ARMBOT

SETUP GUIDE

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ArmBot

ArmBot is a REX robot that can move items around it from one point to another, thanks to the 4-axis robot arm and wheels it has in its body.

What is Robot Arm? Where Is Robot Arm Used?

With new technological developments, the robot arm is a technology that is frequently used to reduce manpower in industrial production, to prevent accidents that people will encounter in dangerous work, etc. The ability of the robot arm to reach different points determines the number of axes. The robot arm set in The REX 8 in 1 kit is a 4-axis robot arm that can reach four different points by using four servo motors.

Types of Robot Arm

Robot arms are divided into five according to their features.

- **Joint Robot Arm**
  The robot with joints that rotates to at least three different points is called the joint robot arm.

- **Spherical Robot Arm**
  It is the robot arm that moves only spherically. The range of motion is restricted according to the length of the arms.

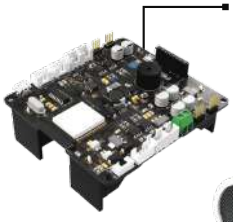
- **Cylindrical Robot Arm**
  This type of robot arms move in a cylindrical workspace.

- **Cartesian Robot Arm**
  It is a robot arm that moves linearly in the X, Y and Z axes.

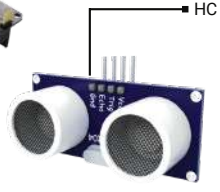
- **SCARA Robot Arm**
  That the rotation axes of the SCARA Robot Arm are vertical is the most basic feature that distinguishes it from a joint robot arm. Although it does not move in the vertical direction, it has many alternatives in the horizontal direction.

The Installation Steps

Required Components to build TrackerBot



REX 8in1 Main Board



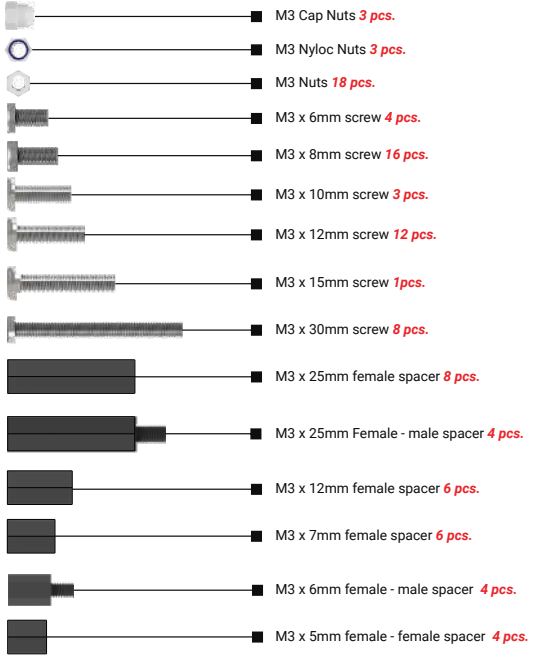
HC - SR04

Gear motor ***4 pcs.***

Servo Motor (MG90)

