

# COMBINATION MANUAL FOR GAS SENSORS

SEN-MQ

## 1. GENERAL INFORMATION

Dear customer,  
thank you for purchasing our product. In the following we will show you what you need to bear in mind when commissioning and using.

Should you encounter any unexpected problems during use, please do not hesitate to contact us.

## 2. DEVICE OVERVIEW



Please note that the sensor requires a warm-up phase in order to provide accurate readings.

There are many different MQ gas sensors, which differ mainly in the gases they measure. Connection and programming are the same for all sensors.

Here is an overview of the different MQ gas sensor types:

Sensor	Gases
SEN-MQ-2	Liquefied petroleum gas (LPG), i-butane (C <sub>4</sub> H <sub>10</sub> ), Propane (C <sub>3</sub> H <sub>8</sub> ), Methane (CH <sub>4</sub> ), hydrogen (H <sub>2</sub> ), Alcohol, smoke
SEN-MQ-3	Ethanol, alcohol via the Hydrogen concentration
SEN-MQ-4	Compressed natural gas (CNG), methane (CH <sub>4</sub> )
SEN-MQ-5	Liquefied petroleum gases (LPG), propane, Methane, butane, other natural gases, etc.
SEN-MQ-6	Liquefied petroleum gas (LPG) such as butane, propane, methane and combustible gases
SEN-MQ-7	Carbon monoxide (CO)
SEN-MQ-8	Hydrogen (H <sub>2</sub> ), many hydrogen-containing gases
SEN-MQ-135	Benzol, Ammoniak, Sulfid, Smoke, nitrogen oxides and other air pollutants



The sensitivity of the digital output of the sensors can be adjusted using the blue potentiometer on the board.

### 3. USE WITH THE RASPBERRY PI

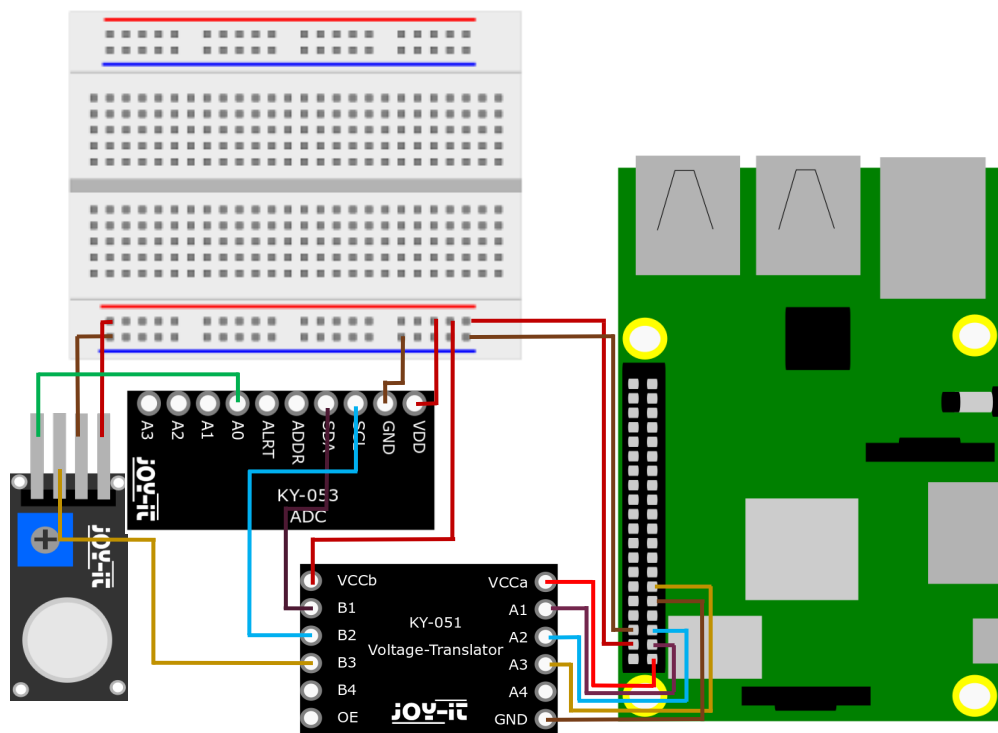


These instructions were written under Raspberry Pi OS Bookworm for the Raspberry Pi 4 and 5. It has not been checked with newer operating systems or hardware.



