Smart Power Tags

A smart home solution

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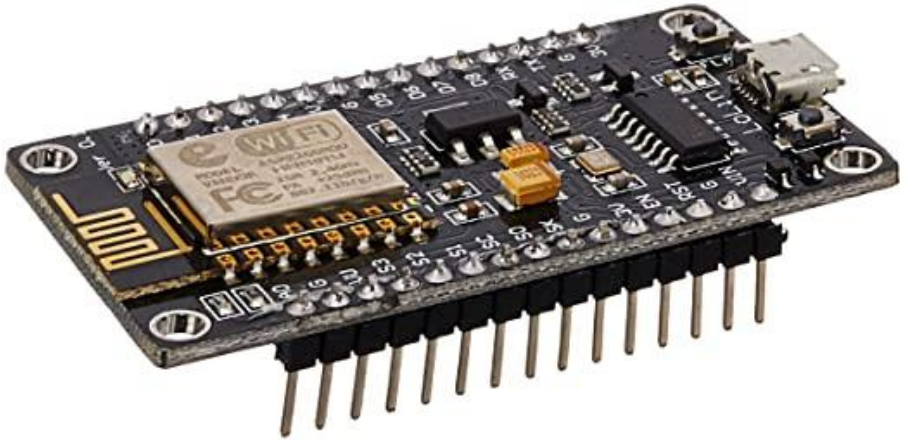
I believe home security can be classified into 3 segments :

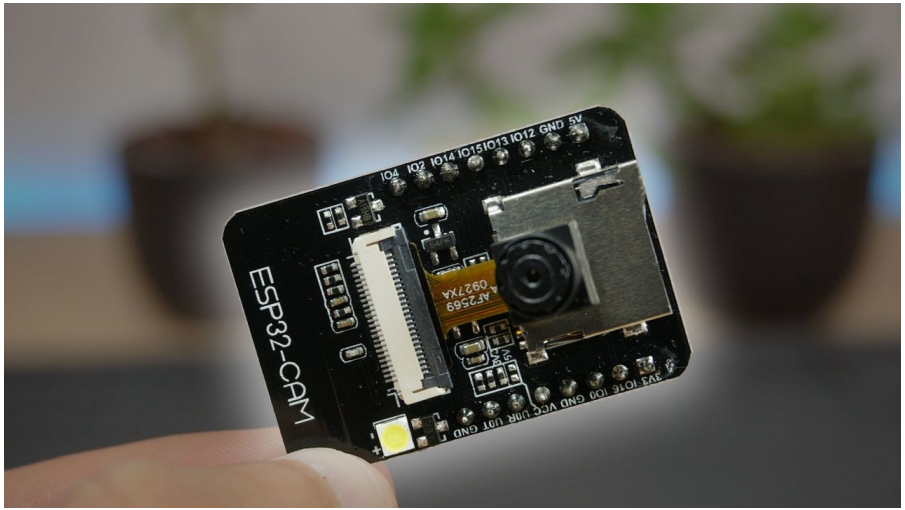
1. Security from theft and intrusion
2. Security from unintentional damages (fire , natural calamities, etc..)
3. Security from accidental economical losses (from unwanted use of electricity, water, etc..)

