

# SKCON5 User Manual

Version: 20190425



World  
Educational  
Robot  
Contest

## table of Contents

1 Foreword.....	4
2 SKCON5 Introduction.....	5
2.1 Core functions and parameters.....	5
2.2 Battery use and switch operation.....	6
3 SKCON5 Operation interface.....	8
3.1 Main interface.....	8
3.2 My program.....	8
3.3 Read sensor.....	9
3.3.1 I/O interface.....	10
3.3.2 Motor interface.....	11
3.3.3 Built-in gyroscope.....	12
3.3.4 Built-in sound intensity detection.....	12
3.4 Commissioning the motor.....	12
3.5 Read and write data.....	14
3.6 Settings.....	14
3.6.1 name.....	15
3.6.2 WLAN .....	15
3.6.3 Hotspot.....	15
3.6.4 Language.....	15
3.6.5 volume.....	15
3.6.6 Electricity.....	15
3.6.7 version.....	15
3.6.8 system update.....	16
4 SKCON5 Programming software.....	17
4.1 Abilix Chart 3.0.....	17
4.1.1 toolbar.....	17
4.1.2 Programming area.....	20
4.1.3 Code preview area.....	twenty one

4.1.4 Program module library.....	twenty two
4.2 Abilix Scratch 3.0 .....	37
5 to sum up.....	38
5.1 Technical support and service.....	38

## 1 Introduction

SKCON5 It is a new generation of educational robot building block series artificial intelligence controller launched by Ability Storm! Its appearance

It has a sense of science and technology, and has many functions and stable and reliable performance required for educational robot teaching and competition!

SKCON5 In terms of hardware, while continuing the design style of the building block series, the shell provides more structural holes to support

Six-sided overlapping, fully realize space expansion; software, support flowchart programming, bar graph programming, C Language programming

and Python Language programming provides you with rich learning and application methods!

This book introduces SKCON5 And the functions of the supporting software and how to use it, the examples provided in the book can help

You learn better to improve the efficiency of the product.

Note: The supporting software of the product depends on the product model, and the actual product shall prevail.

## 2 Introduction to SKCON5

### 2.1 Core functions and parameters



SKCON5 Equipped 1.54 Inch color touch screen, you can complete the program operation and read the sensor by touching

(External and built-in), read and write data, fast programming, debug motor and settings, and can display color static images, dynamic

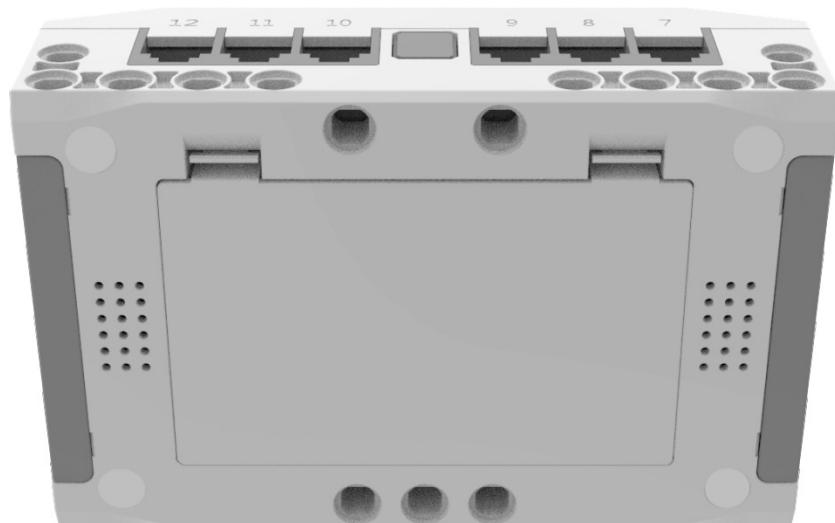
Image documents such as images and texts.

SKCON5 Both USB Wired interface and Wi-Fi Wireless function, support wireless upgrade firmware and network update system

System! Built-in Bluetooth, speaker, microphone, gyroscope, support a variety of external sensor actuators, support image mode

Block, support closed loop motor!

SKCON5 Support detachable dedicated lithium battery power supply, system built-in power monitoring, to meet the needs of teaching and competition.



SKCON5 Supports six-sided lap joints, only need to use some bolts, it can be assembled with blocks (Krypton series) into abundance Rich project.

SKCON5 With powerful hardware configuration, the core parameters are as follows:

a) Dual processor: MTK6580 CPU , 1.3GHz , 4G FLASH , 512M RAM ; 32 Bit Cortex-M3

( STM32F103VET6 ) CPU , 72MHz , 512K FLASH , 64K SRAM .

b) I/O Interface: Total 12 Way, adopt RJ11 Socket, used in conjunction RJ11 The plug cable is firm and convenient

For plugging. Port has analog input ( AI ), digital input ( DI ), digital output ( DO ), UART

Serial universal asynchronous communication interface ( 10 Way) and reusable I<sup>2</sup> C Bus synchronous serial communication interface ( 2 road).

c) Motor interface: total 4 road( RJ11 ). The port has a closed-loop control function, supports controlling the steering of the motor, and

The output voltage is the battery voltage, and the maximum current supported by a single channel is 1.5A . The port also supports reading the return value of the motor encoder.

d) Artificial intelligence module interface: total 1 Road, adopt standard USB-A Interface, support image module, voice module,

Used for robot learning and recognition.

e) Wired connection interface: total 1 Road, adopt standard USB-C Interface, with the use of universal data cable, convenient operation

And reliable. Supports wired download of user programs.

f) Built-in wifi ,stand by WLAN (only 2.4G ) And hot spots 2 A wireless mode that supports wireless download of user programs and

Upgrade firmware wirelessly.

g) Built-in gyroscope, support acquisition 3 The axis angle return value.

h) Built-in microphone, support to get the return value of sound intensity (analog). Support recording.

i) The built-in speaker supports playback of built-in audio and recording files such as "hello, goodbye", "piano, drum kit", etc.

## 2.2 Battery use and switch operation

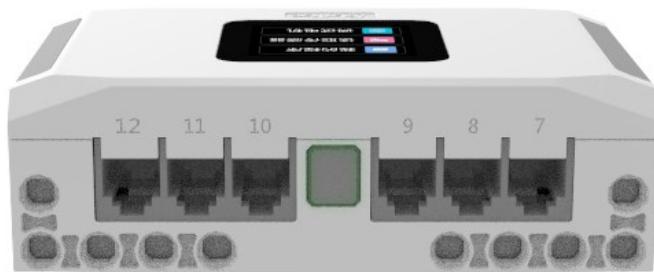


SKCON5 Operating Voltage 7-8.4V , Use a dedicated battery for power supply.

Dedicated lithium battery: 7.4V , 1500mAh , 11.1Wh , Support independent charging.

The battery needs to use a dedicated 8.4V1A The charger is charging. When the indicator light on the charger is red, it means charging

When the battery is fully charged, it turns green.



After installing the battery, long press (about 3 Sec) power button to turn on. After the controller is turned on, no matter in any interface,

Long press the power button (about 3 Seconds) to shut down.

Note: In the power-on state, short press the power button, the operation interface returns to the previous level.

\* Instructions for battery and charger

1. Regularly check whether the charging plug, wire and other parts are damaged. If damage is found, stop using it until  
Repaired intact;
2. Do not use other types of batteries and chargers that are not specified by the company;
3. The battery should be removed from the product before charging, and can only be charged under adult supervision;
4. Press the lithium battery into the back of the controller according to the front facing out and the back facing in to complete the installation. Push the battery card  
Button to take out the battery;
5. Used batteries should be taken out of the product;
6. Avoid liquid flowing into the controller and the lithium battery, so as not to cause battery power supply and short circuit of power terminals;
7. When the battery is not energized or cannot be charged, it can only be replaced by the service provider authorized by Ability Storm or Ability Storm.  
change;
8. Batteries must be recycled or disposed of separately from household garbage;
9. It is strictly prohibited to use the product while charging.

## 3 SKCON5 operation interface

### 3.1 Main interface



SKCON5 After booting, the operation interface presented to you is as shown in the figure above. Swipe up the interface to display more

Multi-function module, click the module to enter 2 Level interface, short press the power button or slide the interface to the right to return.

### 3.2 My program



My program: store the downloaded program (programming software is required, see "SKCON5 Programming software").

Each line in the list is a program, click one of them, the program starts to run, slide one of them to the left, you can

To select delete.

The program name suffixes are respectively. c versus. py .Representing C Language program (using Abilix Chart 3.0 Programming) versus Python Language program (using Abilix Scratch 3.0 Programming).

Note: When the program is running, if there is a "display" code in the program, the corresponding information will be displayed on the screen.

### 3.3 Read sensor



Reading sensors: reading built-in and external sensors, including grayscale, collision sensors and built-in gyroscopes, etc.

Including motor encoder (via motor interface) and so on.

