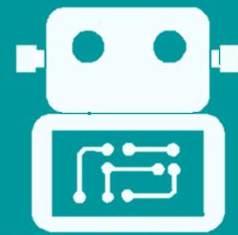


Control de un robot movil con el μ C ESP32

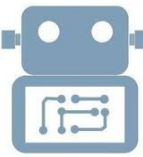
tallerrobotica.fi@gmail.com



DÍA 3:
SENSORES EXTERNOS,
INTERNOS Y RELEVADORES



Taller de Robótica
Abierta

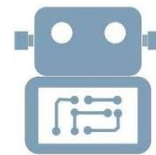


Miércoles 31

- Sensores externos
 - Resistivos
 - Analógicos
 - Digitales
- Sensores internos



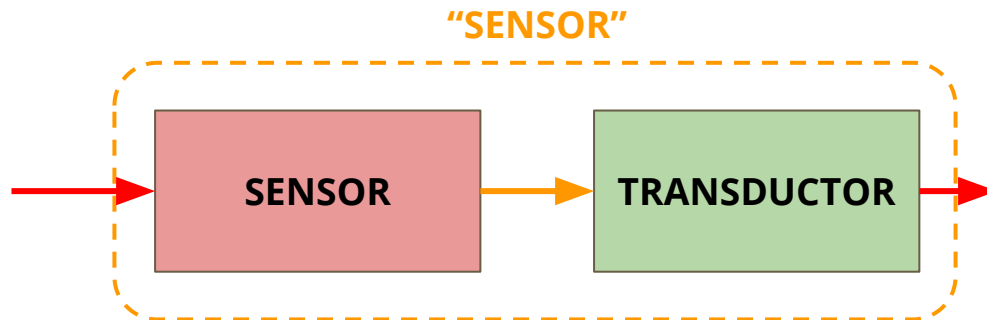
Sensores



Un sensor es un objeto capaz de variar una propiedad ante magnitudes físicas o químicas, llamadas variables de instrumentación, y transformarlas con un transductor en variables eléctricas.

Variables de Instrumentación

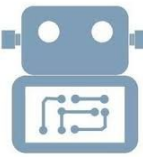
- Intensidad luminosa
- Temperatura
- Distancia
- Fuerza
- Movimiento



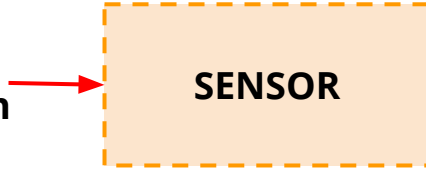
Variables eléctricas

- Resistencia eléctrica
- Capacitancia
- Diferencia de potencial
- Corriente eléctrica

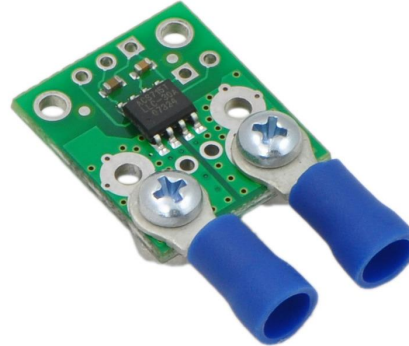
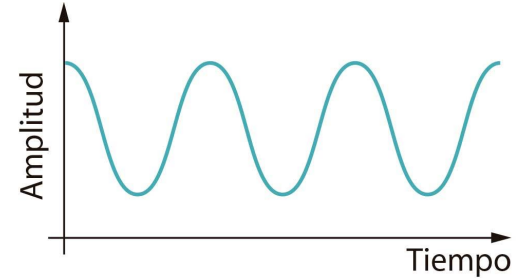
Sensor de señal Analógica



