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Instruction Manual for Teaching Device

V 3.3

2017-07-19

Directory

1 Introduction

HansRobot teaching device is an interface operation software for robot manual operation software for robot manual operation, program preparation, parameter configuration and monitoring. The user can control the robot according to the path specified by the user through the function interface to make the robot complete the desired action. In other words, the teaching device is the steering wheel that controls the motion of the robot.

The teaching device is divided into the following modules：

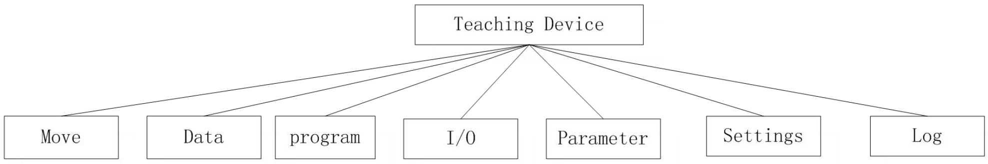


Fig 1.1 function module of teaching device

2 Installation instruction

Follow these steps to install the DCS and the teaching device software.

2.1 DCS and teaching device installation

1. Double click the HansRobot installation package;

Fig 2.1

2. After selecting Chinese/English, click OK;

Fig 2.2

3. After selecting the installation path, click Next;

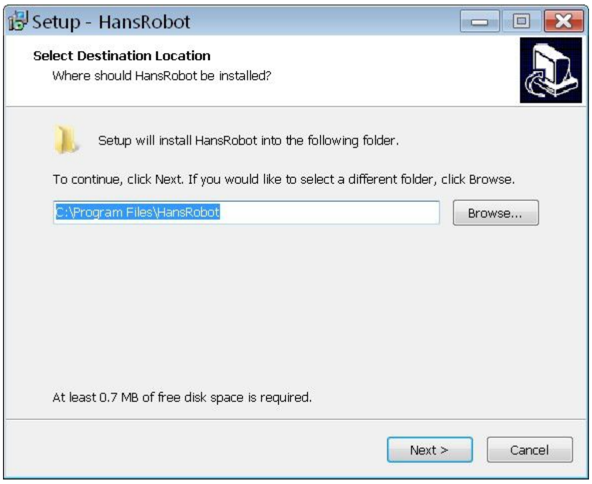


Fig 2.3

4. After selecting full, click Next;

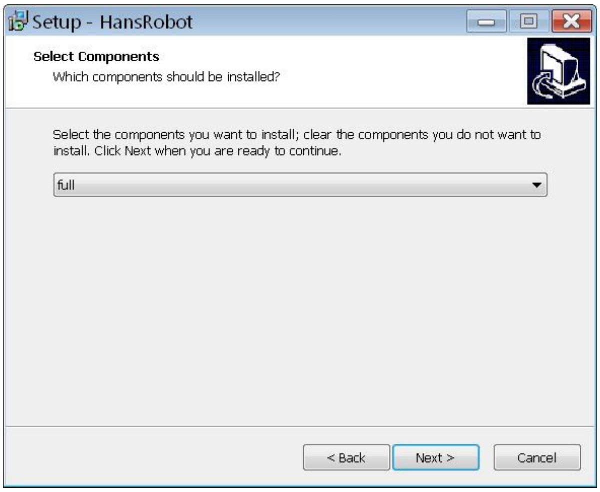


Fig 2.4

5. Click Next;

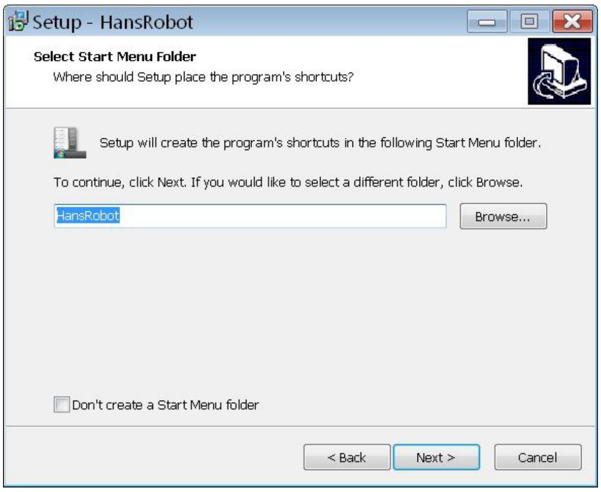


Fig 2.5

6. Default, click Next; (If check "Run DCS with windows", then the EcController and DCS will self-starting)

Fig 2.6

7. Click Install, start installation;

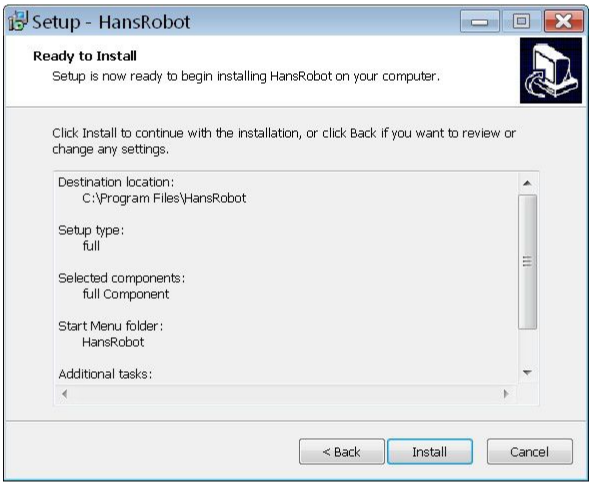


Fig 2.7

8. Waiting for the installation to complete;

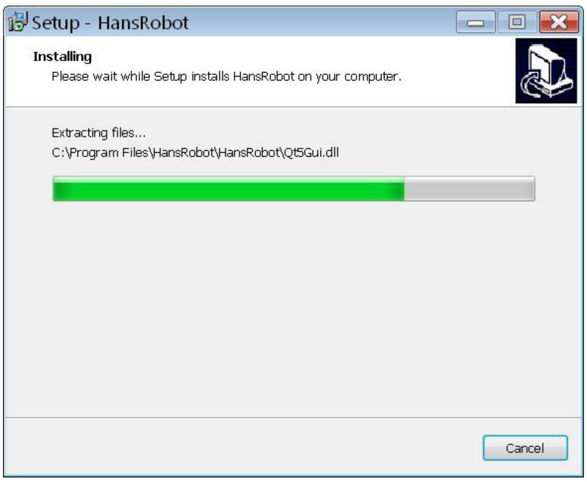


Fig 2.8

9. Click Finish, installation is complete;

Fig 2.9

When the installation is complete, the desktop displays the shortcuts of HansDCS and HansRobot(teaching device).

Fig 2.10

3 Software startup

1. When the computer starts, checking EcController and DCS whether to start successfully or not(the boot time is: 45s)

(1) Flag for successful startup of controller:

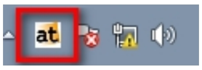


Fig 3.1

(2) Flag for successful startup of DCS:

Window appears: AppMain init finish..., as shown in Figure 3.2;

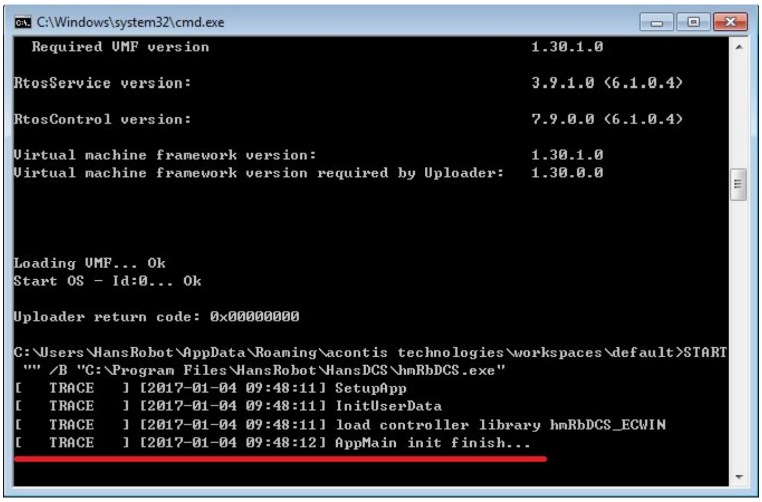


Fig 3.2

2. When the computer starts, if the EcController and DCS have not self-starting. You should start separately EcController and DCS;

Startup sequence:

(1) Start E**cController,** double click "**Start RTOS-hansEcController**";

Fig 3.3

(2) Flag of start successful;

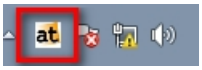


Fig 3.4

(3) Start DCS, double click the "HansDCS" startup software on your computer desktop;

Fig 3.5

(4) When the startup is successful, the following pops up;

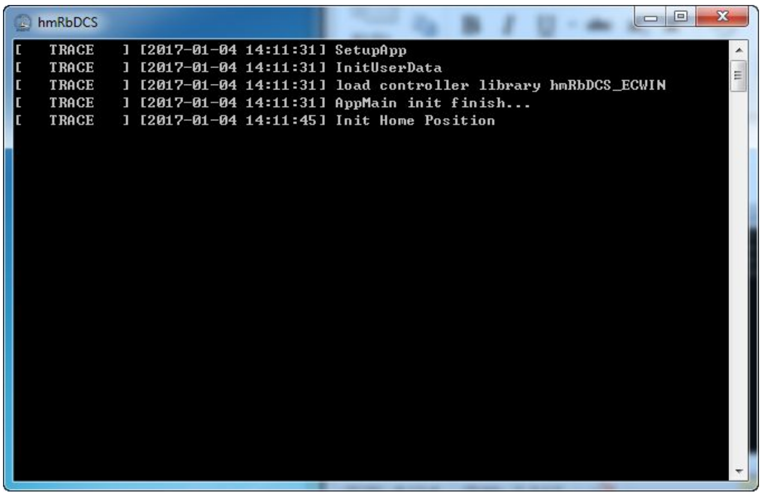


Fig 3.6

3. Start up teaching device

(1) Open the teaching device software, double click the " HansRobot " startup software on the computer desktop;

Fig 3.7 HansRobot

(2) Pop up figure 3.8 user login dialog box, click Ok;(There is a power distinction between users)

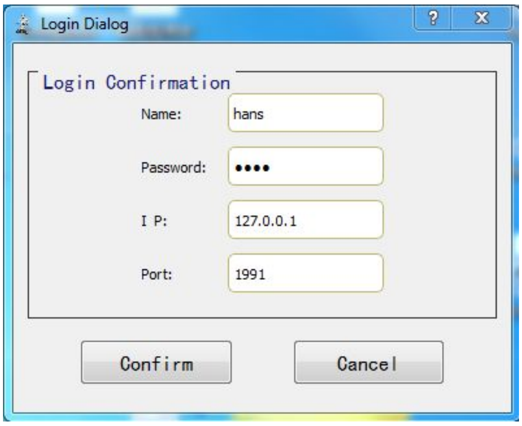


Fig 3.8 user login dialog box

(3) When the login is completed, there are two cases for the state of the main body. if the main body has not been powered on, it will be prompted for power on; When you login ,the body has been powered on. There will be prompted to start the master station;

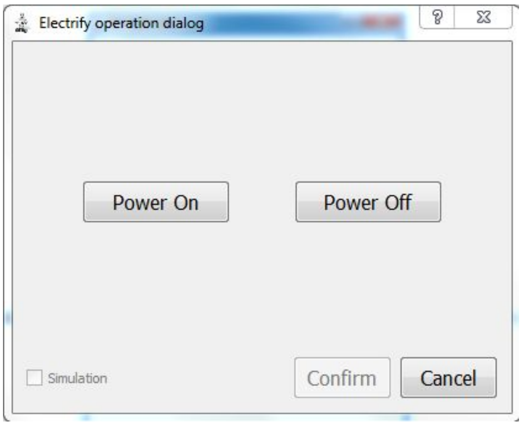


Fig 3.9 Electrically charged interface

(4) After power on, click the Ok button to enter the main interface;

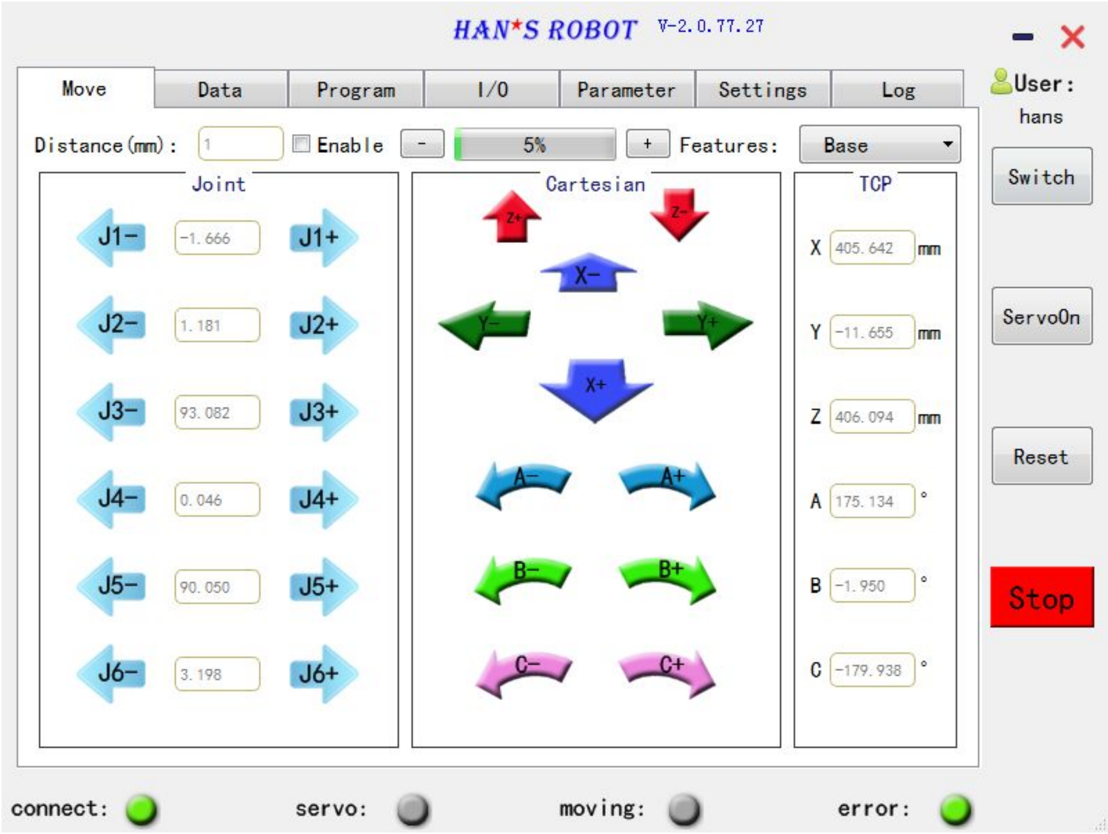


Fig 3.10 main interface window

(5) To complete the above steps, use the teaching device to control the robot.