Swipe up the interface to show more content.

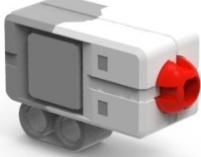
### 3.3.1 I/O interface

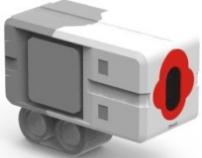
Read port 1~12 , With the function of identifying the sensor type, once the sensor is connected, the interface corresponds to the port

Immediately refresh the name of the recognized sensor type, and display its return value on the interface in real time. Disconnected immediately

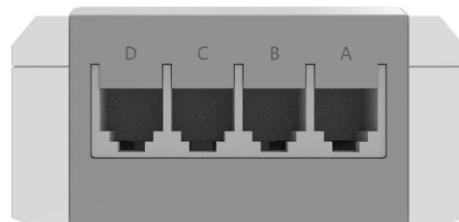
For "port xx : 0 ".

The return value range of each sensor is different, please refer to the following table:

sequence number	name	Schematic diagram	Return value range
1	Grayscale		0~4095
2	collision		0 , 1
3	Ultrasound		50~1500
4	flame		0~4095
5	temperature		0~40

6	Magnetic sensitivity		0 , 1
7	humidity		0~100%
8	Infrared		0~1200mm
9	angle		0~359
10	colour		<p>Color recognition mode: White 0 ,black 1 ,red 2 ,green 3 , Blue 4 ,yellow 5</p> <p>Photosensitive mode: 0-4095</p>

### 3.3.2 Motor interface



port A~D , Can read the return value of the motor encoder in real time (analog quantity). After the first connection, the return value is 0 ,

By rotating the output terminal of the motor, the return value changes accordingly.

sequence number	name	Schematic diagram	Return value range
1	Closed loop Motor		-99999~99999
2	Closed loop small Motor		-99999~99999

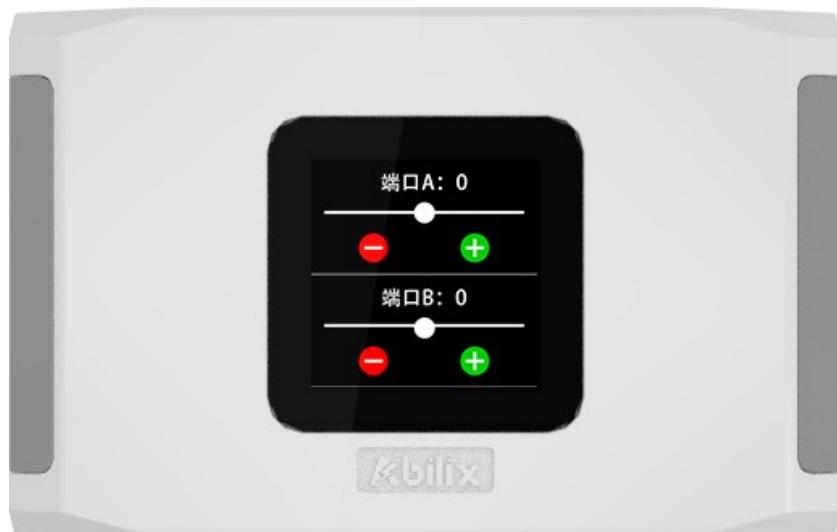
### 3.3.3 Built-in gyroscope

"Gyro X , Y , Z "Is the return value (angle value) of the built-in gyroscope.

### 3.3.4 Built-in sound intensity detection

"Sound intensity" is the return value of the built-in microphone (analog value).

## 3.4 Commissioning the motor



Debug motor: Debug the speed of closed-loop large motor and closed-loop small motor.

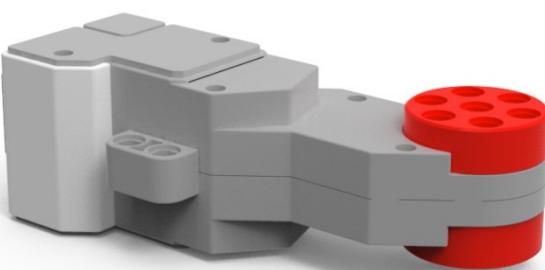
Adjust the value by sliding the slider or the motor plus and minus buttons, when the value is not 0 Time, short press the power button to clear the value;

Slide the interface on the right to reset the value and return to the previous interface.

Note: After entering the "Debug Motor" interface, pay attention to avoid the output of the motor, otherwise there may be friction or

It is strictly forbidden to manually rotate the output terminal of the motor, otherwise there may be a risk of damaging the hardware, which is artificial damage to the product.

Product behavior.

sequence number	name	Schematic diagram	Value range
1	Closed loop Motor		-100~100
2	Closed loop small Motor		-100~100

### 3.5 Read and write data



Read and write data: plastic data can be stored, and the data will not be lost when the machine is turned on and off. total 128 Data.

All data can be modified and saved in the interface, and can also be read and written through programming software.

### 3.6 Set up





### 3.6.1 Name

The name of the machine, used for personalized settings, support customization, length 1~20 Characters.

### 3.6.2 WLAN

Can be SKCON5 Connect to a wireless LAN.

### 3.6.3 Hotspot

When the local hotspot is turned on, you can wifi This hot spot is found in the functional computer network-wireless network.

The name of the hotspot is determined by "Settings-Name". Each time you change the name, you usually need to switch the hotspot again.

The hotspot password supports manual modification.

### 3.6.4 Language

Set the operation interface language, support simplified Chinese, English.

### 3.6.5 Volume

Set the speaker volume, 0~100% .

### 3.6.6 Power

Display the current battery, 0~100% .

### 3.6.7 version

Display the operating system version.

### 3.6.8 System Update

Update the operating system.

Note: Please make sure the battery is greater than 30% , Please make sure that SKCON5 Connect to the internet.

## 4 SKCON5 programming software

SKCON5 Support flowchart programming, C Language programming, bar graph programming and Python Language programming, interactive friends

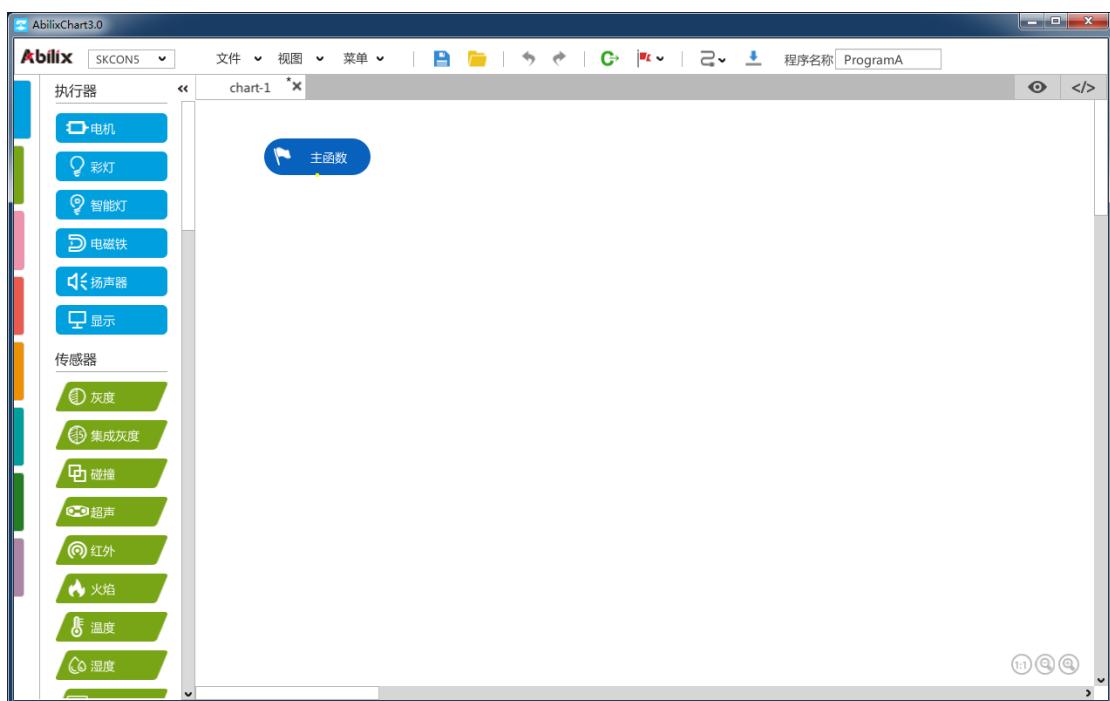
Good, powerful, low entry barrier for beginners, fast advancement, and wide room for advanced expansion!

Serial number	name of software	Programmatically	homescreen icon
1	Abilix Chart 3.0	Flowchart programming	
		C Language programming	
2	Abilix Scratch 3.0	Bar graph programming	
		Python Language programming	

You can obtain the matching software installation files in the product CD, or by visiting the official website of Ability Storm

[www.abilix.com](http://www.abilix.com) , Obtained from the "Technical Services/Data Download" page.

