We have built a web application where the micro-grid can be monitored and controlled from. The application has been built using HTML, CSS and the frontend JavaScript framework called React.js.

Upon launching the web application, a user logs in with an email address and a password. Once authenticated they move on to a control dashboard.

Our dashboard has two main components;

* A Micro-grid diagram which is constantly updated with the current values of currents and voltages as reported by the system.
* A table that display past system states i.e. past values of currents and voltages in the system

These values are sent from the physical circuit by a GSM module which is programmed to hit a particular endpoint (a web address). The endpoint is connected to a microservice (which is a self-contained program) that parses this data and then stores it in a database.

The microservice is written in the JavaScript programming language and runs in a Node.js container that is hosted online. Node.js is a runtime environment that allows JavaScript code to run in an environment other than a web browser which is the languages native environment. The Node.js container is hosted online by Google Firebase. Firebase is an online computing service provider that provides low cost “pay as you go” computing.

The database we are using is also hosted by Firebase.

The React.js framework allows us to program dynamic behaviour into the dashboard components.

The micro-grid diagram component of the dashboard is programmed to pick data from our database and update itself every few seconds.

The table component of the dashboard also periodically updates itself but not as frequently as the micro-grid diagram