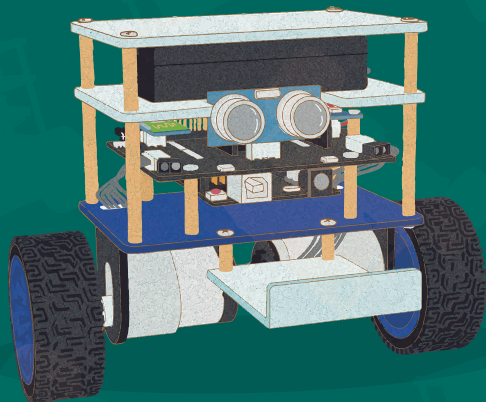


Assembly Tutorial

TUMBLER

V1.1



Thank you for your support and
purchasing ELEGOO products.



If you have any questions regarding our products
please feel free to contact us at

service@elegoo.com (North America area) or
euservice@elegoo.com (Europe and Asia area)

Register membership on [ELEGOO.com](https://www.elegoo.com) and follow
us on social media to subscribe to
our latest news and win exclusive promotions.



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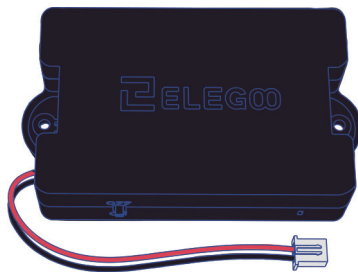
ElegooOfficial

Thank you

Material List



USB Cable * 1PCS



Battery box (Lithium Battery inside)* 1PCS



6P Cables * 2PCS

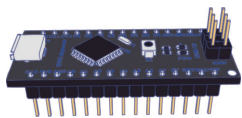


Phillips Screwdriver * 1PCS

Motor * 2PCS



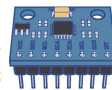
Some material images shown in the instruction manual are illustration purposes only. Actual product may vary.



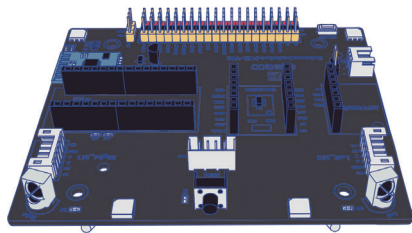
NANO * 1PCS



TB6612FNG Module * 1PCS



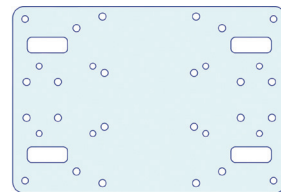
GY-521 Module
(Using MPU6050 chip) * 1PCS



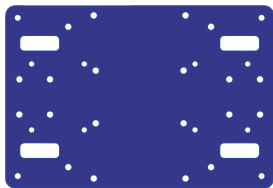
Expansion board * 1PCS



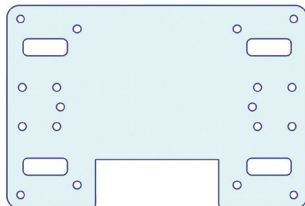
Ultrasonic sensor * 1PCS



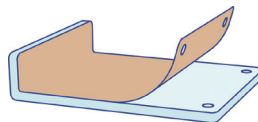
Top plate * 1PCS



Aluminum Alloy Board * 1PCS



Fastener for battery box * 1PCS



Foothold * 1PCS

Material List



M3*12 Pan head machine screws * 2PCS



M3*6 Pan head machine screws * 29PCS

Actually only need 28 pieces for assembly, 1 more additional as spare.



M4*6 Round head Phillips screws * 6PCS



M3*5 Countersunk Screws * 11PCS

Actually only need 10 pieces for assembly, 1 more additional as spare

Coupling * 2PCS



M3*45 Single-pass copper pillar * 4PCS

Motor Bracket * 2PCS



M3*23 Double-pass copper column * 4PCS



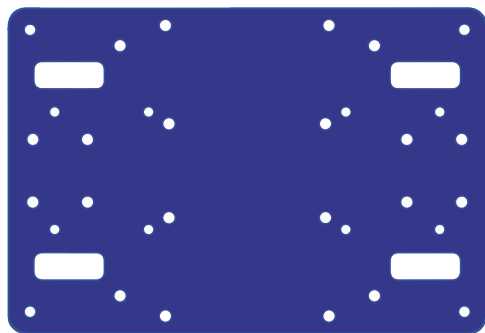
M3 K-type gear nut * 2PCS



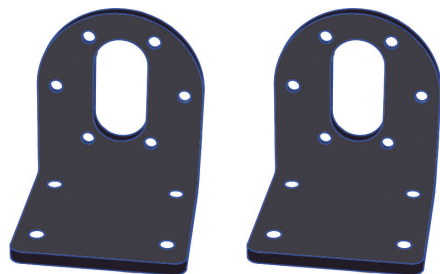
M3*11 Double-pass copper column * 7 PCS



Tires * 2PCS



① 1x Aluminum alloy board

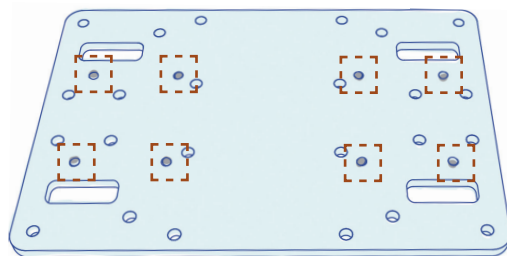
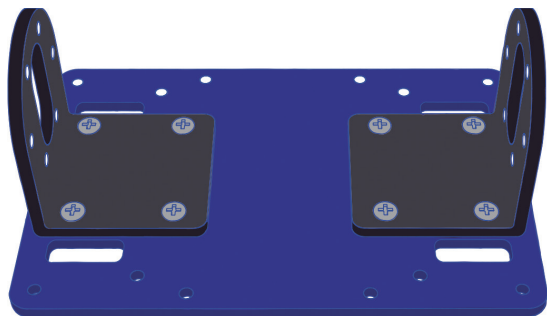


