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Project 12: Bluetooth Control Smart Car



1. Description



There is a DX-BT24 5.1 Bluetooth module in this kit. This Bluetooth

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module comes with 256Kb space and complies with V5.1 BLE Bluetooth specification, which supports AT commands. Users can change parameters such as the baud rate and device name of the serial port as required. Furthermore, it supports UART interface and Bluetooth serial port transparent transmission, which also contains the advantages of low cost, small size, low power consumption and high sensitivity for sending and receiving. Notably, it solely needs a few peripheral components to realize its powerful functions.

In this project, we will use the BT24 Bluetooth module to combine all modules of the car in one code, which contains all functions except IR remote control mentioned in the previous projects. We plan to use mobile APP to connect Bluetooth module, so as to control various functions, which is distinctly simple and convenient.

We will work to read the control characters sent by each button through the Bluetooth connection of the APP.

2. Parameters

Bluetooth protocol: Bluetooth Specification V5.1 BLE

Working frequency: 2.4GHz ISM band

Communication interface: UART

Power supply: 5V/3.3V

Communication distance: 40m

Dimension: 27(L)mm x 13 (W)mm x 2(H) mm

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Bluetooth name: BT24

Serial port parameters: 9600、 eight data bits, one stop bit, no check, no flow control

Working temperature: MIN:-40°C - MAX:+85°C

The DX-BT24 module also supports the BT5.1 BLE protocol, which can be directly connected to iOS devices with BLE Bluetooth function, and supports resident running of background programs. It is mainly used in the field of short-distance data wireless transmission. It enables to avoid cumbersome cable connections and can directly replace serial cables. Successful application areas of BT24 modules:

- ※ Bluetooth wireless data transmission;
- ※ Mobile phone, computer peripheral equipment;
- ※ Handheld POS equipment;
- ※ Wireless data transmission of medical equipment;
- ※ Smart home control;
- ※ Bluetooth printer;
- ※ Bluetooth remote control toys;
- ※ Shared bicycles;



Ports

- ①STATE: Status pin
- ②RX: Receiving pin
- ③TX: sending pin

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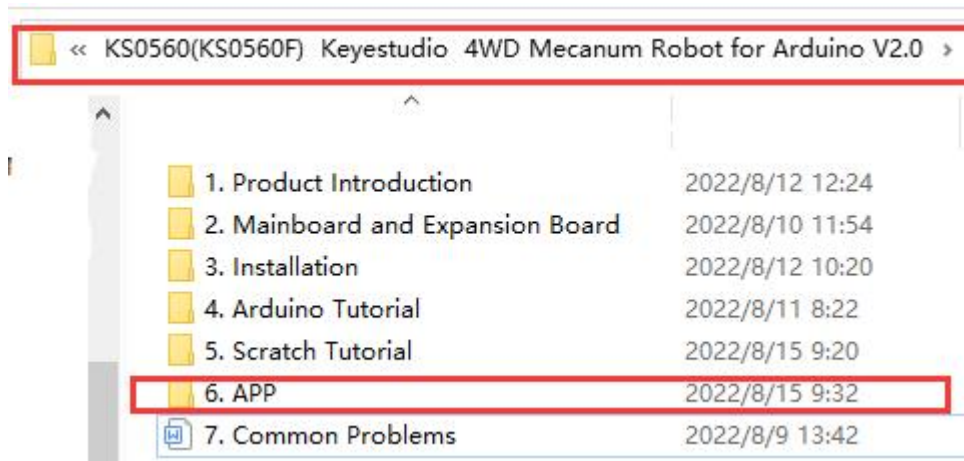
- ④GND: GND
- ⑤VCC: Power
- ⑥EN: Enable pin

Connect the BT module to the development board.

