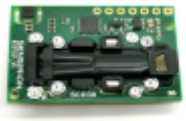
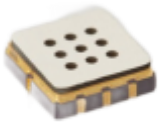
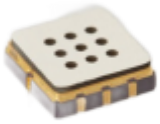
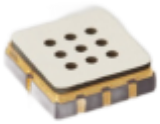
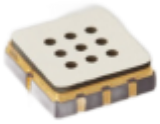
LamaPLC: Gas sensors

Click on the column header to rearrange!

Type of measurement	Model	Power voltage	Measurement, range, accuracy	Communication	Note
G CO_2 VOC	Sciosense **CCS811** 	**3.3V** (1.8 .. 3.6V)	equivalent CO_2 (eCO_2): 400 ppm .. 32768 ppm equivalent Total Volatile Organic Compound (eTVOC): 0 ppb .. 29206 ppb.	I²C default address: **0x5A / 0x5B**	Standard (100kbit/s) and fast (400kbit/s) I²C interface Power Consumption maximum: 46 mW
G T H CO_2 Air-quality Temperature Humidity	Sensirion **SCD40-D-R2** 	**3.3V / 5V** (2.4 .. 5.5V)	CO_2 output range: 0 .. 40'000 ppm CO_2 measurement accuracy: ± 40 ppm Humidity measurement range: 0 %RH .. 100 %RH Humidity measurement accuracy: ±6 %RH Temperature measurement range: 10°C .. 60°C Temperature measurement accuracy: ±1.5 °C	I²C default address: **0x62**	SCL clock frequency: 100 kHz
G Smoke gas Combustible gas	Winsen **MQ-2** 	**5V**	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)	analog signal	Lifespan: 10 years Preheat time: Over 24 hour

Type of measurement	Model	Power voltage	Measurement, range, accuracy	Communication	Note
G Alcohol gas Small sensitivy: Benzine gas	Winsen **MQ-3** 	**5V**	Detecting concentration scope 0.05 mg / 10 mg/L Alcohol Sensing Resistance: 1 MΩ - 8 MΩ (0.4 mg/L alcohol)	analog signal	Preheat time: Over 24 hour
G CH_4 gas Natural gas LNG Small sensitivy: Alcohol Smoke	Winsen **MQ-4** 	**5V**	Detecting concentration scope 200-10'000ppm CH_4, natural gas Sensing Resistance: 10KΩ- 60KΩ (1000ppm CH_4)	analog signal	Preheat time: Over 24 hour
G LPG Iso-butane Propane Small sensitivy: Alcohol Smoke	Winsen **MQ-5** 	**5V**	Detecting concentration scope 200-10'000ppm LPG,LNG, Natural gas, Iso-butane, Propane, Town gas Sensing Resistance: 10KΩ- 60KΩ (5000 ppm methane)	analog signal	Preheat time: Over 24 hour
G Town gas Natural gas LPG LNG Iso-butane Propane Small sensitivy: Alcohol Smoke	Winsen **MQ-6** 	**5V**	Detecting concentration scope 200-10'000ppm LPG ,iso-butane, propane, LNG Sensing Resistance: 10KΩ- 60KΩ (10'00ppm LPG)	analog signal	Preheat time: Over 24 hour
G CO	Winsen **MQ-7** 	**5V**	Detecting concentration scope over 300 ppm CO (Carbon Monoxide) Sensing Resistance: 2KΩ- 20KΩ (100 ppm CO)	analog signal	Preheat time: Over 48 hour

Type of measurement	Model	Power voltage	Measurement, range, accuracy	Communication	Note
G H_2 Small sensitivy: Alcohol LPG cooking fumes	Winsen **MQ-8** 	**5V**	Detecting concentration scope100-10000ppm Hydrogen (H_2) Sensing Resistance: 10KΩ- 60KΩ (1000 ppm H_2)	analog signal	Preheat time: Over 24 hour
G CO CH_4 gas LPG	Winsen **MQ-9** 	**5V**	Detecting range 20 ppm .. 2000 ppm carbon monoxide 500 ppm .. 10'000 ppm CH_4 500 ppm .. 10'000 ppm LPG Sensing Resistance: 2KΩ- 20KΩ (100 ppm CH_4)	analog signal	Preheat time: Over 48 hour
G NO_x NH_3 alcohol Benzene smoke CO_2	Winsen **MQ-135** 	**5V**	Detecting range 10 ppm .. 300 ppm NH_3 10 ppm .. 1000 ppm Benzene 10 ppm .. 300 ppm Alcohol Sensing Resistance: 30KΩ- 200KΩ (100 ppm NH_3)	analog signal	Preheat time: Over 24 hour
G Oxigen	AlphaSense **O2-A2** 	**5V**	Range of oxygen sensor: 0..30 % Load resistance: 47-100 Ω	analog signal	-
G Methane Natural gas	GL Sciences **TGS-2611** 	**5V**	Sensor resistance in 5000ppm of methaneat 20°C and 65% R.H. Sensor resistance: 0.68 .. 6.8 kΩ in 5000 ppm methane	analog signal	Conditioning period before test: 7 days
G T H CO2 humidity temperature	Sensirion **SCD-30** 	**3.3V / 5V**	Humidity range: 0 .. 100 %RH Temperature range: -40°C .. 70°C CO^2 range: 0 .. 40’000 ppm (I^2C, UART), 0 .. 5’000 ppm (PWM)	UART (Modbus Point to Point; TTL Logic), PWM and I^2C	Response time: 20s Sensor lifetime: 15 years

