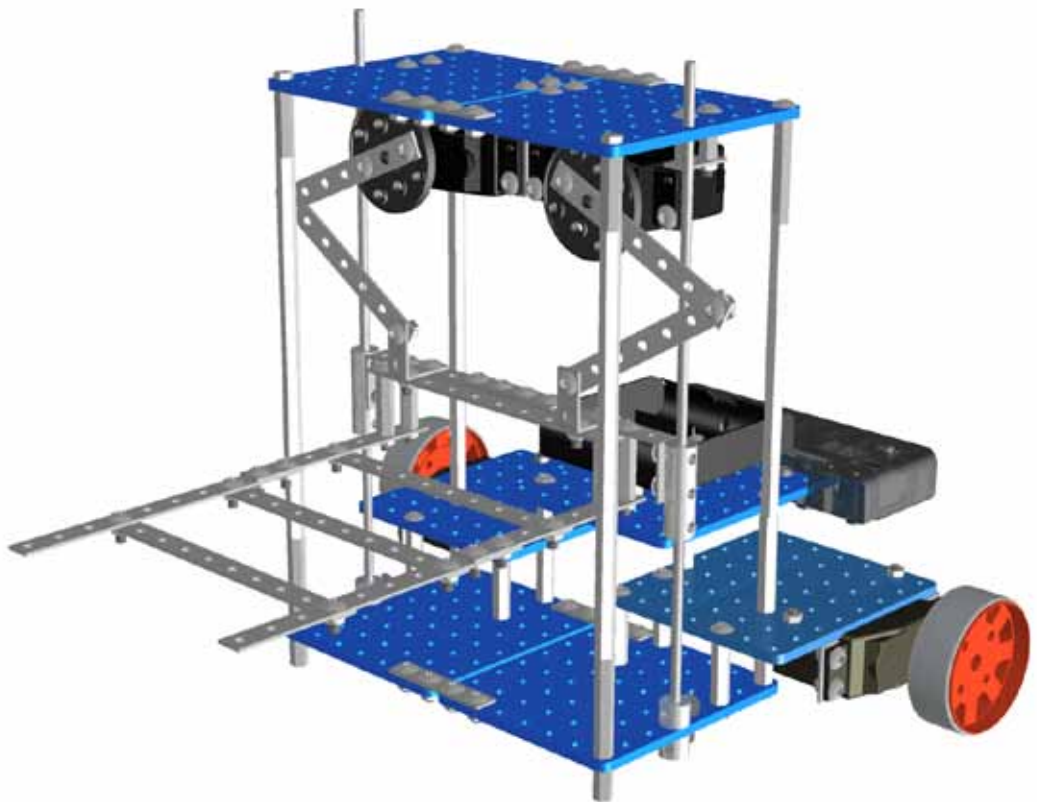


10. Lift Robot



Introduction and working principle

– Rotational Motion and Alternating Motion



Lift Robot is a robot made to be able to lift up and down the object mounted on it. Such motions, such as ceaseless repetitions of moving up and down, are termed linear alternating motions in physics. A cam, a rotating or sliding piece in a mechanical linkage, is used especially in transforming rotary motion into linear motion or vice versa. It is a mechanical device that transforms rotational motions into linear motions.

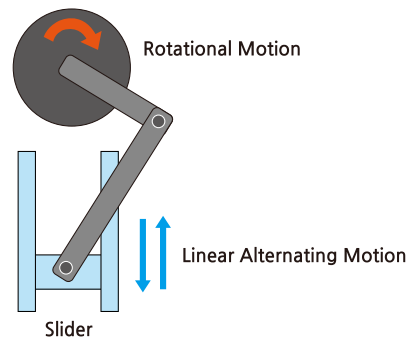


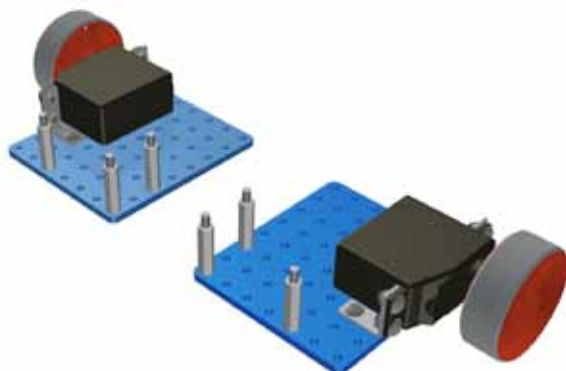
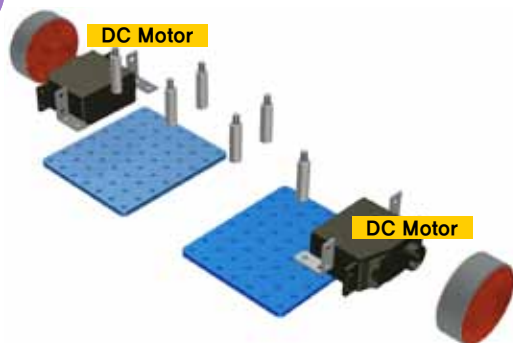
Figure 1. Cam

