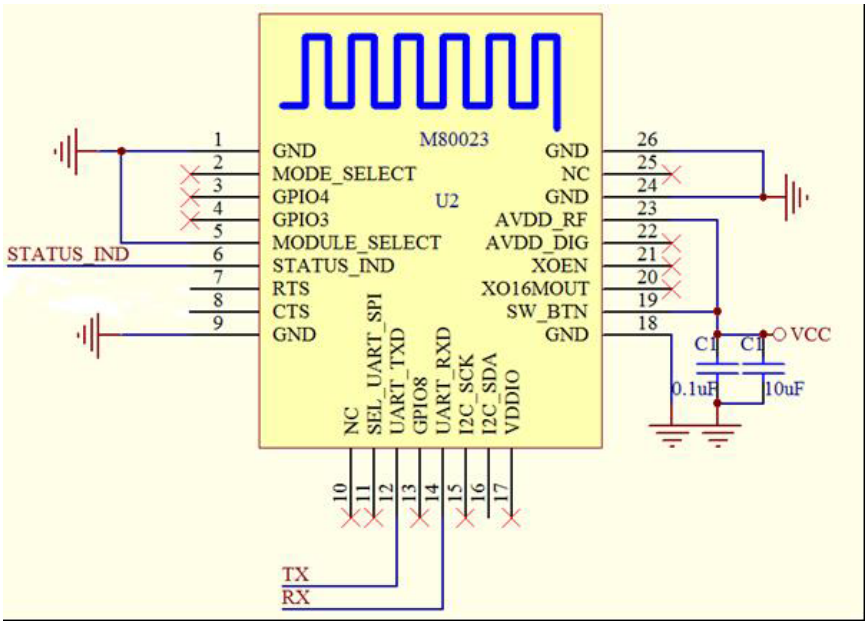
Lesson 1 Mobile Control

Ⅰ. Introduction

In this lesson you will learn how to use the Bluetooth Module and Bluetooth APP.

Ⅱ. Bluetooth Module

Bluetooth module



Pins and circuit diagram

Tips: If you have any questions or run into any problems during assembling and testing Penguin Bot please feel free to contact us at service@elegoo.com or euservice@elegoo.com (Europe customers).

Default parameters:

Protocol	Bluetooth Specification V4.2BLE
Frequency	2.4GHz ISM band
Interface	UART
Power	1.4~3.6V (default 3.3V)
Communication distance	10-15M(open environment)
dimension	18(L)mm x 14.5(W)mm x 2(H)mm
Certificate	BQB FCC CE ROHS REACH
Model Number	BT16
serial port parameters	9600、8 data bits、1 stop bit、no parity, no flow control
Maximum number of single packet bytes	280Bytes
Service UUID	FFE0
Notify UUID	FFE1
Write UUID	FFE2
Storage temperature	MIN:-55℃-MAX:+125℃
Work temperature	MIN:-20℃-MAX:+70℃

Power dissipation

Mode	Status	Current	Unit
Low Power Mode	Discoverable	200	uA
	Connected	1	mA
Normal Power Mode	Discoverable	4	mA
	Connected	4	mA

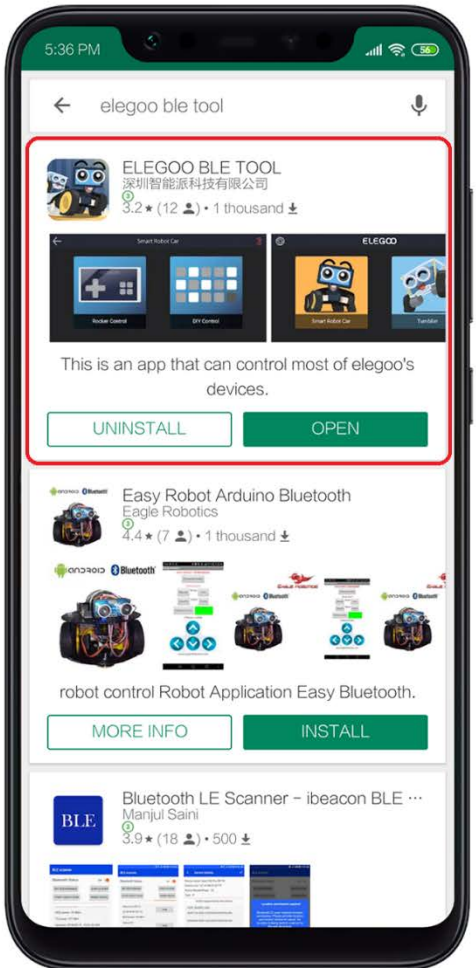
Ⅲ. Control the Penguin Bot with the Bluetooth APP

