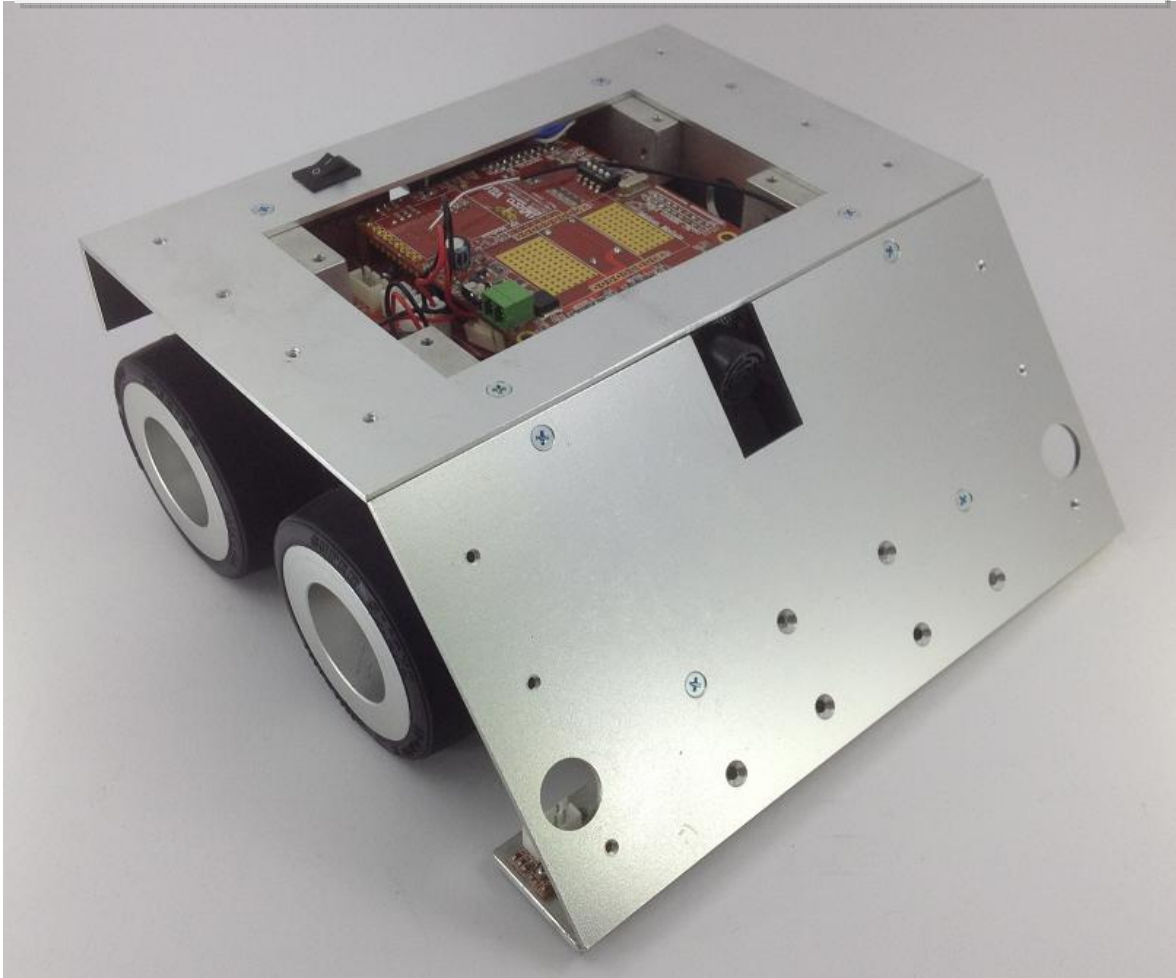


iSumoBot User Guide



iNOVA Microsystems

iSumoBot the Sumo Robot

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1.1 What is iSumoBot?

iSumoBot is a high-quality compact 2-axis robot designed for both **autonomous** and **RC** capabilities.

Autonomous mode during this mode, sumo robot can be programmed to assail and overpower its opponent or retreat to prepare for battle. 1/4 ultra-sonic sensors are mounted around the robot to detect an opponent. Upon detection, it instructs the brain of SUMO to "charge", and to win the match by pushing the opponent out of the ring.