② 2x Motor Bracket



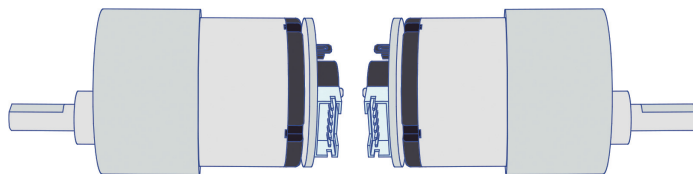
③ 8x M3*6 Pan head machine screws

Take out ③ from No.1 label bag



Back side

Assembly the motor

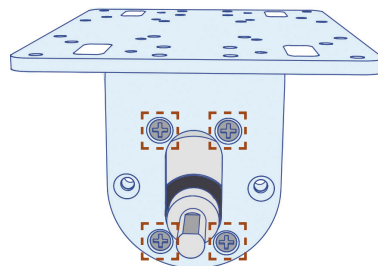


① 2x Motor

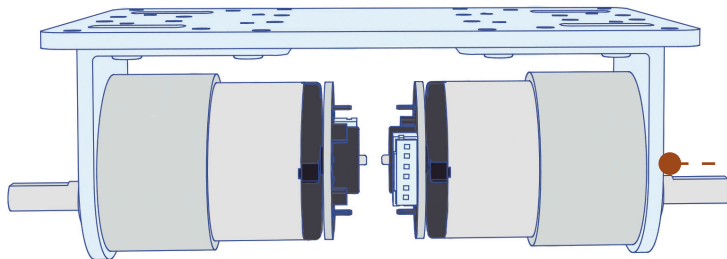


② 8xM3*5 Countersunk Screws

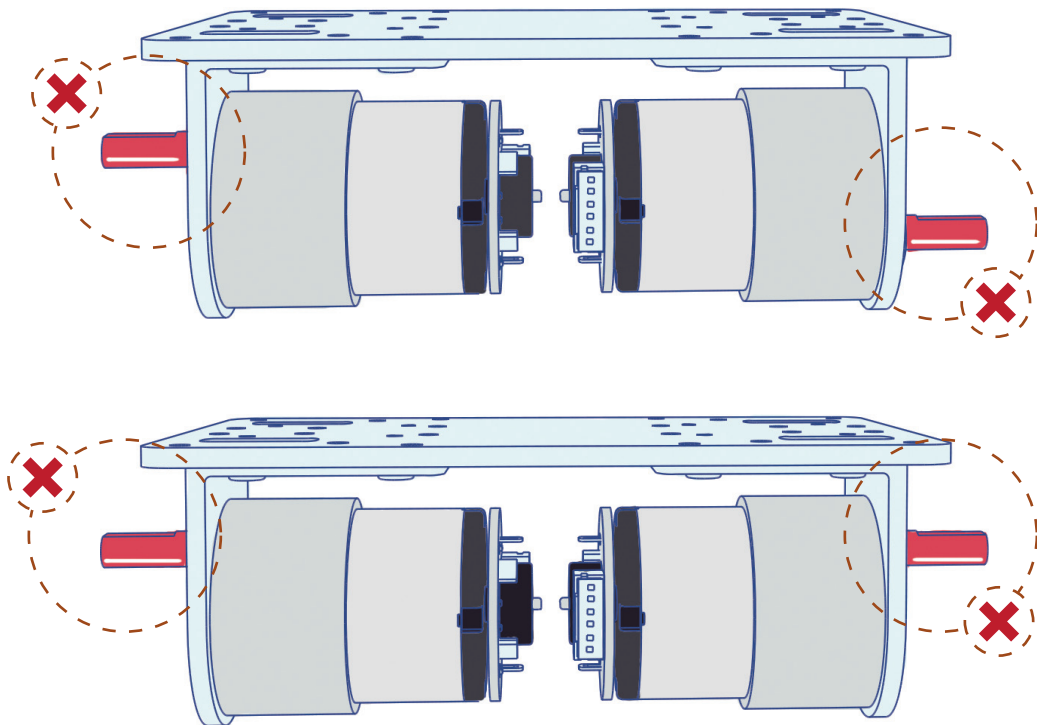
Take out ② from No.2 label bag
(Pay attention to the installation
location of the motor axle)



Pay attention that only lock 4 screws
on Motor Bracket, as the picture shows.

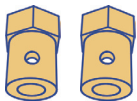


Wrong Installation



Wrong Installation

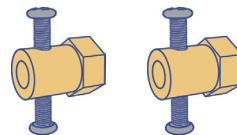
Assembly the tires



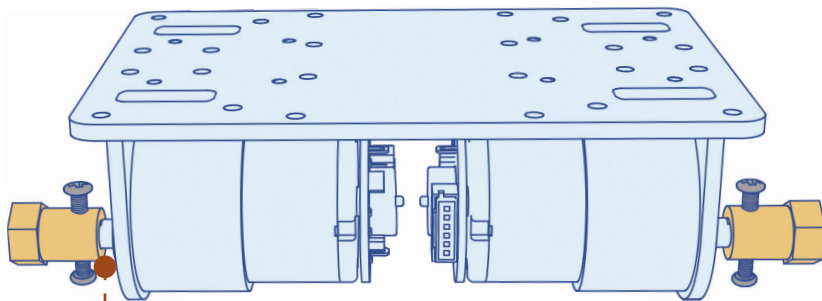
① 2x Coupling



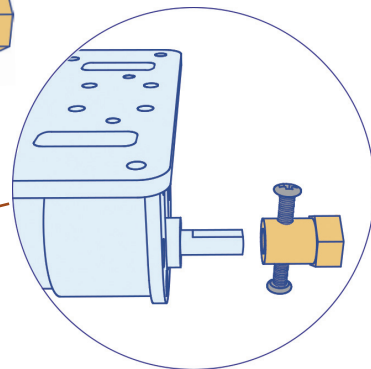
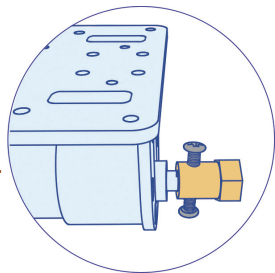
② 6 X M4*6 Round head Phillips screws