4 Software operation instructions

The main interface has 3 sections, including:

① Control panel

② State indicator

③ Function module

As shown in Figure 4.1.

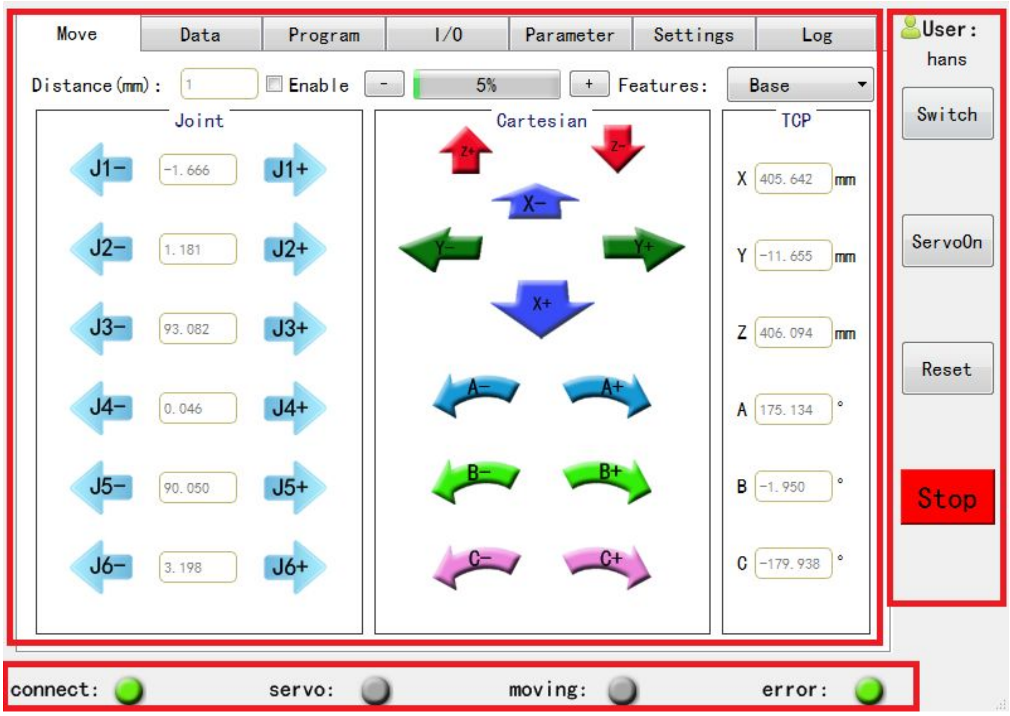


Fig 4.1 main interface window

4.1 Control panel

Control panel, which controls the basic operation of a robot.

Fig 4.2 control panel

1. User: Displays the name of the currently logged in user.
2. Switch: Click "Switch" to switch between ordinary and advanced users. Only login advanced user account can have maximum authority and use certain special function.

   Click "Switch", pop up figure 4.3 shows the teaching device login dialog box. Change the user name and password, click Ok to confirm login, click Cancel to cancel login.

When the login is successful, the user name displays the current login user name. If login fails, the login prompt window pops up, prompting the login to fail. Make sure the user name and password are correct, and then login in again.

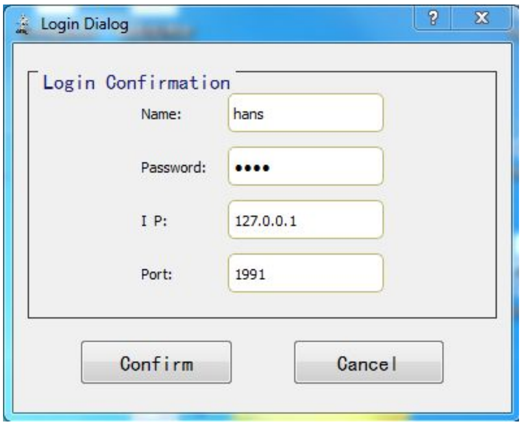


Fig 4.3 teaching device login dialog box

3. Servo On: Click the "Servo On" enable the robot to enter the state of servo on. If successful, the button text becomes "Servo Off" and the state of servo on indicator light turns green(The robot motion must be controlled in the state of servo on).
4. Servo Off: Click the "Servo Off" enable the robot to enter the state of servo off. If successful the button text becomes "Servo On" and the state of servo off indicator light turns gray.
5. Reset: When the drive is reported wrong, the wrong state indictor light is red flashing. Click "Reset" to reset error. After successful cleaning, the wrong indicator light turns green.
6. Stop: In robot motion, click "Stop" enable the robot to stop.

4.2 State Indicator

The state indictor light can identify the robot's condition, determine whether it is beyond safe space and if there is any error.

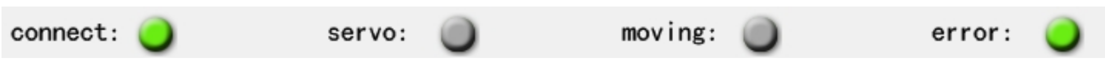


Fig 4.4 state indictor light

1. connection: The indicator light is green indicates that the DCS is connected and the gray indicates that the DCS is not connected.
2. servo: The indicator light is green indicates that the robot is in the servo on state and the gray indicates that the robot is in the servo off state.
3. moving: The green indicates that the robot is in motion and the gray indicates that the robot is not moving at moment.
4. error: Under normal conditions, the indicator light is green. When the error occurs, the

indicator light is red flashing. To make sure what went wrong, you can view the diary module. (1) If the robot is not powered on, click the power on button. (2) If the master station is started, click the start button. (3) If the robot is beyond safe space, use a long moving robot to return to its safe position. Then click the reset button to clear the error and return the indictor green. (4) If the drive is wrong, click the reset button to clear the error and return the indictor green.

4.3 Label->Move

The Move interface is mainly used for the basic operation of robot motion, which enables the robot to perform angular motion and spatial motion.

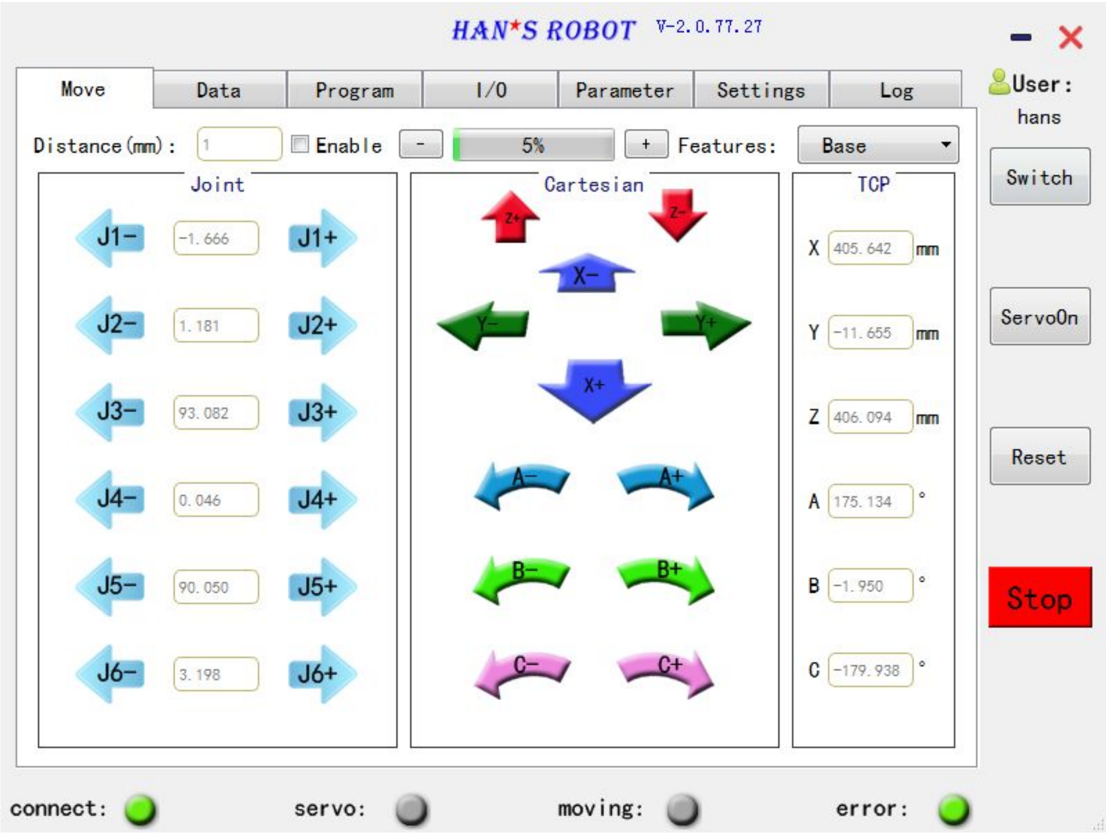


Fig 4.5 inching teaching

Fig 4.6

1. Distance: Motion offset, unit mm/°.
2. Enable: When Enable, relative motion is enabled. If enabled is check, click the move the corresponding offset of the user input in the corresponding direction. For example, the step distance parameter is 10, if enabled is check, click the J1- button, J1 axial negative direction 10°.
3. Speed ratio: The progress bar shows the current speed ratio of the robot ; Click the "-", "+"

buttons on both sides to adjust the robot speed ratio. Each click "+" button increases the speed by 1%. Long press, continuous increase speed, and the release button stops increasing. Each click "-" button decrease the speed by 1%. Long press, continuous decrease speed, and the release button stops decreasing. The current speed range is 1%-100%.

4. Features: A coordinate system for controlling robots is defined. You can switch between base coordinates and user coordinates and tool coordinates.

Robots have two modes of motion: one is angular motion, and the other is spatial motion.

4.3.1 Joint

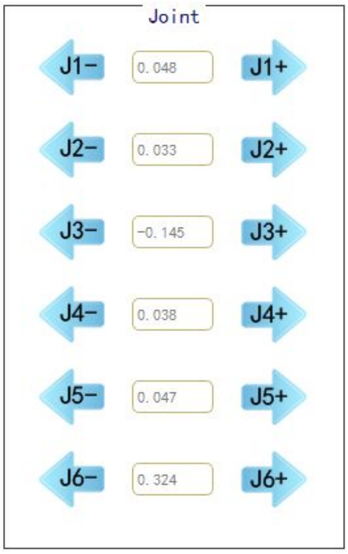


Fig 4.7 angular coordinate

J1-J6 represent the corresponding axes of a robot

The text box displays the angle coordinate values of the corresponding axes of the current robot, unit as angle.

(1) J1-, J2-, J3-, J4-, J5-, J6-corresponding buttons: In the safe space, the robot moves the axis in a negative direction, and the text box shows the current position of the corresponding axis. Each click of the button, corresponding to the axial negative direction of movement 2°. Long press, the corresponding axis moves continuously in the negative direction. Release the button and stop moving. If the relative motion is selected, it moves in an axial negative direction, moving distance as the user enters the step distance.

(2) J1, J2+, J3+, J4+, J5+, J6+ corresponding buttons: In the safe space, the robot moves the axis in a positive direction, and the text box shows the current position of the corresponding axis. Each click of the button, corresponding to the axial positive direction of movement 2°. Long press, the corresponding axis moves continuously in the positive direction. Release the button and stop moving. If the relative motion is selected, it moves in an axial positive direction, moving distance

as the user enters the step distance.

4.3.2 Cartesian

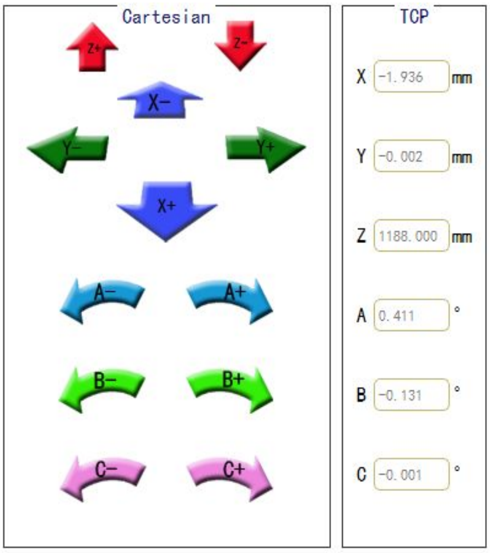


Fig 4.8 Spatial coordinate

TCP: The current tool coordinate name used.

X, Y, Z, A, B, C represented respectively the robot's current spatial coordinates position vectors.

The text box displays the spatial coordinates of current robot TCP(tool)relative to the selected feature.

(1) X-,Y-, Z- corresponding buttons: In the safe space, the robot moves in the negative direction of the component, and each click of the button moves 2 mm in the negative direction of the axis. Long press, the corresponding axis moves continuously in the negative direction. Release the button and stop moving. If the relative motion is selected, it moves in an axial negative direction, moving distance as the user enters the step distance.

(2) A-, B-, C- corresponding buttons: In the safe space, the robot moves in the negative direction of the component, and each click of the button moves 2° in the negative direction of the axis. Long press, the corresponding axis moves continuously in the negative direction. Release the button and stop moving. If the relative motion is selected, it moves in an axial negative direction, moving distance as the user enters the step distance.

(3) X+, Y+, Z+ corresponding buttons: In the safe space, the robot moves in the positive direction of the component, and each click of the button moves 2 mm in the positive direction of the axis. Long press, the corresponding axis moves continuously in the positive direction. Release the button and stop moving. If the relative motion is selected, it moves in an axial positive direction, moving distance as the user enters the step distance.

(4) A+, B+, C+ corresponding buttons: In the safe space, the robot moves in the positive direction

of the component, and each click of the button moves 2°in the positive direction of the axis. Long press, the corresponding axis moves continuously in the positive direction. Release the button and stop moving. If the relative motion is selected, it moves in an axial positive direction, moving distance as the user enters the step distance.

4.4 Label->Data

The table area is used to store point data. In this module, the user can through the ACS/PCS teaching, implement add, modify, and delete dot data. Drive the robot to the specified location according to the point data in the table and it also can loop all the points in the list of points. Data module can be imported locally or exported locally.