### 4.1 Abilix Chart 3.0



Using standard flowchart programming method, support C Code control display, support one-key turn of graphic programming C Code

Cheng. Support wireless and wired downloads.

#### 4.1.1 Toolbar



1) Select model: Support Abilix More products under the brand

note:

- a) It will take effect immediately after selection, and it will be retained until another selection
- b) Before selecting again, pay attention to save the current program file

2) File, view, menu;



3) Save, open;

4) Go back to the previous step and redo the next step;

5) redirect to C Language programming environment, selection function;

6) Select the online method, download the program, and fill in the program name.

Wired connection and download		
first step	Use standard USBC Cable connection SKCON5 "port PC "With computer	
Second step	Select "Wired Connection"	
third step	click to download"	
the fourth step	carry out	

Connect wirelessly and download

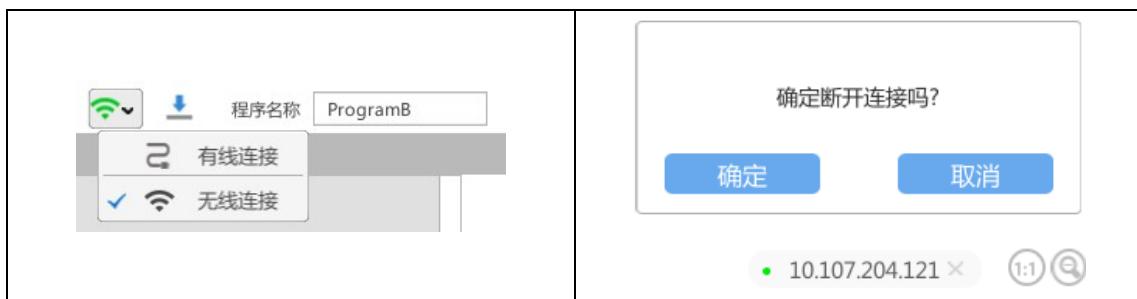
first step	make sure SKCON5 With electricity  Brain connected to the same local area network	  
Second step	Select "Wireless Connection"	
third step	click to download"	
the fourth step	enter SKCON5 The net  Network IP address	
the fifth step	Waiting for connection and download	



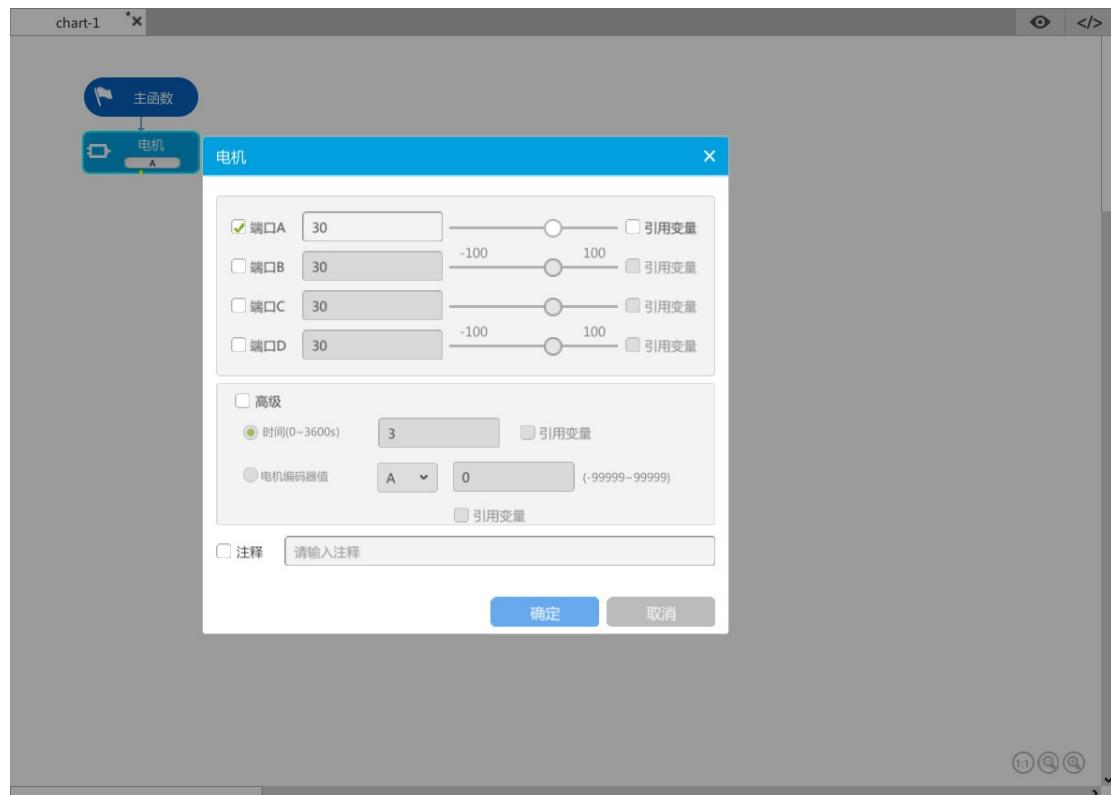
Remarks: After the first wireless connection is successful, the connection mode icon will change. When downloading the program again, no input is required

IP Address until the network is changed. When you need to wirelessly connect to another controller, click the IP address

Just disconnect the current connection.



#### 4.1.2 Programming area

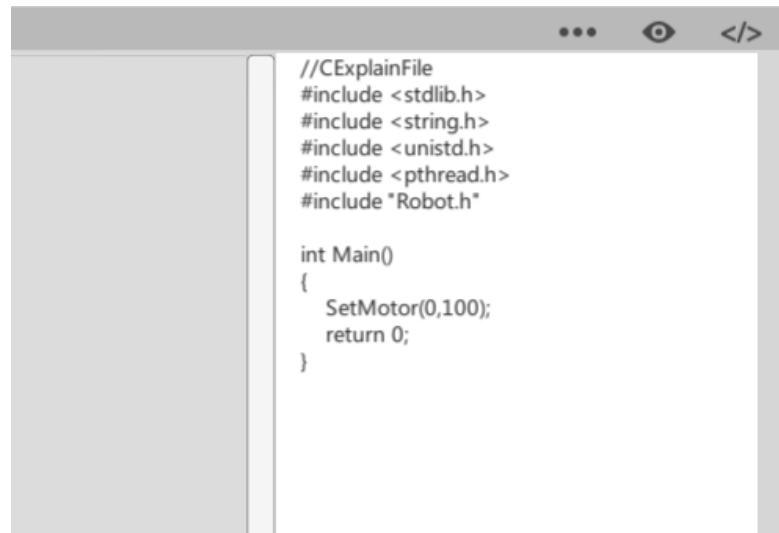


By using the mouse, drag the required program module to the programming area to design the flow chart program;

To set a certain program module in detail (when it can be set), in the programming area, double-click this module, in the second window

Just set it in the mouth, and it will take effect after confirming that it is closed.

#### 4.1.3 Code preview area

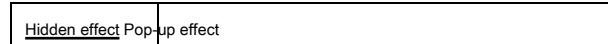


```
//CExplainFile
#include <stdlib.h>
#include <string.h>
#include <unistd.h>
#include <pthread.h>
#include "Robot.h"

int Main()
{
    SetMotor(0,100);
    return 0;
}
```

When you are programming in the "programming area", once the module is connected to the "main function" (or the newly created function

Number), the area on the right can display the current



The code of the graphics program.

Note: This area can be customized display

Or hide,  Button at the bottom right of the toolbar

see.

#### 4.1.4 Program module library

By clicking Hide or pop module library

##### 4.1.4.1 Actuator module

contain:

External actuators: motors, colored lights, smart lights,

Electromagnet

Built-in actuator: speaker, display

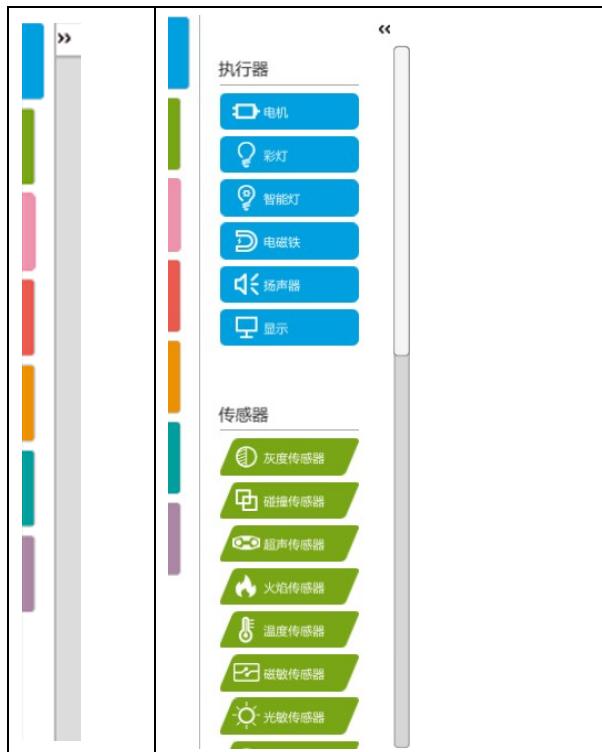
##### 4.1.4.2 Sensor module

contain:

External sensors: grayscale, collision, ultrasound,

Flame, temperature, magnetic sensitivity, color, humidity, infrared,

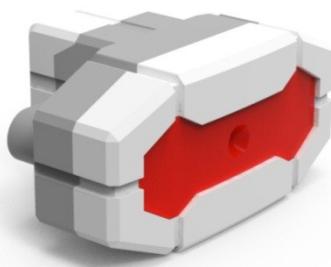
Angle, motor encoder (built-in motor)



Built-in sensors: sound intensity, gyroscope, timer, recording, reading and writing data.

