

RTC & Klimate for the BBC micro:bit

www.kitronik.co.uk/5636

Introduction: This RTC & Klimate board adds a Real Time Clock (RTC) and environmental sensor (BME280) interface with the BBC micro:bit. The environmental sensor will give the ability to measure temperature, barometric pressure and humidity. The RTC will give the ability to read current time and date.

The board produces a regulated 3V supply that is fed into the edge connector to power the inserted BBC micro:bit, removing the need to power the BBC micro:bit directly. Voltage can be supplied via the terminal block or the board's USB connector, in this case the USB connector is for power supply only and not used for data connections. This USB connector can provide more power than connection through the micro:bit USB connector for when placing additional ZIP LED's on to the board.

The coin cell holder allows a CR2032 battery to power the real time clock to continue keeping time while there is no main power to the board and BBC micro:bit.

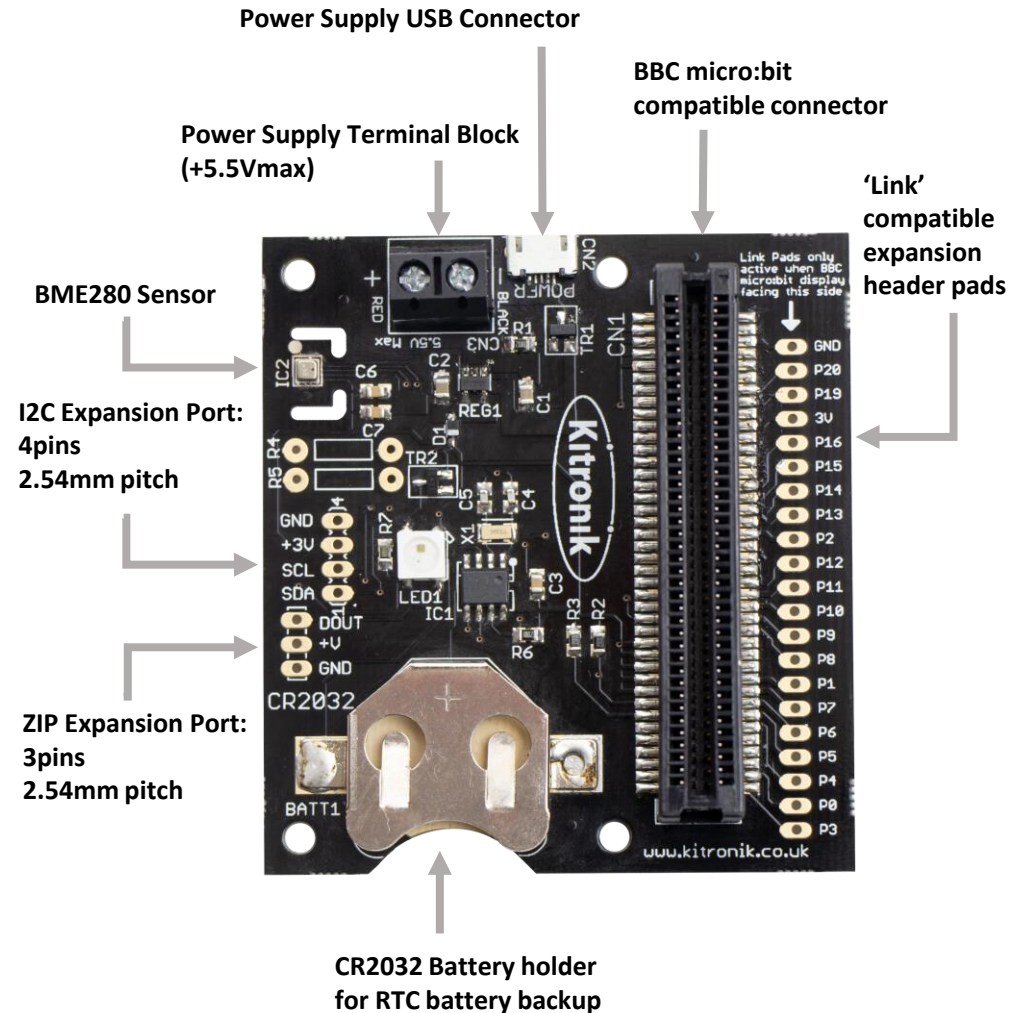
Other features: The micro:bit RTC & Klimate also has an expansion port for adding additional I2C devices with a 3V supply (for example OLED display). A ZIP LED and ZIP expansion port to attach additional ZIP's (for example ZIP Stick www.kitronik.co.uk/35129)



