

## User Manual

Year: 2021 Semester: Spring 2021 Team: 4 Project: Virtual Queue  
 Creation Date: April 7, 2021 Last Modified: April 15, 2021  
 Author: Chok Yip Lau Email: lau55@purdue.edu

### Assignment Evaluation:

Item	Score (0-5)	Weight	Points	Notes
<b>Assignment-Specific Items</b>				
Product Description		x1		
Product Illustration		x2		
Setup Instructions		x3		
Usage Instructions		x3		
Troubleshooting Instructions		x3		
<b>Writing-Specific Items</b>				
Spelling and Grammar		x2		
Formatting and Citations		x1		
Figures and Graphs		x2		
Technical Writing Style		x3		
<b>Total Score</b>				

5: Excellent 4: Good 3: Acceptable 2: Poor 1: Very Poor 0: Not attempted

### Comments:

*Comments from the grader will be inserted here.*

## 1.0 Product Description

During this pandemic, stores can usually only operate with a limited capacity. Ever wonder how you can keep your employees and customers safe during the pandemic and keep your business running? Do you want to avoid long queues outside of your store? Virtual Queue will help you solve these problems by using a system that will provide a seamless and touchless check-in and check-out process. Our queue management system includes a motion sensor, QR code scanner and temperature sensor. The customer only needs to generate a QR code from the web server, scan it and they will be notified when they are able to enter the store. The check-out process is also extremely easy. The customer just needs to walk out the store and our Virtual Queue system will automatically notify the next customer. An administration console will also be provided to customize your store capacity and number of people in the store.

The package will contain:

1. A paper that prints a store secret, link to the console page and the link to the web server.
2. A rechargeable battery
3. A USB charger
4. An Adafruit Micro Lipo - USB LiIon /Lipoly charging cable
5. A Virtual Queue kiosk with removable main box
6. A Qwiic Cable 500mm
7. A door sensor box with motion sensor included

## 2.0 Product Illustrations

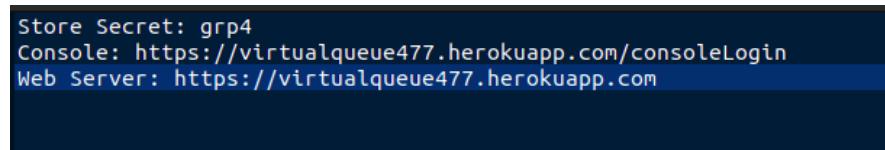


Figure 2.0 Store Secret, Console page, Web Server

# ECE 477 Virtual Queue Group 4

Name:

Email:

# people in party:

Figure 2.1 Web Server

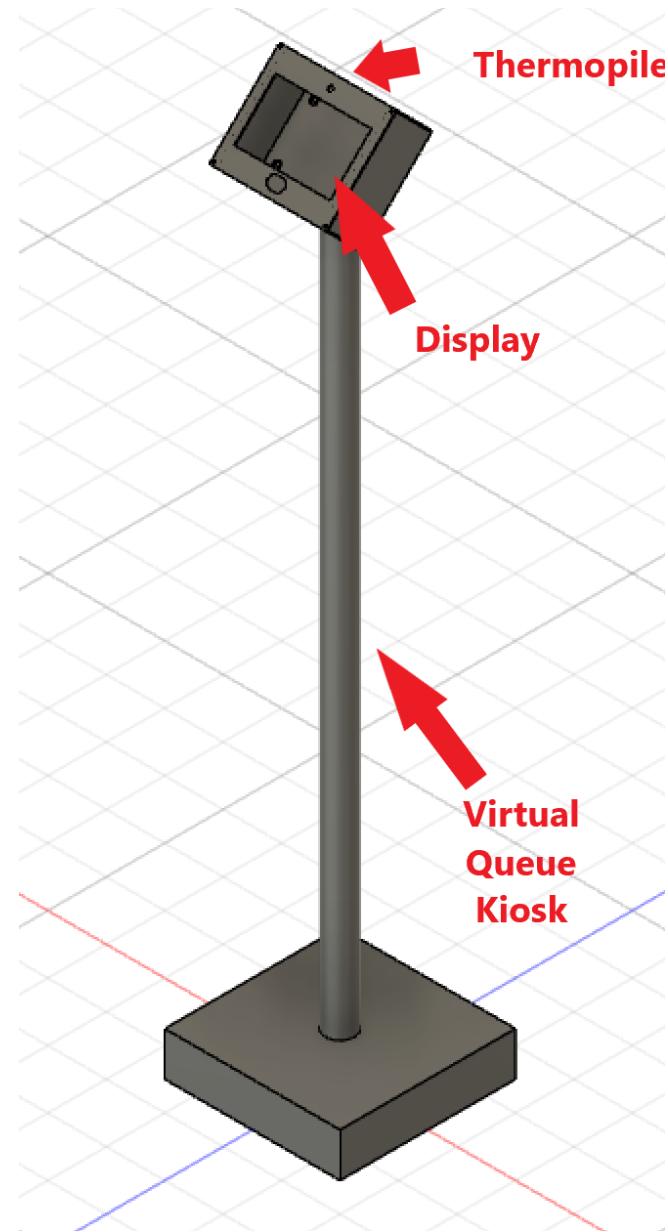


Figure 2.2 Complete System

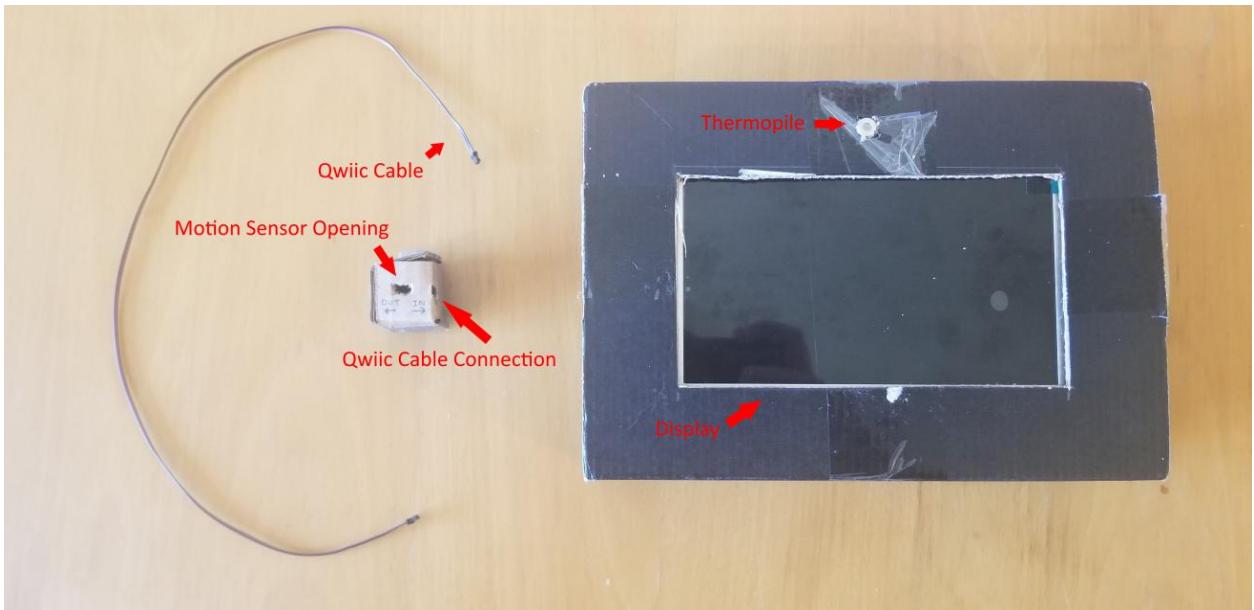


Figure 2.3 Main box with Motion Sensor

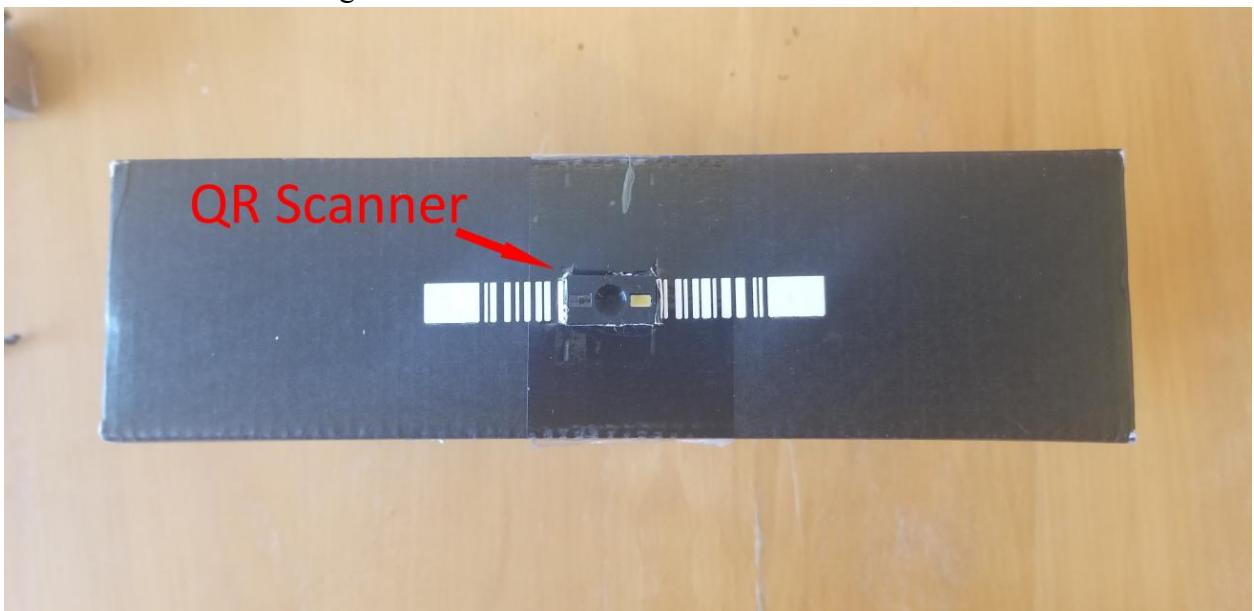


Figure 2.3 QR scanner



Figure 2.4 USB Charger, Charging cable and Rechargeable battery

### 3.0 Setup Instructions

#### *System Setup :*

1. Place the motion sensor near the entryway as shown in Figure 3.0 and Figure 3.1
2. Place Virtual Queue kiosk near the doorway
3. Connect the motion sensor to main box with provided Qwiic cable as shown in Figure 3.2
4. Make sure the battery is fully charged, if not, follow the instructions from above to charge the battery
5. Insert the battery to the Virtual Queue Kiosk
6. Generate two QR codes, one for the WIFI username and one for WIFI password from <https://www.beaconstac.com/qr-code-generator>
7. Scan the QR code for WIFI username and the QR code for WIFI password when prompted by the display
8. Wait for the “Setup complete!” from the display as shown in Figure 3.3