##### 4.1.4.3 Artificial Intelligence Module Library

Including: image acquisition, image recognition, two-dimensional code recognition.



###### 4.1.4.3.1 Image acquisition and image recognition

This is based on SK The artificial intelligence module of the camera application can recognize the color,

The types of building blocks can also be used for face recognition, object recognition and similar situations.

Note: In the case of unification of hardware, the recognition rate depends on the number of samples and the quality of the samples.

Modify the sample to improve the recognition rate.



Image recognition example:

Generally follow the steps below: image acquisition (computer side) -> preliminary correction (computer side) -> image recognition (computer side)

Robot end) -> Correct again (computer end).

1) use USB Cable to connect the camera to the computer (the product may be equipped with USBC turn USBA Cable, also

Can use general purpose USBC Cable). At this time, the light of the observation camera is on, indicating that the power supply is normal.

You need to check whether the connection status or cable status is normal.

2) Put the image acquisition module into the programming area and do not connect to the main function.



Open the image acquisition module for debugging. Click to open the camera, the camera image has been obtained at this time (such as

The following figure).



Note that other cameras on the computer (if any) may be turned on at this time, you need to close the image capture

Try to disable other cameras in the test window: Device Manager-Image Devices-select other cameras-right click to disable.



3) Collect the sample. First adjust the size of the recognition frame appropriately, and then enter the sample name in the type setting

Weigh, move or rotate the sample, and click the learn button for each change.



After a certain amount, change another sample for collection in the same way.



Then remove the sample from the identification box, collect some empty samples and name them.



The collection is complete.

4) Initial correction. At this time, image recognition can be performed in the image acquisition debugging window, and the samples are put into

Identify the frame and observe the recognition result. When a recognition error occurs, right-click the index bar and click to view, and the abnormality will be displayed.

Face deleted. You can also increase the number of corresponding samples appropriately.



After completion, enter the sample file name and save it for later use.



5) Connect the camera to the controller ( USB Interface), put the image recognition module into the programming area and connect to the main

Function, you can add some logical judgments and execution actions (except the display module).

The screenshot displays a software interface for image recognition. On the left, a flowchart illustrates the program logic:

```

graph TD
    Start((主函数)) --> Loop{无限循环}
    Loop --> Detect[开始识别]
    Detect --> Cond1{条件判断}
    Cond1 -- Y --> Sub1[子函数1]
    Sub1 --> Cond2{条件判断}
    Cond2 -- Y --> Sub2[子函数2]
    Sub2 --> Cond1
    Cond2 -- N --> End(( ))
    Sub1 --> End

```

On the right, the corresponding C code is shown:

```

/*
*** Abilix Programme
*** http://www.abilix.com
*/
#include <math.h>
#include "Roboth"
char ai_1[100];
void sub_program1();
void sub_program2();

int main()
{
    while(1)
    {
        GetAIString(1,"三孔梁识别",ai_1,sizeof(ai_1));
        if(strcmp(ai_1,"黄色三孔梁")==0)
        {
            sub_program1();
        }
        else
        {
            if(strcmp(ai_1,"红色三孔梁")==0)
            {
                sub_program2();
            }
            else
            {
            }
        }
    }
}

```

Below the flowchart, a configuration dialog titled "图像识别" (Image Recognition) is open. It contains the following fields:

- 开始识别  停止识别
- 样本文件: 三孔梁识别
- AI变量1
- 注释: 请输入注释
- 确定 (Confirm) 按钮
- 取消 (Cancel) 按钮

When setting the condition, it must correspond to the sample name when the image was collected.

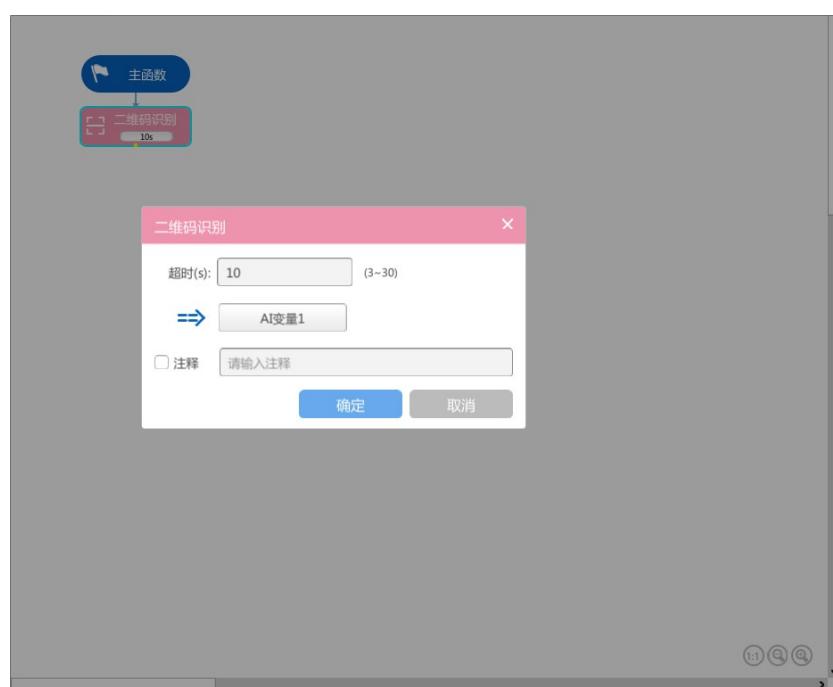


6) Correct again according to the actual situation: first image acquisition, then image recognition.

#### 4.1.4.3.2 QR code recognition

Can recognize common QR codes, including QR Code , UPC Equal symbology (based on UTF-8 Character encoding),

Character length is not greater than 100 .



#### 4.1.4.4 Control module library

Including: condition judgment, infinite loop, multiple loop, condition loop, exit loop, delay.

#### 4.1.4.5 Computing module library

Contains: calculation, advanced calculation, logic, comparison, random number, data classification.

#### 4.1.4.6 Line Inspection Module Library

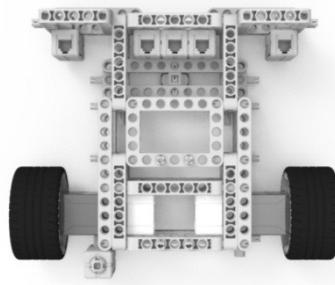
This is a module library specially made for the building block series of line patrol robots with line patrol function as the main function. WER (world Educational Robot Competition) and its related building blocks are widely used in applications (mainly involving WER Professional Building Block Series Match, CARC China Association for Science and Technology Education Robot Engineering Challenge Match, NOC China Audio-visual Education Ability Challenge and other competitions).

The line inspection module library is suitable for rear drive, 5 Grayscale or set

Grayscale, differential drive robot, except for motion

These modules need to be used in large quantities, and can also be combined with other

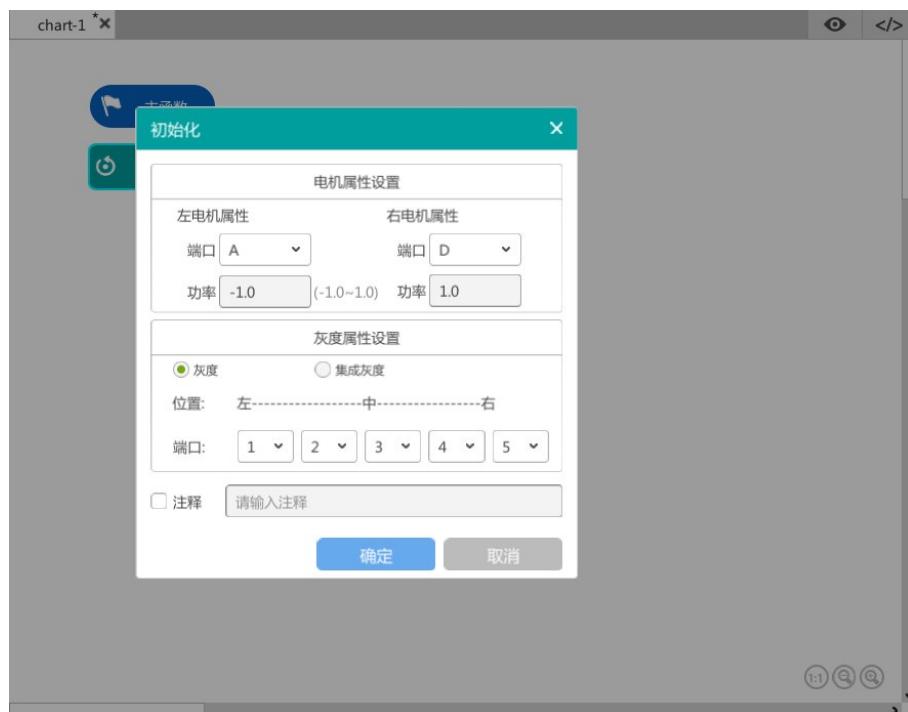
Module library program modules are mixed.



