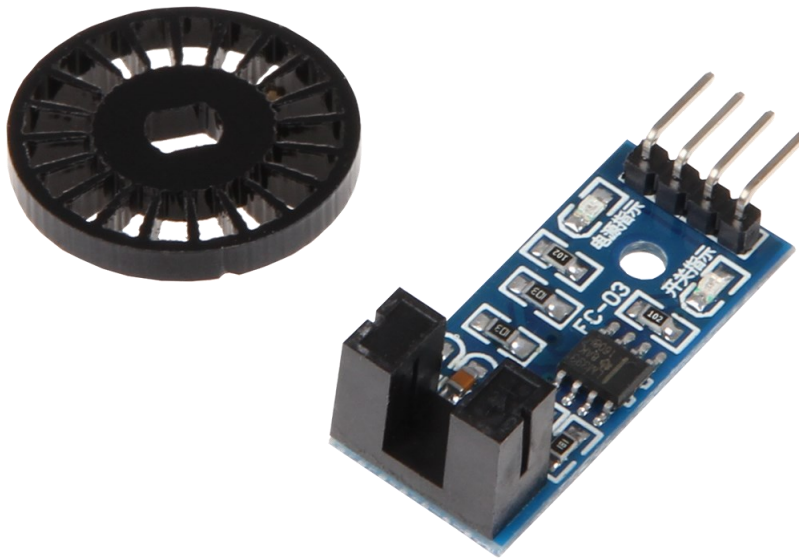# SPEED SENSOR
Speed sensor LM393 with punched disk

1. GENERAL INFORMATIONEN

Dear customer,

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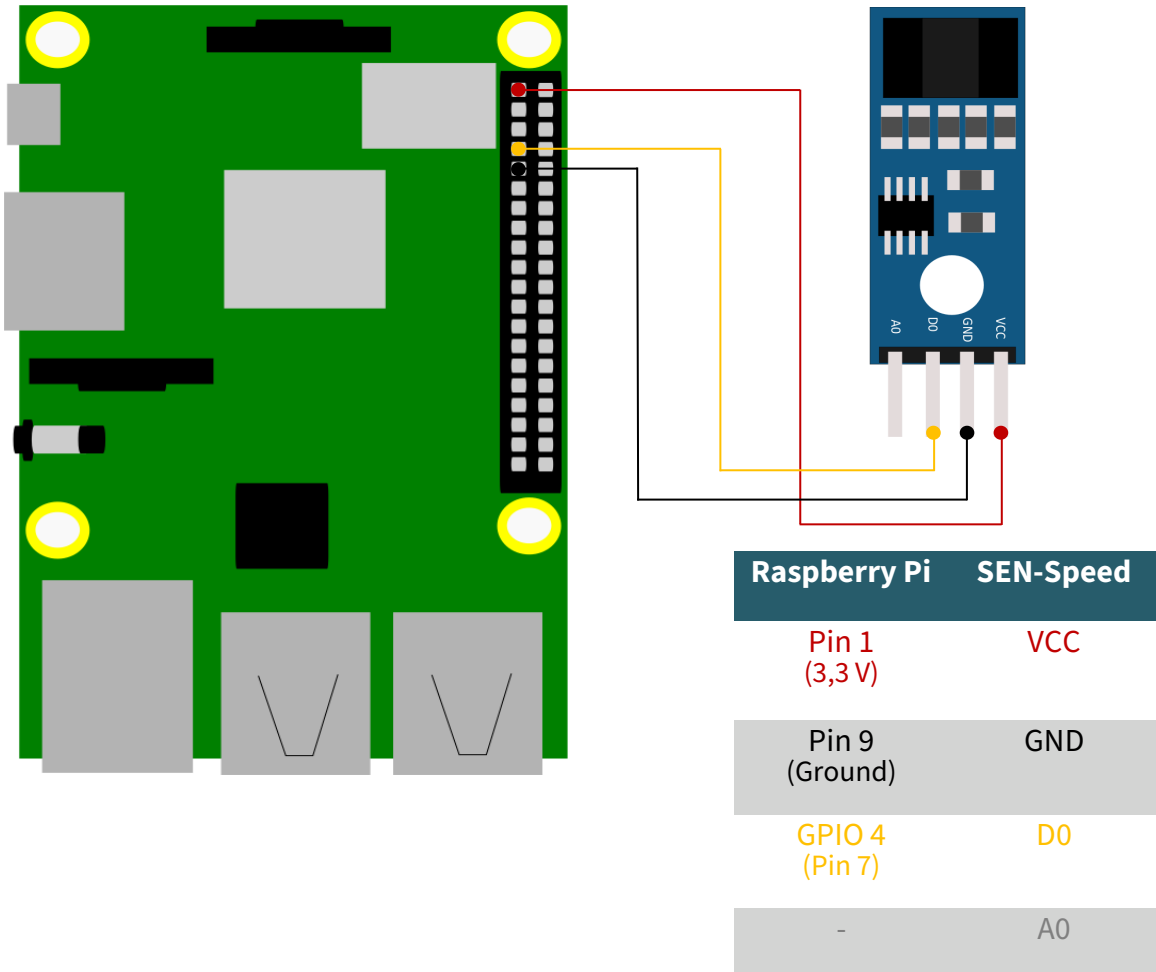
Should you encounter any unexpected problems during use, please do not hesitate to contact us.