In contrast, a crank, an arm at right angles to a rotating shaft by which reciprocating motion is imparted to or received from the shaft, is used to convert circular motion into reciprocating motion.

Linear alternating motions can be found also at the fork part of Lifting Robot which is functioned to place objects, with regard to rotation of the servo motor. Here, servo motor is performing clockwise and counter-clockwise rotations in repetitions within a certain extent of angular degree, not as wide as 360 degrees. Sliding bush thus becomes to perform linear alternating motions along the shaft.

The cam can be seen as a device that rotates from circular to reciprocating motion. It is very useful in robotics where most actuators use motors which executes circular motions.

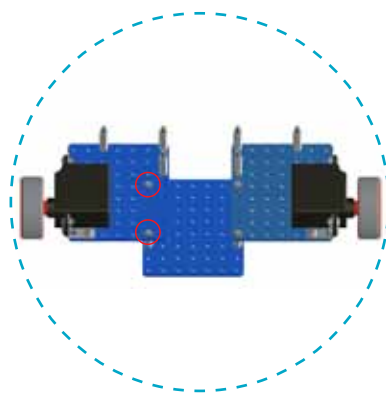
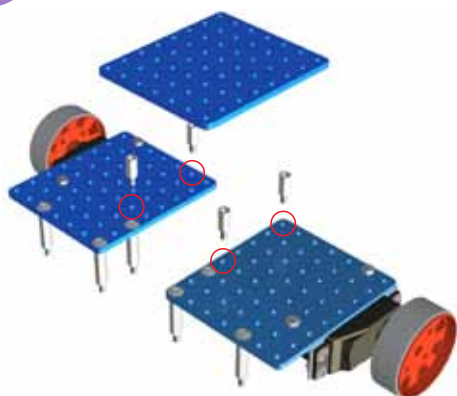
1



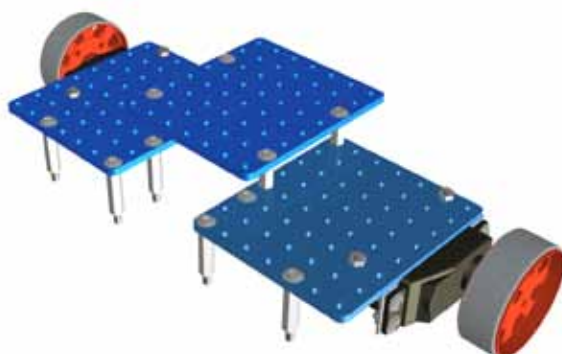
20mm X 6

X 2

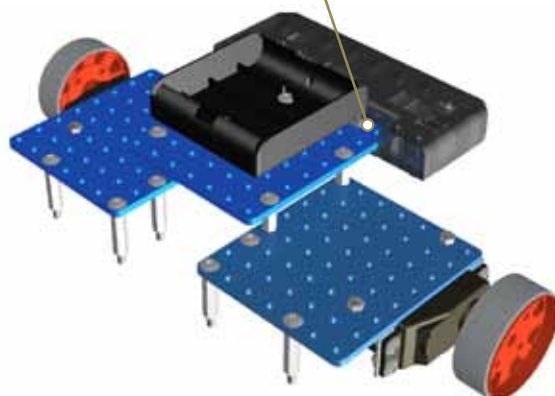
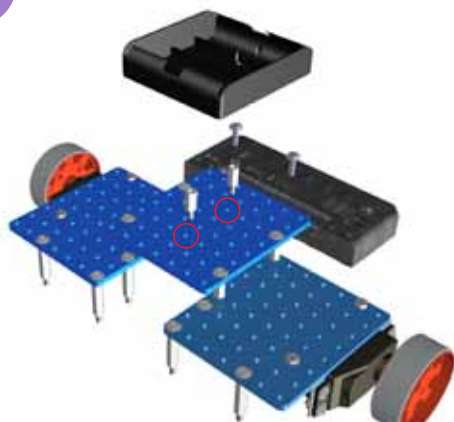
2