The sketch used in this chapter is saved in below path and please refer to *Upload Penguin Bot program* and upload the codes.

\ELEGOO Penguin Bot V2.0\PenguinBot\PenguinBot .ino

STEP1: Install the application.

You can download the latest version of the "ELEGOO BLE TOOL" app on the App Store and Google Play.



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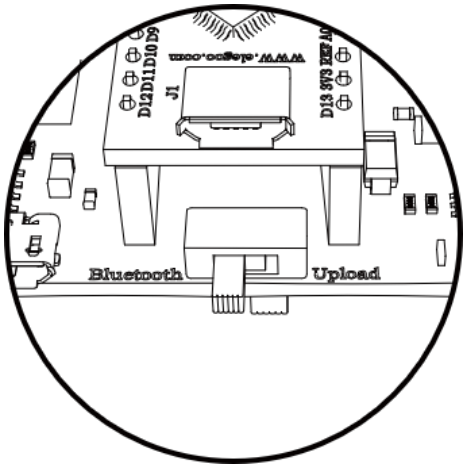
STEP2: Application Settings.

First of all, switch the mode of Penguin Bot the Bluetooth mode.



Open the “Elegoo BLE Tool” App.

Select the “Penguin Bot”.

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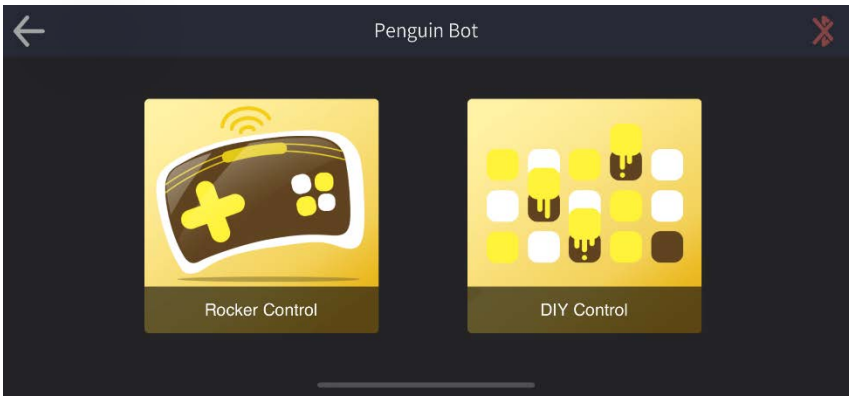
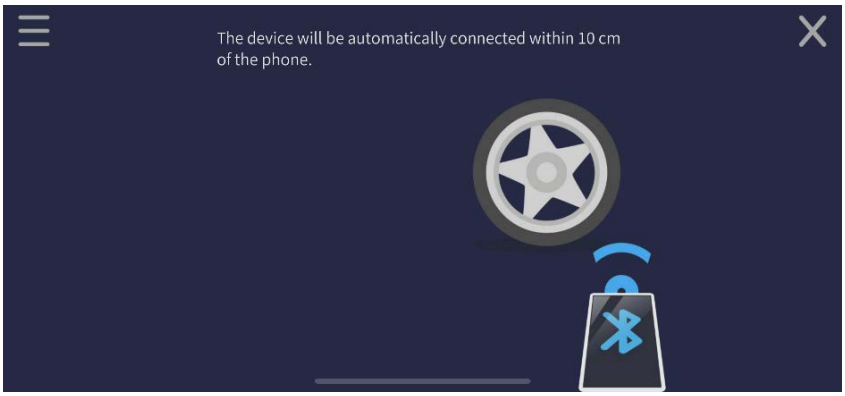
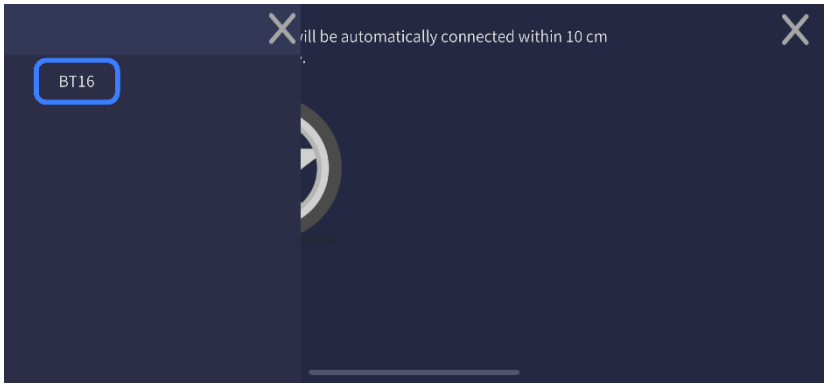
Tap the “  ” icon to enter the Bluetooth searching interface.



