

硬體介紹

- GitHub 倉庫：

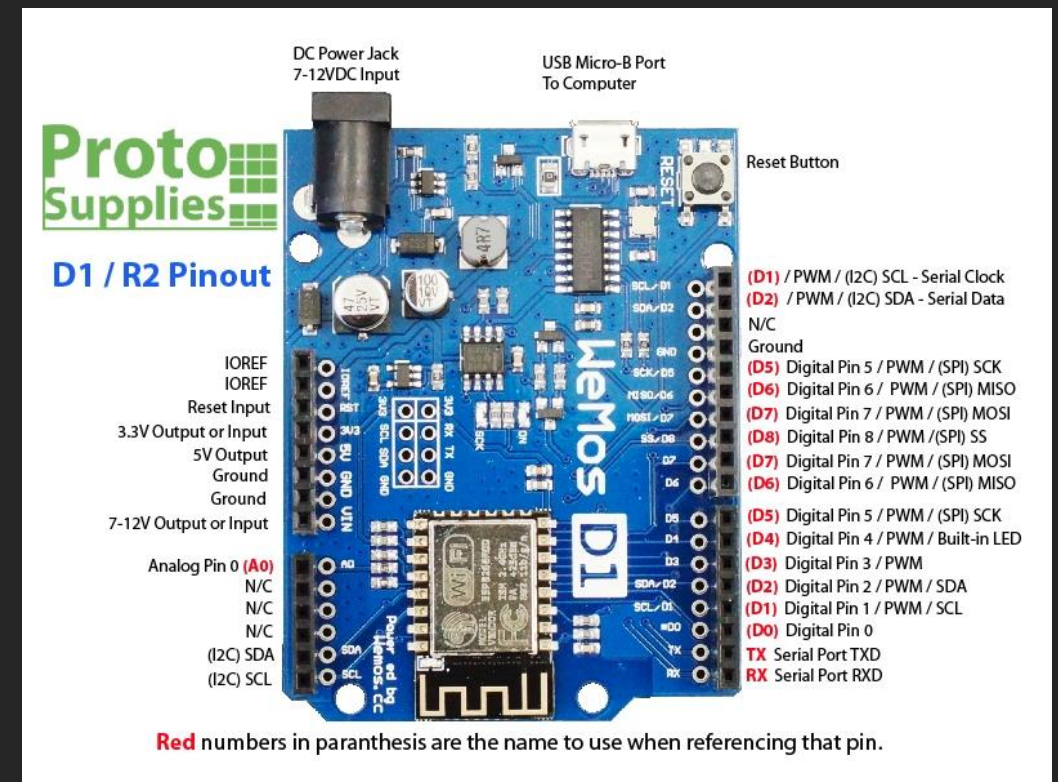
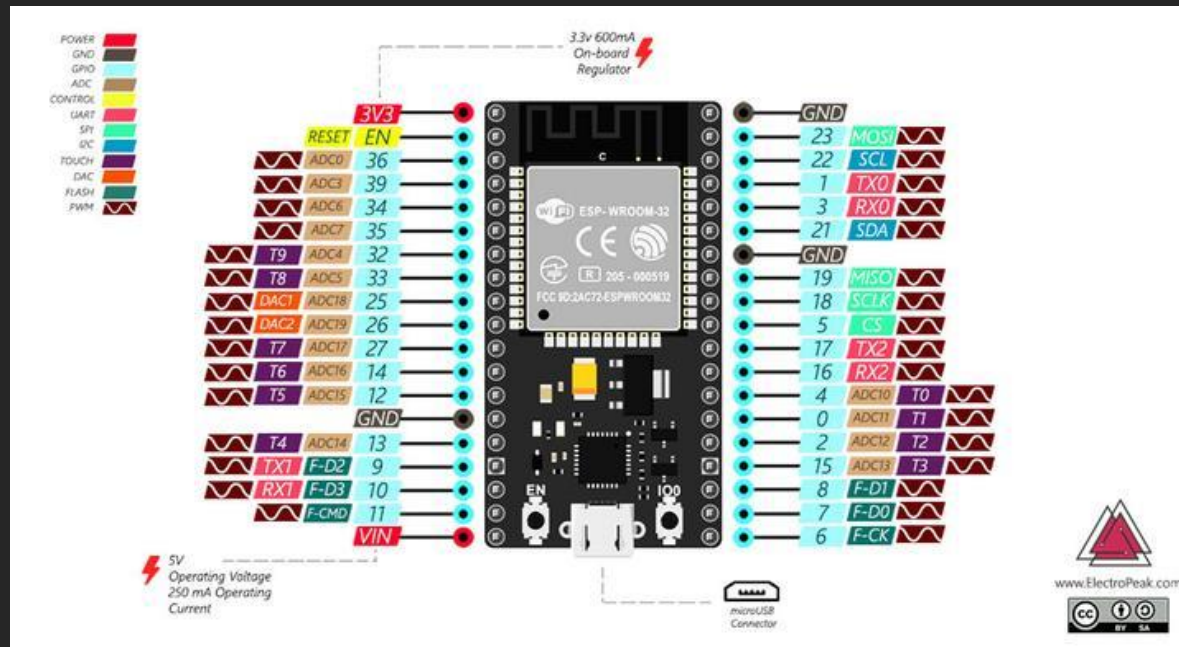
https://github.com/neko0xff/2023_schoolResearch_Server

