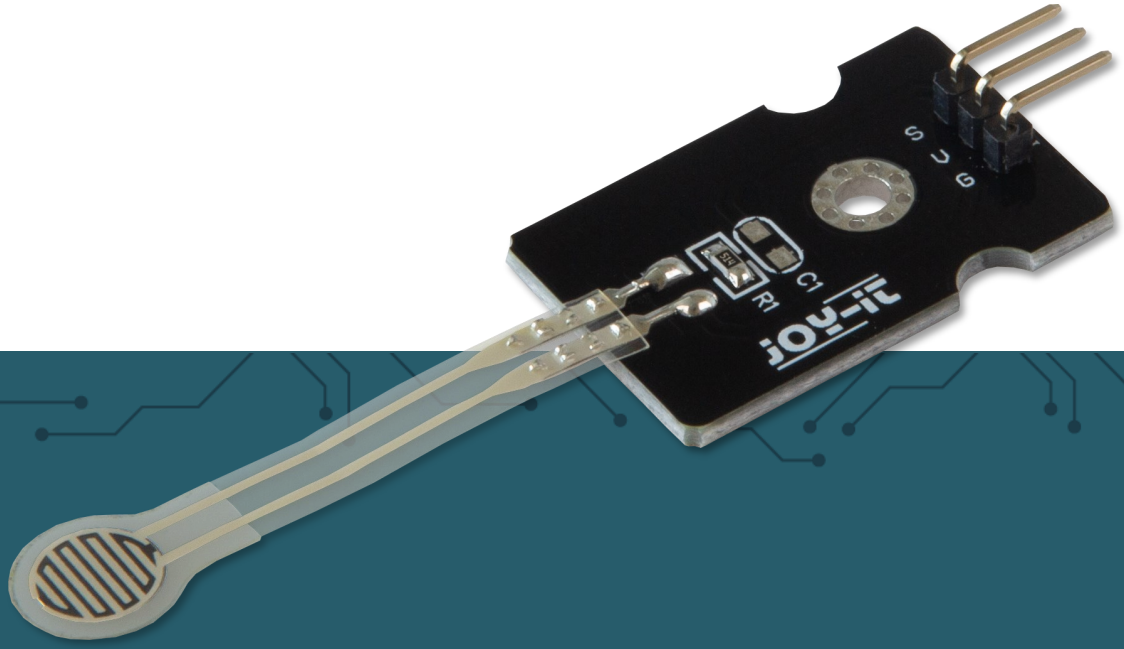


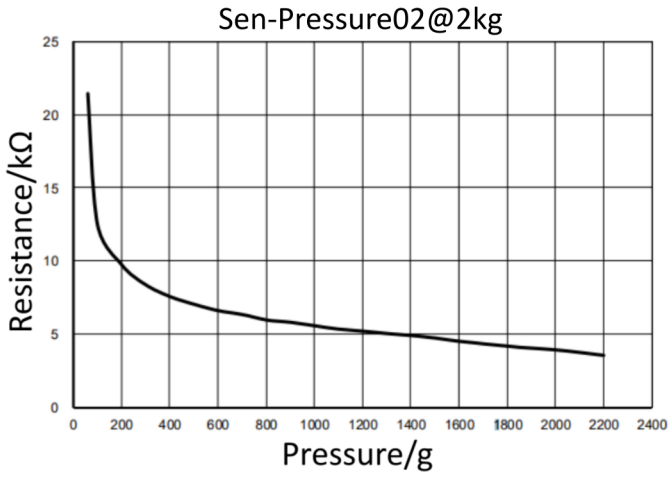
SEN-PRESSURE

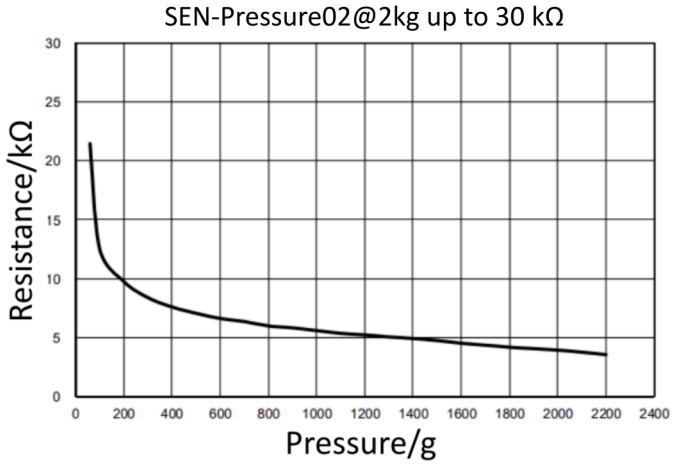
Thin Film Pressure Sensor

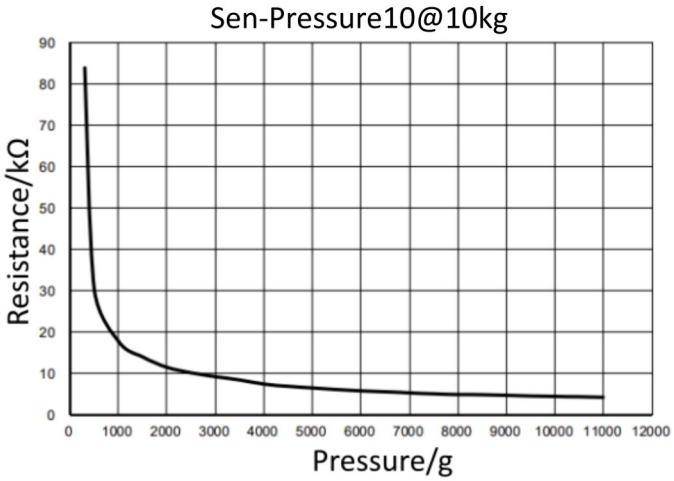
1. GENERAL INFORMATION

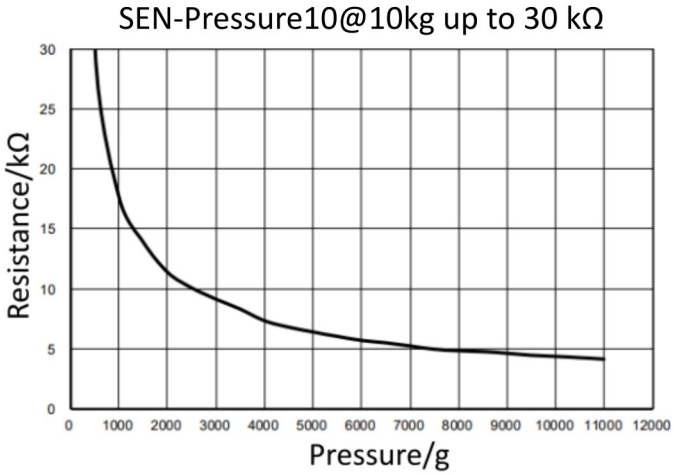
Dear customer,
thank you very much for choosing our product.
In the following, we will introduce you to what to observe while starting up and using this product.