9. Finally, set up the store capacity and number of people in the store from the console website provided

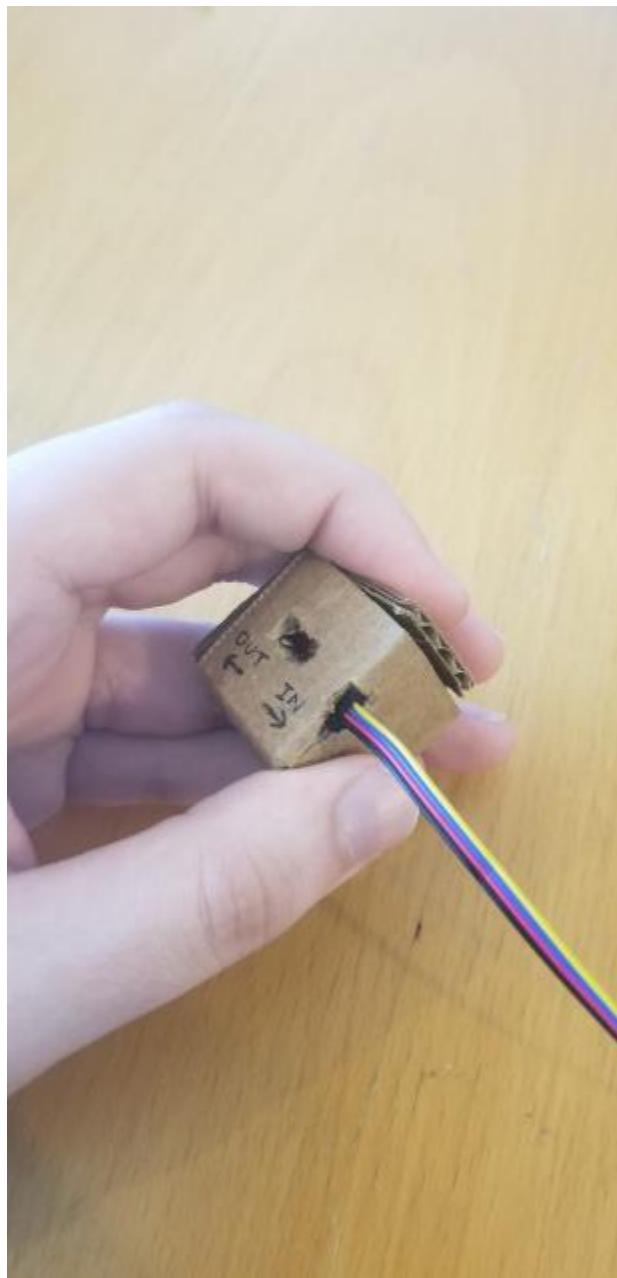


Figure 3.0 Motion Sensor with Qwiic cable



Figure 3.1 Placing Motion Sensor near the entryway



Figure 3.2 Qwiic cable connection to Main Box

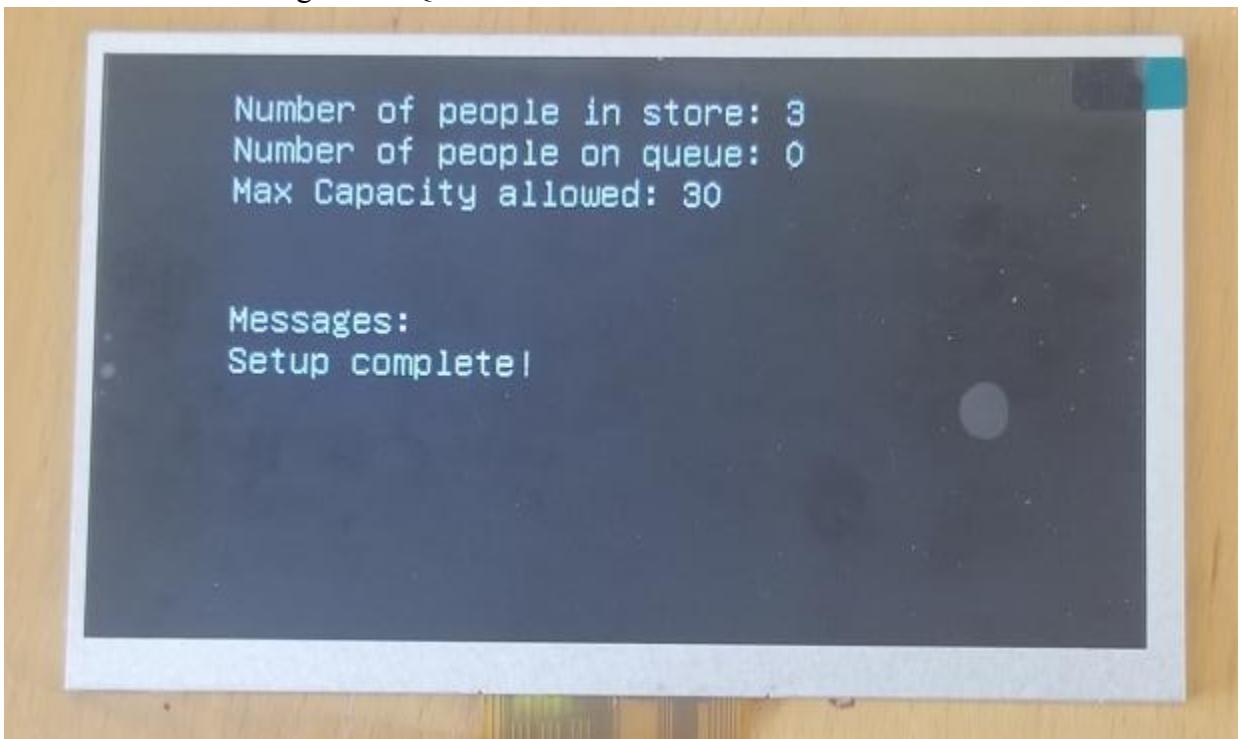


Figure 3.3 Message that will be displayed on the screen if setup is successful

#### 4.0 Usage Instructions

##### ***Customer Usage :***

###### **Enter the store:**

1. Enter your information on <https://virtualqueue477.herokuapp.com/>
2. A QR code will be generated as shown in Figure 4.0

3. Scan the QR code using the QR code scanner upon arriving at the store
4. Wait until getting “**It’s your turn to enter the store**” notification\*
5. Get temperature scanned using the thermophile
6. Enter the store

**QR code:**



c3238252

[Generate New QR-Code](#)

