# *Bohunt School (Wokingham)*

# *Project: Solar-Powered Weather Station*

### *Objectives and item list*

*I'm one of the students who has been attending the (after-school) IoT Computer Club at Bohunt Wokingham academy here in the UK.*

*This is a write-up of my personal project to design and build a solar-powered weather station.*

## *Objectives*

**My overall objective is to build a solar-powered weather station that will be located in one of the school's gardens to measure temperature, humidity and air pressure. The data will be sent via WiFi to the 'Cloud' and by writing some programs the information should be made available locally or remotely.**

**I've broken the project into the following tasks so it will be easier to tackle.**

- *Using a solar panel to charge a Li-Ion battery and power a Wemos D1 Mini.*
- *Putting the Wemos D1 Mini into 'deepsleep' to conserve battery's charge*
- *Switching on/off ancillary devices (e.g. BME280 and ADS1115 modules) to conserve the battery's energy*
- *Measuring and reporting air temperature, humidity and pressure and sending this data to the 'Cloud'*
- *Writing a Node-RED flow to process and display the data (which has been extracted from the 'Cloud') remotely and/or locally*
- *Designing and building an enclosure for the weather station*

## *Item list (hardware)*

**The key hardware items I've used include:**

- *a 5.5V, 1W, 180mA solar-panel (95mm by 95mm in size)*
- *a GIF TR14500, 3.7V, 2700mAh Li-Ion rechargeable battery*
- *a TP4056 lithium battery charging management board*
- *a Wemos D1 Mini Pro (ESP8266-based microcontroller)*
- *a BC547 Bipolar Junction Transistor (BJT) and ZVP4424A p-channel MosFET*
- *an ADS1115 4-channel analog multiplexer*
- *a BME280 transducer*
- *some resistors, connecting wire and prototyping boards*

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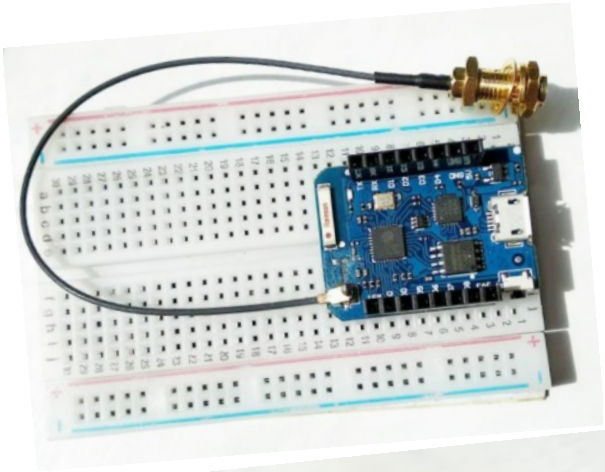
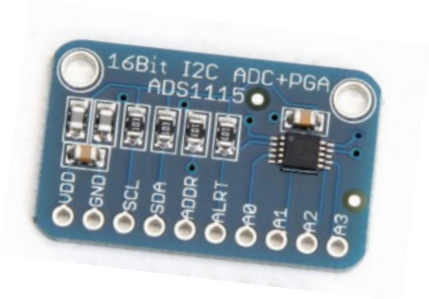
## *Item list (software)*

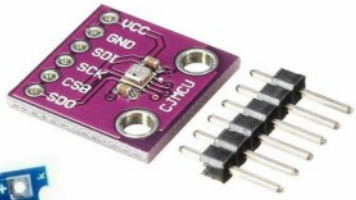
**The software I've used includes:**

- ESP Easy **(Firmware for the Wemos D1 Mini Pro)**
- Node-RED **(Flow-based programming for the Internet of Things)**
- BeeBotte **(Cloud Platform for Real Time Connected Objects)**

## *Some photos of the key hardware items*








**The next thing you need to do is read the write-up for Stage-1.**
***"Using a solar panel to charge a Li-Ion battery and power a Wemos D1 Mini"***

*I need to thank Mr D for helping and encouraging me with this project*