Intellingent communication between home and car

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Esame di Internet of Things

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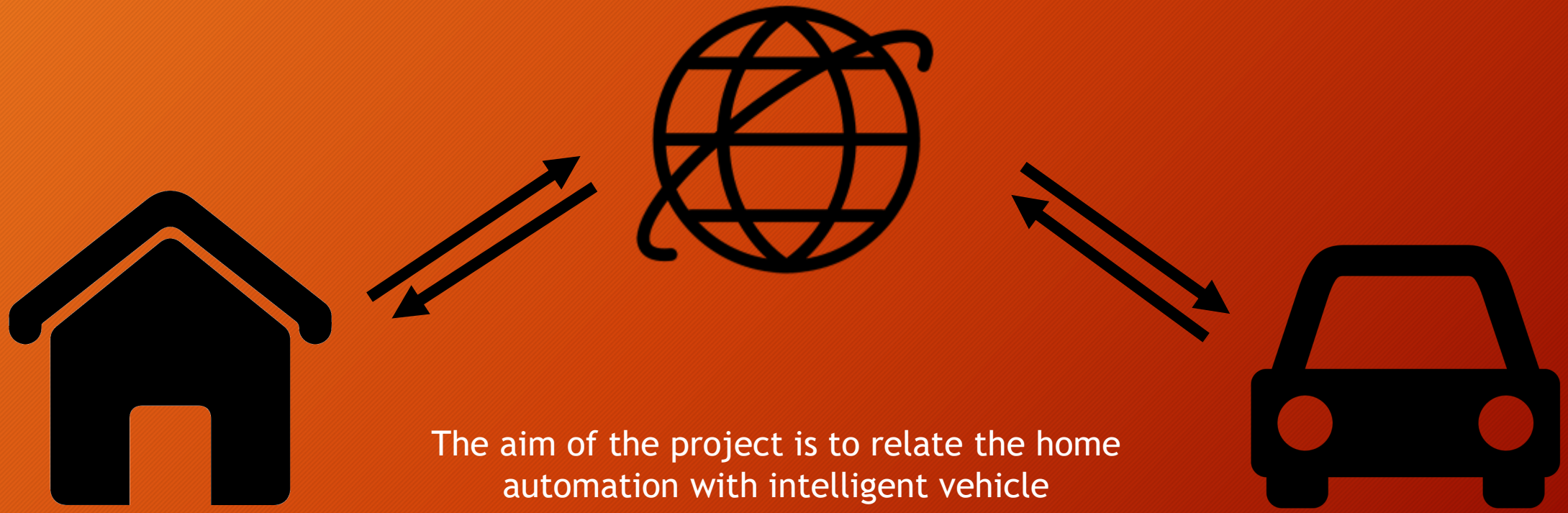
The goal

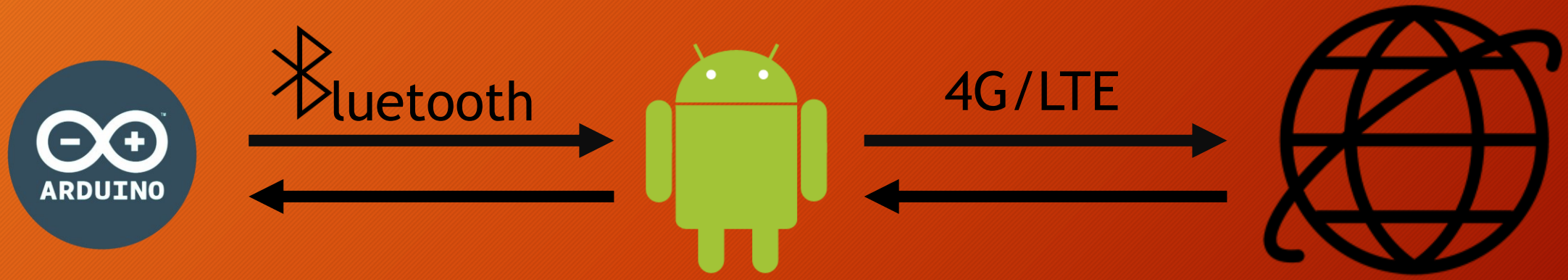


The aim of the project is to relate the home automation with intelligent vehicle technologies to increase both the comfort and the safety of the user.