Uno	BT24
TX	RX
RX	TX
VCC	5V
GND	GND

3.APP

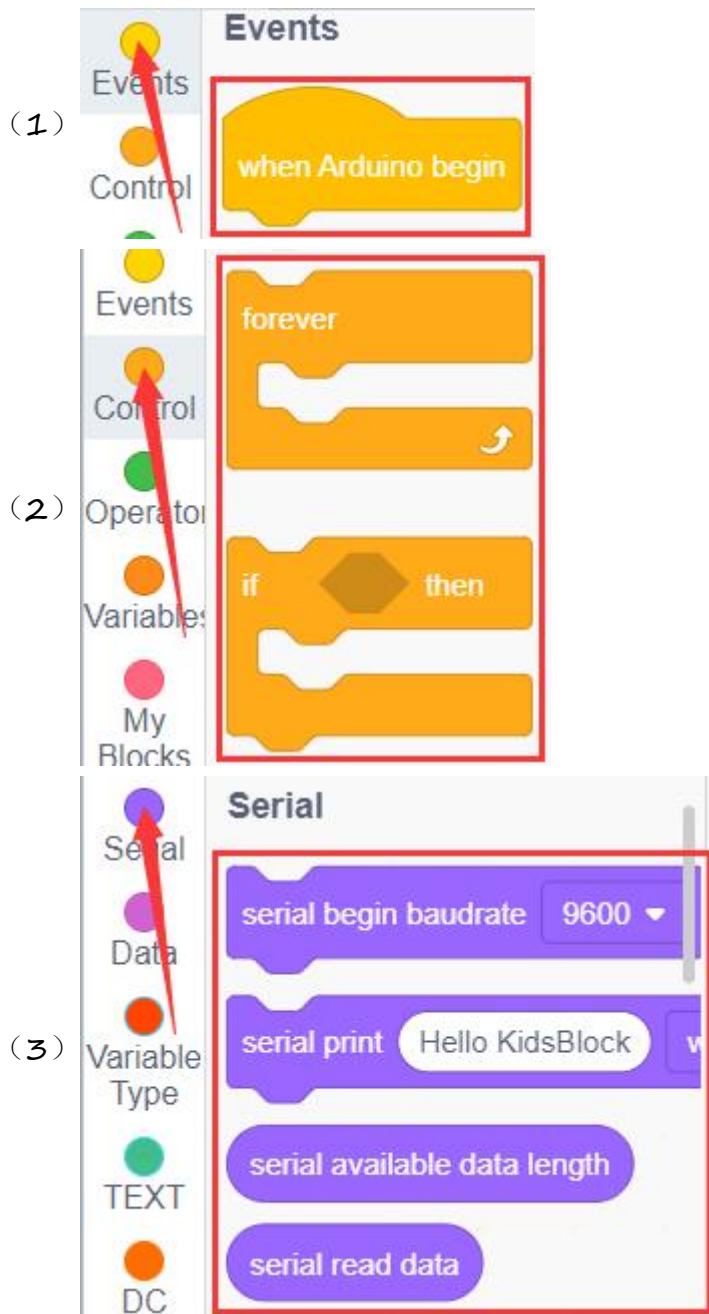
More details please refer to the folder "6. APP"



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4.Test Code

You can drag blocks to edit. Blocks listed below are for your reference



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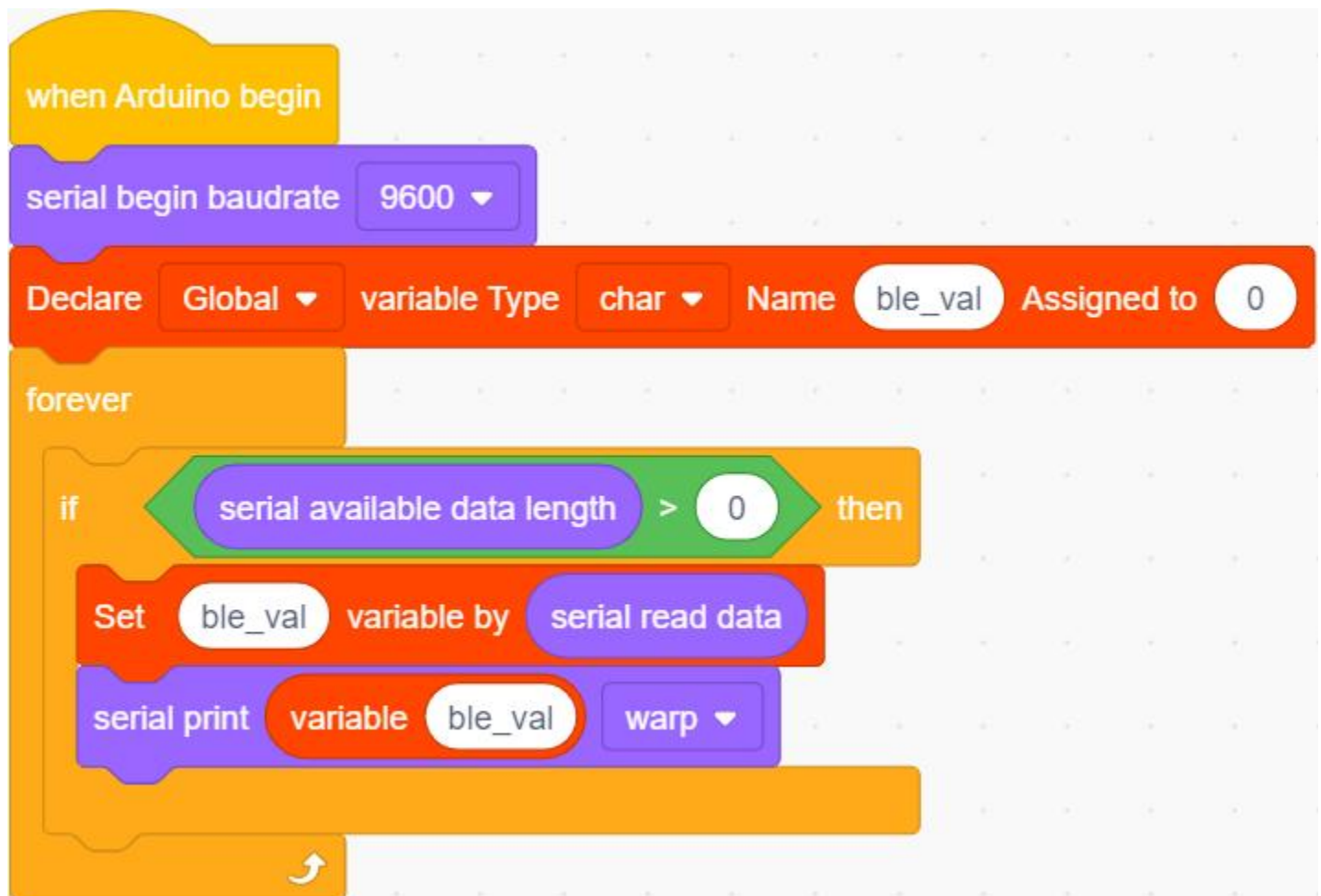