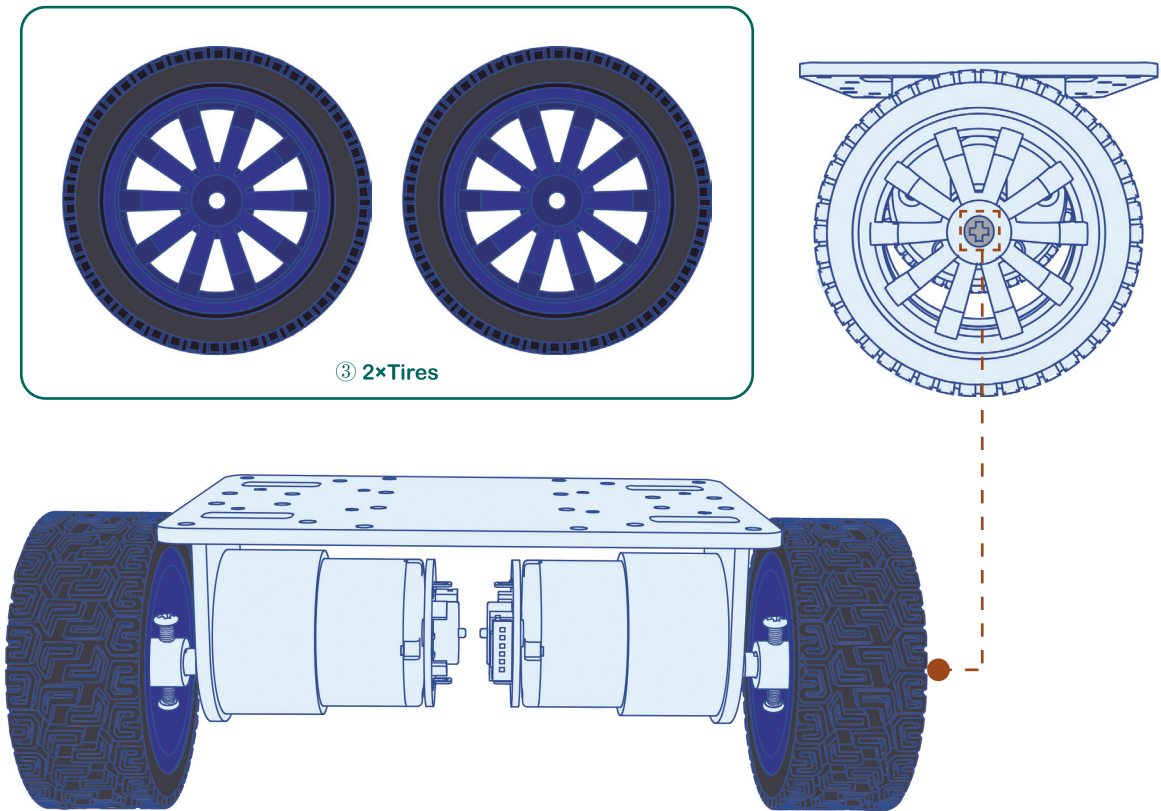
Take out ① ② from No.3 label bag



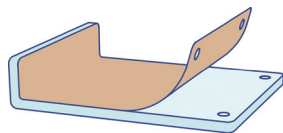
Attention:
Make sure that the screw
on coupling should align with the
cross-section of motor shaft.



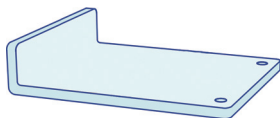
Assembly the tires



Assembly the foothold



① 1x Foothold



② 4x M3*6 Pan head machine screws



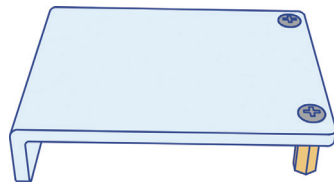
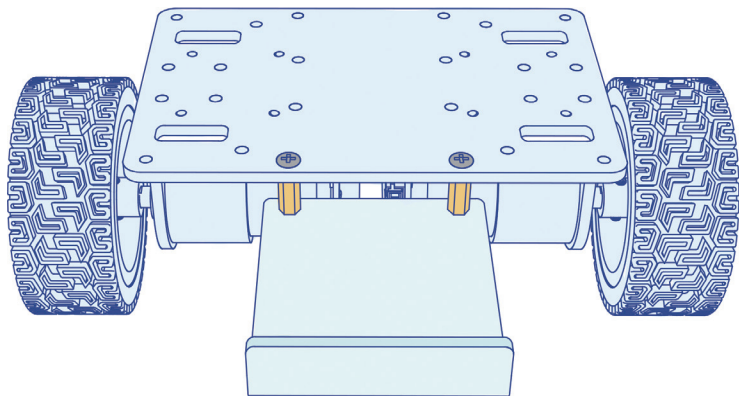
③ 2XM3*18 Double-pass copper column

The second shortest copper column in NO.4 label bag.

Tips: Please make sure you remove the protective film on the Acrylic plate.

Take out ② from No.1 label bag

Take out ③ from No.4 label bag

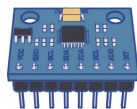




① 1x M3*11 Double-pass copper cylinder



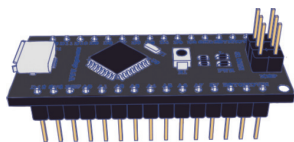
② 2x M3*5 Countersunk Screws



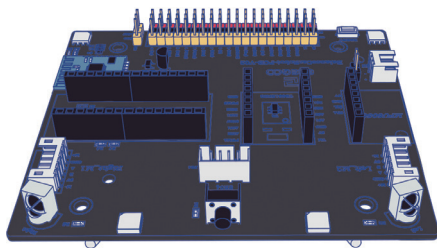
③ 1XGY-521 Module



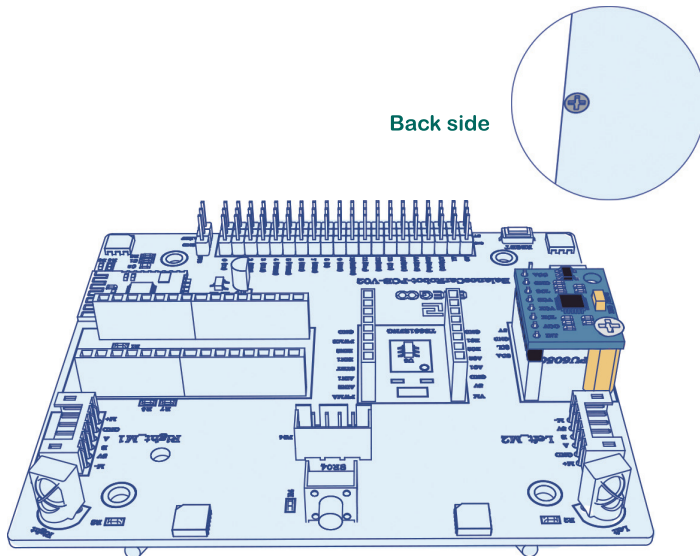
④ 1XTB6612FNG Module



⑤ 1 x NANO



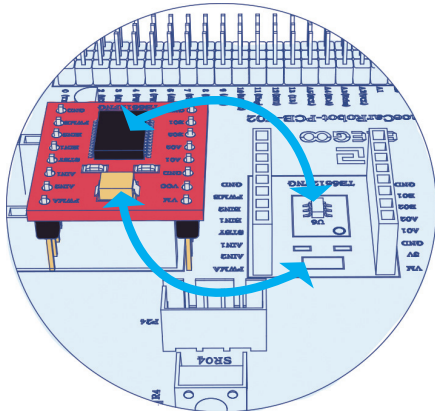
⑥ 1X Expansion Board



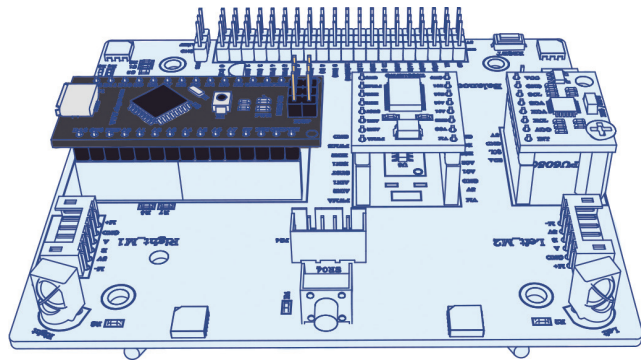
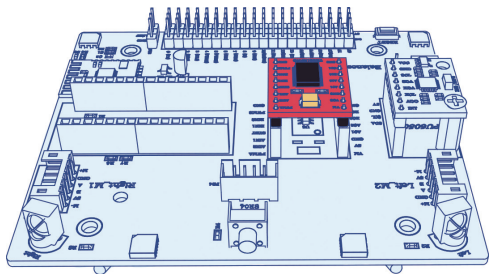
Back side

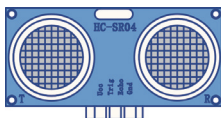
Take out ① from No.4 label bag
Take out ② from No.2 label bag

Assembly the circuit board



To make sure the TB6612FNG Module align with the expansion board according to the correspond sign, as the picture shows.





