



GPUL SCHOOL



Acercámosche o mundo do Software Libre

<https://bit.ly/35Y0Pjd>



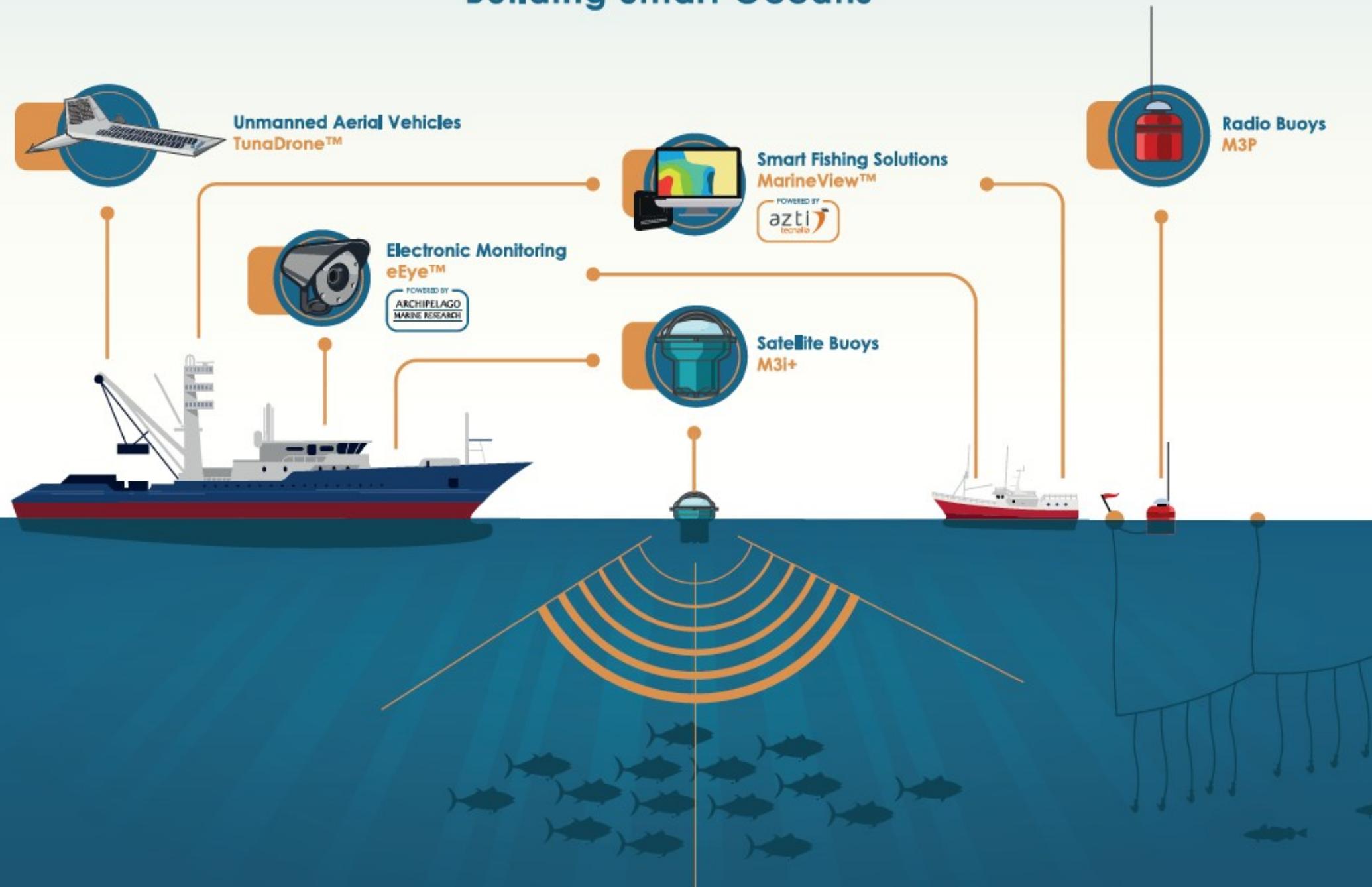
IoT con Raspberry Pi, Parte I

Javier Vila





Building Smart Oceans





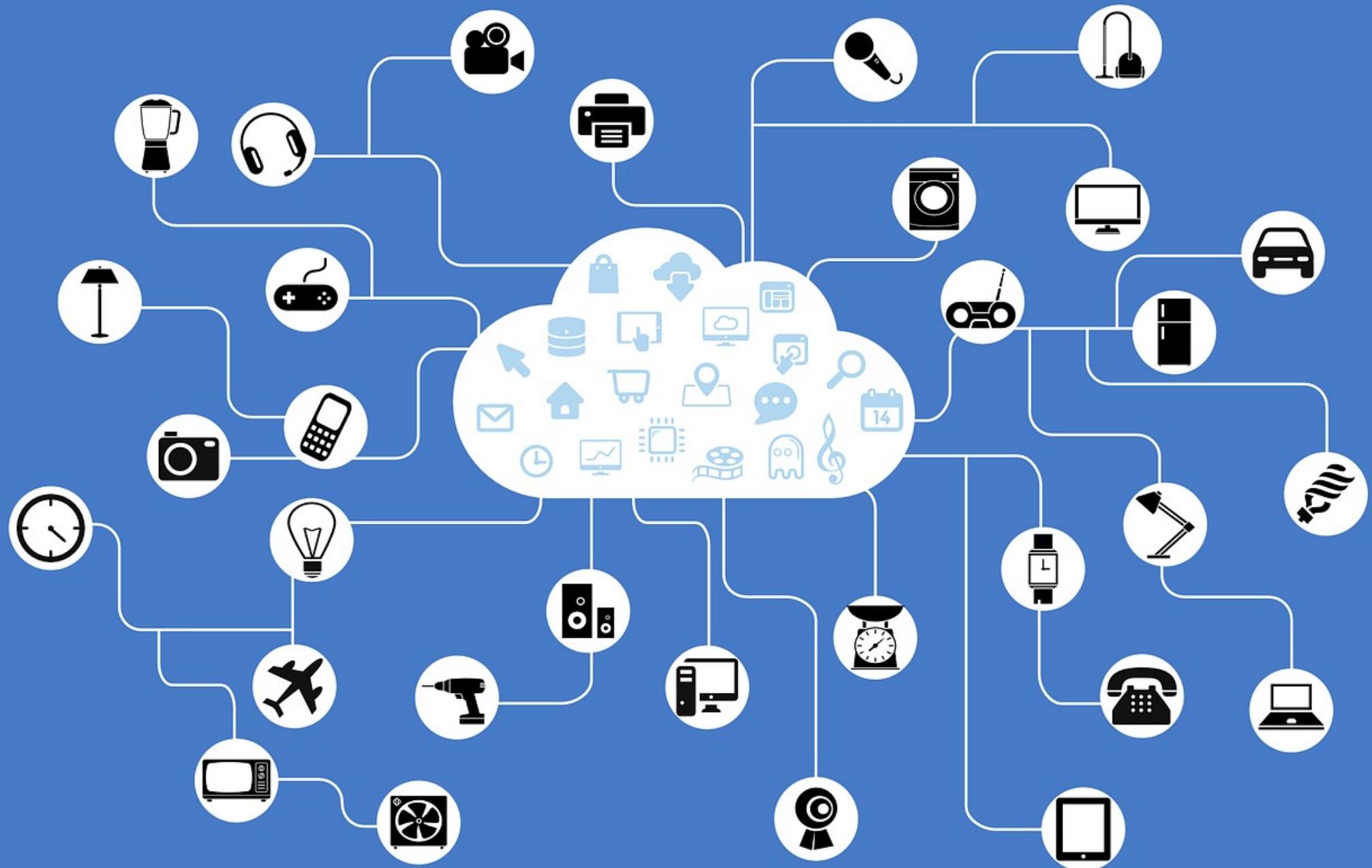
QA Engineer

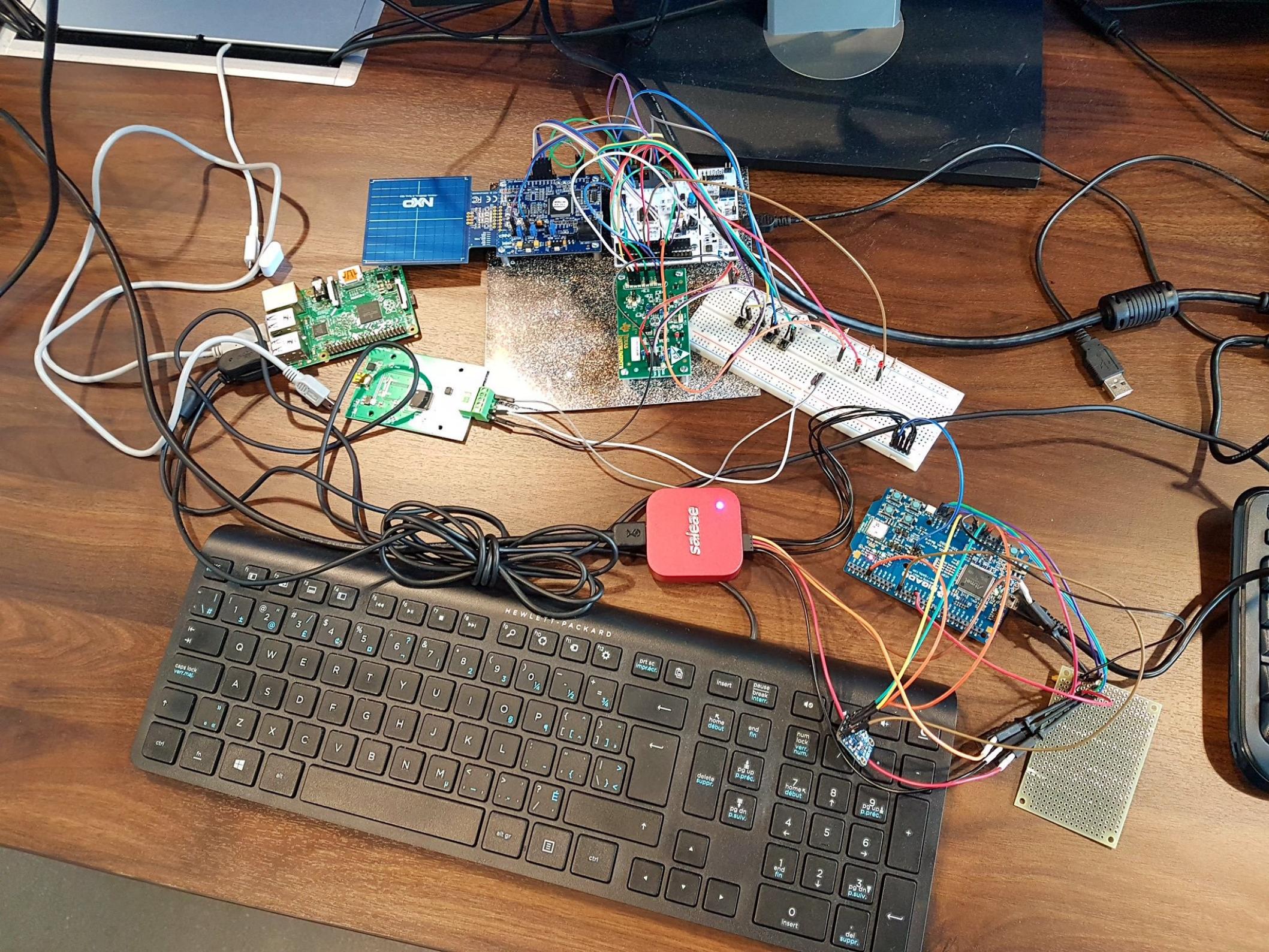
Developer

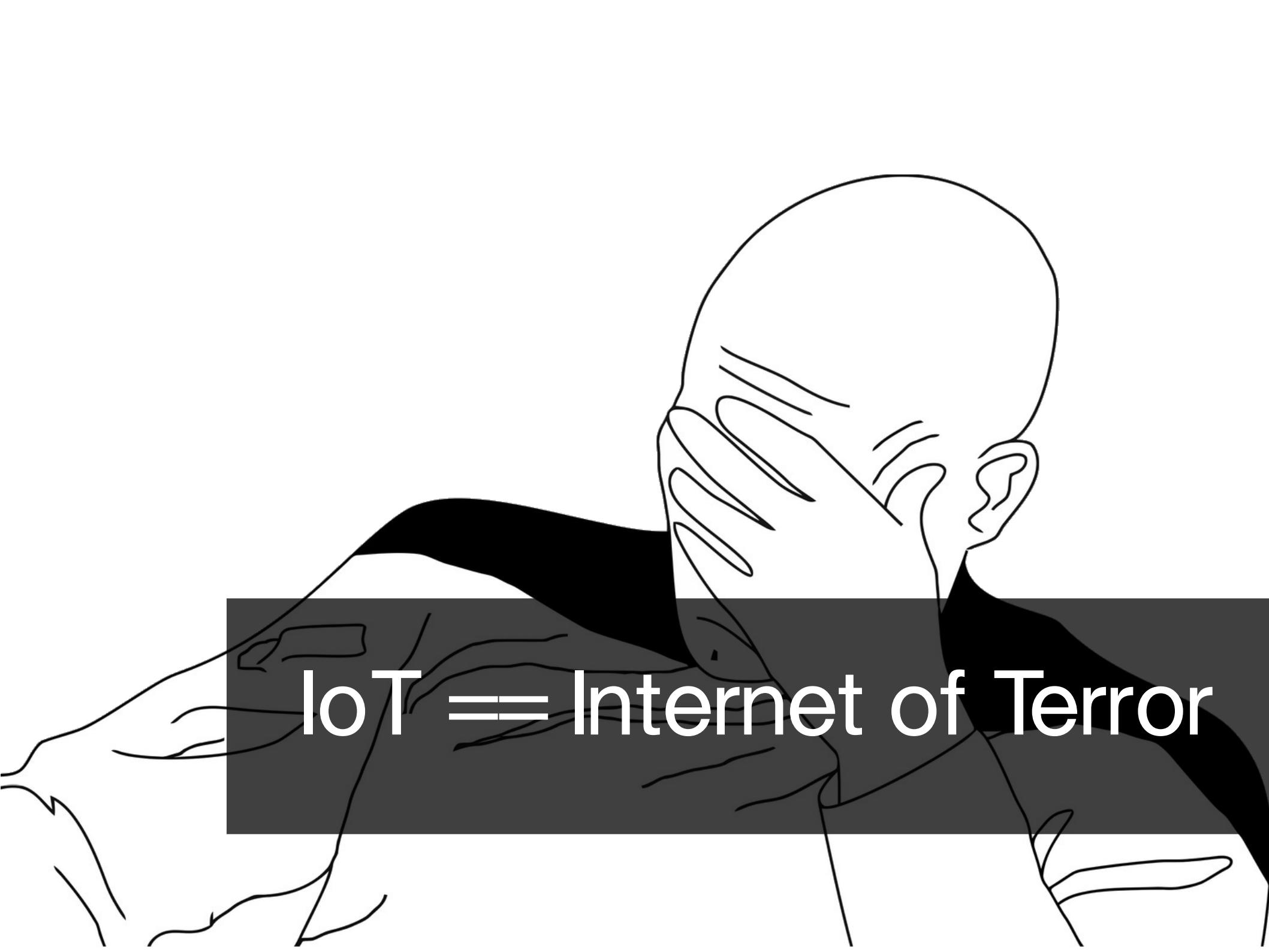
LOL
ComediHa!



¿Qué es esto del IoT?

