SKCON9 USER GUIDE

APPLICABLE TO ABILITY STORM BUILDING BLOCK EDUCATIONAL ROBOT SK SERIES.

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1 Introduction

SKCON9 is the latest generation of educational robotics building blocks series artificial intelligence controller launched by Ability Storm! Its appearance is quite tech-savvy, while possessing many functions needed for educational robot teaching and competition, as well as stable and reliable performance!

In terms of hardware, SKCON9 continues the design style of the building block series, while the shell provides more structural holes, supports six-sided docking, and fully realizes spatial expansion; in terms of software, it supports flowchart programming, bar chart programming, C language programming, and Python language programming, providing you with a rich variety of learning and application methods!

This book introduces the functions and usage methods of SKCON9 and its accompanying software. The examples provided in the book can help you learn better and improve the efficiency of product use. Note: The software that comes with the product varies according to the product model and is subject to the actual product.

2 SKCON9 Overview

2.1 Core Functions and Parameters

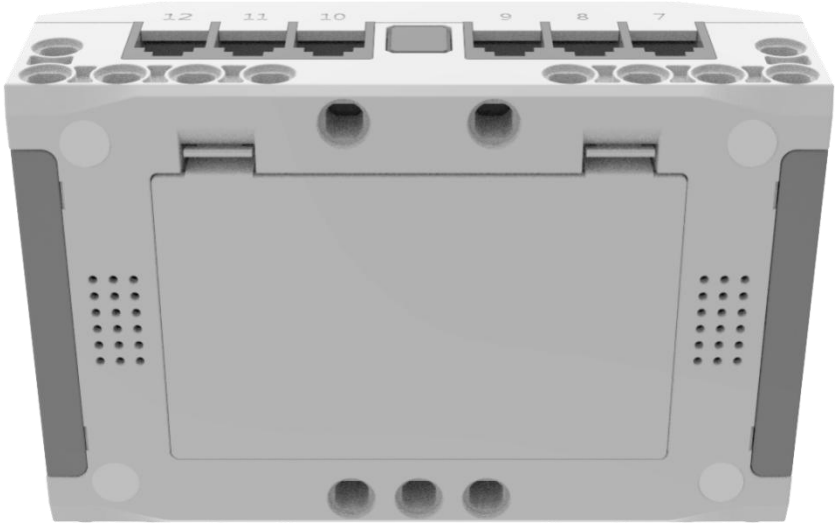
The SKCON9 is equipped with a 3.5-inch color touch screen, which allows you to operate programs, read sensors (external and internal), read and write data, quickly program, debug motors and settings, and display color static images, dynamic images, text, and other image documents through touch.

The SKCON9 features both USB wired interface and Wi-Fi wireless functionality, supporting wireless firmware upgrades and online system updates! It comes with built-in Bluetooth, speaker, microphone, gyroscope, and supports a variety of external sensor actuators, image modules, smart motors (servos), and closed-loop motors!

The SKCON9 supports a removable dedicated lithium battery for power, with an integrated power monitoring system, meeting the needs of teaching and competition.

The SKCON9 features both USB wired interface and Wi-Fi wireless capabilities, supporting wireless firmware upgrades and online system updates! It is equipped with Bluetooth, speakers, microphones, gyroscopes, and supports a variety of external sensors and actuators, as well as image modules, intelligent motors (servos), and closed-loop motors.

The SKCON9 is powered by a removable dedicated lithium battery, with an integrated power monitoring system to meet the needs of teaching and competitions.



The SKCON9 supports six-face docking, requiring only some pins to assemble into rich projects with building blocks (Krypton series).

The SKCON9 boasts powerful hardware configurations, with core parameters as follows:

a) Dual processors: MTK6580 CPU at 1.3GHz, 4G FLASH, 512M RAM; 32-bit Cortex-M3 (STM32F103VET6) CPU at 72MHz, 512K FLASH, 64K SRAM.

b) I/O interfaces: A total of 12 channels using RJ11 jacks, compatible with cables using RJ11 plugs, ensuring a sturdy structure and easy plugging and unplugging. The ports feature analog inputs (AI), digital inputs (DI), digital outputs (DO), UART serial asynchronous communication interfaces (10 channels), and reusable I²C bus synchronous serial communication interfaces (2 channels).

c) Motor interfaces: A total of 4 channels (RJ11). The ports have closed-loop control functions, support controlling the direction of motors, with an output voltage of battery voltage, and a single channel can support a maximum current of 1.5A. The ports also support reading the return values from motor encoders.

d) SERVO interface: A total of 1 channel (RJ11), 485 bus control, capable of controlling 11 intelligent motors.

e) AI module interface: A total of 1 channel, using a standard USB-A interface, supporting image modules, voice modules, for robot learning and recognition.

f) Wired online interface: A total of 1 channel, using a standard USB-C interface, compatible with universal data cables, offering convenient and reliable operation. Supports wired downloading of user programs.

g) Built-in Wi-Fi, supports WLAN (2.4G only) and hotspot wireless modes, supports wireless downloading of user programs and wireless firmware upgrades.

h) Built-in gyroscope, supports obtaining three-axis angle return values.

i) Built-in microphone, supports obtaining sound intensity return values (analog). Supports recording.

j) Built-in speaker, supports playing built-in audio such as "Hello, Goodbye," "Piano, Drum Set," and recorded files.

2.2 Battery Use and Power On/Off Operation

The SKCON9 operates on a working voltage of 7-8.4V, powered by a dedicated battery. Dedicated Lithium Battery: 7.4V, 1500mAh, 11.1Wh, supports independent charging. The battery requires a dedicated 8.4V1A charger for charging; the indicator light on the charger is red when charging and turns green when the battery is fully charged.

After installing the battery, press and hold (about 3 seconds) the power button to turn on the device. Once the controller is turned on, regardless of which interface you are in, press and hold the power button (about 3 seconds) to turn off the device.

Note: In an on state, pressing the power button briefly will return the operation interface to the previous level.

*Battery and Charger Usage Instructions

1. Regularly inspect the charging plug, wires, and other components for damage. If damage is found, stop using it until it is repaired;
2. Do not use batteries and chargers of other types that are not specified by our 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 with the front facing out and the back facing in to complete installation. Pushing the battery latch can remove the battery;
5. Exhausted batteries should be removed from the product;
6. Avoid liquid entering the controller and lithium battery to prevent short circuits in the battery power supply and power terminals;
7. When the battery does not power on or cannot be charged, it can only be replaced by Ability Storm or an Ability Storm authorized service provider;
8. Batteries must be recycled or disposed of separately from household waste;

Note: Using the product while charging is strictly prohibited.

2.3 FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Caution: Any changes or modifications to this device not explicitly approved by manufacturer could void your authority to operate this equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference. and (2) this device must accept any interference received. including interference that may cause undesired operation.

RF Exposure Information

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

3 Conclusion

Now that you have mastered the operation of SKCON9, open the programming software and design your robot program! You can also combine building blocks provided by Abilix to create your own robot projects! There's even a chance to participate in the WER World Educational Robotics Competition (visit wergame.org to register online)!

(WER WECHAT OFFICIAL ACCOUNT)

(WER FACEBOOK)

3.1 Technical Support and Services

You can visit the official website of Abilix at www.abilix.com to a ccess the latest product user guides in the "Technical Services/Downloads " section. Please stay tuned for updates.

If you encounter any issues during use or have suggestions for prod uct improvements, we welcome you to contact us. Contact information:

Service hotline: 400 8080 199

Email: services@abilix.com

We wish you a pleasant experience!