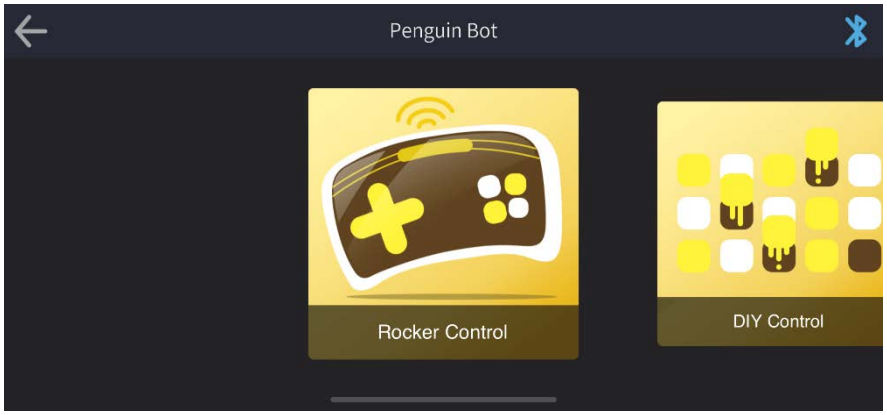
Put your phone close to the Penguin Bot(within 10cm), the app will connected to the Penguin Bot automatically.



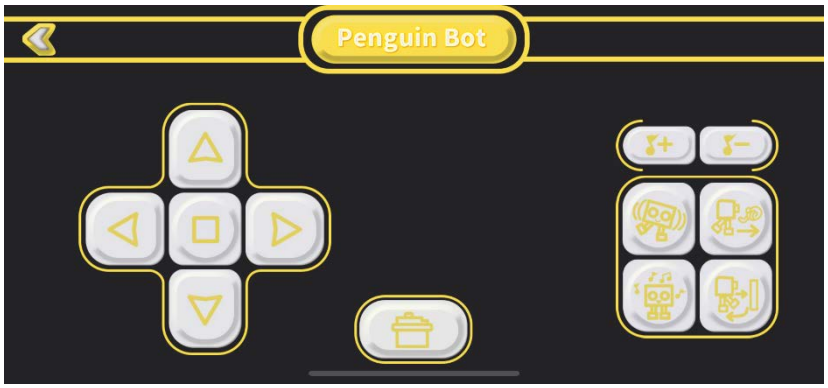
You can also open the Bluetooth device list by tapping the menu icon " " in the upper left corner and select "ELEGOO BT16" to connect the Penguin Bot manually.

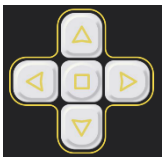


The Bluetooth status icon will turn blue when the Penguin Bot is connected.



The Rocker Control panel of the “Elegoo BLE Tool” App.

