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Spider Robot Assembly Guide

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Set Contents

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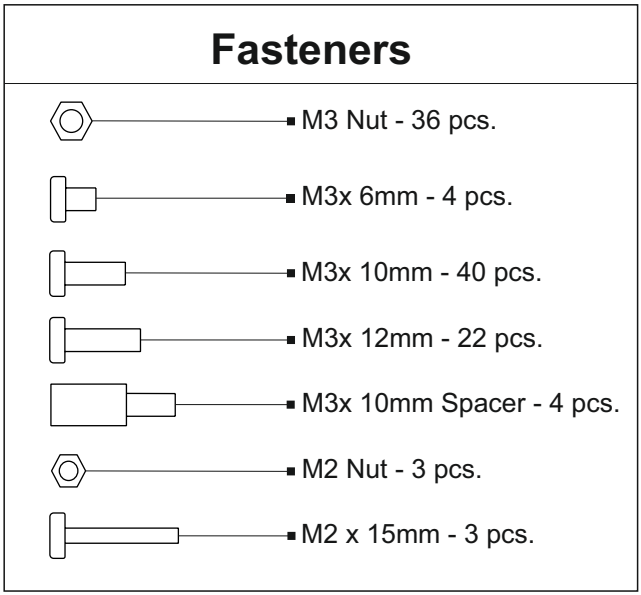
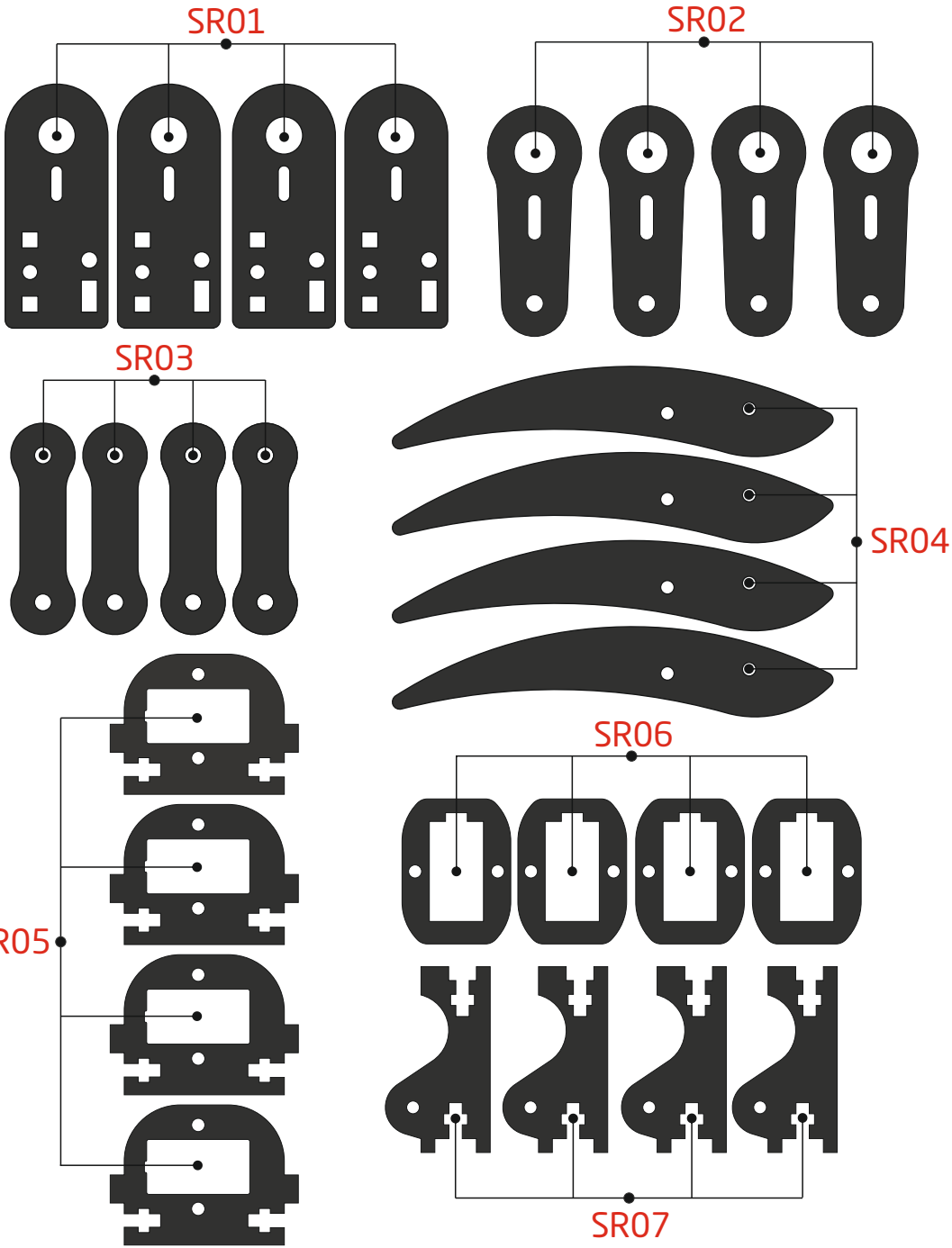
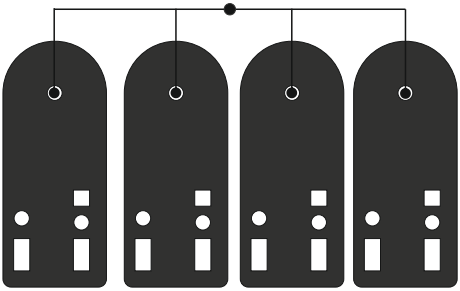
These are the needed fastener components and their quantity for building your spider robot. a screwdriver that is compatible for 3mm bolts is needed for assembling the components. additional screw's for servo motor mounting and servo horns are included in their specific packages.



* The dimensions of fasterners are 1/1 scale if this document printed in A5 booklet format.