Figure 4.0 QR code generated from web server

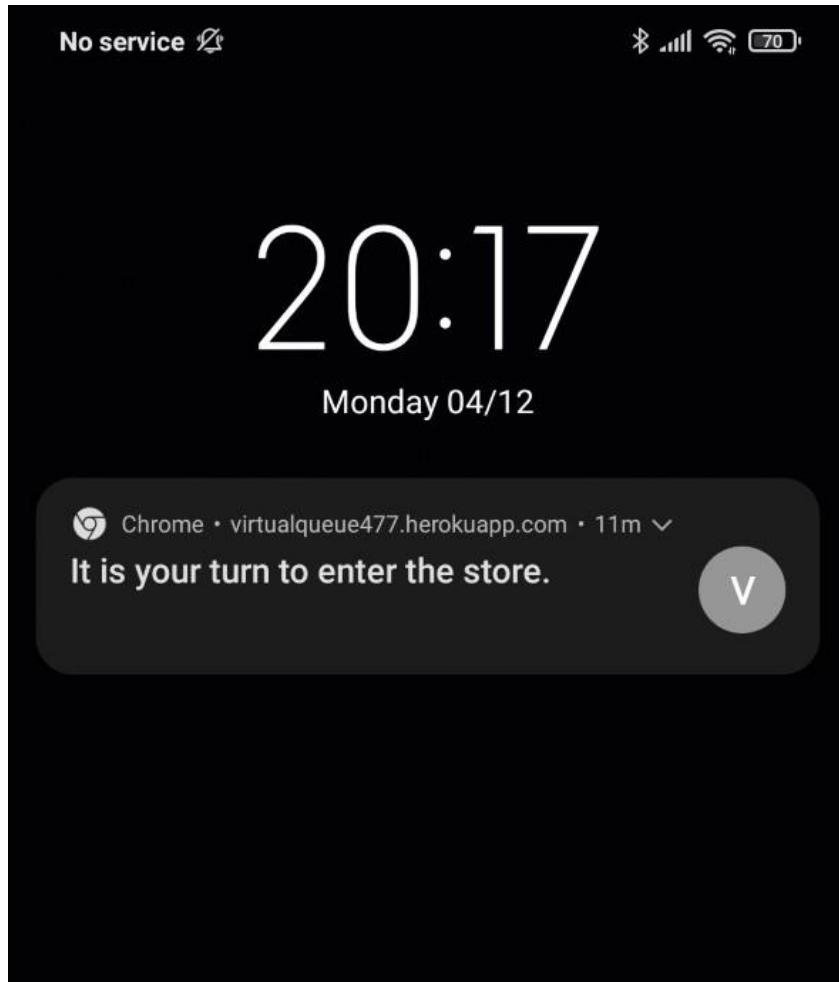


Figure 4.1 Notification triggered by the web server

**Leave the store:**

1. Simply walk out the store

**Store Usage :**

**Override store max capacity:**

1. Log into the store console using the provided store secret
2. Set the store capacity
3. Press set button to finish setting up

**Override number of people in store:**

1. Log into the store console using the provided store secret
2. Set number of people in the store
3. Press set button to finish setting up

## Store Console

Max Capacity:

30

Number of people in the store:

1

Length of queue:

0

Set Max Capacity:

Set Number of people in the store:

Figure 4.2 - Store console page

### Replace Battery:

1. Order a new battery from <https://www.adafruit.com/product/353>
2. Simply remove the old battery from Virtual Queue kiosk
3. Plug in the new battery to the Virtual Queue kiosk



Figure 4.3 Removing battery



Figure 4.4 Replacing battery

**Charging Battery:**

1. Remove the battery from the Virtual Queue kiosk
2. Connect the cable in the Adafruit Micro Lipo provided in the package as shown in Figure 2.4
3. **Charge the battery indoors\*\***
4. Remove the battery once the charger light turns green

**5.0 Troubleshooting Instructions**

Problem	Potential Solutions
Virtual Queue Kiosk will not turn on.	<ul style="list-style-type: none"><li>• Make sure the battery is sufficiently charged</li><li>• Make sure the battery is connected properly</li></ul>
WIFI is not connecting properly	<ul style="list-style-type: none"><li>• Make sure QR codes with correct username and password are generated</li><li>• Are you able to connect to the WIFI using another device?</li></ul>