RC mode during this mode, user become the controller of the robot. Whereby user can instruct the robot to desire movement by transmitting RC standard pulse through transmitter to iSumoBot wirelessly; iSumoBot's on board 2 PWM signal input ports able to read in the data through receiver and allows the controller to do the interpretation. Hence, robot starts to move to position you like.

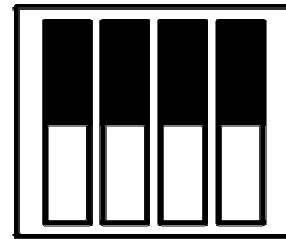
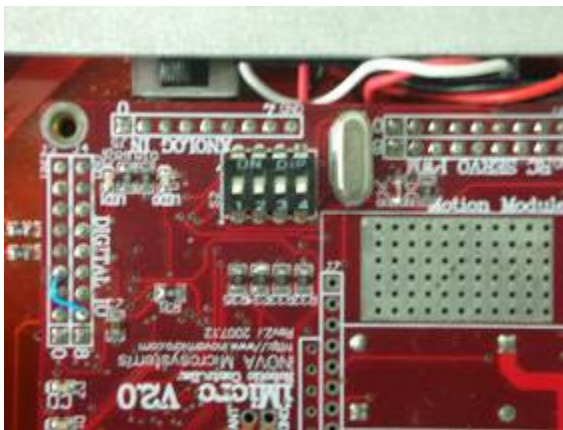
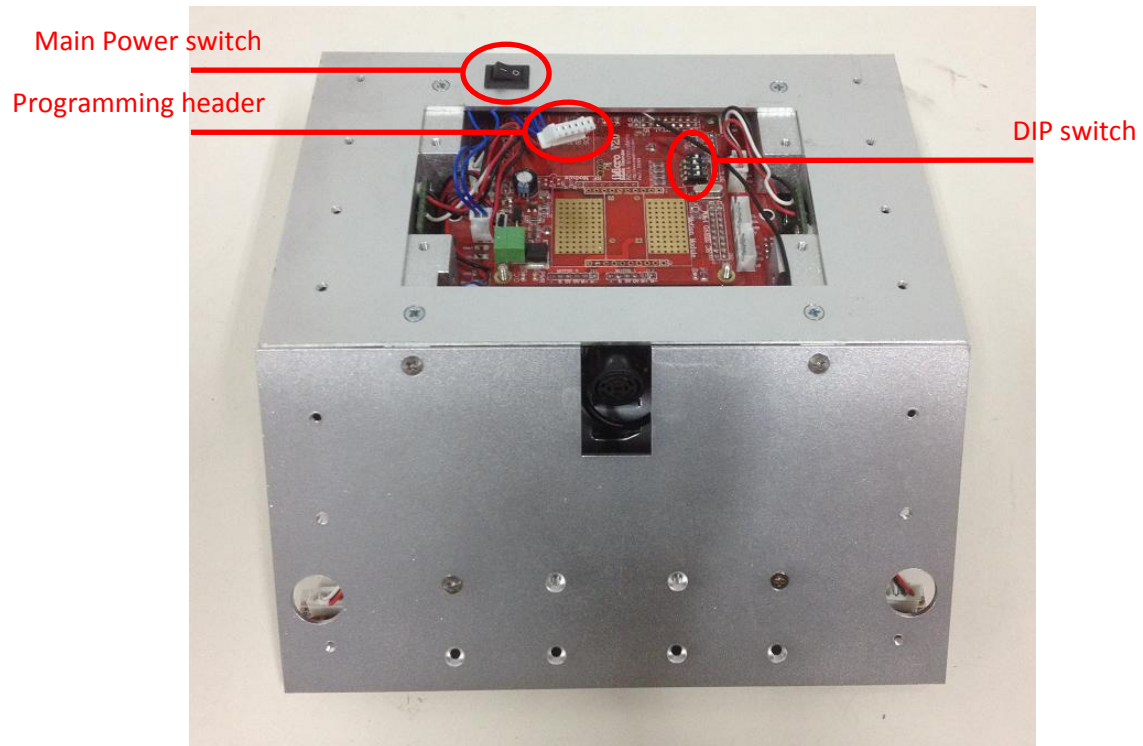
More about the robot, its on-board DC motor controller consists of a 16-bit motion processor with DMOS H-bridge driver. It uses incremental encoder as feedback to control the speed of the motor. The PID parameters of the controller are tunable via software.