Should you encounter any unexpected problems during use, please do not hesitate to contact us.

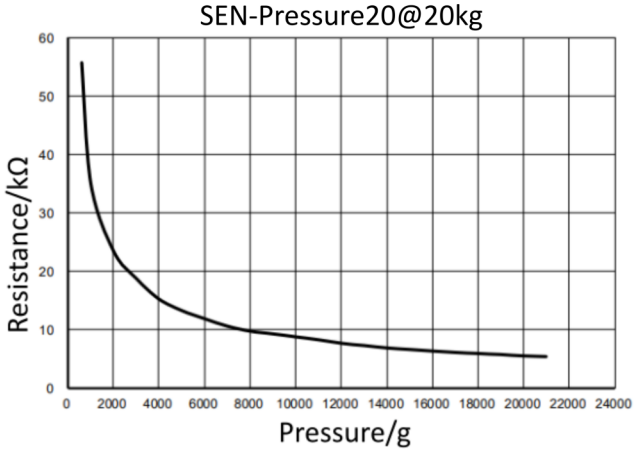
2. DIFFERENCES BETWEEN THE 3 DIFFERENT SENSORS

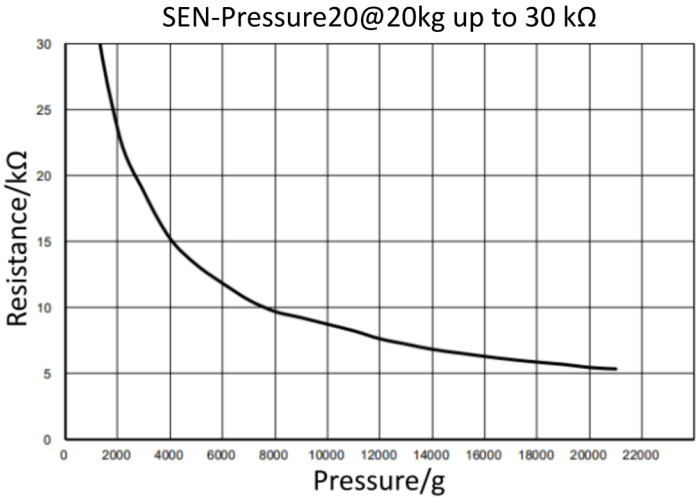












The diagram on the left shows the pressure-resistance relationship for the entire resistance range.