① 1 x Ultrasonic Sensor



② 4X M3*11 Double-pass copper column

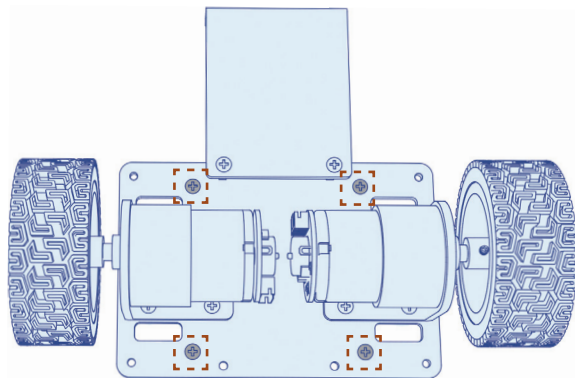
The shortest copper column in NO.4 label bag.



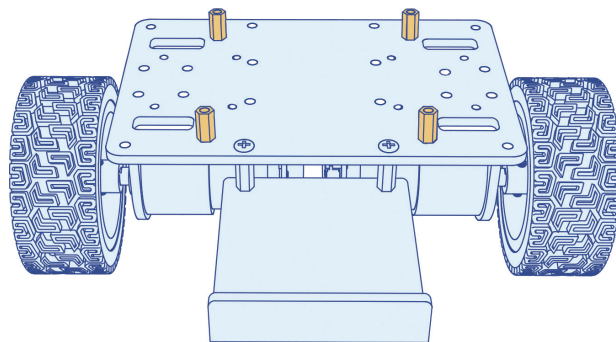
③ 8X M3*6 Pan head machine screws

Take out ② from No.4 label bag

Take out ③ from No.1 label bag

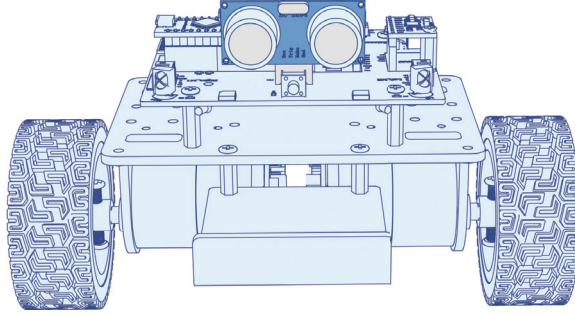
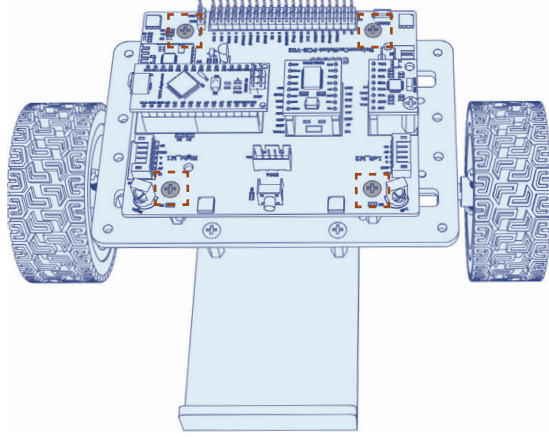


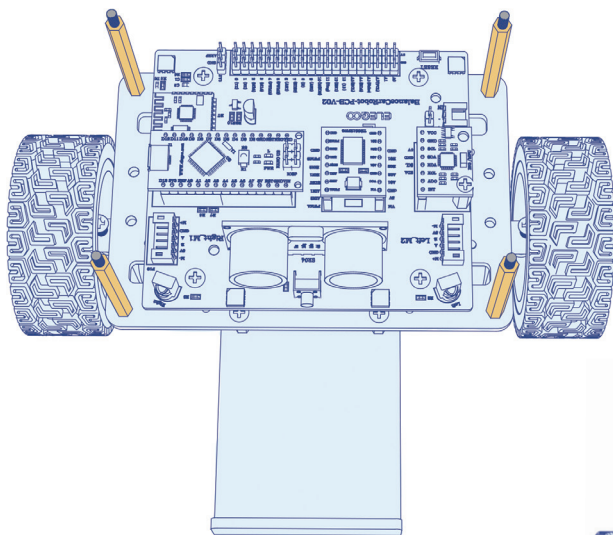
Back side



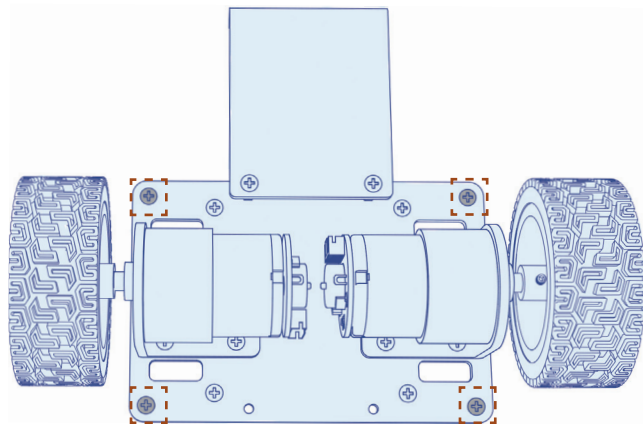
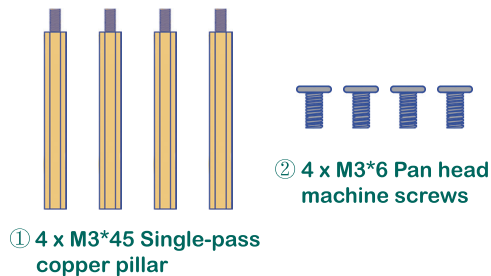
Assembly the ultrasonic sensor