Inserting a BBC micro:bit: To use the RTC & Klimate board the BBC micro:bit should be inserted firmly into the connector as shown left.

This board includes expansion pads that conform to the 'Link' standard allow use with other 'Link' compatible expansion boards

Layout:



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SPECIFICATION	
Voltage Rating	+5.5Vmax
Typical Current Draw	14mA
Battery Backup	CR2032 3V
Typical backup battery life in stand-by mode	> 1 year
BME280 operation range	Pressure: 300hPa – 1100hPa Temperature: -40°C – 85°C Humidity: 0%RH – 100%RH
I2C Expansion port	4 pins 2.54mm pitch <u>PINOUT</u> Pin 1 – SDA (micro:bit pin20) Pin 2 – SCL (micro:bit pin19) Pin 3 – +3V (100mA max) Pin 4 – GND
ZIP Expansion Port	3 pins 2.54mm pitch <u>PINOUT</u> Pin 1 - DOUT Pin 2 - +V Pin 3 - GND

Software

RTC Blocks:

The custom blocks for the Real-Time-Clock, allows the user to set time and date with numbers. Also to read back the latest time and date as a string, this can be scrolled across the BBC micro:bit display.

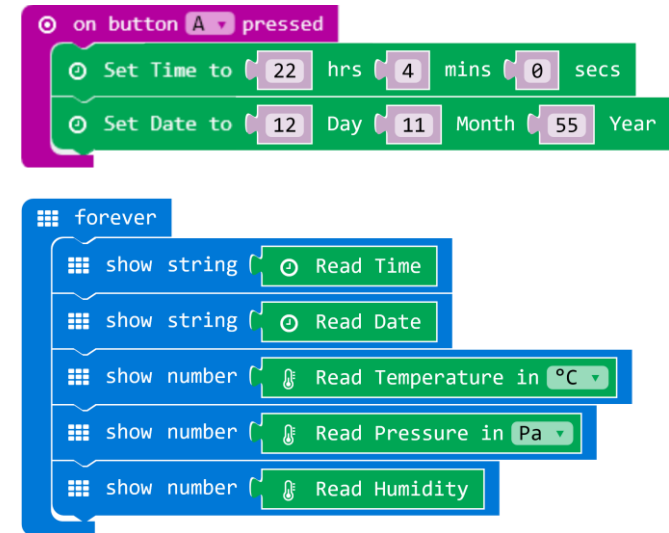
Additional blocks can set and read all the parameters of the RTC with time and date individually.

Klimate Blocks:

Simplified blocks for the BME280 sensor have been created so no setup for the sensor is required. All that is required is placing the read parameter block into the code and selecting which units is required

Example Software: The example code (right) shows how the RTC and Klimate blocks can be used together along with the standard show string block of the BBC micro:bit. Once the time and date is set on start, the code then forever loops displaying (in order) the current time, the current date, the current temperature, the current atmospheric pressure and the current humidity is of the location of the board.

An example microPython use is available from KITRONIK GIT HUB
<https://github.com/KitronikLtd>



```
on button A pressed
  Set Time to 22 hrs 4 mins 0 secs
  Set Date to 12 Day 11 Month 55 Year

forever
  show string Read Time
  show string Read Date
  show number Read Temperature in °C
  show number Read Pressure in Pa
  show number Read Humidity
```

