The cricket IoT board: A great way to create simple low-power remote sensing stations for hydroponics

When you monitor variables in a hydroponic plant where more than a few plants exist, it becomes important to be able to deploy a wide array of sensors quickly and to be able to set them up without having to lay down a couple of miles of wire in your growing rooms or greenhouses. For this reason, I have been looking for practical solutions that could easily connect to Wi-Fi, be low powered, allow for analogue sensor inputs and be more user friendly than things like ESP8266 boards that are often hard to configure and sometimes require extensive modifications to achieve low power consumption. My quest has ended with the finding of the "cricket" an off-the-shelf Wi-Fi enabled chip that fulfills all these requirements (you can find the sensor here). Through this post, I will talk about why I believe it's such a great solution to deploy sensors in a hydroponic environment. It is also worth mentioning that this post is *not* sponsored.



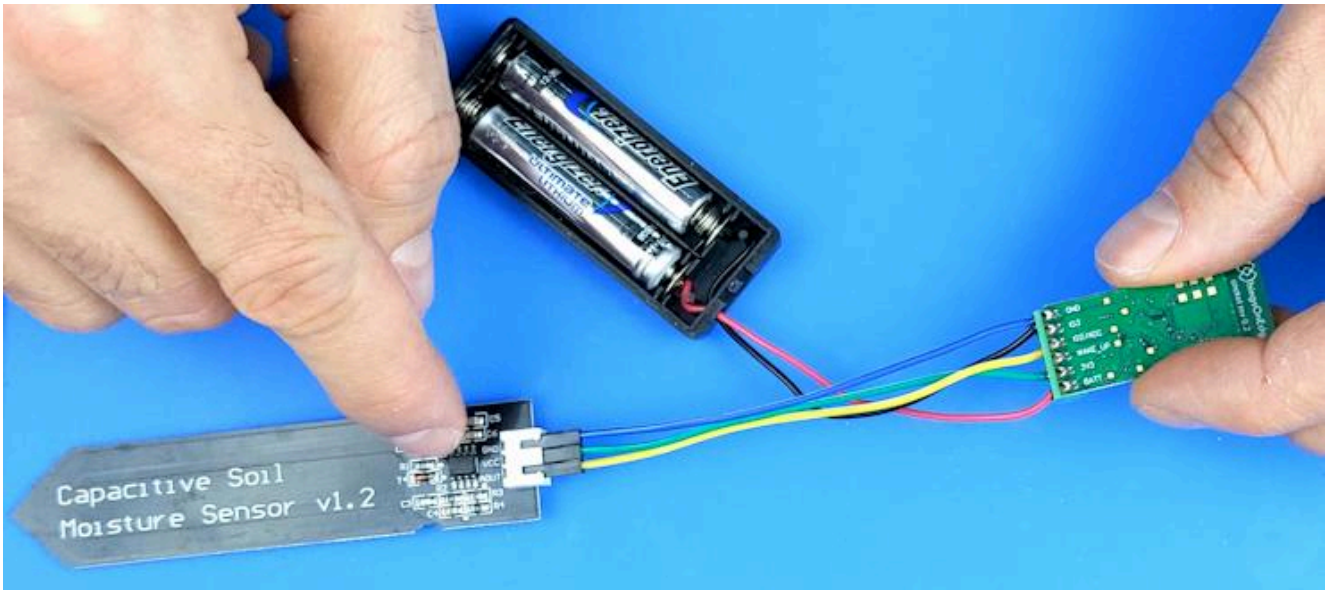
The cricket IoT board by ThingsOnEdge

When I seek to create custom monitoring solutions for

hydroponic crops, one of the first requirements that comes to mind is the ability to connect through wifi effectively and be able to deliver the measurements to computers without needing wires. The cricket does this without any modifications, when you power it on it creates its own wifi hotspot that you can connect to, where you use a web interface to configure the device to connect to the normal network.

Besides connecting to the Wi-Fi, the next problem I often face is having the ability to have a proper protocol to communicate between devices. The MQTT standard has been my preferred solution – due to how easy it is to receive and relay information – so I always seek boards that are able to easily hook up to an MQTT server once they are in a Wi-Fi network. The cricket achieves this effortlessly as well, as MQTT is part of its basic configuration, which allows you to connect it with your MQTT server and relay its data right off the bat.

One of the simplest but most powerful applications for hydroponics is to hook up a capacitive moisture sensor to a cricket board and have this relay the data to an MQTT server. You can set this up to even send the data to an MQTT server powered by ThingsOnEdge, so that you don’t have to send the data to your own server. This setup can be battery powered with 2 AA batteries, it can then give you readings for several months, depending on how often you want the sensor to broadcast its readings. You can read more about how to carry out this project here.



cricket hooked to a capacitive sensor, image taken from here.

One of the disadvantages of the cricket – the main reason why it won't fully replace other boards for me – is that it only has one analog sensor and one digital sensor input. This means that you're limited to only two sensors per cricket and you also have an inability to use more advanced input protocols, such as the i2c protocol that is used by a wide variety of sensors. If you lack i2c it means you're going to miss the opportunity to use a lot of advanced sensors, many of which I consider basic in a hydroponic setup, such as the BME280 sensors (see here why).

Although it is not a perfect sensor, the cricket does achieve two things that make it a great intro for people who want to get into IoT in hydroponics or those who want to setup a couple of low-power sensor stations with absolutely no hassle. The first is that it achieves simple configuration of both Wi-fi and MQTT and the second is that it simplifies the power consumption aspects, making it very easy to configure things such as sleep times, sensor reading intervals, and how often the sensor tries to relay those readings to the MQTT server. **All-in-all, the cricket is a great starting point for those who want to get going with custom IoT in hydroponics with the least possible hassle.**