Type of measurement	Model	Power voltage	Measurement, range, accuracy	Communication	Note
G NO^2	MEMS **GM-102b** 	**5V**	Detection Range: 0.1~10ppm (NO^2) Heater Resistance: 80Ω±20Ω□room temperature	analog signal	-
G alcohol gas	MEMS **GM-302b** 	**5V**	Detection Range: 1..500ppm (Ethanol vapor) 80Ω±20Ω□room temperature	analog signal	-
G Alcohol (C2H5OH) Hydrogen(H2) Formaldehyde(CH2O)	MEMS **GM-502b** 	**5V**	Detection: Alcohol (C2H5OH), 10..500ppm Detection: Hydrogen(H2), 1..1000ppm Detection: Formaldehyde(CH2O), 10..100ppm	analog signal	-
G Carbon monoxide (CO) Hydrogen (H2)	MEMS **GM-702b** 	**5V**	Detection: Carbon monoxide sensor (CO) : 10..5000ppm Hydrogen sensor (H2): 10..500ppm	analog signal	-
G Carbon monoxide (CO) Methane (CH4) Ethanol (C2H5OH) Propane (C3H8) Butane (C4H10) Hydrogen (H2) Hydrogen sulfide (H2S) Ammonia (NH3)	Fermion **MICS-5524 V1.0** 	**5V**	The module is intended for educational and hobby purposes! Measuring range: 1 .. 1000 ppm (carbon monoxide CO) 10 .. 500ppm (Ethanol C2H5OH) 1 .. 1000ppm (Hydrogen H2) 1 .. 500 ppm (NH3 ammonia) > 1000 ppm (methane CH4)	analog signal	-

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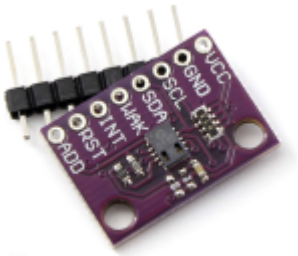
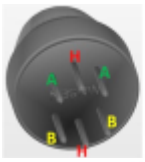
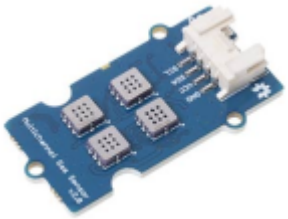
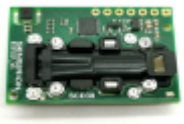
Gas sensor moduls

The gas sensor modules contain the additional technology required for sensor ICs (voltage regulation, pull-up resistors,...) and the connection pins simplify the connection of the sensors to, for example,

Arduinos. The modules are typically universal and can be used for several sensors, so it's worth paying attention to which sensor is installed on the module, mainly because of the power supply (almost all sensors work with 3.3V, but not all of them work with 5V). There are often bridges used for addressing on the modules, which can be soldered in and out, and for example I²C addresses can be set with them.

Type of measurement	Name	Pics	Sensors	Description
G CO_2 TVOC	**CJMCU-811**		CCS811	I²C interface, address: ADDR pin low: **0x5A**, ADD pin high: **0x5B** **VCC:** normally 3.3V **GND:** GND **SCL:** Serial Clock Line, interface to I2C **SDA:** Serial Data Address, interface to I2C **WAK:** Wake (active low, not connected) **INT:** Interrupt (active low, not connected) **RST:** Reset (active low, not connected) **ADD:** 10k pull-down to GND, setting the I2C address to 0x5A Arduino library: ✔

