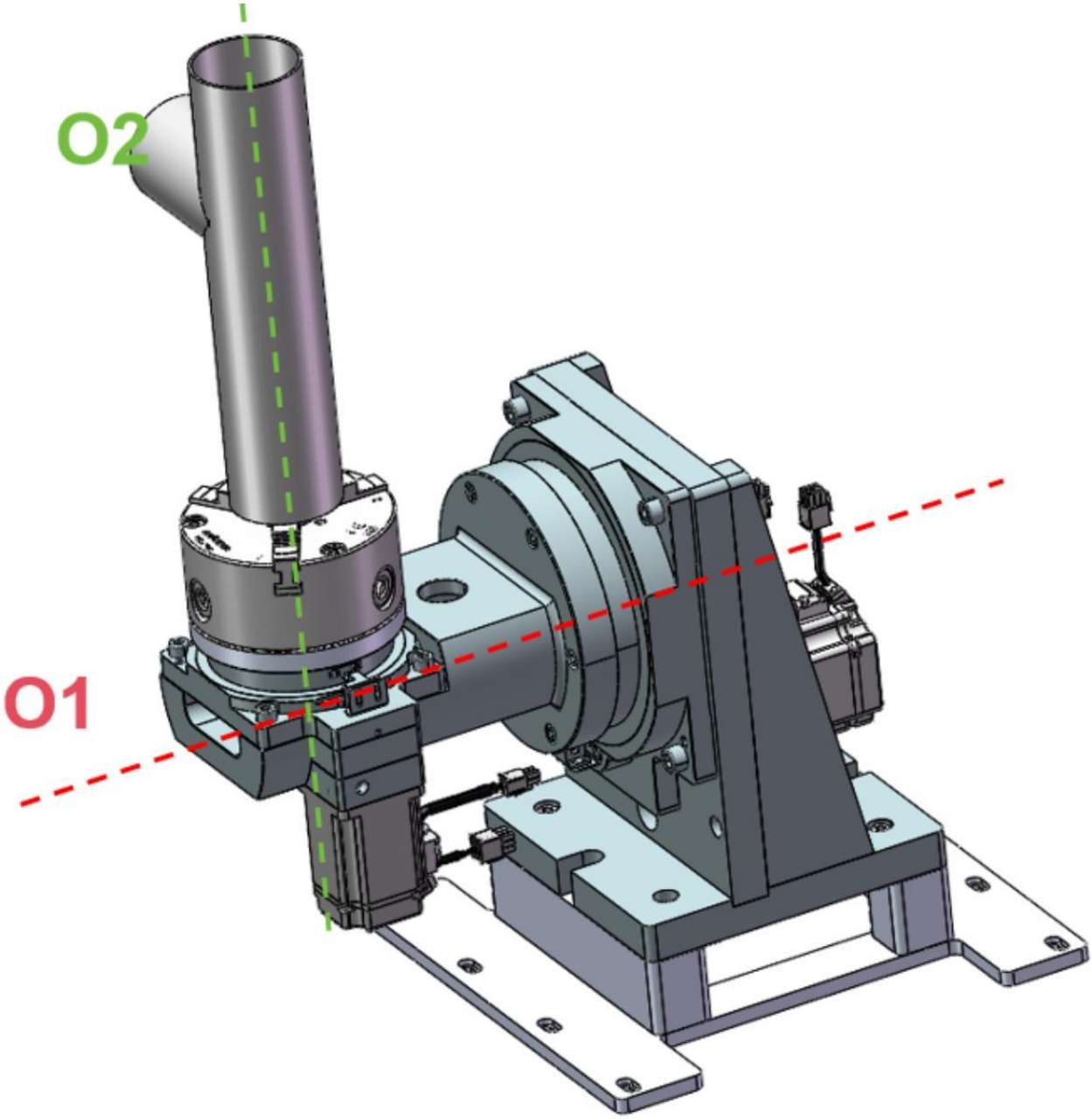
· Select "Waypoint_1", in the properties window, select "Positioner movement" to enter the positioner movement interface:



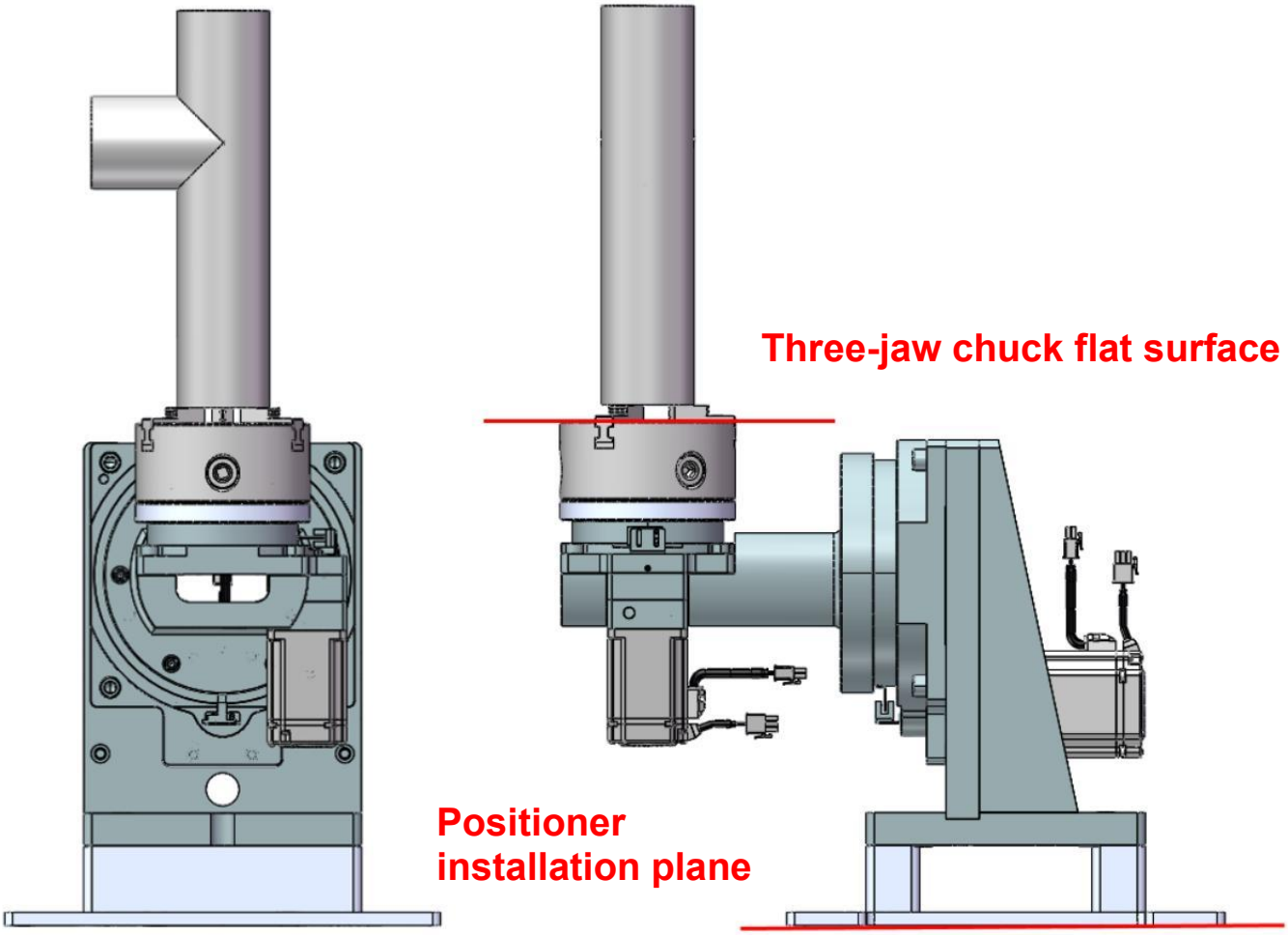
Activate external axes according to the number of controlled axes. If it is a ground track, activate axis 1 and set the others to "not activated".

7.4 External axis calibration

IIMT portable welding workstation supports simultaneous control of four axes. As shown in the figure below, the external axis O1 is axis 1 and O2 is axis 2.

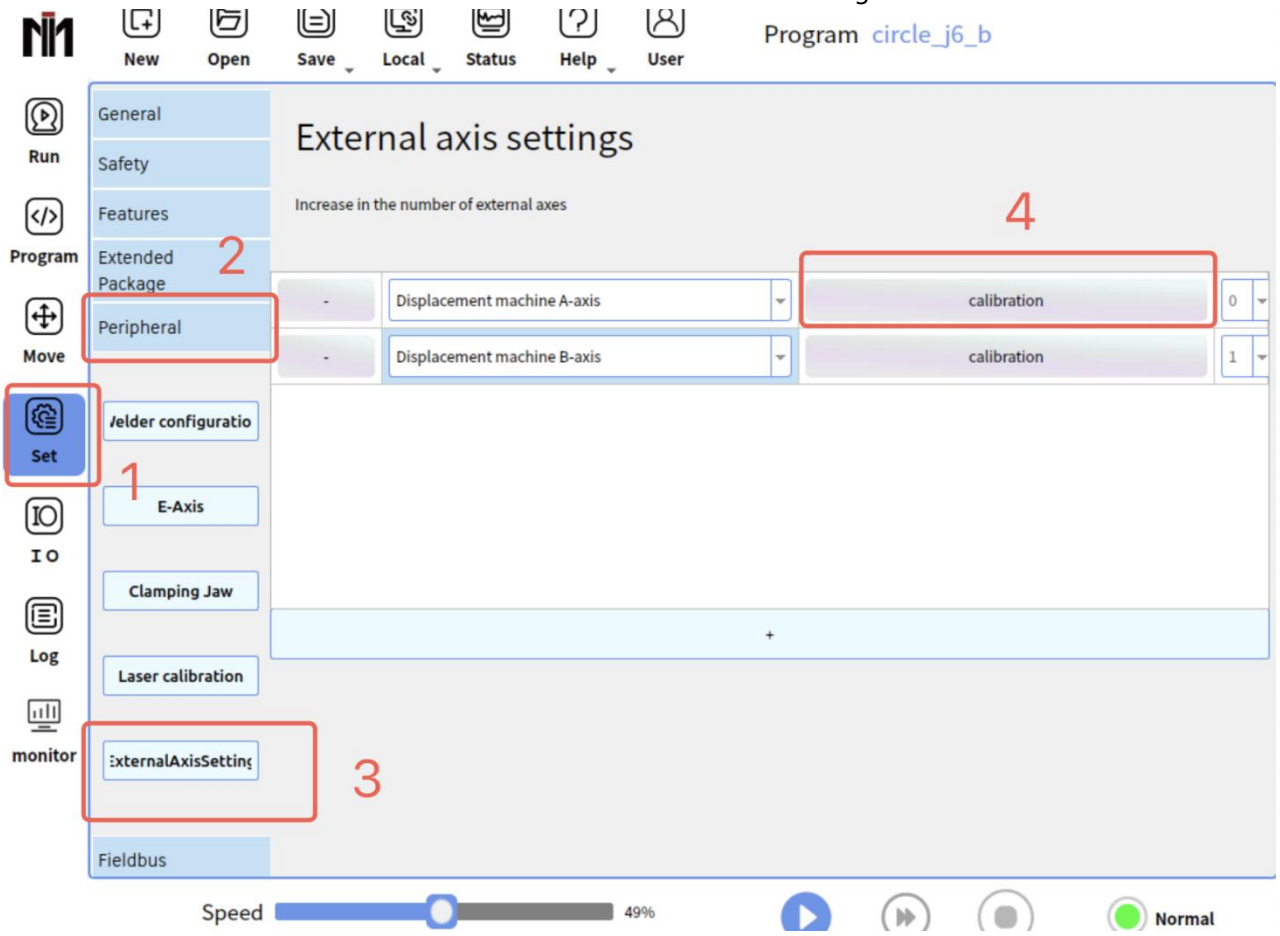


Before calibration, the zero position of the positioner must be set. The plane of the three-jaw chuck should be parallel to the installation plane of the positioner, as shown in the figure:

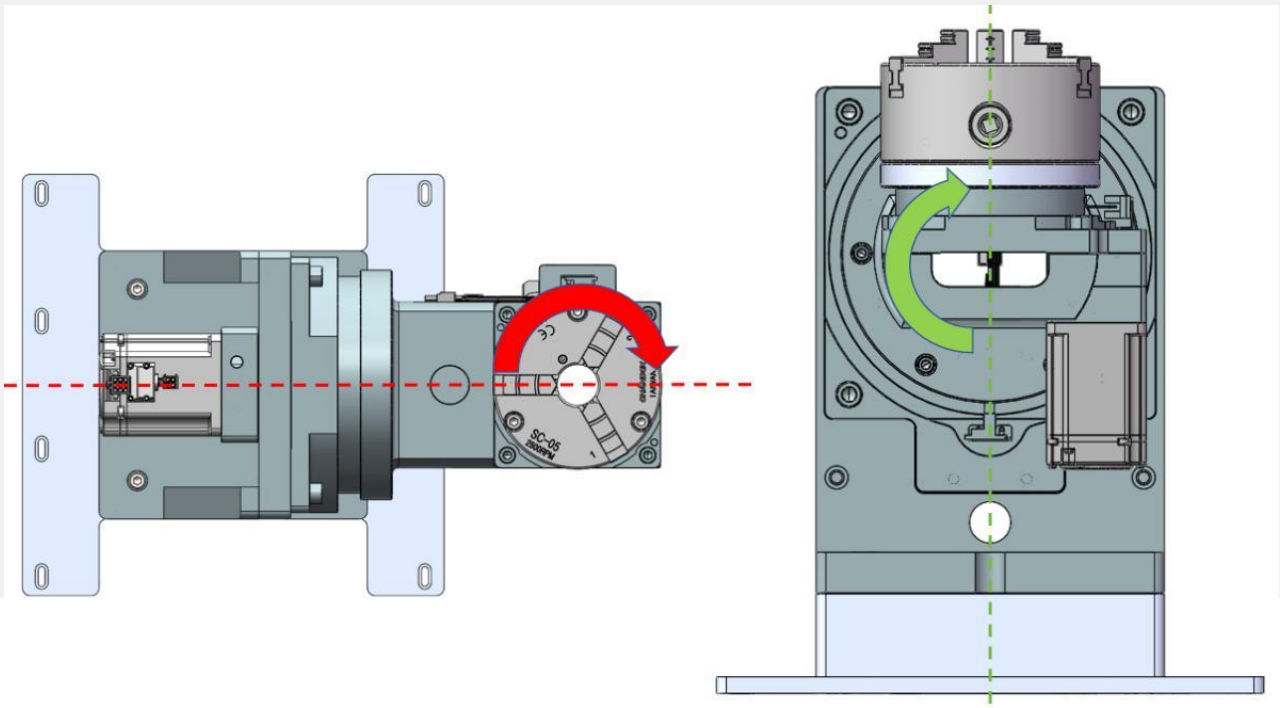


In the positioner operation interface, you can control the rotation of the positioner axis to start calibration.

In the robot control interface, select "Configuration-Robot Peripherals-External Axis Calibration", select "Positioner A Axis-Calibration" on the left to enter the external axis calibration interface.