- 維護者：

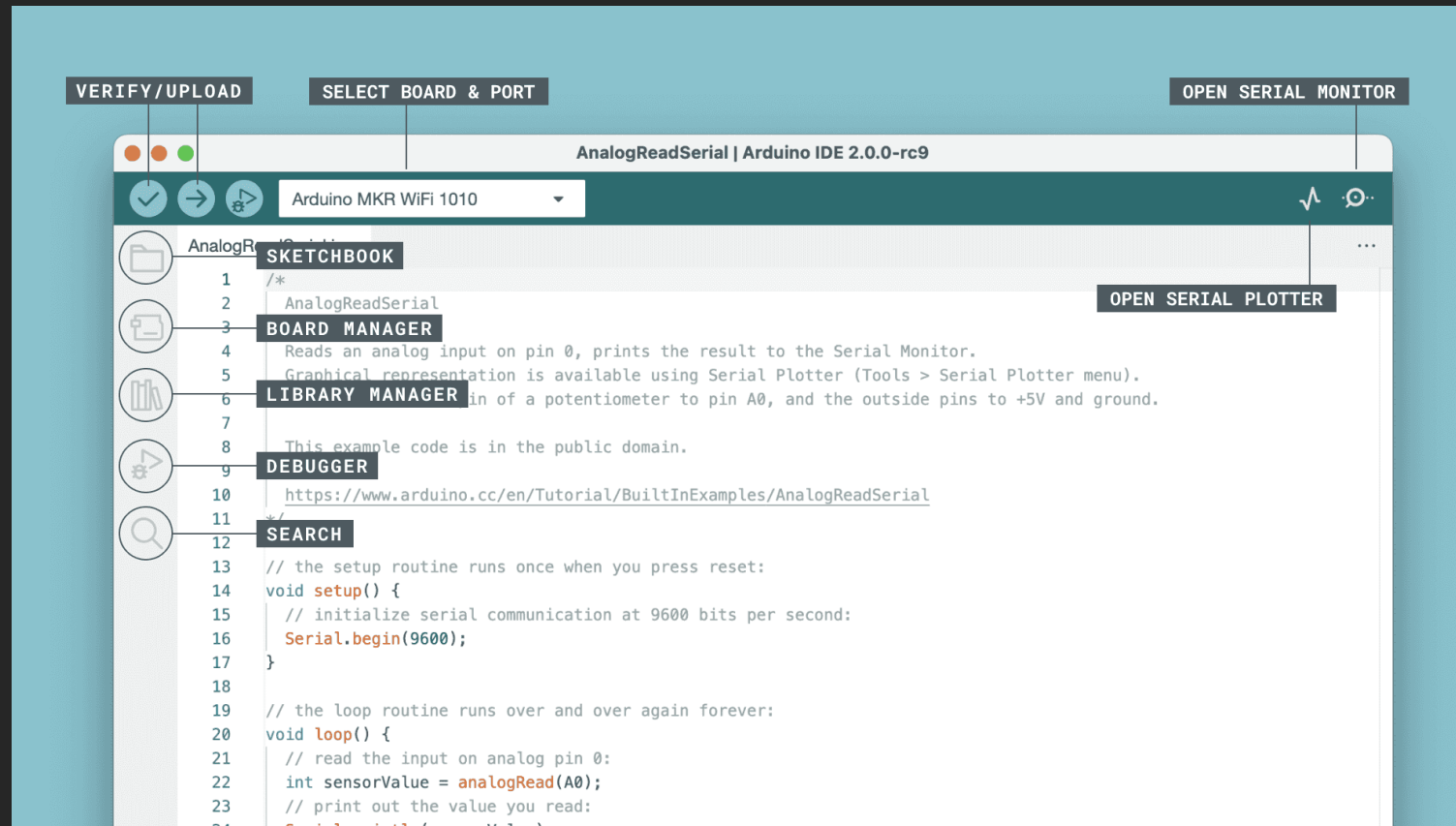
[neko0xff] <https://github.com/neko0xff>