Its peripheral processor provides the RC servo control and communication function. Radiometrix RF module is supported directly to allow point-to-point communication.

The main processor that is to run user application is one 8-bit 40Mhz Microchip processor (18F Family with 64K program memory and 4K data memory). It is supported by ANSI C compiler and IDE with debugging capability and numerous online resources at Microchip website.

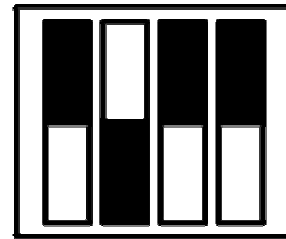
Typical robotic applications of iSumoBot robot include Singapore Robotic Games - **Sumo Robot** category etc.

2. Operating of iSumoBot – Autonomous Mode

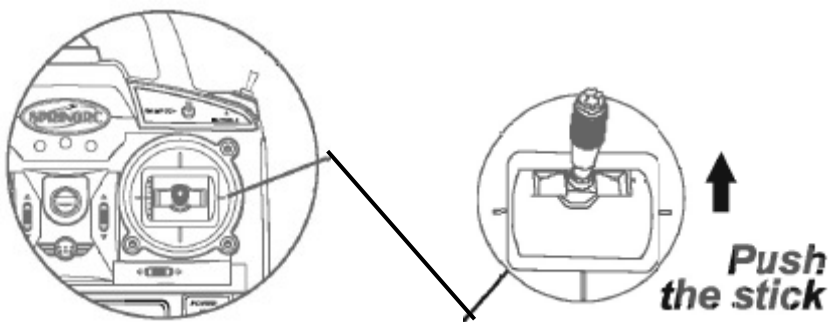


Make sure the DIP-Switch setting is the same as shown on the picture.

3. Operating of iSumoBot – RC Mode

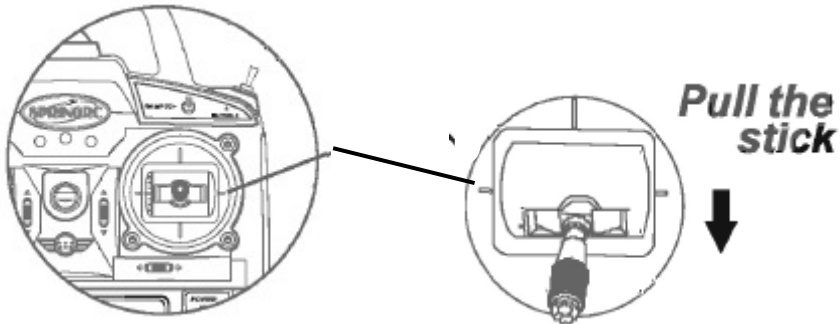


Step 1. Make sure the DIP-Switch setting is the same as shown on the picture.

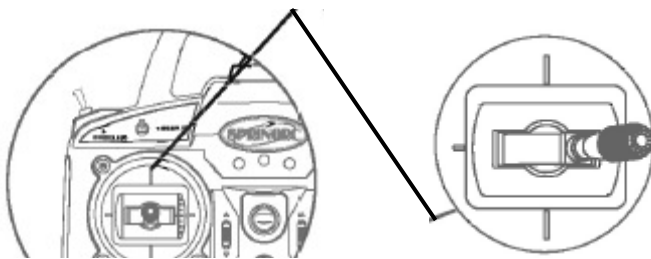


Step 2. To move forward, please follow the instruction on the picture.

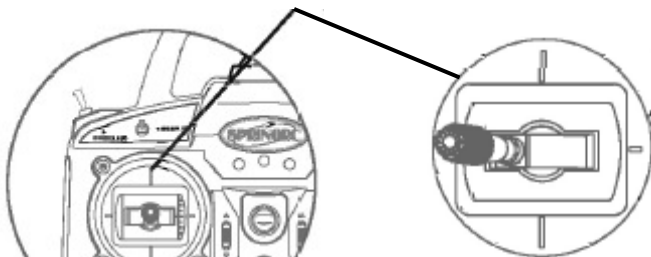
3. Operating of iSumoBot – RC Mode



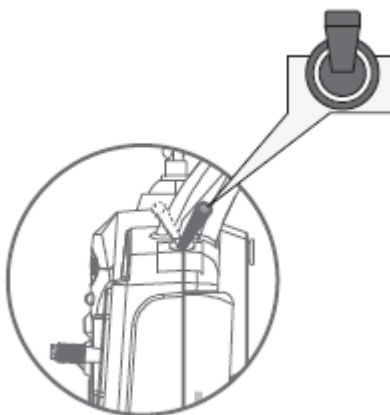
Step 3. To move backward, please follow the instruction on the picture.



