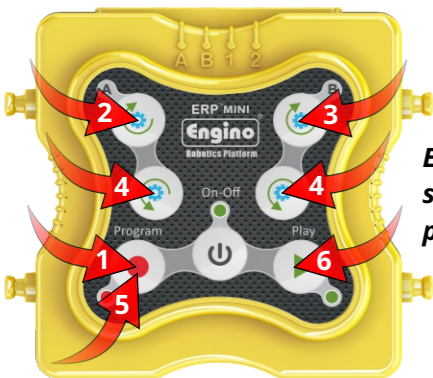


Fan solutions

For the manual solutions, push the buttons on the controller in the specified order depicted by the arrows. When two buttons have the same number, you should push these buttons simultaneously.



Exercise 3 solution program

Find the solution of exercise 4 in the Solution file and double click on it. This will open the solution program in the KEIRO ERP MINI software. Connect the fan model with the PC or smart device through USB or Bluetooth and send the program to the controller. Push play to test it.

Exercise 1. Push the buttons on the ERP device (input) and write briefly the outcome you observe on the model (output).

Input	Output
Motor A switch in position II	fan rotates clockwise
	fan rotates anticlockwise

Exercise 2. Create a second fan for your model at the opposite side of the first fan and connect the second motor in port B. You can see a building example on the right.



Exercise 3. Press "Program" (red flashing light indicates that the program is being recorded) and then the necessary buttons to create the following sequence:

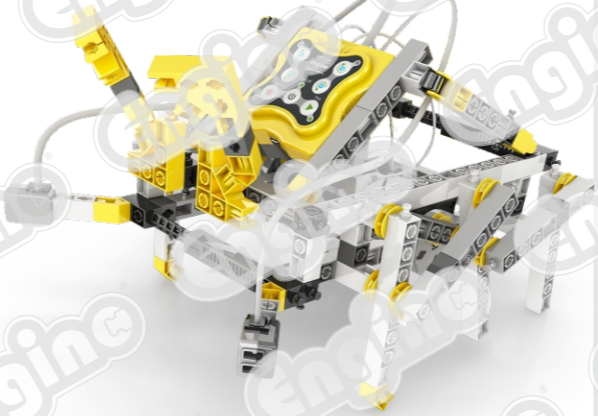
- fan A rotates clockwise;
- fan B rotates clockwise;
- both fans rotate at the same time in opposite directions;

Press the "Program" button again to save the program and then press the "Play" button to check if the command sequence is correct. If you press and hold the play button for longer time the program will go into loop.

Exercise 4. On the flow diagram, right-click on each block in order to make the appropriate changes described below. You can add more actions (motors, idle time) from the left menu:

- fan A rotates clockwise for 2 seconds with 100 speed;
- fan B rotates clockwise for 2 seconds with 100 speed;
- robot does nothing for 1 second (use idle time block);
- both fans rotate at the same time in same directions for 3 seconds, A with 100 speed and B with 40 speed.
- the program should activate 1 time only. Right-click on the start block and change number of repeats.

Hexapod solutions



For the exercise 2 solution, push the buttons on the simulator in the specified order depicted by the arrows. When two buttons have the same number, you should push these buttons simultaneously.



Exercise 2 solution program

Find the solution of exercise 4 in the Solution file and double click on it. This will open the solution program in the KEIRO ERP MINI software. Connect the hexapod model with the PC or smart device through USB or Bluetooth and send the program to the controller. Push play to test it.

Exercise 1. Drag and drop the peripherals (motors and sensors) into the ports of the ERP simulator, according to the hexapod model. Choose IR OBJECT for the two sensors, as you will need them for later activities. Design the blocks in the picture here as well.



Exercise 2. Control hexapod using the ERP MINI Simulator according to the following sequence:

- the hexapod turns right using one leg;
- the hexapod turns left using one leg;
- the hexapod moves forward with both legs;
- the hexapod moves backwards with both legs.

Tip: to move forward and backward you should click on two motor buttons at the same time. For this, click on "multiple select" button, choose the appropriate motor buttons and then click on "multiple record".

Exercise 3. What problems might arise when legs are used for robotic movement instead of wheels?
Legs are less stable and move slower than wheels because they lose contact with the ground when the robot is moving. Legs are usually more difficult to construct as they require a complex design of linkages that will work as joints, similar to the joints of the knees.

Exercise 4. Create the following program so that the hexapod avoids obstacles at either side:

- hexapod moves forward continuously;
- if the left IR sensor detects an obstacle, the right leg should move backwards and the left leg should move forward;
- if the right IR sensor detects an obstacle, the left leg should move backwards and the right leg should move forward.

Place the appropriate blocks inside the IF block. Consult page 16 on how to configure the IR sensors for object detection.



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