10mm X 4



3



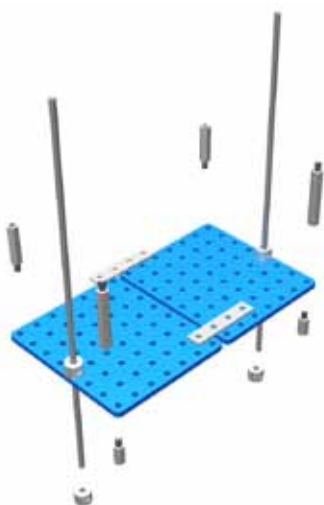
X 2



X 2

10mm

4



X 2



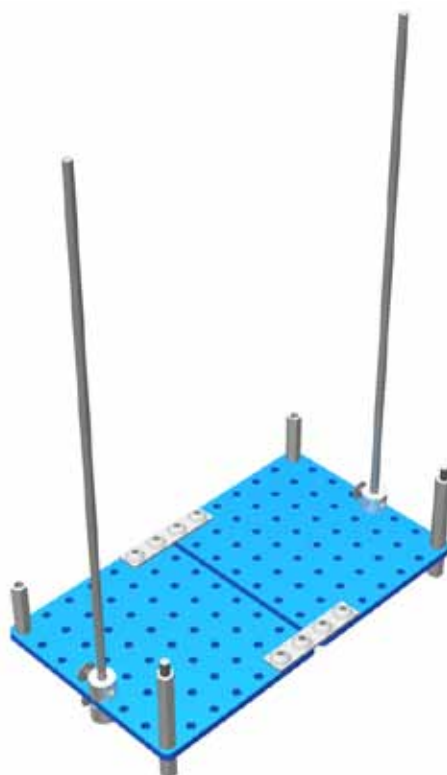
X 2

20mm

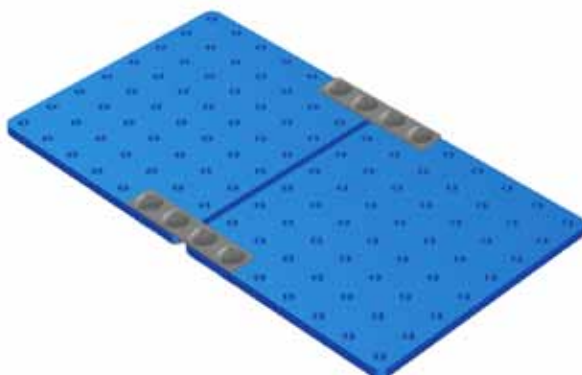
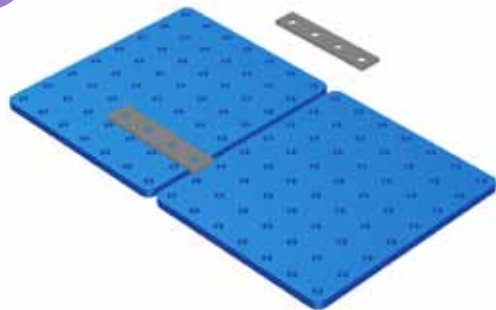


X 2

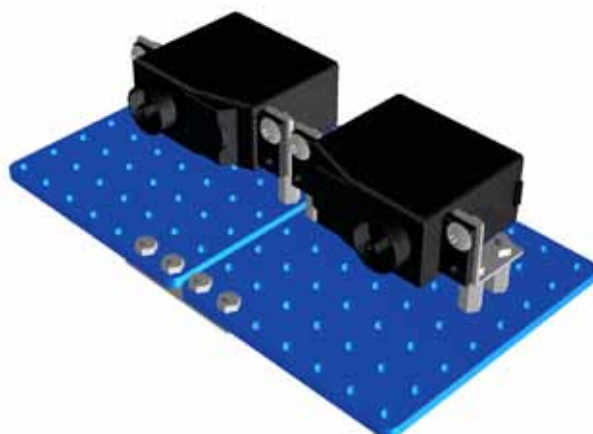
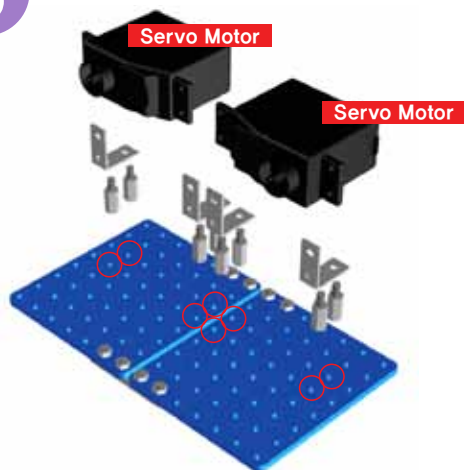
30mm