SR01
SR02
SR03
SR04
SR05
SR06
SR07

SR08



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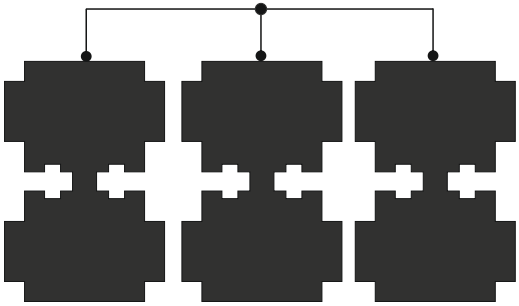
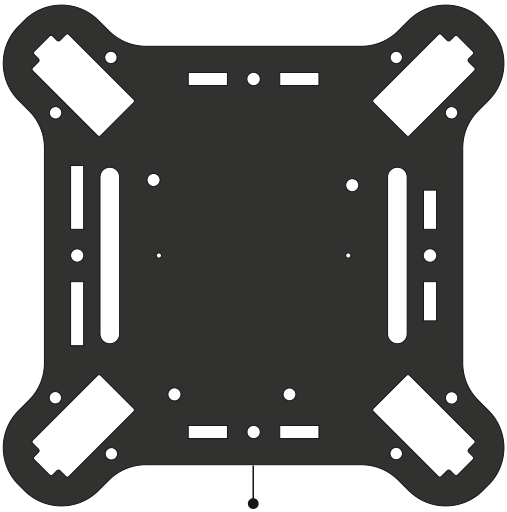
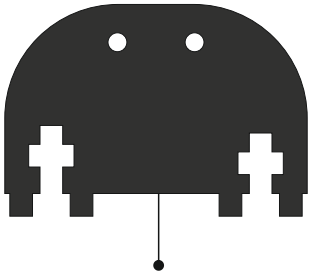
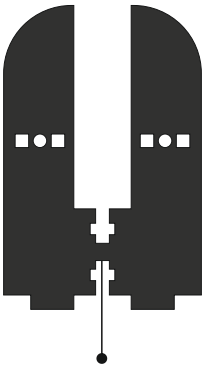




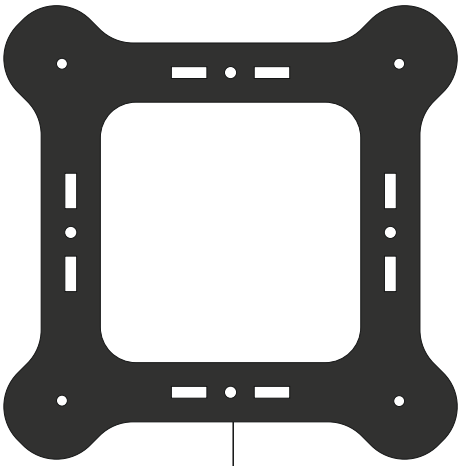
SR09



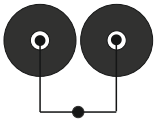
SR13



SR11



SR12



SR14

02

Assembling Spider Robot

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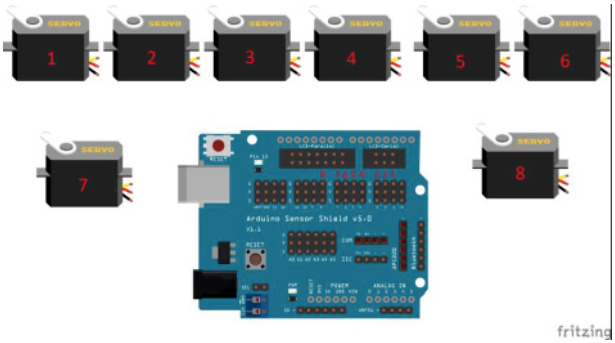
If your servo motors are 360 degree analog servos, you cannot do manual cabling. That's why you can calibrate your servo motors thanks to the code I shared with you at the bottom.



As in the circuit diagram on the side, turn your servo motors into 1.2.3.4.5.6.7.8. Install the code at the bottom to your arduino by attaching it to the pins. If you do not do this, your robot will not work stably.

```
servo_test_kod | Arduino 1.8.13
Dosya Düzenle Taslak Araçlar Yardım
servo_test_kod

#include <Servo.h>    // include servo library

// Define 8 Servos
Servo myServo1; // Front Left Pivot Servo
Servo myServo2; // Front Left Lift Servo
Servo myServo3; // Back Left Pivot Servo
Servo myServo4; // Back Left Lift Servo
Servo myServo5; // Back Right Pivot Servo
Servo myServo6; // Back Right Lift Servo
Servo myServo7; // Front Right Pivot Servo
Servo myServo8; // Front Right Lift Servo

void setup() {
  // put your setup code here, to run once:
  myServo1.attach(1);
  myServo2.attach(2);
  myServo3.attach(3);
  myServo4.attach(5);
  myServo5.attach(6);
  myServo6.attach(7);
  myServo7.attach(8);
  myServo8.attach(9);

  myServo1.write(90);
```

You can access the whole code with the link and QR code below.

http://rbt.ist/spiderrobot

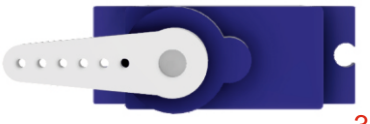
Attention !
Servo motors which included in packages are already calibrated however,
if you want to learn about calibrating about servo motors. you can fallow these steps.

1

Attach the servo horn to the servo motor, then slowly turn the servo horn clockwise until it stops.
It is not a problem if the servo horn is not the same as the angle shown in the image above.
The important thing here is that you have hit the last note of the servo.

2

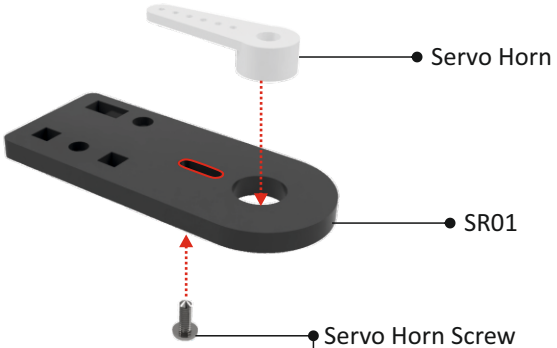
Remove the servo arm from the servo motor and reposition it perpendicular to the servo motor as shown.

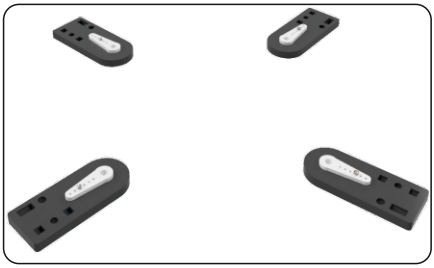


3

Slowly turn the servo horn counter clockwise until it is parallel with the servo motor, as seen in the image. When this step is finished, it means that the servo motor is in the center position. It is important that you apply this process to other servo motors in the set. Afer processing the other motors, remove the servo horn and set aside for assembly.

①



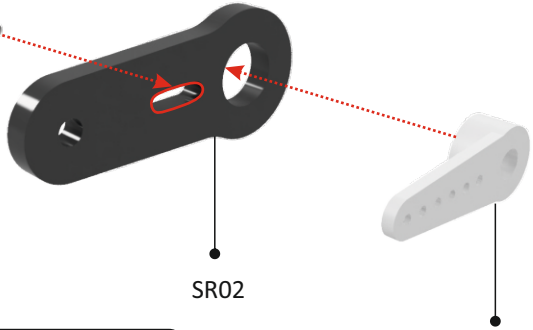


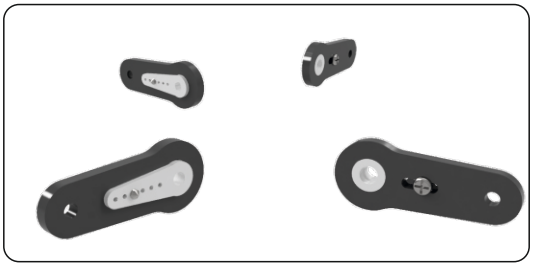
*Repeat this step three more times.