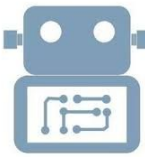
Variable de
Instrumentación



Variable eléctrica,
SEÑAL
ANALÓGICA



Sensor infrarrojo de proximidad Sharp



SHARP GP2Y0A21YK0F

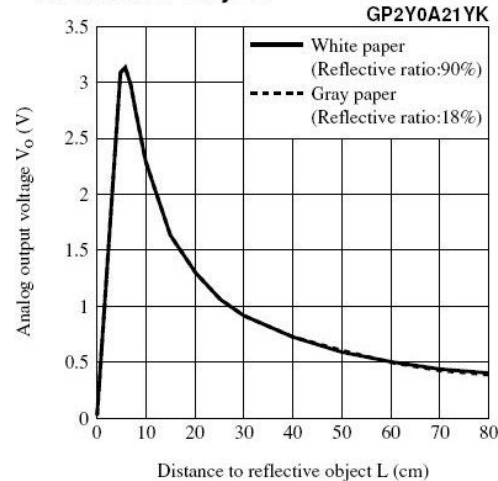
CARACTERÍSTICAS

Se alimenta a 5V
la salida va hasta 3.1V

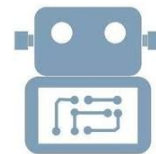
Sensor:

<https://www.pololu.com/product/136>

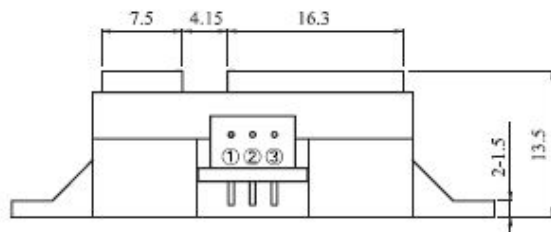
Fig.5 Analog Output Voltage vs. Distance to Reflective Object



Sensor infrarrojo de proximidad Sharp



Output
GND
5V



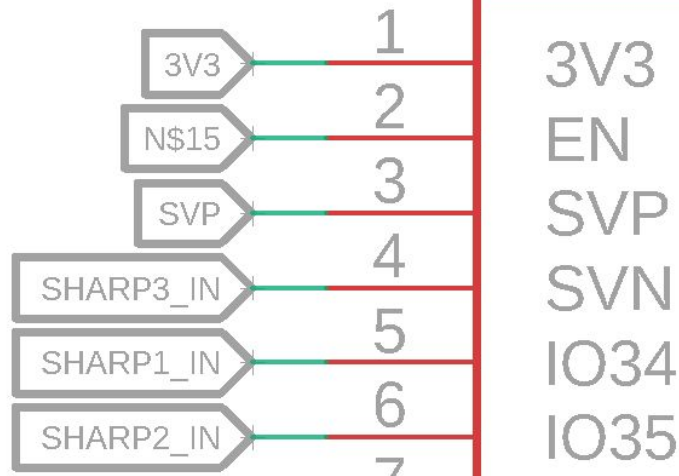
Connector signal

signal name
① V _o
② GND
③ V _{cc}

Connector :
Shenglan Technology Co.,Ltd
(JCTC)
12001W90-3P-HF

Materials

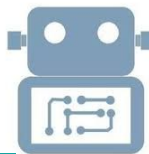
Lens :Acrylic acid resin
(Visible light cut-off resin)
Case :Carbonic ABS
(Conductive resin)
PWB :Paper phenol



Datasheet:

<https://www.pololu.com/file/0J85/gp2y0a21yk0f.pdf>

Sensor infrarrojo de proximidad Sharp



D3_02_sharp_test

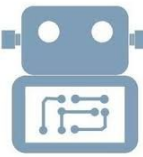
```
//Fórmula para el cálculo de distancia tomada de:
//https://github.com/sparkfun/simple_sketches/blob/master/sharp/sharp.inohttps://github.co

void setup() {
  // put your setup code here, to run once:
  analogReadResolution(10); //Establecemos la resolución de 10 bits en arduino para que cu
  Serial.begin(115200);
}

void loop() {
  // put your main code here, to run repeatedly:
  int reading = analogRead(34); //sharp sensor conected to the GPIO34
  int calculated = (6762/(reading-9))-4; //Es calculado con la lectura del ADC de 10bits

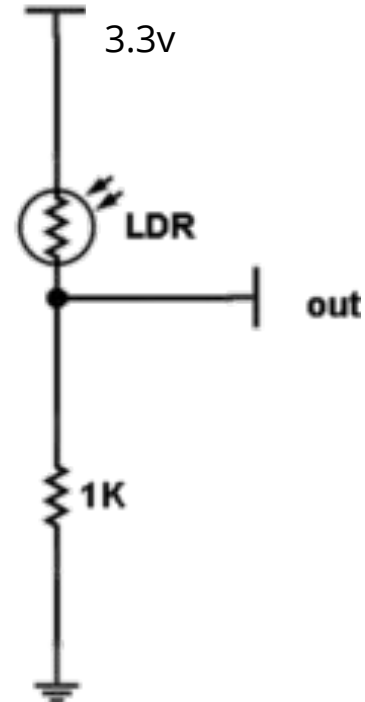
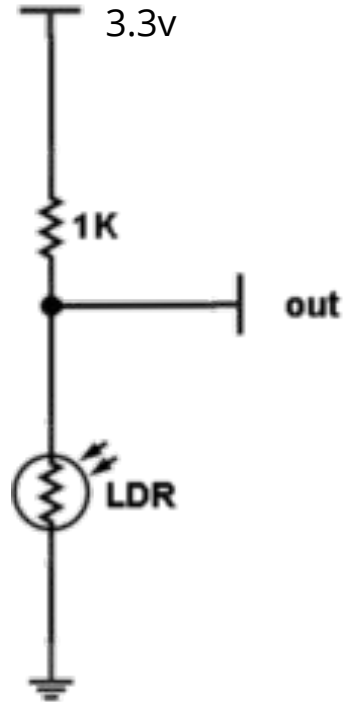
  Serial.println(calculated);
  delay(200);
}
```

Light-Dependent Resistor (LDR)