The project

To this end we want to set a communication between two Arduino, one installed at home and the other mounted in the car; both of them will collect data by sensors present in the two nodes.

The project



In order to interchange data we adopted an elementary idea: both arduino connected with an android device (a cellphone) via Bluetooth that is able to comunicate with an online server.

The project

Server

http://tinywebdb.appinventor.mit.edu

Client

Client

The connection consists in a server-client based comunication:
this choice make possible to retrieve data from any device on which the app is installed.
The server we use is the MIP App Inventor server.

The application: home side

Features:

- Temperature reading and regolation
- Lights control
- Garage control
- Allarm
- Accident notification

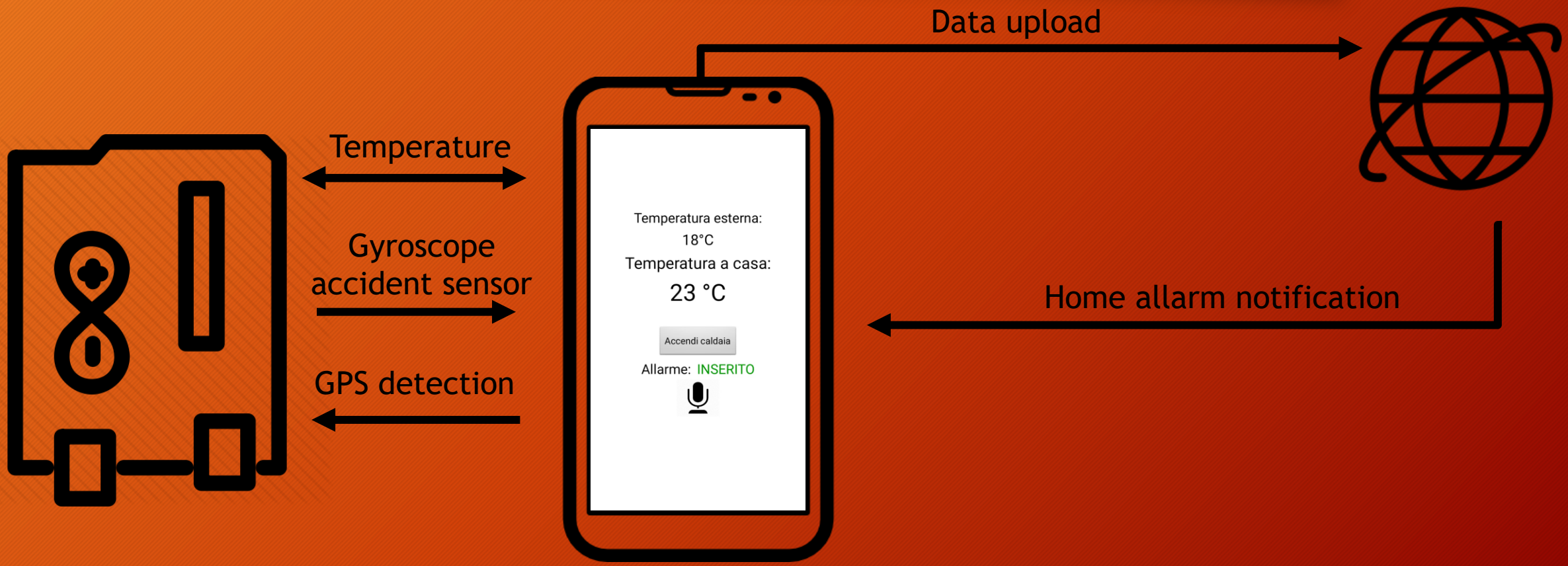
The application: home side

The application: car side

Features:

