Environmental Control Board for the BBC micro:bit

www.kitronik.co.uk/5697

Introduction: The Environmental Control Board provides a variety of sensor inputs and connection points for the BBC micro:bit and provides the ability to control outputs such as a water pump or heater pad. This makes it ideal for feedback control systems.

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 BME 280 environmental sensor (temperature, pressure & humidity) and a Real Time Clock. There is an onboard piezo buzzer, 2 1A outputs (ideal for a water pump, heater pads or fan), 3 status ZIP LEDs, a ZIP LED expansion connector and servo output. In addition to these, 3 BBC micro:bit pins are broken out to croc-clip connections as further inputs and outputs, along with pads for 3V and GND.

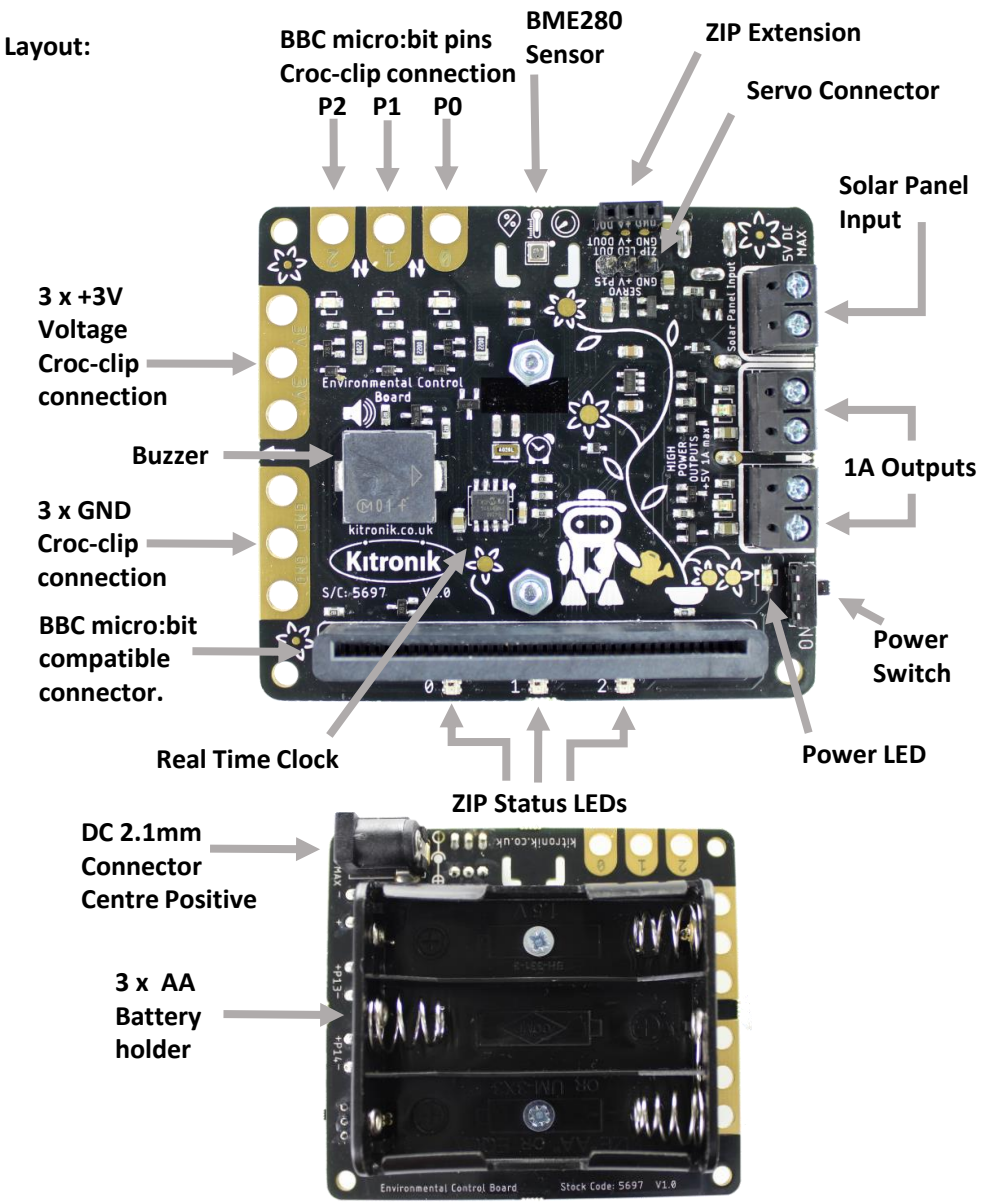
Power is provided via the 3xAA battery holder or the 2.1mm DC Jack. The voltage supply is controlled using a power switch, with a green LED to indicate when the board is turned on.