Required components such as; servo horn and its screws can be found inside the packages of servo motors.

②

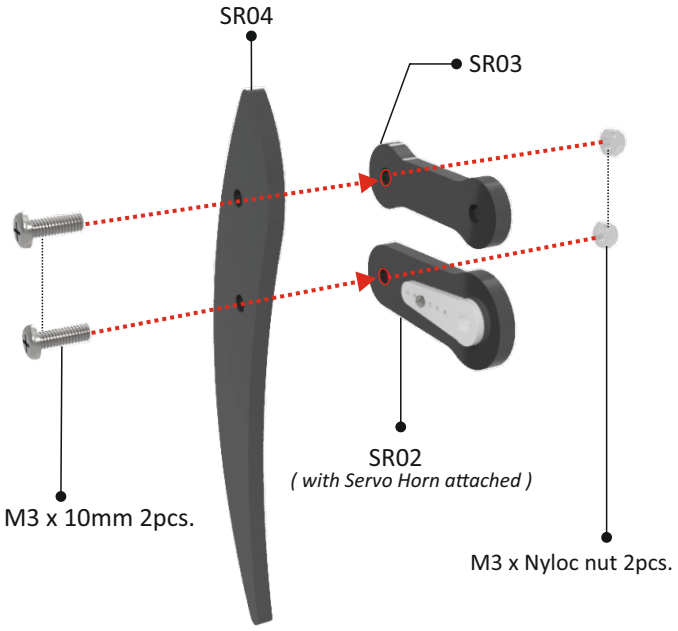
Required components such as; servo horn and its screws can be found inside the packages of servo motors.

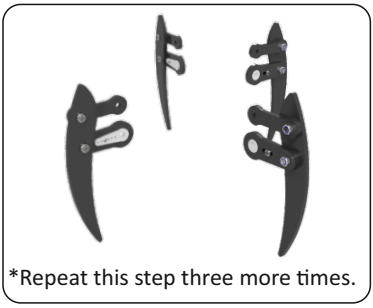




*Repeat this step three more times.

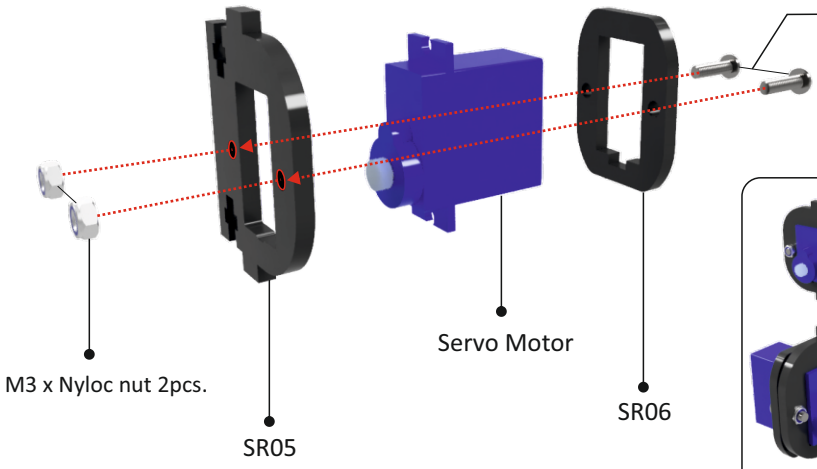
③

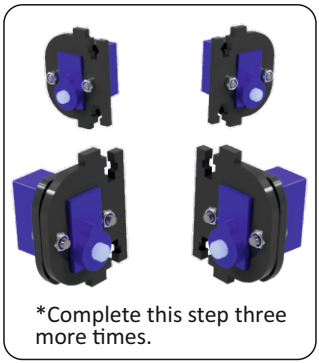

SR04
SR03
SR02
(with Servo Horn attached)
M3 x 10mm 2pcs.
M3 x Nyloc nut 2pcs.


*Repeat this step three more times.

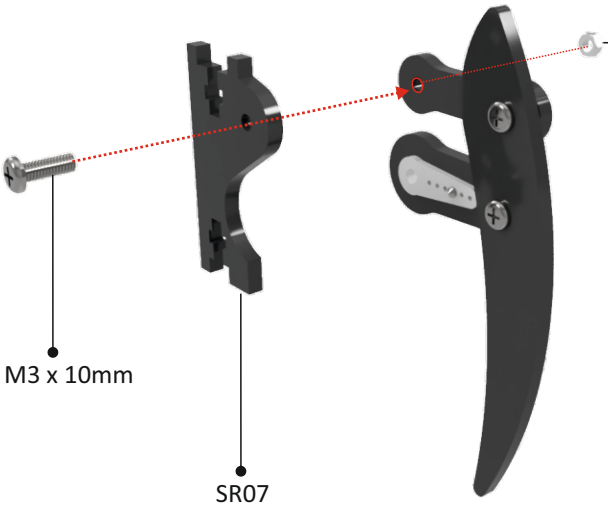
*Make sure joints are not strict and moving freely on their axis.

④


M3 x 10mm 2pcs.
M3 x Nyloc nut 2pcs.
SR05
Servo Motor
SR06

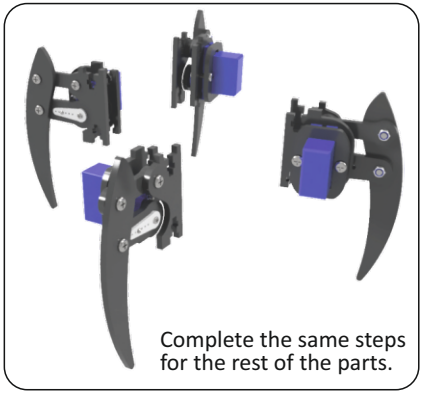

*Complete this step three more times.

