

## Group 4

### Team members:

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# HUMBER

# Charging Stations

# Functionality

The charging stations will be connected to a power grid which will then be used to charge the autonomous vehicles.



# Dependency

This system will rely on the Power Grid, GPS system, Payment system (if implemented) and the autonomous vehicle concept that will be present in the city.

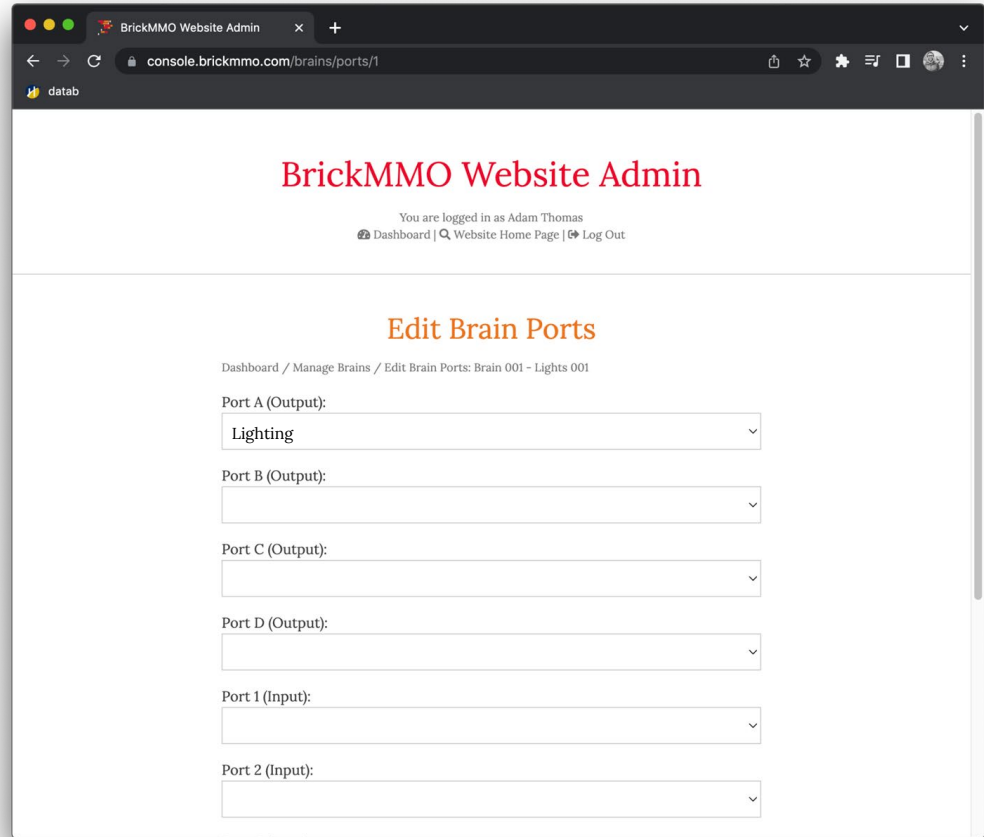




### 3. Settings and Info

# Module: Charging Stations

- Power grid ports
- GPSsystem ports
- Vehicles charging ports
- Payment system ports



The screenshot shows a web browser window with the title 'BrickMMO Website Admin' and the URL 'console.brickmmo.com/brains/ports/1'. The page header includes the title 'BrickMMO Website Admin' and a user login status 'You are logged in as Adam Thomas' with links for 'Dashboard', 'Website Home Page', and 'Log Out'. The main content area is titled 'Edit Brain Ports' and shows a breadcrumb trail 'Dashboard / Manage Brains / Edit Brain Ports: Brain 001 - Lights 001'. Below this, there are six dropdown menus for configuring ports: 'Port A (Output)' (set to 'Lighting'), 'Port B (Output)', 'Port C (Output)', 'Port D (Output)', 'Port 1 (Input)', and 'Port 2 (Input)'.

BrickMMO Website Admin

You are logged in as Adam Thomas  
[Dashboard](#) | [Website Home Page](#) | [Log Out](#)

## Edit Brain Ports

Dashboard / Manage Brains / Edit Brain Ports: Brain 001 - Lights 001

Port A (Output):  
Lighting

Port B (Output):

Port C (Output):