The board 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 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 environmental control board the BBC micro:bit should be inserted firmly into the connector as shown to the left.

Layout:



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Electrical Information

Operating Battery Voltage (Vcc)	+5V max
Operating 2.1mm Jack Voltage	+5V DC max (Centre Positive)
Solar Cell Input	+5V max
High Power Output	2 (Output at Vcc voltage, max current draw 1A per channel)
High Power Output control pins	P13, P14
Additional Input Output pins	P0, P1, P2
ZIP LED control pin	P8
Piezo Buzzer	P12
Servo Control pin	P15
BME280 and RTC control	P19, P20 (I2C lines)
BME280 operating range	Pressure: 300hPa – 1100hPa Temperature: -40°C – 85°C Humidity: 0%RH – 100%RH

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Makecode Blocks Editor Code

Kitronik have created a custom extension to support the use of the Environmental Control 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-smart-greenhouse

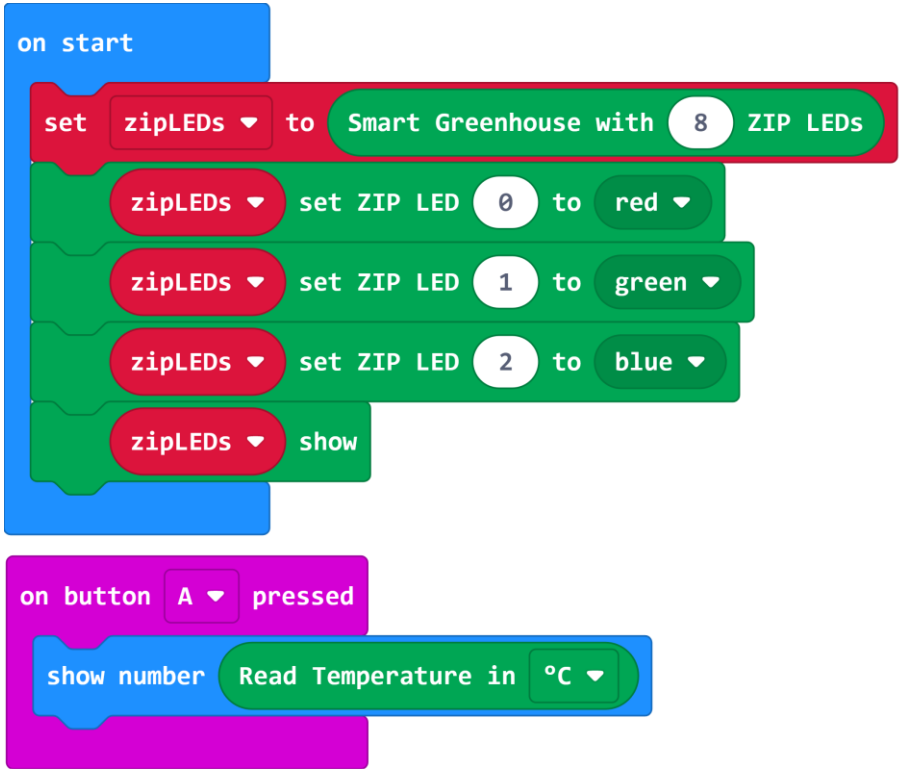
This example code will help get you started:

The blocks in the “onStart” bracket are all from the ZIP LED section. First, setup the ZIP LEDs (3 on the board and 5 on the expansion point by default). The next three blocks assign a colour to a certain LED. Finally, the “show” block will illuminate the LEDs with the colours that have been set.