In the script, you can refer directly to the point taught by the system point. The point of motion in the script is represented by _P0, _P1, _P2...._Pn.

Fig 4.9 system point

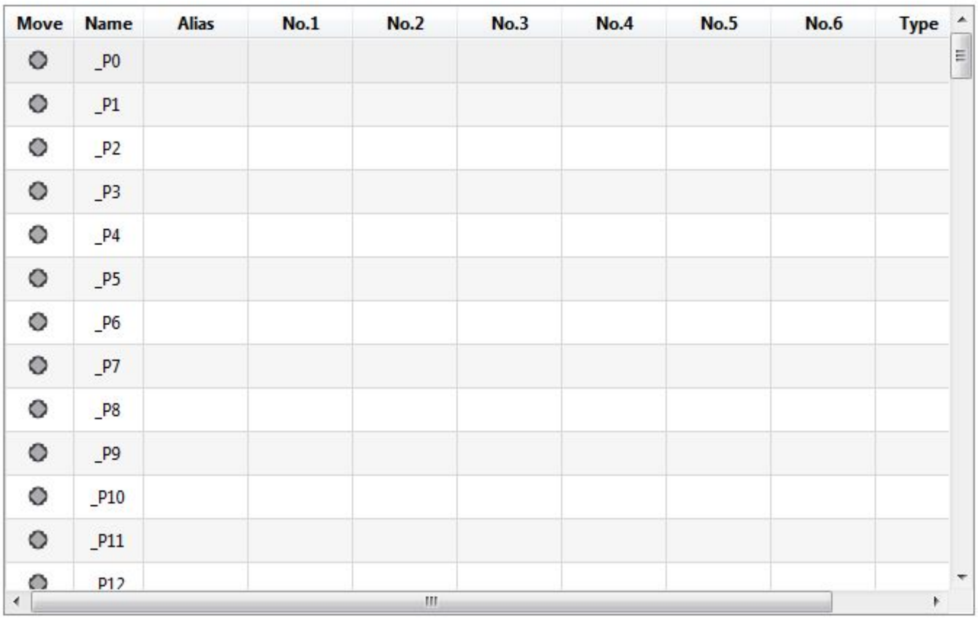
1. ACS Teach: Angle coordinate point data added, modified. Click the " ACS Teach " button to jump to the point-to-point display interface. Move the robot to the desired position, click the Ok button to obtain the current robot's angle coordinate value. Double click the table to manually edit the coordinate parameter values.
2. PCS Teach: Spatial coordinate point data is added and modified. Click the "PCS Teach" button to jump to the point-to-point display interface. Move the robot to the desired position,

click the Ok button to obtain the current robot's spatial coordinate value. Double click the table to manually edit the coordinate parameter values.

3. Loop Run: Click the "Loop Run" button to circle all stations in the list of jobs in infinite order. An ACS type of point will default to the angular movement, and the PCS type will default to the rectilinear motion. The movement state indictor turns green, and the other function buttons on the interface become servo off state. When the robot moves to a certain station, the corresponding move light turns green. Click on the stop button, the robot immediately stop cycling movement, the movement state indictor is displayed as gray, and the other function buttons on the interface resume the servo on state.
4. Move To: Long press the "Move To" button, the robot moves to the selected target point in the prescribed movement mode. A ACS type of point will default to the angular movement, and the PCS type will default to the rectilinear motion. In the course of movement, the Move light is green and the Move light turns gray after moving to the target point.
5. Edit: Click the "Edit" button to delete the selected system point.
6. Open: Click the "Open" button， select the .spi file, then click the open button. That is, local system point information is imported to the teaching device.
7. Save: Click "Save" button, select the storage path, edit the exported file name, click save. That is, exporting system point information to the local, save as .spy file.
8. Form:

Maximum coordinates of 128 system points can be set;

Double click the table to manually edit point information.



Move	Name	Alias	No.1	No.2	No.3	No.4	No.5	No.6	Type
	_P0								
	_P1								
	_P2								
	_P3								
	_P4								
	_P5								
	_P6								
	_P7								
	_P8								
	_P9								
	_P10								
	_P11								
	_P12								

Fig 4.10 point table

(1) Move: Movement indicator lamp; During the movement, the movement to a system point,

then the corresponding system point's Move light is green, other system point's Move light is gray.

(2) Name: System point name, use _P0, _P1, ..._Pn naming; In scripting, you use this variable name directly to refer to the corresponding system point.

(3) Alias: User defined name , the default name is P0, P1,...Pn. Double click the table of the corresponding system table rows for editing.

(4) No.1~ No.6: Axis 1 to axis 6 coordinate values, can be obtained by ACS /PCS teaching. Double click the table of the corresponding system table rows for editing.

(5) Type: coordinate, ACS is the angle coordinate type, and PCS is the space coordinate type.

4.5 Label->Program

The interface of Program module is mainly used for scripting, so that the robot can be based on the list of scripting functions to set the trajectory of movement. In the actual production process, the script can enable the robot to continue to complete a series of production actions. **For scripting, refer to the HansRobot script help documentation.**

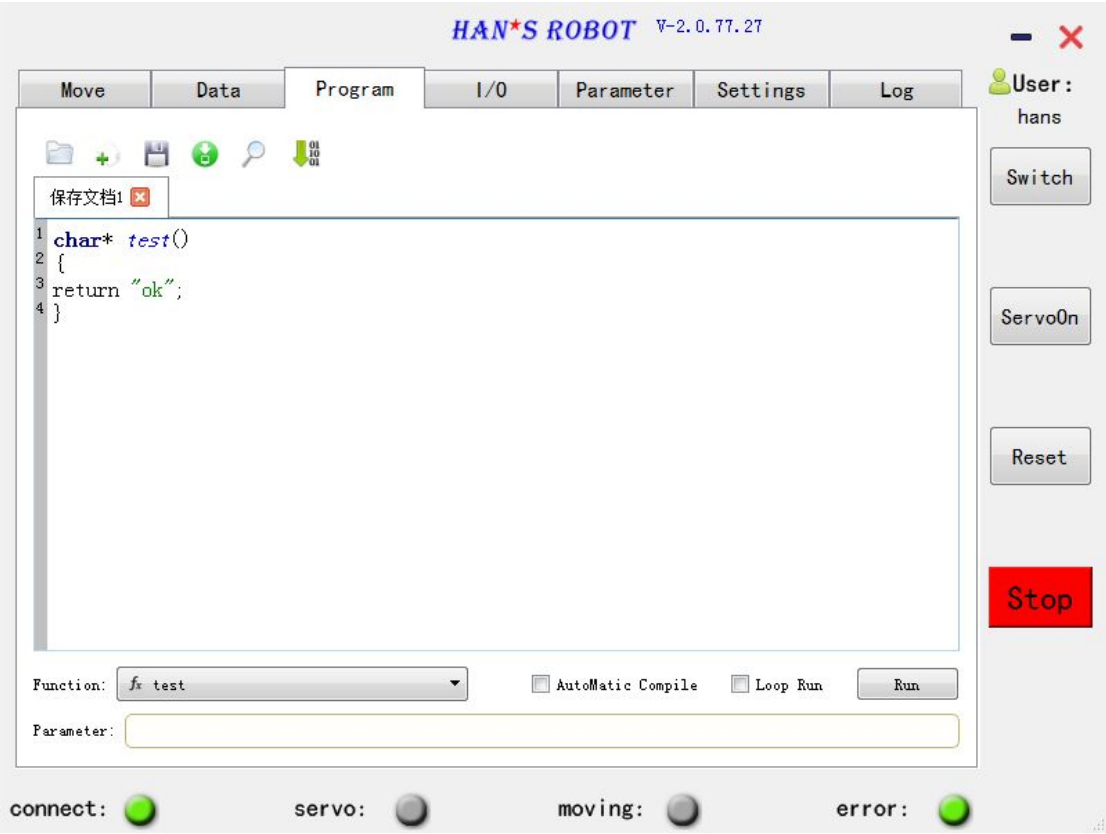


Fig 4.11 scripting

1.  : Open the required script file and import the .c file.

2.  : Create a new script file and write scripts directly on the new file.

3.  : Script file prepared by newspaper storage.

4.  : Save the script file to the specified location.

5.  : Find and replace script strings. Find shortcut key allows you to quickly find the information you need; Replace All shortcut key can replace the string in the Find box with the Replace box.

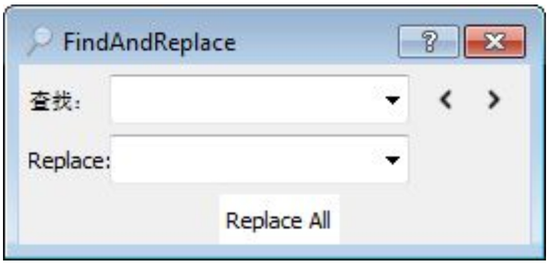


Fig 4.12

6.  : Compile script. Compile successfully, pop up successfully compiled dialog box; Function list shows the script function. Compiled failed , pop up the failed dialog box ; Modify script file error according to prompt content, recompile after modification. If the script content uses the system task function and compiles successfully, the system task function is started.

7. Function:script function,after compiling successfully,the script function is displayed in the list.The drop down box can select the required script function.

8. Parameter: The list of parameters corresponding to the custom function. Each parameter is separated by an English comma. Format as: **Param1, Param2,…, Paramn** .

9. AutoMatic Compile:If Auto is checked,restart the hansDCS will automatically compile the script.

10. Cycle operation: After the loop is checked, click the run button to cycle the selected script function.

11. Run: Run the selected script function. Click the run button to run the selected script file at one run.

Operation case: After writing the script file, click the compiler icon button to show that the function is selected at the function list after the compilation succeeds. Click on the "Run" button, and the robot will run in accordance with the selected script function.

notes: If the script content uses the system task function and compiles successfully, the system task function is started.

4.6 Label->I/O

The main function of the I/O management interface is to manage the IO settings, add or modify IO information, and view the input/output state.

4.6.1 Output

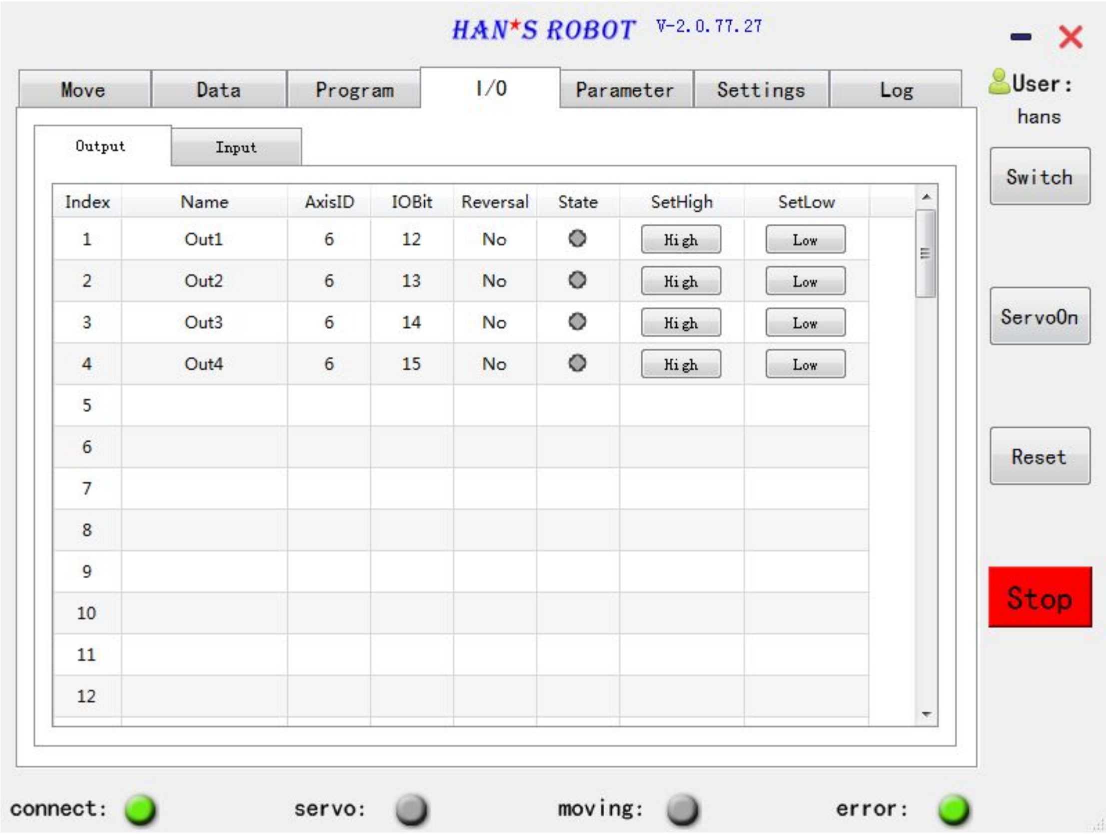


Fig 4.13 output IO

1. Index: Output IO index.(The digital output used by scripting corresponds to the output of the IO index)

2. Name: The name of the output IO.

3. AxisID: ID of the output axis.

4. IOBit: Output IO bit.

5. Reversal：Whether to reverse the level.

6. State: Output IO state indictor light. When the value of Reserval is No, the output is low level and the indicator light is gray; the output is high level and the indicator light is green. When the value of Reserval is Yes, the output is low level and the indicator light is green; the output is high level and the indicator light is gray.

7. SetHigh: Sets the high level of the output IO. Click on High, the level will be pulled high, Stata light is green.

8. SetLow: Sets the high level of the input IO. Click on Low, the level will be pulled low, Stata light is gray.

9. Double click the IO table row to add and modify the output IO information.

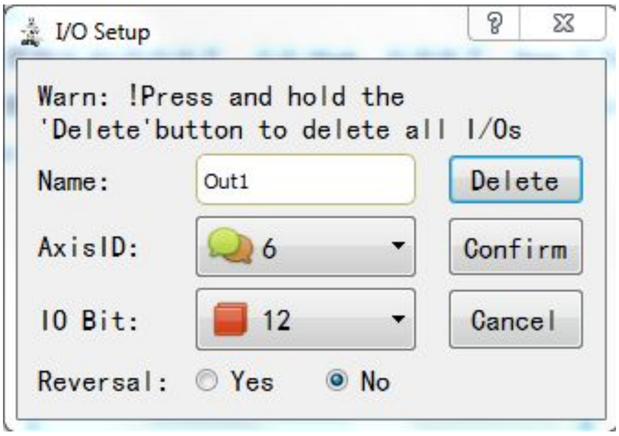


Fig 4.14 IO edit wire label

(1) Name: The name of the output IO.