The right diagram is a partial section of the left diagram and shows the pressure-resistance relationship normalized for resistance values up to 30 kΩ.

The actual data should be tested after installation. All data without guarantee!

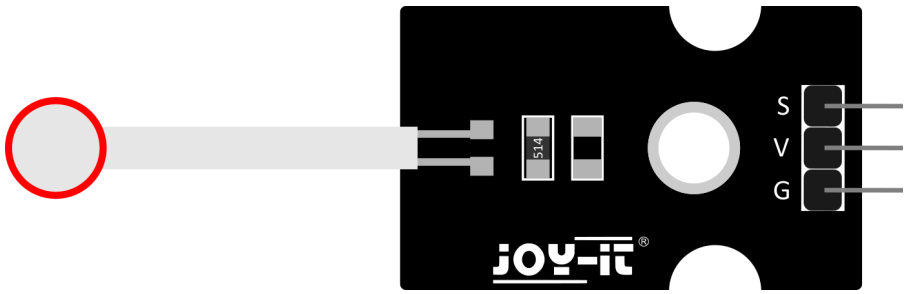
The following formula is used to calculate the voltage from the measured values:

$$VOUT = \frac{VCC}{RC + 510} \cdot 510$$

The above formula is composed of the **supply voltage (VCC)**, the **known resistor value from the above diagram (RC)** and the **known resistance value on the PCB of the sensor (510 kΩ).**

3. DETECTION OF THE SUPPORT SURFACE WITH WHICH MEASUREMENT IS CARRIED OUT

Important with this sensor is that you can only measure with a certain part of the sensor. The part which is used here for measuring is outlined in red in the figure below. This part is only **7.5 x 7.5 mm in size.**



4. CONNECT TO THE RASPBERRY PI

First connect the module to your Raspberry Pi.

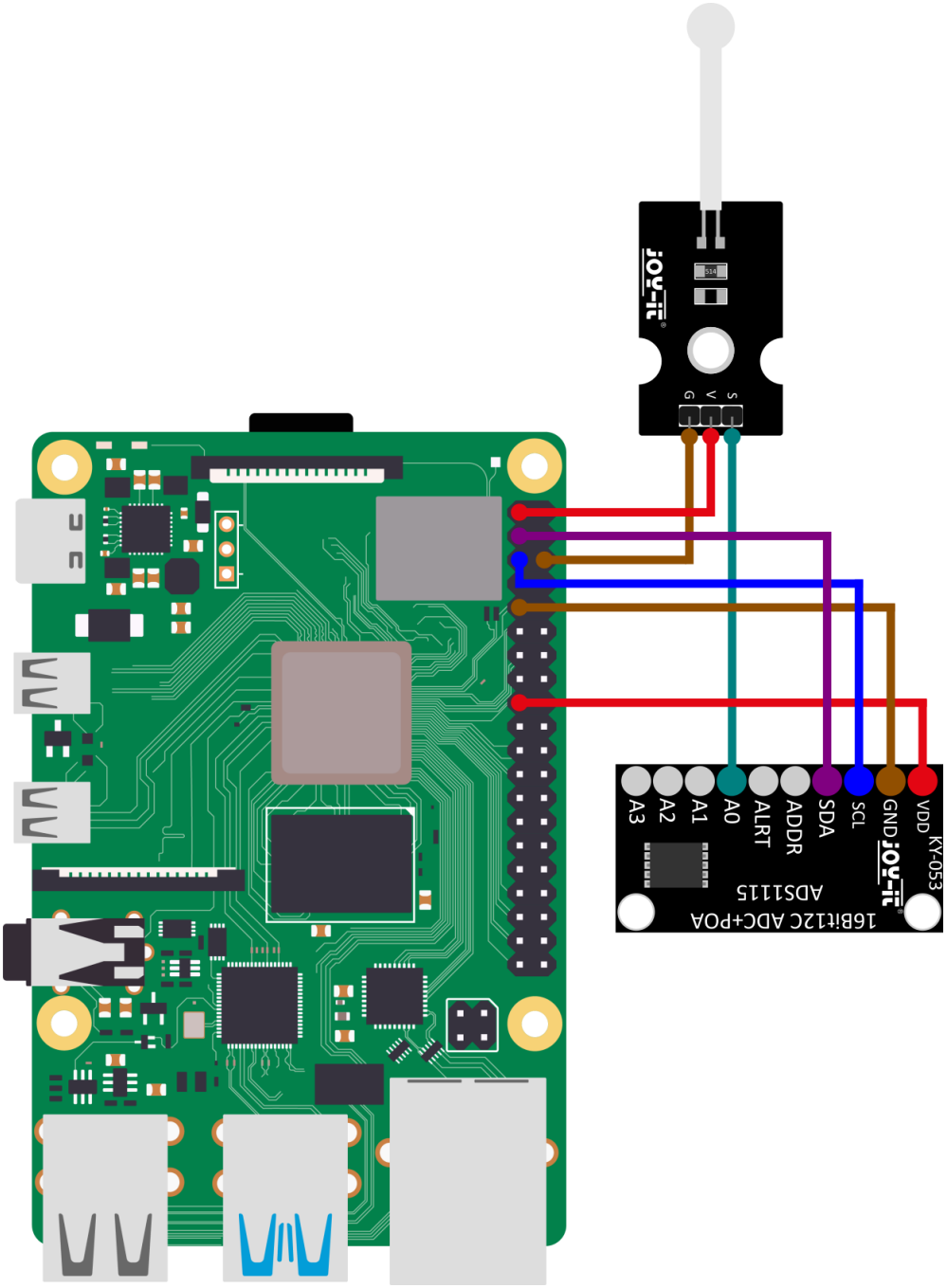
This pressure sensor is an analog sensor.