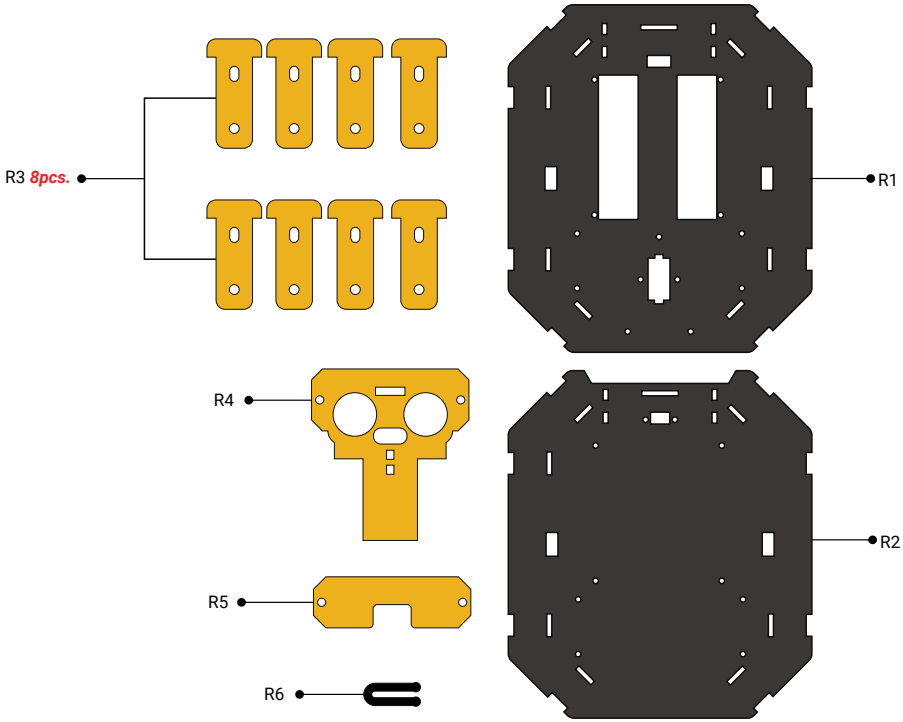
Gear Motor Wheel ***4pcs.***

Converter Board

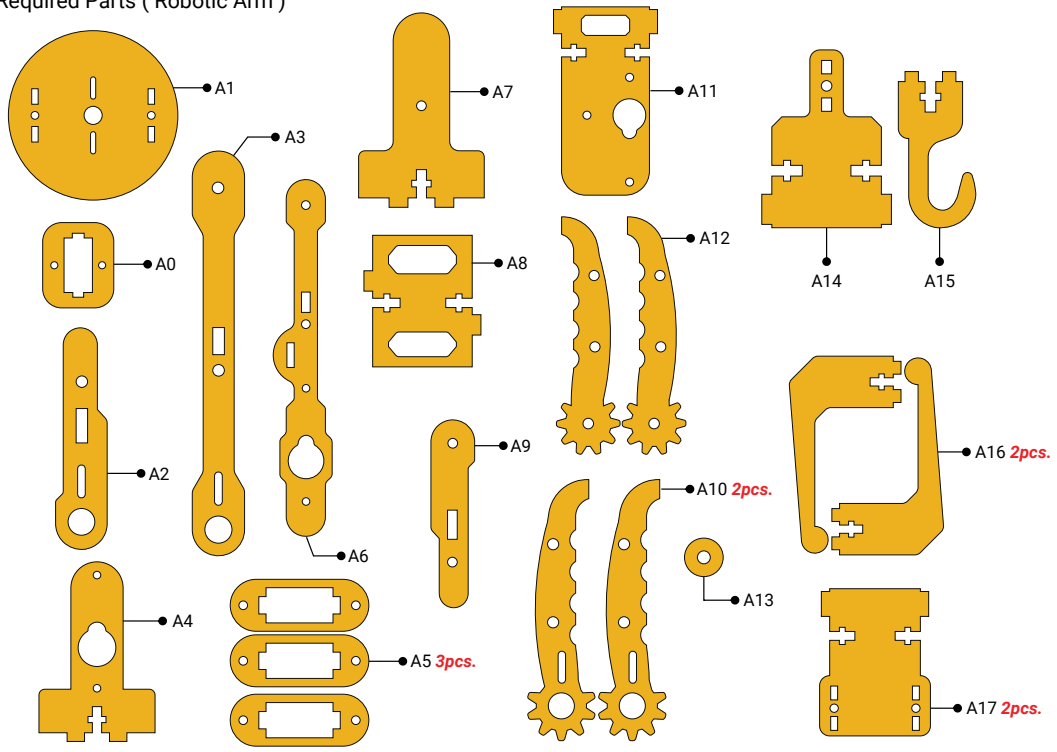


- M3 Cap Nuts ***3 pcs.***
- M3 Nyloc Nuts ***3 pcs.***
- M3 Nuts ***18 pcs.***
- M3 x 6mm screw ***4 pcs.***
- M3 x 8mm screw ***16 pcs.***
- M3 x 10mm screw ***3 pcs.***
- M3 x 12mm screw ***12 pcs.***
- M3 x 15mm screw ***1pcs.***
- M3 x 30mm screw ***8 pcs.***
- M3 x 25mm female spacer ***8 pcs.***
- M3 x 25mm Female - male spacer ***4 pcs.***
- M3 x 12mm female spacer ***6 pcs.***
- M3 x 7mm female spacer ***6 pcs.***
- M3 x 6mm female - male spacer ***4 pcs.***
- M3 x 5mm female - female spacer ***4 pcs.***

Required Parts

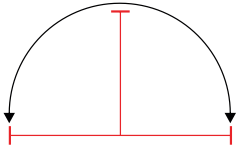


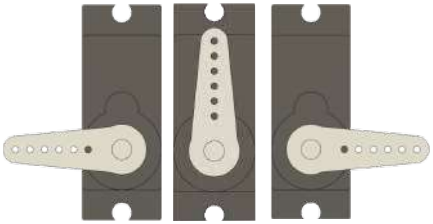
Required Parts (Robotic Arm)



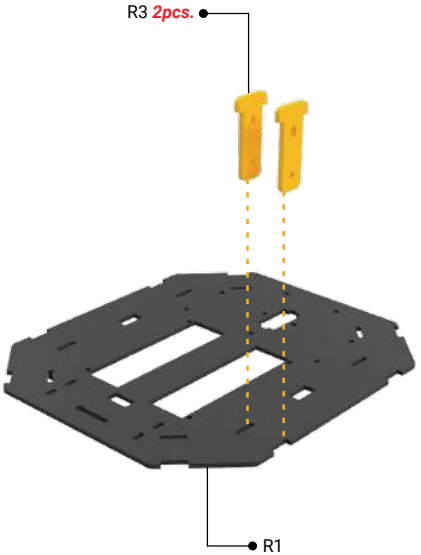
Calibrating the Servo Motors.

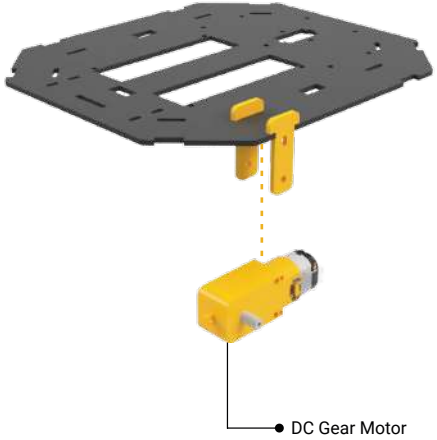
To ensure that the Robotic Arm operates smoothly, it is crucial to calibrate the servo motors properly. There are various methods that can be used to achieve this, and the provided library code is just one of them. It is essential to follow the instructions provided and make sure that the servo motors are calibrated correctly, as demonstrated in the images below.