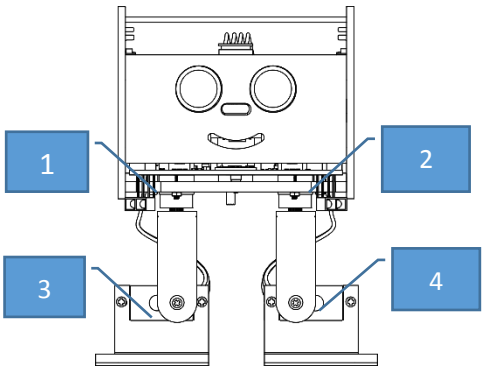




Direction control mode: When pressing the 4 direction button, the Penguin Bot will enter the Direction Control mode ,and the bot will move accordingly to the direction you pressed, you can press the middle stop button to make it stop.

Servo adjustment function: You can use this function to adjust the correction angle of each servo separately.

After pressing the servo correction button, four servo icons will appear above the button. The corresponding icons of the four icons are as shown:



If the bot's feet and legs are not perpendicular to each other as shown in the right picture, and the offset angle is within ±15°, the steering gear can be fine-tuned by the APP's servo adjustment function, each time pressing "+" or " - " the servo will rotated 1° to the left or right.

If the offset angle of the servo is greater than ±15°, it must be corrected in accordance with the method of correcting the steering gear on pages 12-13 of the manual.

Volume Control Mode：You can press the "+"button or "-"button to increase or decrease the volume.

Dance mode

When you press the dance button, Penguin Bot will start dancing and you can press the button again to switch background music and dance moves. Three dance moves are provided by default.

Music mode

When the music mode button is pressed, Penguin Bot will start playing music, and you can switch music by pressing the button again. Three music is provided by default in the TF card.

Auto-follow Mode

Put your hand in front of the left Infrared sensor within 7cm, the Penguin Bot will turn left and if you put your hand in front of the right Infrared sensor within 7cm, the Penguin Bot will turn right.

Keep your hand straight ahead of the Bot within 20cm and it will keep walking forward and if it doesn't detect any object within 20cm then it will stop moving.

Obstacle-avoidance Mode

When in obstacle-avoidance mode, Penguin Bot will walk forwards automatically until there is an obstacle within 20cm ahead then it will make a turn and choose a path where there is no obstacle in front.

The DIY control panel of the "Elegoo BLE Tool" App.

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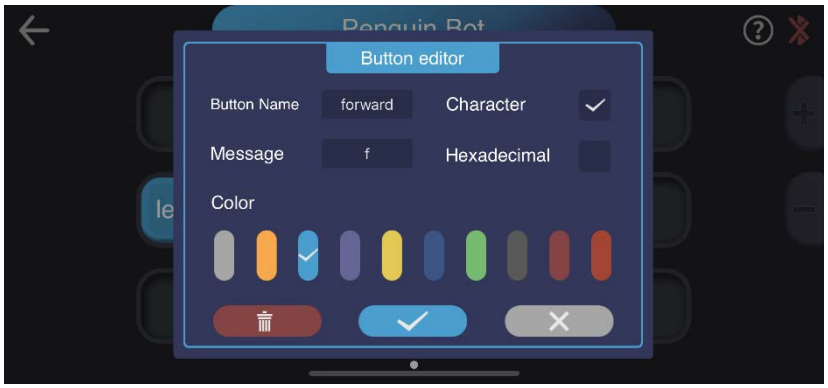
In the default settings, the DIY interface has only a few blank grids, we need to set their names, messages and colors to creat buttons.

Long press the button you want to set, a “Button editor” option box will pop up as shown above. You need to fill in the “Button Name”, “Message” and select the color of the button in this page
(All preset Messages are of the character type, so you only need to check the "Character" option.)



❖ **The comparison table of default Message and the Function is shown below.**

function	Message
FORWARD	f
BACK	b
LEFT	l
RIGHT	i
Music mode	1
Dance mode	2
Obstacles mode	3
Follow mode	6
Volume	Volume+: 4 Volume-: 5
Servo 1	Angle+: 9 Angle-: d
Servo 2	Angle+: 0 Angle-: e
Servo 3	Angle+: 7 Angle-: a
Servo 4	Angle+: 8 Angle-: c

*Case sensitive