##### 9.1.2.6.1 Initialization

Set motor attributes and grayscale attributes. It only works on other modules in the line-following module library. In the design competition solution

In case of a case, it is usually necessary to place this module at the beginning of the program.



Motor attribute setting: port A~D Single choice, power range- 1.0~1.0 Floating point data.

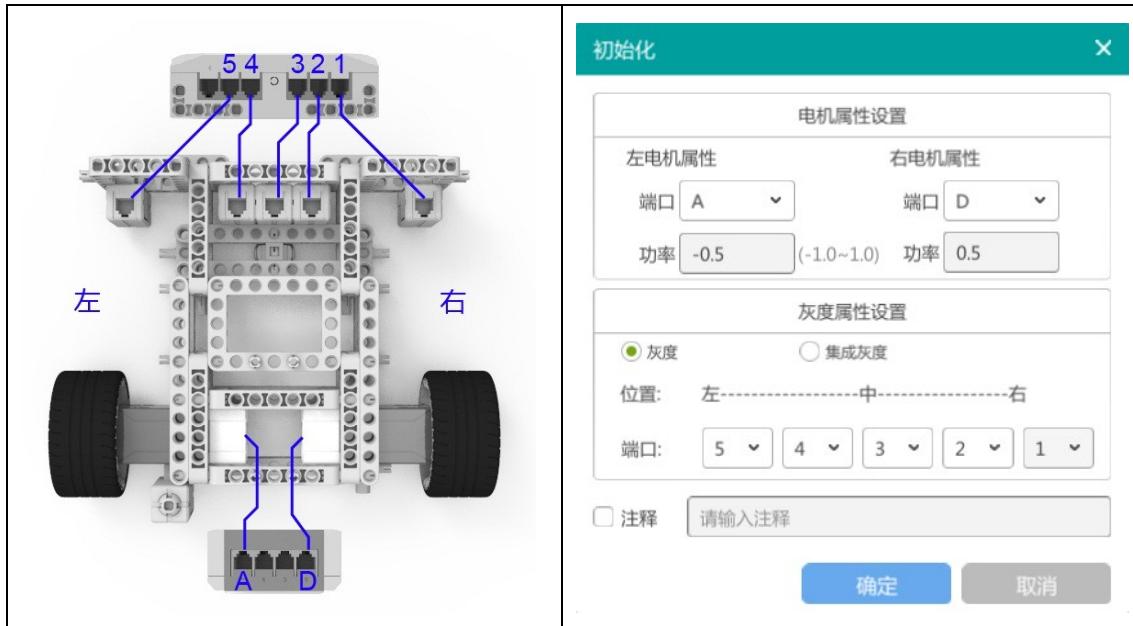
Gray property setting: Gray indicates that the robot is equipped with a single-channel gray, and the number of sensors is 5 One; integrated gray scale

Indicates that the robot is equipped with multi-channel integrated gray scale, and the number of sensors is 1 But integrated 5 Channels.

Position refers to the position of the gray-scale sensor installed in the forward direction of the robot; port refers to the connection of these sensors

Connected to SKCON2 On the port.

Reference example:



Note: Left motor properties "- 0.5 ", means "setting reverse, power 50% ". Set to reverse to solve the

When the machine is turned over and installed, the output ends of the left and right motors rotate clockwise at the same time, causing the robot to rotate counterclockwise on the ground.

Like; in the early debugging, the closer the power value 0 , The higher the fault tolerance rate, the value will be close to 1 or

- 1 To speed up the overall situation.

#### 9.1.2.6.2 Environmental collection

It is used to calibrate the gray sensor value of the robot. Usually when the competition map is used for the first time, or the drawing is generated due to use

It is recommended to use this module when the color changes.

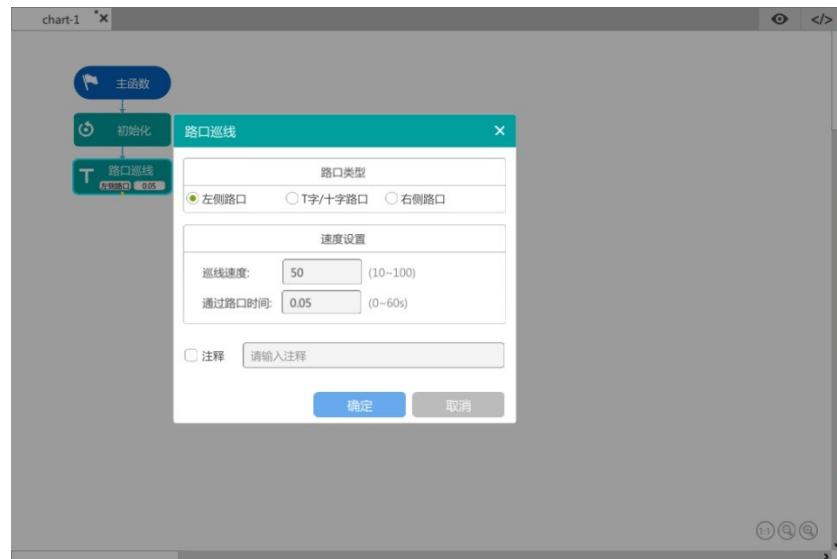


Note: When downloading and running this module program, follow the instructions on the robot screen. The collected values will be stored sequentially in SKCON5 Data location 11-20 , Where data 11-15 Store the value of the trajectory, 16-20 Store the value of the background.

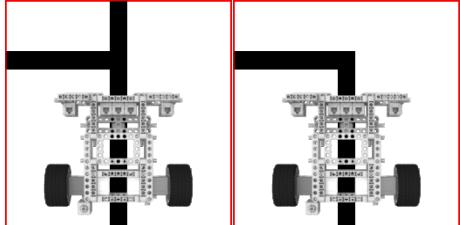
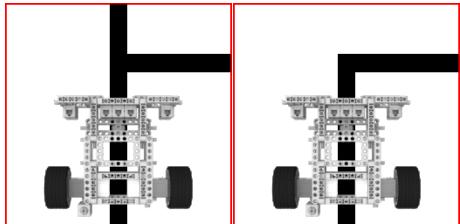
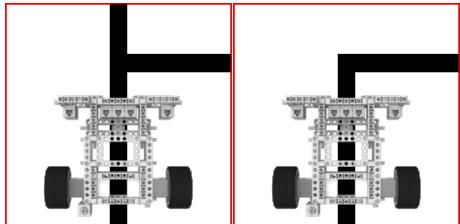
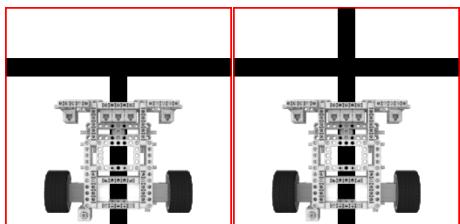
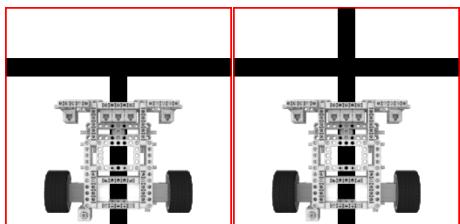
These values can be modified, and modification should be done with caution.

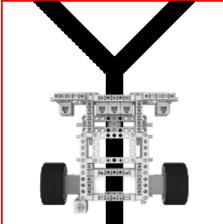
#### 9.1.2.6.3 Intersection patrol

Find the module of the intersection by patrolling the line, the intersection type includes: left intersection, T Word/crossroads, intersection on the right.



