

Experiment 12 – Weather station

Instruction

The changing weather is so annoying, I even got a cold because of it! No, I have to think of a way to remind myself of changes in the weather at all times. I have to pay attention to keep warm and never catch a cold again. Less gossip, let's make a weather station to ensure we can obtain temperature and humidity anytime and anywhere to solve this problem!

Target

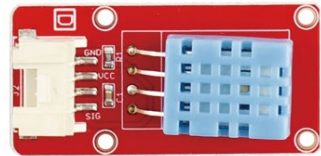
- Learn how Temperature&Humidity sensor work and use it to make a weather station.
- Learn how to add an extension package.
- Learn how to use two onboard buttons of micro:bit.

Required Parts

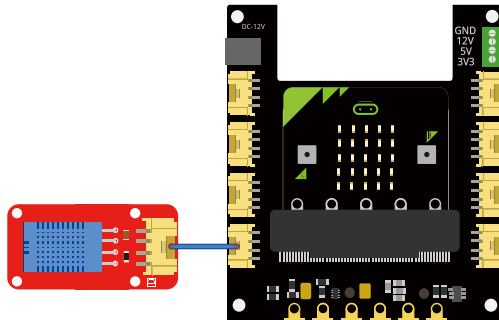
- Micro:bit x1
- Crowtail-Base shield for Micro:bit x1
- Crowtail-Temperature&Humidity Sensor x1
- Crowtail-Cable x1
- USB cable x1

Hardware learning and connection

This module can help you detect the temperature and humidity of the environment of your house. The module contains a DHT11 temperature & humidity sensor that is a complex sensor with a calibrated digital signal out. It uses digital module acquisition technology and temperature&humidity sensor technology. The sensor consists of a resistance type moisture element and an NTC temperature measuring element. Because of the single-wire serial interface, it is easy to use the module.



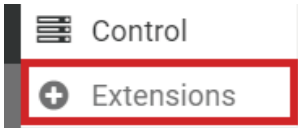
Connect Crowtail-Temperature&Humidity Sensor to P0 port of Crowtail-Base shield for Micro:bit. The hardware connections are as follows:



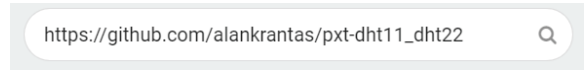
Programming and note

To using the Crowtail-Temperature&Humidity Sensor, we need to add the extension package. Follow the steps below to add extension package:

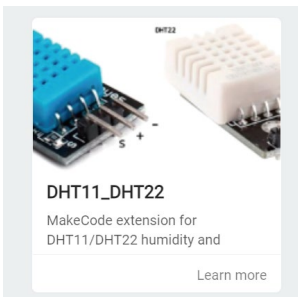
- **Step 1:** Click on the Extensions



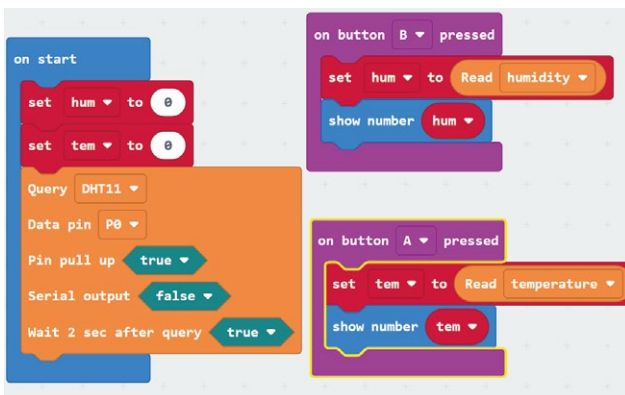
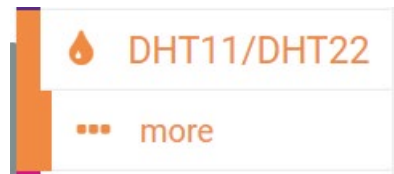
- **Step 2:** Enter the address in the search bar and search: https://github.com/alankrantas/pxt-dht11_dht22



- **Step 3:** You will view the search results and click on it.



- **Step 4:** Then you can see the extensions package you added in Makecode and click to use the DHT11 block.



- **On button pressed:** Start an event handler (part of the program that will run when something happens, like when a button is pressed). This handler works when button A or B is pressed, or A and B together. When you are using this function in a web browser, click the buttons on the screen instead of the ones on the micro:bit. In this experiment, when button A is pressed, show the temperature on micro:bit's matrix LEDs; when button B is pressed, show humidity on micro:bit's matrix LEDs.
- **Value of dht11...at pin...:** Use this block in the extension package we added to set the pin of Crowtail-Temperature&Humidity Sensor and get data from it. Available data includes Fahrenheit, Celsius and Humidity. In here, we get Celsius and Humidity from the sensor.