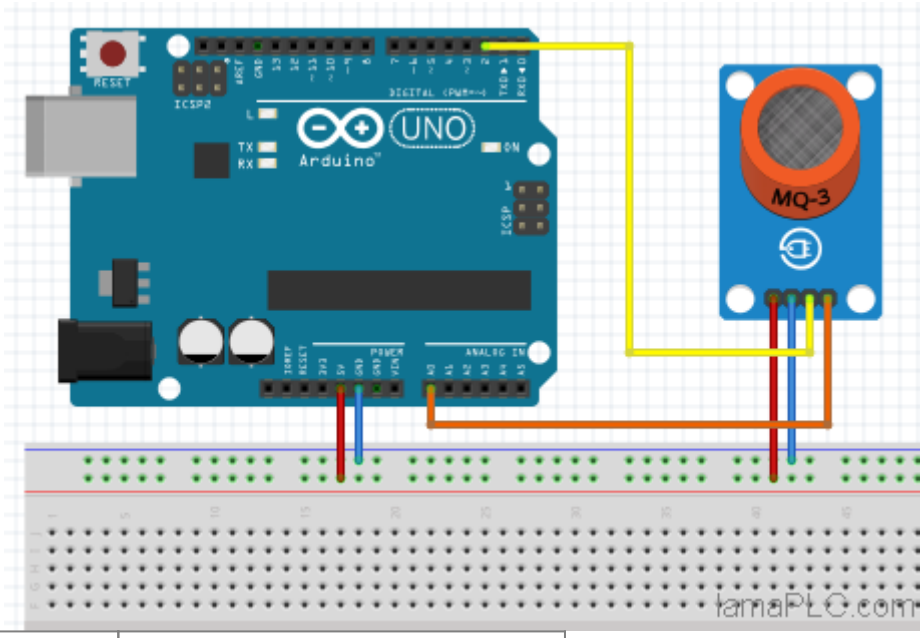
Type of measurement	Name	Pics	Sensors	Description
G gas	**MQ-nnn**	 	MQ-2 (flamable gas) MQ-3 (alcohol) MQ-4 (CH_4) MQ-5 (LPG, LNG, natural gas) MQ-6 (LPG, iso-butane,..) MQ-7 (CO) MQ-8 (H_2) MQ-9 (CO, CH_4, LPG) MQ-135 (NH_3, benzene)	Analog and digital signals *Pinout for modul:* **VCC:** normally 5V **GND:** GND **DO:** Digital (alarm) signal, by setting a threshold value using the potentiometer **AO:** Analog (measuring) signal, 0..5 V *Pinout for sensor:* **H-Pins:** Out of the two H pins, one pin is connected to supply and the other to ground **A-B-Pins:** A pins and B pins are interchangeable. These pins will be tied to the supply voltage Preheat duration minimum 20 seconds Arduino library: ✔
G CO H2 Alcohol (C2H5OH) Hydrogen(H2) Formaldehyde(CH2O) Alcohol gas NO^2	**GRV GAS SENS V2**		**All 4 sensors in one platform:** GM-102b (NO^2) GM-302b (alcohol gas) GM-502b (Alcohol (C2H5OH), Hydrogen(H2), Formaldehyde(CH2O)) GM-702b (Carbon monoxide (CO), Hydrogen (H2))	I^2C interface, default address:**0x55** **VCC:** normally 5V **GND:** GND **SCL:** Serial Clock Line, interface to I2C **SDA:** Serial Data Address, interface to I2C Arduino library: ✔

Type of measurement	Name	Pics	Sensors	Description
G T H Temperature Humidity CO^2	**SCD-30 modul**		SCD-30	Pinout: - VDD: Supply Voltage (-0.3 V –6.0V) - GND: Ground - TX/SCL: Modbus: Transmission line (Push/Pull with 3V level) I^2C:Serial clock(internal 45kΩ pull-up resistor, pulled to 3V, for higher voltages a level shifter is needed) - RX/SDA: Modbus: Receive line (Input must not exceed 5.5V) I^2C:Serial data(internal 45kΩ pull-up resistor, pulled to3V, for higher voltages a level shifter is needed) - RDY: Data ready pin. High when data is ready for read-out - PWM: PWM output of CO^2 concentration measurement - SEL: Interface selectpin. Pull to VDD(do not exceed 4V, use voltage divider in case your VDD is > 4V)for selecting Modbus, leave floating or connect to GND for selecting I^2C The default I^2C address of SCD30 is **0x61**

Software example

The easiest way to find the example program for the current sensor is in the Arduino program in the *“Library Manager”*.

Example to MQ-3 sensor to Arduino Uno



Arduino pin	Modul pin	Description
5 V	Vin	power supply can be 5V
GND	GND	-
D2	DO	Digital (alarm) signal from modul
A5	AO	Analog measuring value (0..5V)

gas, sensor, i2c, onewire, communication, MQ-3, MQ-4, MQ-5, MQ-6, MQ-7, MQ-8, MQ-9, MQ-135, GM-102b, GM-302b, GM-502b, GM-702b, alcohol, ch4, natural gas, smoke, lng, co, co2, lpg, h2, iso-butane, nox, nh3, benzene, town gas, formaldehyde, propane, humidity, temperature, voc, GRV GAS SENS V2