⑤

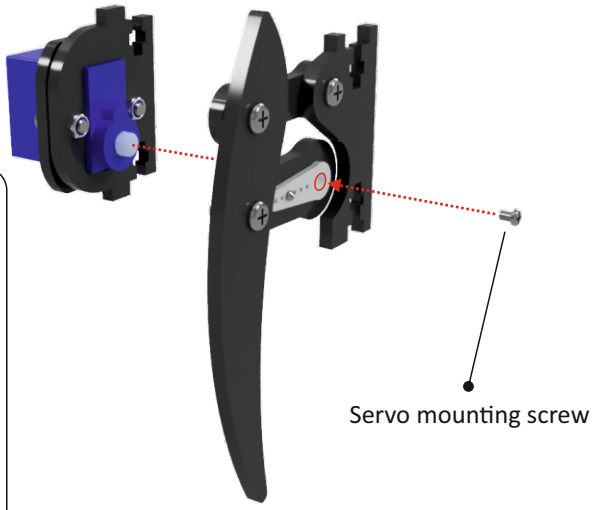


Complete the same step for rest of the legs

⑥

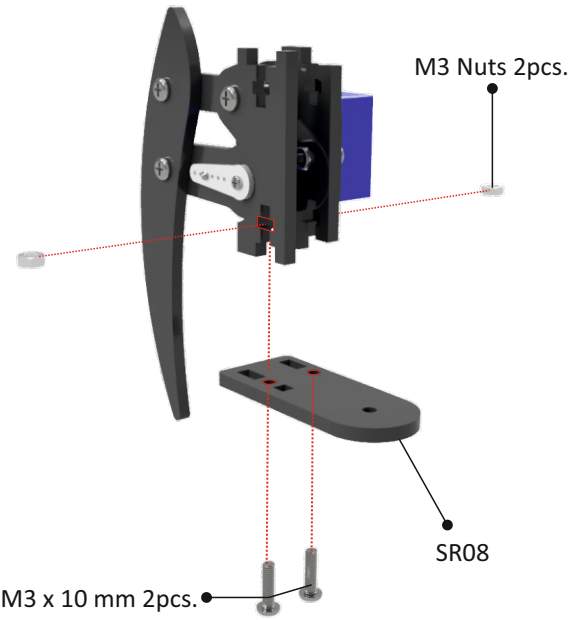


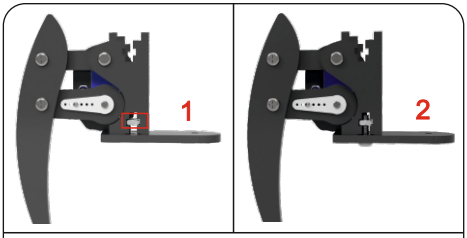
Complete the same steps for the rest of the parts.



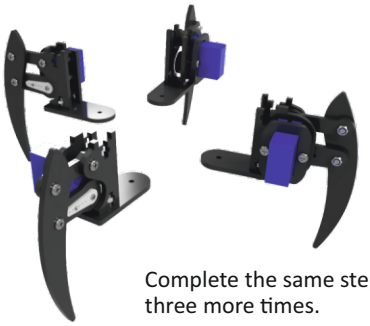
Connecting the servo motor to the front leg rotation parts.

⑦



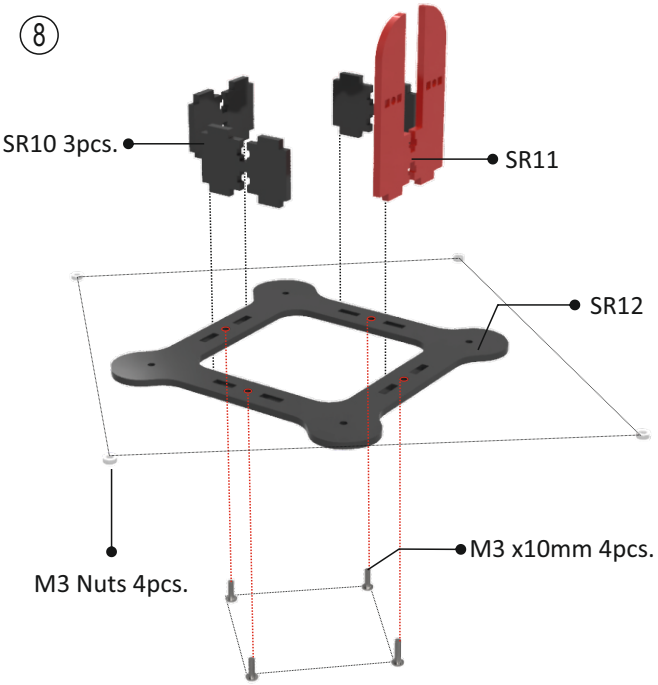


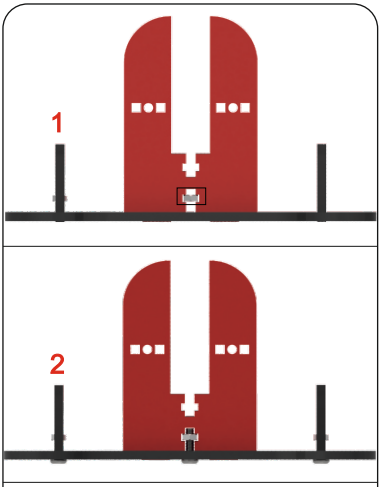
In order to make this connection easily we recommend placing the **M3 Nuts** first then use the **M3 x 12mm** to tighten it.



Complete the same step three more times.

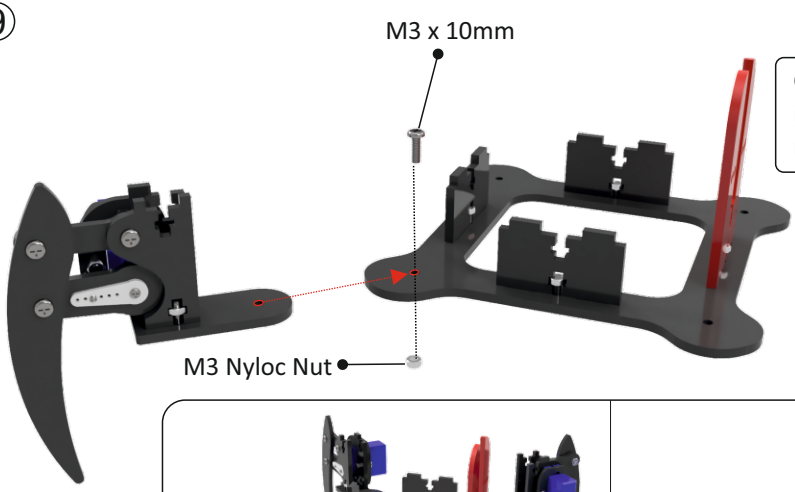
⑧



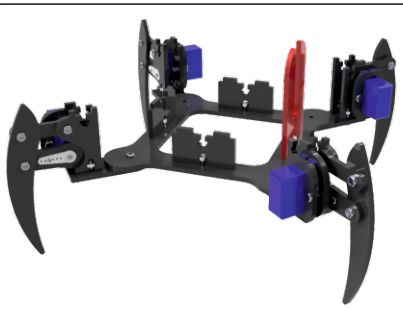


In order to make this connection easily we recommend placing the **M3 Nuts** first then use the **M3 x 12mm** to tighten it.