Examples of intersection types:

 	Type of intersection:  Intersection on the left
 	Type of intersection:  Intersection on the right
 	Type of intersection:  The left intersection (when turning left in the next step), Or the intersection on the right (when turning right in the next step), or T Word intersection, Or intersection (when going straight ahead)

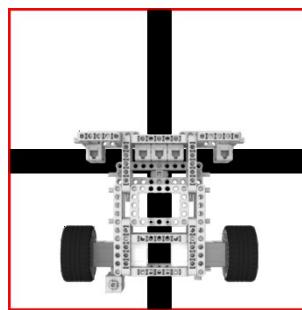
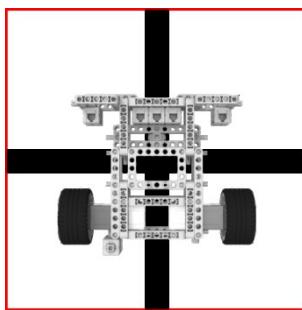
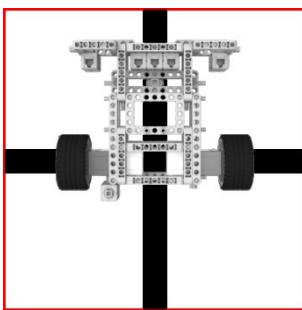
	<p>Type of intersection: The left intersection (when turning left in the next step), Or the intersection on the right (when turning right next step). Note: Do not select T Word intersection or crossroads.</p>
---	--

Intersection time: the time used to find and pass the intersection, usually 0.0-1.0 Floating point

Data, and the actual operation effect varies with the "line patrol speed". Remarks: the quality of the same robot,

The difference in tire friction is negligible, but try to keep the ground and tires clean.

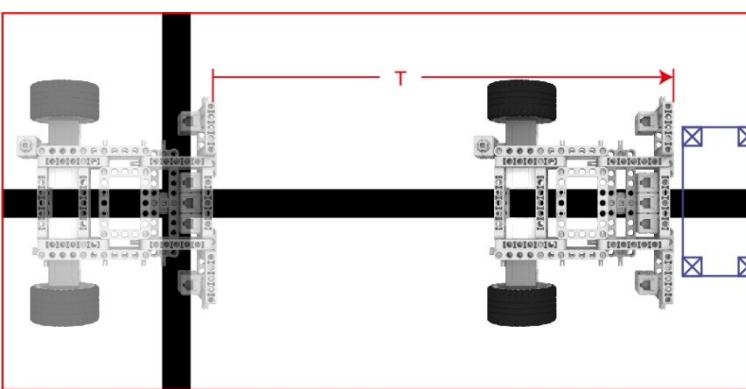
Examples of crossing time:

		
Crossing time ( S ): 0	Crossing time ( S ): 0.1	Crossing time ( S ): 0.2

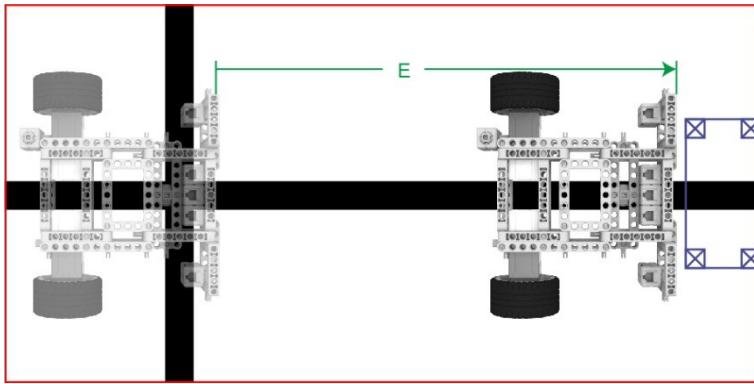
#### 9.1.2.6.4 Advanced line tracking

Follow specific conditions to track the line, the conditions include: time value, motor encoder value and sensor value.

Examples of time value conditions:


<p>Time value ( s ) : 2           Remarks: The robot patrols the line until 2 Stop in seconds. Generally used for short-distance rough displacement, widely used, but the accuracy is not High, the debugging process needs constant correction.</p>

Examples of motor encoder values:

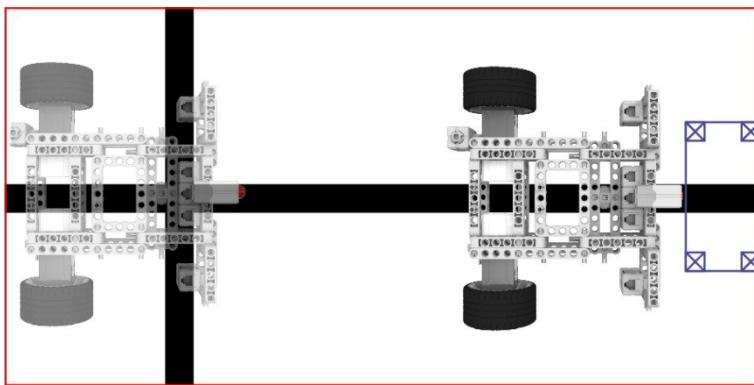


Motor encoder value: left motor, 6400

Remarks: The robot patrols the line until the left motor encoder reading is greater than 6400 Stop when. Mostly used for short-distance precise displacement,

The higher the consistency of the starting position and attitude, the higher the consistency of the stopping position and attitude.

Examples of sensor values:



Sensor value: port 7 (Reading value)= 1

Remarks: Robot patrols the line until the port 7 equal 1 (That is, the collision is pressed) to stop. When the sensor type is grayscale,

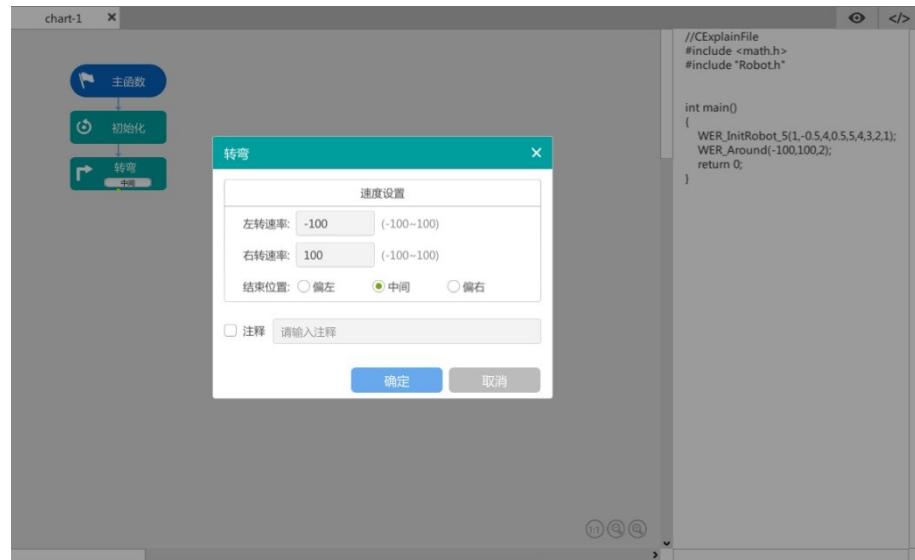
It is also applicable to analog input data such as infrared. Used in specific scenarios. In the example, the target position is simulated

A project model fixed on the field, the collision of the robot in the forward direction, the robot will encounter the project model

Type so that the corresponding port ( 7 ) The reading is determined by 0 Becomes 1 , Which triggers the condition and finally achieves the purpose of displacement.

#### 9.1.2.6.5 Turn

Through the different steering of the left and right motors, and determine the gray return value in turn, the robot turning action is completed.

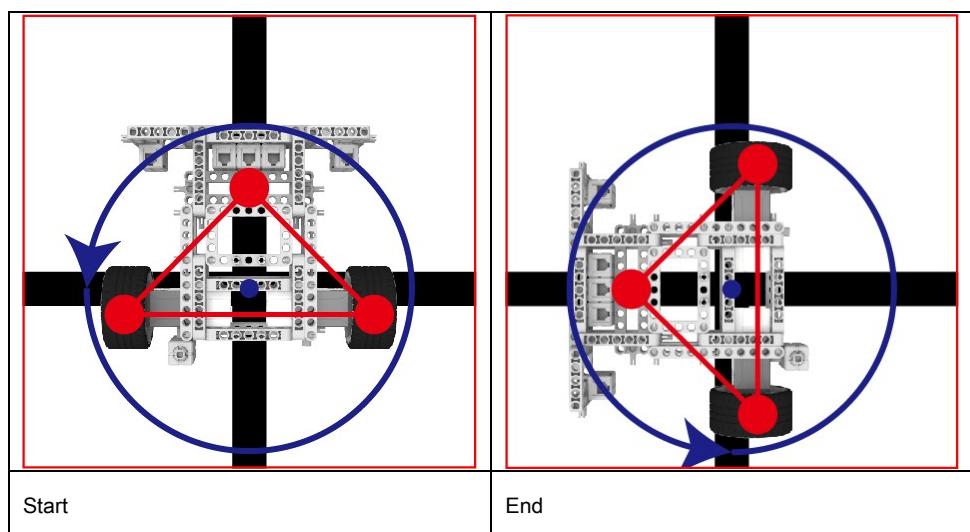


Robot turning mode, there are 3 This can be achieved by controlling the speed of the left and right motors. Take a left turn as an example:

Turn examples a) : Turn left (the left wheel moves backward, the right wheel moves forward)



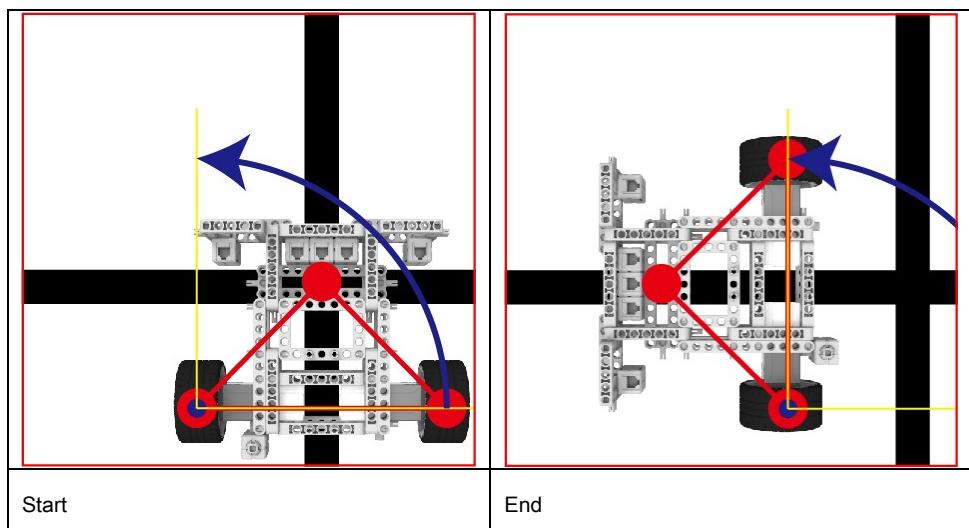
This method is widely used and easy to understand. Features, small turning radius.



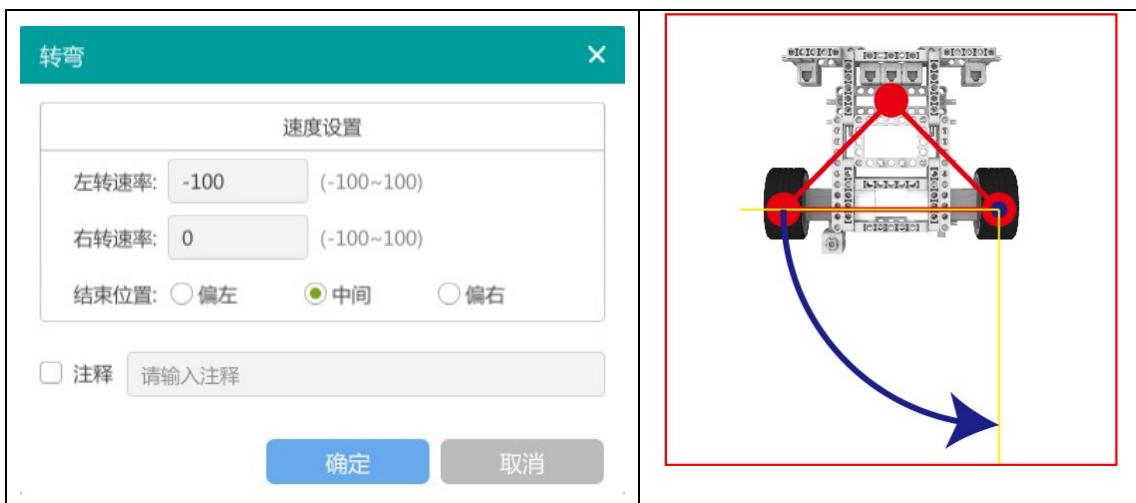
Turn examples b) : Turn left (the left wheel stops, the right wheel moves forward)



This method is special and has fewer applications. Features, large turning radius.

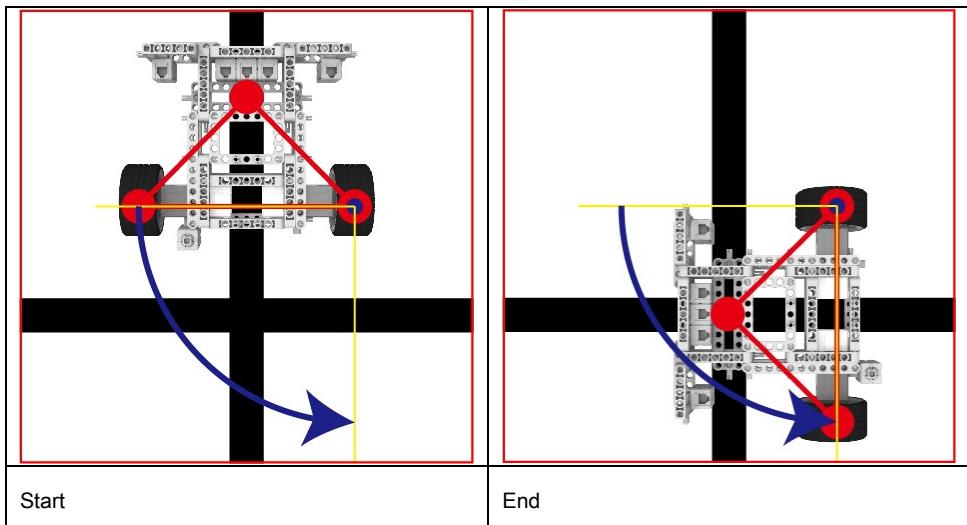


Turn examples c) : Turn left (the left wheel moves back, the right wheel stops)

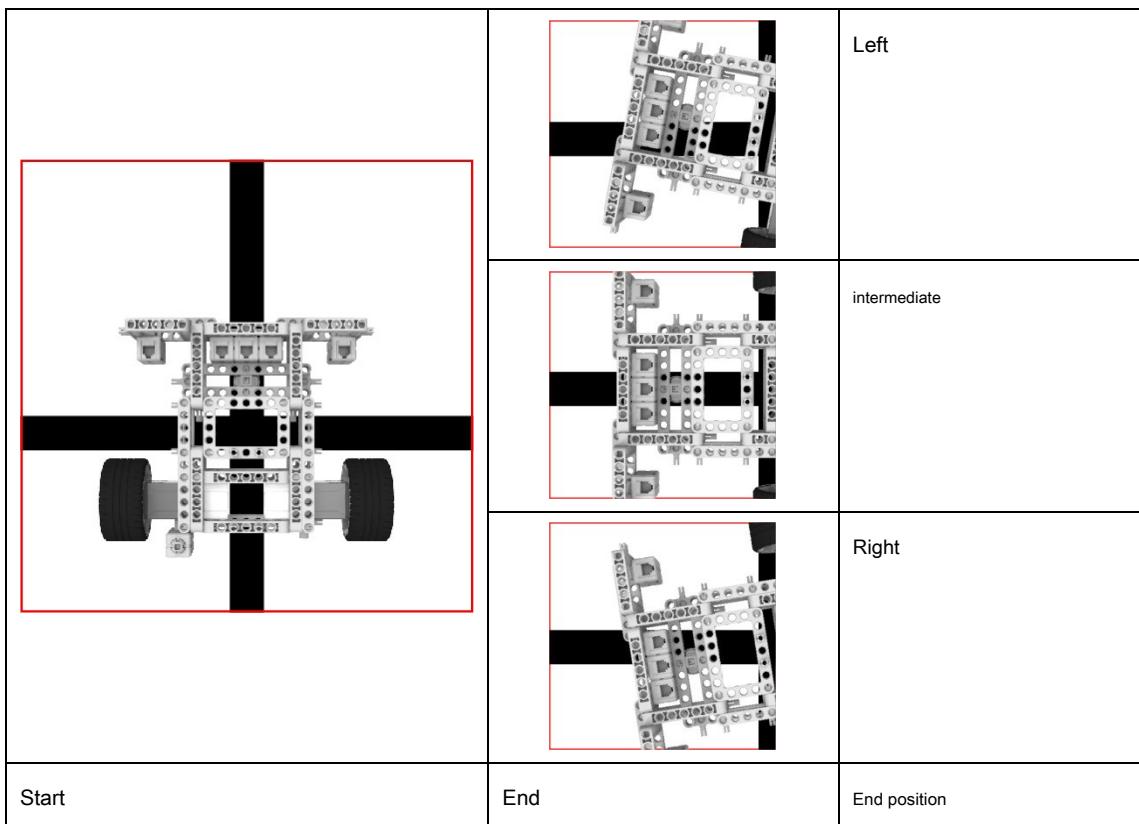


This method is also quite special, and it is characterized by a large turning radius, but the advantage is that it leaves a longer distance track after turning.

Traces are used for posture correction.