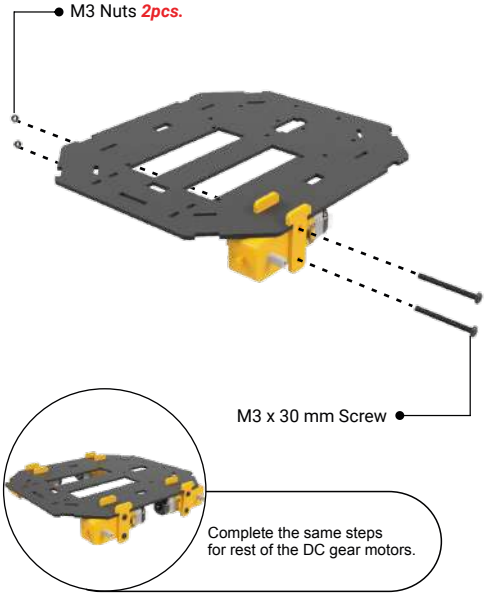


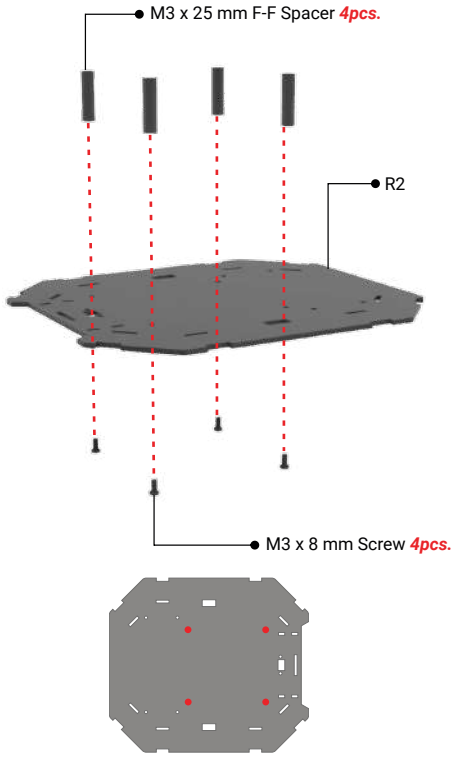


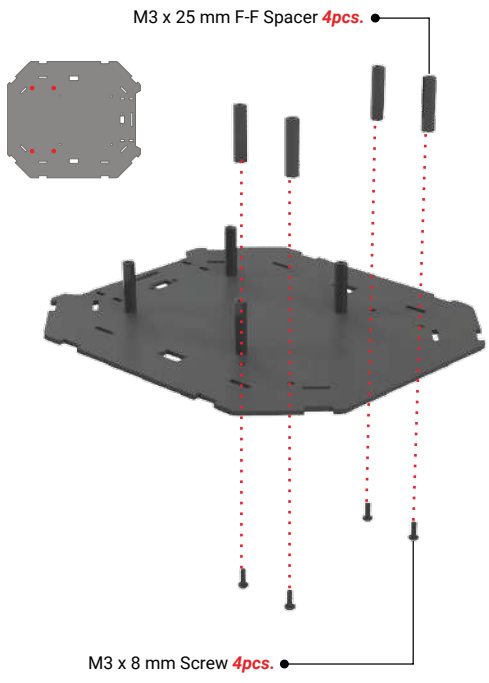
For more detailed information about servo motor calibration, scan the QR code.

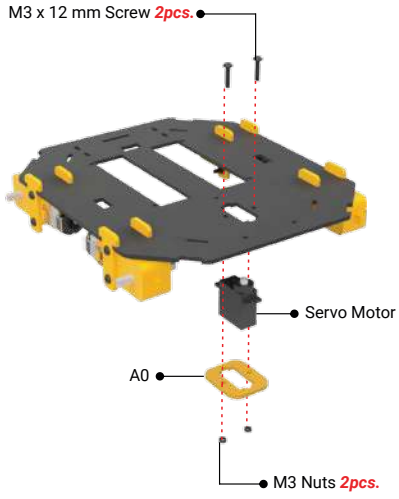


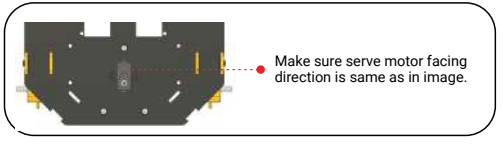

DC Gear Motor

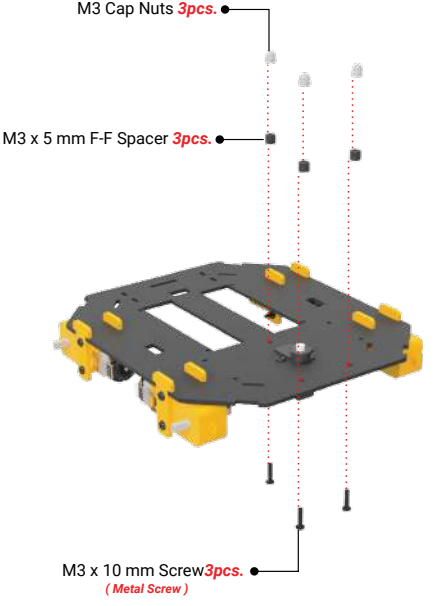

M3 Nuts 2pcs.
M3 x 30 mm Screw
Complete the same steps
for rest of the DC gear motors.

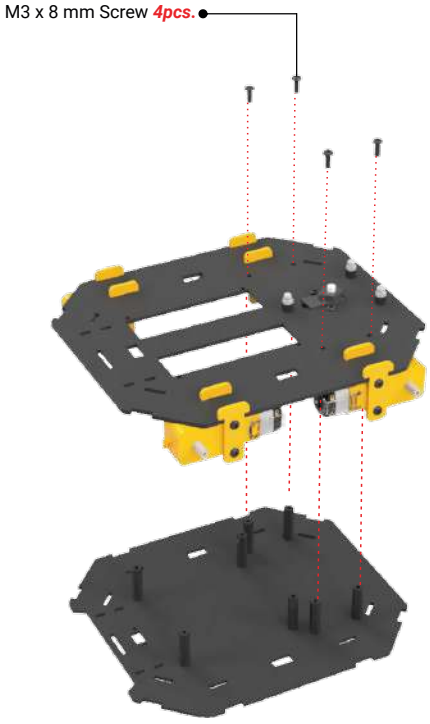

M3 x 25 mm F-F Spacer 4pcs.
R2
M3 x 8 mm Screw 4pcs.

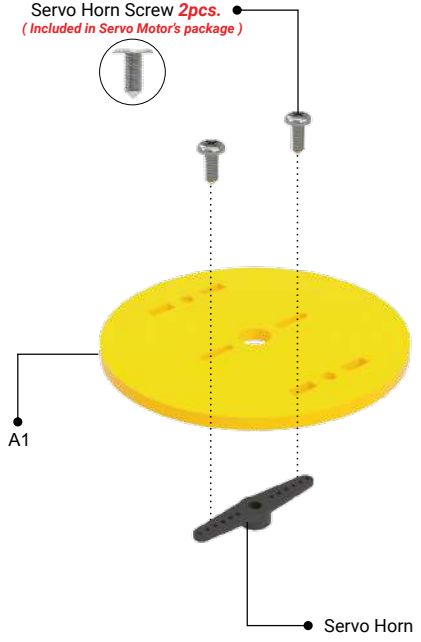

M3 x 25 mm F-F Spacer 4pcs.
M3 x 8 mm Screw 4pcs.


M3 x 12 mm Screw 2pcs.
Servo Motor
A0
M3 Nuts 2pcs.

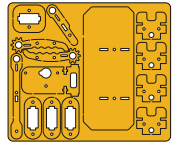

Make sure serve motor facing direction is same as in image.


M3 Cap Nuts 3pcs.
M3 x 5 mm F-F Spacer 3pcs.
M3 x 10 mm Screw3pcs.
(Metal Screw)


M3 x 8 mm Screw 4pcs.