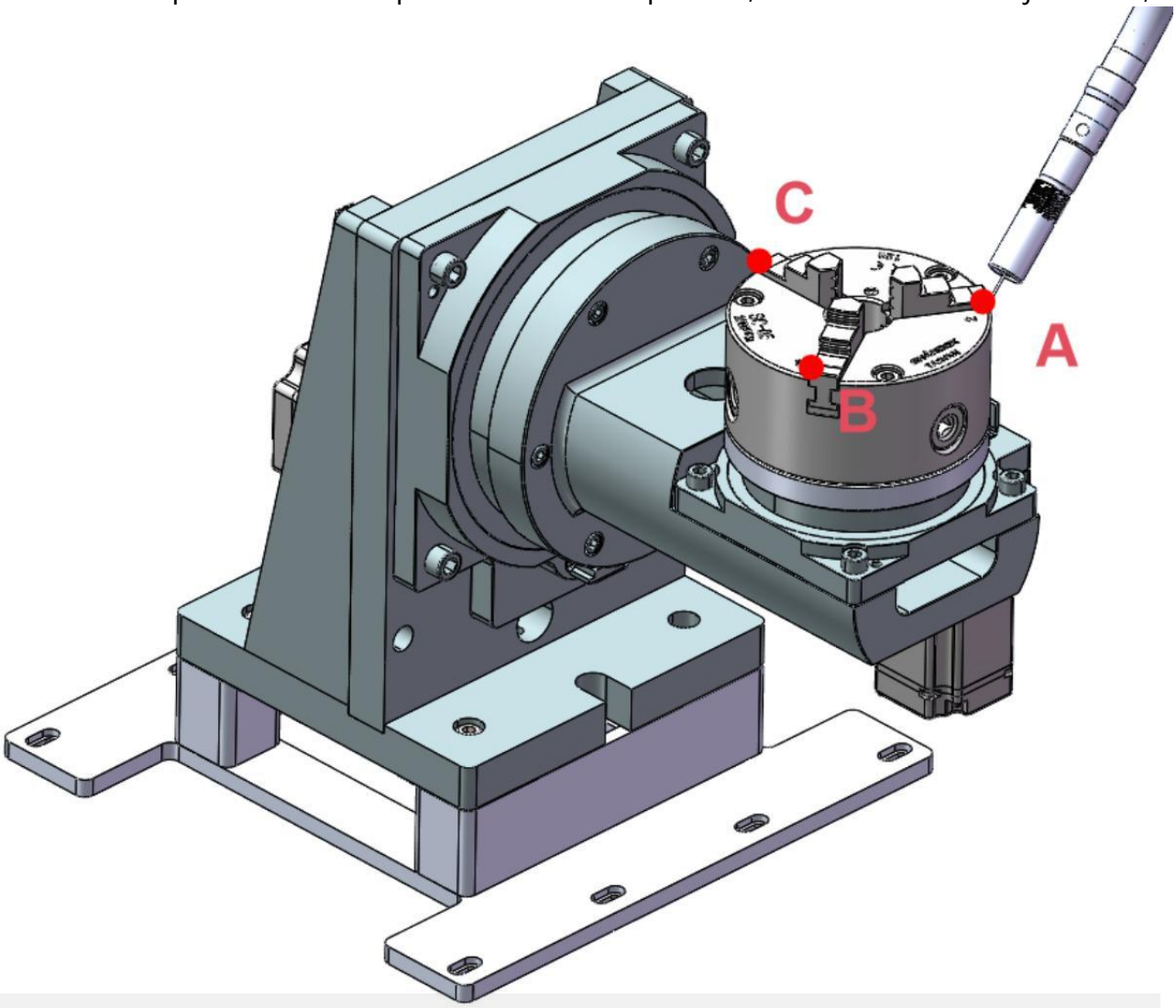


Before calibration, you need to determine the positive direction of the two axes of the positioner. In the positioner operation interface, press + Control Positioner, and the corresponding axis rotation direction is the positive direction of the axis. For example, the positive direction of axis 1 and axis 2 is as shown in the figure.