(2) Axis ID: 16 options are available.

(3) IO bit: Maximum 32 choices.

(4) Reversal: Whether to reverse the level.

(5) Delete: Click delete select output IO, long press delete all output IO.

(6) Confirm: Make sure to add and modify the output IO information.

(7) Cancel: Cancel to add and modify the output IO information.

4.6.2 Input

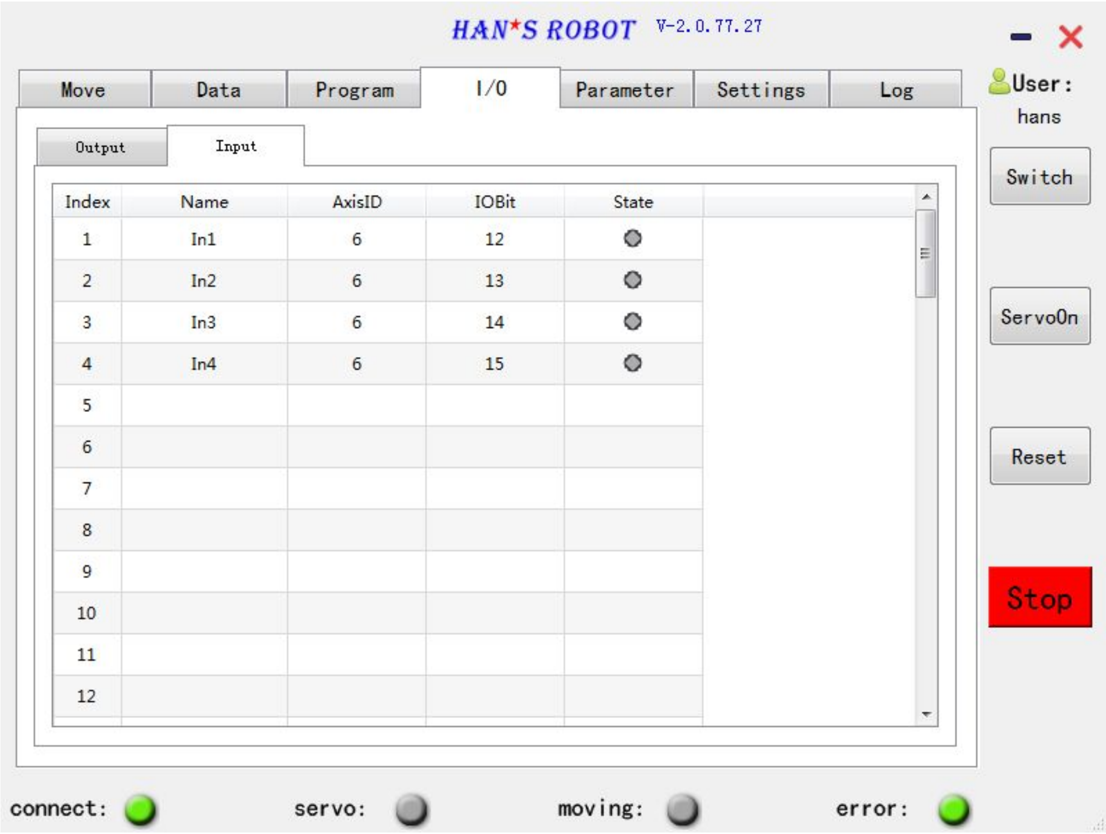


Fig 4.15 input IO

1. Index: Input IO index.(The digital input used by scripting corresponds to the input of the IO index)

2. Name: The name of the input IO.

3. AxisID: ID of the input axis.

4. IOBit: Input IO bit.

5.State: Input IO state indictor light. the input is low level and the indicator light is gray ; the input is high level and the indicator light is green.

6. Double click the IO table row to add and modify the input IO information.

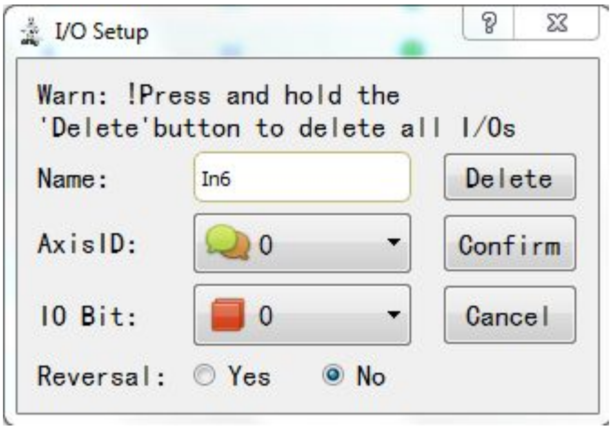


图 4.16 IO 编辑对话框

(1) Name: The name of the input IO.

(2) Axis ID: 16 options are available.

(3) IO bit: Maximum 32 choices.

(4) Reversal: Whether to reverse the level.

(5) Delete: Click delete select input IO, long press delete all input IO.

(6) Confirm: Make sure to add and modify the input IO information.

(7) Cancel: Cancel to add and modify the input IO information.

4.7 Label->Parameter

The interface of Parameter module can carry out the safety scope parameter setting, tool coordinate setting, user coordinate setting and brake set.

4.7.1 Limits

Setting up the robot motion safety space parameters, only the advanced can set up the safe space.

The security space can be divided into: (1) Angle range; (2) Spatial range.

When the robot is beyond the safe space of the setting, the error indicator light is red flashing. At this point, **the teaching device can only move over the safe range of the axis, and can only move in the direction of the safe range.** You can quickly find the axis beyond the space range by moving the interface and logging module.**(Inching interface: The text box is red indicating that the axis is beyond the security range; Log module: Show the axis beyond the safe range)**

After exceeding the security space, you can solve the following two cases:

(1) If the robot is in servo on state, the axis which beyond the safety space can back to safety

by long motion move or reset the security space range of parameters. Then click the reset button, the error indicator light turns green. The robot can continue to control the robot's movement only when the robot is in its normal state.

(2) If the robot is in servo off state, click the reset button to turn the error indicator green. Click "Servo On" button, after the robot is in servo on state, the axis which beyond the safety back to safety by long motion move. Then click the reset button, the error indicator light turns green.

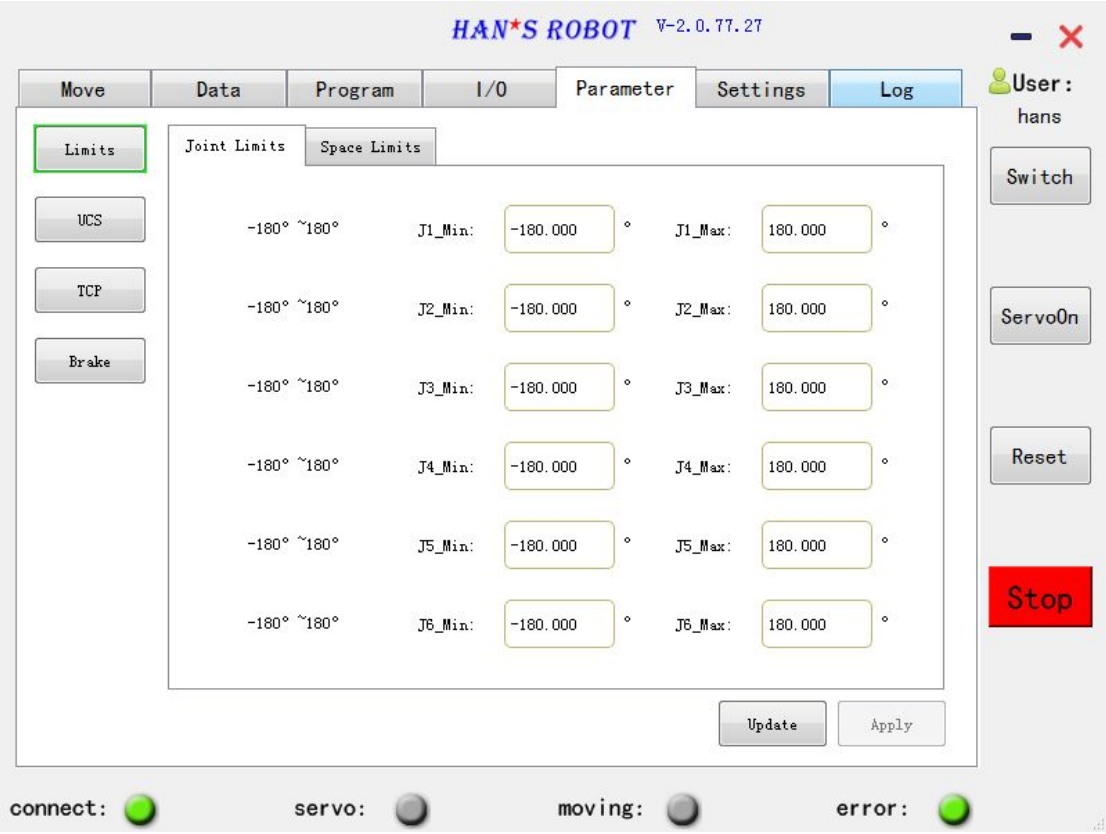


Fig 4.17 Joint Limits

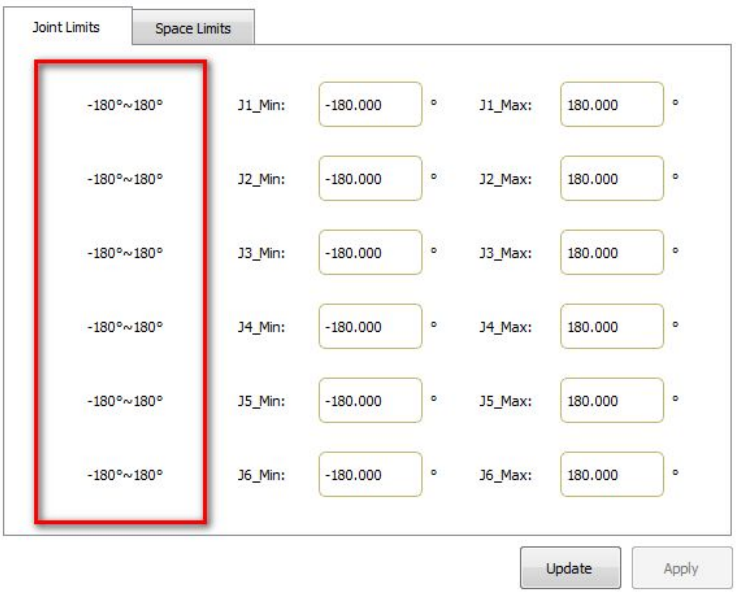


Fig 4.18 set range

1. Joint Limits: Set the safe space of each axis.

2. Parameters of J1_Min, J2_Min, J3_Min, J4_Min, J5_Min , J6_Min, J1_Max, J2_ Max , J3_ Max, J4_ Max, J5_Max, J6_Max: The robot's angle motion safety space range is provide. If the parameter does not meet the requirements, the text box is red, and the application button is not clickable.

3. Parameters of X_Min, Y_Min , Z_Min, A_Min, B_Min , C_Min, X_Max, Y_ Max, Z_ Max, A_ Max, B_Max, C_Max: Specifies the scope of the robot's spatial motion safety. If the parameter does not meet the requirements, the text box is red, and the application button is not clickable.

4. Refresh: Without clicking the application button, click refresh to restore the previously saved data.

5. Apply: Sets the safe range parameter for each axis. After the security zone parameter sets the parameters of the various axis security parameters required for the area input, click apply, and the successful dialog box pops up.

4.7.2 UCS

Setting user coordinates allows you to manually entering user coordinate parameter values, and by means of teaching.

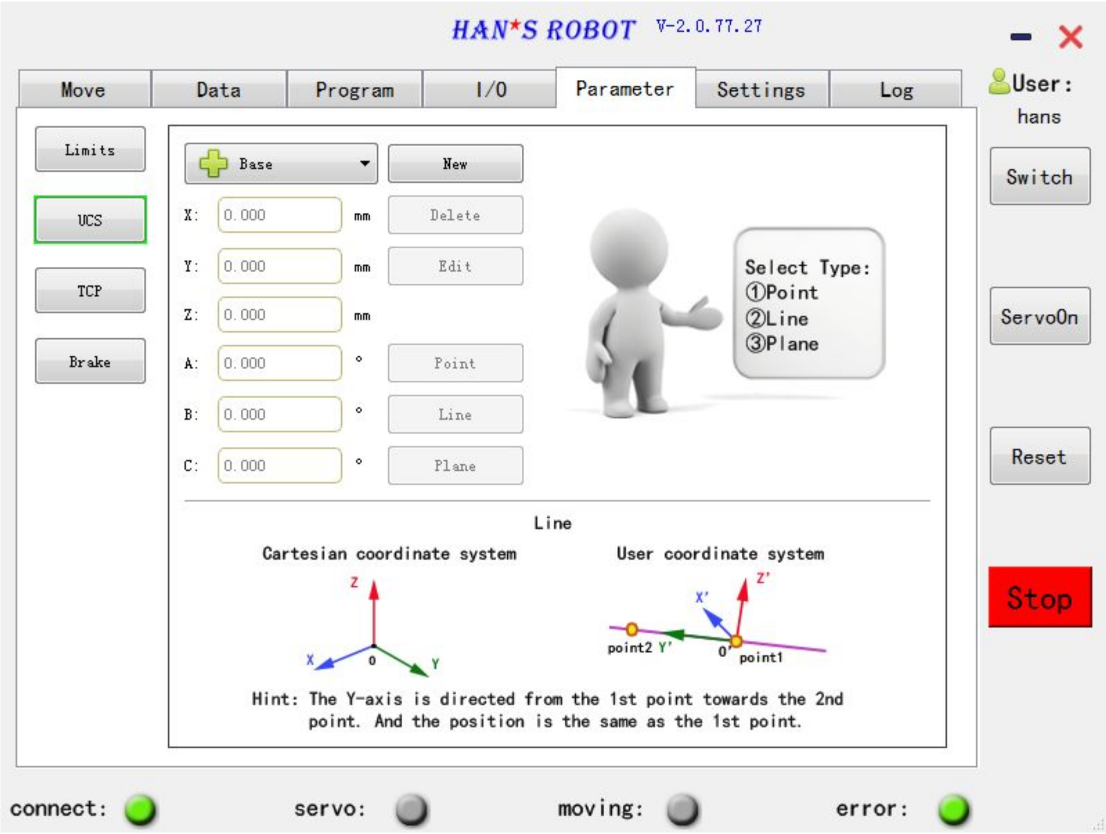


Fig 4.19 user coordinates

1. New: New user coordinate, defaults to 0.
2. Delete: Delete the selected user coordinates.
3. Edit: Manually edit user coordinate parameter values.
4. Point: Click the "Point", automatically jump to the teaching point interface. Drive the robot to the desired position, click the "Ok" button at the bottom right of the moving interface to confirm the demonstration. Click the "Cancel" button to give up teaching this point.
5.Modification point: Modification teaching point, click the modification point button automatically jump to the teaching point interface. Drive the robot to the desired position, click the "Ok" button. Click the "Cancel" button to give up modification this point.
6.MoveTo: Long press the "MoveTo" button, the position of the robot movement to the corresponding teaching points.
7. Setup: Click the "Setup" button to set the calculated results to the selected user coordinates.
8. Cancel: Cancel user coordinates.