Step 4. To move right, please follow the instruction on the picture.

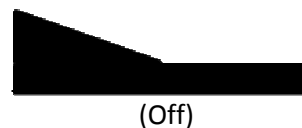
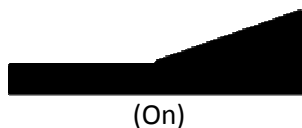


Step 5. To move left, please follow the instruction on the picture.



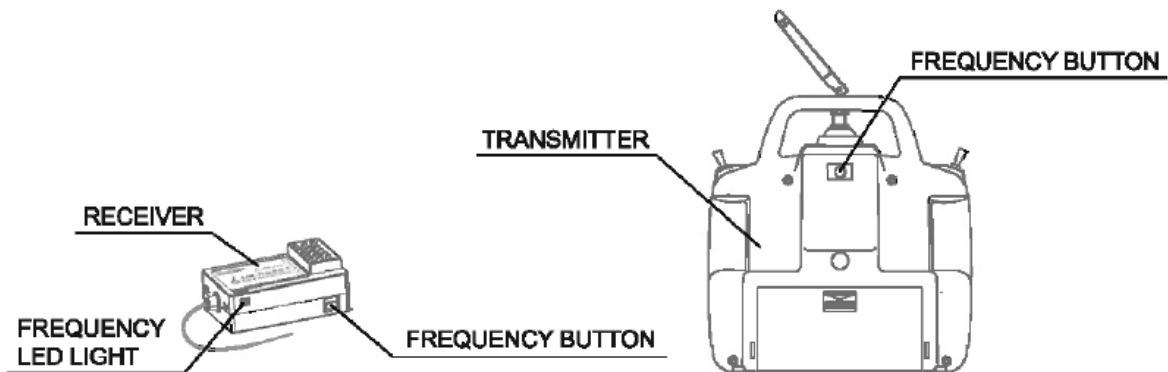
Step 6. Push the toggle switch to enable special motion. During the special movement, the sticks are disabled. Pull back the toggle switch to stop the special motion and enable the sticks.

3. Operating of iSumoBot – RC Mode



Step 7. To switch-off the robot, simply by pressing again on the start/stop button (while robot is in active mode).

4. Binding of Transmitter & Receiver



Step 1. Make sure both transmitter & receiver are in off mode.

**Step 2. Now holds the frequency button(Transmitter side) and switch on the transmitter.
(Once you see blue LED is blinking, you can let go the frequency button)**

**Step 3. Now holds the frequency button(Receiver side) and power up the receiver.
(This procedure should last for 3 seconds and Red LED should not light up during this period of time, if Red LED is light up please repeat this step again)**

Step 4. Switch-Off both transmitter and receiver.