5

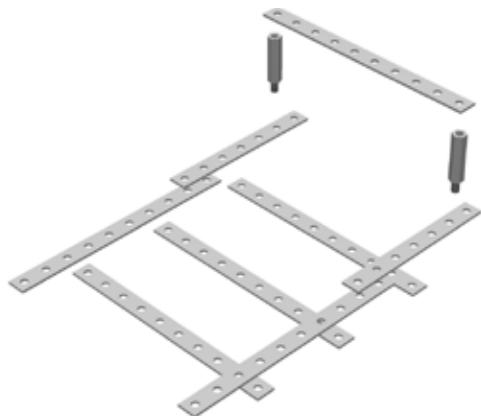


6



10mm X 8

7



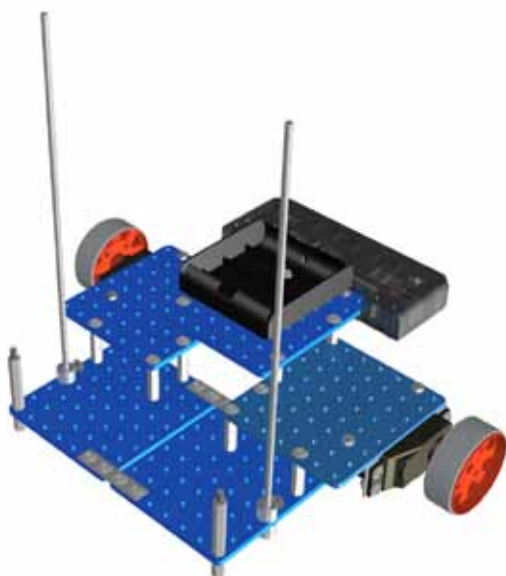
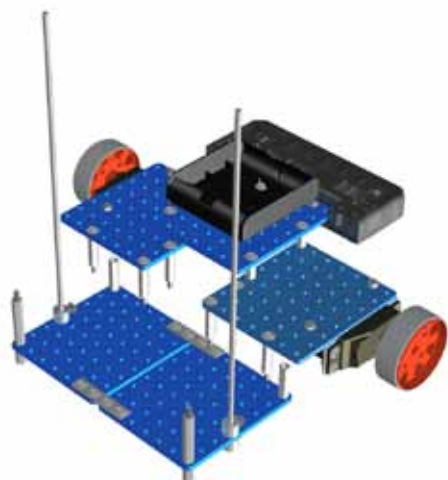
20mm X 2

8

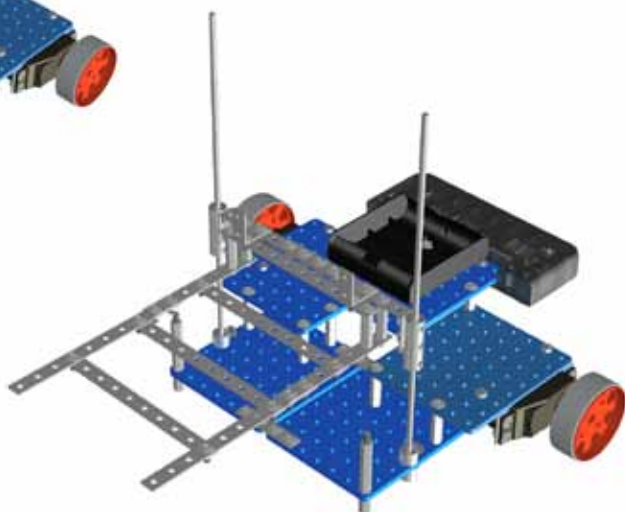
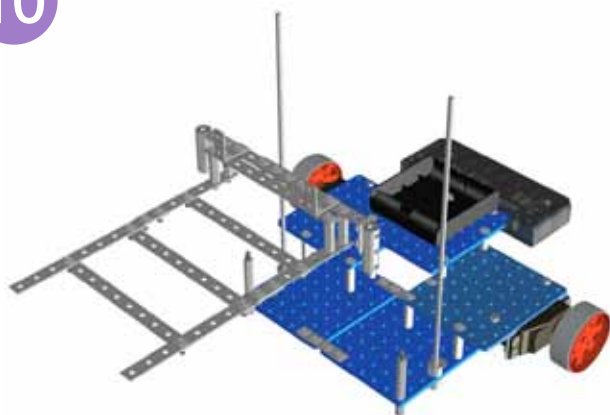