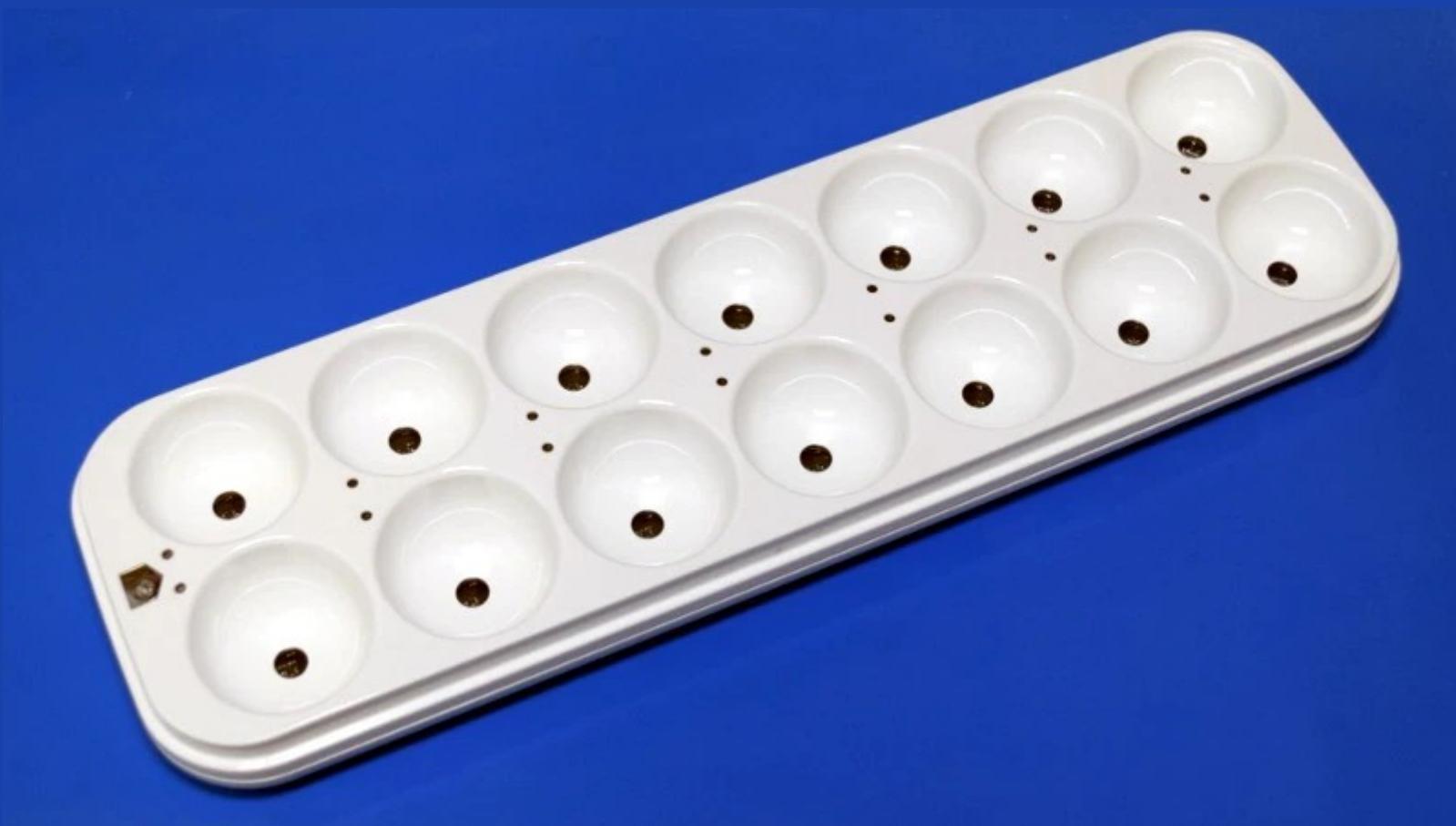






IoT = Internet of Terror











Smart ovens have been turning on overnight and preheating to 400 degrees

June Oven owners are reporting preheating incidents

By Ashley Carman | @ashleyrcarman | Aug 14, 2019, 2:54pm EDT

f   SHARE

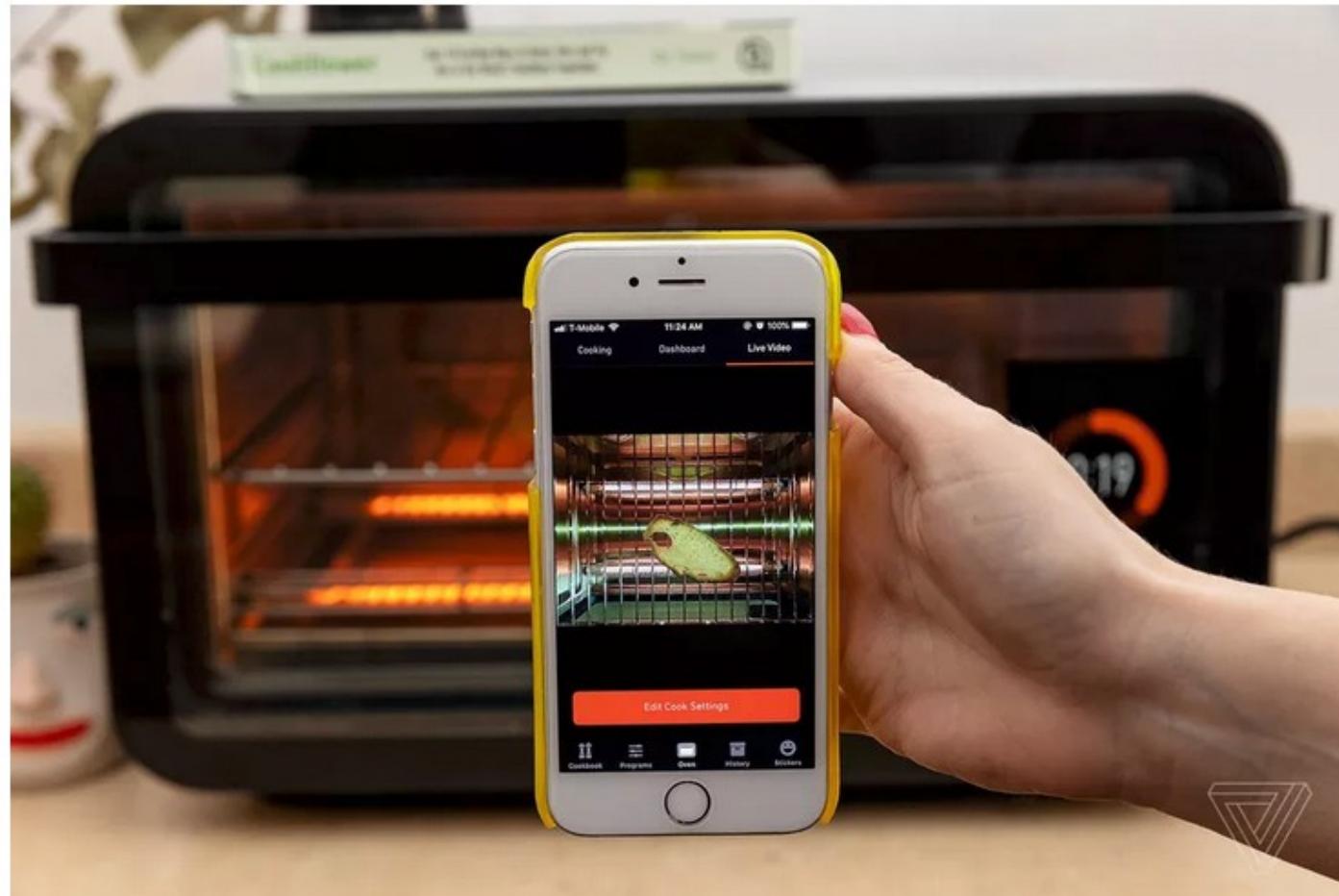


Photo by Amelia Holowaty Krales / The Verge

GOOD DEALS



The Verge Guide to Cyber Monday











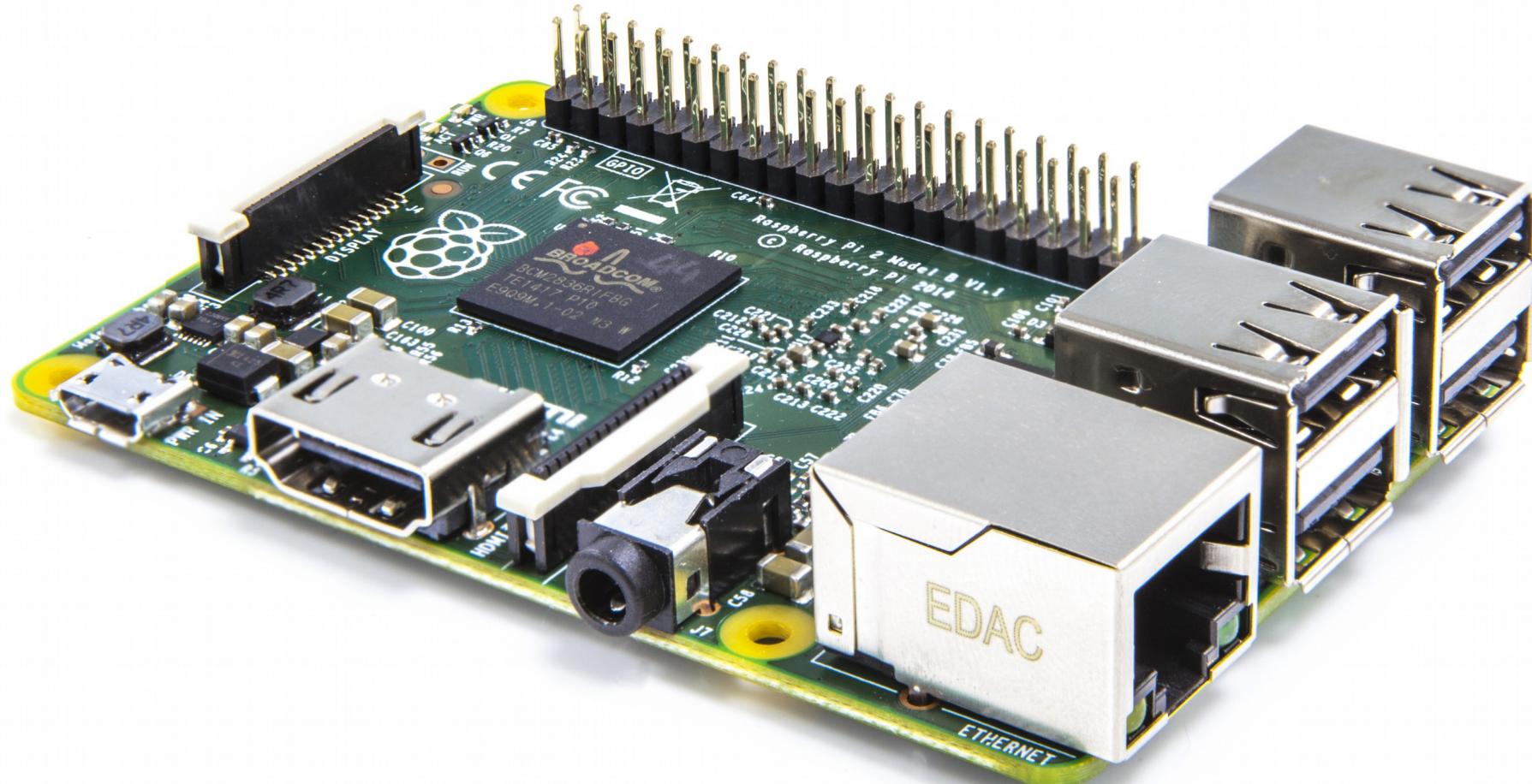


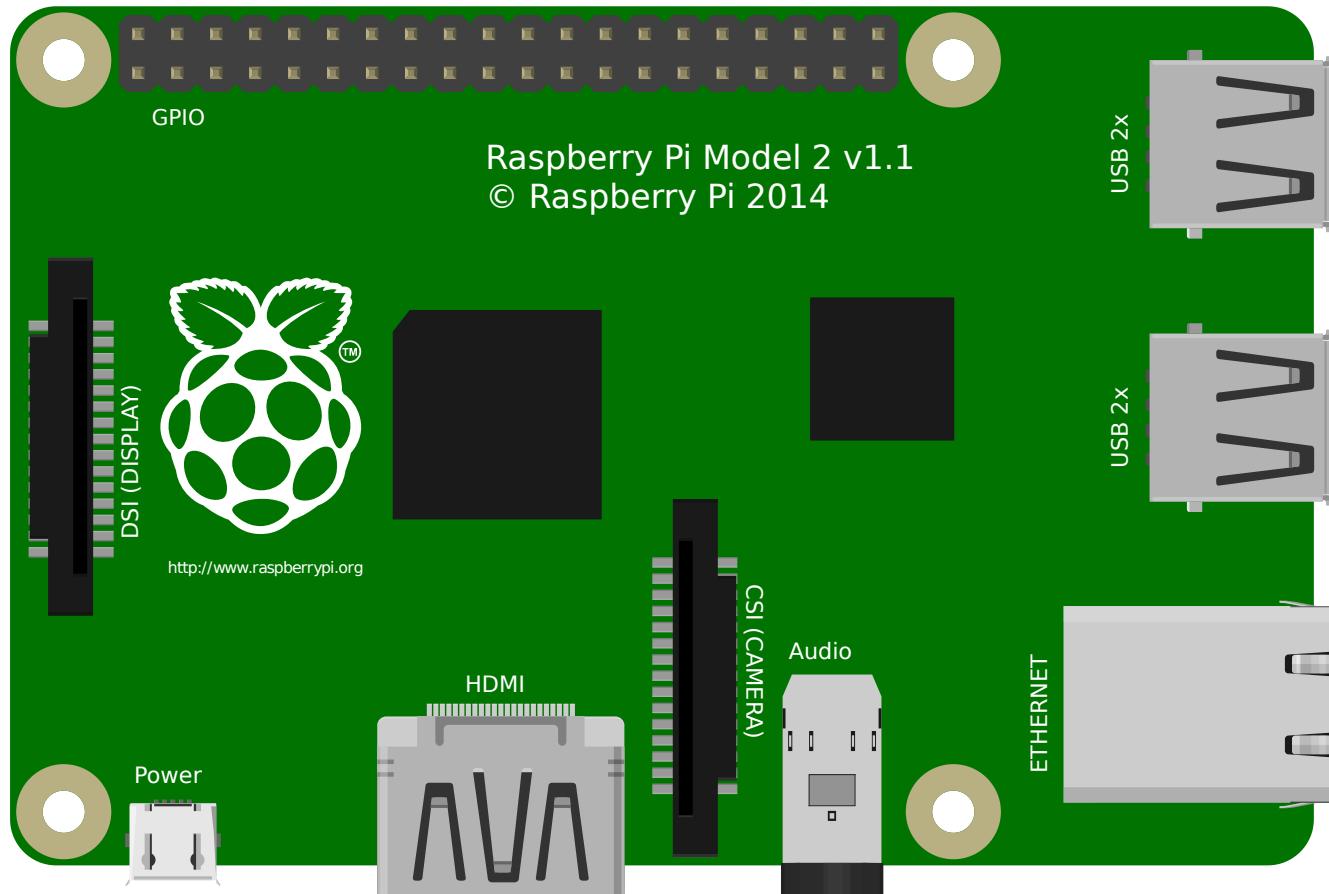




Sentidiño!

@internetofshit







Instalación del sistema operativo (Raspbian)



Raspbian Buster with desktop

Image with desktop based on Debian Buster

Version: September 2019

Release date: 2019-09-26

Kernel version: 4.19

Size: 1123 MB

[Release notes](#)

Download Torrent

Download ZIP

SHA-256:

2c4067d59acf891b7aa1683cb1918da78d76d2552c02749148d175fa7f766842

<https://www.raspberrypi.org/downloads/raspbian/>



Forums

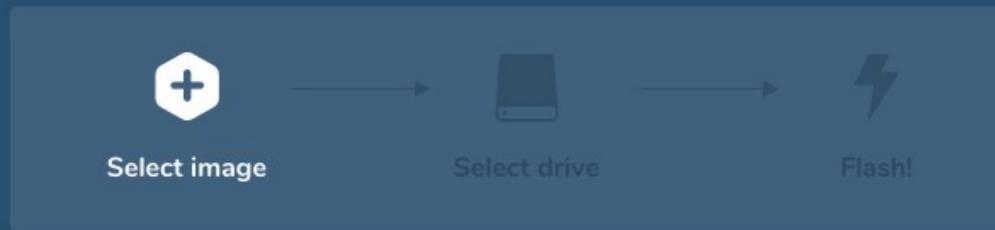
Mailing list

Changelog

Etcher Pro

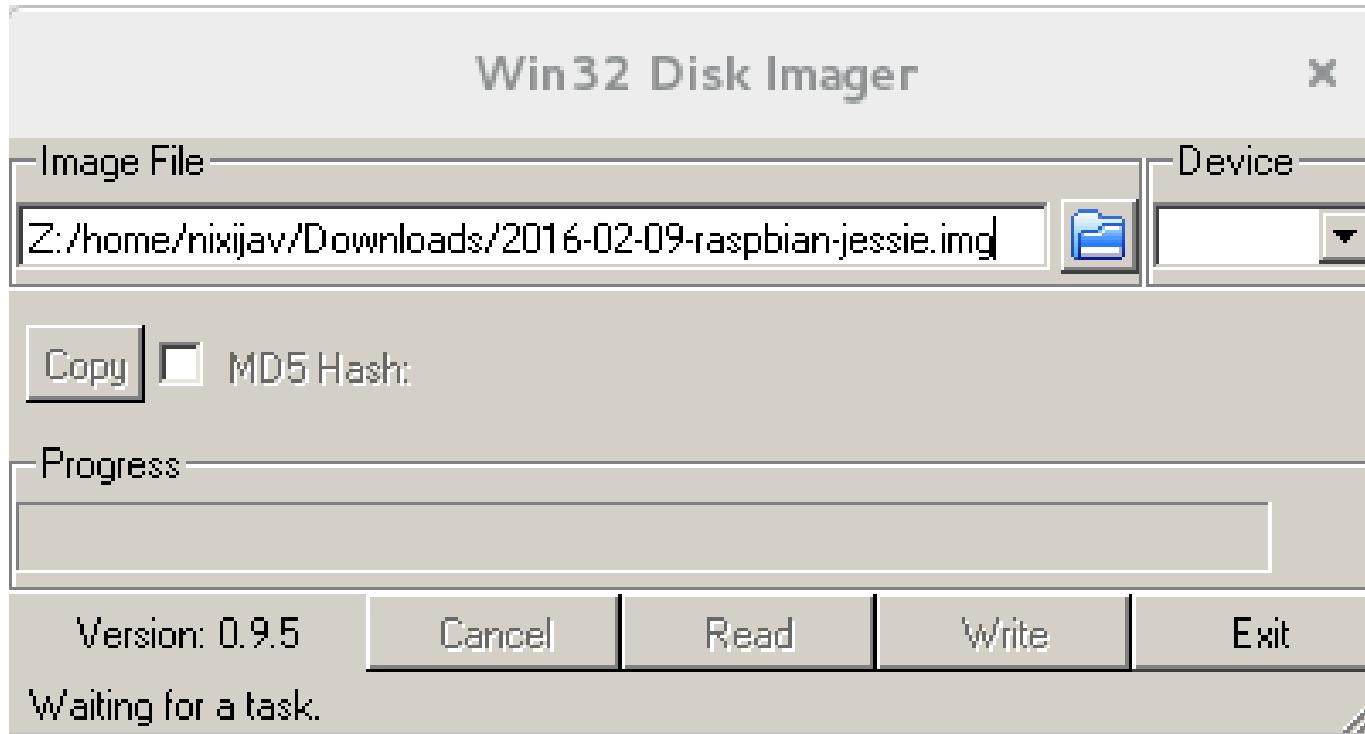
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v1.5.64 [See what's new](#)



<https://sourceforge.net/projects/win32diskimager/>



Usuario: pi
Contraseña: raspberry

Raspberry Pi Software Configuration Tool (raspi-config)

- 1 Change User Password** Change password for the current user
- 2 Network Options Configure network settings
- 3 Boot Options Configure options for start-up
- 4 Localisation Options Set up language and regional settings to match your location
- 5 Interfacing Options Configure connections to peripherals
- 6 Overclock Configure overclocking for your Pi
- 7 Advanced Options Configure advanced settings
- 8 Update Update this tool to the latest version
- 9 About raspi-config Information about this configuration tool

<Select>

<Finish>

sudo raspi-config

Raspberry Pi Software Configuration Tool (raspi-config)

- A1 Expand Filesystem** Ensures that all of the SD card storage is available to the OS
- A2 Overscan You may need to configure overscan if black bars are present on display
- A3 Memory Split Change the amount of memory made available to the GPU
- A4 Audio Force audio out through HDMI or 3.5mm jack
- A5 Resolution Set a specific screen resolution
- A6 Pixel Doubling Enable/Disable 2x2 pixel mapping
- A7 GL Driver Enable/Disable experimental desktop GL driver
- A8 Compositor Enable/Disable xcompmgr composition manager
- A9 Pi 4 Video Output Video output options for Pi 4
- AA Overlay FS Enable/Disable read-only file system