9. Point:

The position of the point feature is defined by the location of the TCP at that point. The direction of the point feature is the same as that of the TCP. The point characteristic coordinate system rotates about 180° of its X axis, i.e., the Z axis of the point feature is opposite to the Z axis of the point TCP.

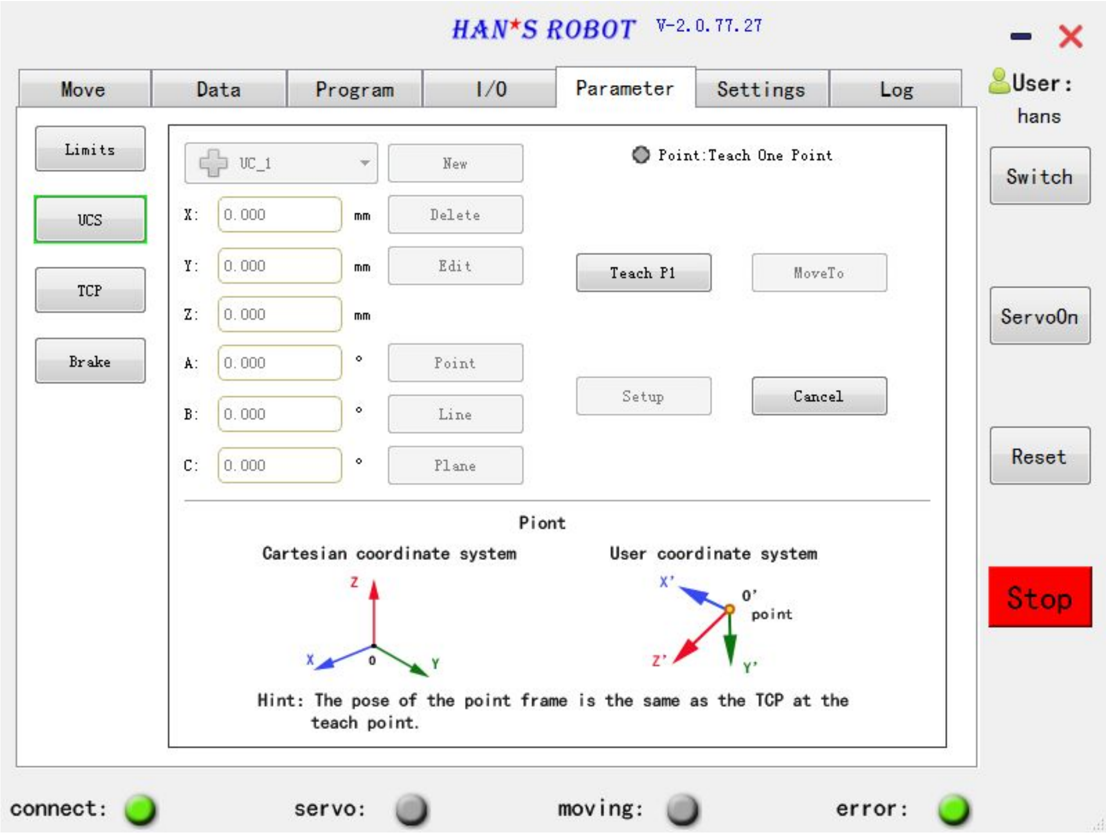


Fig 4.20 point feature

Point teaching example:

(1) Click the "New" button to create a new user coordinate system, which defaults to 0.

(2) Click the "Point" button, and teach a point according to the prompt. Click the "Teach P1", automatically jump to the inching interface. Drive the robot to the desired position, click the "Ok"

button back to the teach user coordinate interface. Interface display the results of the calculation, click the setting button to complete the teaching user coordinates.

(3) The user coordinates can be switched at the feature selector of the point action interface.

10. Line:

The line feature is defined by the axis between two teaching points. The Y axis of a linear coordinate system is defined by the direction of the first teaching point pointing to the second coordinate point. The Z axis of the coordinate system is the same as the Z axis of the first teaching point in the vertical projection direction of the line. The position of the linear coordinate system is the same as the location of the first teaching point.

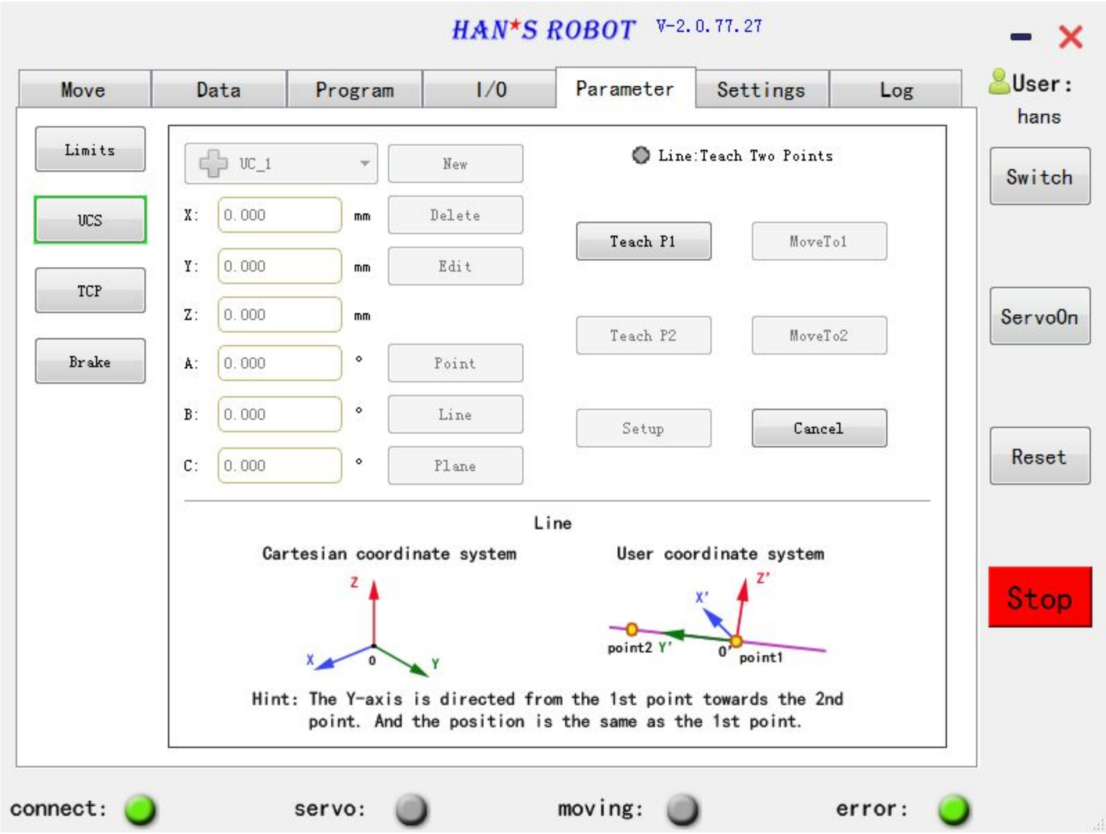


Fig 4.21 linear feature

Example of linear teaching:

(1) Click the "New" button to create a new user coordinate system, which defaults to 0.

(2) Click the "Line" button, and teach two points according to the prompt. Click the "Teach P1", automatically jump to the inching interface. Drive the robot to the desired position, click the "Ok" button back to the teach user coordinate interface.

(3) Click the "Teach P2", automatically jump to the inching interface. Drive the robot to the desired position, click the "Ok" button back to the teach user coordinate interface. Interface display the results of the calculation, click the "Setup" button to complete the teaching user coordinates.

(4) The user coordinates can be switched at the feature selector of the inching interface.

11. Plane:

The plane coordinate system is defined by 3 teaching points. The position of the coordinate system is the same as the TCP location of the first teaching point. The Y axis of a linear coordinate system is defined by the direction of the first teaching point pointing to the second coordinate point. The Z axis is the normal line of the plane, and the angle between the Z axis of the first one is less than 180°.

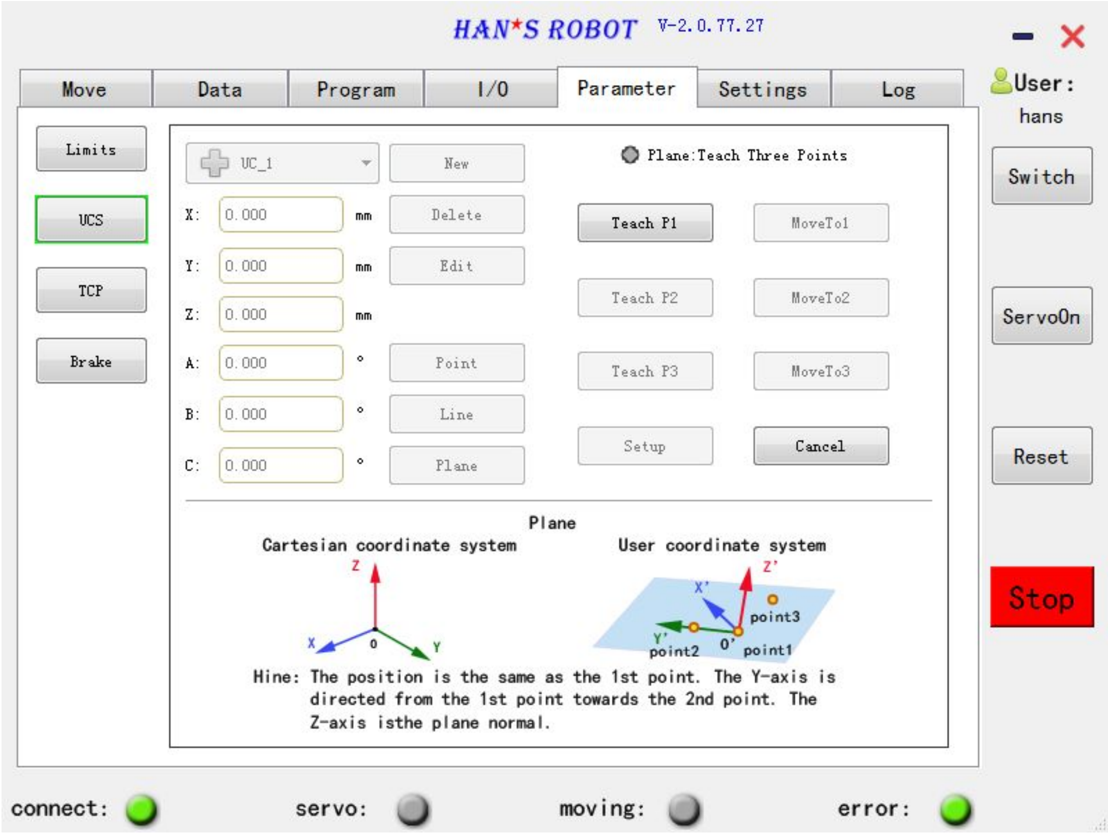


Fig 4.22 surface feature

Example of surface teaching:

(1) Click the "New" button to create a new user coordinate system, which defaults to 0.

(2) Click the "Plane" button, and teach three points according to the prompt. Click the "Teach P1", automatically jump to the inching interface. Drive the robot to the desired position, click the "Ok" button back to the teach user coordinate interface.

(3) Click the "Teach P2", automatically jump to the inching interface. Drive the robot to the desired position, click the "Ok" button back to the teach user coordinate interface.

(4) Click the "Teach P3", automatically jump to the inching interface. Drive the robot to the desired position, click the "Ok" button back to the teach user coordinate interface. Interface display the results of the calculation, click the setting button to complete the teaching user coordinates.

(5) The user coordinates can be switched at the feature selector of the inching interface.

4.7.3 TCP

Setting tool coordinates allows you to manually entering tool coordinate parameter values, and by means of teaching.

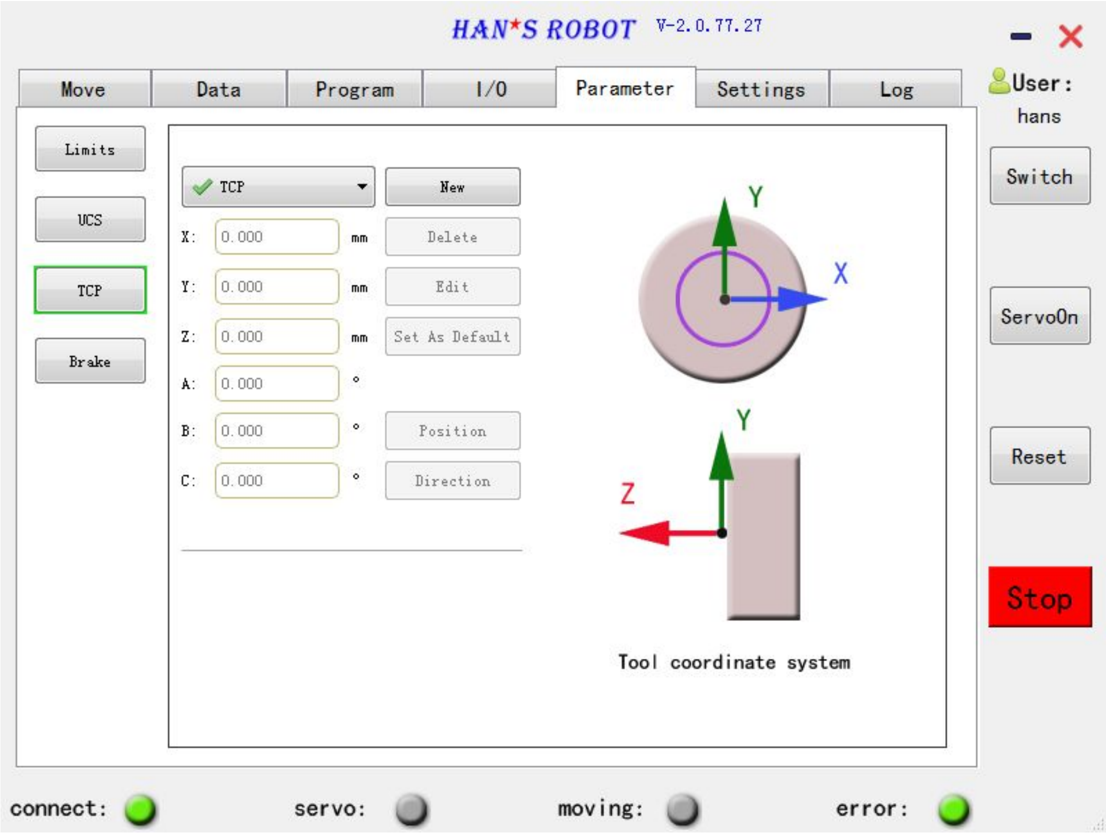


Fig 4.23 surface feature

1. New: New tool coordinate, defaults to 0.

2. Delete: Delete the selected tool coordinates.

3. Edit: Manually edit tool coordinate parameter values.

4. Set As Default: Only one of the configured TCP is the default TCP. In the TCP drop-down menu, set the name of the default TCP with a green √ icon on the left. TCP at inching interface displays the default TCP name. Set the current tool coordinate to the default TCP, you only need select the TCP button.