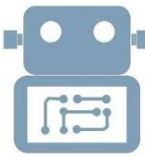


$$V_2 = \frac{R_2}{R_1 + R_2} V$$

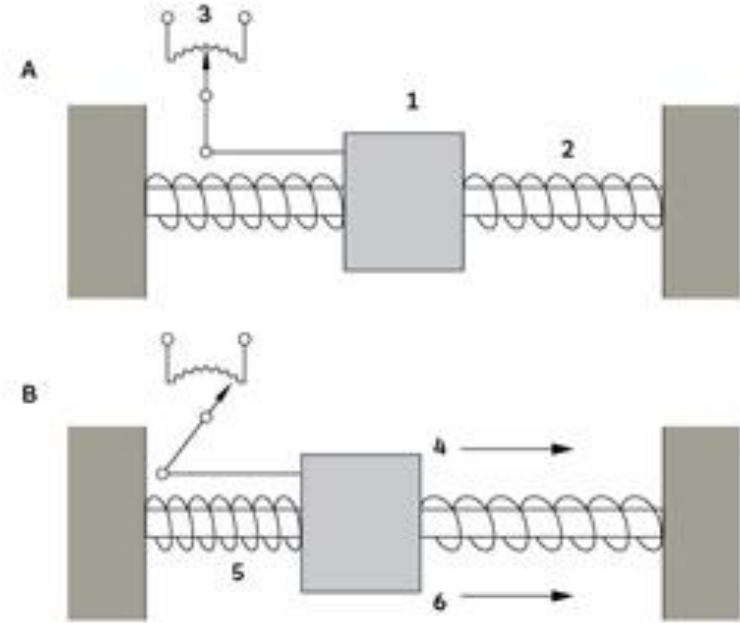
$$V_1 = \frac{R_1}{R_1 + R_2} V$$



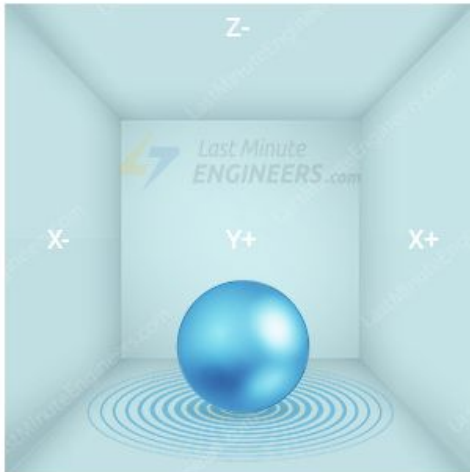
Acelerometro Analogico ADXL335 – GY-61



Generalmente
calibrados en "G"
 9.8 m/s^2

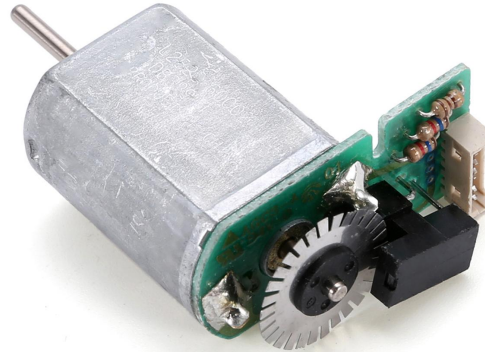
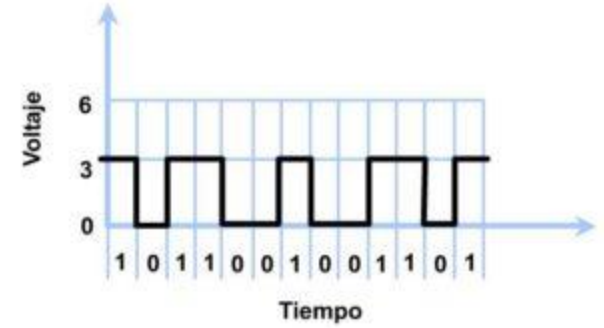
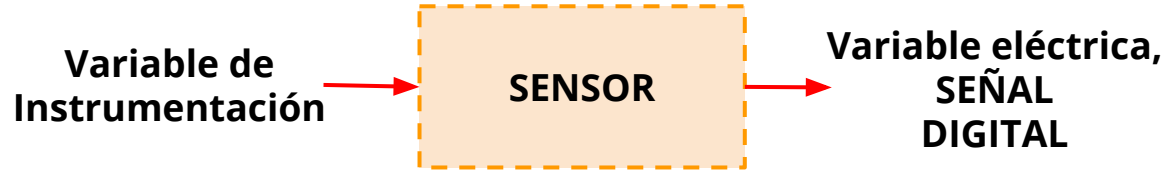
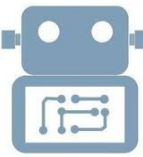


