

# Introduction to Robotics

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## 1. Educational Goals

The goals once the student finishes the exercises are:

1. Introduction to educational robots
2. Introduction to Lego Mindstorms ecosystem
3. Introduction to graphical programming environment
4. Introduction to Motors
5. Introduction to Sensors
6. Introduction to graphical programming with Lego Mindstorms EV3

## 1. Educational Software

To develop educational software for Lego Mindstorms robots, it is necessary to download the software from the following address:

<http://www.lego.com/es-es/mindstorms/downloads/download-software>

### 1.1 Exercise: Install the software to develop robots

Install in your computer the software.

## 2. The brick

Lego Mindstorms is a Lego product line designed to create educational robots. In the third generation, Lego Mindstorms EV3, the product has a rechargeable battery.

### 2.1 Exercise: Recharge the battery of your EV3 brick

Extract the battery from your EV3 Brick to recharge the battery.

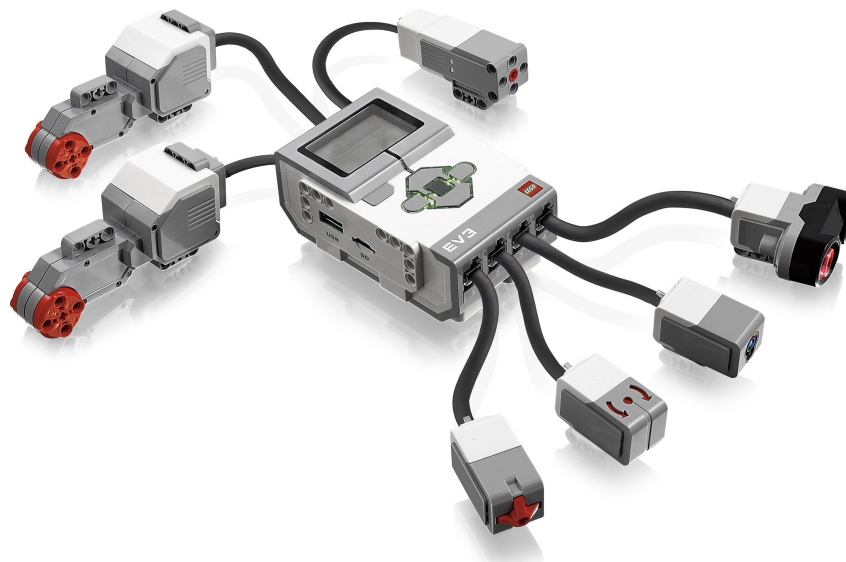


*Illustration 1: EV3 Brick battery*

When the battery has a green led, this is the moment to stop recharging the battery.

## 2.2 Turn on the brick

Turn on the brick and connect some motors and sensors.



*Illustration 2: EV3 Brick with Sensors and Actuators connected*

## 2.3 Exercise: Learn to use the EV3 Menu

Turn on the EV3 Brick and connect 2 motors in the part for actuators (Output ports: A, B, C, D) and learn to use the menu options. Search the option menu: **Motor Control**. Try to interact with the motors with the buttons.

### 1. Question:

1. In what motor port, does the robot ask you to connect the motors?

## 2.4 Exercise: Learn to use sensors

Turn on the EV3 Brick and connect a IR Sensor in the part for sensors (Input ports: 1, 2, 3, 4) and learn to use the menu options. Search the option menu: **Port view & Port Datalog**

### 1. Question:

1. Why change the values in the view “port view”?
2. What is the value x in the view “port datalog”?
3. What is the maximum value measured on a EV3 IR Sensor?



*Illustration 3: EV3 IR Sensor*