Assembly the ultrasonic sensor





Take out ① from No.4 label bag
 Take out ② from No.1 label bag



Back side

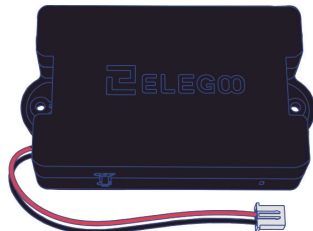
Assembly the battery box



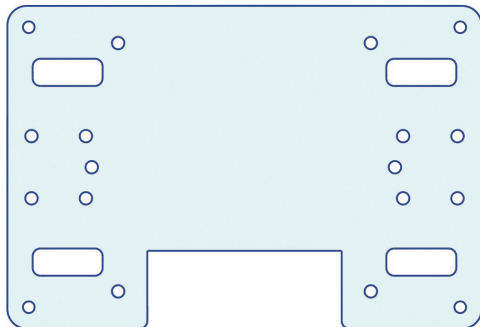
① 2 x M3 K-type gear nut



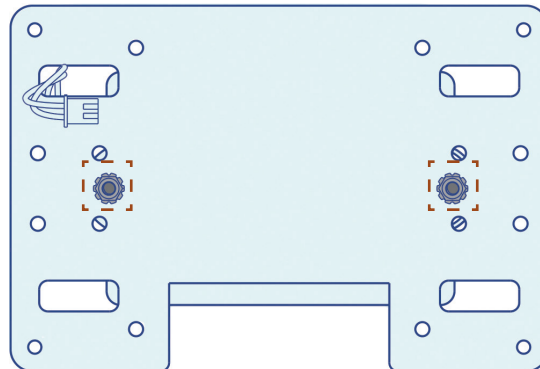
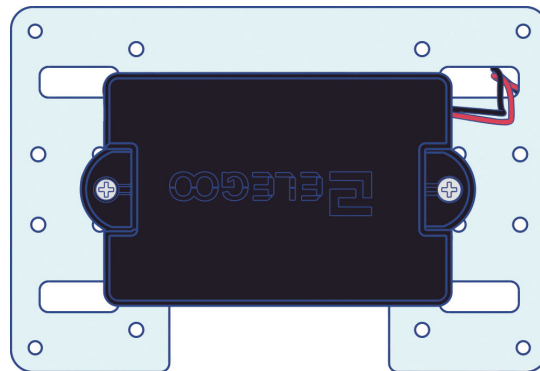
② 2 x M3*12 Pan head machine screws



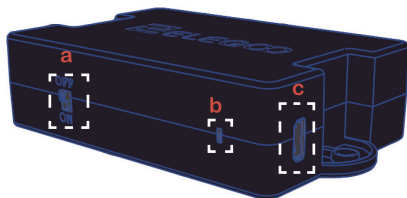
③ 1 x Battery box (Lithium Battery inside)



④ 1 x Fastener for battery box
Take out ①② from No.5 label bag

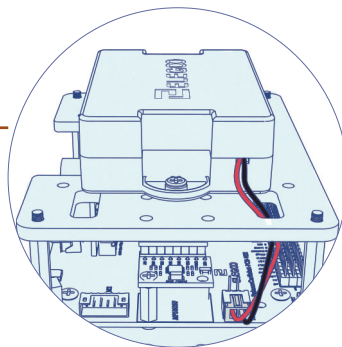
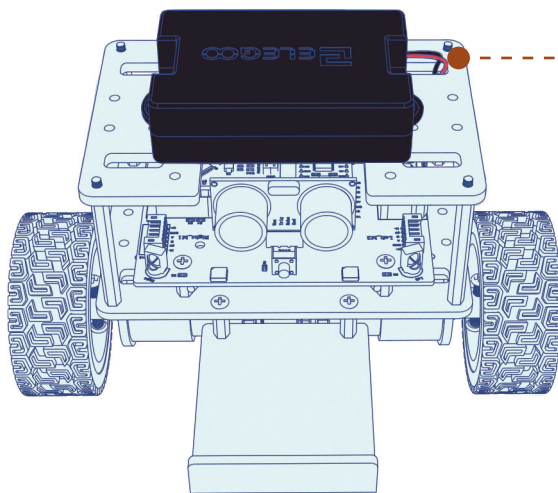


Back side

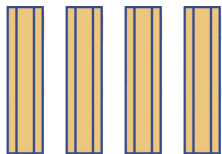


- a Power switch
- b Status indicator (lights in green when charging and it will be turned off once fully charged.)
- c USB charging interface

Attention: Please fully charge batteries before using.



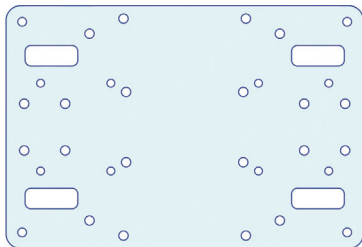
Assembly the top board



① 4 x M3*23 Double-pass copper cylinder



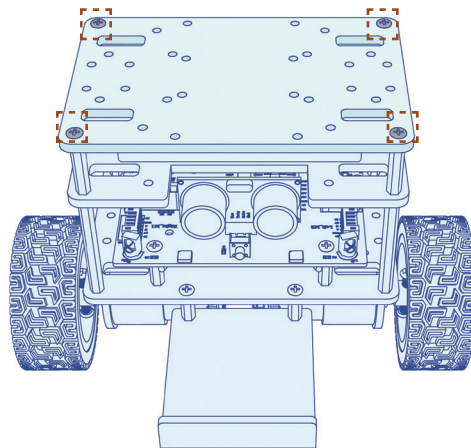
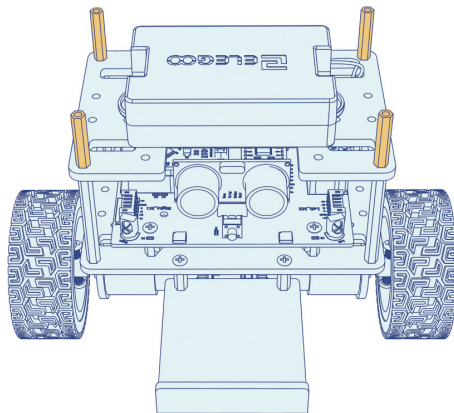
② 4 x M3*6 Pan head machine screws