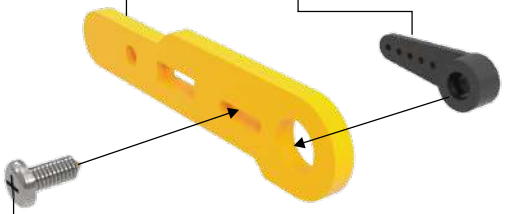

Servo Horn Screw 2pcs.
(Included in Servo Motor's package)
A1
Servo Horn

If you're having trouble attaching the servo horn to the part due to the hole size, you can utilize the parts available on this plate as an alternative solution



A2

Servo Horn



Servo Horn Screw

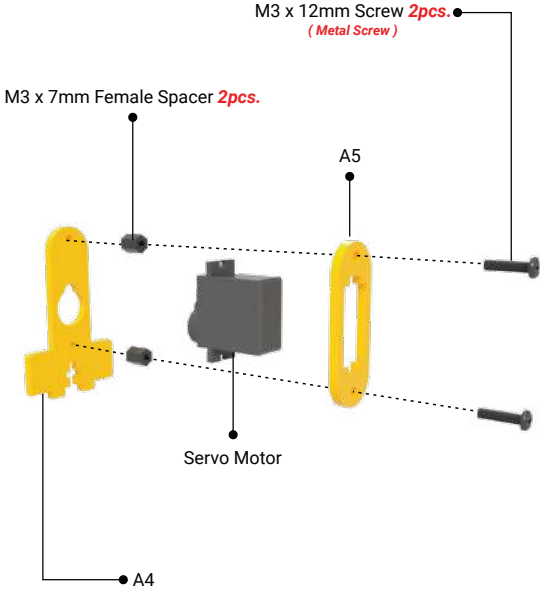
(Included in Servo Motor's package)

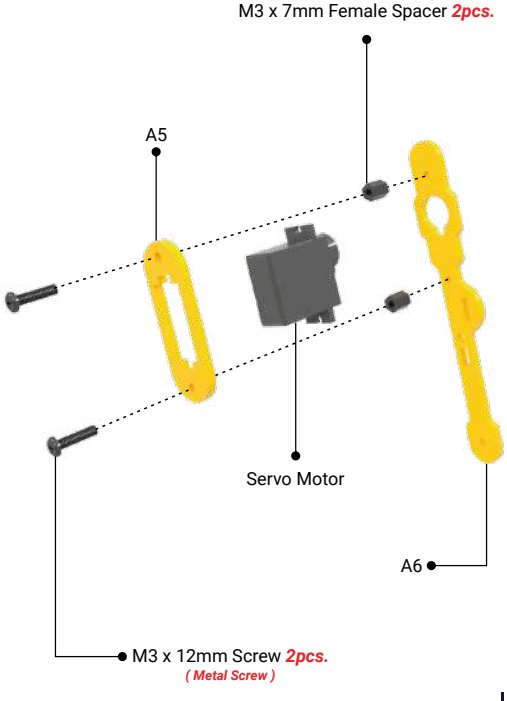
A3

Servo Horn

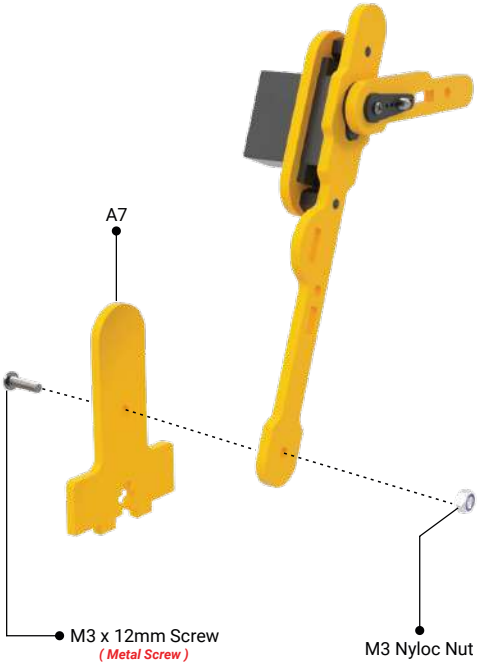
Servo Horn Screw

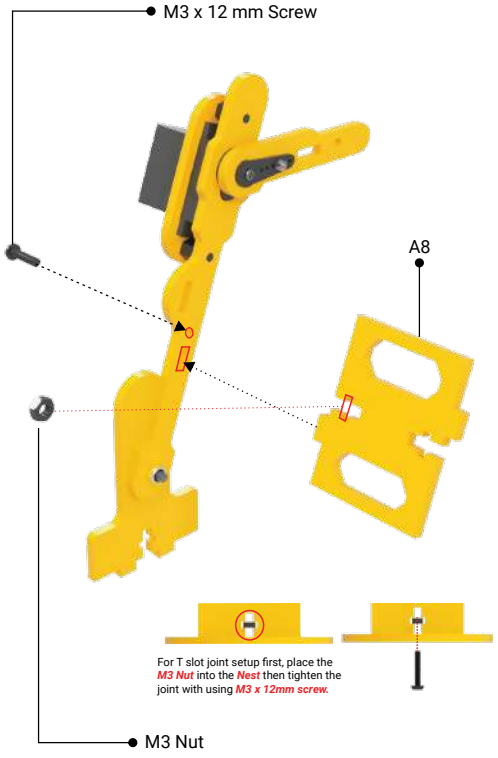
(Included in Servo Motor's package)


M3 x 12mm Screw 2pcs.
(Metal Screw)
M3 x 7mm Female Spacer 2pcs.
A5
Servo Motor
A4


M3 x 7mm Female Spacer 2pcs.
A5
Servo Motor
A6
M3 x 12mm Screw 2pcs.
(Metal Screw)

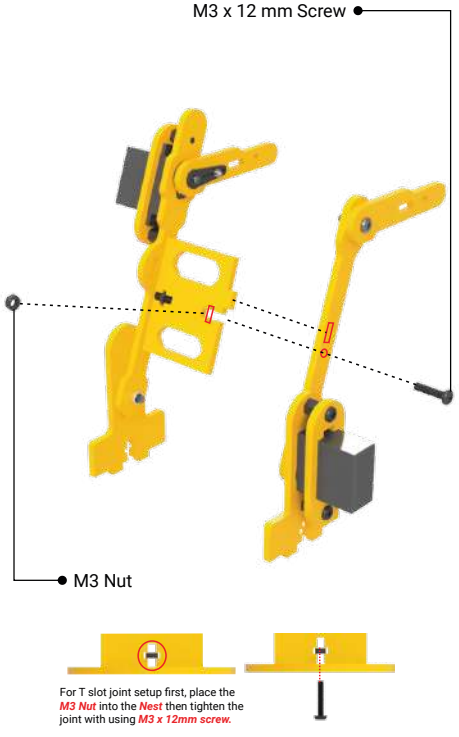
Servo Mounting Screw
(Included in Servo Motor's package)

