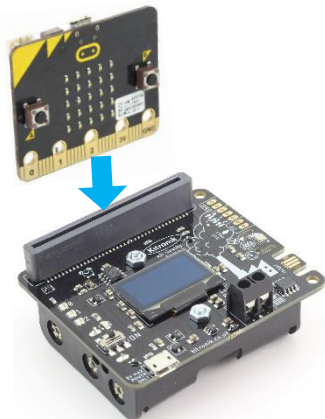


Air Quality Board for BBC micro:bit

Introduction: The Air Quality Board provides a variety of sensor inputs and connection points for the BBC micro:bit and provides the ability to log, store and display data effectively with onboard memory and an OLED screen.

The board includes an integrated Edge Connector for your BBC micro:bit to easily slot into. The BBC micro:bit can then read inputs from a BME688 air quality and environmental sensor (temperature, pressure, humidity, air quality index and eCO₂) and a Real Time Clock. There is a black and white 128x64 OLED display screen and 3 status ZIP LEDs for visually displaying data. For data logging, there is 1Mbit of onboard EEPROM memory. There are also 3 BBC micro:bit pins broken out to 0.1" pitch solder pads as further inputs and outputs, along with pads for 3V and GND.

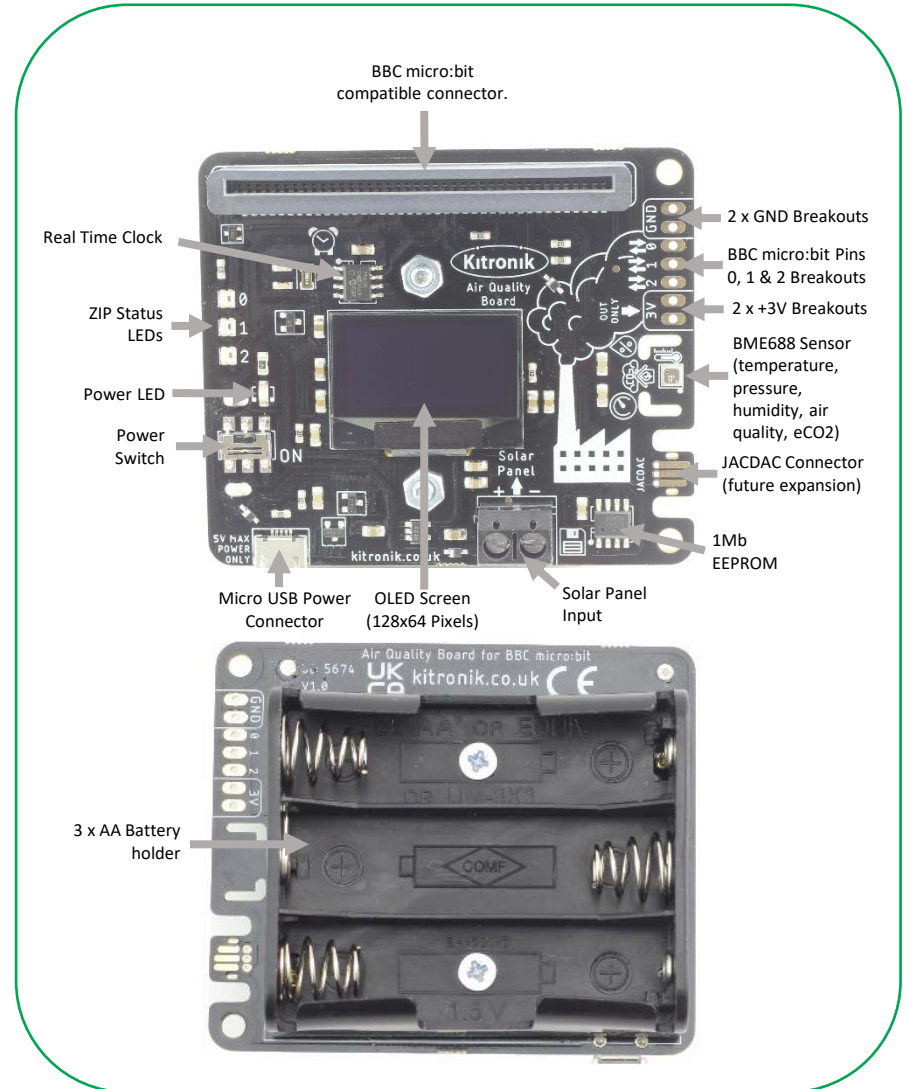
Power is provided via the 3xAA battery holder or the micro USB connector. The voltage supply is controlled using a power switch, with a green LED to indicate when the board is turned on. The board also produces a regulated 3V supply which is fed into the edge connector to power the inserted BBC micro:bit, removing the need to power the BBC micro:bit separately.



On the board is a connection point for a solar cell, including a blocking diode, to recharge batteries.