⑨

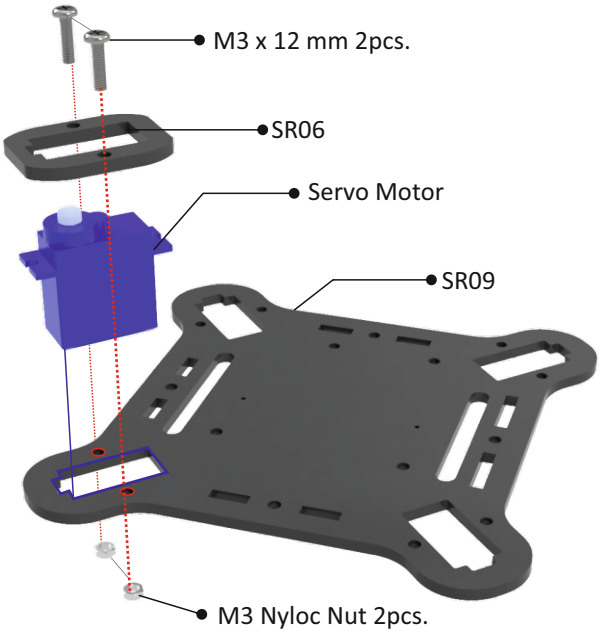


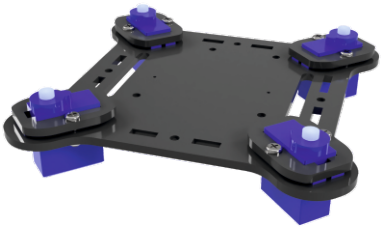
Connect the front leg rotation part to the main chasis.



Complete the same step three more times and make sure **joints are not strict and moving freely on their axis.**

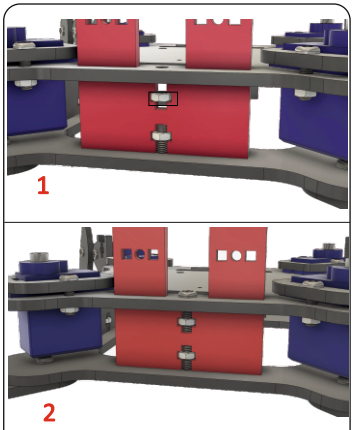
⑩



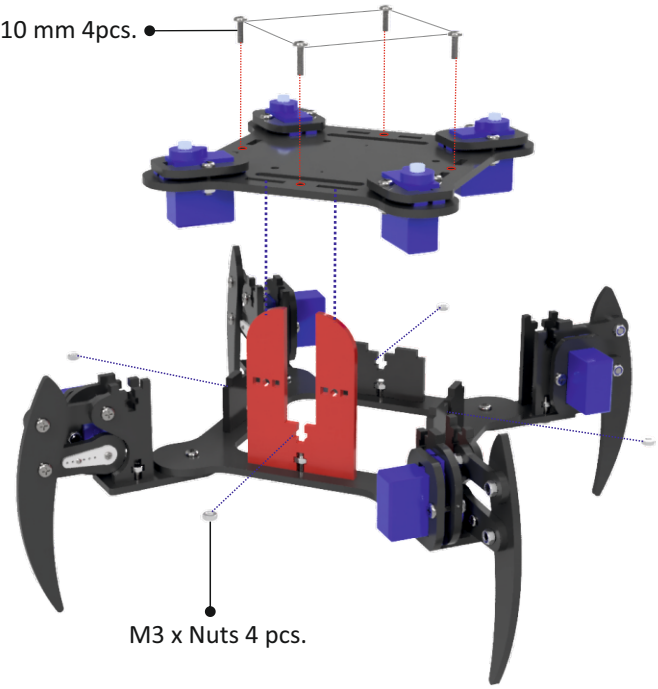


Assemble the rest of the servo motors on the chasis.**(SR09)**

11



In order to make this connection easily we recommend placing the **M3 Nuts** first then use the **M3 x 12mm** to tighten it.



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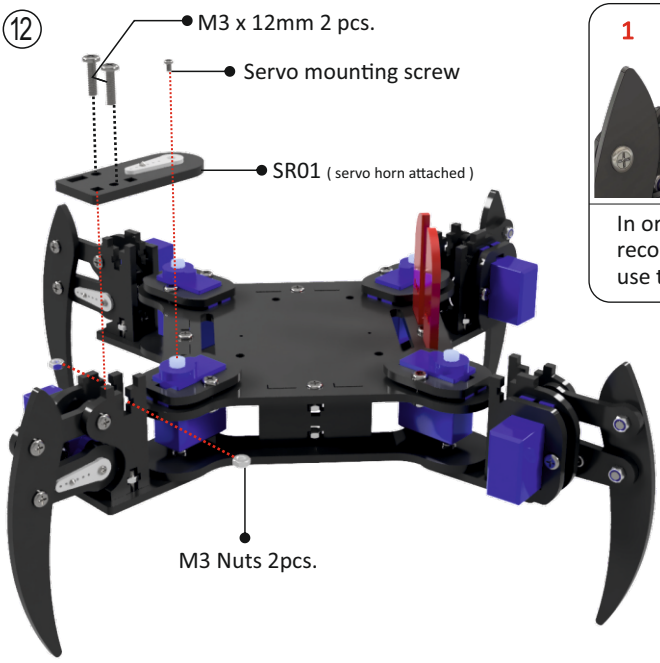
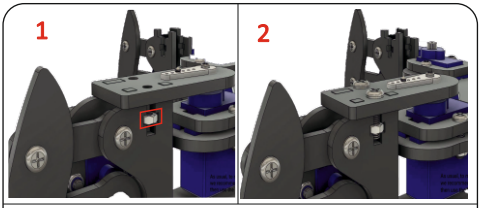
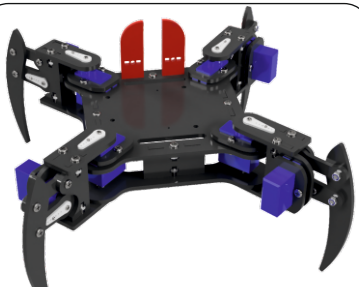


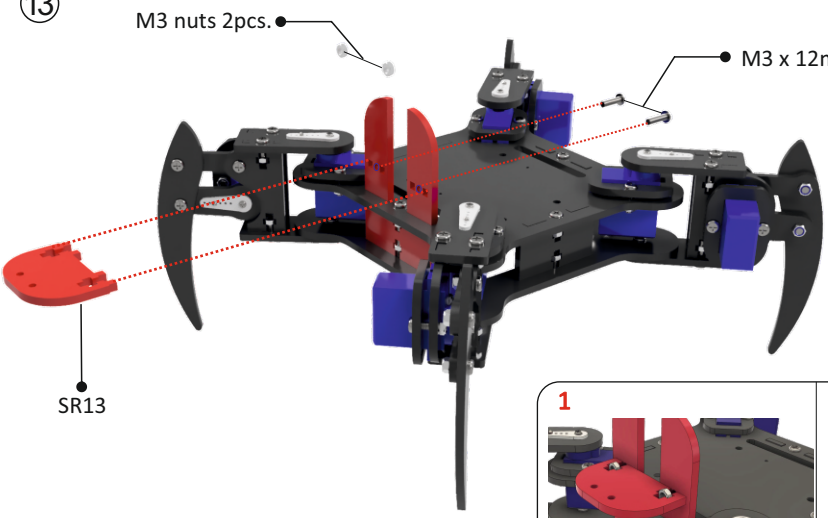


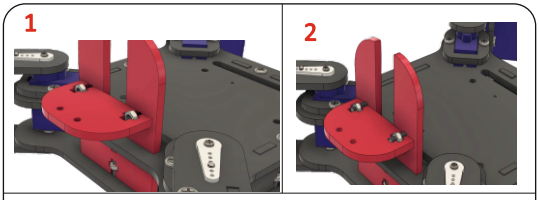
In order to make this connection easily we recommend placing the **M3 Nuts** first then use the **M3 x 12mm** to tighten it.