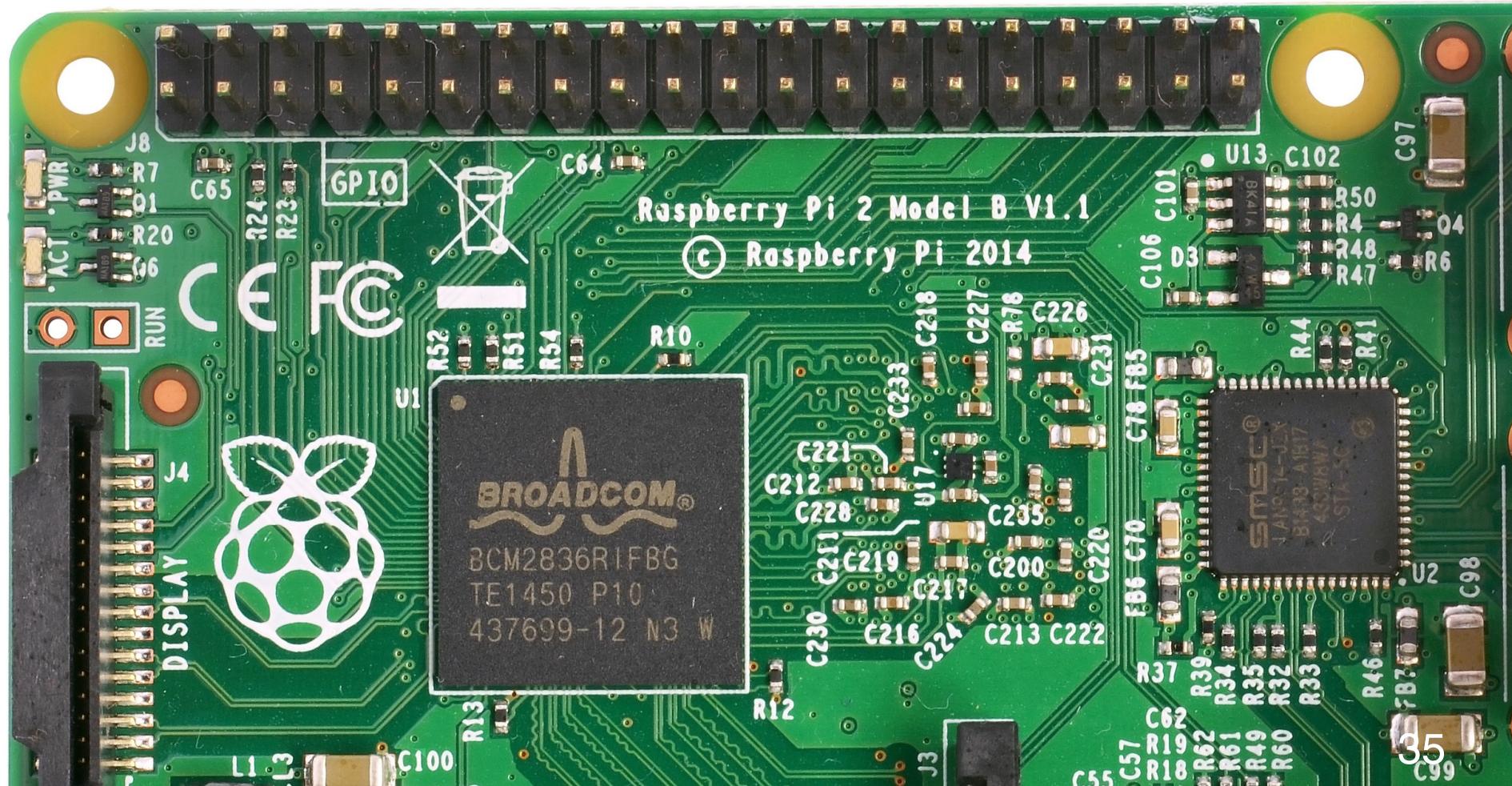
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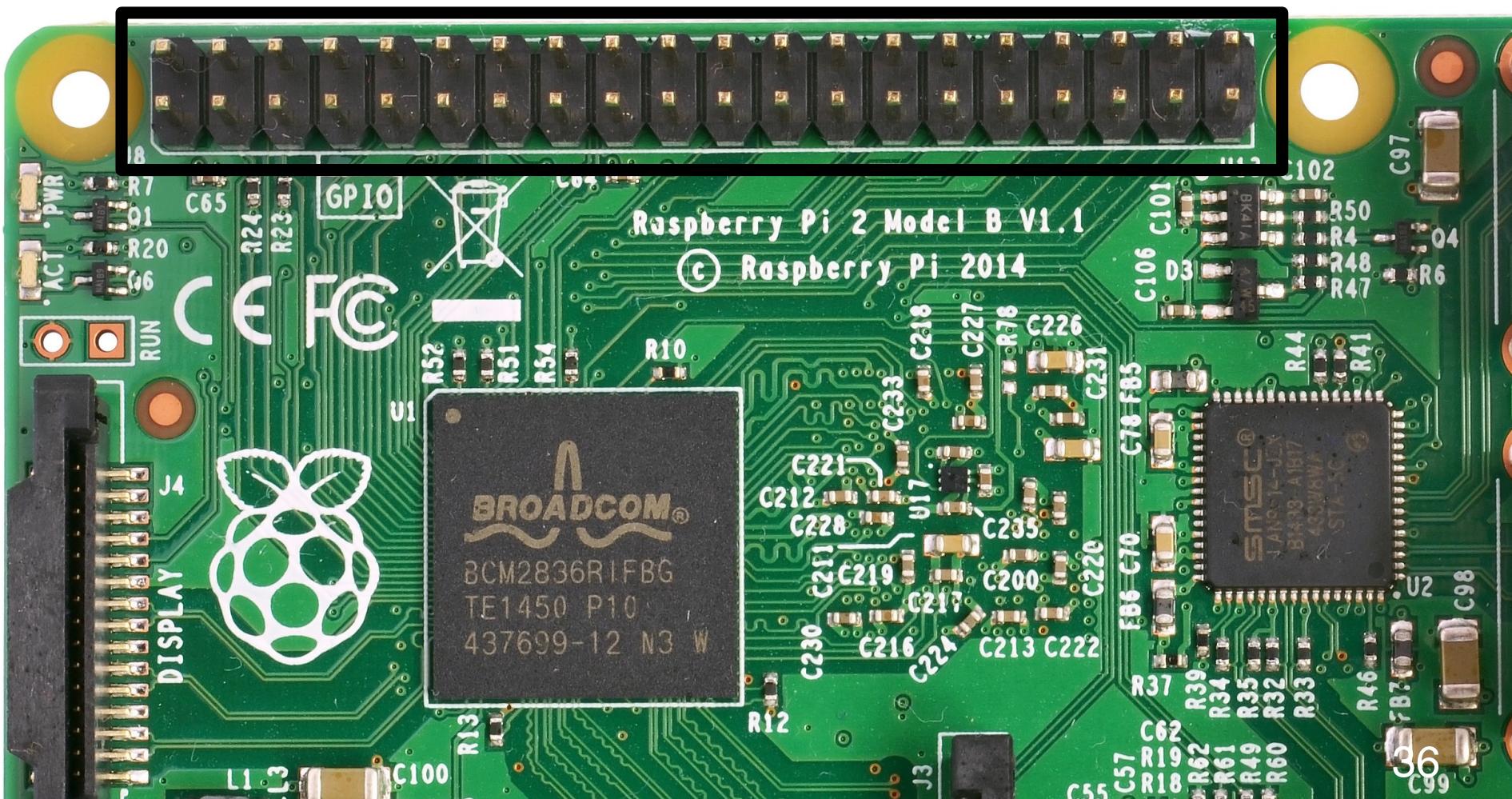
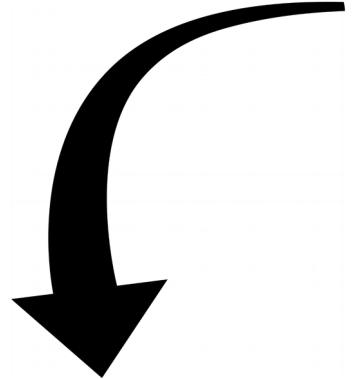
<Back>

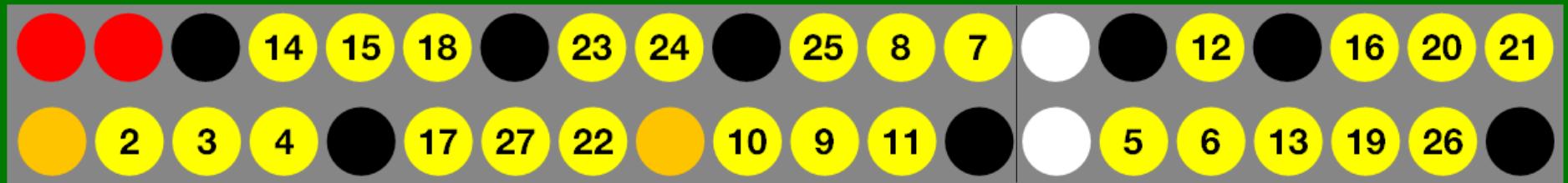
Opciones avanzadas



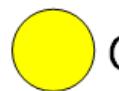
Introducción al GPIO







Raspberry Pi A+ / B+ and Raspberry Pi 2 GPIO pins



GPIO



Ground



3.3v



5v



ID EEPROM
Advanced use only!

<https://es.pinout.xyz>

| <i>Pin#</i> | <i>NAME</i> | | <i>NAME</i> | <i>Pin#</i> |
|-------------|-----------------------|--|-----------------------|-------------|
| 01 | 3.3v DC Power | | DC Power 5v | 02 |
| 03 | GPIO02 (SDA1 , I2C) | | DC Power 5v | 04 |
| 05 | GPIO03 (SCL1 , I2C) | | Ground | 06 |
| 07 | GPIO04 (GPIO_GCLK) | | (TXD0) GPIO14 | 08 |
| 09 | Ground | | (RXD0) GPIO15 | 10 |
| 11 | GPIO17 (GPIO_GEN0) | | (GPIO_GEN1) GPIO18 | 12 |
| 13 | GPIO27 (GPIO_GEN2) | | Ground | 14 |
| 15 | GPIO22 (GPIO_GEN3) | | (GPIO_GEN4) GPIO23 | 16 |
| 17 | 3.3v DC Power | | (GPIO_GEN5) GPIO24 | 18 |
| 19 | GPIO10 (SPI_MOSI) | | Ground | 20 |
| 21 | GPIO09 (SPI_MISO) | | (GPIO_GEN6) GPIO25 | 22 |
| 23 | GPIO11 (SPI_CLK) | | (SPI_CE0_N) GPIO08 | 24 |
| 25 | Ground | | (SPI_CE1_N) GPIO07 | 26 |
| 27 | ID_SD (I2C ID EEPROM) | | (I2C ID EEPROM) ID_SC | 28 |
| 29 | GPIO05 | | Ground | 30 |
| 31 | GPIO06 | | GPIO12 | 32 |
| 33 | GPIO13 | | Ground | 34 |
| 35 | GPIO19 | | GPIO16 | 36 |
| 37 | GPIO26 | | GPIO20 | 38 |
| 39 | Ground | | GPIO21 | 40 |



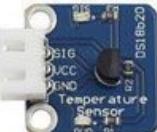
| <i>Pin#</i> | <i>NAME</i> | | <i>NAME</i> | <i>Pin#</i> |
|-------------|-----------------------|-------|-----------------------|-------------|
| 01 | 3.3v DC Power | | DC Power 5v | 02 |
| 03 | | i2c → | DC Power 5v | 04 |
| 05 | | | Ground | 06 |
| 07 | GPIO04 (GPIO_GCLK) | | | 08 |
| 09 | Ground | | ← Serial | 10 |
| 11 | GPIO17 (GPIO_GEN0) | | (GPIO_GEN1) GPIO18 | 12 |
| 13 | GPIO27 (GPIO_GEN2) | | Ground | 14 |
| 15 | GPIO22 (GPIO_GEN3) | | (GPIO_GEN4) GPIO23 | 16 |
| 17 | 3.3v DC Power | | (GPIO_GEN5) GPIO24 | 18 |
| 19 | | | Ground | 20 |
| 21 | SPI → | | (GPIO_GEN6) GPIO25 | 22 |
| 23 | | | ← SPI | 24 |
| 25 | Ground | | | 26 |
| 27 | ID_SD (I2C ID EEPROM) | | (I2C ID EEPROM) ID_SC | 28 |
| 29 | GPIO05 | | Ground | 30 |
| 31 | GPIO06 | | GPIO12 | 32 |
| 33 | GPIO13 | | Ground | 34 |
| 35 | GPIO19 | | GPIO16 | 36 |
| 37 | GPIO26 | | GPIO20 | 38 |
| 39 | Ground | | GPIO21 | 40 |



20 mA máx. por pin. 51 mA totales.