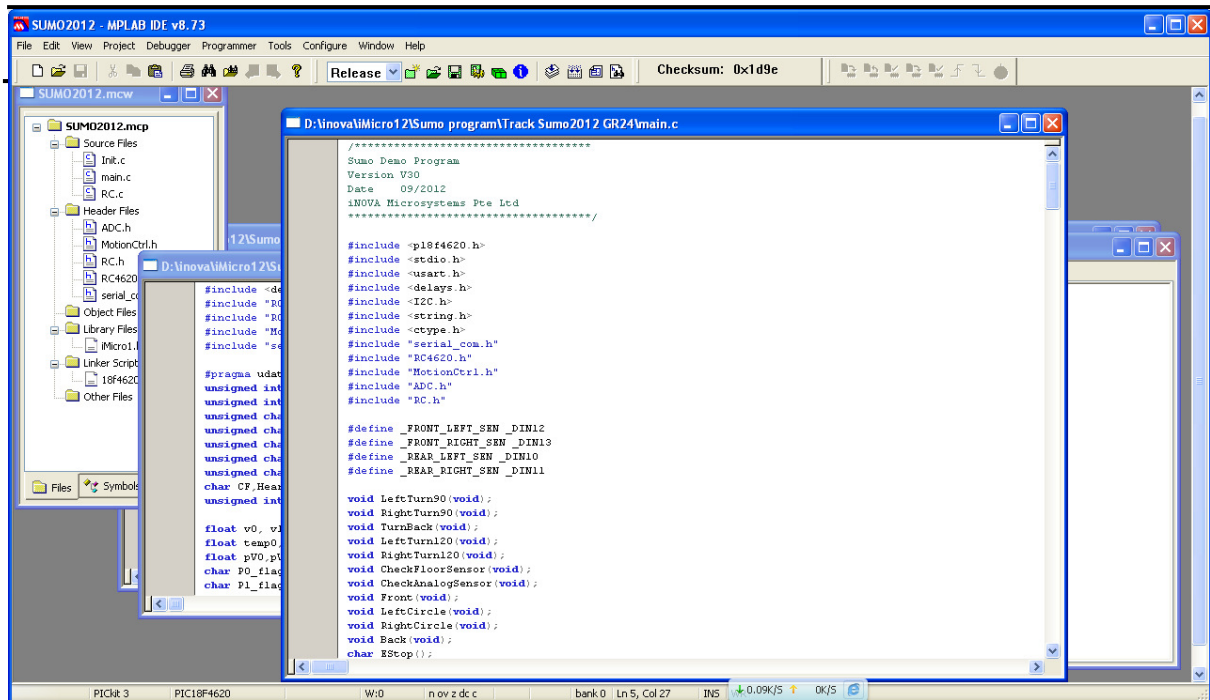
**Step 5. Switch-On both transmitter and receiver, there's a delay before transmitter's blue LED and receiver's red LED to light up. Once both LED light up the binding procedure is successful.
Now you can start operating the robot!**

5. Programming



Programming tool: PICKit 3

Step 1. Connect the PICKit 3 to the programming header. Make sure the triangle arrow of PICKit 3 point to the red wire of the programming header.



Step 2. Keep the power switch off and Download the program from MPLAB windows application.

6. Battery & Charger

5.1 Battery Specification

Lithium Polymer Battery

- Voltage: 14.8V
- Cells: 4-Cell
- Capacity: 1600mAh
- Max Continuous Discharge: 20C
- Max Burst Discharge: 25C
- Max Continuous Current: 44A
- Max Burst Current: 55A
- Weight: 190g
- Dimensions: 28 x 31 x 105mm