Apply the same steps for the rest of the rotation parts.

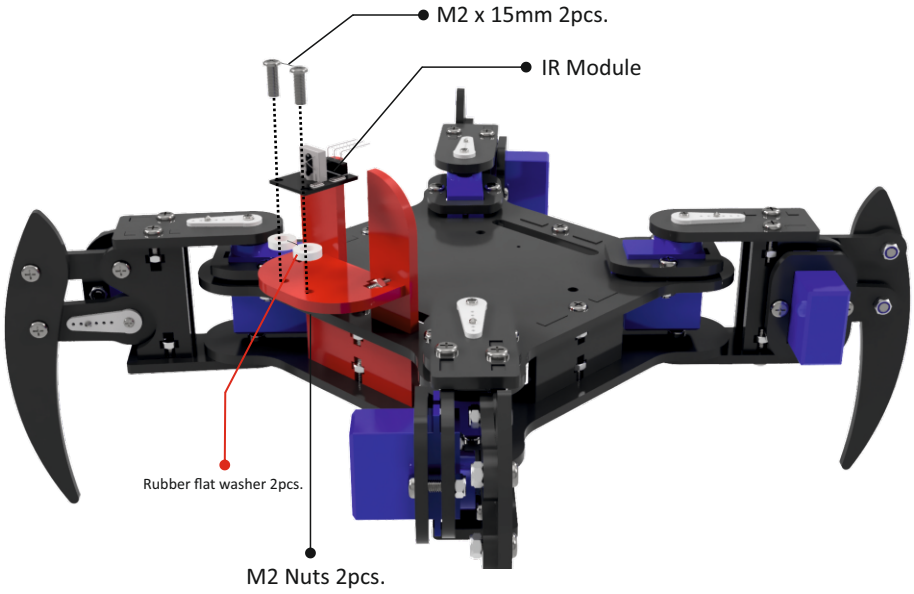
13





As we did in previous steps, In order to make this connection easily we recommend placing the **M3 Nuts** first then use the **M3 x 12mm** to tighten it.

14



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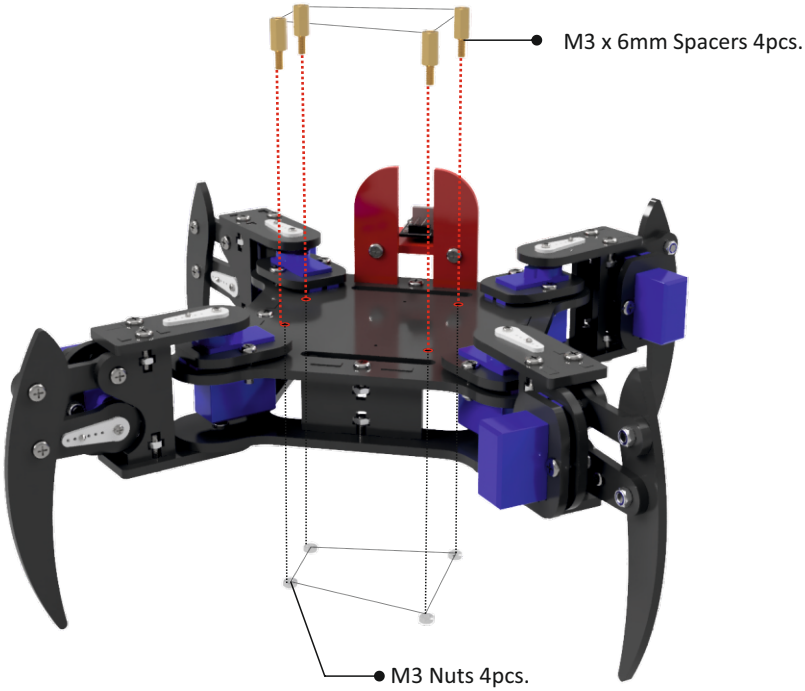
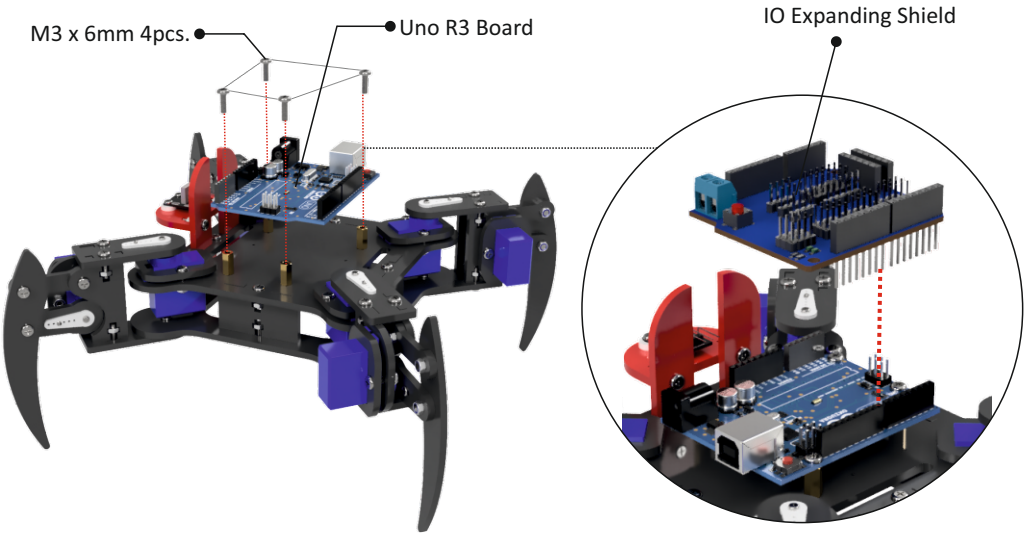
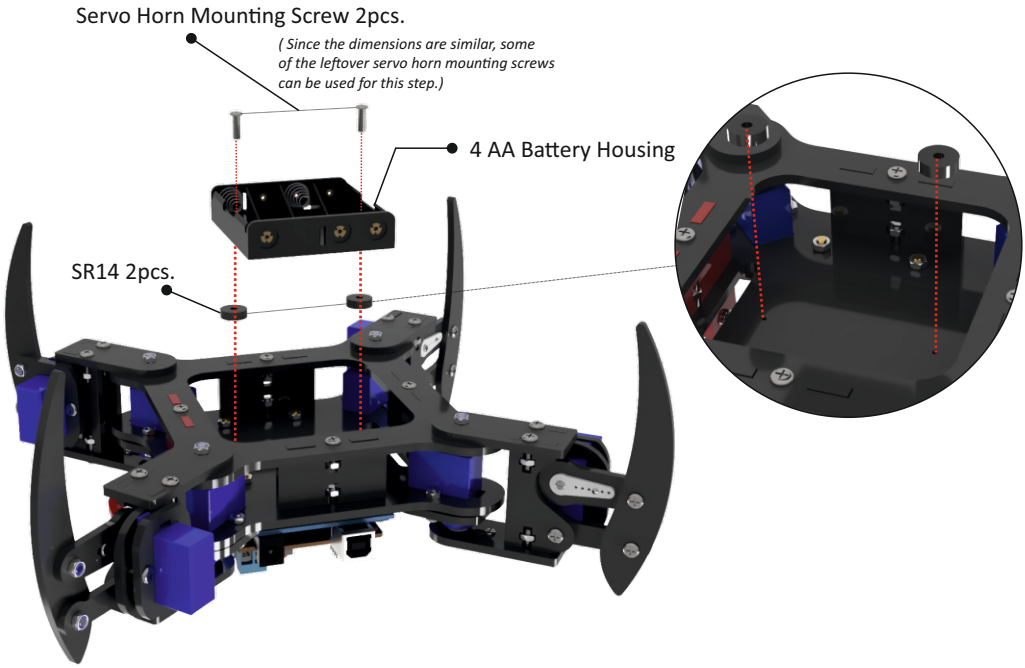