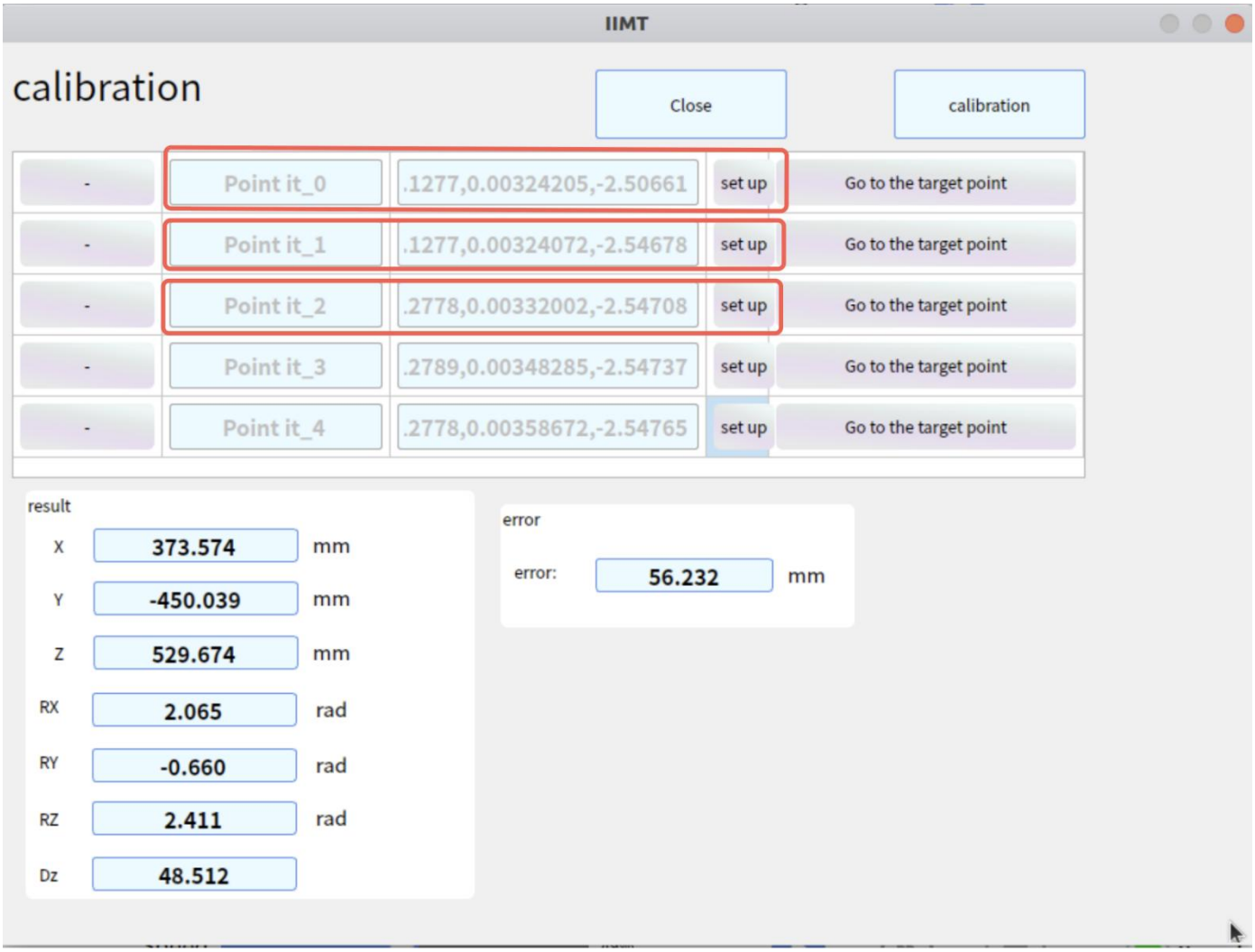
Calibration step

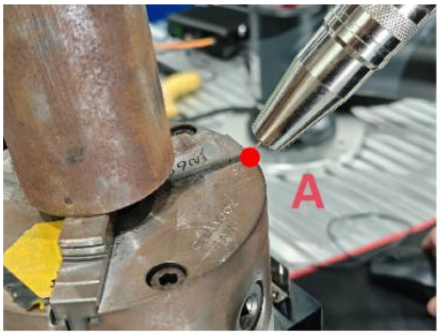
· Step 1: Return the positioner to zero point and find three points A, B and C on the three-jaw chuck;

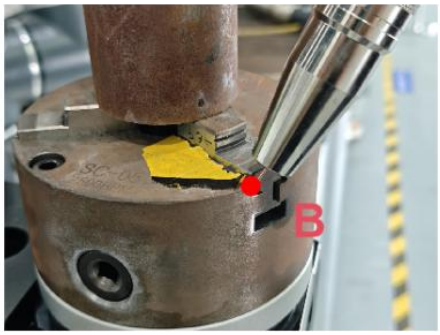


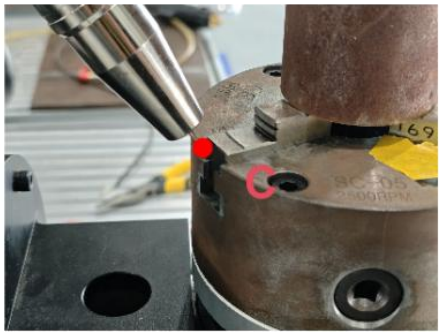
> The calibration point ABC needs to be selected according to the positive rotation direction of each axis. In this example, if the positive rotation direction of axis 2 is clockwise, the calibration point should be selected clockwise.

- Step 2: In the external axis calibration interface, select "Axis 0-Setting", move the robot arm, move the tip of the welding wire to point A, click to confirm the entry of the point position, and the operation of points B and C is the same, and the recording of points 0, 1, and 2 is completed;