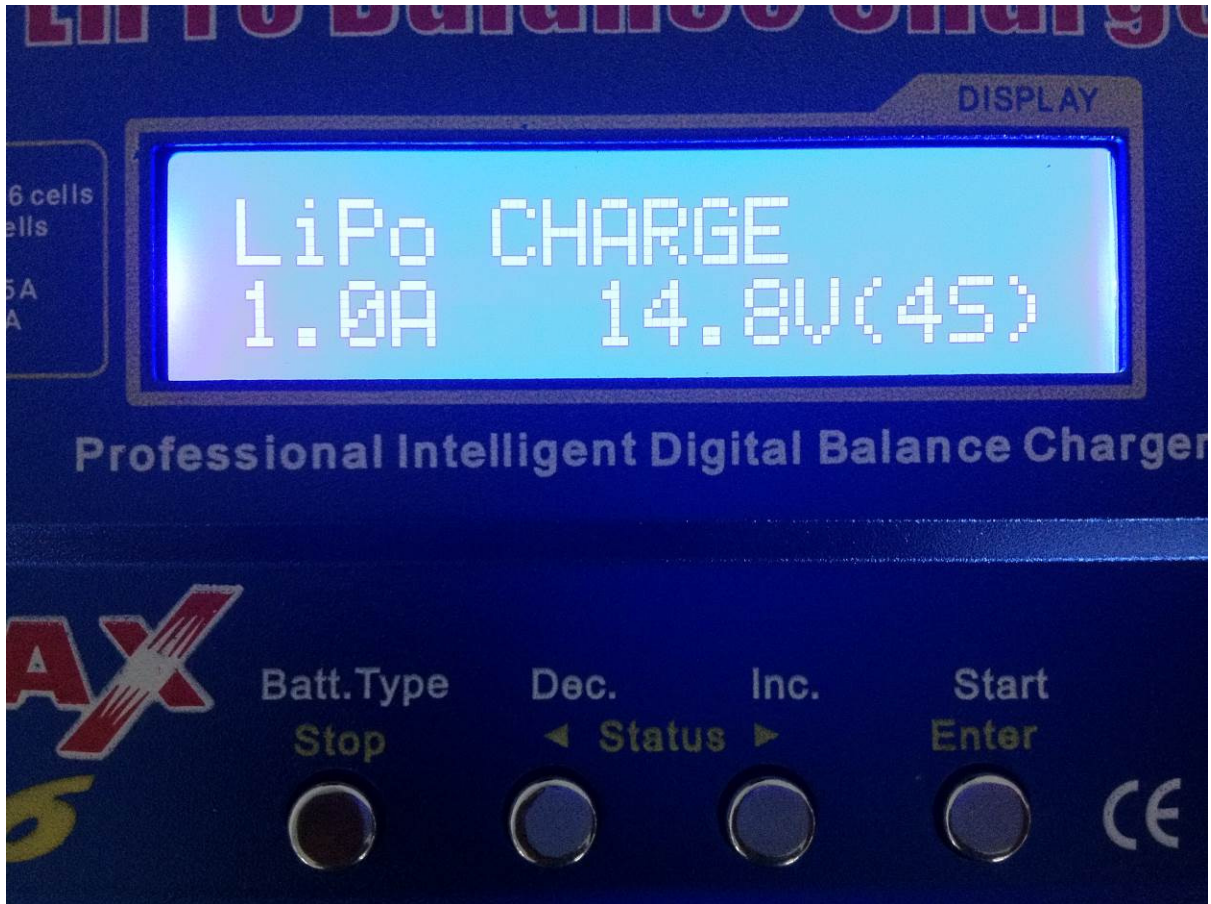
NOTE: Please handle the battery with extreme care as it is highly flammable!

5.2 Battery charging with iMAX charger



Step 1. Connect the power cable and balance cable as the picture shown.

6. Battery & Charger



Step 2. Press 'Enter' to select the charging mode and specs. Press 'Dec.' or 'Inc.' set the value to be the same as the picture shown.

Step 3. Hold 'Enter' for 2 second, then the charging should start. Once the charging finished, the buzzer should sound.

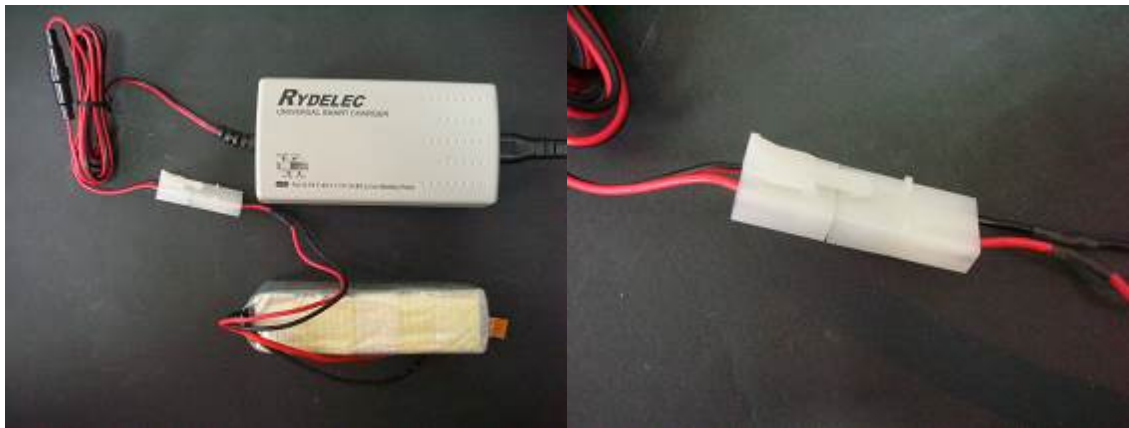
NOTE: Please read the iMAX instruction manual before charging the battery!

6. Battery & Charger

5.3 Battery Charging with RYDELEC Charger



Step 1. Make sure the charger setting(14.8V) as shown picture.



Step 2. Connect the battery to the charger as shown on picture.