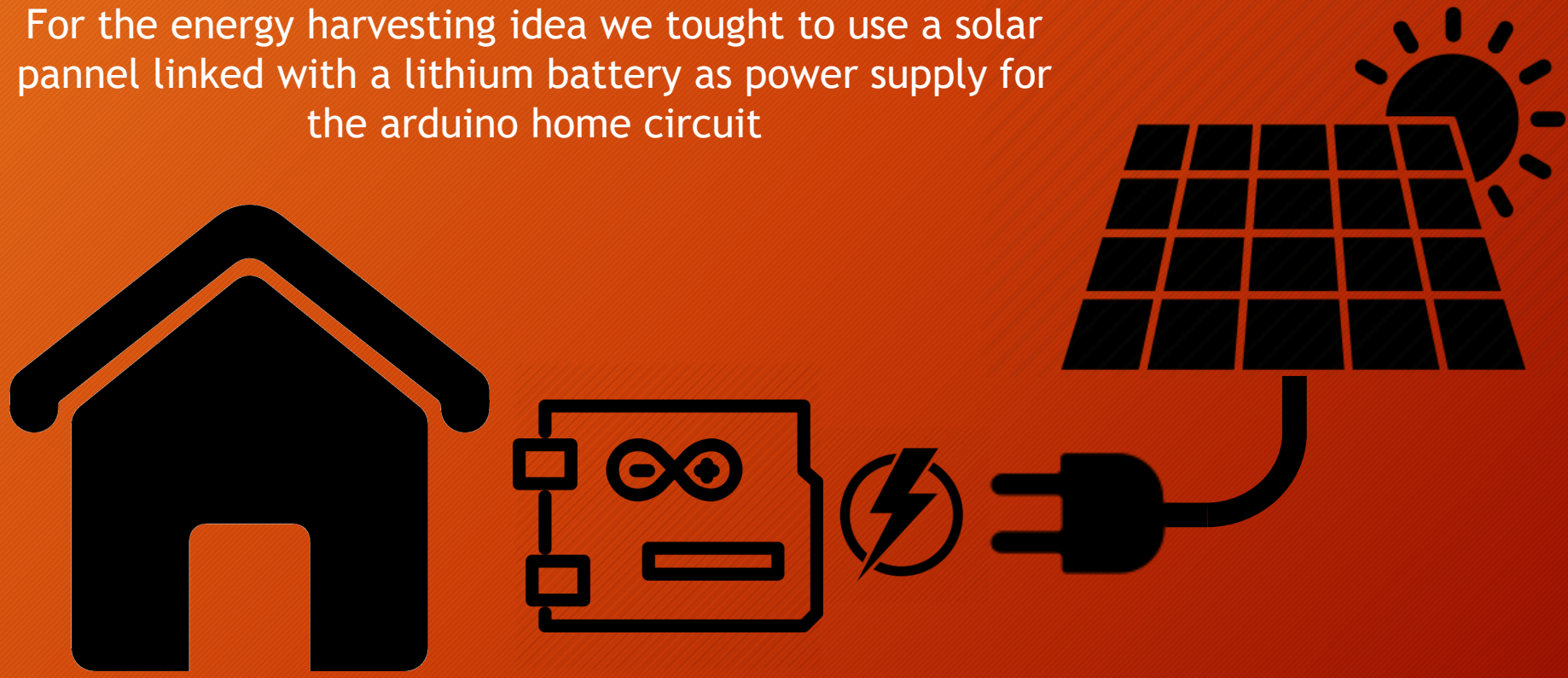
- Real-time home temperature control
- GPS reading
- Accident detection
- Allarm notification