5. Payload: Robot tool weight.

6. Center of Gravity: The tool's center of gravity can be specified using fields, CX, CY, CZ. If not specified, the tool center point is designated as the center of gravity of the tool. The setting will apply to all specified TCP.

7. Position:

The position coordinates X, Y and Z determine the location of the TCP.

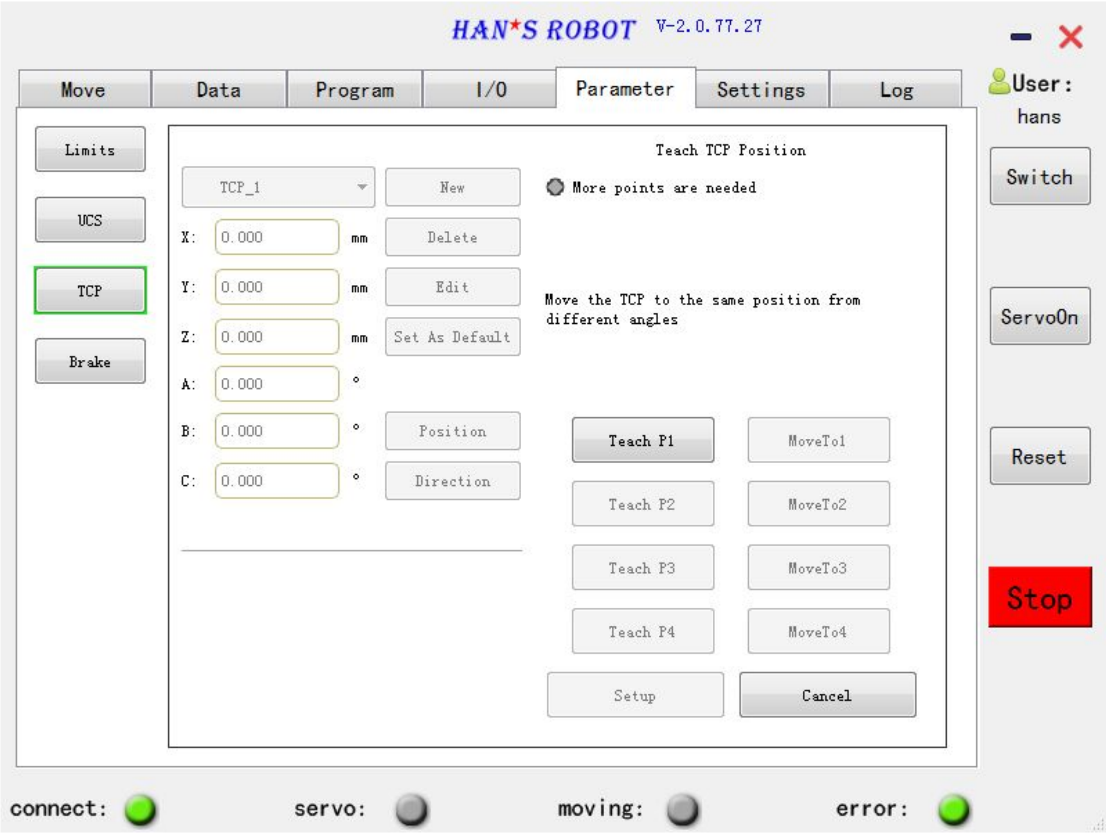


Fig 4.24 teach TCP location

The TCP position coordinates can be automatically calculated through the following steps:

(1) Click "New" button.

(2) Click "Position" button

(3) Teach three points according to the prompt(Move the TCP from the different angles to the selected point).

(4) Teach fourth points to verify the resulting TCP coordinates and set them to the selected TCP using the settings button.

notes: Teaching points must be sufficiently varied to ensure that the calculation is correct. Otherwise, the button above will turn red.

The quality of each teaching point is indicated by the light of the corresponding button. Green=Excellent, Yellow=General, Red=Unqualified.

8.Direction:

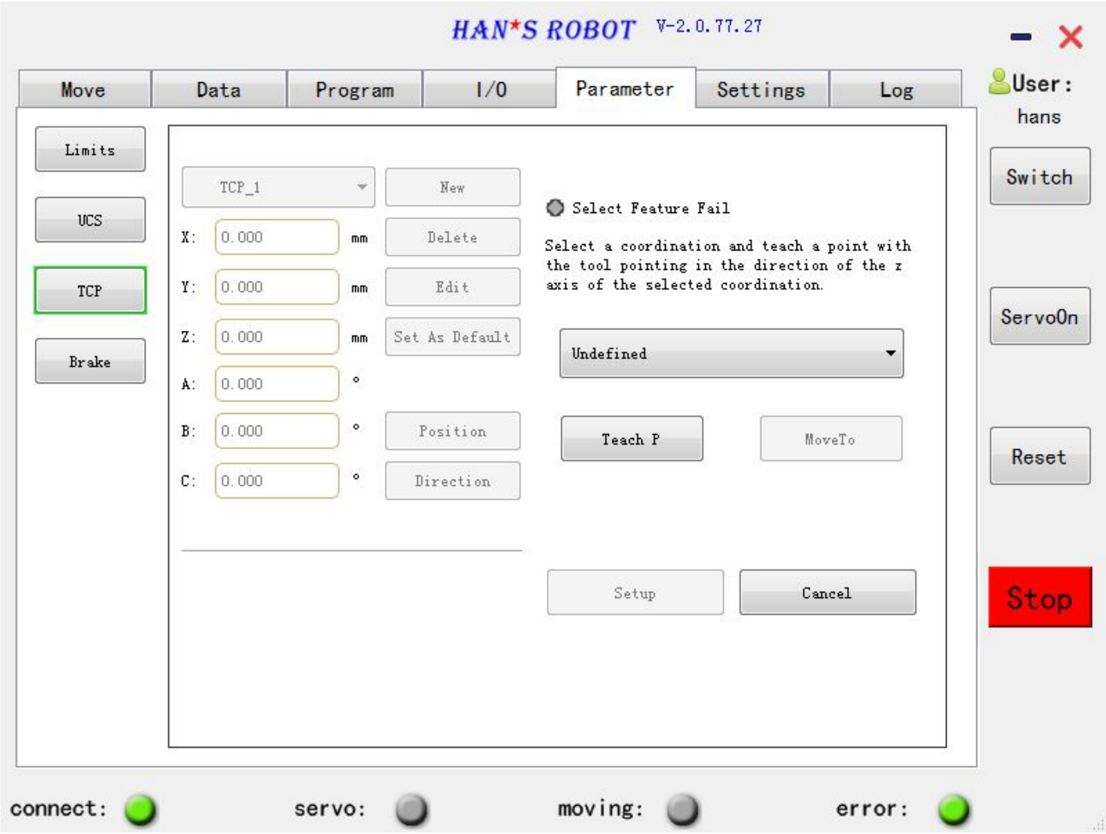


Fig 4.25 teach TCP direction

The TCP direction can be automatically calculated through the following steps:

(1) Click "New" button.

(2) Click "Direction" button.

(3) According to the prompt, select a coordinate system from the drop-down list.

(4) Click "Teaching Points", teach a point so that the direction of the tool is the same as the Z axis of selected coordinate system. This indicates that the teaching TCP direction is complete.

(5) Verify the calculated TCP direction, and use the setting button to set it to the selected TCP.

4.7.4 Brake

In Brake module, you can manually open the brake, manual reset,**Note:this function can be used in the servo on state.**

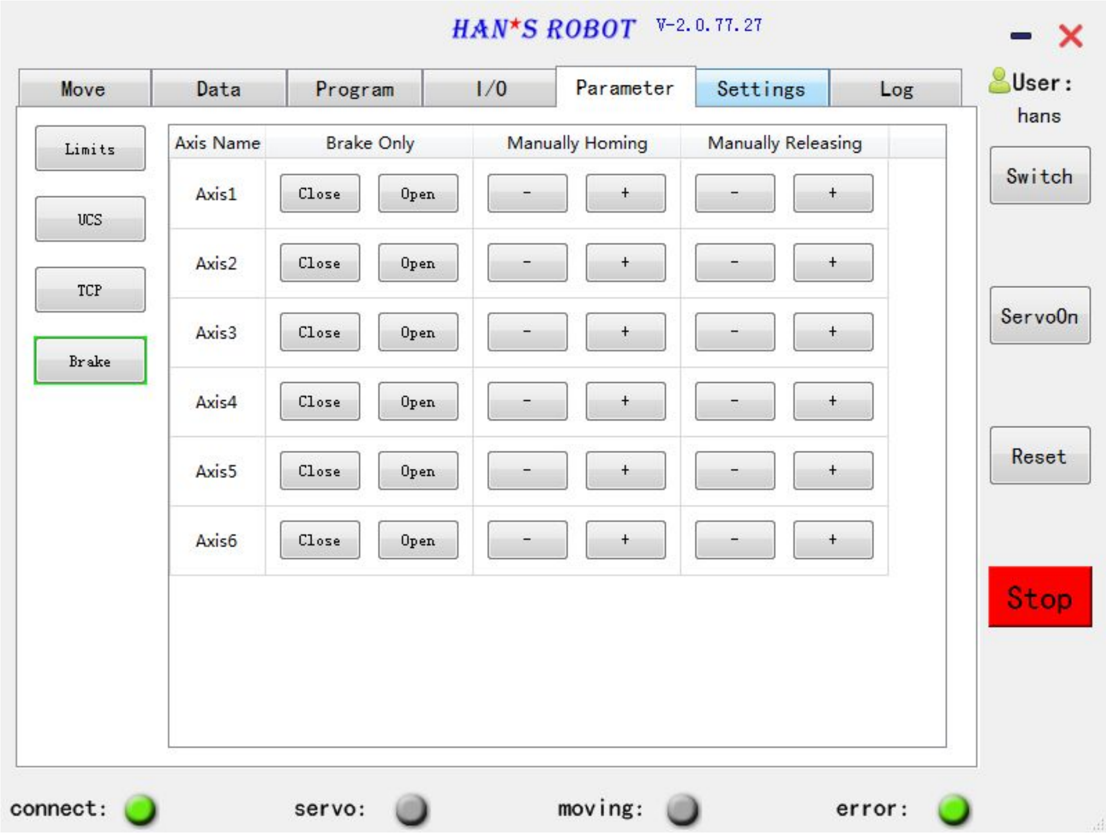


Fig 4.26 brake set

1. Axis Name: The name of axis.

Axis1~Axis6: 1 axis~6 axis.

2.Brake Only: Manual brake switch

(1) Open: Open the corresponding manual brake axis.

(2) Close: Close the corresponding manual brake axis.

3.Manually Homing: Positive and negative direction recognition multi-circle encoder location.

(1) "-" button: The negative direction identifies the location of the corresponding axis multi-circle encoder.

(2) "+"button: The positive direction identifies the location of the corresponding axis multi-circle encoder.

4. Manually Releasing: Manually release the corresponding axis.

4.8 Label->Settings

4.8.1 Speed

In this module, you can sets motion and stop speed, acceleration and jerk speed.(Privileged user privileges)

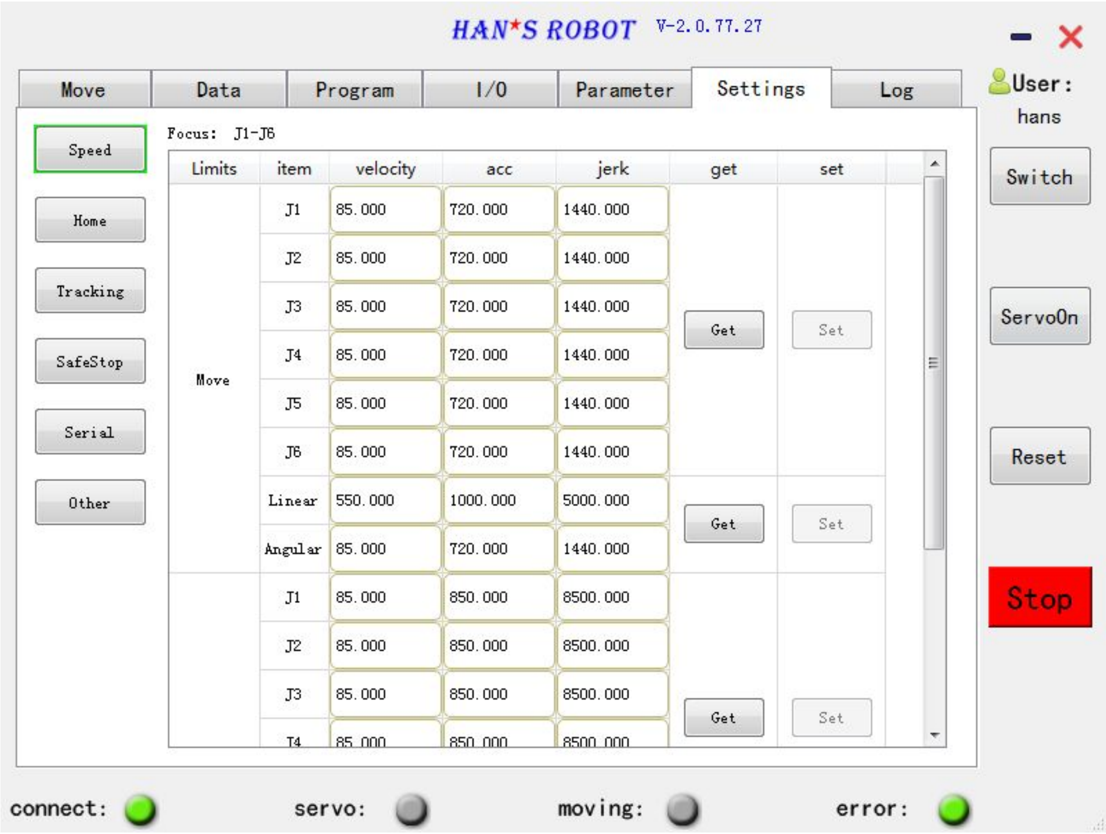


Fig 4.27 speed setting

Name	Description	Name	Description
velocity	speed	J1~J6	Axis 1to axis 6 corresponding parameters
acc	acceleration	Linear	Linear motion/brake parameter setting
jerk	jerk speed	Angular	Angular motion/ brake parameter setting
Move	Motion parameter setting	Get	Gets the current speed setting parameter
Stop	Brake parameter setting	Set	Setting speed parameters

table 4.1 speed setting

4.8.2 Home

Set the mechanical origin of the robot.