③ 1 x Top plate

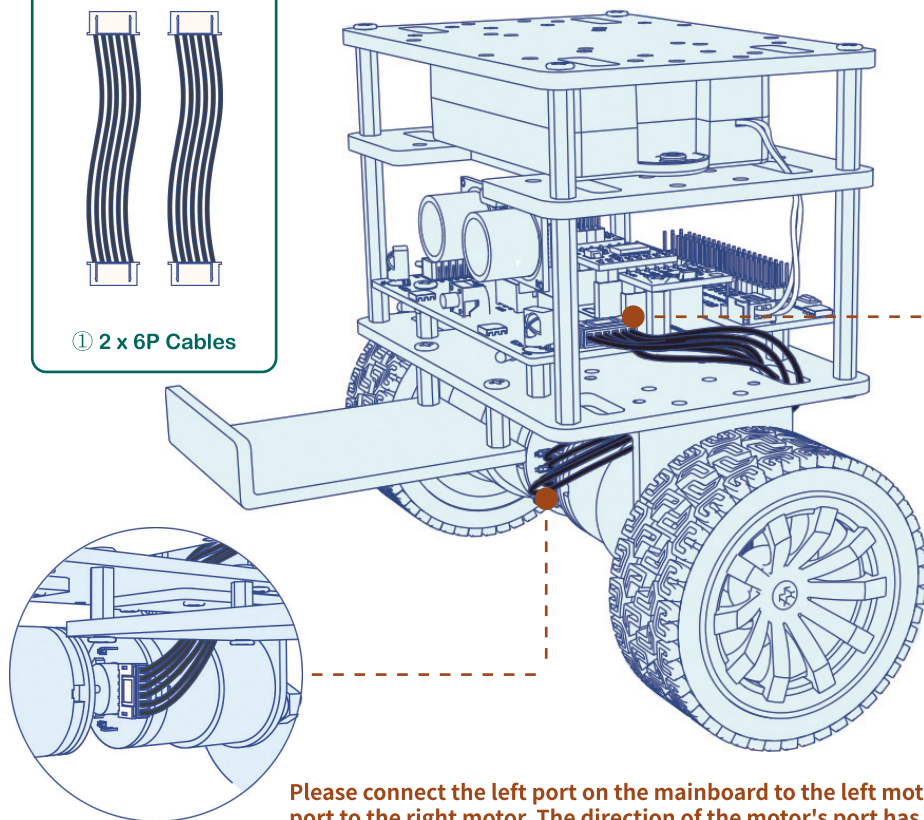
Take out ① from No.4 label bag

Take out ② from No.1 label bag



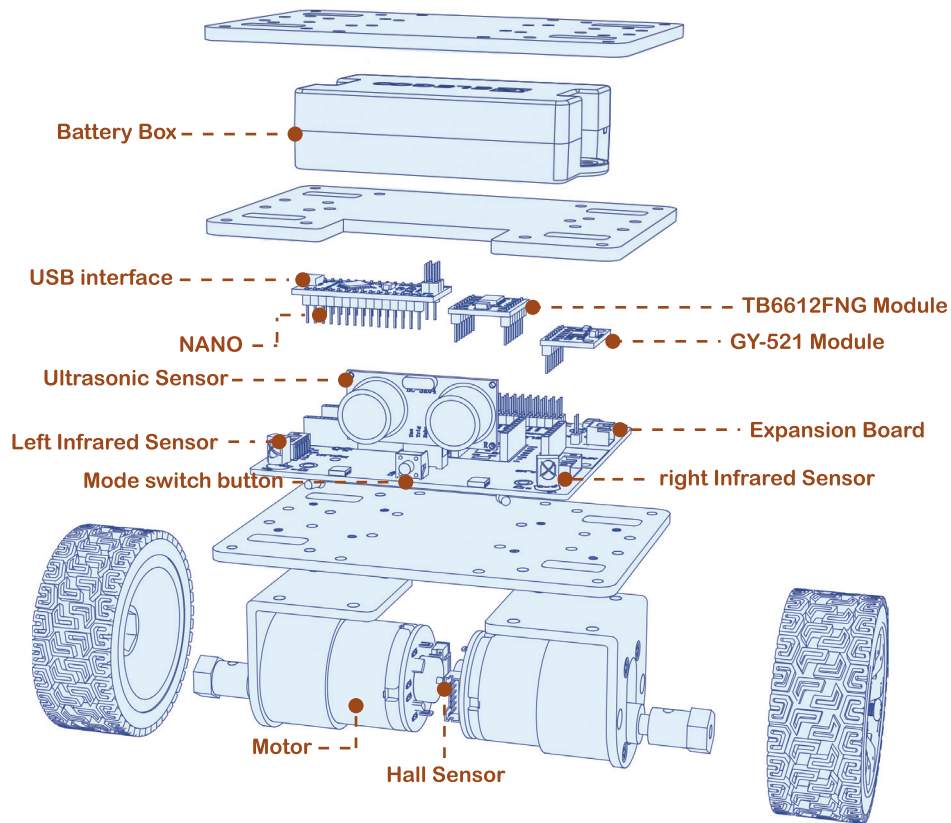


① 2 x 6P Cables



Please connect the left port on the mainboard to the left motor and the right port to the right motor. The direction of the motor's port has no effect on the function.

Wire the motor



Tumbler component parts

Function of each component parts

Battery Box

Power Supply

TB6612FNG Module

Motor Drive

GY-521 Module

Motion Detection

Ultrasonic Sensor

Detect the distance from the obstacle ahead

Expansion Board

Provide Module Interface

Mode switch button

Switch each function mode

Left Infrared Sensor

Detect the distance from the obstacle on the left side

right Infrared Sensor

Detect the distance from the obstacle on the right side

NANO

Main Controller

USB interface

Upload program

Motor

Move Mechanism

Hall Sensor

Measure Speed

Notice:

We have uploaded some necessary programs in advance, thus you can skip uploading the programs. However, if you change the codes, you will need to reupload them.

First of all, please go to our website below to download the
Tumbler tutorial: <http://www.elegoo.com/download/>

And then select the tutorial files based on your computers' running systems.

For **Windows** system, please refer to "Upload Tumbler program for Windows.pdf"

For **MacOS** system, please refer to "Upload Tumbler program for MacOS.pdf"

Standby Mode

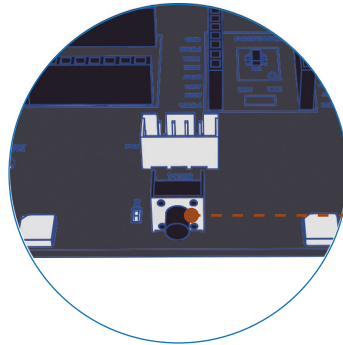
Obstacle-avoidance Mode

Glowing Mode

Auto-follow Mode

Bounce Mode

Mobile Control



Mode switch button

Put the Tumbler on the ground and tilt it forward, then open the switch on the battery case, the Tumbler will automatically stand up and maintain balance. Then you can operate the Tumbler through APP or the mode switch button.

The Tumbler has 6 modes which are

The Tumbler has 6 modes which are

Auto-follow Mode (Forward)

- Press the mode switch button once, Tumbler will be in the follow mode “forward”, then Tumbler will light up in green.
- If there is an obstacle within 10-35cm in front, the 2 LEDs in front flash in green, and Tumbler will move forward with the obstacle.
- If there is an obstacle within 0-20cm on the left or right side, Tumbler will turn left or right with obstacle.
- If there are obstacles on both right and left side within 0-20cm, Tumbler will move forward with the obstacles.

Obstacle-Avoidance Mode

Then press the mode switch button twice, Tumbler will be in the obstacle-avoidance mode and light up in yellow. In this mode, Tumbler will avoid obstacles automatically if there is an obstacle within 0-50cm in front.