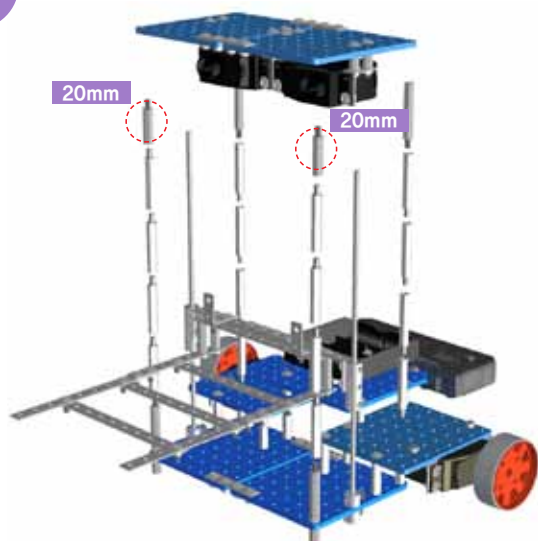
20mm X 2

9



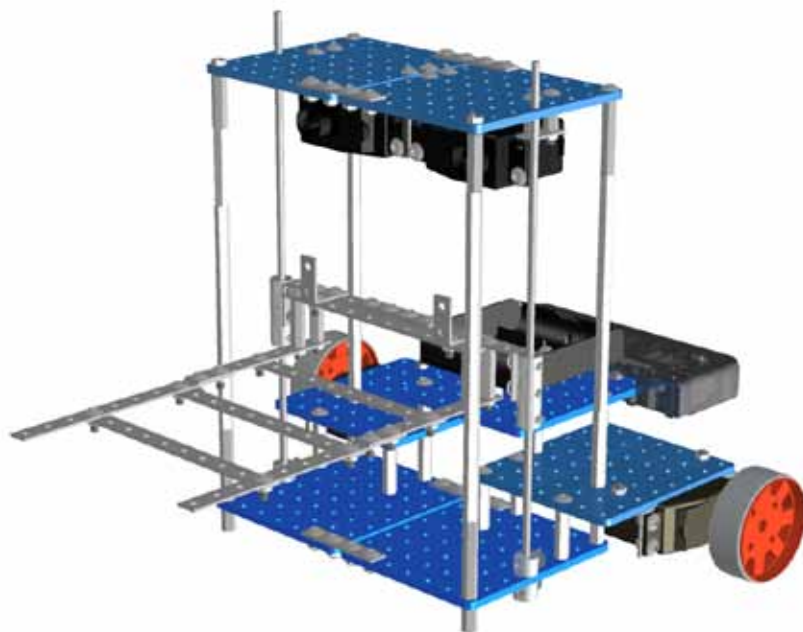
10

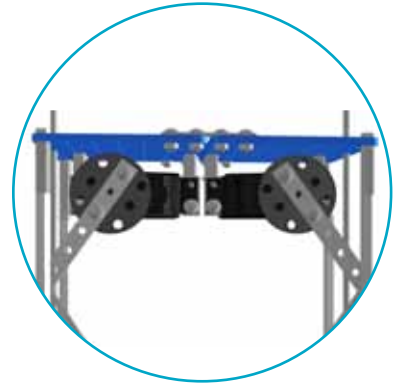
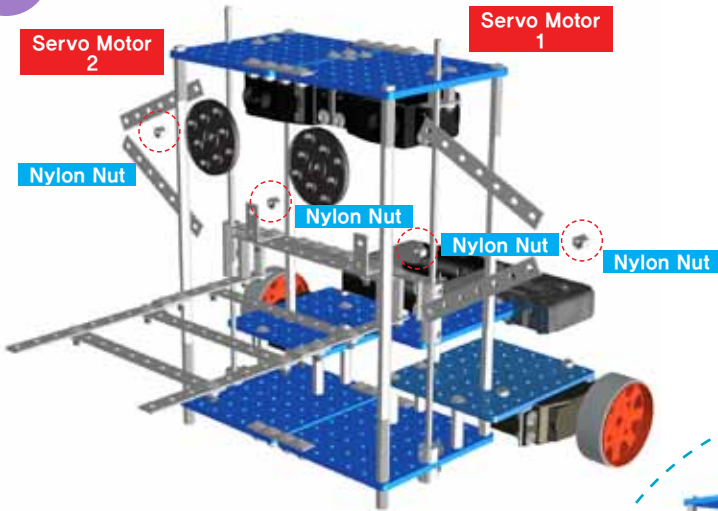




