



## SparkFun gator:environment - micro:bit Accessory Board

SEN-15269

The SparkFun gator:environment micro:bit Accessory Board utilizes the popular CCS811 and BME280 ICs to take care of all of your environmental readings of atmospheric quality. This sensor board can provide a variety of environmental data, including barometric pressure, humidity, temperature, equivalent TVOCs and equivalent CO<sub>2</sub> (or eCO<sub>2</sub>) levels. The gator:environment connects to the SparkFun gator:bit via alligator-clip cables, allowing for easy access to the micro:bit's I<sup>2</sup>C pins.

The CCS811 is a digital metal oxide (MOX) gas sensor that detects wide range of Volatile Organic Compounds (VOCs). With an integrated microcontroller that implements special algorithms to process the raw measurements, the CCS811 outputs the equivalent total VOC (eTVOC) and equivalent CO<sub>2</sub> (eCO<sub>2</sub>) values over an I<sup>2</sup>C connection. It provides readings for the total volatile organic compounds in the parts per billion (PPB) and equivalent CO<sub>2</sub> (or eCO<sub>2</sub>) in the parts per million (PPM). It also has a feature that allows it to fine tune its readings if it has access to the current humidity and temperature. Luckily for us, the BME280 provides humidity, temperature, and barometric pressure! This allows the sensors to work together to give us more accurate readings than they'd be able to provide on their own.

Note: Unfortunately, CO<sub>2</sub> isn't a VOC and MOX type of sensors can't directly measure CO<sub>2</sub>, despite being great at VOC detection. However, in an indoor setting, humans are a primary source of VOCs through the process of breathing. The equivalent CO<sub>2</sub> (eCO<sub>2</sub>) values are then estimated based on algorithms that are used to analyze the sensor data to determine the TVOC attributed by the presence of humans. This type of sensor should not be used in applications that directly require the measurement of CO<sub>2</sub>; it is an inferred value.

The micro:bit is a pocket-sized computer that lets you get creative with digital technology. Between the micro:bit and our shield-like bit boards you can do almost anything while coding, customizing and controlling your micro:bit from almost anywhere! You can use your micro:bit for all sorts of unique creations, from robots to musical instruments and more. At half the size of a credit card, this versatile board has vast potential!

## FEATURES

- gator:bit Compatible
- CCS811
  - Operating Voltage: 1.8V-3.6V
  - Supply Current: 30 mA (average)
  - Equivalent Total VOCs (eTVOC): 0-32768 ppb
  - Equivalent CO<sub>2</sub> (eCO<sub>2</sub>): 400-29206 ppm
  - I<sup>2</sup>C Address: 0x5B (HEX)
- BME280
  - Operating Voltage: 1.71V-3.6V
  - Supply Current: < 714  $\mu$ A
  - Humidity Range: 0 to 100% RH
  - Temperature Range: -40°C to 85°C
  - Pressure Range: 300 to 1100 hPa
  - I<sup>2</sup>C Address: 0x77 (HEX)