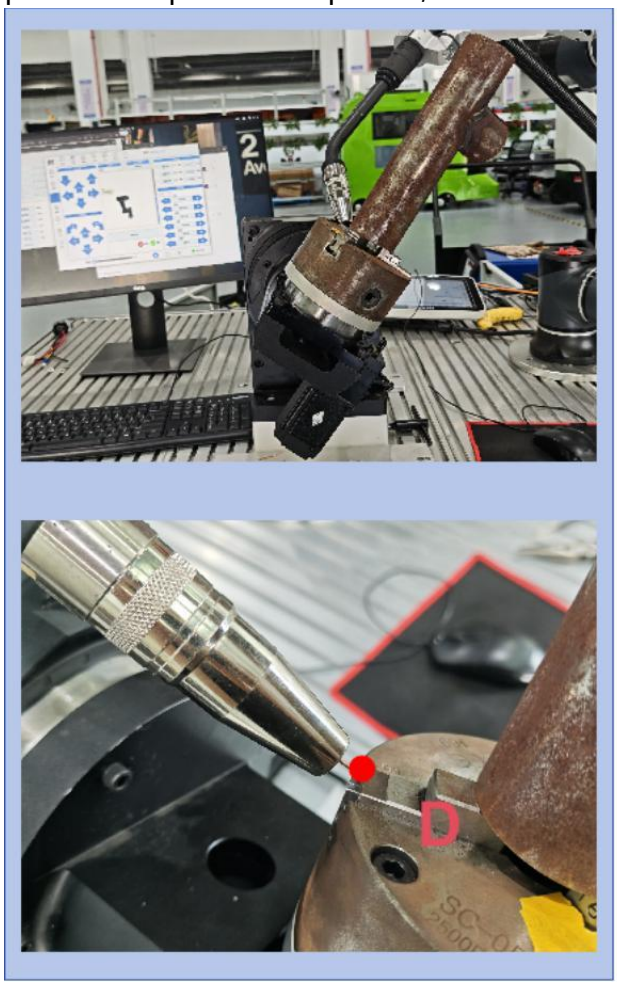


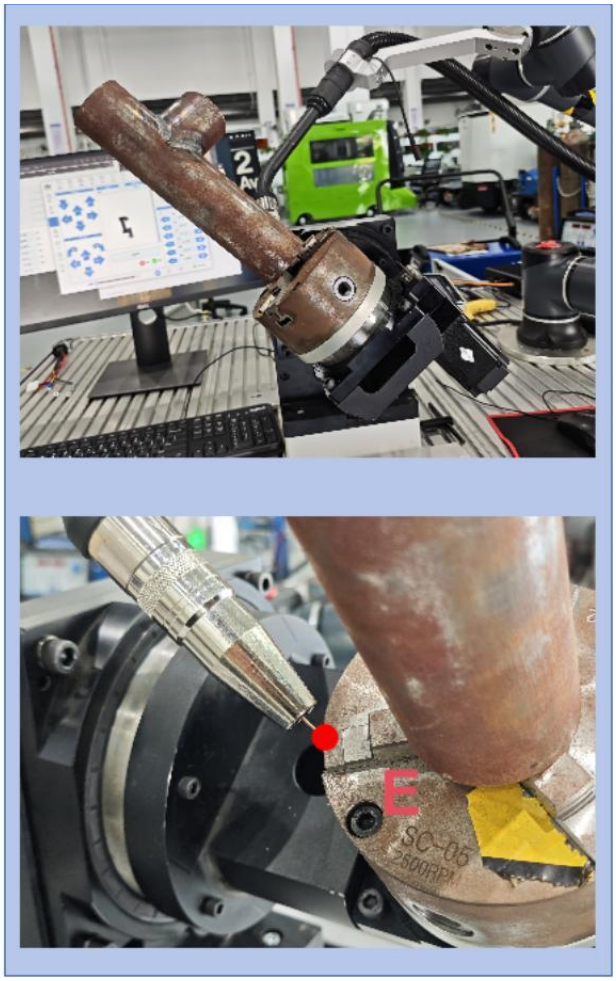




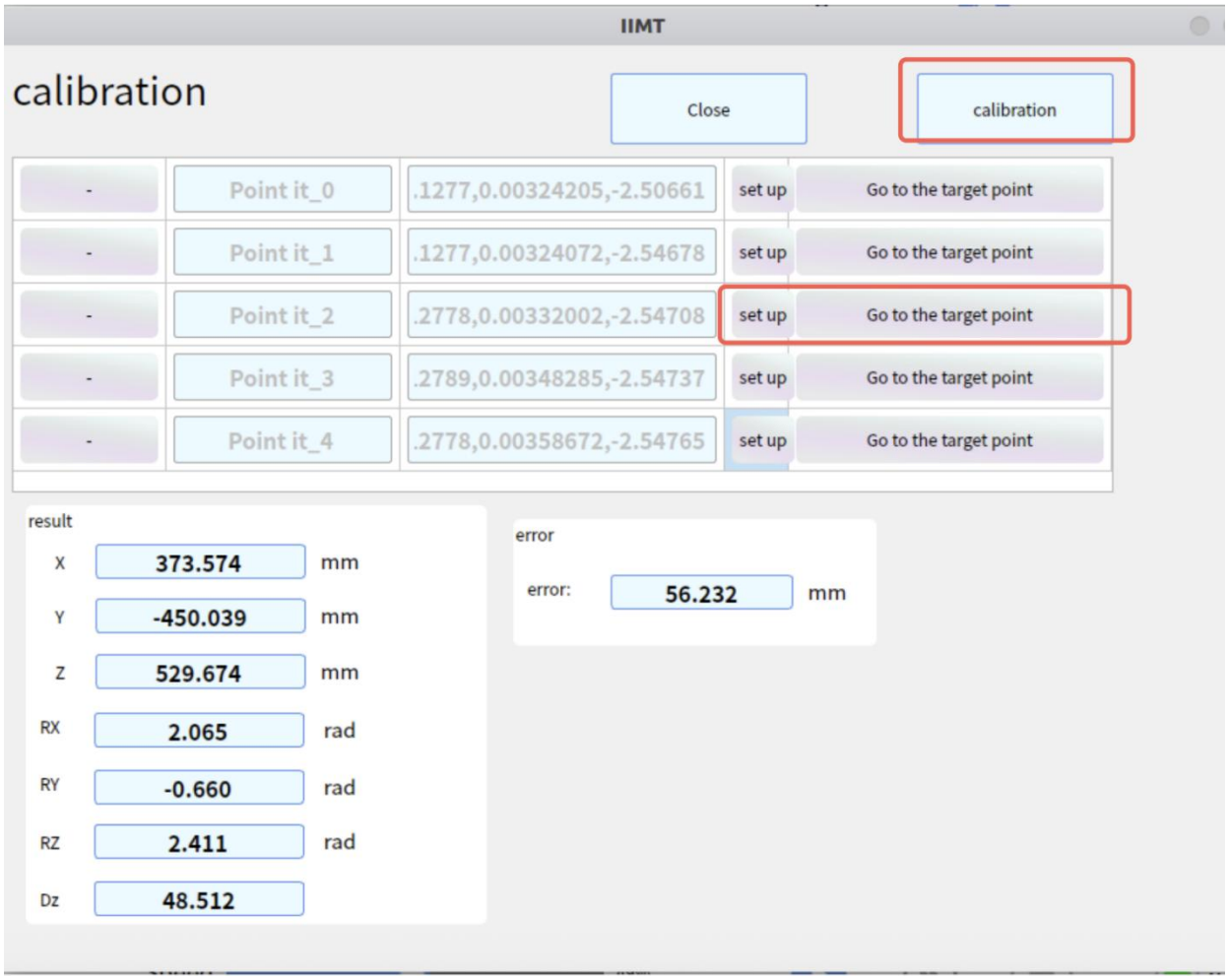


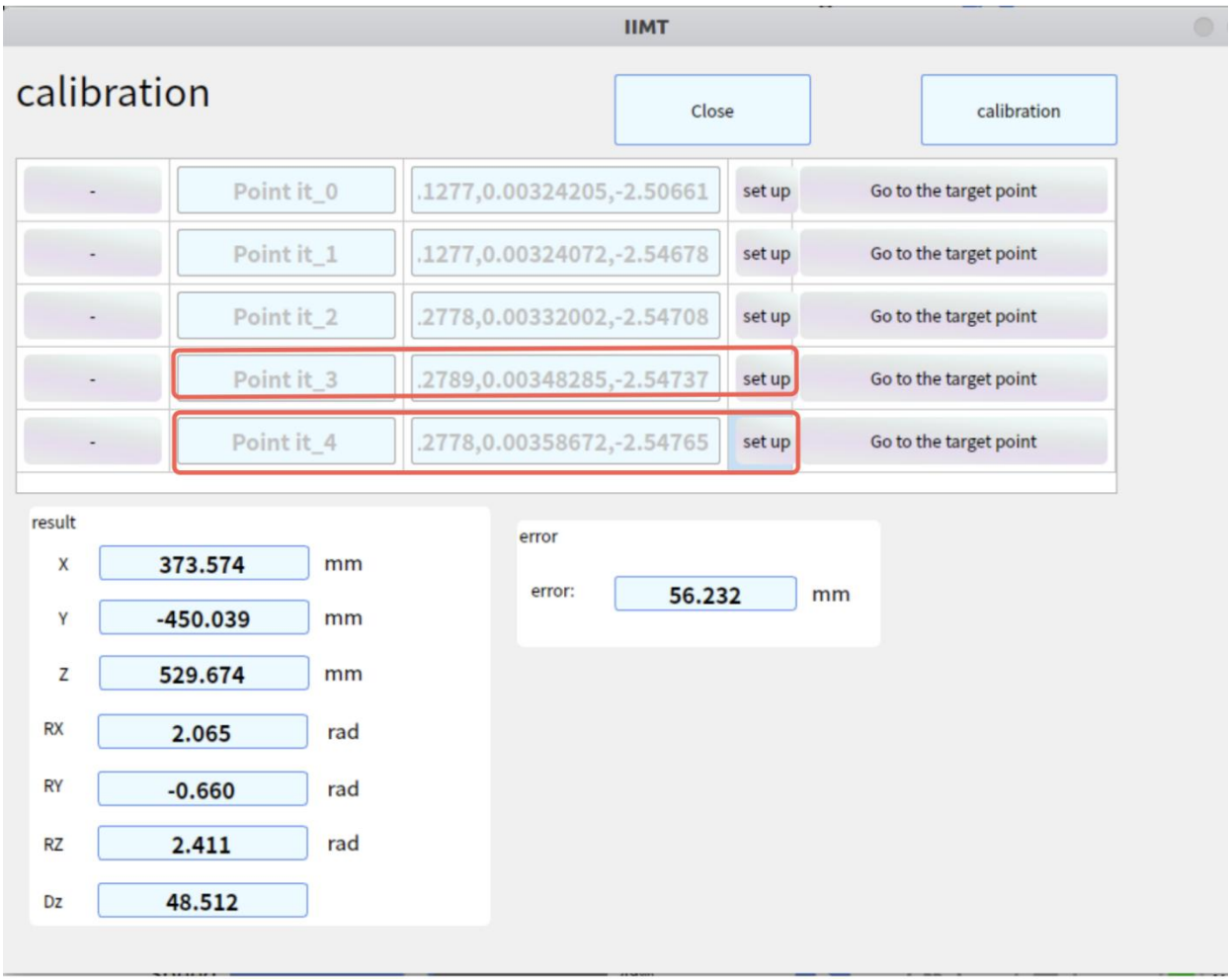
· Step 3: Control the positioner to rotate axis 1 forward from the zero position by a certain angle, record the position of point C in step 1 as point D, rotate axis 1 reversely