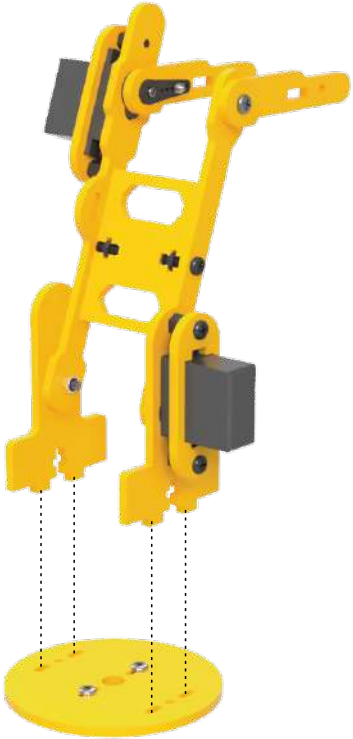

A7
M3 x 12mm Screw
(Metal Screw)
M3 Nyloc Nut

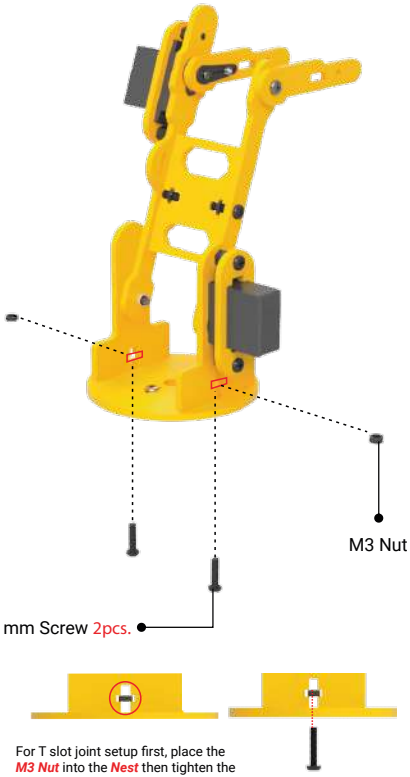

M3 x 12 mm Screw
A8
For T slot joint setup first, place the
M3 Nut into the Nest then tighten the
joint with using M3 x 12mm screw.
M3 Nut

A9
M3 x 12mm Screw
(Metal Screw)
M3 Nyloc Nut

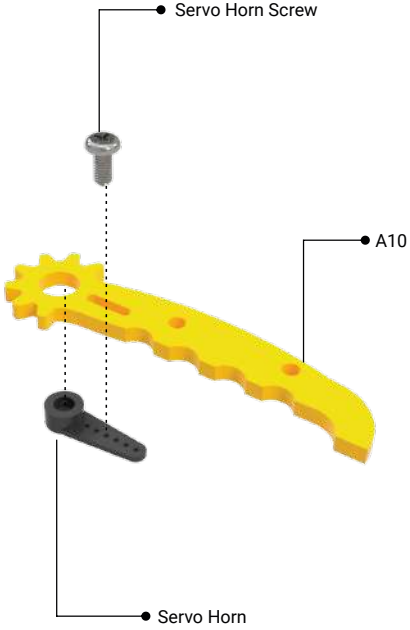
Servo Mounting Screw
(Included in Servo Motor's package)

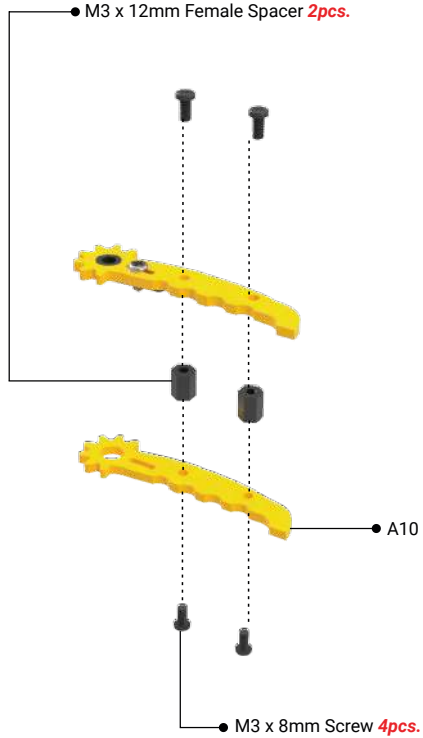

M3 x 12 mm Screw
M3 Nut
For T slot joint setup first, place the
M3 Nut into the Nest then tighten the
joint with using M3 x 12mm screw.



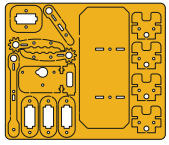


For T slot joint setup first, place the ***M3 Nut*** into the ***Nest*** then tighten the joint with using ***M3 x 12mm screw.***

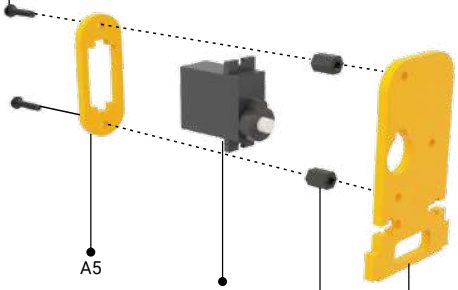

Servo Horn Screw
A10
Servo Horn


M3 x 12mm Female Spacer 2pcs.
A10
M3 x 8mm Screw 4pcs.

If you're having trouble attaching the servo motor to the part due to the hole size, you can utilize the parts available on this plate as an alternative solution



M3 x 12mm Screw ***2pcs.***
(Metal Screw)