Barometer



DS18B20 Temperature



Passive buzzer



Auto-flash LED



Dual-color LED



Analog temperature



Flame Sensor



Photoresistor



Analog Hall



Humiture sensor



Potentiometer



Active buzzer



Infrared-Receiver



Button module



Laser Transmitter



RGB LED



ADDA Converter



Mercury Switch



Rotary Encoder



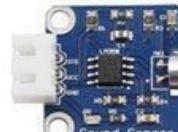
MPU6050



Obstacle Avoidance



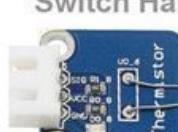
RTC-DS1302



Sound Sensor



Hall Switch



Thermistor module



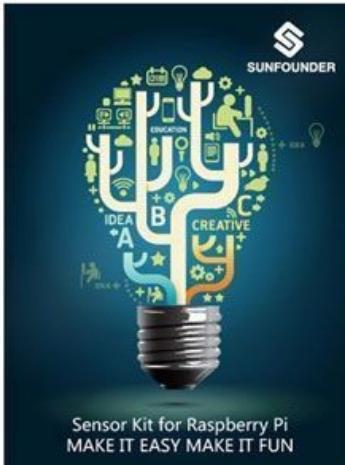
Joystick PS2 module



MQ-2 Gas Sensor



Relay Module



1602LCD



Remote Controller



GPIO Extension Board



Raindrop Sensor



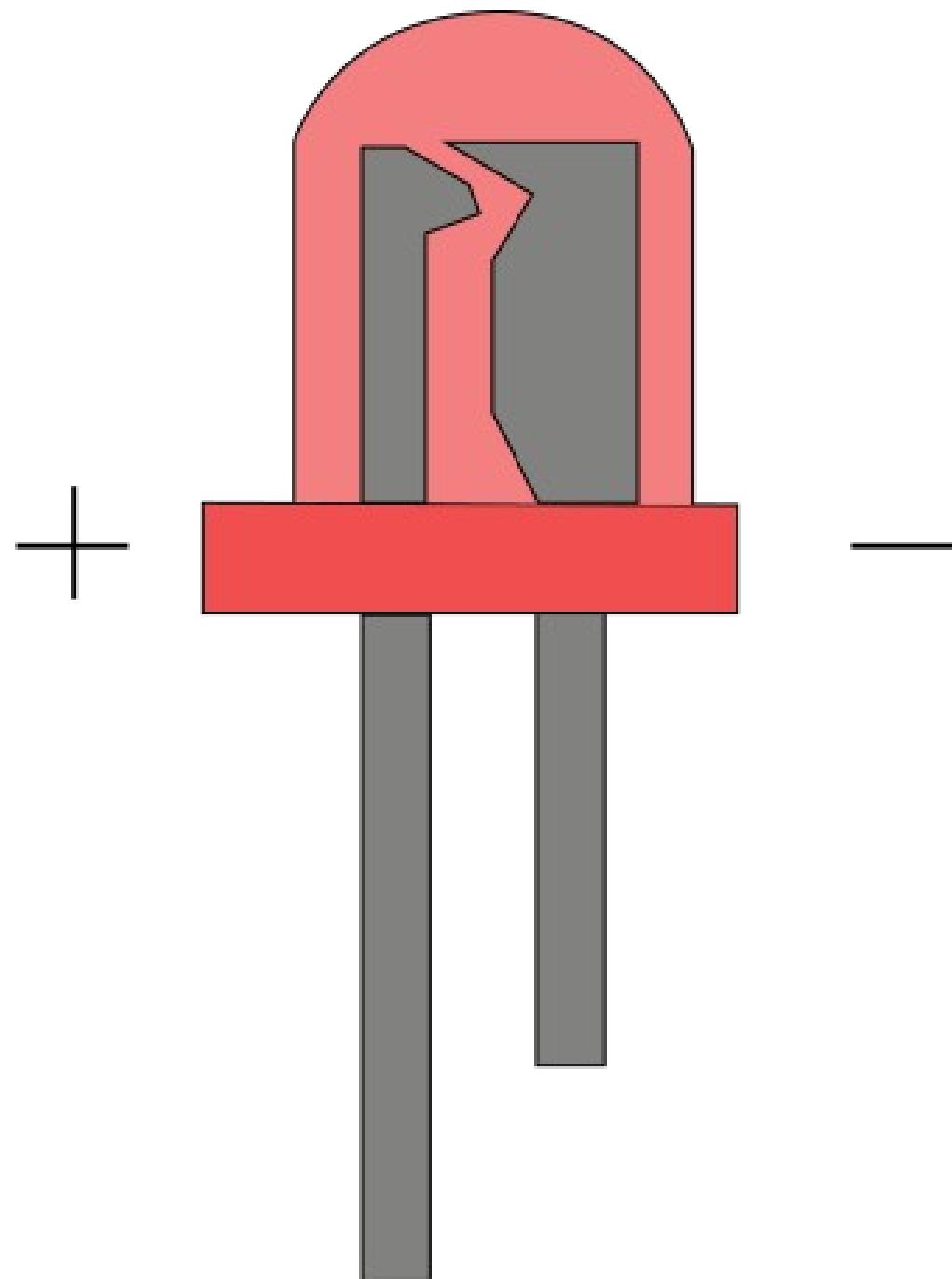
Tilt Switch

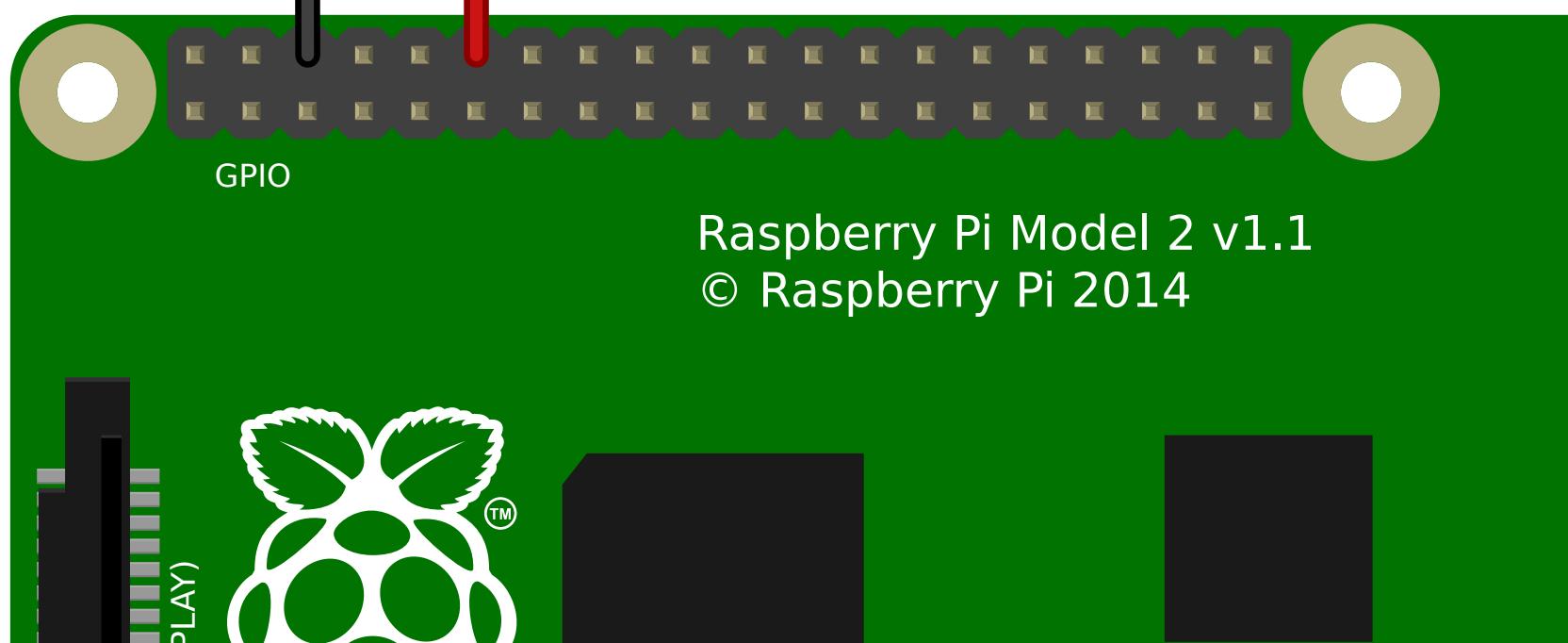
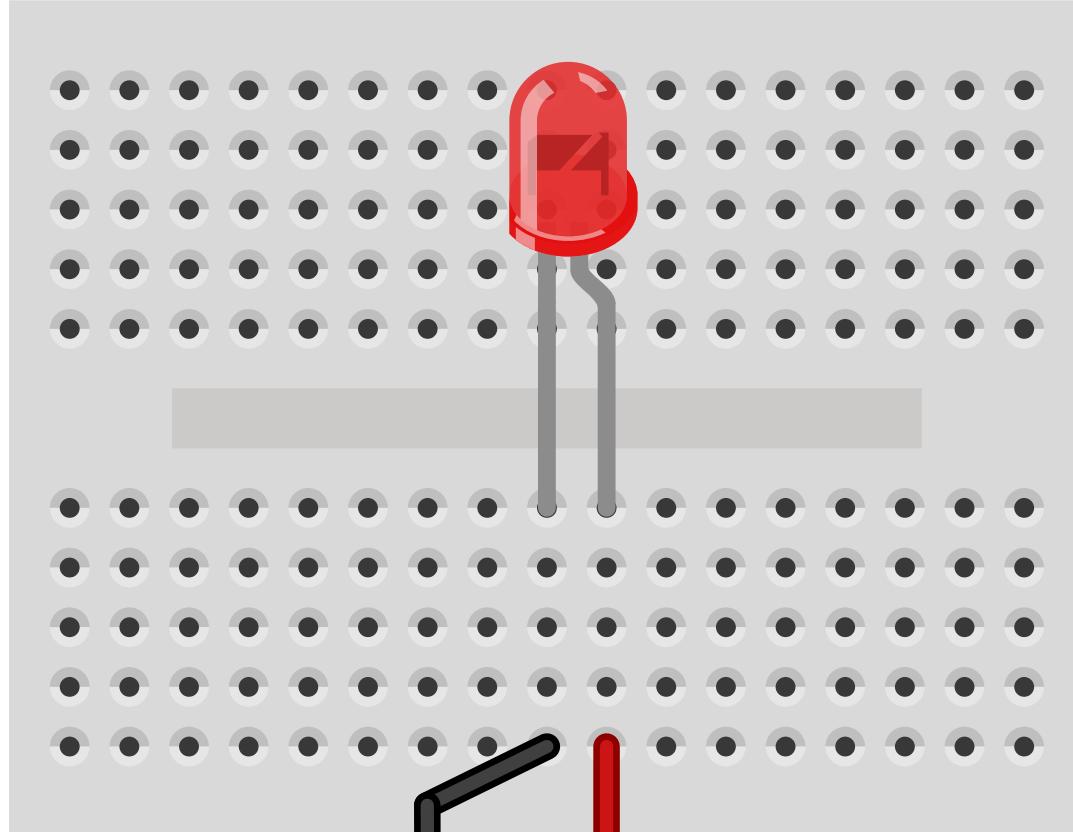