Auto-follow Mode (Backward)

- Press the mode switch button for 3 times, Tumbler will be in the follow mode “backward”, then Tumbler will lights up in green.
- If there is an obstacle within 10-35cm in front, the 2 LEDs in back flash in green, and Tumbler will move backward with the obstacle.
- If there is an obstacle within 0-20cm on the left or right side, Tumbler will turn left or right with obstacle.
- If there are obstacles on both right and left side within 0-20cm, Tumbler will move backward with the obstacles.

Glowing Mode

Press the mode switch button for 4 times, Tumbler will be in the glowing mode and light up a random lighting effect

Standby Mode

Press the mode switch button for 5 times, Tumbler will be in standby mode and stop all motions.
Likewise to repeat.

Mobile Control

- For Android system, copy the APK file to the Android products and install it.
- The APK file located in “ELEGOO Tumbler Self-Balancing Car Tutorial\ ELEGOO BLE Tool”, or go to google play and search for “ELEGOO BLE Tool” to download and install our app .

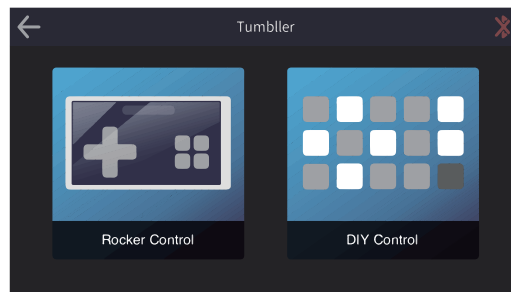
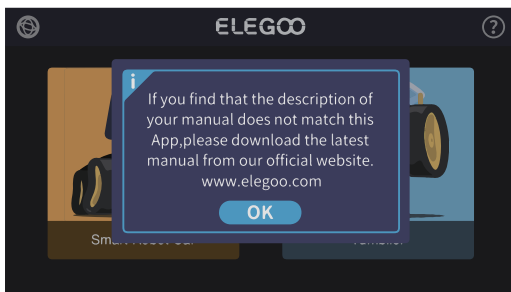
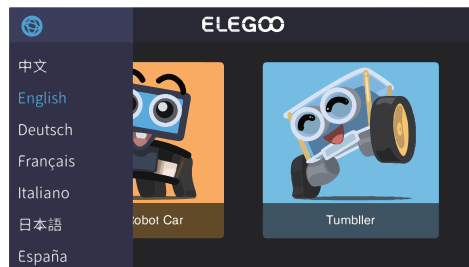
Below, take the Apple mobile phone or tablet for example:

- First of all , search “ELEGOO BLE Tool” in Apple APP Store. Install the APP and then run it on your phone.



ELEGOO BLE Tool

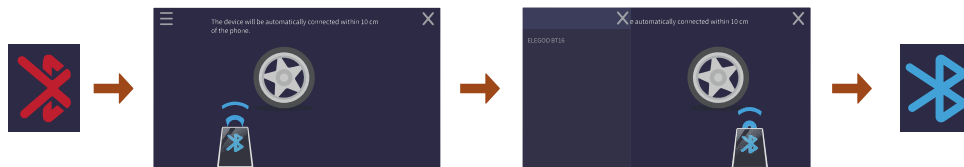
Click the icon in the top left corner, to enter the language list, then choose the language you prefer.



Click OK, then click Tumbler to enter the control page

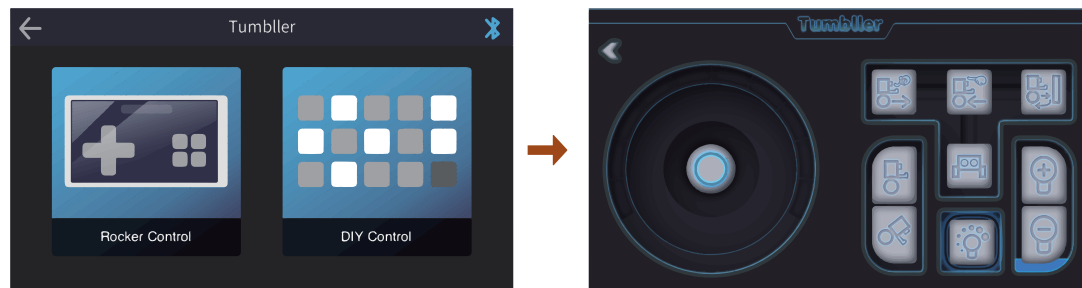
-Click the Bluetooth icon in the right upper corner to enter the Bluetooth search page, then click the search list of Bluetooth name in the upper left corner, and select our Bluetooth name (ELEGOO BT16) to connect.

-If you can't find the Bluetooth name(ELEGOO BT16), please turn off Tumbler, then turn it back on and reconnect Bluetooth.

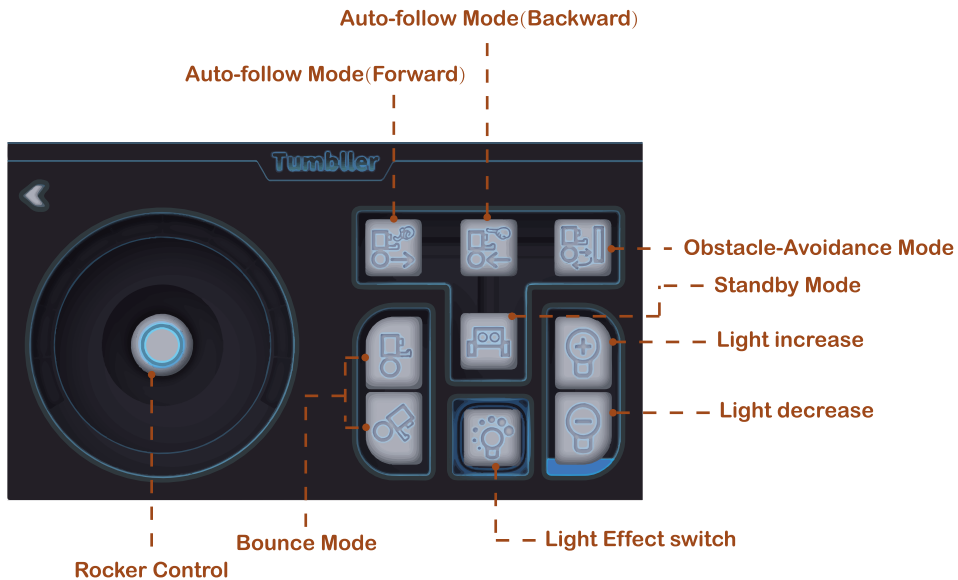


When the Bluetooth icon turns to blue in the upper right corner, that means Bluetooth is connected.

Click the Rocker Control on the left to enter the designed control page.



Rocker Control control page introduction



Rocker Control

- You can control the Tumbler to move in 8 directions by holding rocker. Tumbler will move towards the direction which the rocker points. Release the rocker then Tumbler will enter in standby status.