The application: car side

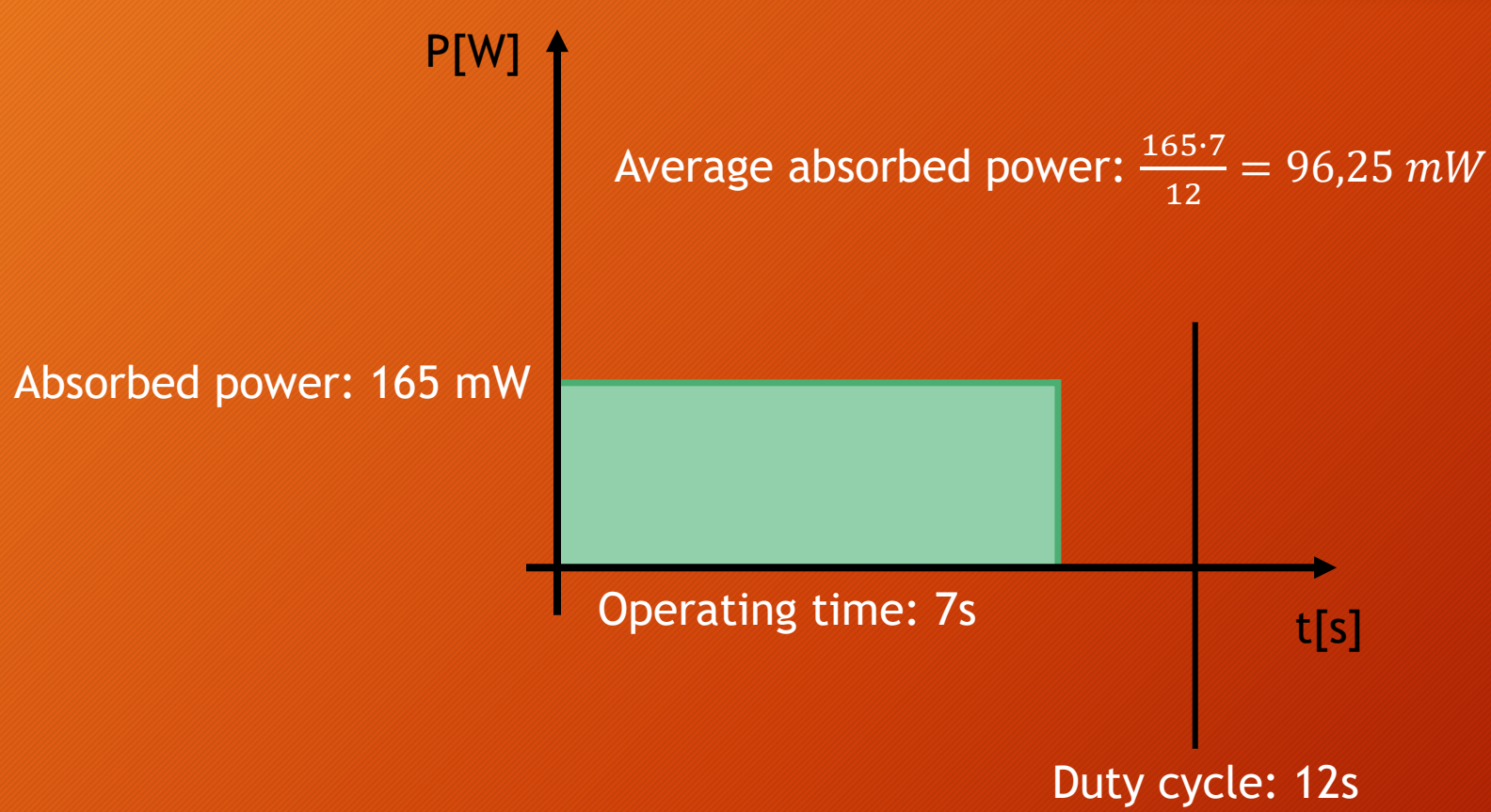


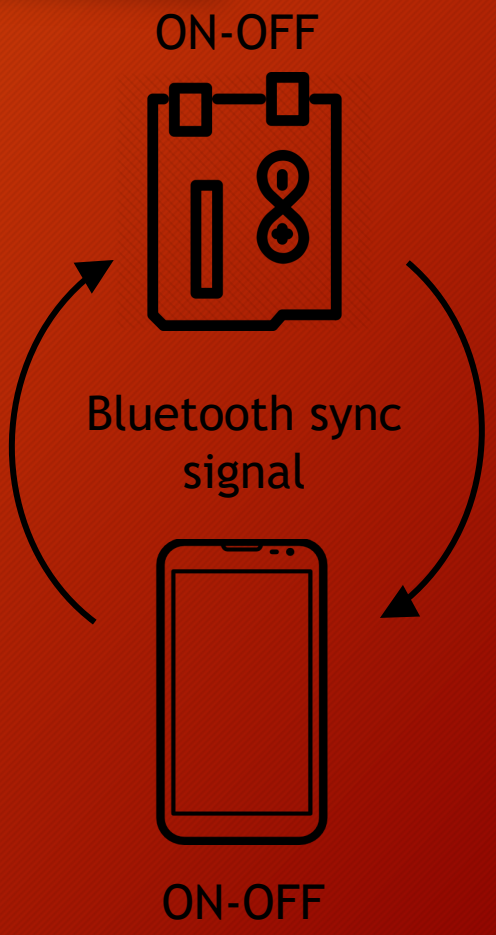
Energy Harvesting

For the energy harvesting idea we tought to use a solar pannel linked with a lithium battery as power supply for the arduino home circuit

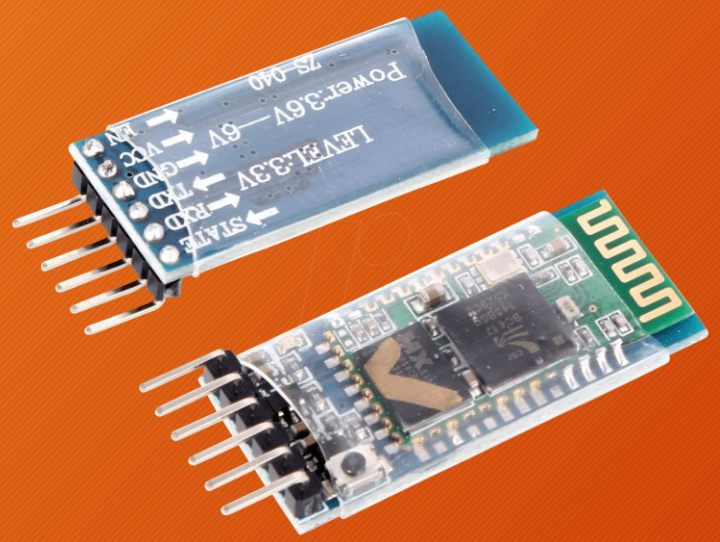


Absorbed power ottimization





HC-05



Specifications:

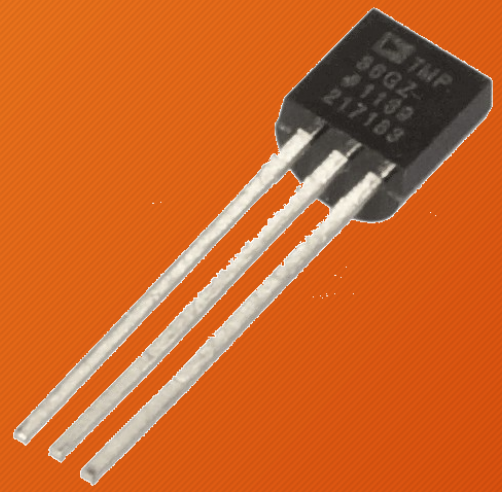
- USB protocol: USB V1.1/2.0
- Frequency: 2.4 GHz ISM band
- Transmit power: =4 dBm, class 2
- Support profiles: Bluetooth serial port (master and slave)
- Power supply: +3.3 V DC, 40 mA
- Working temperature: -5 - +45 centigrade

HC-SR501

Specifications:

- Input Voltage: from 4,5Vdc to 20Vdc
- Output Voltage: 0-3,3V
- Output Current: 10mA
- View angle: <140°
- Detection distance: from 3 to 7 mt

TMP36



Specifications:

- Voltage Input: 2.7 V to 5.5 VDC
- 10 mV/°C scale factor
- ±2°C accuracy over temperature
- ±0.5°C linearity
- Operating Range: −40°C to +125°C