LamaPLC: MQ Winsen Gas-sensors

Winsen's MQ series gas sensors are low-cost, semiconductor-type (chemiresistive) sensors designed to detect a wide range of gases, including flammable gases, alcohol, and smoke. Each model is tailored to detect specific gases or a range of gases.

- **Operating Principle:** The sensors use a sensitive material (typically SnO2 semiconductor) and a heating element. The sensor's conductivity varies with air-gas concentration, enabling measurement using a simple voltage divider.
- **Voltage:** They operate on a standard 5-volt DC power supply.
- **Low Cost:** A major advantage is their affordability, making them popular for a wide variety of civil and industrial applications, including smart homes and IoT projects.
- **“Burn-in” Time:** A *“burn-in”* period of 12 to 24 hours is often recommended to improve measurement accuracy.

G smoke LPG (liquefied petroleum gas) propane hydrogen	Winsen **MQ-2** 	Flammable gas concentracion: 300 .. 10'000ppm Heater Resistance; RH: 29Ω ±3Ω（room tem.） Heater consumption; PH: ≤950mW Sensitivity;S: Ro(in air) / Rs (2000 ppm C_3H_8) ≥ 5 Output Voltage;Vs: 2.5V（4.0V）in 2000 ppm C_3H_8） Concentration Slope;α: ≤0.6 (R3000 ppm / R1000 ppm C_3H_8)
G alcohol (C_2H_5OH) Small sensitivy: Benzine gas	Winsen **MQ-3** 	Detecting concentration scope：0.05 mg / 10 mg/L Alcohol Sensing Resistance: 1 MΩ - 8 MΩ (0.4 mg/L alcohol)
G Methane CH_4 Natural gas LNG Small sensitivy: Alcohol Smoke	Winsen **MQ-4** 	Detecting concentration scope：200-10'000ppm CH_4, natural gas Sensing Resistance: 10KΩ- 60KΩ (1000ppm CH_4)
G LPG Iso-butane Propane Small sensitivy: Alcohol Smoke	Winsen **MQ-5** 	Detecting concentration scope: 200-10,000ppm LPG, LNG, Natural gas, Iso-butane, Propane, Town gas Sensing Resistance: 10KΩ- 60KΩ (5000 ppm methane)

G Town gas Natural gas LPG LNG Iso-butane Propane Small sensitivy: Alcohol Smoke	Winsen **MQ-6** 	Detecting concentration scope：200-10'000ppm LPG ,iso-butane, propane, LNG Sensing Resistance: 10KΩ- 60KΩ (10'00ppm LPG)
G CO	Winsen **MQ-7** 	Detecting concentration scope： over 300 ppm CO (Carbon Monoxide) Sensing Resistance: 2KΩ- 20KΩ (100 ppm CO)
G H_2 Small sensitivy: Alcohol LPG cooking fumes	Winsen **MQ-8** 	Detecting concentration scope：100-10000ppm Hydrogen (H_2) Sensing Resistance: 10KΩ- 60KΩ (1000 ppm H_2)
G CO Methane CH_4 LPG	Winsen **MQ-9** 	Detecting range： 20 ppm .. 2000 ppm carbon monoxide 500 ppm .. 10'000 ppm methane CH_4 500 ppm .. 10'000 ppm LPG Sensing Resistance: 2KΩ- 20KΩ (100 ppm CH_4)
G ozone	Winsen **MQ-131** 	-
G NO_x Ammonia NH_3 alcohol Benzene smoke CO_2	Winsen **MQ-135** 	Detecting range： 10 ppm .. 300 ppm Ammonia NH_3 10 ppm .. 1000 ppm Benzene 10 ppm .. 300 ppm Alcohol Sensing Resistance: 30KΩ- 200KΩ (100 ppm Ammonia NH_3)

G Ammonia NH_3	Winsen **MQ-137** 	Detecting range 5 ppm .. 500 ppm Ammonia NH_3

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Arduino

Interfacing the **MQ-135** air quality sensor with an Arduino can be done either by reading raw analog signals or by using a dedicated library to obtain calibrated PPM (parts per million) readings.

Arduino wiring

MQ-135	Pin	Arduino Pin	Description
VCC	5V	Power supply (the sensor has a built-in heater)	
GND	GND	Ground	
AOUT / AO	A0	Analog output (voltage level based on gas concentration)	
DOUT / DO	D2 (Optional)	Digital output (goes high/low based on threshold)	

Arduino code

This code provides a raw reading from 0 to 1023, which is useful for basic threshold detection (e.g., triggering a fan or an alarm).

```
int sensorPin = A0; // Select the input pin for MQ-135

void setup() {
  Serial.begin(9600); // Initialize serial communication
}

void loop() {
  int sensorValue = analogRead(sensorPin); // Read analog value (0-1023)
  Serial.print("Raw Air Quality Value: ");
  Serial.println(sensorValue);
  delay(1000); // Wait 1 second for next reading
```

```
}
```

MQ, MQ-2, MQ-3, MQ-4, MQ-5, MQ-6, MQ-7, MQ-8, MQ-9, MQ-131, MQ-135, MQ-137, Winsen, Gas-sensor, sensor, arduino, code, alcohol, C_2H_5OH, Benzine gas, smoke, LPG, propane, C_3H_8, hydrogen, H_2, methane, CH_4, Iso-butane, Town gas, Ammonia, NH_3

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