from the zero position by a certain angle, record the position of point C in step 1 as point E, control the robot arm to move the welding wire to point D and point E respectively, and enter the point positions as point 3 and point 4;





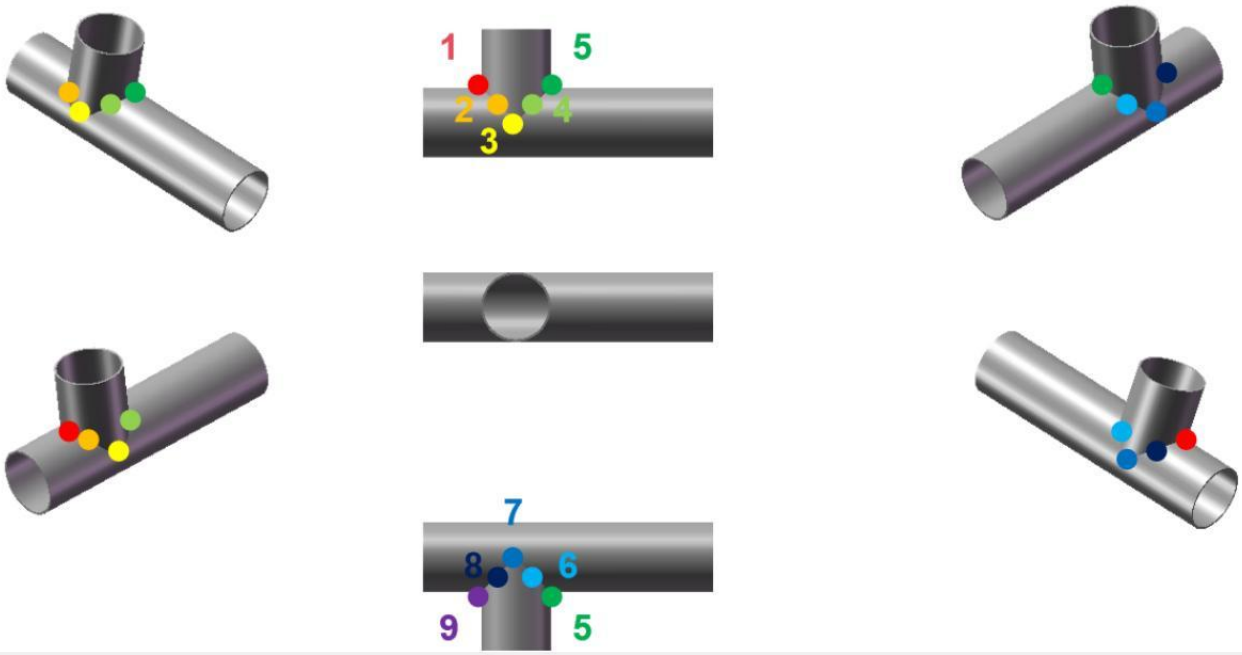
· Step 4: Click "Calibrate" to complete the positioner calibration.