Since the Raspberry Pi has no analog inputs, you have to use an analog-to-digital converter. In this example we use the ADC **COM-KY053** from **Joy-IT**.

Raspberry Pi	COM-KY053
GND (Pin 9)	GND
3V3 (Pin 17)	VDD
SCL (Pin 5)	SCL
SDA (Pin 3)	SDA
-	ADDR
-	ALRT

SEN-Pressure	COM-KY053
S	ADS1115 (A0)

SEN-Pressure	Raspberry Pi
G	GND (Pin 6)
V	3V3 (Pin 1)



4.1 CODE EXAMPLE RASPBERRY PI

We provide a code example for use with the Raspberry Pi which you can download **here**. To be able to use the ADC you have to activate I2C first.

To do this, enter the following command:

```
sudo raspi-config
```

Now navigate to the item **Interfacing Options -> I2C** and activate the I2C interface.
You also need to install the ADC's Python library.

To do this, enter the following command:

```
sudo apt-get update

sudo apt-get install python3-pip

sudo pip3 install adafruit-circuitpython-ads1x15
```

In our following code example the analog value is read out via the ADC and then returned as voltage.

The value range of the sensor is from 0 to 3.3 V. Please note that the higher the analog input voltage, the higher the measured pressure acting on the sensor.

To do this, first open your console and enter

```
nano SEN-pressure.py
```

to create a file where you can copy the following code.

```
from time import sleep
import board
import busio
import adafruit_ads1x15.ads1115 as ADS
from adafruit_ads1x15.analog_in import AnalogIn
import RPi.GPIO as GPIO
GPIO.setmode(GPIO.BCM)

GPIO.setup(17, GPIO.IN)
# Create the I2C bus
i2c = busio.I2C(board.SCL, board.SDA)

# Create the ADC object using the I2C bus
ads = ADS.ADS1115(i2c)
# Create single-ended input on channels
chan0 = AnalogIn(ads, ADS.P0)
chan1 = AnalogIn(ads, ADS.P1)
chan2 = AnalogIn(ads, ADS.P2)
chan3 = AnalogIn(ads, ADS.P3)


try:
  while True:
    print("{:>5.3f}".format(chan0.voltage))
    sleep(2.5)
except KeyboardInterrupt:
  GPIO.cleanup()
```

You can then save the file with **CTRL+O** and close it with **CTRL+X**. To execute the file, you then only need to enter