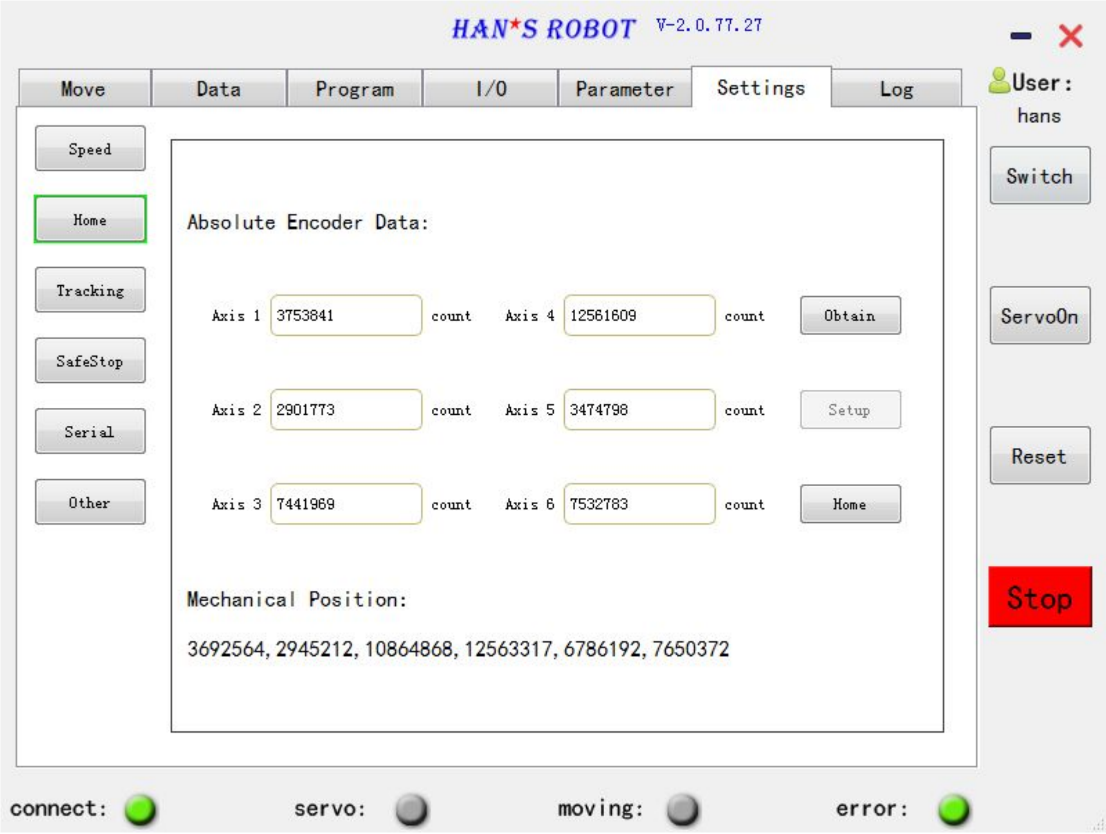


Fig 4.28 mechanical origin

1. Axis 1~axis 6: The text box displays the absolute encoder value of the corresponding axis.
2. Obtain: Get the encoder for the current location.
3. Setup: Set the parameter value of the text box to a mechanical origin. **Advanced users only have permissions and can be set in the servo on state.**
4. Home: The long press makes the robot return to zero location.
5. Mechanical origin: The mechanical origin of the display setting.

4.8.3 Tracking

Not added.

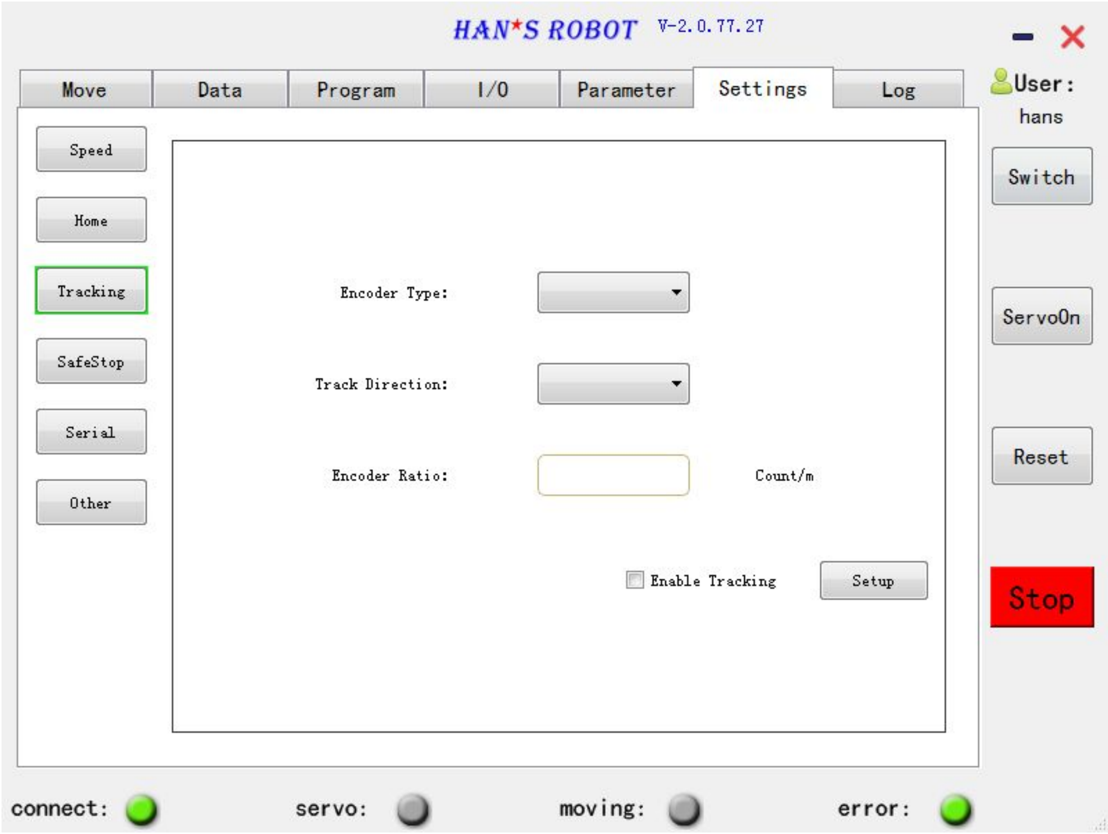


Fig 4.29 follow setting

4.8.4 SafeStop

The safe stop interface is used for collaboration function related parameter setting. When the robot is running, the collision detection is performed according to the configuration parameters. Zero state switching is also performed on the sub menu of the interface. Before the robot runs, the load parameters should be set up according to the load condition at the end of the robot. (Privileged user privileges)

1. Threshold

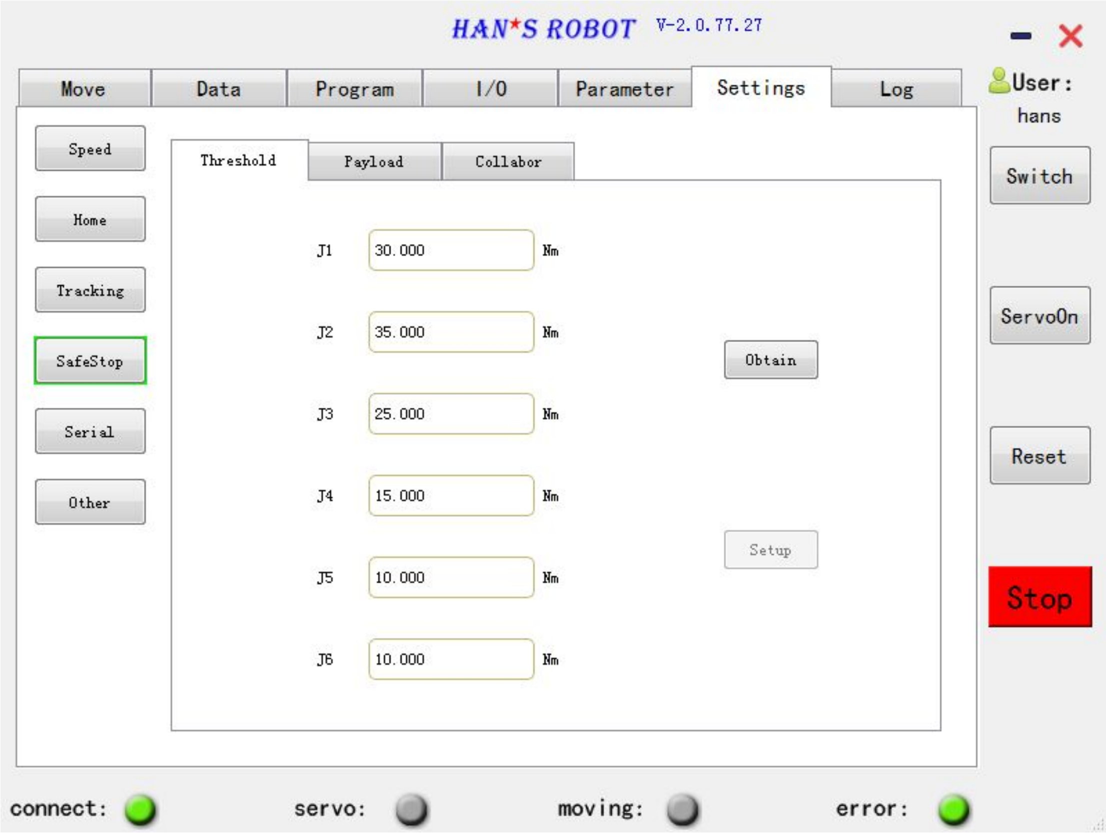


Fig 4.30 Safe stop threshold parameter

(1) J1~J6: Safe stop threshold for each axis. When the interference threshold of each joint caused by the collision exceeds the corresponding setting value, a safe stop is triggered. After a collision, a "Collision Shutdown" error will be reported, and the robot will be in servo off state. You need to click the "Reset" button to clear the error before you can servo on the robot.

(2) Obtain: Get the safe parking threshold parameter.

(3) Setup: Set the parameter value of the text box to the safe stop threshold for each axis.

notes: Because of the kinematic characteristics of the cooperative robot arm, there may be a risk of being clipped in the following two areas. Care should be taken to avoid or prevent robot from entering these areas:

① When the robot moving, close to the base of robot body within 200mm;

② When the robot moves along the radial direction, it is separated from the area outside the robot body base 750mm.

2. Payload

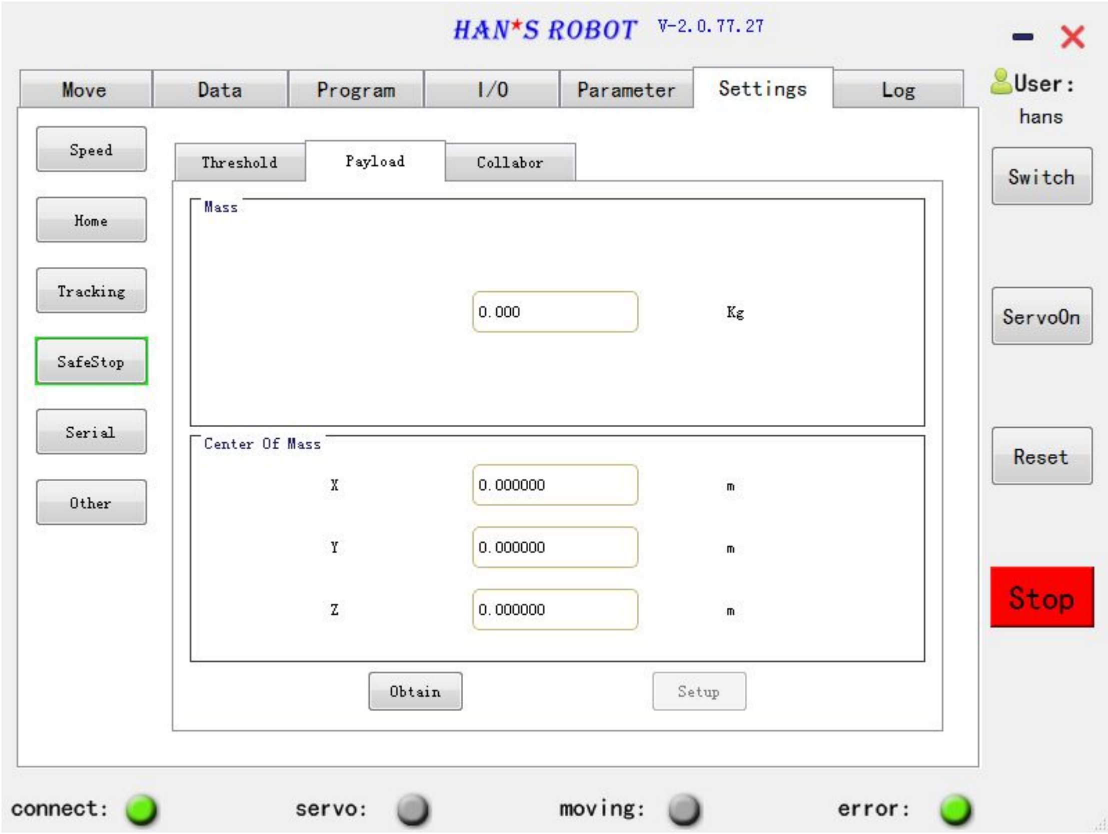


Fig 4.31 payload

(1) Mass: Weight of load, unit: KG.