所使用到的開發版

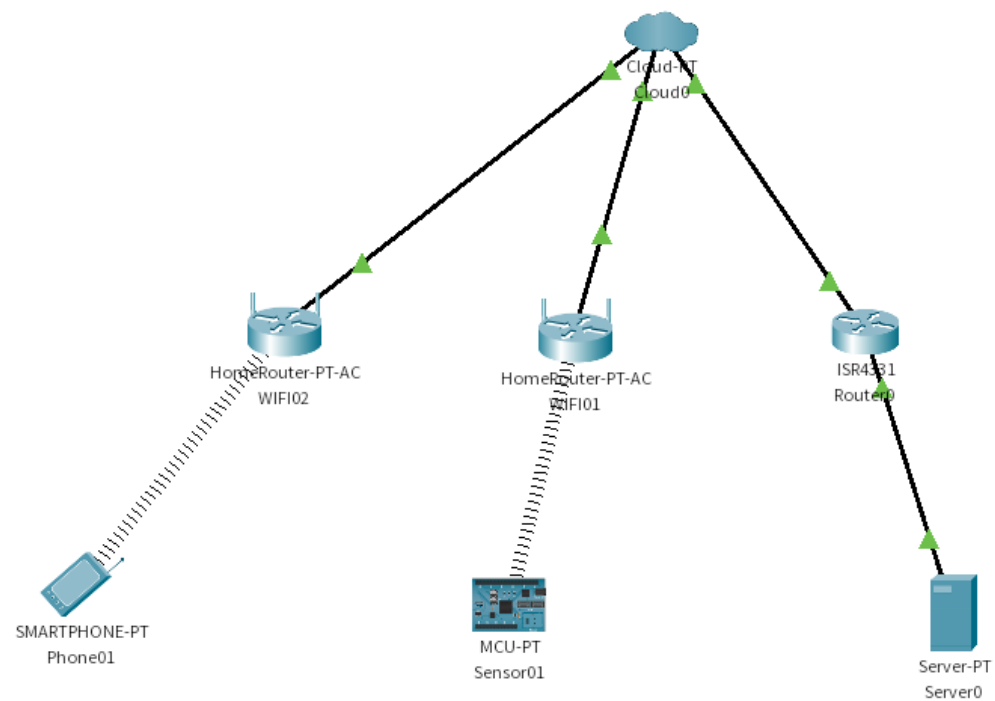
- ESP32/8266



開發環境: Arduino IDE 2.0

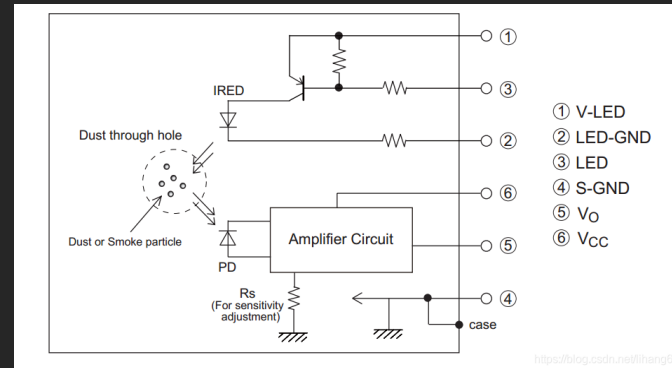
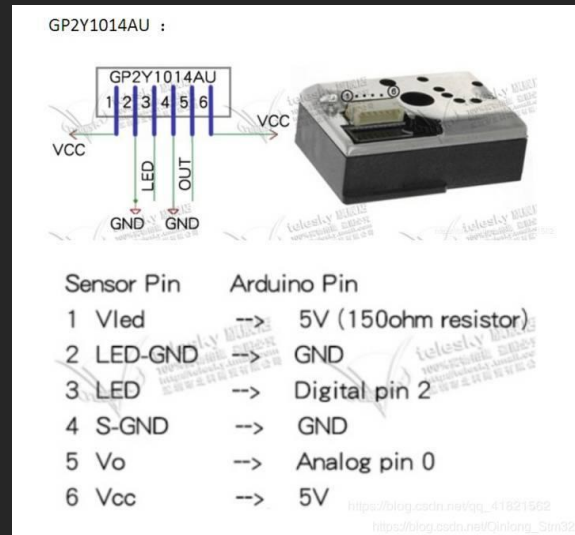