> **i** 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.

1. Connection

Raspberry Pi	SEN-Speed
Pin 1 (3,3 V)	VCC
Pin 9 (Ground)	GND
GPIO 4 (Pin 7)	D0
-	A0

2. Code example Raspberry Pi (Python)

This sensor is used to measure the speed of motors. It uses an encoder disk with holes (here: 20), which pass through a light barrier. This disk is normally fixed to the shaft of the motor. The light barrier can count the holes of the encoder disk so that the rotations can be counted.

The following is an example code with which you can output the number of rotations of the disk per minute in a 10 second interval.

To do this, first create a file with the following command:

```
nano sen-speed.py
```

Then, copy the following code example into this file.

Alternatively, you can download the files from our website download joy-it.net.

```python
from gpiozero import DigitalInputDevice
import threading
import time

class ResettableTimer(threading.Thread):
    def __init__(self, interval, function):
        super().__init__()
        self.interval = interval
        self.function = function
        self.timer = None
        self.running = False
        self.daemon = True  # Optionally make this a daemon thread

    def run(self):
        self.running = True
        while self.running:
            self.timer = threading.Timer(self.interval, self.function)
            self.timer.start()
            self.timer.join()

    def stop(self):
        self.running = False
        if self.timer:
            self.timer.cancel()

def count():
    global counter
    counter += 1

def output():
    global counter
    speed = int((counter / 2) * calc / wheel)
    print("Drehzahl pro Minute:", speed)
    counter = 0

counter = 0
pin = 4  # Using BCM pin numbering
interval = 10.0
calc = 60 / interval
wheel = 20

# Setup the GPIO pin
device = DigitalInputDevice(pin, pull_up=False)
device.when_activated = count

# Create and start the timer
timer = ResettableTimer(interval, output)
timer.start()

try:
    # Keep the main program running
    while True:
        time.sleep(1)
except KeyboardInterrupt:
    timer.stop()
    timer.join()
    device.close()
```
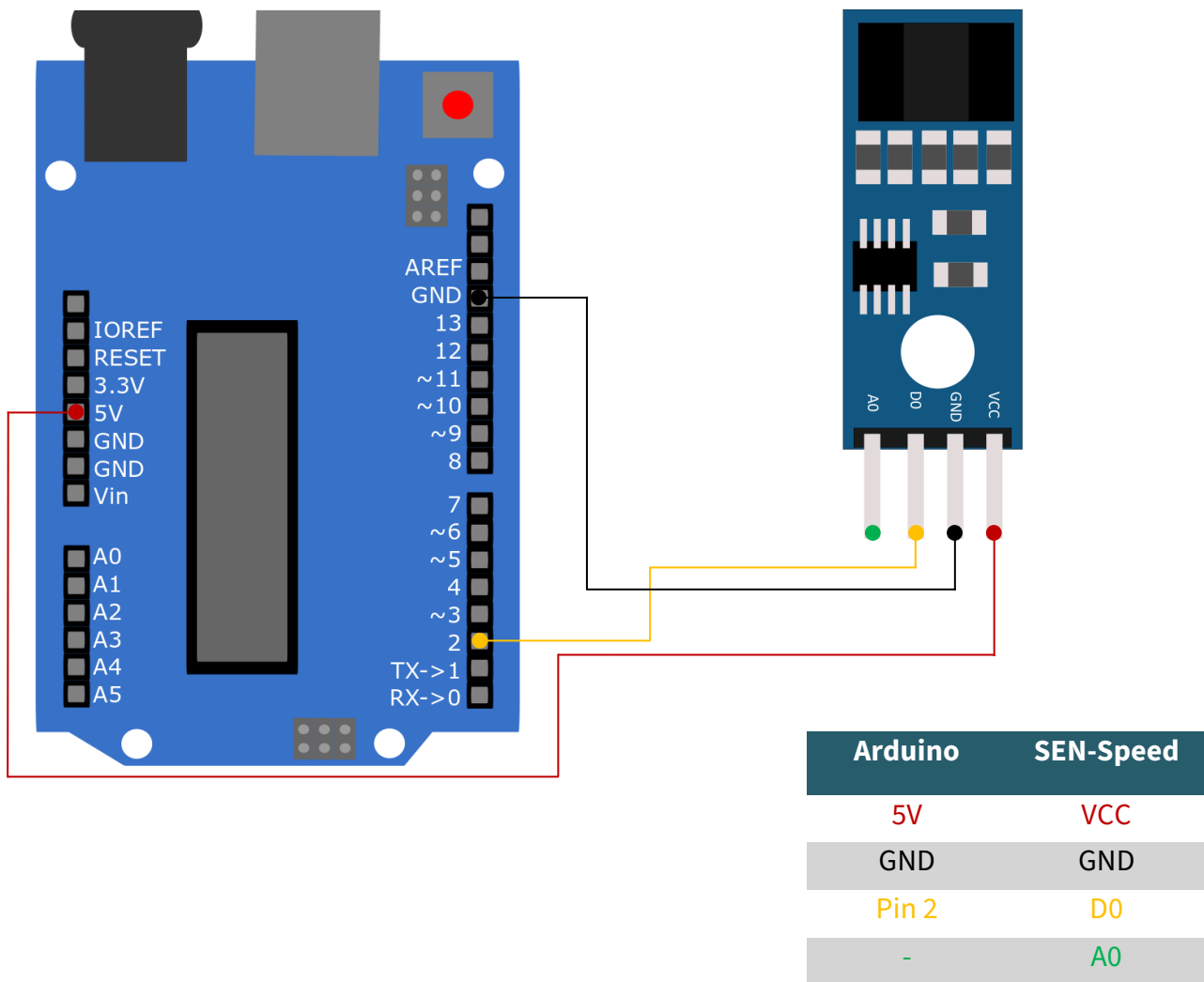
Save the file with **CTRL+O** and leave the editor with **CTRL+X**. Now, you can execute the code example with the following command.

```
python3 sen-speed.py
```

