REX8

ARMBOT
SETUP GUIDE

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 advancements in technology, robotic arms are frequently used to reduce manpower in industrial production and prevent accidents that individuals might encounter in hazardous tasks. The capacity of the robot arm to reach various points is determined by the number of axes. The robot arm included in The REX 8 in 1 kit is a 4-axis robotic arm capable of reaching four different points by utilizing four servo motors.
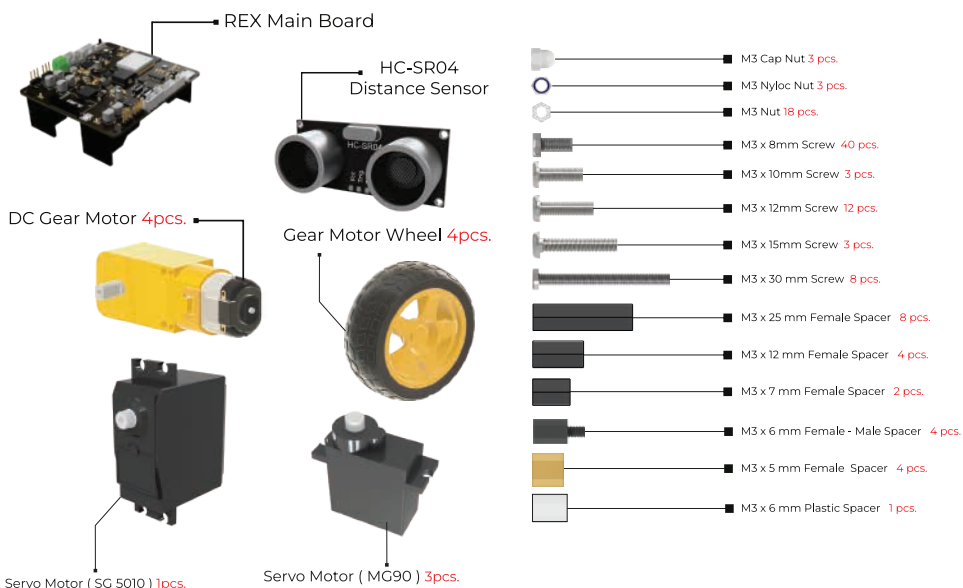

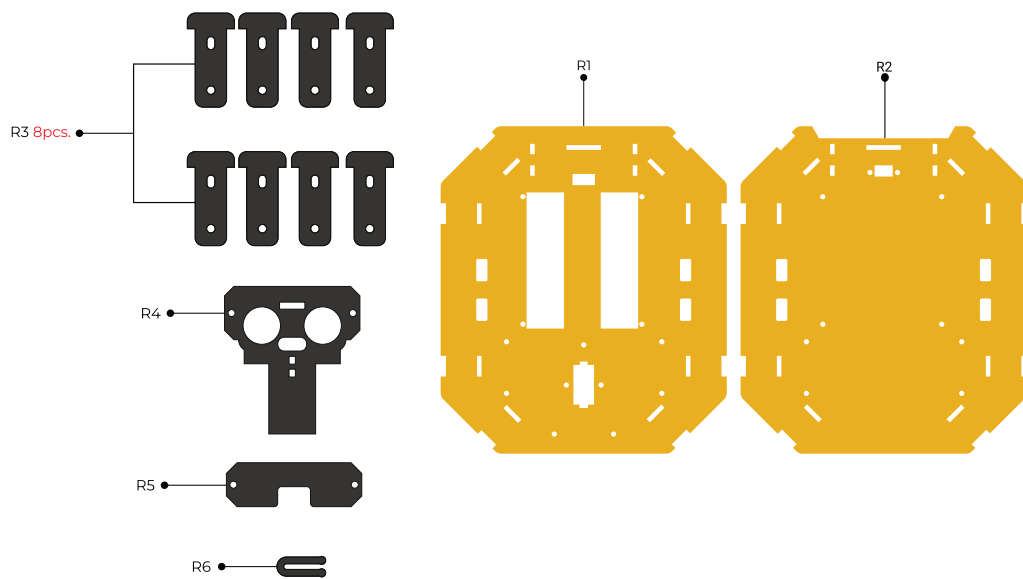
Crane

Forklift

Gripper

Types of Robot Arm

Robot arms are divided into five according to their features.