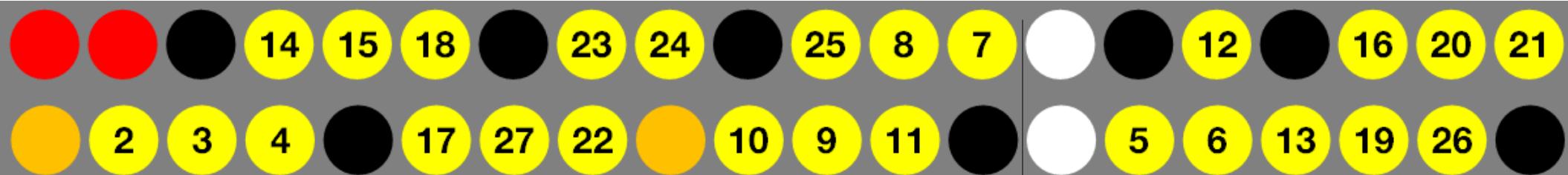
Touch Switch



adafruit

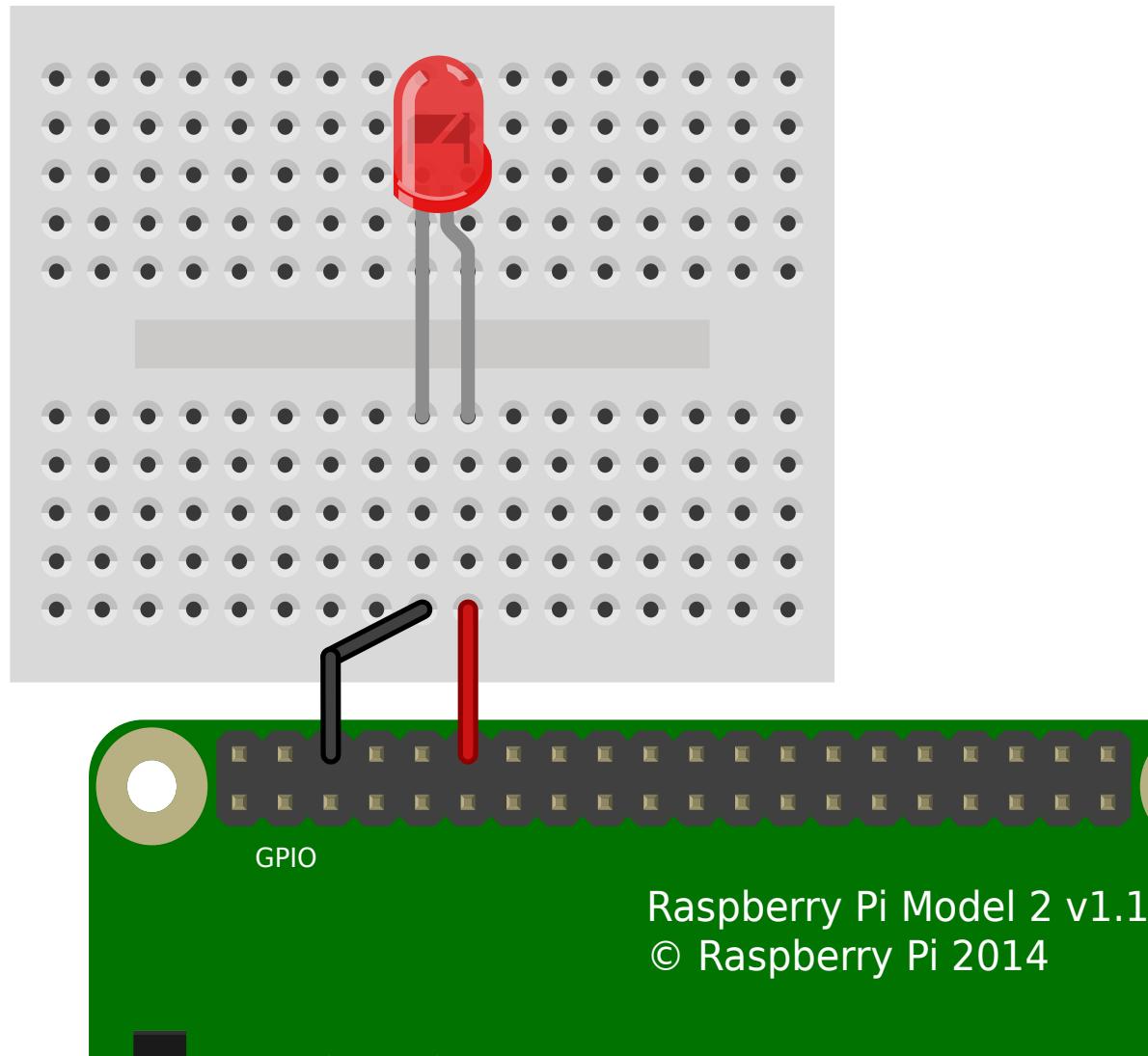


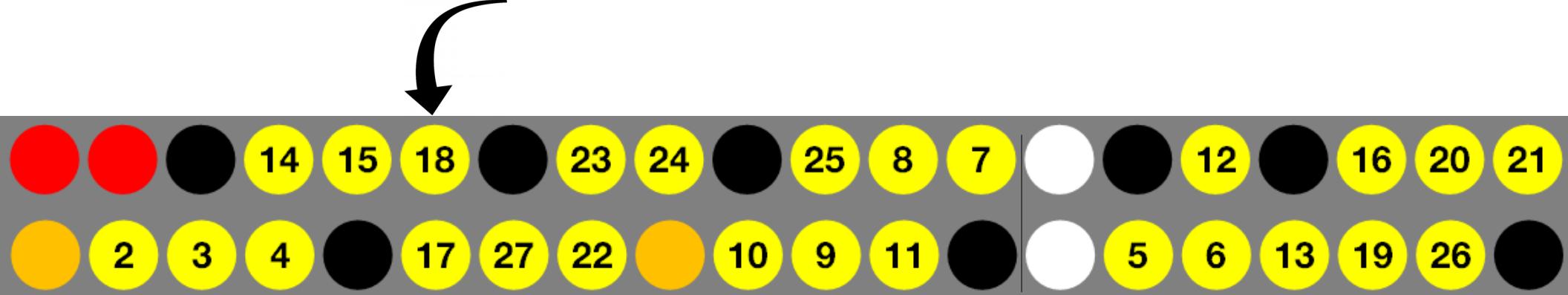




gpio -g mode 18 out

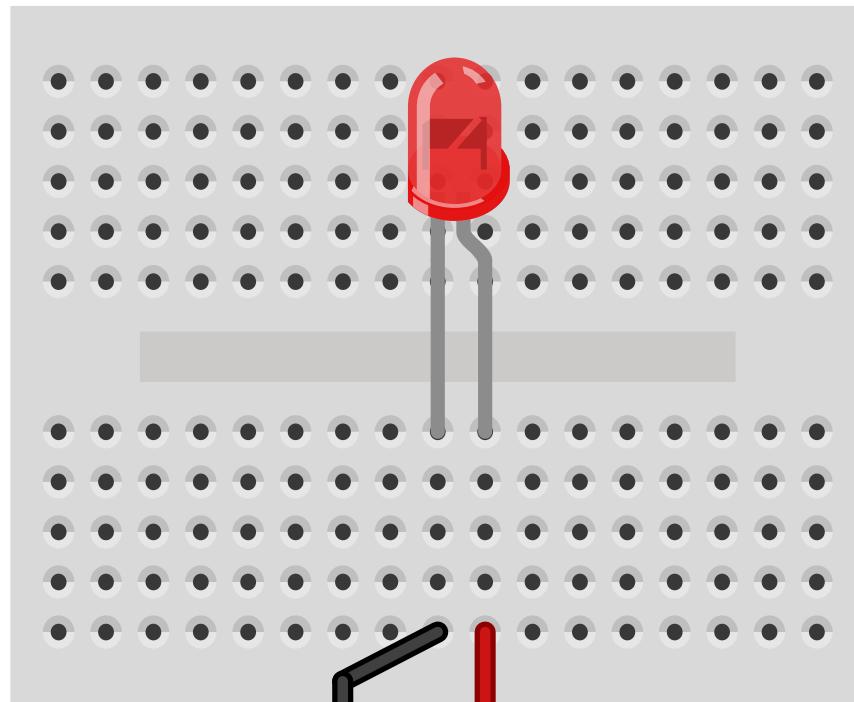
gpio -g write 18 1





gpio -g mode 18 out

gpio -g write 18 1



GPIO

Raspberry Pi Model 2 v1.1
© Raspberry Pi 2014

```
import RPi.GPIO as GPIO  
import time
```

```
GPIO.setwarnings(False)  
GPIO.setmode(GPIO.BCM)
```

```
GPIO.setup(18, GPIO.OUT)
```

```
while 1:
```

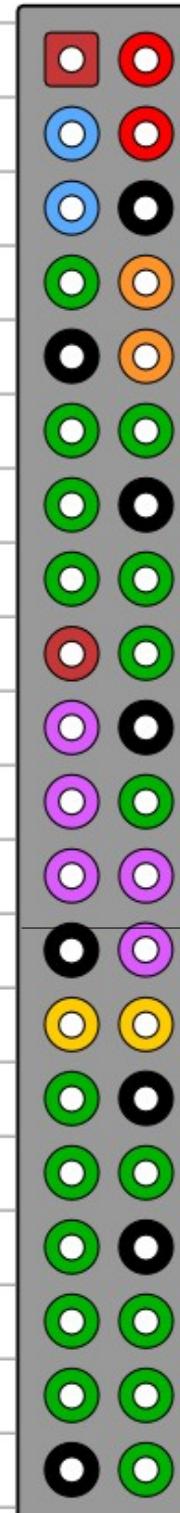
```
    GPIO.output(18, True)  
    time.sleep(1)  
    GPIO.output(18, False)  
    time.sleep(1)
```

```
wget https://goo.gl/XuvJZ8 -o  
led.py
```



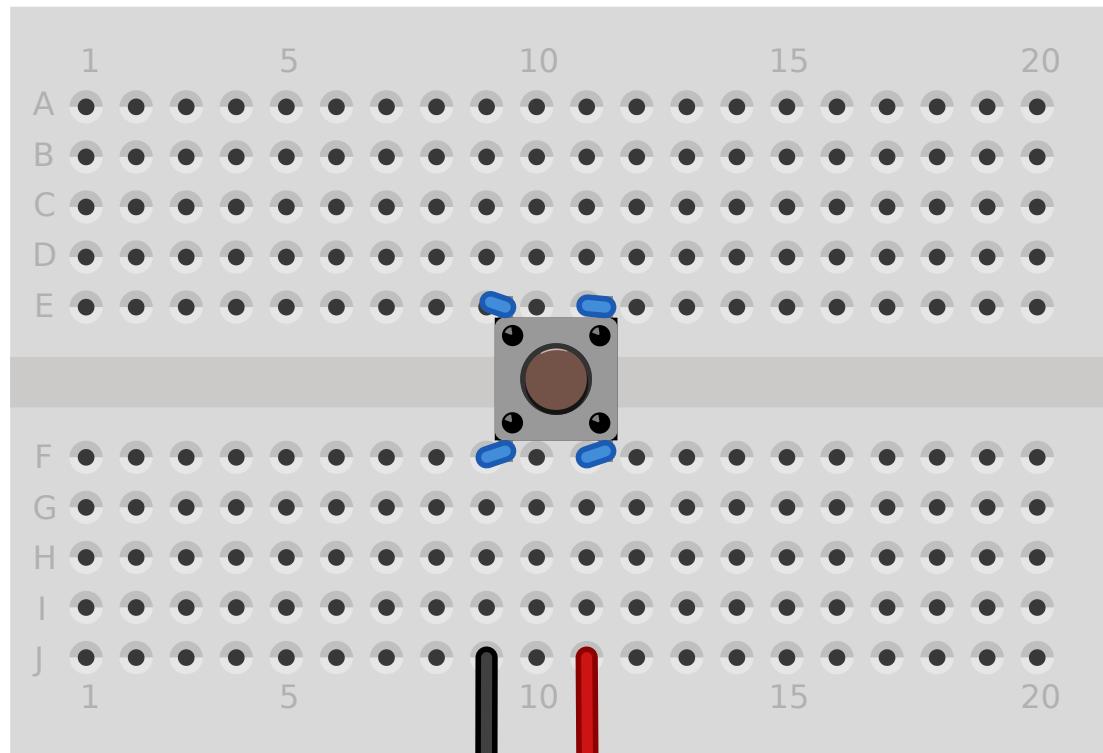
Lectura de sensores

| <i>Pin#</i> | <i>NAME</i> | | <i>NAME</i> | <i>Pin#</i> |
|-------------|-----------------------|--|-----------------------|-------------|
| 01 | 3.3v DC Power | | DC Power 5v | 02 |
| 03 | GPIO02 (SDA1 , I2C) | | DC Power 5v | 04 |
| 05 | GPIO03 (SCL1 , I2C) | | Ground | 06 |
| 07 | GPIO04 (GPIO_GCLK) | | (TXD0) GPIO14 | 08 |
| 09 | Ground | | (RXD0) GPIO15 | 10 |
| 11 | GPIO17 (GPIO_GEN0) | | (GPIO_GEN1) GPIO18 | 12 |
| 13 | GPIO27 (GPIO_GEN2) | | Ground | 14 |
| 15 | GPIO22 (GPIO_GEN3) | | (GPIO_GEN4) GPIO23 | 16 |
| 17 | 3.3v DC Power | | (GPIO_GEN5) GPIO24 | 18 |
| 19 | GPIO10 (SPI_MOSI) | | Ground | 20 |
| 21 | GPIO09 (SPI_MISO) | | (GPIO_GEN6) GPIO25 | 22 |
| 23 | GPIO11 (SPI_CLK) | | (SPI_CE0_N) GPIO08 | 24 |
| 25 | Ground | | (SPI_CE1_N) GPIO07 | 26 |
| 27 | ID_SD (I2C ID EEPROM) | | (I2C ID EEPROM) ID_SC | 28 |
| 29 | GPIO05 | | Ground | 30 |
| 31 | GPIO06 | | GPIO12 | 32 |
| 33 | GPIO13 | | Ground | 34 |
| 35 | GPIO19 | | GPIO16 | 36 |
| 37 | GPIO26 | | GPIO20 | 38 |
| 39 | Ground | | GPIO21 | 40 |





SÓLO 3.3V!



