Datasheet:

another bright idea!
MONK MAKES

CO2 MINI FOR MICRO:BIT

V1A - 2024-04-17

This board provides a CO2, temperature and Relative Humidity measurements to a BBC micro:bit.

- Powered by the micro:bit
- Reverse polarity protection
- LED power indicator
- RGB LED Air Quality indicator
  Green – under 1000ppm,
  Orange – under 3000ppm,
  Red – over 3000ppm
- Relative Humidity
- Temperature
- Serial interface

Absolute Maximum Ratings

		Units
Max. supply voltage	5.5	V

Sensing (SCD41 Sensor)

		Units
CO2 concentration range	400-5000	ppm
Temperature	-10-+60	C
Relative humidity	0-100	%

Electrical Characteristic

|		Units
Max. Current consumption	30	mA
Supply voltage	2.4-5.5	V
Serial interface baud rate	9600	baud

CE RoHS3

Sensing Specification

This board uses the SCD41 Sensirion sensor Module. For more information on the sensors' accuracy and precision, see the link below.

https://sensirion.com/media/documents/48C4B7FB/6426E14D/CD_DS_SCD40_SCD41_Datasheet_D1_052023.pdf

Schematic
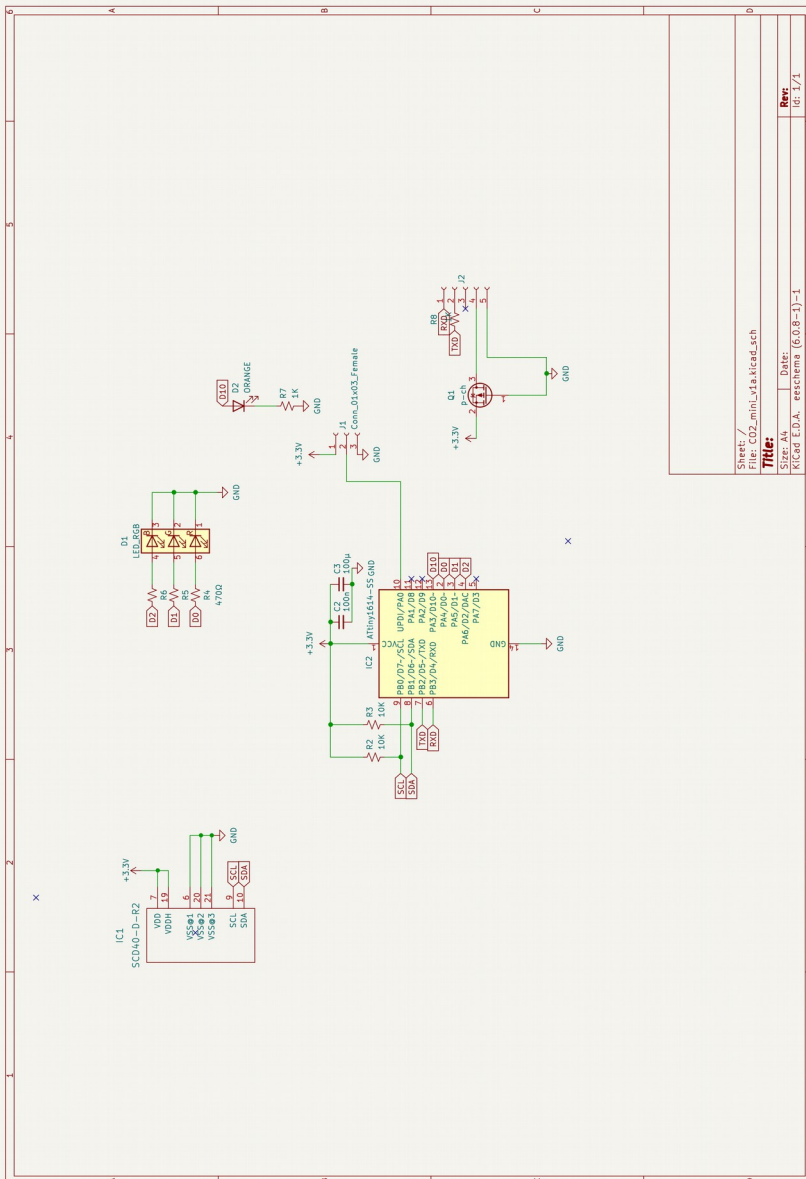
Serial Protocol

All communication is at 9600 baud 8N1. Commands are a single letter with no terminating character or line feed required. Any extraneous command characters are ignored by the board. Some commands are followed by a response from the board within a few milliseconds. The responses are variable length and terminated with a \n character.

Command	Response	
c	c=550\n	Returns the CO2 level in ppm as an integer
t	t=20.5\n	Returns the temperature in degrees C as a float
h	h=50.5\n	Returns the relative humidity % as a float
k	no response, LED blinks Blue once.	Calibrate to 400ppm. **IMPORTANT NOTE BELOW**
m=2000	no response, LED blinks blue 4 times.	Set altitude compensation to value in metres
j	{"co2" : 550, "humidity":50, "temp":20}	Returns all three readings in JSON format
L	no response	Turn on the LED to display the current CO2 level.
l	no response	LED off
v	2\n	Returns the firmware version
f	no response, LED blinks blue 5 times.	Factory reset **IMPORTANT NOTE BELOW**

IMPORTANT NOTE. The k and f commands both cause the SCD41 to write to EEPROM. This EEPROM is only good for about 2000 writes, after the SCD41 sensor will not operate normally. So call these sparingly.

Self Test

When the sensor first starts up it goes through a self-test routine, turning the RGB LED red, green and blue in turn. The LED will then blink blue for a few seconds while the sensor stabilizes.

If there is a problem during the self test, then the orange LED in the MonkMakes logo will blink an error message. The number of blinks indicates the problem with the board.

* 1 - couldn't connect to sensor using I2C

* 2 - couldn't take the sensor out of continuous measurement mode

* 3 - couldn't put the sensor into continuous measurement mode