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Complete Test Code



5.Test Result

After uploading the code, plug in the Bluetooth, be careful not to plug it upside down. Connect the Bluetooth module and turn on the serial monitor.

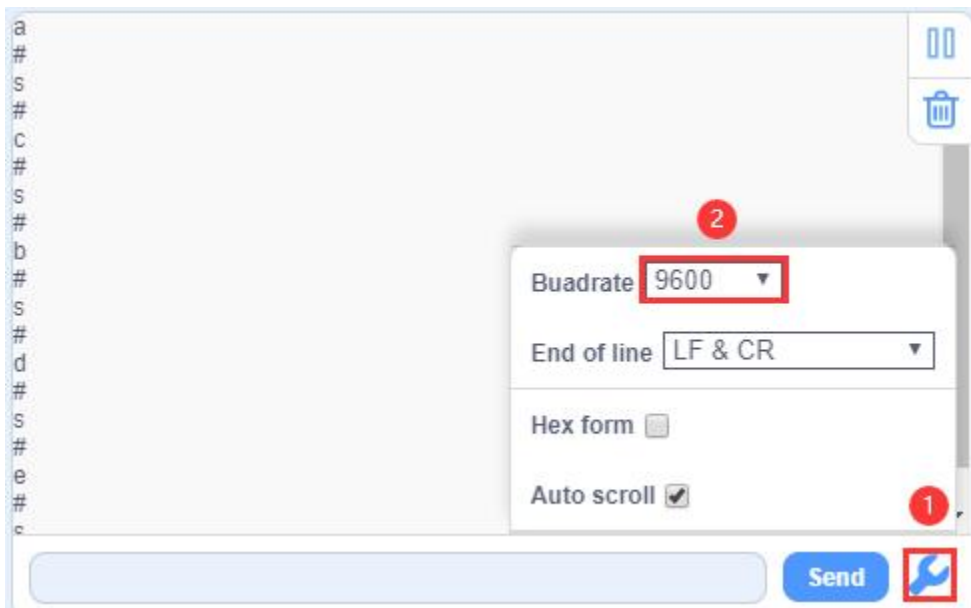
Aim at the Bluetooth module and press the APP button of the mobile phone. We can see the corresponding control characters of the APP button, as

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shown below.

Note: The RXD, TXD, GND and VCC of the Bluetooth module are connected to TX, RX, G and 5V on the motor driver expansion board respectively, while the STATE and BRK pins of the Bluetooth module do not need to be connected.

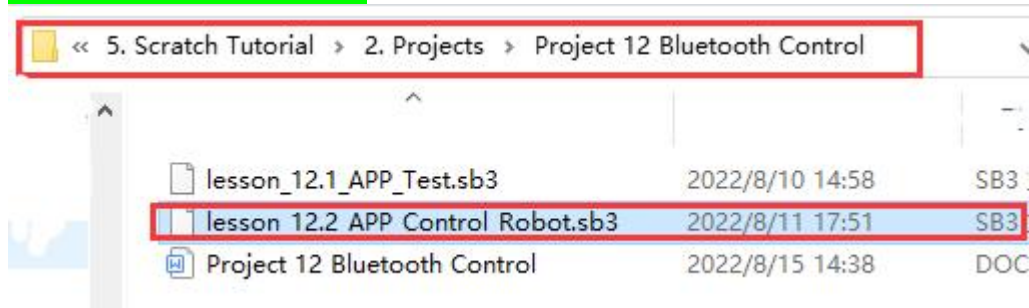
The Bluetooth is plugged directly into the motor driver expansion board, we need to mind the direction, and do not plug in the Bluetooth module until you have uploaded the code.



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6.Comprehensive Project: APP Control Smart Car


Complete Test Code





After uploading the code successfully, turn the DIP switch to the ON end and power up, plug in the bluetooth, then connect it to BT24. We can do the following operations:

Click  to open the 7-color LED, click it again the LED will be turned off.

Click  to enter tracking mode, click it again will exit the mode.

Click  to enter follow mode, click it again will exit the mode.

Click  to enter obstacle avoidance mode, click it again will exit the mode.

 Pulling these two strips will change the speed of the two motors on the left and the same operation on the right.

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These buttons are used to switch the color of the four 2812 LEDs

under the base board, and the middle button is used to close the function. The rest of the buttons are all used to drive the car, but unlike the other buttons, they drive when we press them and stop when we release them.