Raspberry Pi Model 2 v1.1
© Raspberry Pi 2014

```
import RPi.GPIO as GPIO
import time

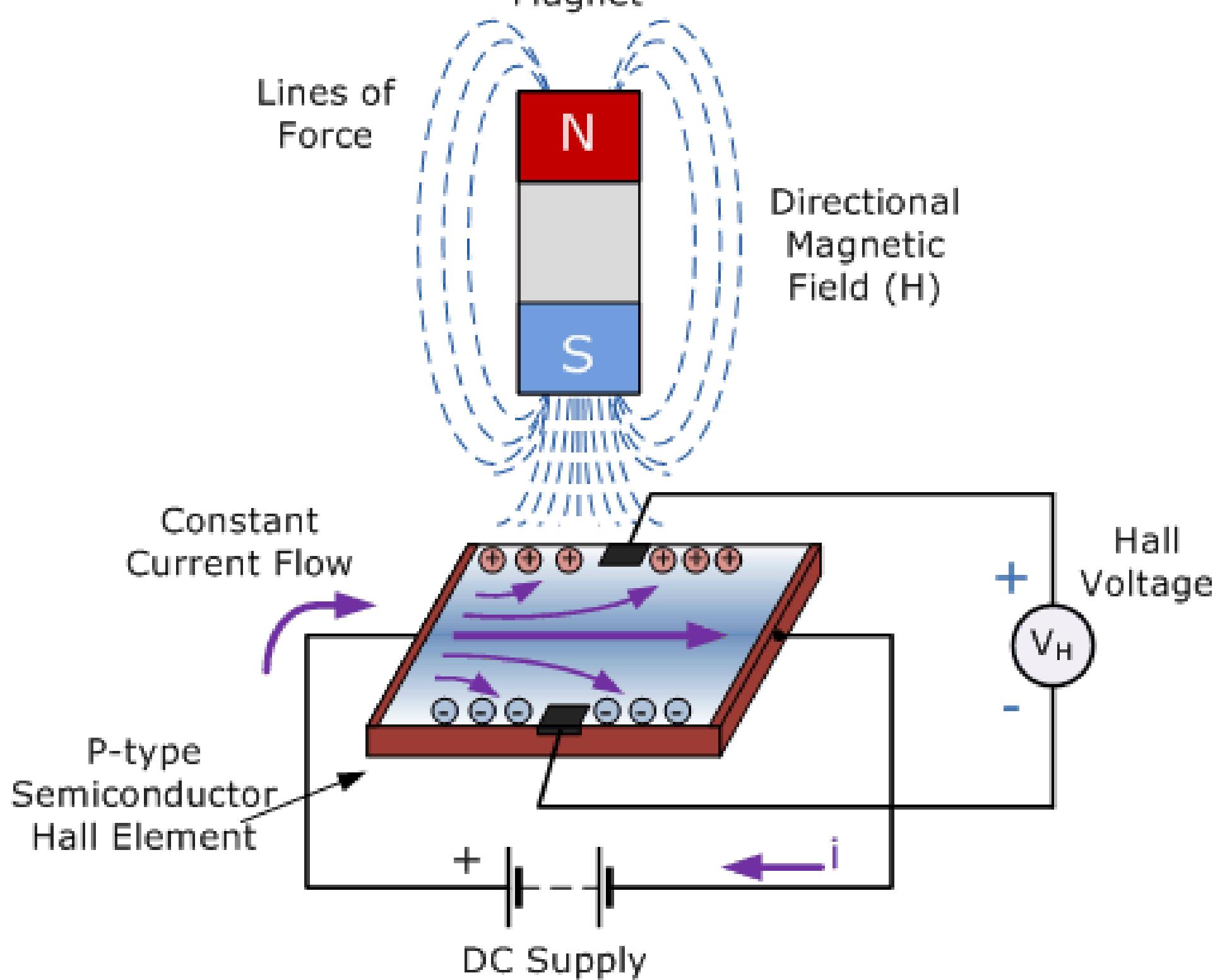
GPIO.setwarnings(False)
GPIO.setmode(GPIO.BCM)

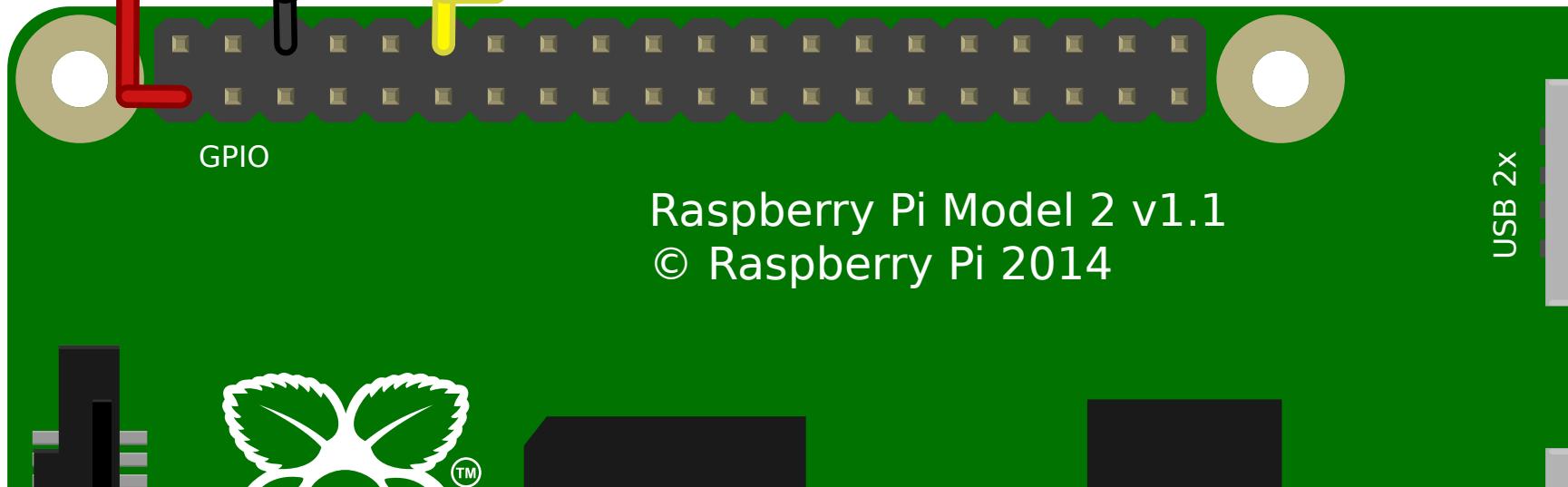
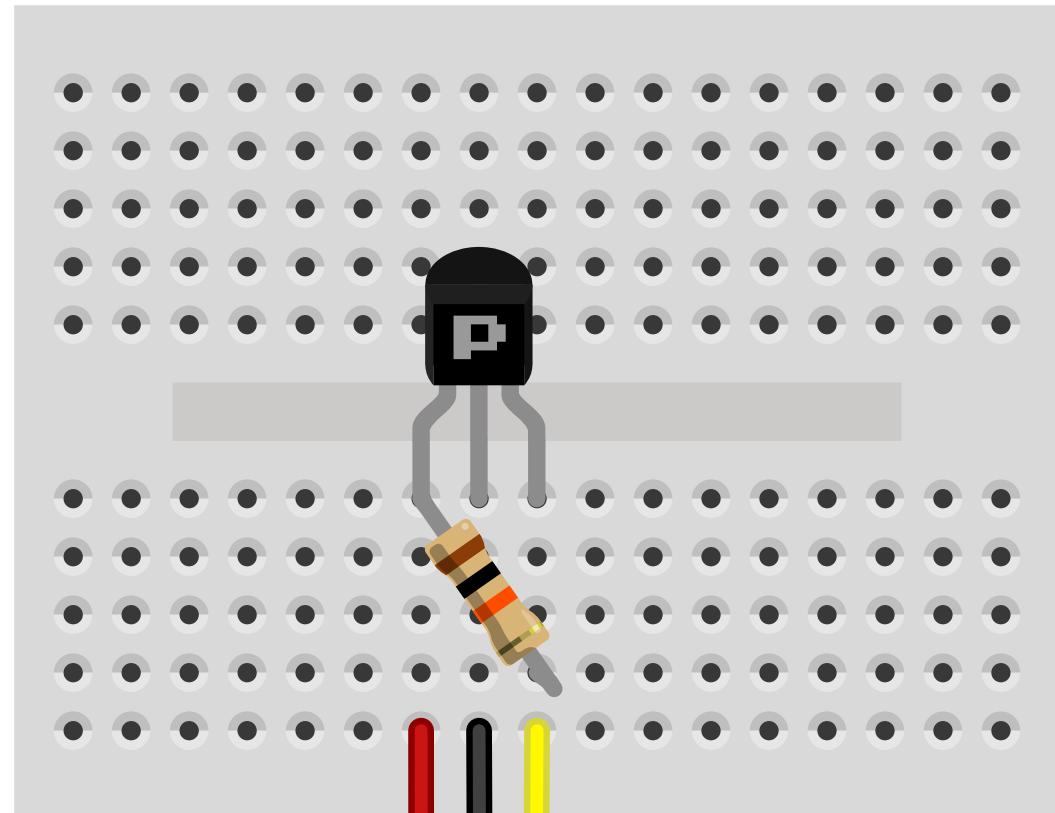
GPIO.setup(23, GPIO.IN, pull_up_down
= GPIO.PUD_UP)

while 1:
    print(GPIO.input(23))
    time.sleep(5)
```

```
 wget https://goo.gl/u5oyQA -o  
 button.py
```

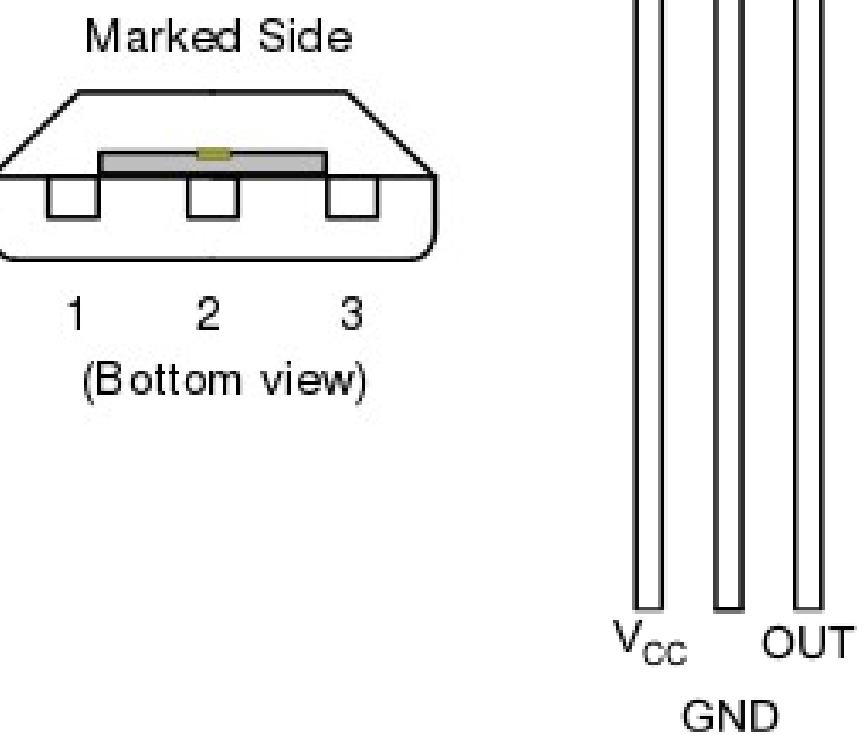


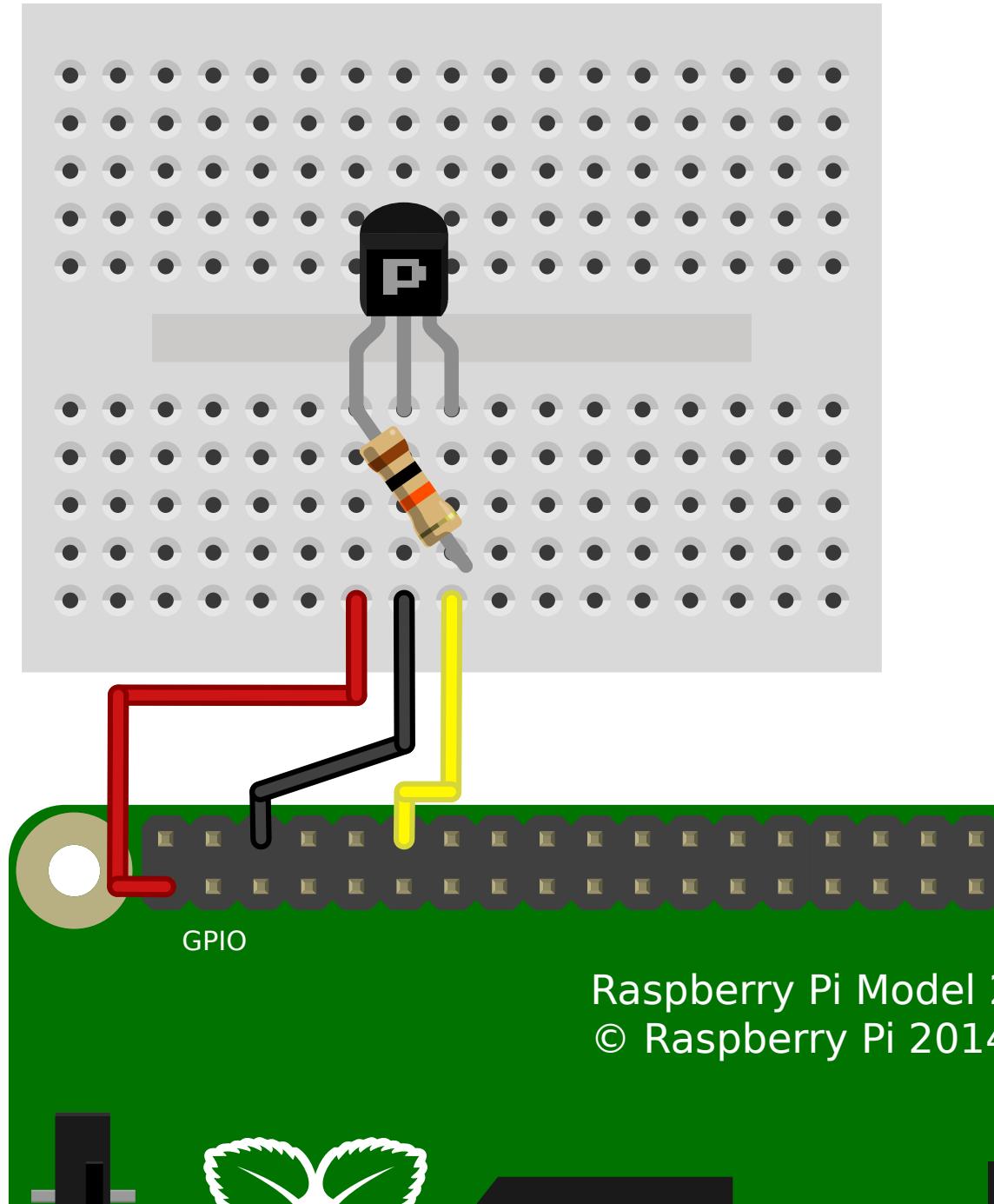
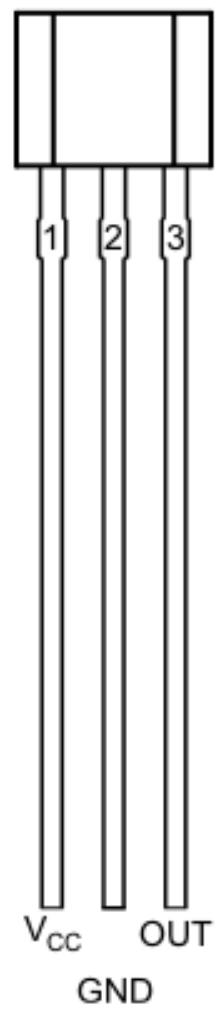
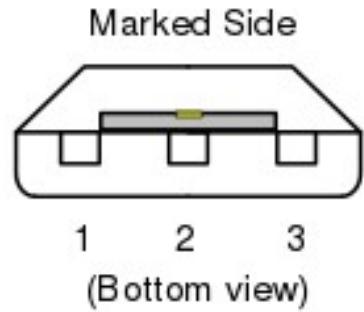