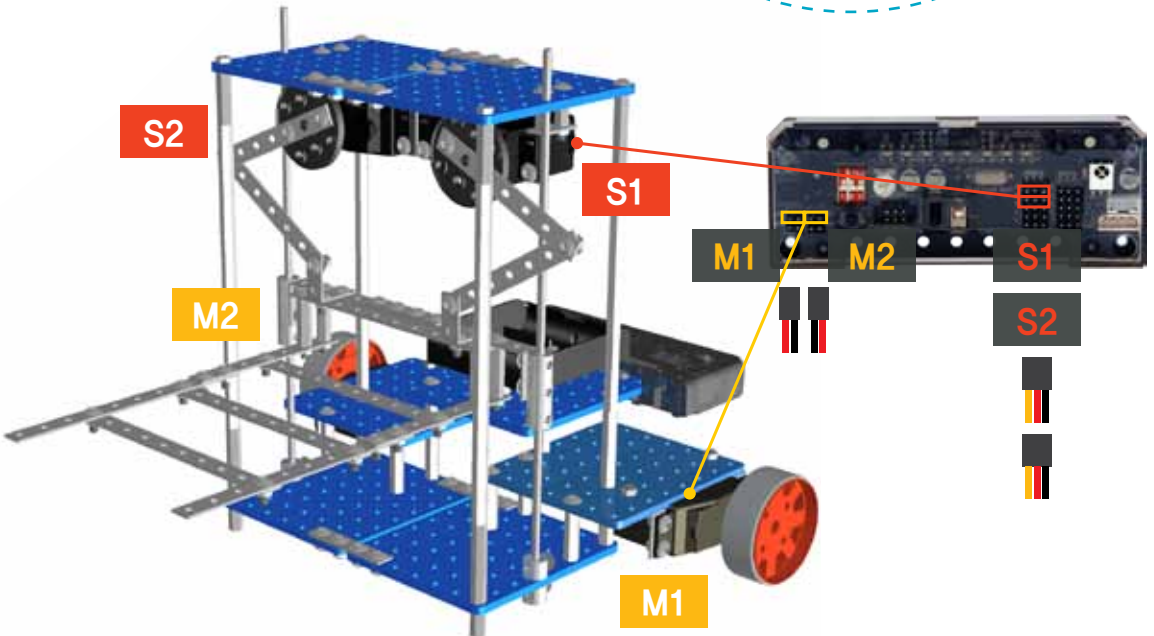
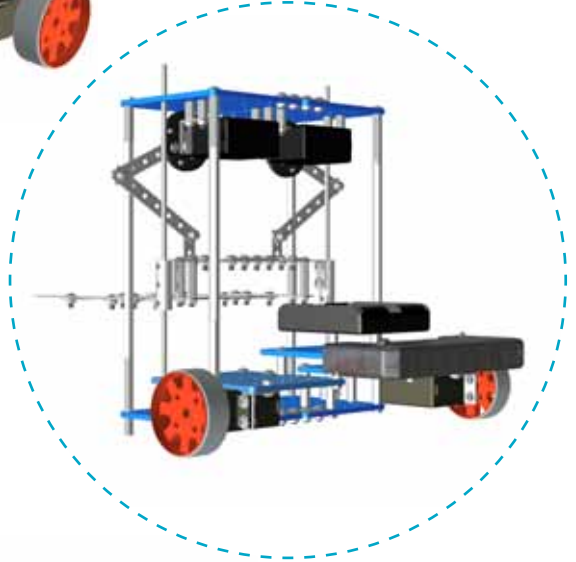
20mm X 2

30mm X 18





Scan the QR code with your
Smart phone, and watch
How the robot is driven.