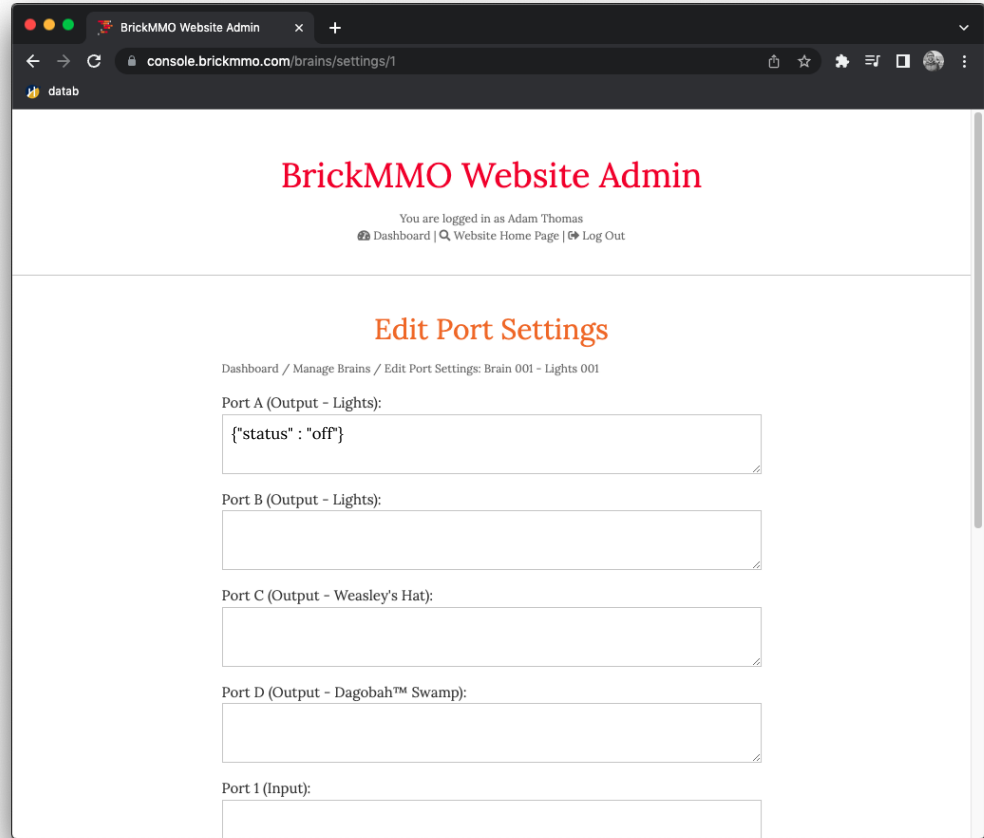
Port D (Output):

Port 1 (Input):

Port 2 (Input):

# Module Settings

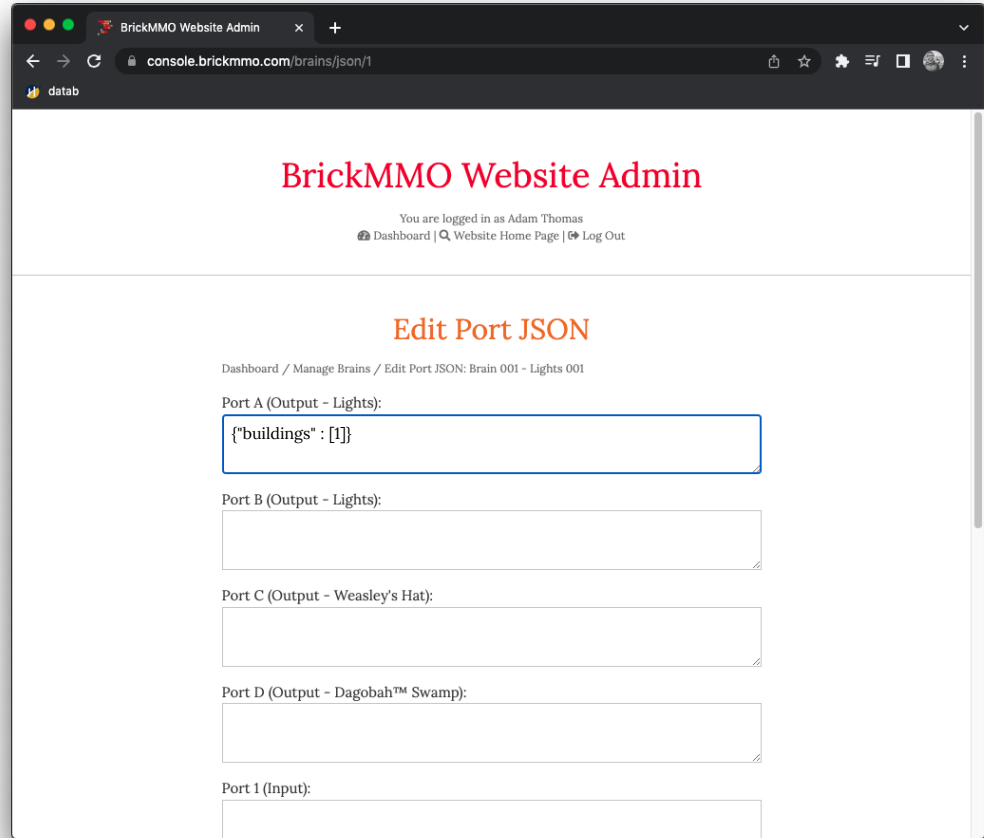
- The stations will be powered if the power grid is turned on (assuming the P.G. is on 24/7).
- There will be an available and occupied status for the charging stations. (GPS system).
- The vehicles can use this feature only if they have been approved by the payment system.