Raspberry Pi Model 2 v1.1
© Raspberry Pi 2014

USB 2x





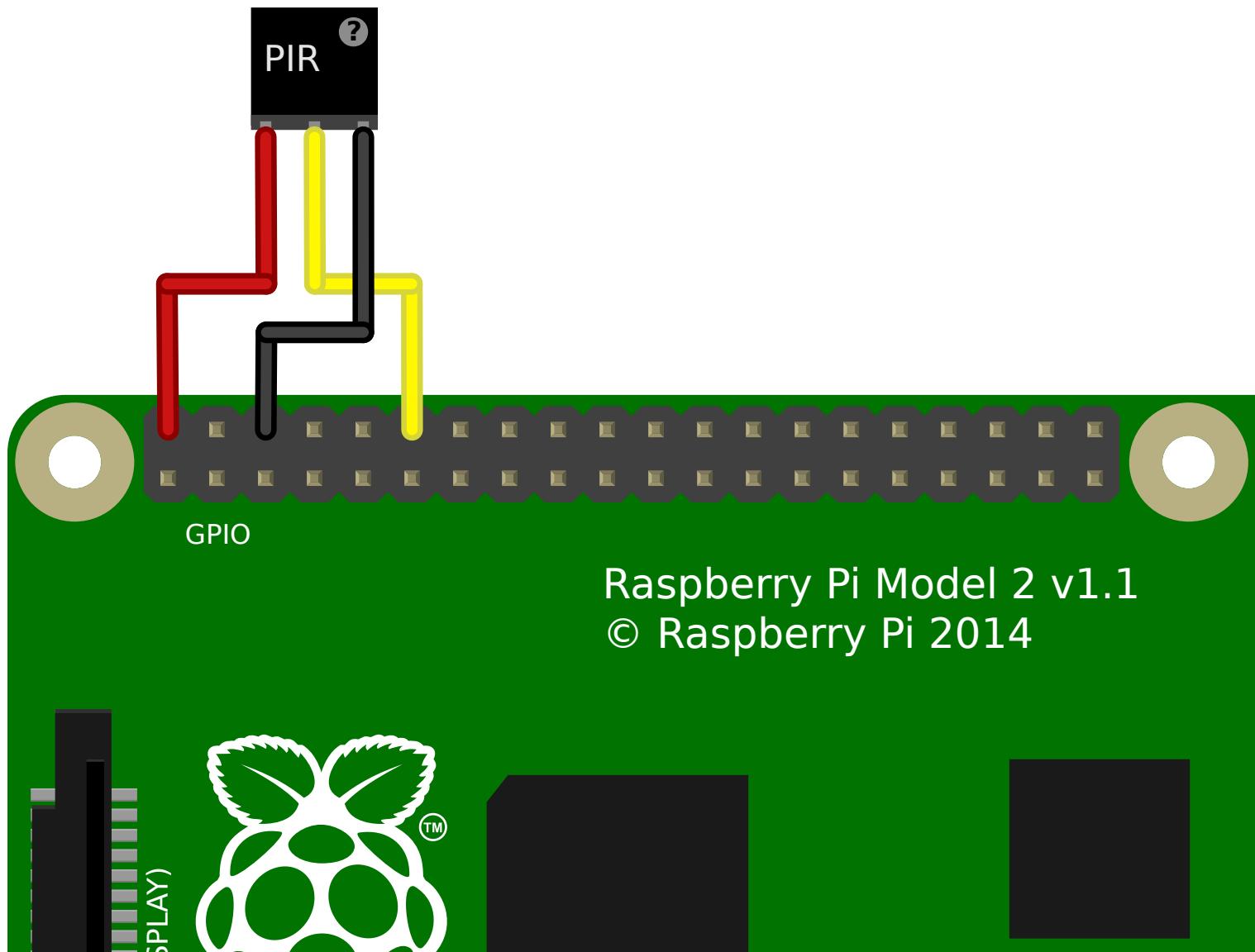
```
import RPi.GPIO as GPIO
import time

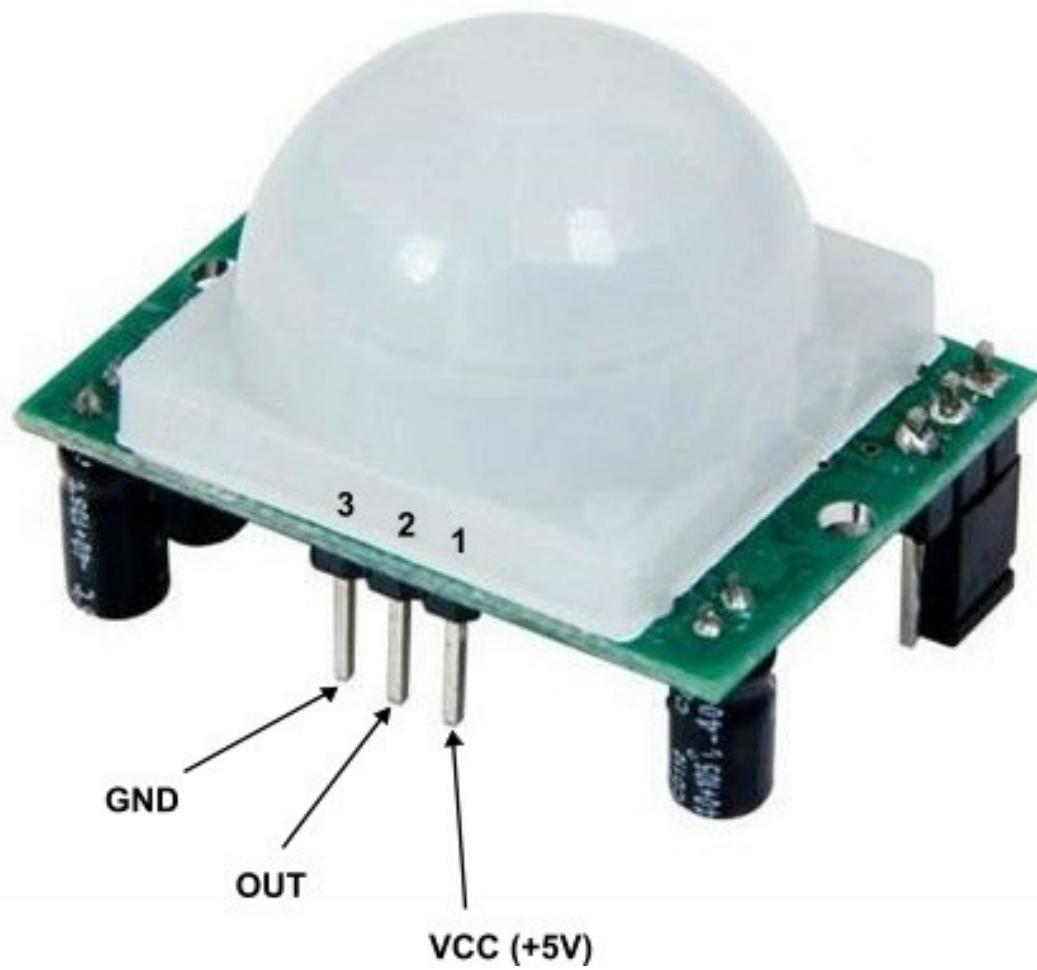
GPIO.setwarnings(False)
GPIO.setmode(GPIO.BCM)

GPIO.setup(18, GPIO.IN)
while 1:
    if(GPIO.input(18)):
        print("Sensor hall activado")
    else:
        print("Sensor hall desactivado")
    time.sleep(0.5)
```

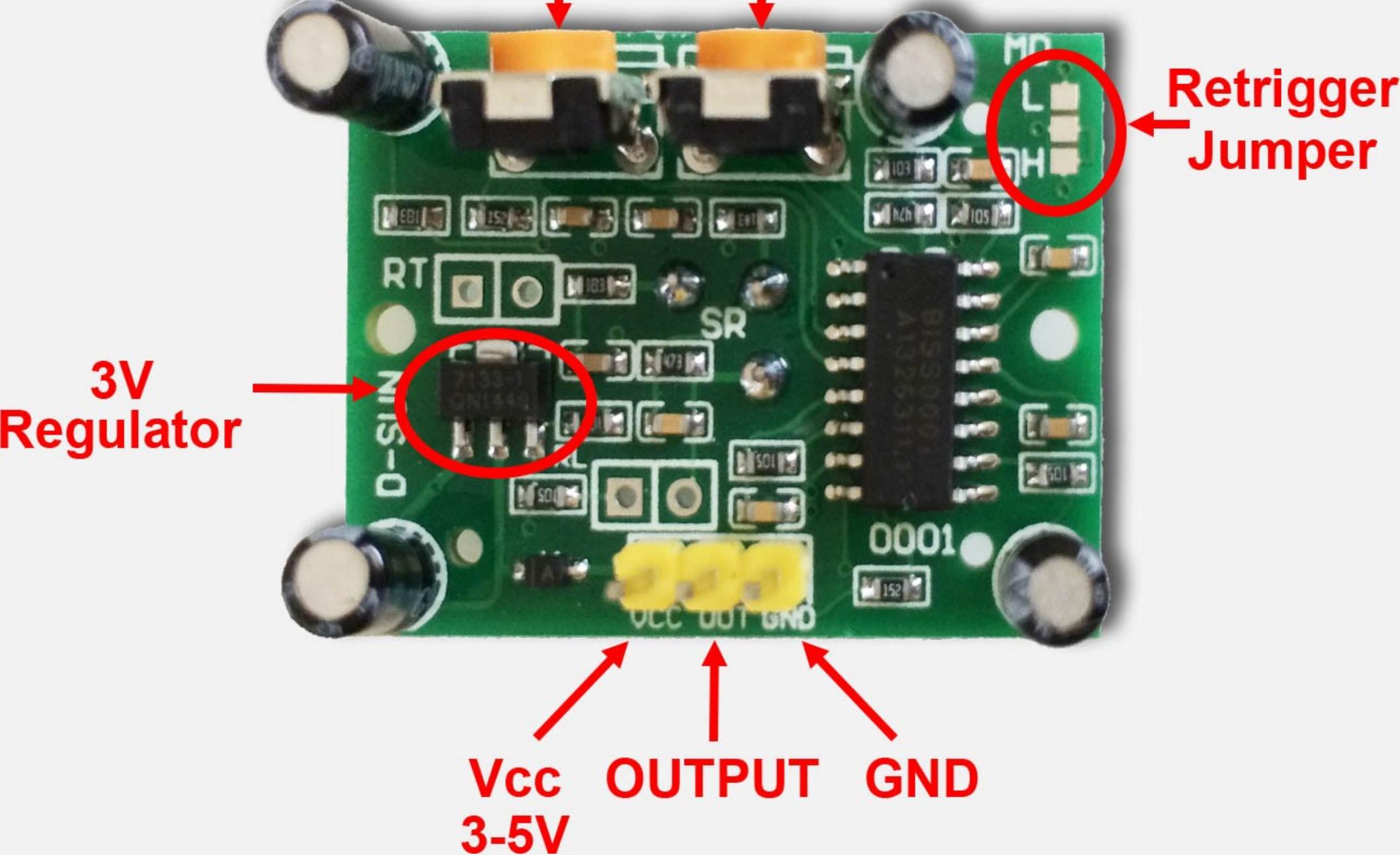
```
 wget https://goo.gl/VmC5z1 -o  
       hall.py
```







DELAY SENSITIVITY



```
import RPi.GPIO as GPIO
import time

GPIO.setwarnings(False)
GPIO.setmode(GPIO.BCM)

GPIO.setup(18, GPIO.IN)

while 1:
    if(GPIO.input(18)):
        print("El PIR ha detectado \
movimiento")
    time.sleep(0.5)
```

```
wget https:// goo.gl/RStthi -o  
pir.py
```

Qué hacemos con
todo esto?





Do more with the services you love

If + This Then That

`https://maker.ifttt.com/trigger/
[evento]/with/key/[...]`

```
import RPi.GPIO as GPIO
import time
import requests

GPIO.setwarnings(False)
GPIO.setmode(GPIO.BCM)

GPIO.setup(18, GPIO.IN)

while 1:
    if(GPIO.input(18)):
        requests.get('maker.ifttt...')

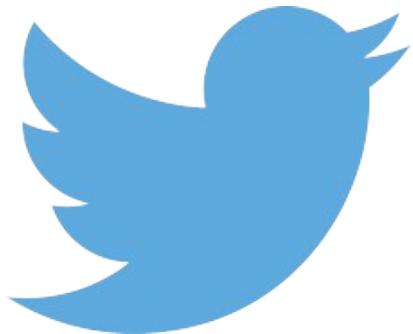
    time.sleep(0.5)
```



openHAB
empowering the smart home

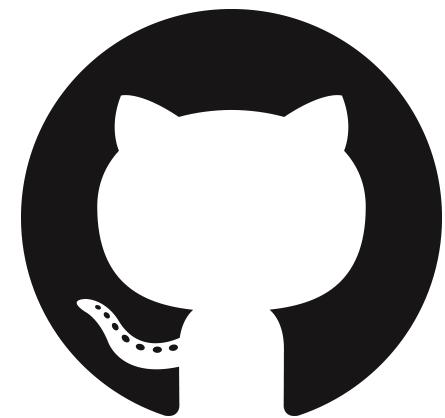
Garden





@nixijav

@ResonantWave



@

iot@nixijav.com