	<ul style="list-style-type: none"> <li>• Restart the Virtual Queue Kiosk</li> </ul>
Display is not updated	<ul style="list-style-type: none"> <li>• Make sure the internet connection is stable</li> <li>• Restart the Virtual Queue</li> </ul>
Entry/ Exit detection inconsistent	<ul style="list-style-type: none"> <li>• Make sure the customers are spaced out</li> <li>• Make sure the customer is entering and exiting the store one at a time</li> </ul>
QR code is not being scanned properly	<ul style="list-style-type: none"> <li>• Make sure the lenses are clean</li> <li>• Restart the Virtual Queue</li> </ul>

Sometimes, an error message may show up on the display with the format:

AN ERROR HAS OCCURRED

ERROR: <Error code>

If this happens, use the following table to determine the cause and find a potential solution. If the error persists, please contact support.

Error Code	Meaning and Potential Solutions
WIFI MODE	<ul style="list-style-type: none"> <li>• There was an internal issue setting the internal WiFi adapter to the proper mode</li> <li>• Try resetting the Virtual Queue</li> </ul>
WIFI NUMCONS	<ul style="list-style-type: none"> <li>• There was an issue setting the proper number of connections for the internal WiFi adapter</li> <li>• Try resetting the Virtual Queue</li> </ul>
WIFI CONNECT	<ul style="list-style-type: none"> <li>• There was an issue connecting to the WiFi network</li> <li>• Make sure the QR codes you created are correct</li> <li>• If so, try resetting the Virtual Queue</li> </ul>
WIFI TCP	<ul style="list-style-type: none"> <li>• There was an issue connecting to the Virtual Queue website</li> <li>• Try resetting the Virtual Queue</li> </ul>
HTTP FAIL 1	<ul style="list-style-type: none"> <li>• There was an error sending a QR code</li> <li>• Make sure the QR code is a valid ID</li> <li>• If so, try resetting the Virtual Queue</li> </ul>
HTTP FAIL 2	<ul style="list-style-type: none"> <li>• There was an error sending a motion</li> </ul>

	<p>sensor detection or an invalid temperature reading</p> <ul style="list-style-type: none"> <li>• If the error is infrequent, you can manually adjust store information in the employee console</li> <li>• Otherwise, try resetting the Virtual Queue</li> </ul>
HTTP FAIL 3	<ul style="list-style-type: none"> <li>• There was an error retrieving the store and queue status for the display</li> <li>• Try resetting the Virtual Queue</li> </ul>
JSON DNE 1	<ul style="list-style-type: none"> <li>• The Virtual Queue received a response without any data from the website when sending a QR code</li> <li>• A reset may fix this error, but this likely indicates a web server problem. Please contact support</li> </ul>
JSON DNE 2	<ul style="list-style-type: none"> <li>• The Virtual Queue received a response without any data from the website when sending a motion sensor detection or an invalid temperature reading</li> <li>• A reset may fix this error, but this likely indicates a web server problem. Please contact support</li> </ul>
JSON DNE 3	<ul style="list-style-type: none"> <li>• The Virtual Queue received a response without any data from the website when trying to retrieve the queue and store status for the display</li> <li>• A reset may fix this error, but this likely indicates a web server problem. Please contact support</li> </ul>
JSON FAIL 1	<ul style="list-style-type: none"> <li>• The Virtual Queue received a response with improperly formatted data from the website when sending a QR code</li> <li>• A reset may fix this error, but this likely indicates a web server problem. Please contact support</li> </ul>
JSON FAIL 2	<ul style="list-style-type: none"> <li>• The Virtual Queue received a response with improperly formatted data from the website when sending a motion sensor detection or an invalid temperature reading</li> </ul>

	<ul style="list-style-type: none"><li>• A reset may fix this error, but this likely indicates a web server problem. Please contact support</li></ul>
JSON FAIL 3	<ul style="list-style-type: none"><li>• The Virtual Queue received a response with improperly formatted data from the website when trying to retrieve the queue and store status for the display</li><li>• A reset may fix this error, but this likely indicates a web server problem. Please contact support</li></ul>

Need more help? Please contact [477grp4@purdue.edu](mailto:477grp4@purdue.edu), we will get back to you as fast as possible!

**\* Currently notification service is only available on Android devices. Coming soon for iPhone users. If the customers are using an iPhone, they will need to constantly check the webpage for any updates.**

**\*\* Charging temperature ranges from 0°C to 45°C, so charging outdoors should strictly be avoided or else it might cause an explosion.**