1. Connection

Arduino	SEN-Speed
5V	VCC
GND	GND
Pin 2	D0
-	A0

2. Code example Arduino

This sensor is used to measure the speed of motors. It uses an encoder disk with holes (here: 20), which pass through a light barrier. This disk is normally fixed to the shaft of the motor. The light barrier can count the holes of the encoder disk so that the rotations can be counted.
The following is an example code with which you can output the number of rotations of the disk per minute in a 10 second interval.

To use this sample code, make sure that the port and board are correctly selected in your Arduino IDE. It must also have set the baud rate of the serial monitor to 9600. Furthermore, the library TimerOne must be installed.

After you have verified this, copy the following code into your Arduino IDE.

Alternatively, you can download the files from our website download joy-it.net.

```
// sen-speed Demo
// The code measures the revolutions of the encoder disk over a period of
// time (5 seconds by default), then converts it to revolutions per minute
// and outputs it via the serial interface.

// library import
#include "TimerOne.h"
#define pin 2


// needed variables
int interval, wheel, counter;
unsigned long previousMicros, usInterval, calc;

void setup()
{
  counter = 0;  // setting counter to 0
  interval = 5;  // 5 second interval
  wheel = 20; // number of encoder disc holes

  calc = 60 / interval;  // calculate interval to one minute
  usInterval = interval * 1000000;  // convert interval to micro
                                    // seconds
  wheel = wheel * 2;  // number of encoder disc wholes times 2

  pinMode(pin, INPUT);  // setting pin 2 as input
  Timer1.initialize(usInterval);  // initialize timer with interval time
  attachInterrupt(digitalPinToInterrupt(pin), count, CHANGE);
  // executes count, if the level on pin 2 changes

  Timer1.attachInterrupt(output);  // executes output after interval time
  Serial.begin(9600);  // starts serial interface with 9600 Baud
}

// counts holes on disc (with filter)
void count(){
  if (micros() - previousMicros >= 700) {
    counter++;
    previousMicros = micros();
  }
}

// output to serial
void output(){
  Timer1.detachInterrupt(); // interrupts the timer
  Serial.print("Drehzahl pro Minute: ");
  int speed = ((counter)*calc) / wheel;
  // calculate round per minute

  Serial.println(speed);
  counter = 0;  // resetting the counter
  Timer1.attachInterrupt(output);  // restarts the timer for output
}

void loop(){
 // no loop needed
}
```

You can execute the code by clicking on the "Upload" button.

Our Information and Take-back Obligations according to the Electrical and Electronic Equipment Act (ElektroG)

Symbol on Electrial and Electronic Products:
This crossed-out bin means that electrical and electronic products do not belong into the household waste. You must hand over your old appliance to a registration place. Before you can hand over the old appliance, you must remove used batteries and replacement batteries which are not enclosed by the device.

Return Options:
As the end user, you can hand over your old appliance (which has essentially the same functions as the new one bought with us) free of charge for disposal with the purchase of a new device.
Small devices, which do not have outer dimensions bigger than 25 cm can be handed in for disposal independently of the purchase of a new product in normal household quantities.

1. Possibility of return at our company location during our opening hours
Simac Electronics Handel GmbH, Pascalstr. 8, D-47506 Neukirchen-Vluyn

2. Possibility of return nearby
We will send you a parcel stamp with which you can send us your old appliance free of charge. For this possibility, please contact us via e-mail at pickup@joy-it.net or via telephone, then please dial 02845 93 60 -23

Information about Package:
Please package your old appliance safe for transport. Should you not have suitable packaging material or you do not want to use your own material, you can contact us and we will send you an appropriate package.

If any questions remained open or problems may arise after your purchase,we are available by e-mail, telephone and ticket support system to answer these.

E-Mail: service@joy-it.net

Ticket-system: https//support.joy-it.net

Telephone: +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 visit our website:
www.joy-it.net

Published: 2024.05.03