網路架構





所使用到的Sensor型號



(T_a=25°C)

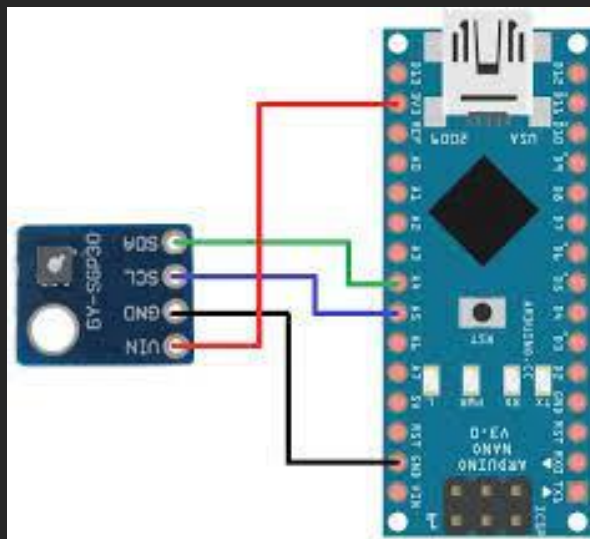
Parameter	Symbol	Rating	Unit
Supply voltage	V _{CC}	-0.3 to +7	V
*1 Input terminal voltage	V _{LED}	-0.3 to V _{CC}	V
Operating temperature	T _{opr}	-10 to +65	°C
Soldering temperature	T _{sol}	-20 to +80	°C

*1 Open drain drive input

<http://blog.csdn.net/lihang606>

GP2Y1014AU 顆 粒物濃度傳感器 (PM2.5)

- 原理：微塵會反射光線（基於光學原理），相對的微塵越多會導致接收到的光線越少



Technische Details:

- Betriebsspannung: 3.3 bis 5.0 V
- tVOC: 0 - 60.000 ppb (parts per billion)
- eCO2: 400 - 60.000 ppm (parts per million)
- H2 / Ethanol: 0 - 1000 ppm (parts per million)
- Messgenauigkeit: 10-15 % im Messbereich
- Betriebstemperaturbereich: -40 bis 85 °C
- Schnittstelle: I2C - Hex Adresse 0x58



GY-SGP40

二氧化碳 / TVOC 感測器

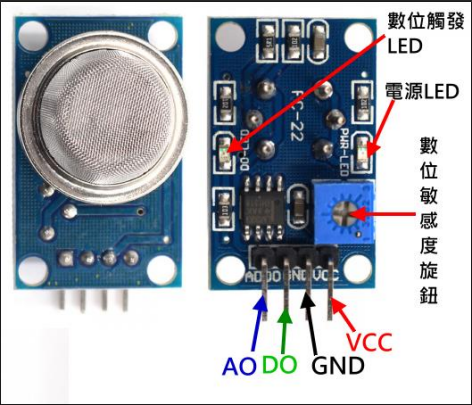
- 基於多像素技術來容許感應器透過可偵測天燃氣類型和濃度的各種接收器，以感知周圍環境

MQ-7

一氧化碳感測器

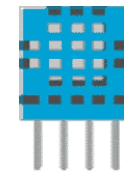
产品型号		MQ-7	
产品类型		半导体气敏元件	
标准封装		塑封	
检测气体		一氧化碳	
检测浓度		10-1000ppmCO	
标准 电路 条件	回路电压	V_e	$\leq 10V$ DC
	加热电压	V_h	$5.0V \pm 0.2V$ ACorDC (高) $1.5V \pm 0.1V$ ACorDC (低)
	加热时间	T_h	$60 \pm 1S$ (高) $90 \pm 1S$ (低)
	负载电阻	R_L	可调
标准 测试 条件	加热电阻	R_h	$31 \Omega \pm 3 \Omega$ (室温)
	加热功耗	P_h	$\leq 350mW$
下元 件特 性	敏感体表 面电阻	R_s	$2K \Omega - 20K \Omega$ (in100ppmCO)
	灵敏度	S	$R_s(\text{in air})/R_s(100ppmCO) \geq 5$
	浓度斜率	α	$\leq 0.6(R_{200ppm}/R_{100ppm} CO)$
标准 测试 条件	温度、湿度	$20^\circ C \pm 2^\circ C$; $65\% \pm 5\% RH$	
	标准测试电路	$V_e: 5.0V \pm 0.1V$; V_h (高): $5.0V \pm 0.1V$; V_h (低): $1.5V \pm 0.1V$	
	预热时间	不少于48小时	