Auto-follow Mode(Forward)

- Click the Auto-Follow Mode (forward) icon as picture, to make Tumbler enter in Auto-Follow mode and flashes in green light.
- If there is an obstacle within 10-35cm in front, the 2 LEDs in front flash in green, and Tumbler will move forward with the obstacle.
- If there is an obstacle within 0-20cm on the left or right side, Tumbler will turn left or right with obstacle.
- If there are obstacles on both right and left side within 0-20cm, Tumbler will move forward with the obstacles.



Auto-follow Mode(Backward)

- Click the Auto-Follow Mode (Backward) icon as picture , to make Tumbler enter in Auto-Follow mode and flashes in green light.
- If there is an obstacle within 10-35cm in front, the 2 LEDs in back flash in green, and Tumbler will move backward with the obstacle.
- If there is an obstacle within 0-20cm on the left or right side, Tumbler will turn left or right with obstacle.
- If there are obstacles on both right and left side within 0-20cm, Tumbler will move backward with the obstacles.



The Tumbler has 6 modes which are

Obstacle-Avoidance Mode

- Click the Obstacle-Avoidance Mode icon as picture, to make Tumbler enter Obstacle-Avoidance Mode and flashes in yellow light.
- In this mode, Tumbler will avoid obstacles automatically if there is an obstacle within 0-50cm in front.



Bounce Mode

- Click the stand icon as picture , Tumbler will stand up instantly and keep balance.
- Click the tilt forward icon as below, to make Tumbler enter Bounce Mode.



Standby Mode

- Click the standby icon as picture , will enter in standby mode, Tumbler will stop all actions.



Light increase

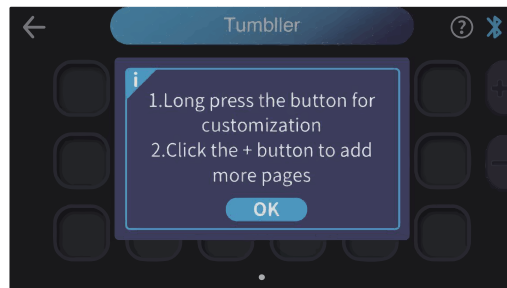
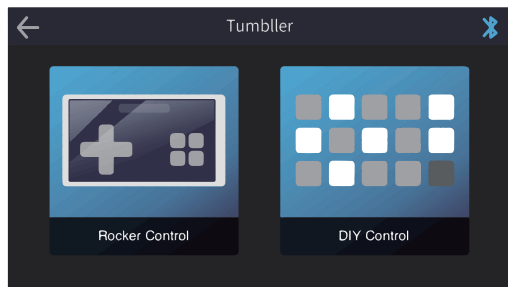
Light Effect switch

- Click the icon as picture, Tumbler will light up one light effect, then click it again, will switch to another one. There are total 6 light effects for switching.

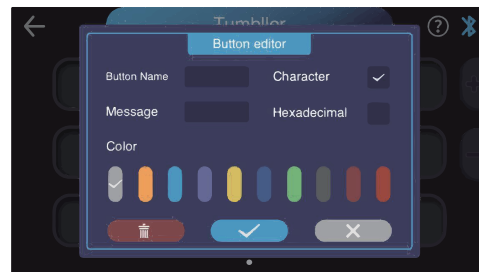
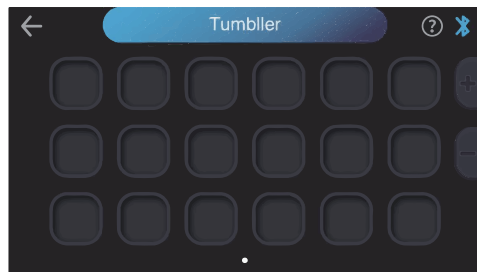


Light decrease

If you want to customize the buttons, you can click “DIY control” to enter in the customization page, then click “ok”.



Press and hold any button to pop up the “Button editor”. Then you can choose color and edit name of the button as you like. But please notice that, the “message” is corresponding to below definition, (refer to next page) you can enter the “message” field according to your own needs.



The Tumbler has 6 modes which are

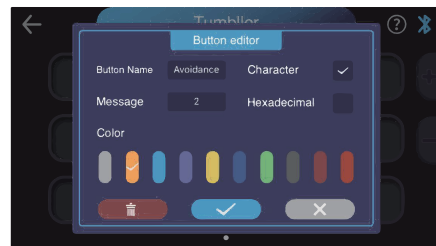
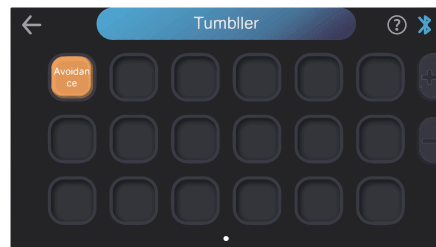
The Tumbler has 6 modes which are

The following is the message sent for each function

- f — Forward
- b — Backward
- l — Turn Left
- i — Turn Right
- s — Standby Mode
- 0 — Auto-Follow Mode (Backward)
- 1 — Auto-Follow Mode (Forward)
- 2 — Obstacle Avoidance Mode
- 3 — Light Effect Switch
- 4 — Tilt Forward
- 5 — Stand up instantly
- 7 — Light Decrease
- 8 — Light Increase

For example, I want to customize the button of obstacle avoidance mode

First, click DIY control and enter in customization page. Then press and hold any button to pop up the "Button editor". I like orange so I choose orange as the button color and name it as "avoidance". And according to the information left side, the message for "Obstacle Avoidance Mode" is 2, so I enter "2" in message field and click "✓". Then it's done. Likewise, you can customize the buttons for any function of Tumbler.



The following are the issues to be aware of when using Tumbler

- 1- Make sure the battery is fully charged before using. The indicator LED of the battery box is green when charging and will turn off when fully charged .
- 2- The LED will flash red when the battery is running out of power.
- 3- When you pick up the Tumbler vertically, the wheel will still rotate. After tilting the Tumbler $\pm 27^\circ$, the rotation will stop.
- 4- In the use of all types of motion modes, Tumbler will automatically enter the standby mode or the motor stops moving if it hit something and makes the Tumbler tilt more than $\pm 27^\circ$.
- 5- Tumbler can't be used in places where the sunshine or light is very strong, because the strong brightness will affect the sensor.
- 6- Charge the battery via the USB port of the cell box .
- 7- The screw on the coupling is easy to get loose, please do lock tight.
- 8- The USB interface on NANO is only used for burning program. When burning program, please turn off the battery compartment switch to prevent interference.

If you feel it difficult to assemble the Tumbler, please check the assembling tutorial video from www.elegoo.com.

Please download the tutorial from our website elegoo.com/download.

If you have any questions during assembling or testing please feel free to contact us at service@elegoo.com.

Elegoo Team



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