7.5 External shaft welding operations

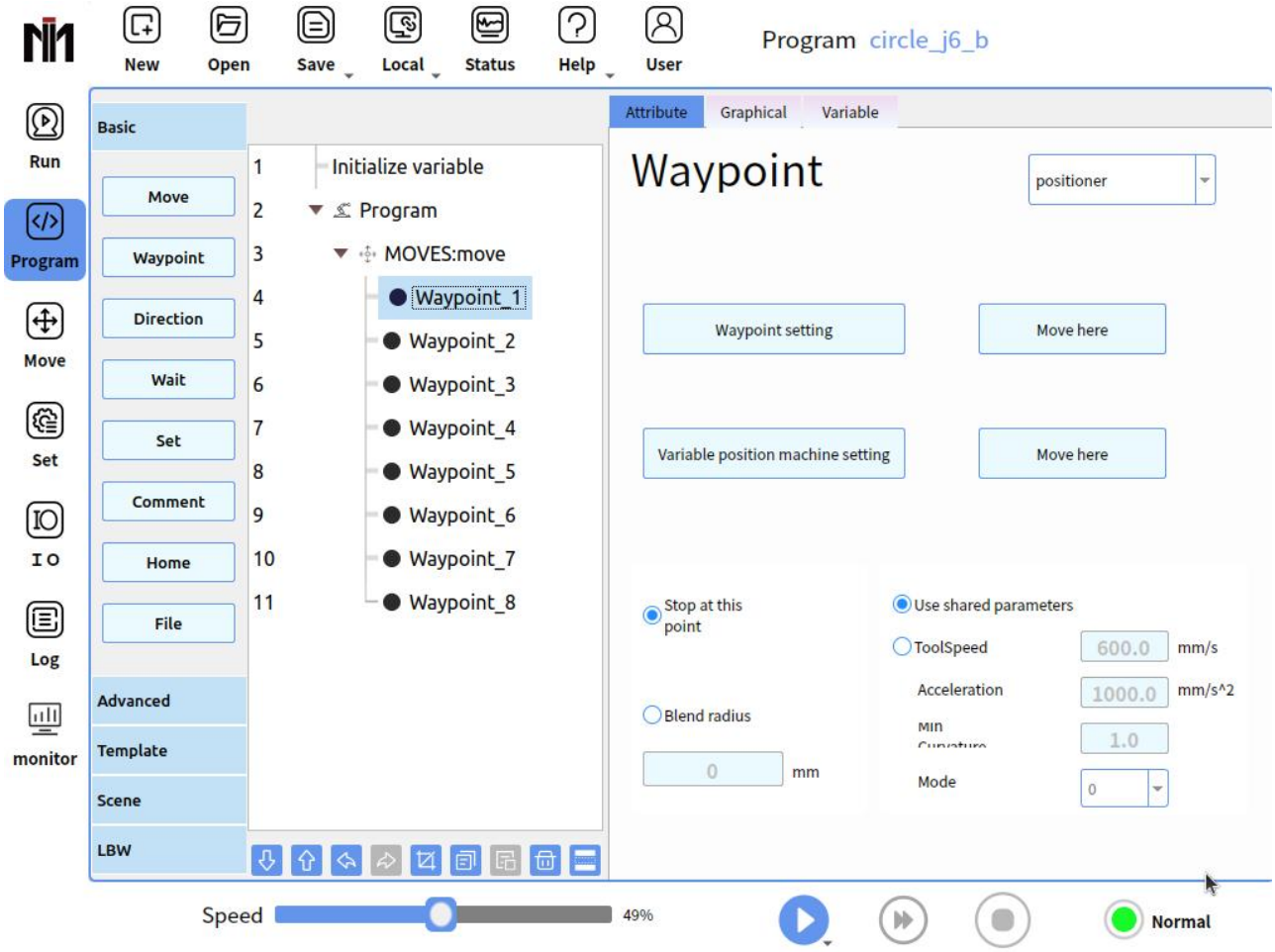
Taking the welding intersection line as an example, the key points are shown in the figure below:



> Waypoint 1 and waypoint 9 are at the same position on the workpiece, but due to the movement of the two axes of the positioner, the positions of waypoint 1 and waypoint 9 relative to the robot arm may be different.

For example, for waypoint 1, the point selection operation is as follows:

- Return to the robot control interface, select "Program-Basic-Waypoint-MOVEJ", change "MOVEJ" to "MOVES" in the property window, click "Waypoint" to create a new waypoint. As shown in the figure, nine waypoints are created. For the location of the waypoints, refer to Section 7.5;



- Click "Positioner Setting", move the positioner to the target position,

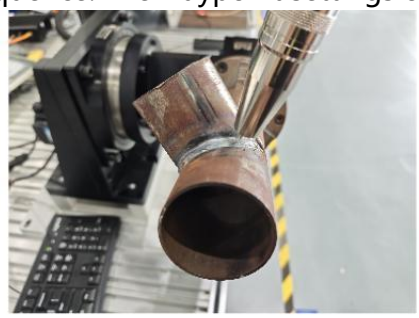
and click "OK" to record the current position of the positioner·

Click "Waypoint Setting", move the robot arm to the target position, and click "OK" to record the current position of the robot arm;

- Just record nine waypoints in sequence. The waypoint settings can be seen in the figure below:



Waypoint 1



Waypoint 2



Waypoint 3



Waypoint 4



Waypoint 5



Waypoint 6



Waypoint 7



Waypoint 8



Waypoint 9

> When selecting points, try to ensure that the welding gun tip is perpendicular to the tangent of the intersection line.

集萃智造

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Jiangsu Jitri Intelligent Manufacturing Technology Institute Co., Ltd.