敏感体功耗 (P_s) 值可用计算下式: $P_s = V_e^2 \times R_s / (R_s + R_L)^2$

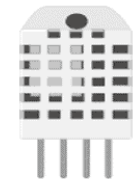


DHT11

溫/溼度感測器



DHT11



DHT22

	DHT11	DHT22
Operating Voltage	3 to 5V	3 to 5V
Max Operating Current	2.5mA max	2.5mA max
Temperature Range	0-50°C / $\pm 2^{\circ}\text{C}$	-40 to 80°C / $\pm 0.5^{\circ}\text{C}$
Humidity Range	20-80% / 5%	0-100% / 2-5%
Sampling Rate	1 Hz (reading every second)	0.5 Hz (reading every 2 seconds)
Advantage	low cost	More Accurate

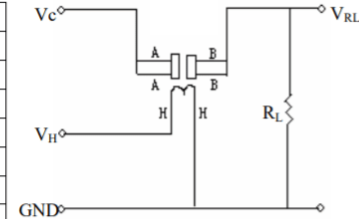
Technical Data

Model No.		MQ131	
Sensor Type		Semiconductor	
Standard Encapsulation		Bakelite (Black Bakelite)	
Detection Gas		Ozone	
Concentration		10-1000ppm Ozone	
Circuit	Loop Voltage	V_c	$\leq 24V$ DC
	Heater Voltage	V_H	$5.0V \pm 0.2V$ AC or DC
	Load Resistance	R_L	Adjustable
Character	Heater Resistance	R_H	$31\Omega \pm 3\Omega$ (Room Tem.)
	Heater consumption	P_H	$\leq 900mW$
	Sensing Resistance	R_s	$50K\Omega - 500K\Omega$ (in 50ppm O_3)
	Sensitivity	S	$R_s(\text{in air})/R_s(\text{in } 50ppm O_3) \geq 3$
	Slope	α	$(R_{100ppm}/R_{10ppm} O_3)$
Condition	Tem. Humidity	$20^\circ C \pm 2^\circ C$; $65\% \pm 5\% RH$	
	Standard test circuit	$V_c: 5.0V \pm 0.1V$; $V_H: 5.0V \pm 0.1V$	
	Preheat time	Over 48 hours	

Power of Sensitivity body(P_s): $P_s = V_c^2 \times R_s / (R_s + R_L)^2$

Resistance of sensor(R_s): $R_s = (V_c / V_{RL} - 1) \times R_L$

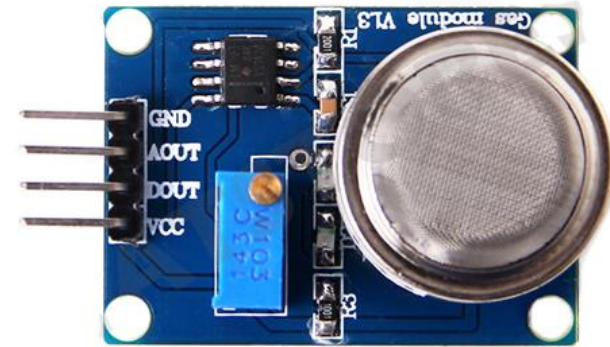
Basic test loop



The above is basic test circuit of the sensor. The sensor need to be put 2 voltage, heater voltage(V_H) and test voltage(V_C). V_H used to supply certified working temperature to the sensor, while V_C used to detect voltage (V_{RL}) on load resistance (R_L) whom is in series with sensor. The sensor has light polarity, V_c need DC power. V_C and V_H could use same power circuit with precondition to assure performance of sensor. In order to make the sensor with better performance, suitable R_L value is needed:

MQ131 Pinout

GND
Analog Out
Digital Out
VCC



MQ-131 臭氧(O_3)

The background features a vibrant, abstract design. A horizontal rainbow gradient band stretches across the middle of the frame. Above and below this band, there are overlapping, semi-transparent geometric shapes, primarily triangles and squares, in various colors including green, yellow, orange, red, purple, and blue. The overall effect is a dynamic and colorful composition.

報告完畢