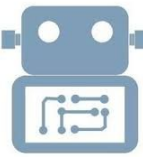
Gravitational
Force $1g$



$X=0g$
 $Y=0g$
 $Z=1g$

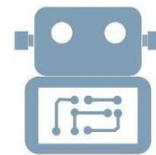
Sensor de señal Digital





- Sensor de Efecto Hall
- Sensado Capacitivo
- Temperatura del chip

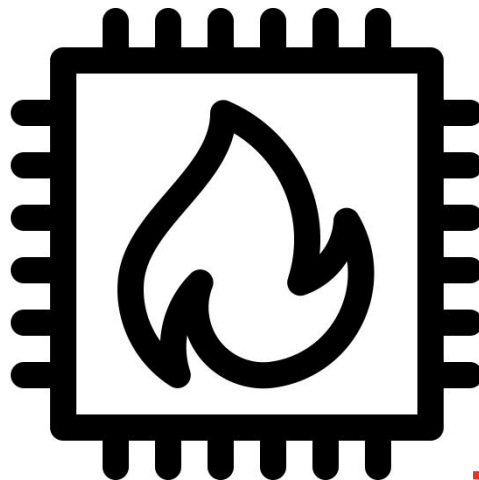
Sensor de Temperatura



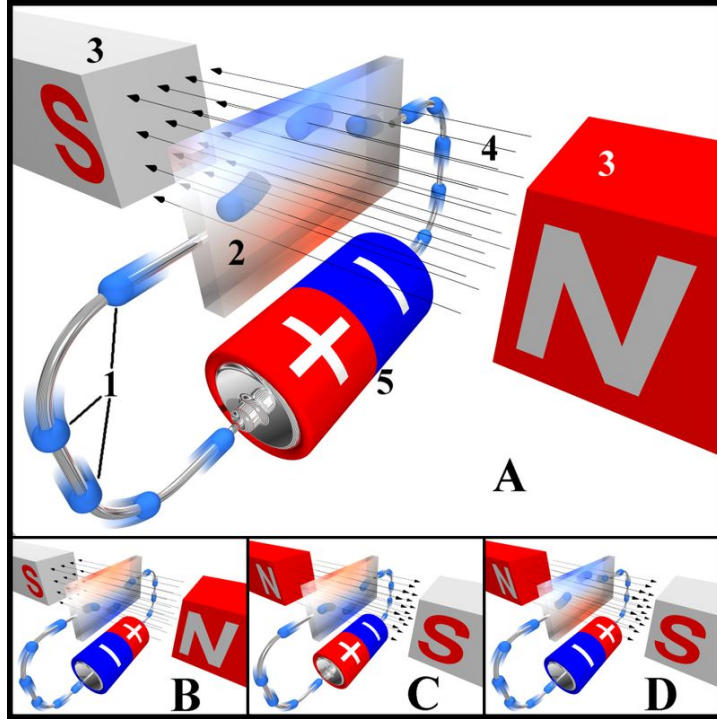
¿Por qué o para qué medir temperatura en la ESP32?



Temperatura de operación:
-40° a 105° C (para el chip que tiene la memoria FLASH embebida)
-40° a 125° C (para el resto)



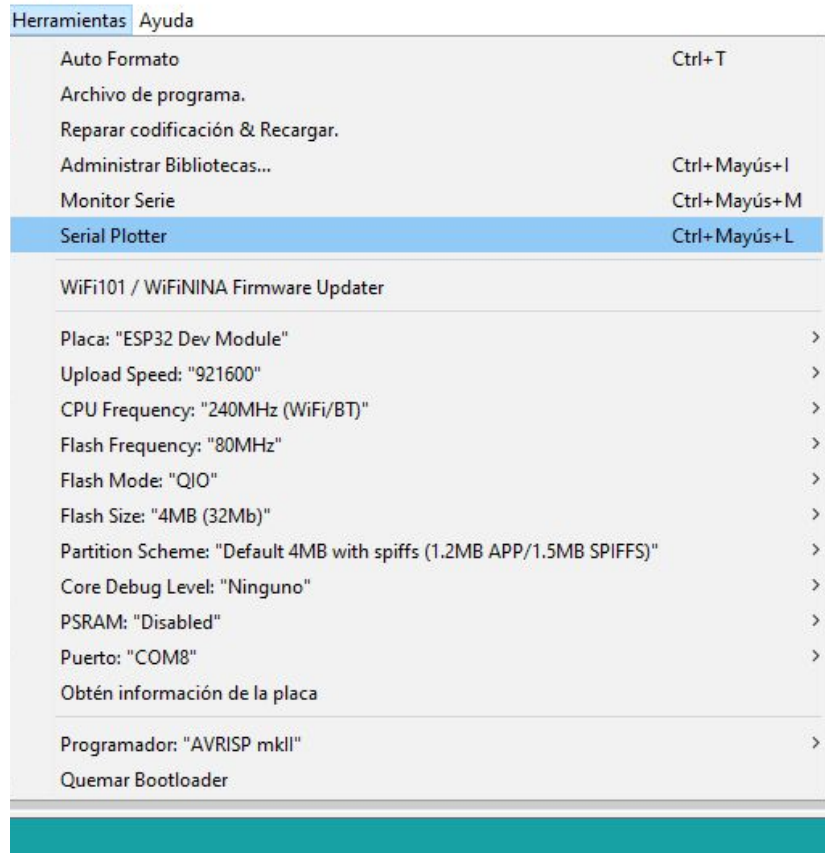
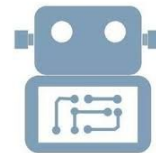
Sensor de efecto Hall