- **Joint Robot Arm**
  A robot with joints that can rotate to at least three different points is referred to as a robotic arm with joints.

- **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**
  The most fundamental characteristic that sets the SCARA Robot Arm apart from a joint robot arm is that its rotation axes are vertical. While it does not have vertical movement, it offers various options in the horizontal direction.
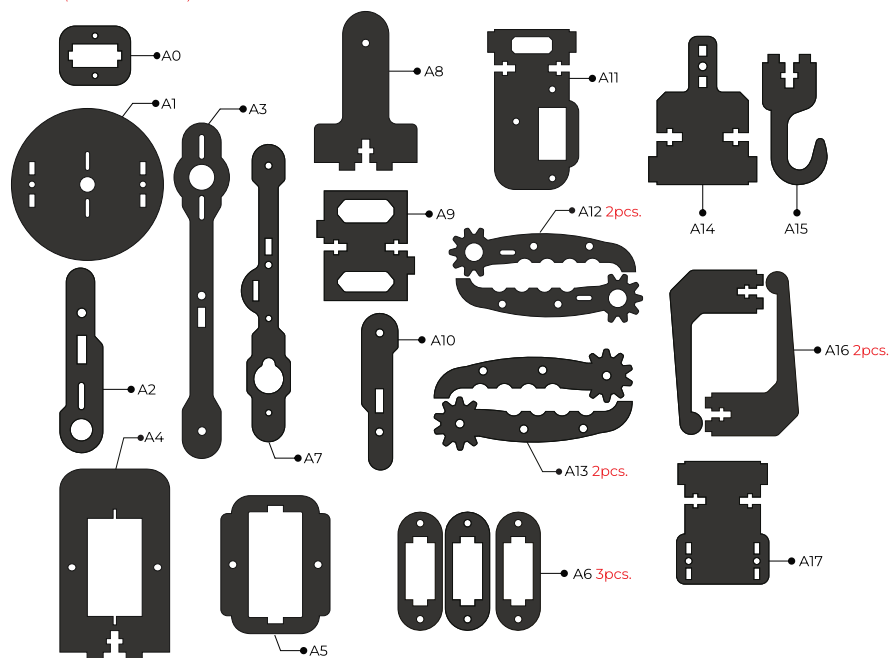