This gas sensor is an analog sensor and since the Raspberry Pi has no analog inputs, you must use an analog-to-digital converter. You will also need a 3V to 5V logic level converter. In this example, the ADC COM-KY053 and the logic level converter COM-KY051 from Joy-it are used.

Connect the sensor as shown in the diagram and the table.



Raspberry Pi	COM-KY051	ADC	Sensor
GND	GND	GND	GND
5 V	VCCb	VDD	VCC
3 V	VCCa	-	-
GPIO 17	A3	-	-
-	B3	-	D0
-	-	A0	A0
SCL / GPIO3	A2	-	-
-	B2	SCL	-
SDA / GPIO2	A1	-	-
-	B1	SDA	-

Code example:

To use the ADC, some dependencies must first be installed. To do this, carry out the following steps one after the other.

Enter the following command to access the Raspberry Pi Config at:

```
sudo raspi-config
```

Navigate to the **Interfacing Options** item and activate the I2C interface.

Now install pip3 with the following command:

```
sudo apt install python3-pip
```

Next, you need to set up a virtual environment to install the ADC's library. To do this, enter the following commands:

```
mkdir project-name && cd project-name
```

```
python -m venv --system-site-packages env
```

```
source env/bin/activate
```

Now install the Adafruit-Circuitpython-ADS1x15 library with the following command:

```
pip3 install adafruit-circuitpython-ads1x15
```

Now you can download the prepared code example with this command:

```
wget https://joy-it.net/files/files/Produkte/SEN-MQ2/SEN-MQ-Python.zip
```

Now unpack the .zip file and remove the .zip file again with the following command:

```
unzip SEN-MQ-Python.zip && rm SEN-MQ-Python.zip
```

You can now execute the example with the following command:

```
python3 SEN-MQ-Python.py
```

Alternatively, you can copy the code example here manually and paste it into your Python file.

```
from time import sleep
import board
import busio
import adafruit_ads1x15.ads1115 as ADS
from adafruit_ads1x15.analog_in import AnalogIn
from gpiozero import DigitalInputDevice

# Set up the digital input device for the gas sensor
gas_sensor = DigitalInputDevice(17)

# Create the I2C bus
i2c = busio.I2C(board.SCL, board.SDA)

# Create the ADC object using the I2C bus
ads = ADS.ADS1115(i2c)
ads.gain = 2/3

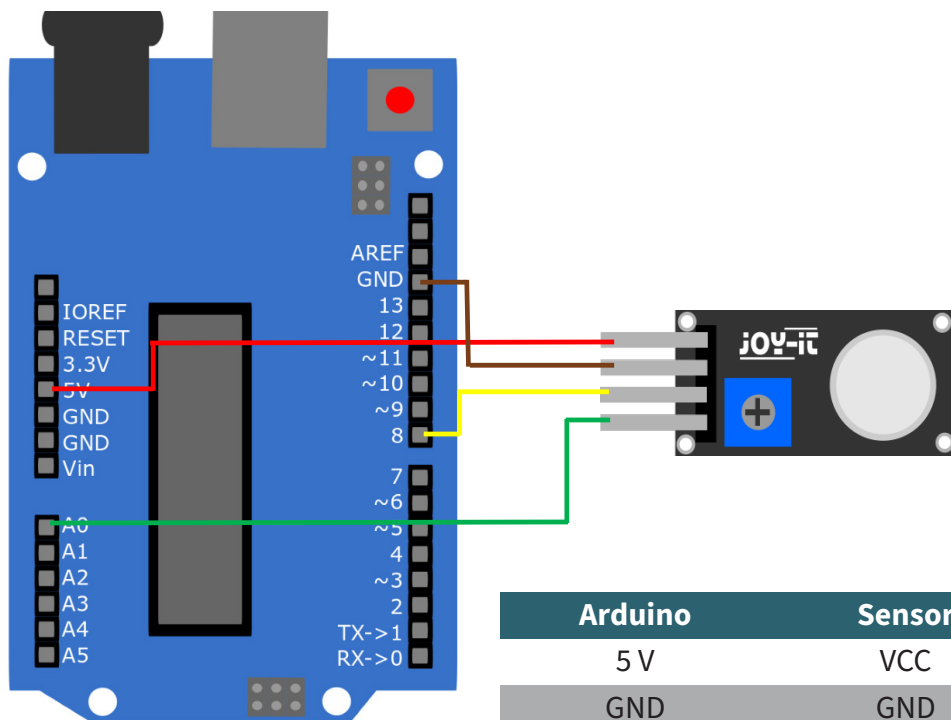
# Create single-ended input on channel
chan0 = AnalogIn(ads, ADS.P0)

try:
    while True:
        print("{:>5.3f}".format(chan0.voltage))
        if not gas_sensor.value: # True when the sensor is triggered
            # (typically active low)
            print("Warning: Threshold exceeded!!!")
            sleep(1)
except KeyboardInterrupt:
    pass # No need for cleanup, gpiozero handles it automatically
```