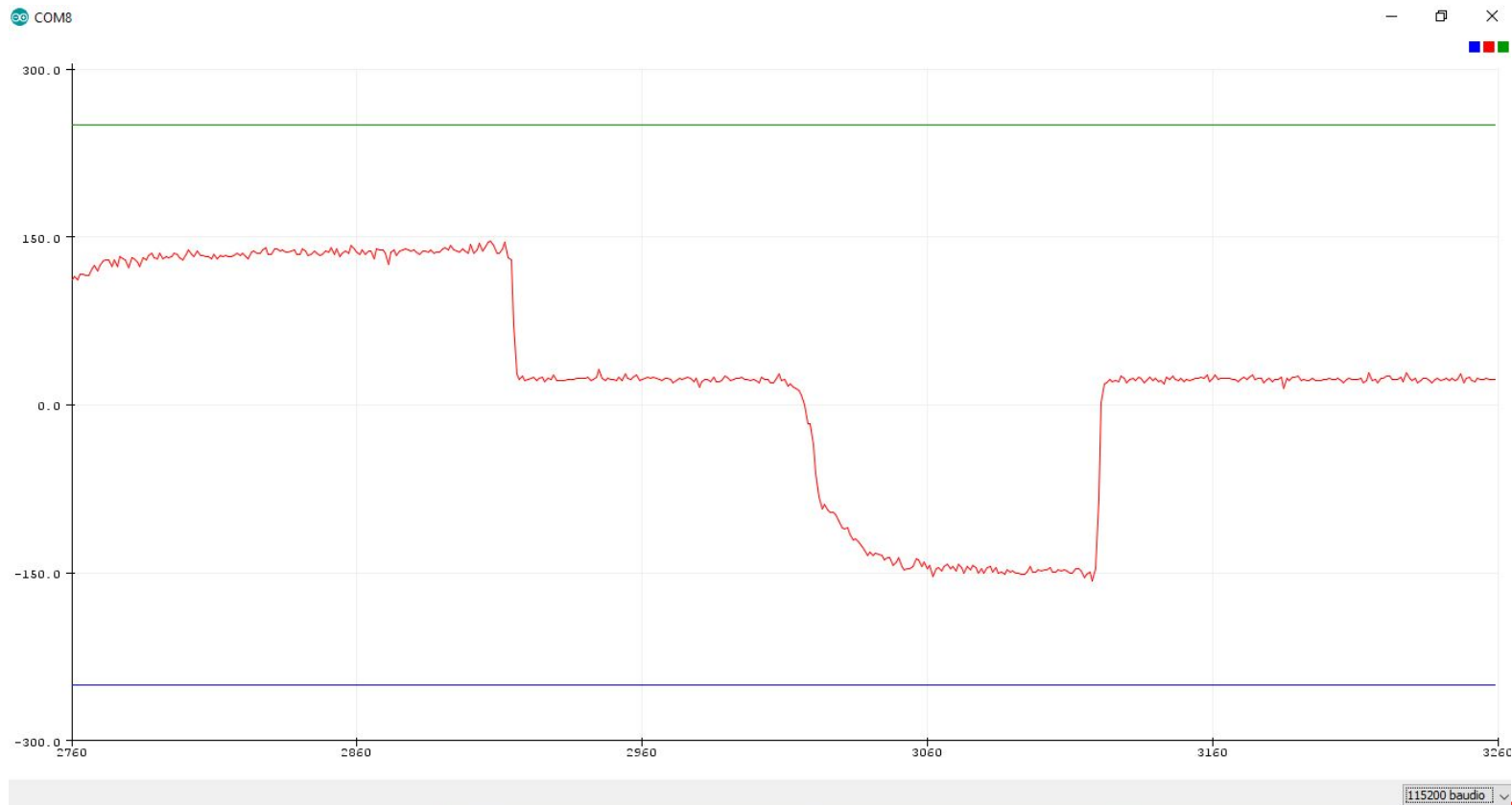
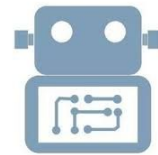
Se utiliza la función:

`hallRead()`

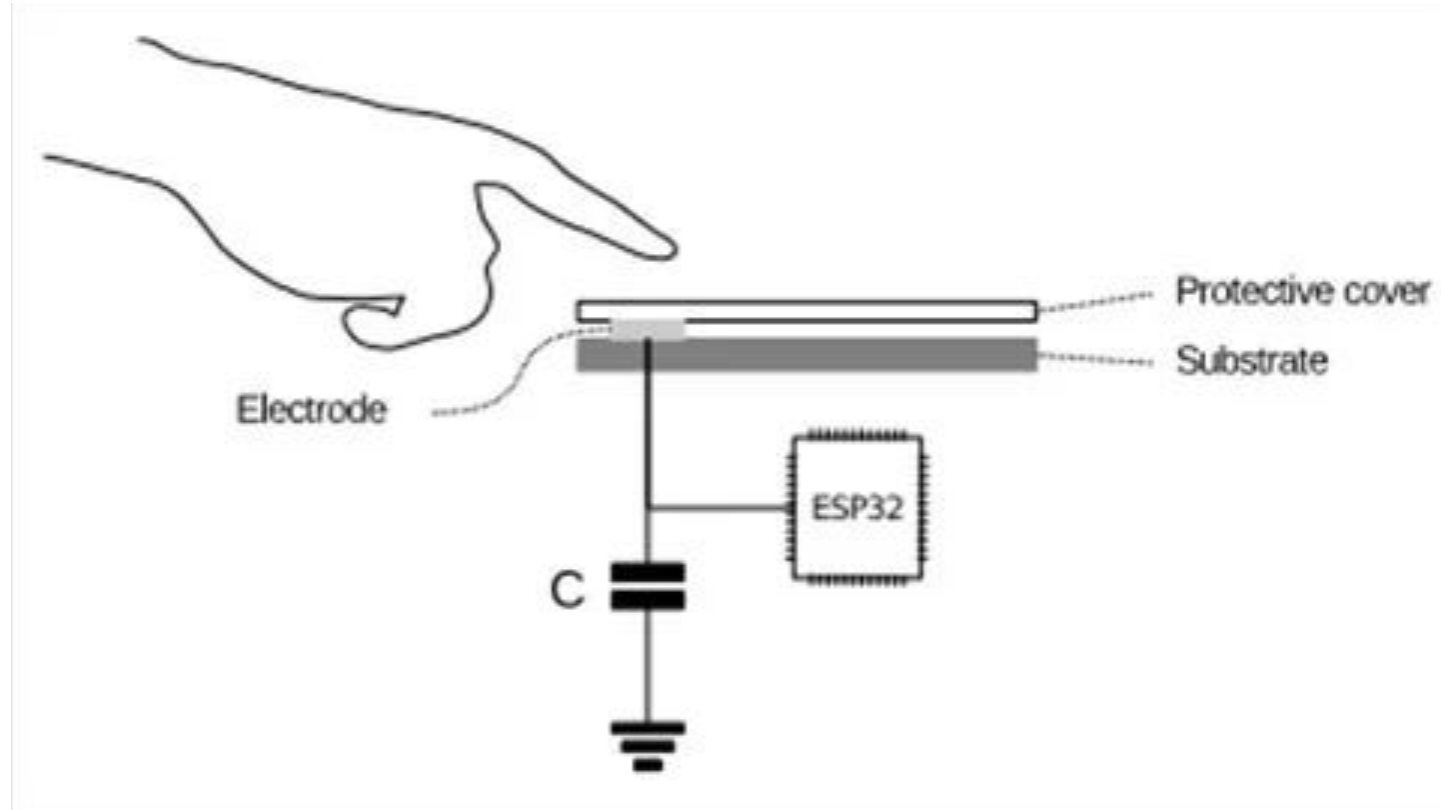
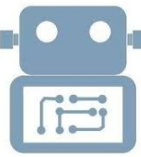
“serial plotter” en el IDE de arduino



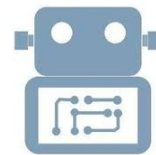
Sensor de efecto Hall: salida



Sensado Capacitivo



Sensado Capacitivo



```
42 static const uint8_t T0 = 4;
43 static const uint8_t T1 = 0;
44 static const uint8_t T2 = 2;
45 static const uint8_t T3 = 15;
46 static const uint8_t T4 = 13;
47 static const uint8_t T5 = 12;
48 static const uint8_t T6 = 14;
49 static const uint8_t T7 = 27;
50 static const uint8_t T8 = 33;
51 static const uint8_t T9 = 32;
52
```

Se utiliza la función:
touchRead()

Por ejemplo, para leer la entrada
de sensado capacitivo en el pin 4
(Touch 0):
touchRead(T0) ;