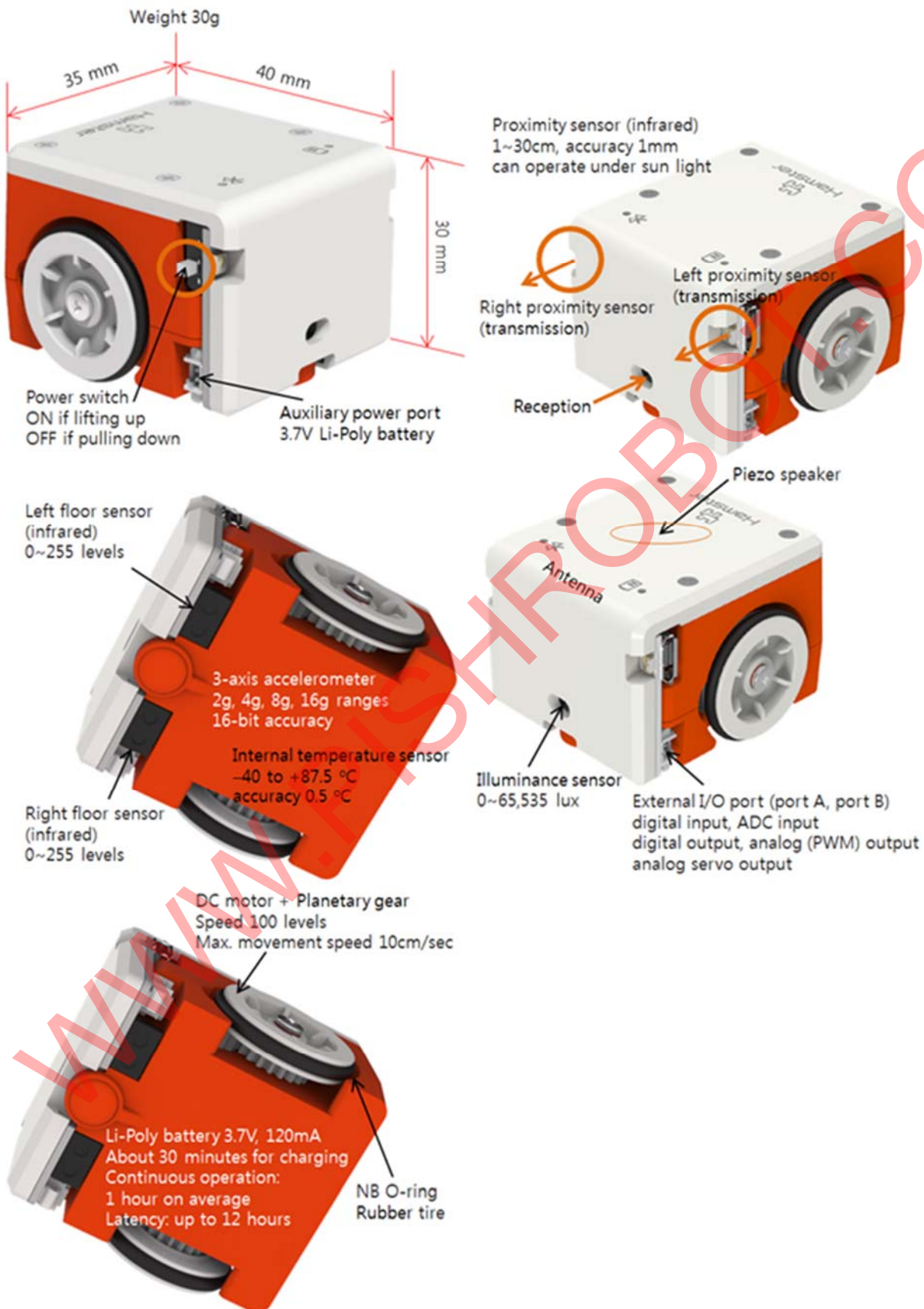# Hamster Robot

What's the Hamster robot?

The Hamster robot is a small and lovely robot for software education, and includes various devices as follows.