The higher the analog input signal, the higher the corresponding gas value of the sensor. The value range extends from 0 to 5 V. The D0 pin of the sensor is automatically set to LOW when the limit value is reached. You can set the limit value using the blue potentiometer on the circuit board.

## 4. USE WITH THE ARDUINO

Connect the sensor as shown in the diagram and the table.



Arduino	Sensor
5 V	VCC
GND	GND
Digital Pin 8	D0
Analog Pin 0	A0

Copy the following code example into your programming environment and upload it to your Arduino. Alternatively, you can also download the code example [here](#) download.

```
void setup() {  
  Serial.begin(9600);  
  pinMode(A0, INPUT);  
  pinMode(8, INPUT);  
}  
void loop() {  
  if (digitalRead(8)==LOW){  
    Serial.println("Warning: Threshold exceeded!!!");  
  }  
  Serial.println(analogRead(A0));  
  delay(1000);  
}
```

The higher the analog input signal, the higher the corresponding gas value of the sensor. The value range is from 0 to 1023. The D0 pin of the sensor is automatically set to LOW when the limit value is reached. You can set the limit value using the blue potentiometer on the circuit board.

## 5. INFORMATION & TAKE-BACK OBLIGATIONS

Our information and take-back obligations under the German Electrical and Electronic Equipment Act (ElektroG)



### **Symbol on electrical and electronic equipment:**

This crossed-out garbage can means that electrical and electronic appliances do not belong in household waste. You must hand in the old appliances at a collection point. Before handing them in, you must separate used batteries and accumulators that are not enclosed by the old appliance.

### **Return options:**

As an end user, you can hand in your old appliance (which essentially fulfills the same function as the new appliance purchased from us) for disposal free of charge when purchasing a new appliance. Small appliances with no external dimensions greater than 25 cm can be disposed of in normal household quantities regardless of whether you have purchased a new appliance.

### **Possibility of return at our company location during opening hours:**

SIMAC Electronics GmbH, Pascalstr. 8, D-47506 Neukirchen-Vluyn

### **Return option in your area:**

We will send you a parcel stamp with which you can return the device to us free of charge. To do so, please contact us by e-mail at [Service@joy-it.net](mailto:Service@joy-it.net) or by telephone.

### **Packaging information:**

Please pack your old appliance securely for transportation. If you do not have suitable packaging material or do not wish to use your own, please contact us and we will send you suitable packaging.

## 6. SUPPORT

We are also there for you after your purchase. If you still have any questions or problems arise, we are also available by e-mail, telephone and ticket support system.

E-Mail: [service@joy-it.net](mailto:service@joy-it.net)

Ticket-System: <https://support.joy-it.net>

Phone: +49 (0)2845 9360 - 50 (Mon - Thur: 09:00 - 17:00 o'clock CET,  
Fri: 09:00 - 14:30 o'clock CET)

For further information, please visit our website:

[www.joy-it.net](http://www.joy-it.net)