Components / Circuits

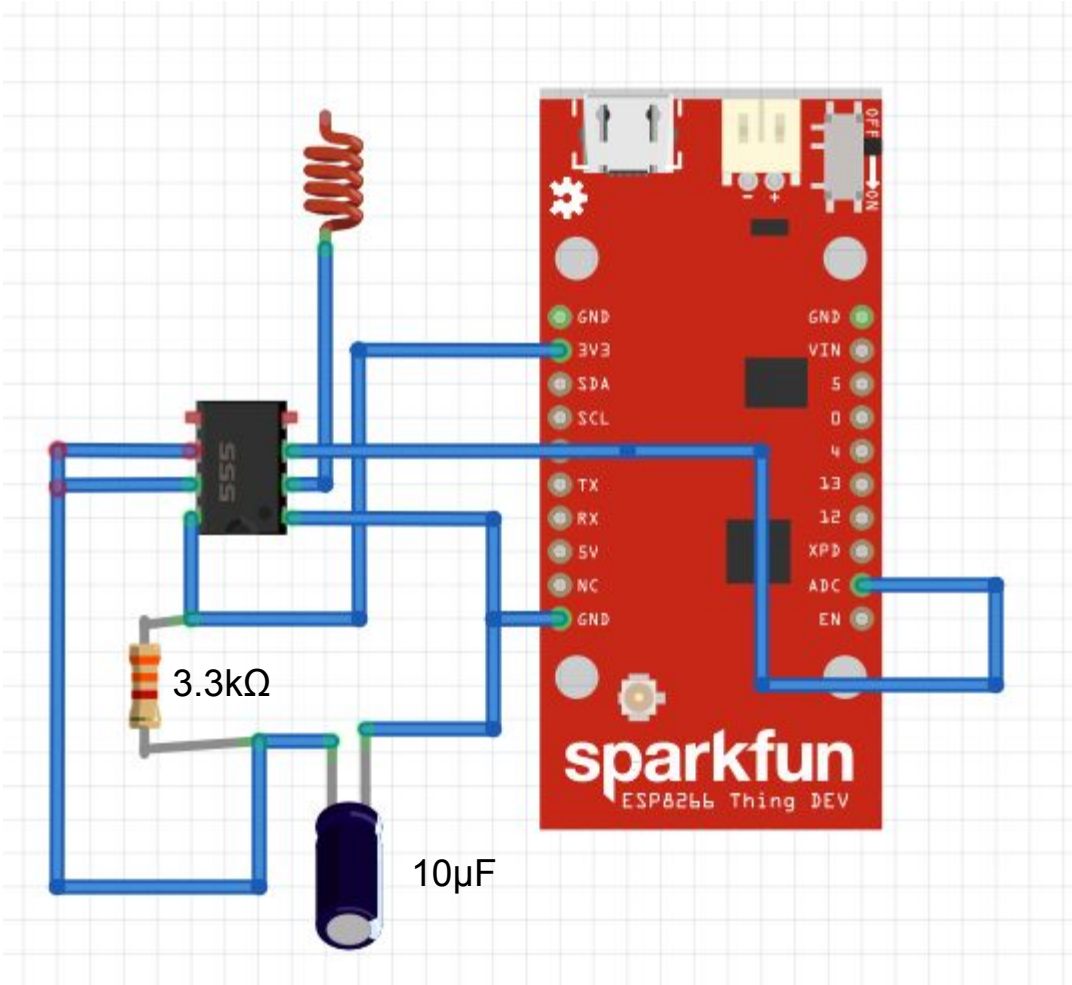
ESP8266 NodeMCU



Esp32 CAM

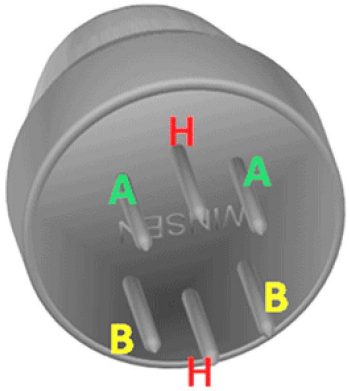


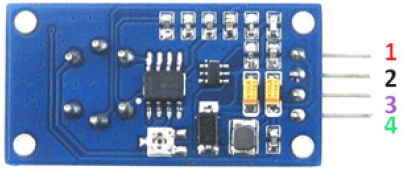
Wireless voltage detector using 555IC



LM393 LDR sensor module

Mq-2 Gas Sensor Module Smoke Methane Butane Detection





Pin No.	Pin Name
1	Vcc(+5V)
2	Ground
3	Digital Out
4	Analog out

Data Flow :

sensors ⇒ 555 voltage detector / LDR / Smoke detector

1. **Power Tags -** ESP8266 + (1 or more sensors) + Battery

    - ESP8266 is in deepsleep with wakeup timer set to 10sec - 1mts (to save power)
    - When the MCU wakes up it checks sensor readings
    - MCU compares sensor readings with the previous readings stored in the EEPROM
    - If there is any change immediately processed sensor reading is sent to Master Board via ESP-NOW.
    - As a backup if ESP-NOW fails, the tags can directly connect to WiFi and use REST api to send readings to main server

2. **Master Board -** ESP32 CAM (connected to UPS power supply)

    - Master board have 2 jobs:
    - 1. Live broadcast the camera feed
    - 2. Get sensor value from Power tags and forward to main server via REST apis

3. **ESP-NOW** - local communication

    - ESP NOW is a P2P communication protocol designed for ESP MCUs
    - Transmits data based on pre-configured MAC address ⇒ less time spent for connection making
    - Low time for sending data ⇒ less battery usage