M3 x 6mm Spacers 4pcs.
M3 Nuts 4pcs.

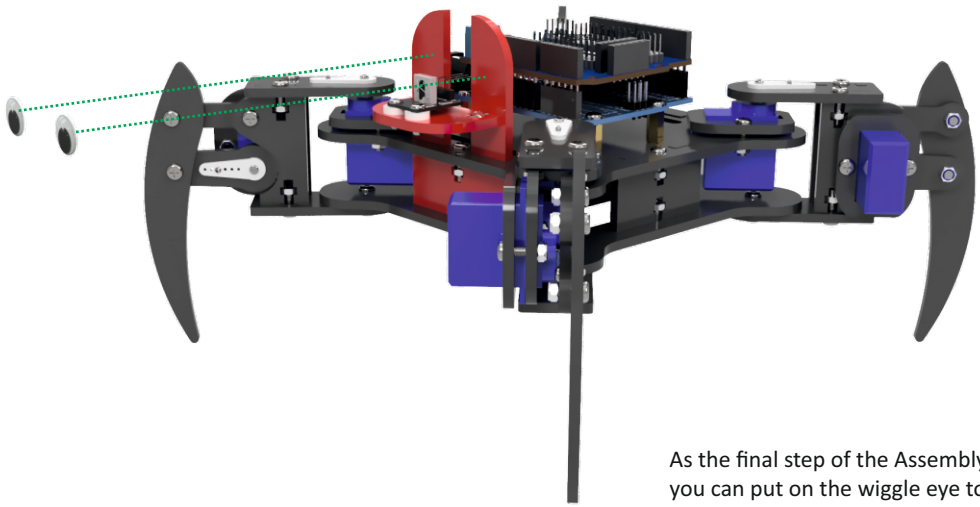
16


M3 x 6mm 4pcs.
Uno R3 Board
IO Expanding Shield

17



18



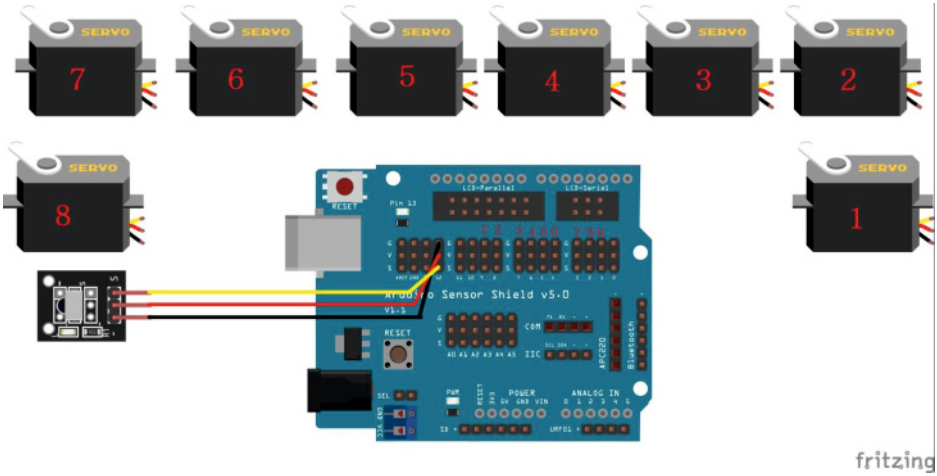
As the final step of the Assembly, you can put on the wiggle eye to prefered part

Its time top make connections between Arduino.

Please follow the instructions :

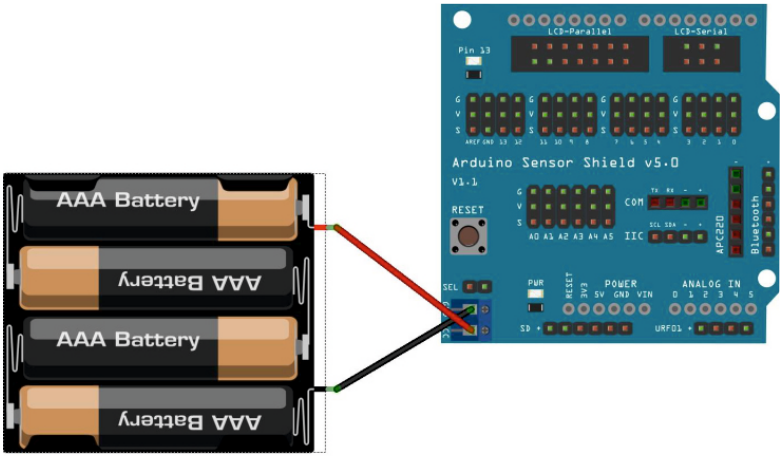
front-left-axis : 2. Pin
front-left-lift : 3. Pin
back-left-axis : 4. Pin
back-left-lift : 5. Pin
back-right-axis : 6. Pin
back-right-lift : 7. Pin
front-right-axis : 8. Pin
front-right-lift : 9. Pin

IR Module : 12. Pin



Connect the servo motors in order starting from the 2nd digital pin to the 9th digital pin as seen in the circuit diagram. Connect the IR receiver module to the 12th pin as in the diagram.