NOTE: Please ensure the correct rechargeable batteries are fitted before charging, they should be NiMH.

Inserting a BBC micro:bit: To use the air quality board the BBC micro:bit should be inserted firmly into the connector as shown to the left.



Electrical Information

Operating Battery Voltage (Vcc)	+5V max
Operating USB Connector Voltage	+5V DC max
Solar Cell Input	+5V max. Includes blocking diode
Power Output Pins	2 x 3V, 2 x GND (100mA current draw max)
Additional Input / Output Pins (Digital & Analogue)	P0, P1, P2
ZIP LED control Pin	P8
BME688, RTC, OLED Display & EEPROM control	P19, P20 (I2C lines)
BME688 operating range	Pressure: 300hPa – 1100hPa Temperature: -40°C – 85°C Humidity: 0%RH – 100%RH Index for Air Quality (IAQ): 0 – 500 [0 = Excellent, 500 = Extremely Polluted] eCO2: 250 – 40000+ ppm [Estimated]

MakeCode Blocks Editor Code

Kitronik have designed a custom extension to support the use of the Air Quality Board in the micro:bit MakeCode Block editor. This can be added via the add Extensions function in the editor by searching “Kitronik” or from: <https://github.com/KitronikLtd/pxt-kitronik-air-quality>

This example code will help get you started:

The blocks in the “on start” bracket setup the gas sensor in the BME688 and then take some initial readings to form baselines for gas resistance and ambient temperature (these are required for air quality calculations).

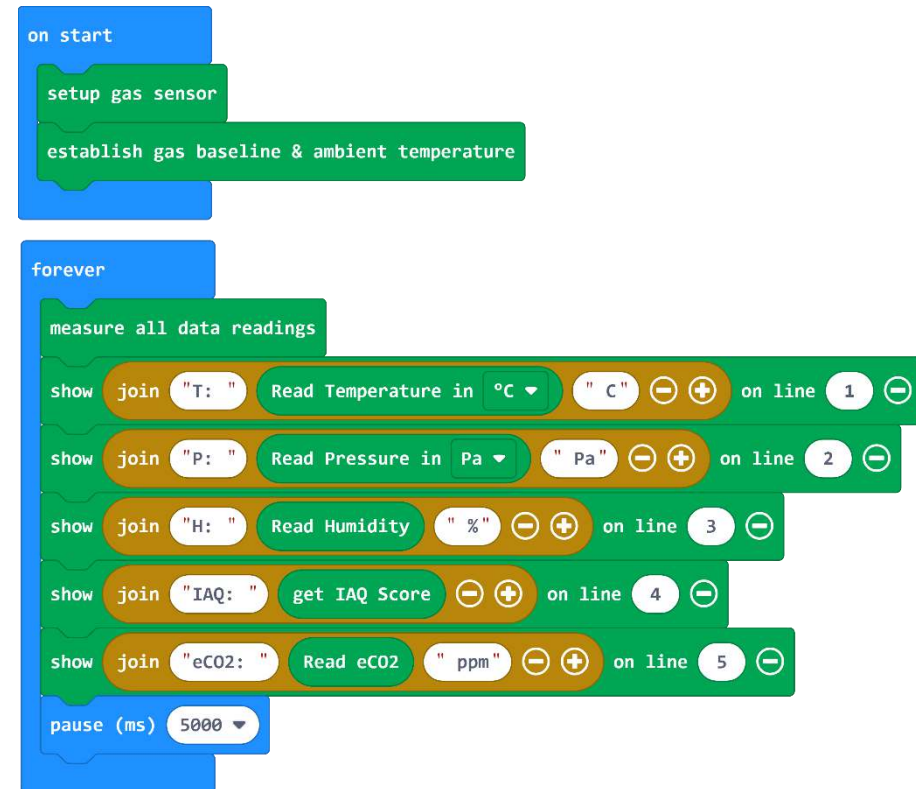
In the “forever” loop, first, all the different measurements are taken on the BME688, and then these readings are displayed on different lines of the OLED display screen on the Air Quality Board. For example:

Line 1 – T: 25 C
Line 2 – P: 10008 Pa
Line 3 – H: 46 %
Line 4 – IAQ: 76
Line 5 – eCO2: 529 ppm

This loop repeats every 5 seconds.

For more information on programming the Air Quality Board visit:

kitronik.co.uk/5674



```
on start
  setup gas sensor
  establish gas baseline & ambient temperature

forever
  measure all data readings
  show join "T: " Read Temperature in °C " C" on line 1
  show join "P: " Read Pressure in Pa " Pa" on line 2
  show join "H: " Read Humidity "%" on line 3
  show join "IAQ: " get IAQ Score on line 4
  show join "eCO2: " Read eCO2 " ppm" on line 5
  pause (ms) 5000
```

Dimensions