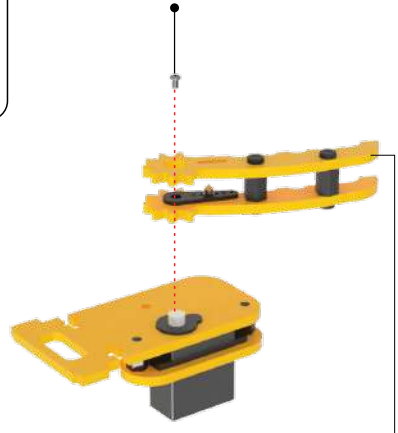
A5

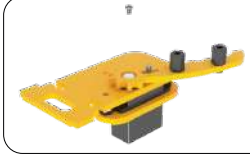
Servo Motor

M3 x 7mm Female Spacer ***2pcs.***

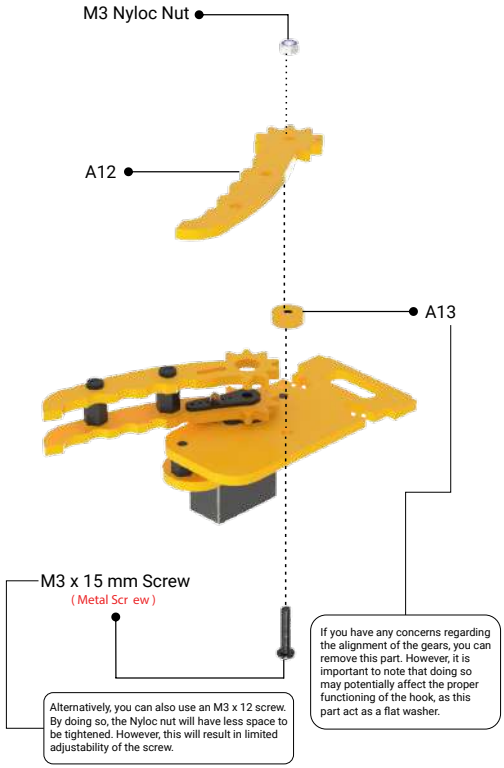
A11

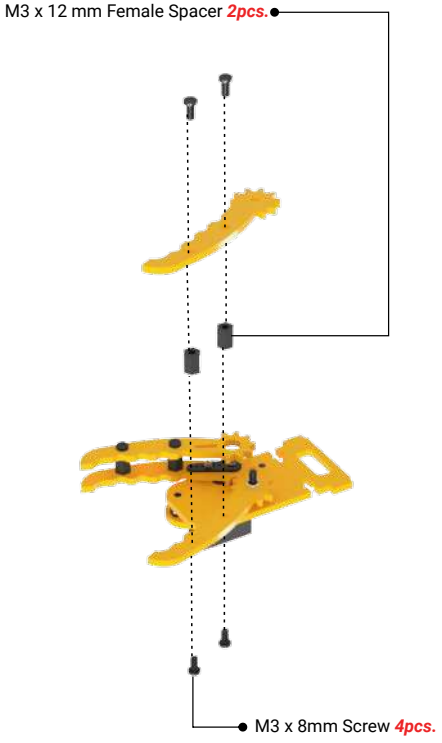
Servo Mounting Screw
(Included in Servo Motor's package)

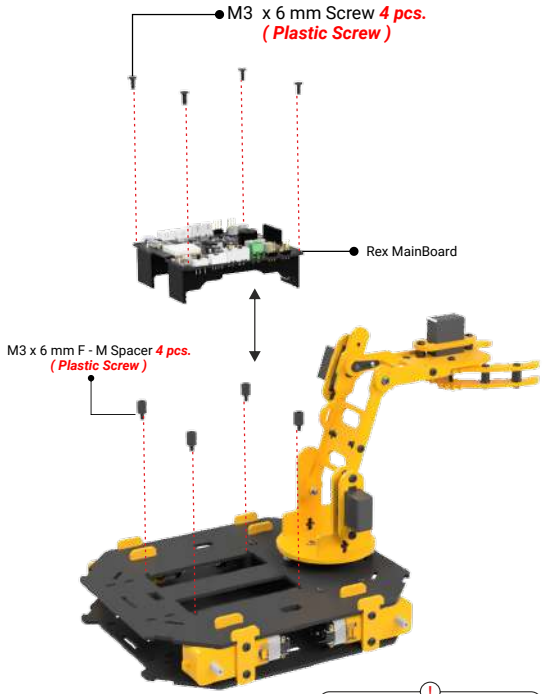




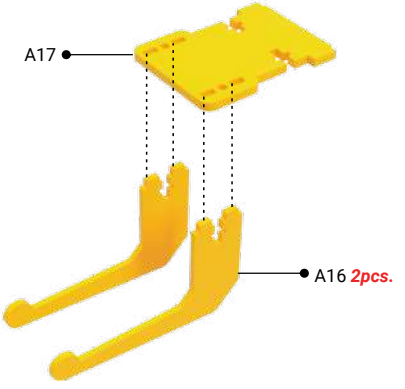
If you have issues with mounting screw, you can just simply take off the upper part of the hook.

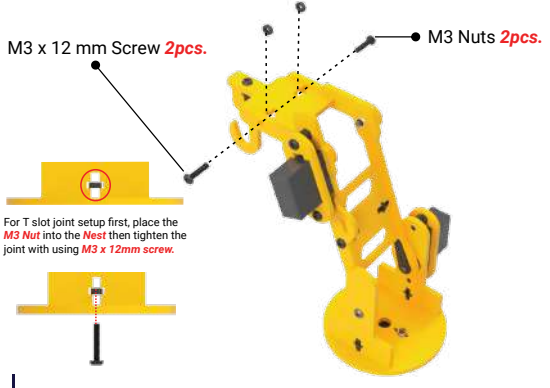

M3 Nyloc Nut
A12
A13
M3 x 15 mm Screw
(Metal Scr ew)
If you have any concerns regarding the alignment of the gears, you can remove this part. However, it is important to note that doing so may potentially affect the proper functioning of the hook, as this part act as a flat washer.
Alternatively, you can also use an M3 x 12 screw. By doing so, the Nyloc nut will have less space to be tightened. However, this will result in limited adjustability of the screw.

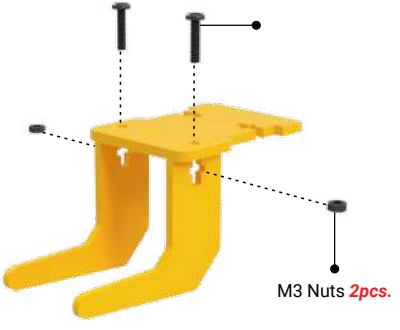

M3 x 12 mm Female Spacer 2pcs.
M3 x 8mm Screw 4pcs.