(2) Center of Mass: The centroid of the load is determined by X, Y, Z, unit: m。

(3) Obtain: Get the parameters of the load.

(4) Setup: Set the parameter value of the next box to the load parameter.

3. Collabor

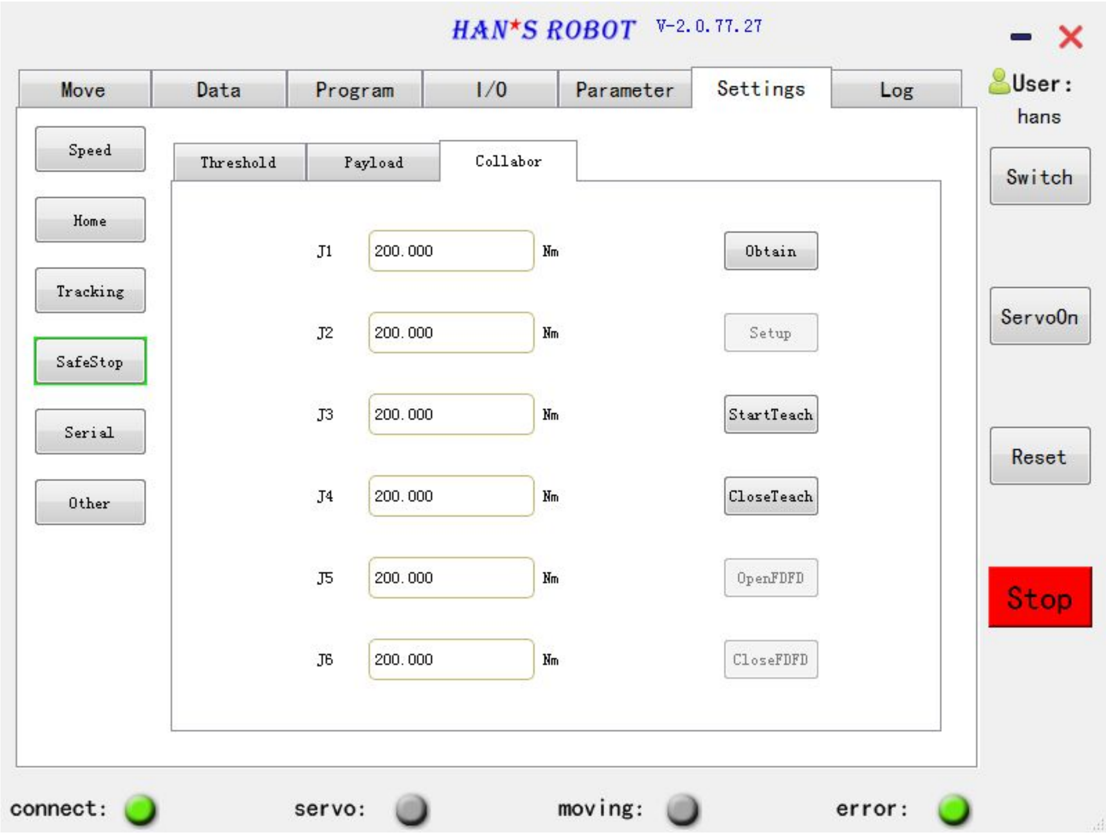


Fig 4.32 Collabor

(1) J1~J6: Zero force teaching threshold of each axis. When the rotational torque of the joint is shown to be greater than the corresponding setting value by manual teaching, the safety stop in the teaching mode is trigged. After a collision, a "Collision Shutdown" error will be reported, and the robot will be in servo off state. You need to click the "Reset" button to clear the error before you can servo on the robot. If there are no special requirements, it is not recommended to modify the parameters that have been configured.

(2) Obtain: Get zero force teaching threshold.

(3) Setup: Set the parameter value of the text box to the threshold for the zero force teaching of each axis.

(4) StartTeach: Start zero force teaching model, after successfully start, you can manually drag the robot. **The robot in servo on state to start successfully.**

(5) CloseTeach: Close Collabor model.

(6) OpenFDFD: The function has not been added is not available for customer use, Thank you.

(7) CloseFDFD: The function has not been added is not available for customer use, Thank you.

4.8.5 Serial

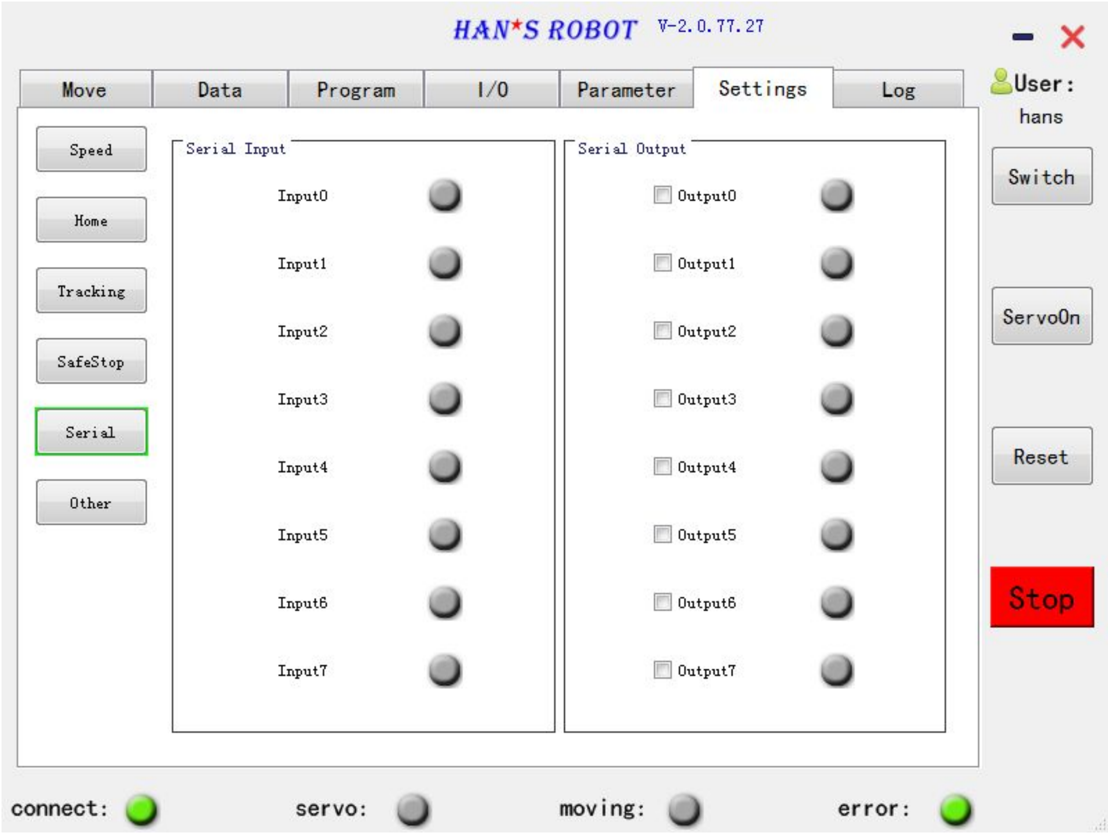


Fig 4.33 serial port setup

1. Serial Input, serial input 0~7. If the serial port input is high level, then the input serial port indicator light turns green.
2. Serial Output, serial outport 0~7. Check the corresponding output serial port, the output level of the serial port is high, and the output serial port indictor ligth turns green.

4.8.6 Other

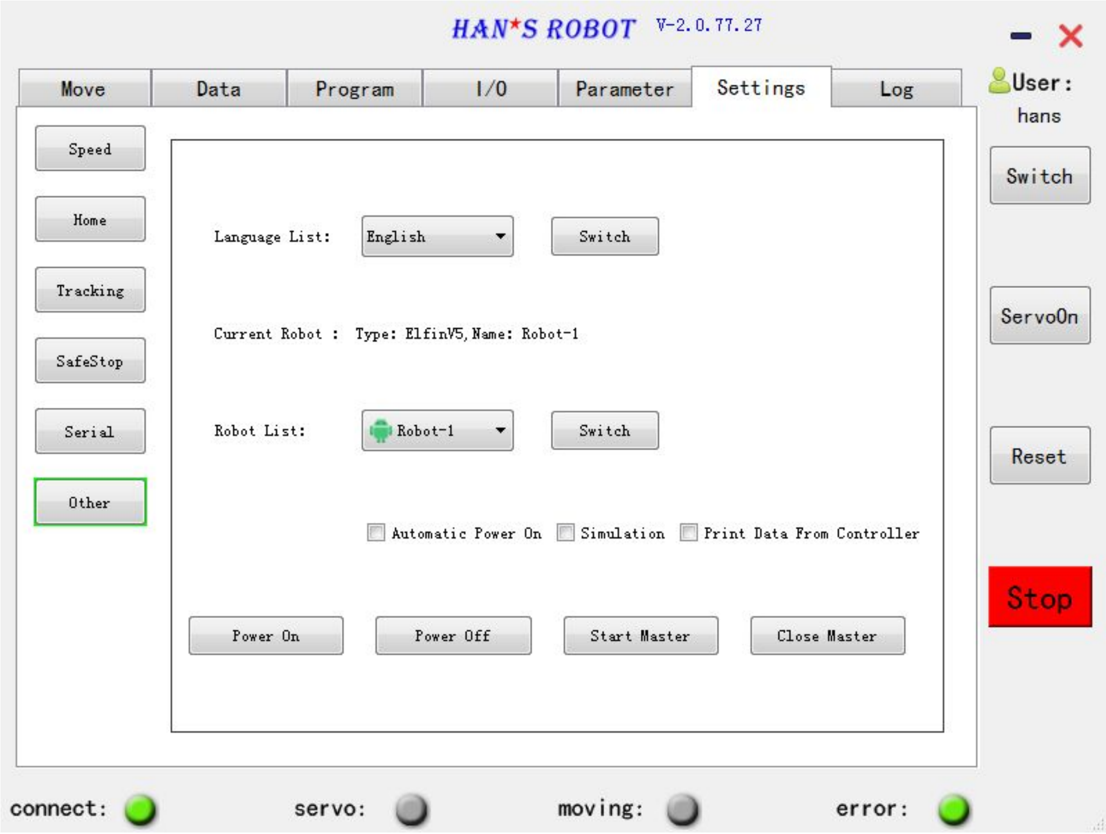


Fig 4.34 Other Options

1. Language List: Switching display language. Select the language, click on the switch,and then switch the language successfully according to the prompt message.
2. Current Robot: Displays the type of robot that is currently connected, the robot.
3. Robot list: Switch the current connection to the robot.
4. Autimatic Power On:After being checked,restart the hansDCS will automatically to power the robot body.
5. Simulated: After being checked, robot movement can be simulated.
6. Print Data From Controller: Check and print controller information.
7. Power on: Click on the "Power on" button to power the robot body. Power on includes power on and start master station.
8. Power Off: Click Blackout button to blackout the robot body. Blackout includes shutdown of main station and blackout.
9. Start Master: Click the start master button to start the master button.
10. Close Master: Click the close master station button to turn off the master station.

4.9 Label->Log

Check the state and error message of the robot.

There are three types:

(1) general message (2)warning message (3)error message

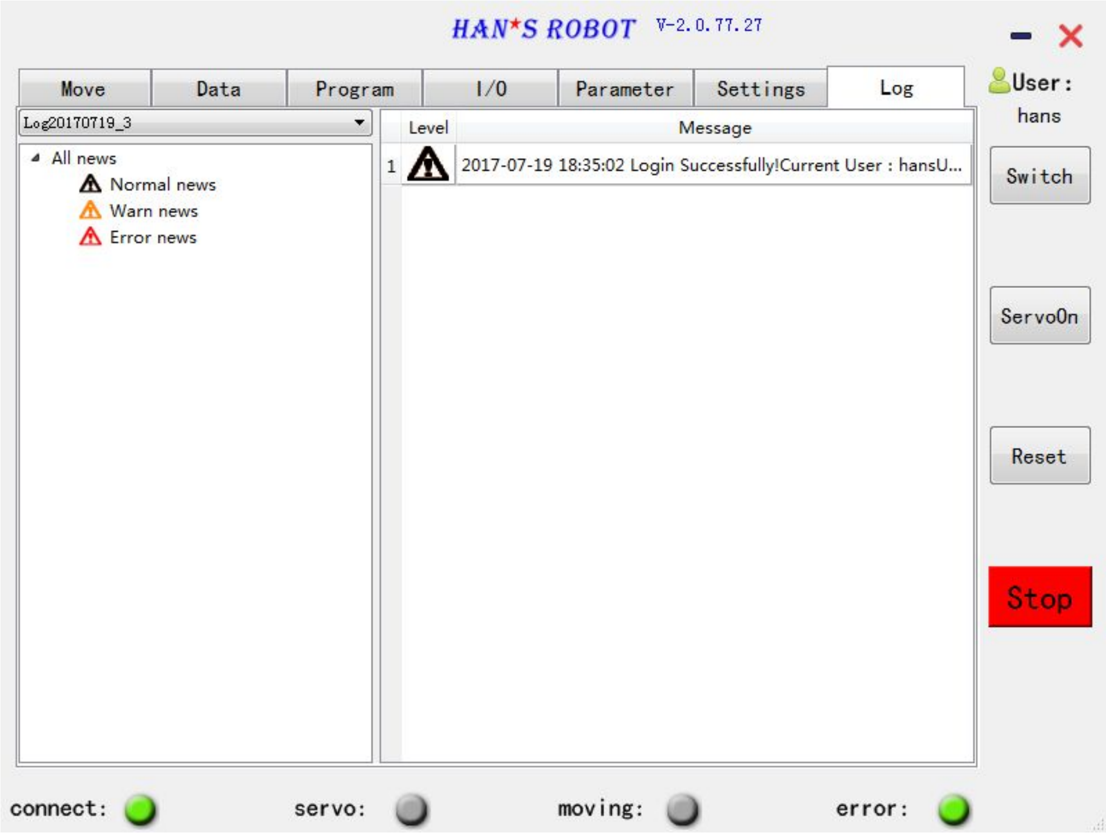


Fig 4.35 log module