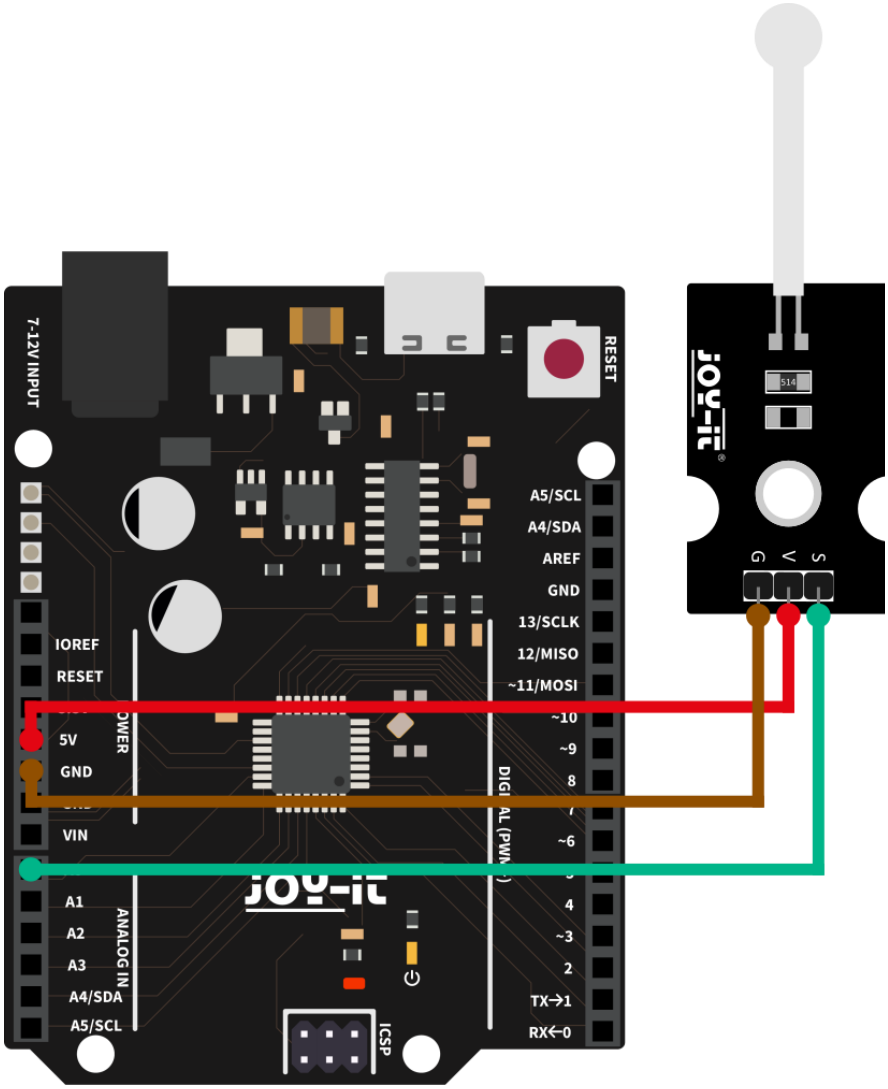
```
Python3 SEN-pressure.py
```

in the console. With CTRL+C you then terminate the code.

5. CONNECTING TO THE ARDUINO

First connect the module to your Arduino:

Arduino	SEN-Pressure
GND	G
5V	V
Analog Pin A0	S



5.1 CODE EXAMPLE ARDUINO

We provide a code example for use with the Arduino which you can download **here**.

The higher the analog input signal, the higher the measured force acting on the sensor. The value range is from 0 to 1023.
In the following code example the analog value of the sensor is read out every 2 seconds and displayed in the serial monitor.

You can transfer this code example with the **Arduino IDE** to your board.

Make sure that the **port** and the **board** are set correctly under **Tools**.

```
int val;
void setup() {
  // put your setup code here, to run once:
  pinMode(A0, INPUT);
  Serial.begin(9600);
}

void loop() {
  // put your main code here, to run repeatedly:
  val = analogRead(A0);
  Serial.println(val);
  delay(2000);
}
```

6. ADDITIONAL INFORMATION

Our information and take-back obligations according to the Electrical and Electronic Equipment Act (ElektroG)

Symbol on electrical and electronic equipment:

This crossed-out dustbin means that electrical and electronic appliances do not belong in the household waste. You must return the old appliances to a collection point.

Before handing over waste batteries and accumulators that are not enclosed by waste equipment must be separated from it.

Return options:

As an end user, you can return your old device (which essentially fulfills the same function as the new device purchased from us) free of charge for disposal when you purchase a new device.

Small appliances with no external dimensions greater than 25 cm can be disposed of in normal household quantities independently of the purchase of a new appliance.

Possibility of return at our company location during opening hours:
SIMAC Electronics GmbH, Pascalstr. 8, D-47506 Neukirchen-Vluyn, Germany

Possibility of return in your area:

We will send you a parcel stamp with which you can return the device to us free of charge. Please contact us by email at Service@joy-it.net or by telephone.

Information on packaging:

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.

7. SUPPORT

If there are still any issues pending or problems arising after your purchase, we will support you by e-mail, telephone and with our ticket support system.

Email: **service@joy-it.net**
Ticket system: **http://support.joy-it.net**
Telephone: +49 (0)2845 9360-50 (10-17 o‘clock)

For further information please visit our website:
www.joy-it.net

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