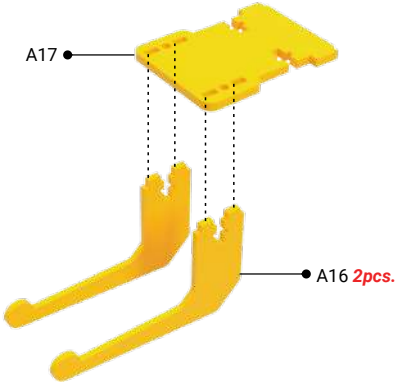


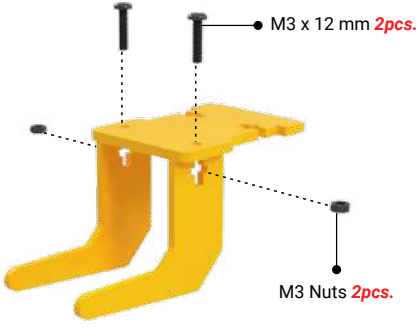
In order to prevent any short circuit issues, please use ***plastic screws and spacers for electronic cards.***

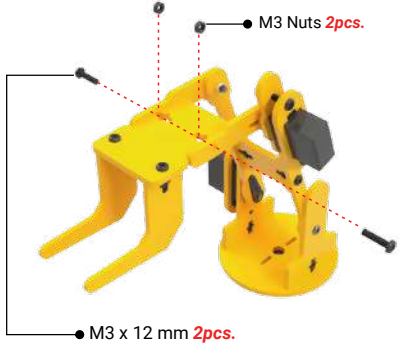

A17
A16 2pcs.

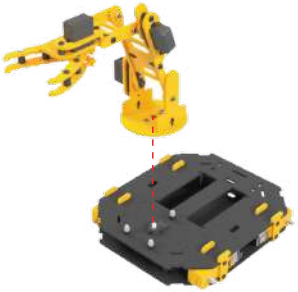

M3 x 12 mm Screw 2pcs.
M3 Nuts 2pcs.
For T slot joint setup first, place the M3 Nut into the Nest then tighten the joint with using M3 x 12mm screw.

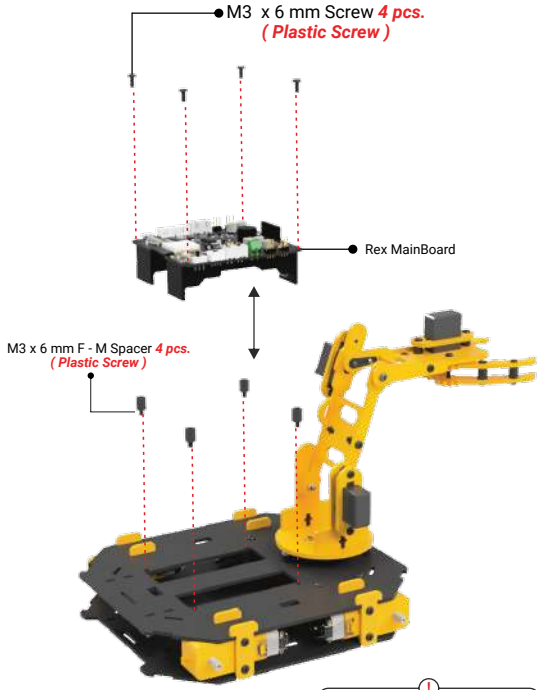

M3 Nuts 2pcs.


A17
A16 2pcs.

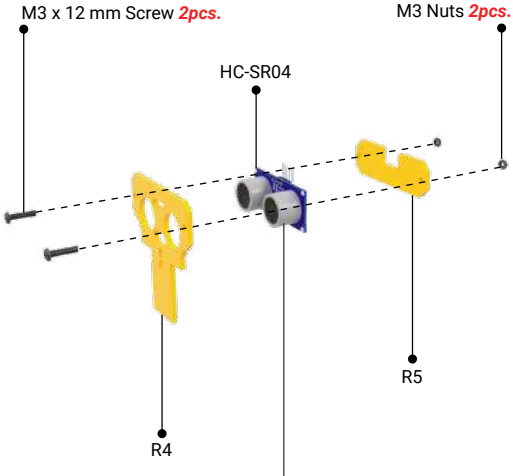

M3 x 12 mm 2pcs.
M3 Nuts 2pcs.

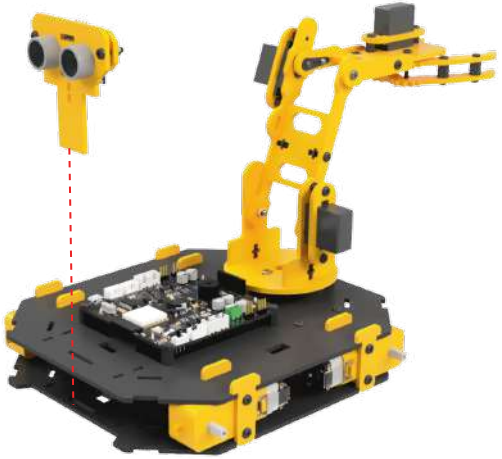

M3 Nuts 2pcs.
M3 x 12 mm 2pcs.

