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Last Updated February 20, 2022

Information for the SCD30 CO_2 Sensor

Introduction

- The SCD30 is a low-cost NDIR-based sensor that measures CO_2, temperature, and humidity.
- Any microcontroller can control this sensor. However, this guide and the associative codes use an Arduino Uno to operate the device.
- It is compatible with three different communication methods: I^2C, UART, and PWM. This guide only covers how to use I^2C.
- A separate device, the Bi-Directional Logic Level Converter, is needed to operate the sensor more reliably.

Important Notes

- This device is EXTREMELY sensitive to electrostatic discharge.
- NEVER touch the sensor UNLESS wearing Anti-Static Gloves.
- Even if the sensor is not connected to a power source, exercise extreme caution.
- DO NOT place the SCD30 in direct contact with sunlight.

Specifications

	Via I^2C
Range	0 – 40,000 ppm
Accuracy	± (30 ppm + 3%MV) for 400-10000 ppm
Repeatability	± 10 ppm
Frequency	2.1 sec
Current	19 mA (avg) 75 mA (max)
Voltage	3.3 V - 5.5 V
Response Time	20 sec (τ63%)
Lifespan	15 years

Links

- Product Info for Sensor: https://sensirion.com/products/catalog/SCD30/
- Product Info for Level Converter: https://www.sparkfun.com/products/12009
- Arduino Library: https://github.com/sparkfun/SparkFun_SCD30_Arduino_Library
- Arduino Code https://github.com/RiceAllDay22/EGI_Arduino_Collection/tree/main/SCD30

Wiring

- To operate the sensor, a minimum of 4 pins are required to be connected to an Arduino:
  - VIN (Voltage Input)
  - GND (Ground)
  - SCL (Clock Line for I^2C communication)
  - SDA (Data Line for I^2C communication)
- The sensor can accept a voltage input range of 3.3V to 5.5 V.
- The I^2C pins can be at 5V but are highly recommended to be at 3.3 V.
- Therefore, the sensor can be wired up in two ways.

Wiring – Method #1 (Recommended for reliability)

- This method powers the sensor at 5V with the SCL and SDA lines operating at 3.3 V using a Bi-Directional Logic Converter.
- Below is a wiring diagram and a schematic diagram of the circuit.

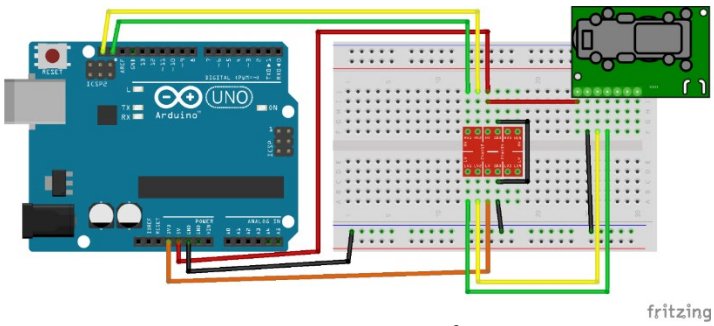

Figure 1. Wiring Diagram for I^2C lines at 3.3 V

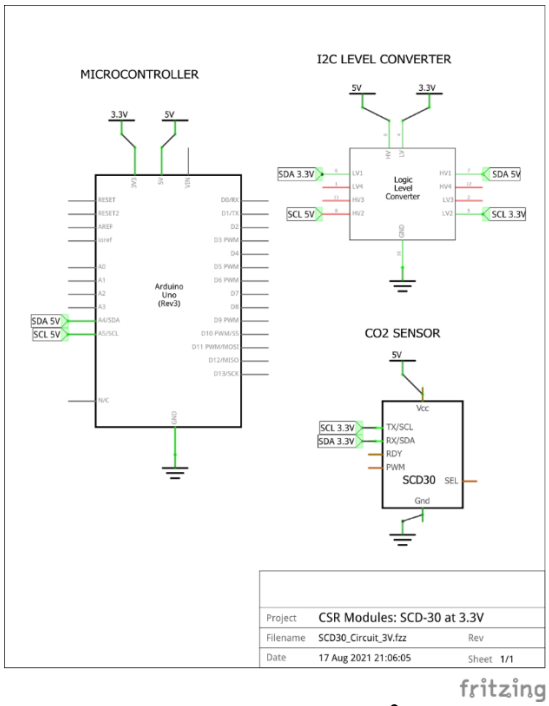

Figure 2. Schematic Diagram for I^2C lines at 3.3 V

Wiring – Method #2 (Not recommended, but is simpler)

- This method powers the sensor at 5V with the SCL and SDA lines operating at 5 V. Below is a wiring diagram and a schematic diagram of the circuit.

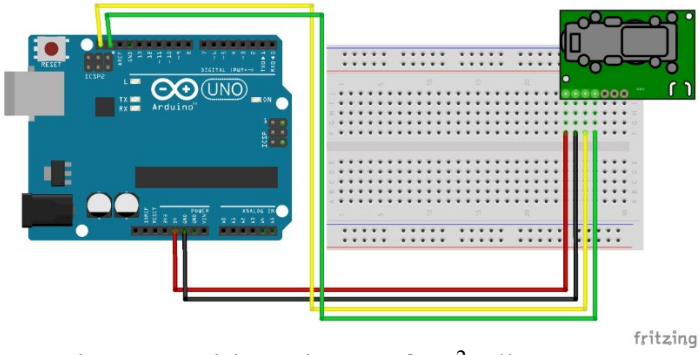

Figure 3. Wiring Diagram for I^2C lines at 5 V

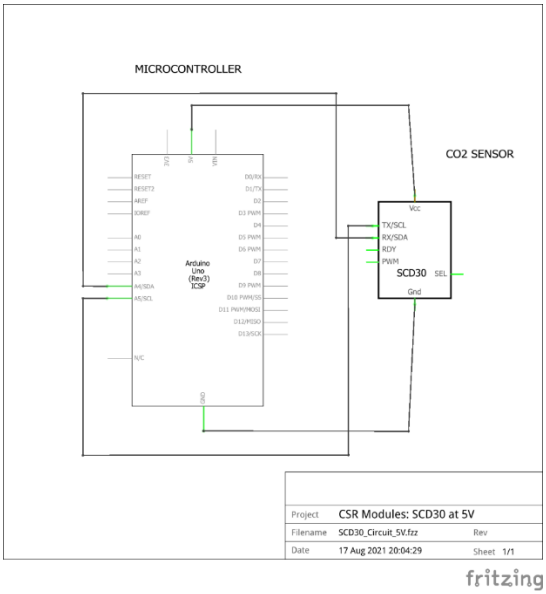

Figure 4. Wiring Diagram for I^2C lines at 5 V

Calibration

- Manual calibrations occur via software.
- The following line of Arduino code performs a calibration to 1000 ppm:
  - airSensor.setForcedRecalibrationFactor(1000)
  - The number inside the parentheses can is changeable to any value

Contact

For any questions or assistance, email Adriann Liceralde at adriann8399@gmail.com.