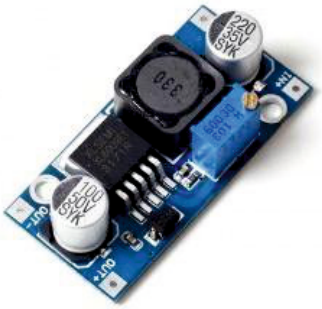
You can use the batteries included in the set by connecting them directly to the shield by inserting
them into the 4-battery slot as seen in the connection diagram at the bottom. Because GP brand batteries are of good quality, they can give very efficient voltage output. That's why the spider is a pretty good power source for the robot.



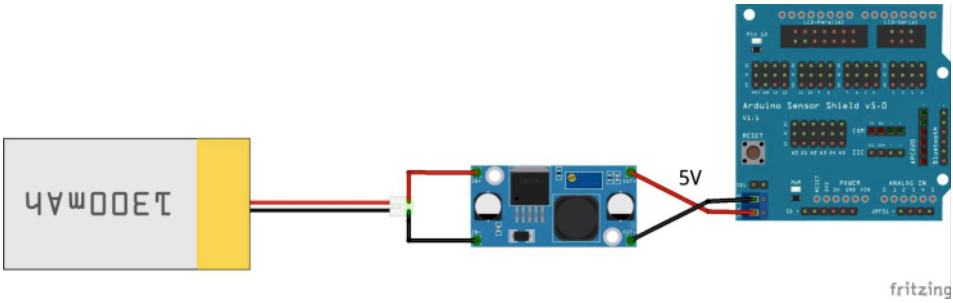
Since the spider robot works with more than one servo motor, the power of the arduinon is insufficient, for this we need to make an external power input.

You need to energize the shild with a minimum 4.8v maximum 5v power supply. It is up to you what kind of energy you will give, whether with a lipo battery or a pen battery. The important thing here is that it should not exceed 5 volts, otherwise your Arduino will be damaged.

I have shared a few battery samples with you below as an example.



If you are going to use a lipo battery type battery on the upper side, you must use the voltage reducing circuit on the side. Because voltages greater than 5 volts will damage your card.



As seen in the circuit diagram, it will be sufficient to set the output of the voltage reducing circuit to 5 volts and attach it to the shield.

02

Software Installation

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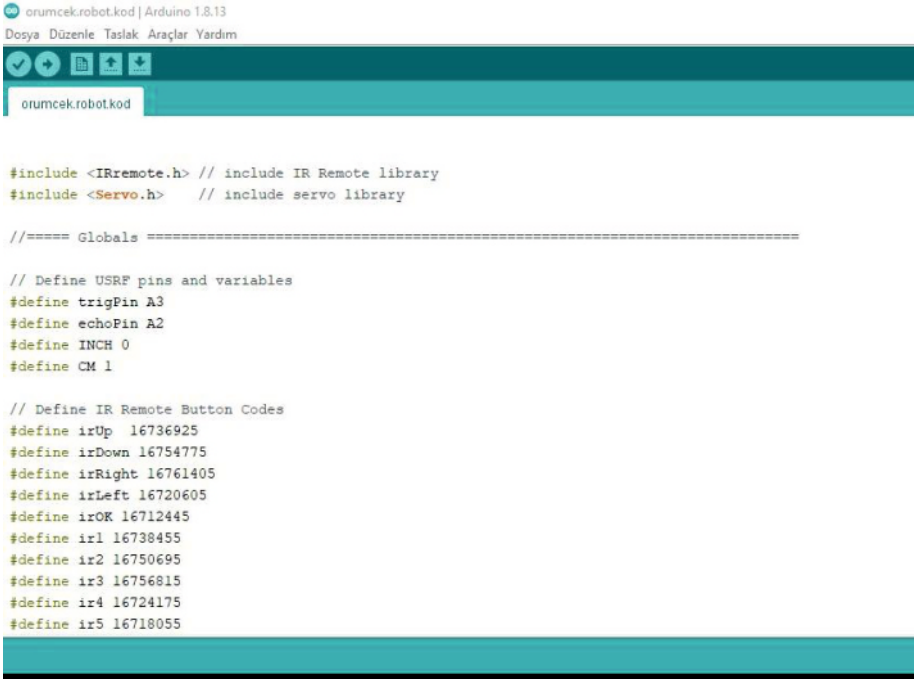
We have prepared a code for you so that you can move the spider robot without any problems at first. A few commands are ready in the code, but you can revise it yourself.

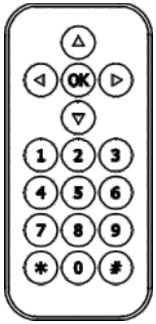



```
#include <IRremote.h> // include IR Remote library
#include <Servo.h>    // include servo library

//===== Globals ================================================================

// Define USRF pins and variables
#define trigPin A3
#define echoPin A2
#define INCH 0
#define CM 1

// Define IR Remote Button Codes
#define irUp  16736925
#define irDown 16754775
#define irRight 16761405
#define irLeft 16720605
#define irOK 16712445
#define ir1 16738455
#define ir2 16750695
#define ir3 16756815
#define ir4 16724175
#define ir5 16718055
```

You can access all the codes with this links :

http://rbt.ist/spiderrobot

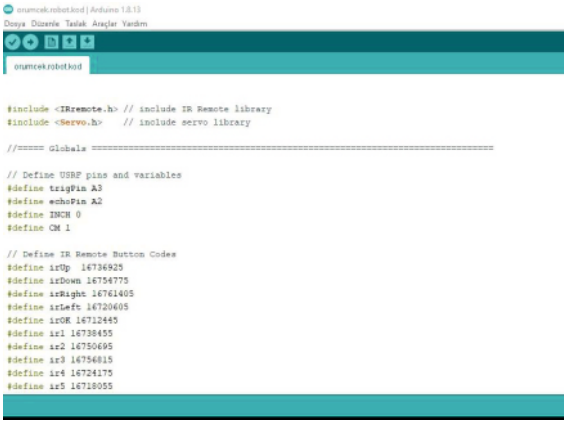
The list of the functions of the IR controller that you will use to move the robot is given below.



up arrow : forward
down arrow : back
one-
2nd-
3: increase walking speed
4-
5-
6 : decrease walking speed
7-
8 : dance mode
9-
0 : restore all servos
* : wave to the left
# : wave to the right

These movements defined to the control are the movements defined in the arduino code before. You can define the idle pins of the controller in the code according to your own wishes.

Each remote has its own unique ID numbers. In order to introduce your own remote to your robot, you need to know the ID number of the buttons of your remote. In this, you need to download the code at the bottom to your Arduino first, learn the ID number of your remote's keys one by one, and copy it into your main code.



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Robotistan Elektronik Ticaret A.Ş.

Mehmet AKÇALI (Editor) - Mehmet Nasır KARAER (Graphics) - Sercan Okay (Visuals & Design)
info@robotistan.com - www.robotistan.com
Tel: 0850 766 0 425