# Module JSON

Additional information will:

- The charging units required for a certain type of vehicle.

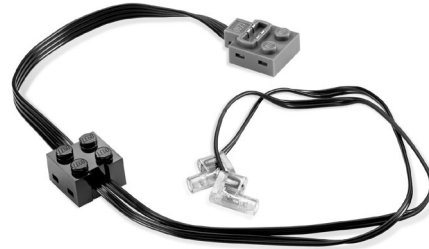




## 4. Ports, Motors, and Settings

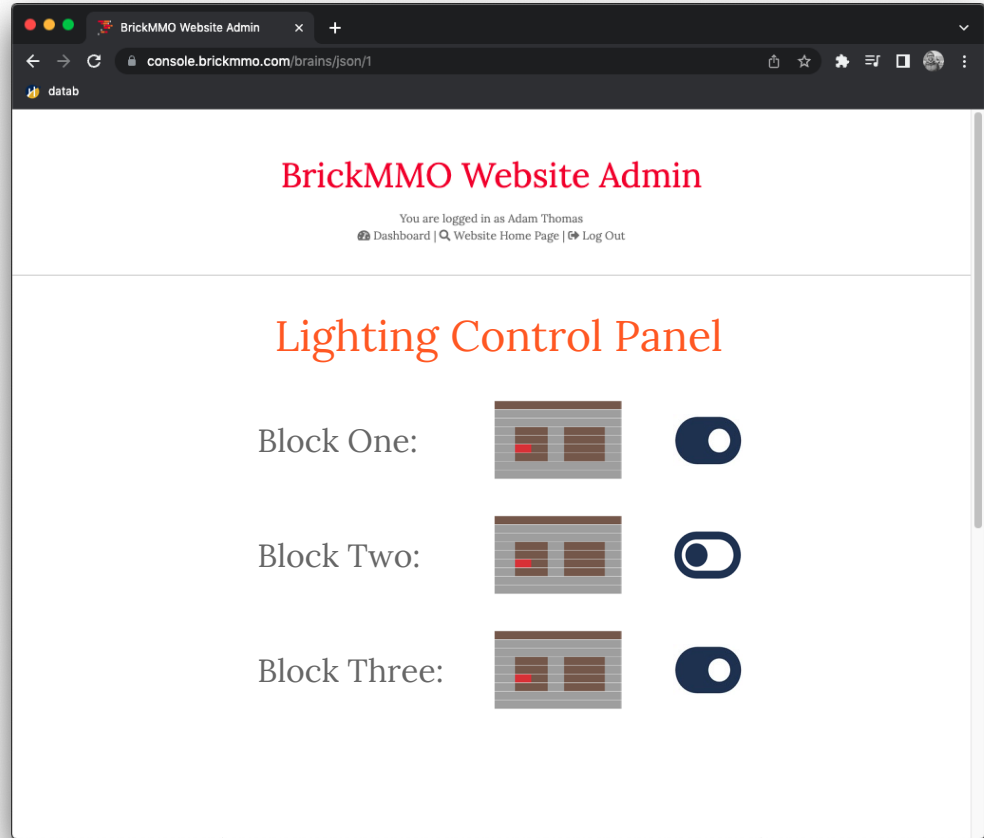
# Sensors and Motors

- **Distance sensor** – to check if the charging station is occupied or not
- **Switch** – to start/stop the charging process
- **Lights** – to display the occupancy status for the stations
- **Cables** – for connecting the systems



# Admin Control Panel

Admin will be responsible to look after the payments for the service as well as the availability of the stations.



## 5. Pseudocode

# IOT Loop

```
While (availability == true) {  
  
    set lights = "Green";  
  
    UpateGPS( );  
  
    if (payment == successful) {  
  
        Charging( );  
  
    else {  
  
        return "Payment  
        unsuccessful";  
    }  
}
```



The LEGO Group. (n.d.). Diagon Alley™. Retrieved 2022, from <https://www.lego.com/en-ca/product/diagon-alley-75978>.

# API Endpoints

`/api/chargingStation/list`

Will return a list of charging station data in JSON, e.g. location, price, availability .



The LEGO Group. (n.d.). Diagon Alley™. Retrieved 2022, from <https://www.lego.com/en-ca/product/diagon-alley-75978>.