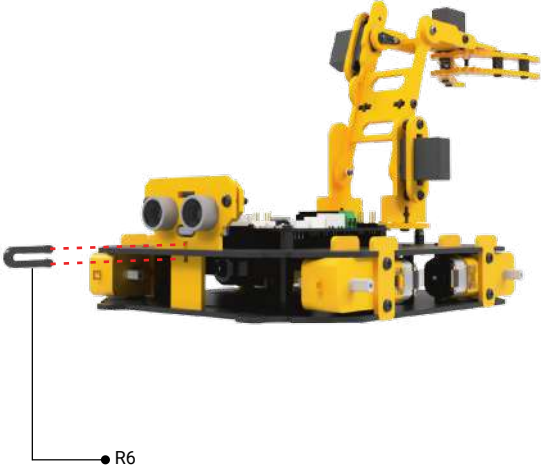


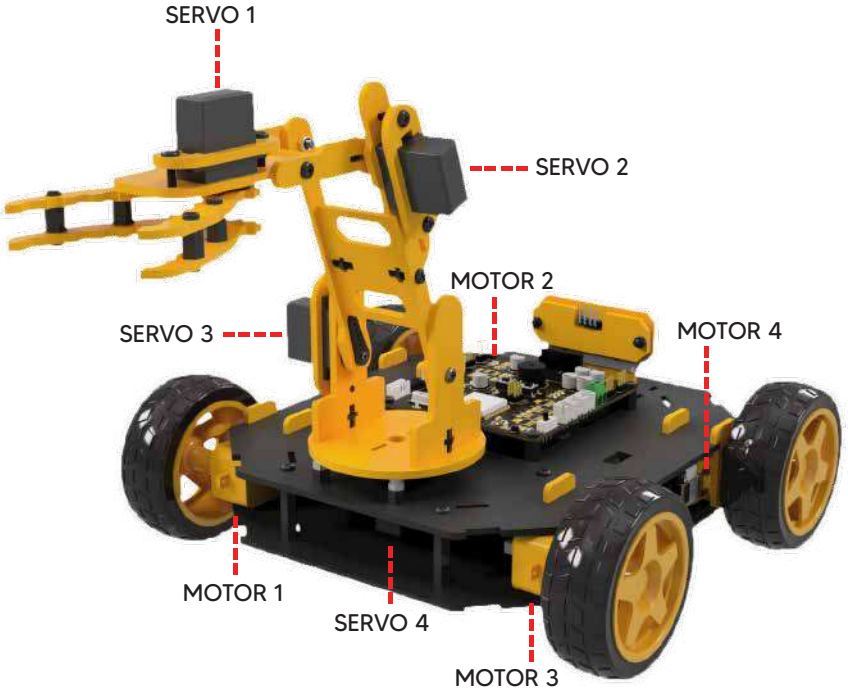


In order to prevent any short circuit issues, please use ***plastic screws and spacers for electronic cards.***

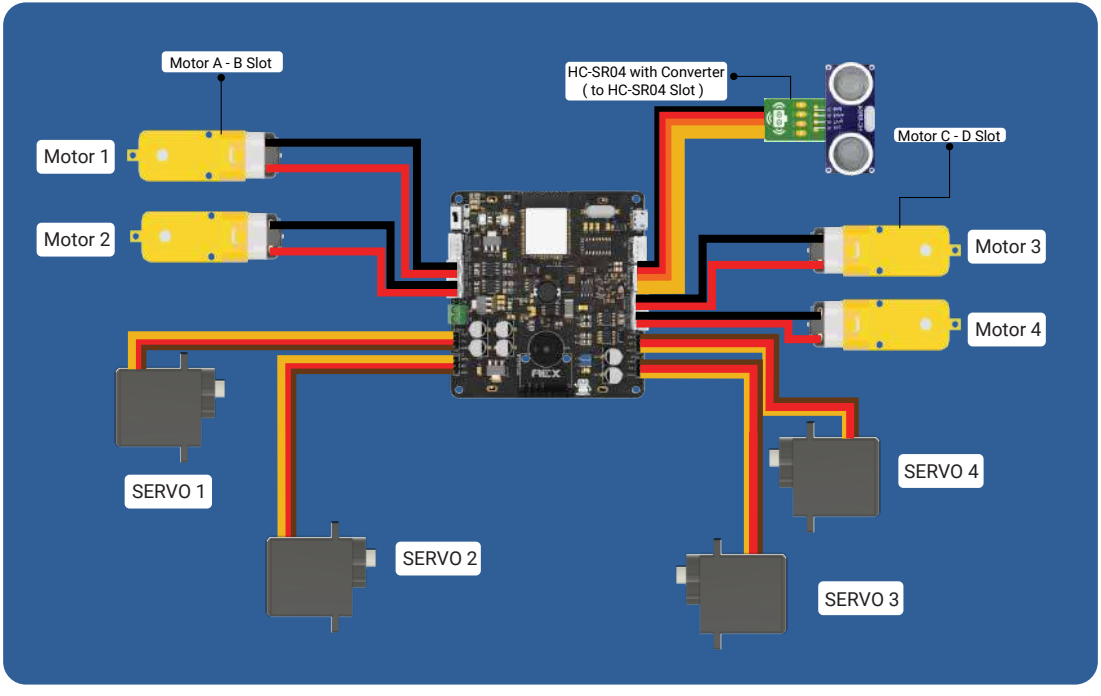

M3 x 12 mm Screw 2pcs.
M3 Nuts 2pcs.
HC-SR04
R5
R4
Make sure HC-SR04 pins are facing upward as in the image.



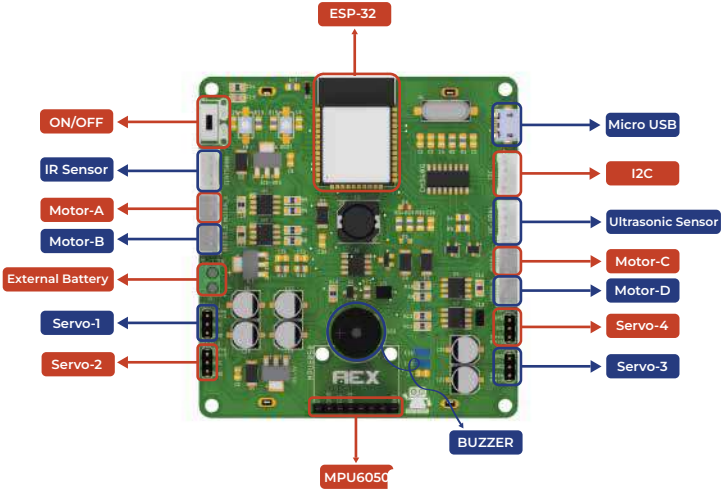

R6


SERVO 1
SERVO 2
MOTOR 2
SERVO 3
MOTOR 4
MOTOR 1
SERVO 4
MOTOR 3

The Circuit Diagram



REX Main Board Diagram



Arduino Code

ArmBot.ino

```
//"""REX Bin1 Arm Bot"""
//Check the web site for Robots https://rex-rdt.readthedocs.io/en/latest/

#define CUSTOM_SETTINGS
#define INCLUDE_GAMEPAD_MODULE
#include <DabbleESP32.h>
#include <Arduino.h>
#include <analogWrite.h>
#include <ESP32Servo.h>

enum MOTOR_TYPE {
  DC_MOTOR,
  SERVO_MOTOR
};
enum MOTOR_TYPE motorType = DC_MOTOR;

//define pins of motors
#define MotorA1 15
#define MotorA2 23

#define MotorB1 32
#define MotorB2 33

#define MotorC1 17
#define MotorC2 16

#define MotorD1 27
#define MotorD2 14

int position1 = 0 ;
int position2 = 0 ;
int position3 = 0 ;
int position4 = 0 ;

//define buzzer pins which named "horn"
#define horn 2

//define pins of servo motors
Servo Servo1; // Forward-Bakcward
Servo Servo2; // Right-Legt
Servo Servo3; // Up-Down
Servo Servo4; // Open-Close
```

Scan the QR code to go to the whole code and the necessary libraries.

REX8

GitHub

rbt.ist/rexgithub

Rex DOC

rbt.ist/rexrdt

Shop.robotistan/Rex

rbt.ist/rexrdt