Weight 30g

35 mm 40 mm

30 mm

Power switch
ON if lifting up
OFF if pulling down

Auxiliary power port
3.7V Li-Poly battery

Proximity sensor (infrared)
1~30cm, accuracy 1mm
can operate under sun light

Left proximity sensor
(transmission)

Right proximity sensor
(transmission)

Reception

Piezo speaker

Antenna

Left floor sensor
(infrared)
0~255 levels

3-axis accelerometer
2g, 4g, 8g, 16g ranges
16-bit accuracy

Internal temperature sensor
−40 to +87.5 °C
accuracy 0.5 °C

Right floor sensor
(infrared)
0~255 levels

Illuminance sensor
0~65,535 lux

External I/O port (port A, port B)
digital input, ADC input
digital output, analog (PWM) output
analog servo output

DC motor + Planetary gear
Speed 100 levels
Max. movement speed 10cm/sec

Li-Poly battery 3.7V, 120mA
About 30 minutes for charging
Continuous operation:
1 hour on average
Latency: up to 12 hours

NB O-ring
Rubber tire

How to turn on/off the power?

- Push up the power switch to turn on the power.
- Pull down the power switch to turn off the power.

Power switch
ON if lifting up
OFF if pulling down
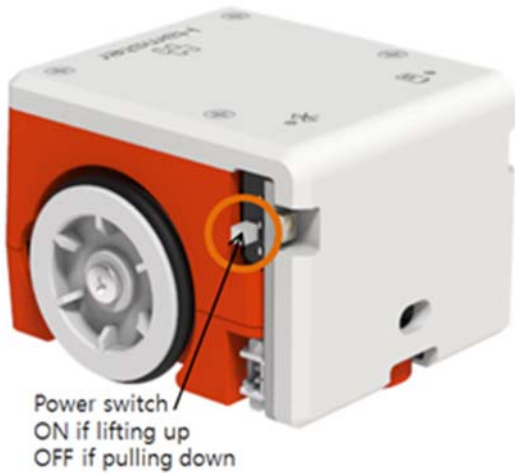
How to charge?

- You can charge a Hamster robot by the charger for a smart phone. You need to connect the micro USB plug to the charge socket of a Hamster robot.
- You can also charge a Hamster robot by a USB cable. You need to connect the micro USB plug of the cable to the charge socket of a Hamster robot and the opposite plug of the cable to the USB port (socket) of a computer.
- The charge indicator is continuously on with red during charging and will be off when the charging is completed.
- Fully charged, you can use the Hamster robot for about 1 hour. (30 minutes for charging, sustained operation: 1 hour in average, waiting (non-operation): up to 12 hours)
- It is better to charge after turning off the robot.

Turned off when charging is completed
Charge indicator

USB charge port
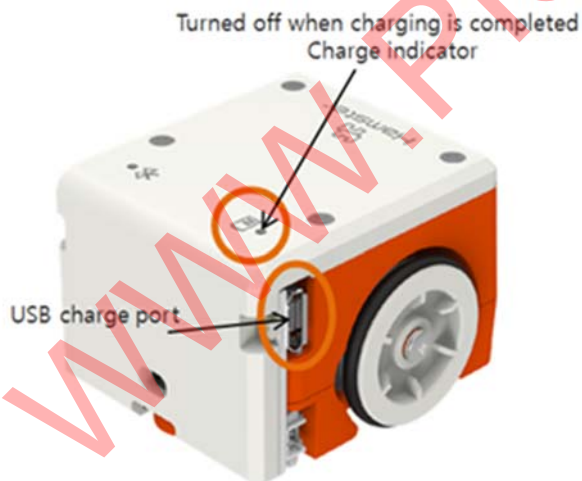
Bluetooth connection indicator
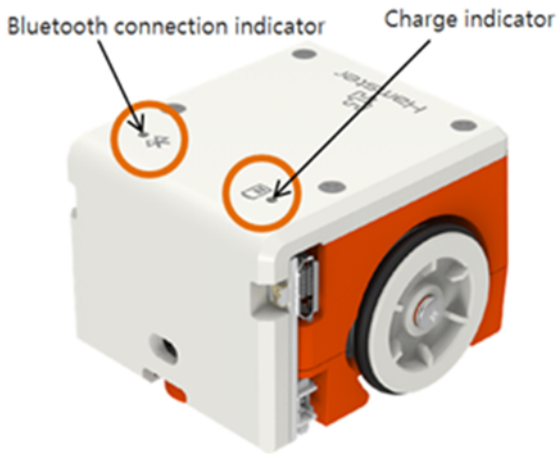
- **Blink slowly in blue**
  Waiting connection
  The Bluetooth connection indicator is blinking slowly in blue when the power of the robot is turned on.
- **Continuously on with blue**
  Connected
  The Bluetooth connection indicator is continuously on with blue if the robot is connected to a PC or a smart phone/tablet.
- **Blink quickly in blue**
  Data transmission
  The Bluetooth connection indicator is blinking quickly in blue while the robot receives data from a PC or a smart phone/tablet.
- **Blink slowly and intermittently in dark blue (or the charge indicator blinks in red)**
  Battery low
  The Bluetooth connection indicator is blinking slowly and intermittently in dark blue or the charge indicator is blinking in red if the battery of the robot is very low. In this case, you have to charge the robot.
  The Bluetooth connection indicator blinks slowly and intermittently in dark blue for the Hamster robot produced in the beginning, while for the Hamster robot produced after November 20th, 2015, the charge indicator blinks in red.
- **Turned off**
  The power of a robot is turned off.