The “on button A” block uses the standard “show number” block from the Basic category to display the temperature, measured using the “Read Temperature” block from the Sensors section of the Smart Greenhouse. Each time button A on the BBC micro:bit is pressed, a temperature reading will be taken and displayed on the BBC micro:bit screen.

For more information on programming the Environmental Control Board visit: kitronik.co.uk/5697

Example micropython code for the BBC micro:bit is also available at:
https://github.com/KitronikLtd/micropython-microbit-kitronik-smart-greenhouse



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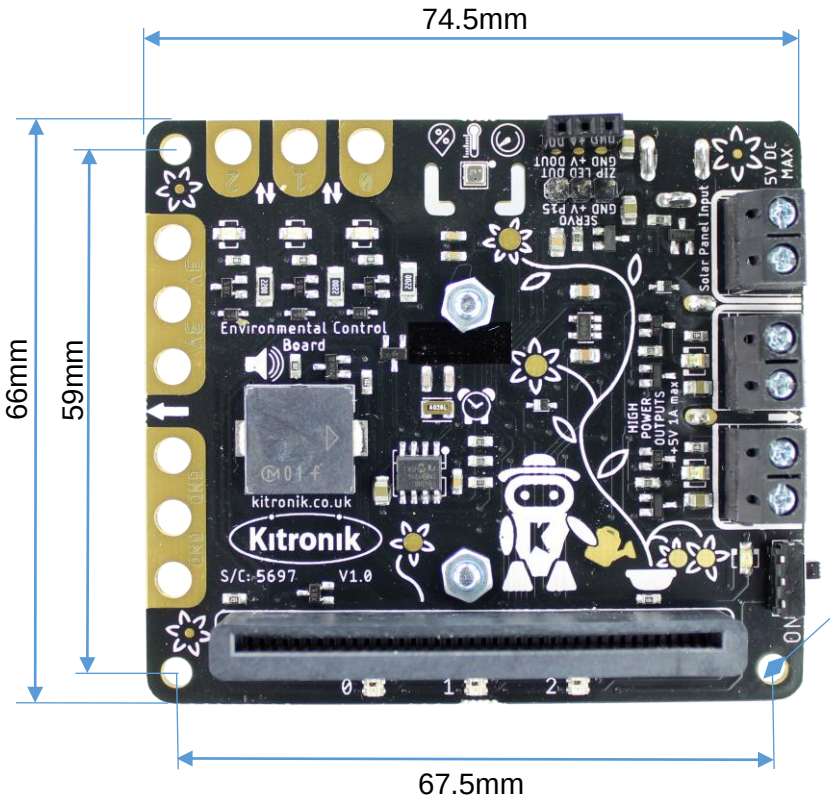
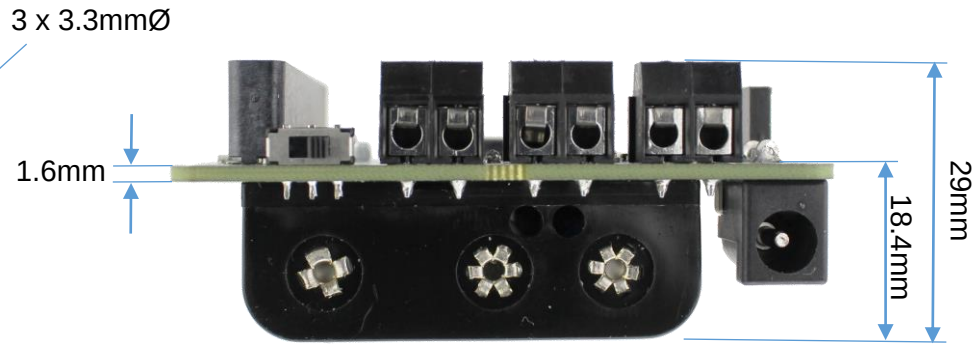
Dimensions





(Dimensions +/- 0.8mm)

2.1mm Connector - Centre Positive