Components of ArmBot

REX Main Board

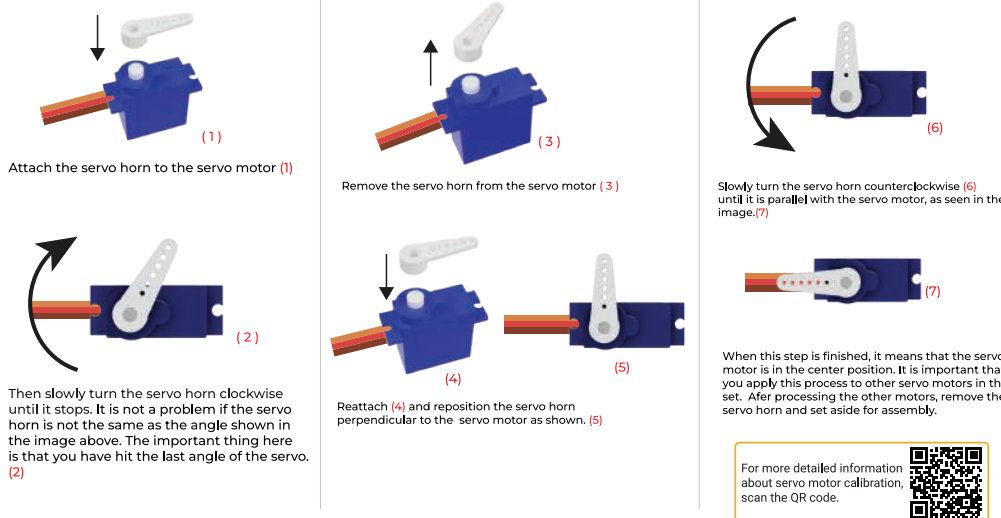HC-SR04 Distance Sensor

DC Gear Motor 4pcs.

Gear Motor Wheel 4pcs.

Servo Motor (SG 5010) 1pcs.

Servo Motor (MG90) 3pcs.

M3 Cap Nut 3 pcs.
M3 Nyloc Nut 3 pcs.
M3 Nut 18 pcs.
M3 x 8mm Screw 40 pcs.
M3 x 10mm Screw 3 pcs.
M3 x 12mm Screw 12 pcs.
M3 x 15mm Screw 3 pcs.
M3 x 30 mm Screw 8 pcs.
M3 x 25 mm Female Spacer 8 pcs.
M3 x 12 mm Female Spacer 4 pcs.
M3 x 7 mm Female Spacer 2 pcs.
M3 x 6 mm Female - Male Spacer 4 pcs.
M3 x 5 mm Female Spacer 4 pcs.
M3 x 6 mm Plastic Spacer 1 pcs.

Plexiglass Parts (Robot Chasis)

R3 8pcs.

R1

R2

R4

R5

R6

Plexiglass Parts (Robotic Arm)

A0
A1
A3
A8
A11
A9
A12 2pcs.
A14
A15
A10
A2
A4
A7
A13 2pcs.
A16 2pcs.
A6 3pcs.
A5
A17

Servo Motor Calibration (Essential)

Before starting the assembly, you have to manually calibrate the angles of the servo motors. Otherwise, Servo Motors won't be working properly.

(1)
Attach the servo horn to the servo motor (1)

(3)
Remove the servo horn from the servo motor (3)

(6)
Slowly turn the servo horn counterclockwise (6) until it is parallel with the servo motor, as seen in the image.(7)

(2)
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 angle of the servo. (2)

(4)
(5)
Reattach (4) and reposition the servo horn perpendicular to the servo motor as shown. (5)

(7)
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.

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

Body Assembly of The Robot

① R3 2 pcs.

R1

② DC Gear Motor

③ M3 Nuts 2 pcs.

Motor cables can be arranged as seen in the image.

M3 X 30 mm Screw 2 pcs.

Complete same steps for other sides.

④ M3 X 25 mm Female Spacer 4 pcs.

R2

M3 X 8mm Screw 4 pcs.

⑤ M3 X 25 mm Female Spacer 4 pcs.

M3 X 8mm Screw 4 pcs.

⑥ M3 x 12 mm Screw 2 pcs.

Servo Motor (MG90)

A0

Attention !
Don't forget to calibrate the servo motors. (Page 24)

M3 Nuts 2pcs.

Make sure that servo motor is facing same direction as seen in the image.

⑦ M3 Cap Nuts 3pcs.

M3 x 5mm Female Spacer 3 pcs.

M3 x 10mm Screw 3 pcs.

Assembly of The Robot Arm

① M3 x 8mm Screw 4pcs.

② Servo Horn Screw 2pcs.
(Included in Servo Motor's Package. MG90)

A1

Servo Horn
(Included in Servo Motor's Package. MG90)

③ Servo Horn Screw
(Included in Servo Motor's Package. MG90)

A2

Servo Horn
(Included in Servo Motor's Package. MG90)

④ Servo Horn (SG - 5010)
(Included in Servo Motor's Package. SG - 5010)

Servo Horn Screw 2pcs.
(Included in Servo Motor's Package. MG90)

*We recommend using the screws from the MG-90 servo motor's package

⑤ M3 Nuts 2pcs.