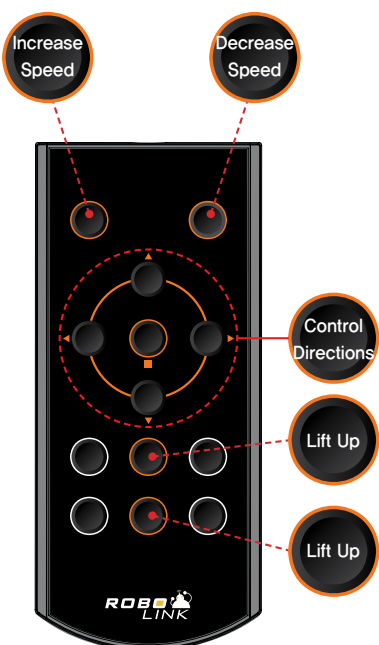
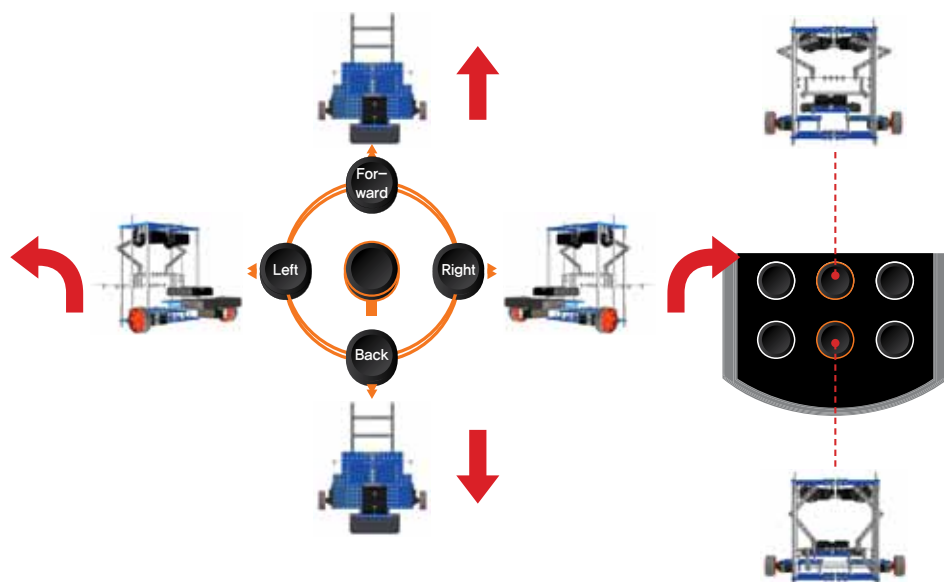
Acting Module



For driving Lift Robot, select and press program mode 10.



In Smart Rokit Step 2, program is due to be running on with number 2 toggle of DIP switch turned upward. In other words, Smart Rokit Step 2 basically uses channel number 3. Refer to '2. Channel set-up for remote control' in page number 15 that gives you more in details for further reference.



When the speed increases, a brightness of the light increases.



When speed is high



When speed is low

Play the Game!

– Lift Robot Game



The fork part of a completed lift robot is located slightly up from surface. Give a thought on what troubles can be arising when it lifts up objects and modify it to be able to lift them up with no help from humans.

Requirements : A number of objects weighing 200g and less, including drink can, purse and paper box.

1. It is a game that can be played by a pair of teams, either consisted of 1 or 2 player(s) for each team. Place each Lift Robot player on a fixed start line, and arrange a variety of objects in the area at 1.5m ahead of the start line.
2. Recommended play time is 'within 2 minutes'. And the robot players shall be confined to the Lift Robots which have been made through, and modified, through this chapter.
3. The Scoring Area is located at the very behind of start line, where each robots shall put down the objects carried with. About 20cm to 30 cm size, both in width and length, is suitable for the game. It would be good if marked by sticky tapes.
4. Once the game is started, each lift robot move forward and lift up the object placed ahead of him. Then carry it on to the Scoring Area and put it down into the Scoring Area. Who has successfully transported most in number wins the game.
5. Instead of using tapes to mark Scoring Area, it is also fine if a book of a thickness is used to replace Scoring Area and its mark. In case that Scoring Area has been marked with tapes, scores shall be accepted when objects have been put down and not bordered on the tapes. In case that a book of a thickness is used to replace Scoring Area, scores shall be accepted when objects have been put down and not dropped out of it until the end of play time.