At the end of the turn 3 Kind, take a left turn as an example:



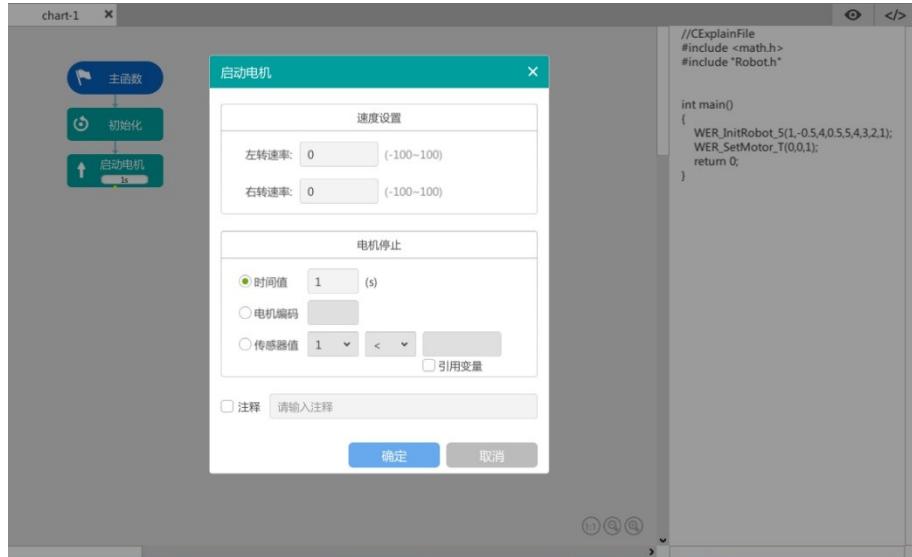
Note: When the mass is constant, the greater the speed, the greater the inertia. The actual stop position of the "end position" must be affected by inertia

The sound is different, so you need to use this function flexibly.

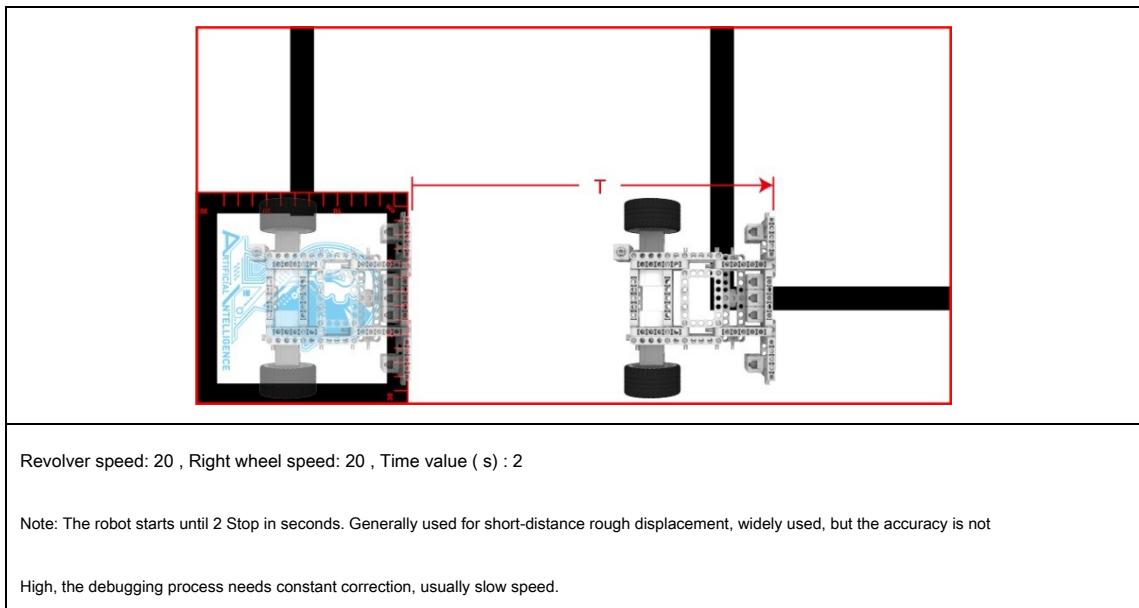
#### 9.1.2.6.6 Starting the motor

Start the motor through specific conditions, including: time value, motor encoder value and sensor value.

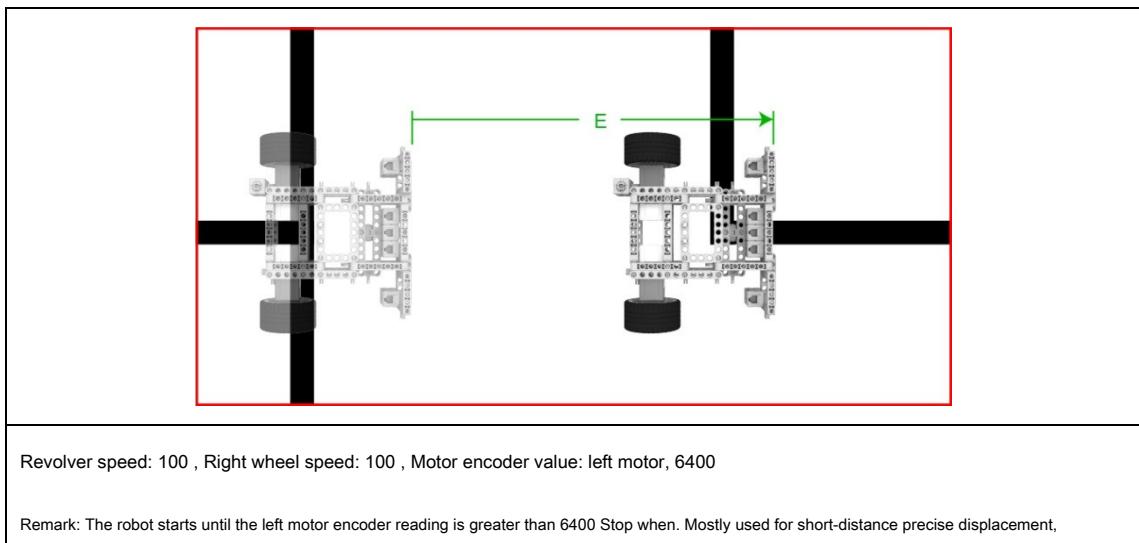
The applicable displacement method can be straight line, curved line, forward and backward.



Examples of time value conditions:

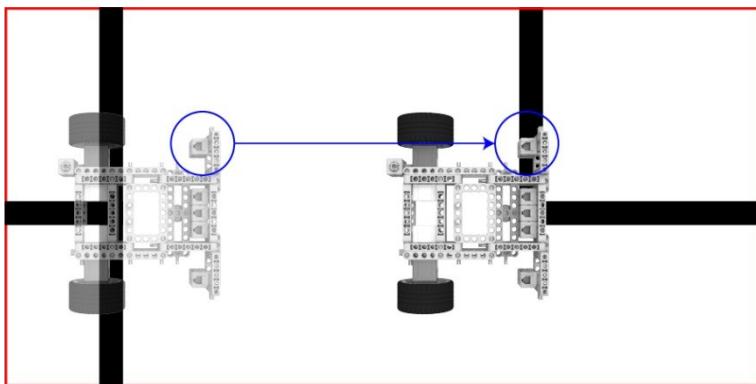


Examples of motor encoder values:



The higher the consistency of the starting position and attitude, the higher the consistency of the stopping position and attitude.

Examples of sensor values:



Sensor value: port 5 (Reading value)> 2500

Note: The robot will patrol the line until the port return value is greater than 2500 (That is, when the grayscale detects the track), it stops. When sensing

It is also applicable when the device type is analog input such as infrared or digital input data such as magnetic sensitivity and collision. Used for specific

Scenes. In the example, the start position port is simulated 5 Light-colored ground is detected, after the robot moves forward, the port 5 detected

Trace so that the corresponding port ( 5 ) The return value is determined by < 2500 Becomes> 2500 , Which triggers the condition and finally reaches the displacement  
the goal of.

#### 4.1.4.7 Function module

Create new functions, tasks, returns, and customize.

#### 4.1.4.8 Other modules

It is added as the software version iterates.

## 4.2 Abilix Scratch 3.0

Stay tuned!

## 5 Summary

Now you have mastered SKCON5 Operation method, open the programming software, design your robot program

Right! You can also combine the building blocks provided by Ability Storm to create your own robot project! More chance to participate WER

World Educational Robot Competition (Visit [wergame.org](http://wergame.org) Online Registration)!



(WER WeChat public account)



(WER FACEBOOK)

### 5.1 Technical support and service

You can visit the official website of Ability Storm [www.abilix.com](http://www.abilix.com), Get the latest in "Technical Service/Data Download"

Please pay attention to the product instructions.

If you encounter problems during use, or have suggestions for product improvement, you are welcome to contact us. Contact information:

service line: 400 8080 199

Email : [services@abilix.com](mailto:services@abilix.com)

I wish you a happy use!