Charge indicator
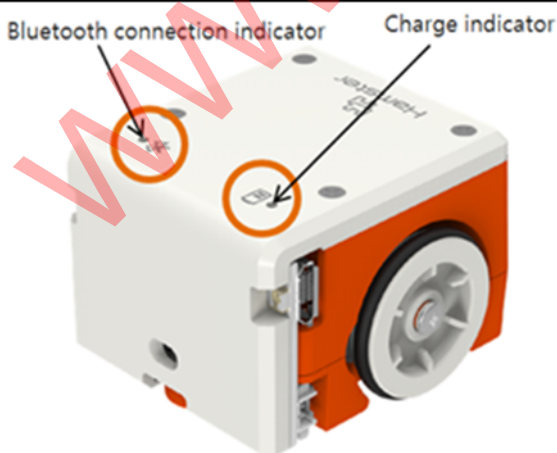
- **Continuously on with red**
  Charging

- **Turned off**
  Charging is completed.
- **Blinks in red (or the Bluetooth connection indicator blinks slowly and intermittently in dark blue)**
  Battery low
  The charge indicator is blinking in red or the Bluetooth connection indicator is blinking slowly and intermittently in dark blue if the battery of the robot is very low. In this case, you have to charge the robot.
  The Bluetooth connection indicator blinks slowly and intermittently in dark blue for the Hamster robot produced in the beginning, while for the Hamster robot produced after November 20th, 2015, the charge indicator blinks in red.

Specification

- **Manufacturer:** Robomation / Republic of Korea
- **Dimensions:** Width 35mm x depth 40mm x height 30mm
- **Weight:** 30g (own weight without decoration)
- **Sensors**
  - Front proximity sensor (infrared sensor) x 2: Left/right, 1 - 30cm, measure 100 times per second, transmit 50 times per second
  - Floor sensor (infrared sensor) x 2: Left/right, reflective photo interrupter, measure 100 times per second, transmit 50 times per second
  - 3-axis accelerometer: ranges 2g, 4g, 8g, 16g, band width 7.81 - 1000Hz
  - Illuminance (light) sensor: 0 - 65,535Lux, measure 10 times per second
  - Internal temperature sensor: -40 to 87.5°C, accuracy 0.5°C
  - Battery voltage sensor: accuracy 0.01V
- **Effectors**
  - DC geared motor x 2: Left/right, 100 levels of PWM, maximum movement speed 10cm/sec, planetary gear
  - LED x 2: Left/right, 7 colors (RED, GREEN, BLUE, CYAN, MAGENTA, YELLOW, WHITE)
  - Buzzer: 1 - 167772.15Hz, monotone, accuracy 0.01Hz
  - Note: 88 keys, A3 - A7, 12 temperament, accuracy +/- 0.1cent
- **External I/O extension:** Only one mode is available for each port A/B, each mode can be changed during operation
  - Auxiliary power: 2 pins, power output, on/off available
  - Digital input x 2
  - ADC input x 2: 8 bits, 0 - 3.6V
  - Digital output x 2
  - Analog output x 2: PWM, 255 levels
  - Analog servo output x 2: 0 - 180 degrees
- **Communication:** Bluetooth 4.0 BLE, range within 15m
- **Transmission speed:** 20 msec (50 times per second)
- **Battery:** Li-Poly, 3.7V, 120mA, 30 minutes for charging, continuous operation: 1 hour in average, waiting (non-operation): up to 12 hours
- **Charging port:** Micro USB charging port, 5 pins, compatible with the charger of a smart phone/tablet
- **Power management:** Slider switch, power on/off
- **Detection of battery remains and signal strength:** Available when connected to a smart phone/tablet