M3 x 12 mm Screw 2 pcs.

A5

Servo Motor (SG - 5010)

A4

⑥ Servo Motor SG - 90

M3 x 12 mm Screw 2pcs.

A7

M3 x 7mm Female Spacer 2pcs.

A6

⑦ Servo Horn Mounting Screw
(Included In Servo Motor's Package. MG - 90)

⑧ A8

M3 x 12 mm Screw

M3 Nyloc Nut

⑨

⑩

Servo Horn Mounting Screw
(Included In Servo Motor's Package, SG - 5010)

⑪

M3 x 12mm Screw

M3 Nut

For T Slot Joint Setup first, Place the M3 Nut into the Nest then tightn the joint with using M3 x 12mm Screw.

⑫

A1

⑬

M3 Nut 2pcs.

M3 x 12mm Screw 2pcs.

For T Slot Joint Setup first, Place the M3 Nut into the Nest then tightn the joint with using M3 x 12mm Screw.

⑭

Servo Horn Mounting Screw
(Included In Servo Motor's Package, MG - 90)

A12

Servo Horn
(Included In Servo Motor's Package MG 90)

⑮

M3 x 8mm Screw 2pcs.

A12

A12

M3 x 12mm Female Spacer 2pcs.

M3 x 8mm Screw 2pcs.

⑯

M3 Nuts 2pcs.

Servo Motor (MG 90)

M3 x 12 mm Screw 2pcs.

A6

A11

⑰

Servo Horn Mounting Screw
(Included In Servo Motor's Package, MG - 90)

You can remove the upper part if its difficult to joint the parts together

⑱

M3 Nyloc Nut

A12

M3 x 6mm Plastic Spacer

M3 x 15 mm Screw

⑲

M3 x 12 mm Female Spacer 2pcs.

A13

M3 x 8mm Screw 4pcs.

⑳

M3 Nut 2pcs.

M3 x 12 mm Screw 2 pcs.

Interchangable Parts

Robotic Arm is packed and ready to be built with two different heads. You can choose in between depending on your project needs.

Crane

Forklift

Crane Assembly

①

A14

A15

③

②

M3 x 12 mm Screw

M3 Nut

M3 x 12 mm Screw 2pcs.

M3 Nut 2pcs.

For T Slot Joint Setup first, Place the M3 Nut into the Nest then tightn the joint with using M3 x 12mm Screw.

④

Forklift Assembly

①

A17

A16 2pcs.

③

②

M3 x 12 mm Screw 2pcs.

M3 Nut 2pcs.

M3 Nut

M3 x 12 mm Screw 2pcs.

M3 Nut 2pcs.

For T Slot Joint Setup first, Place the M3 Nut into the Nest then tightn the joint with using M3 x 12mm Screw.

④

㉑

㉒

Servo Horn Mounting Screw
(Included In Servo Motor's Package.)

M3 x 6mm Screw 4pcs.

㉓

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

Rex 8in1 Main Board

M3 x 6mm F-M Spacer 4pcs.

㉔

M3 x 12 mm Screw 2 pcs.

M3 Nut 2pcs.

HC-SR04
Distance Sensor

R5

㉕

R6

㉖

Gear Motor Wheel 4 pcs.

The assembly is finished and you can move on with coding steps.

SERVO 4

SERVO 3

MOTOR 1

SERVO 2

MOTOR 3

MOTOR 2

SERVO 1

MOTOR 4

The Circuit Diagram

After assembling the acrylic pieces, you can proceed with circuit installation as shown in the diagram below.

Motor A - B Slot

HC-SR04
Distance Sensor

Motor C - D Slot

Motor 1

Motor 2

Motor 3

Motor 4

SERVO 1

SERVO 3

SERVO 2

SERVO 4

Arduino Code

V4
rbt.ist/armbotcode

V5
rbt.ist/armbotv5

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