



Senior Design Smart Cooler

Week 7 Oct 8- Oct 12



Progress made during the week

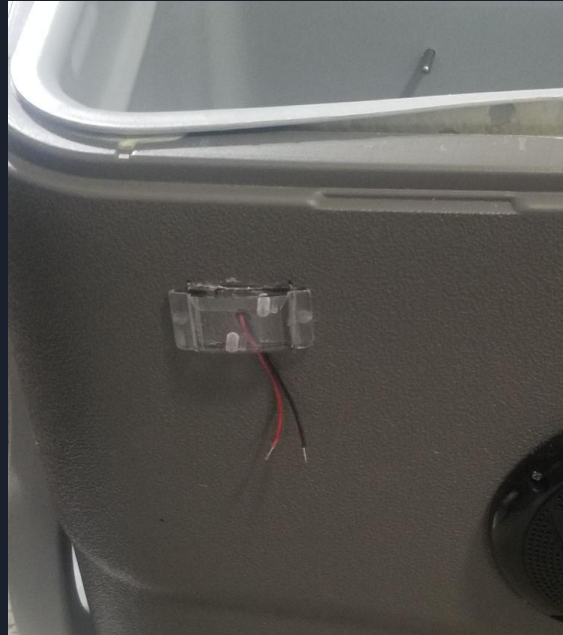
- Mounted and Wired the Solar Panel
- Mounted and wired optical sensor
- Run Entire system off Batteries
- Place and recess Sensors
- Get RFID working
- Door position sensor
- Get waterproof temperature sensors working
- Battery level indicator

Solar Panel

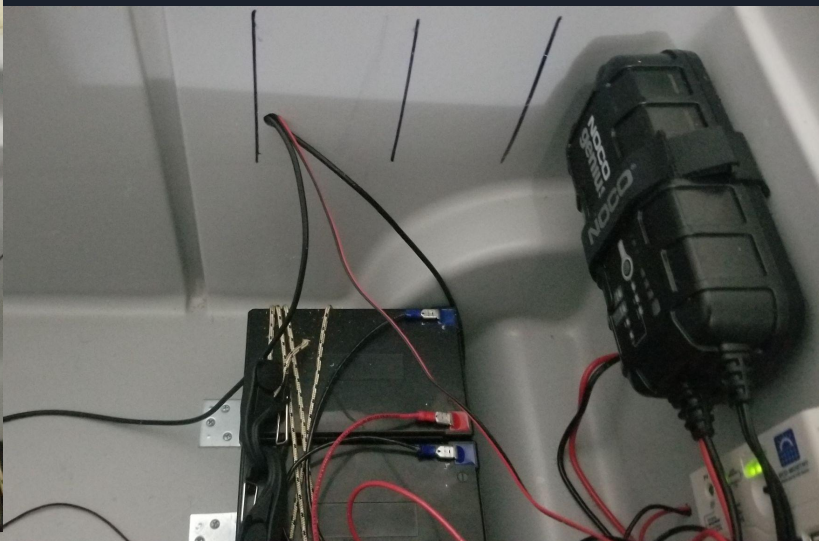


Optical Sensor

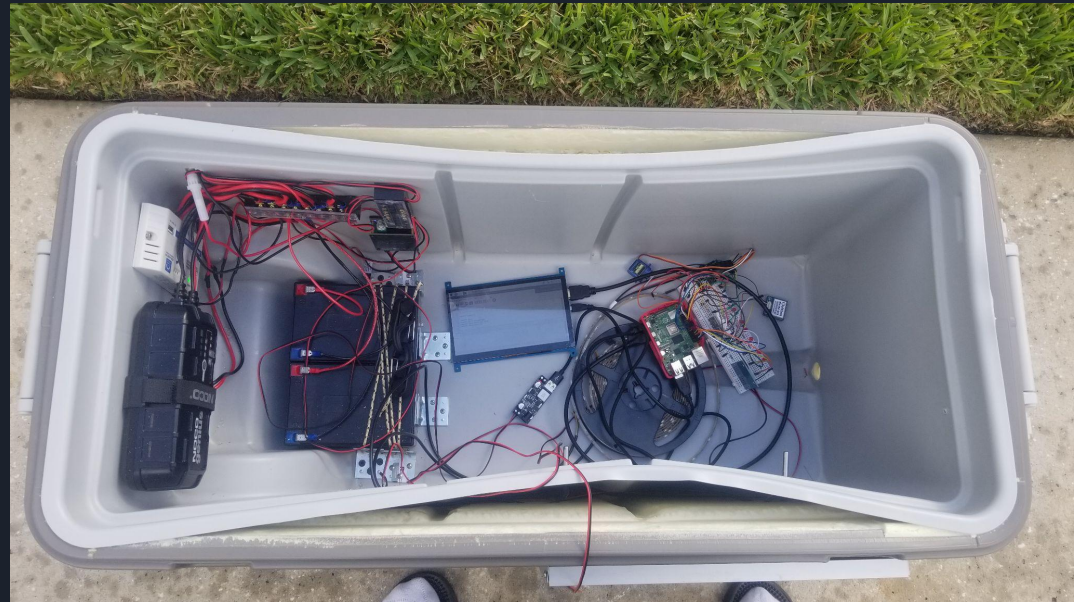
Placed the optical sensor and confirmed operation when we tested the unit outside.



Temperature Sensor



Outside testing



Temperature Sensors

Now using waterproof sensors

Uses I2C communication

```
316  
317 if(magnet_sensor.is_pressed):
```

```
Temp Sensor Two: 24.88C  
Light Sensor Reading=0.14
```

```
Voltage=0.47  
Voltage=3.30
```

```
Battery Level Reading=1.00  
Temp Sensor One: 25.06C  
Temp Sensor Two: 24.88C
```

```
Voltage=0.47  
Voltage=3.30
```

```
Light Sensor Reading=0.14  
Battery Level Reading=1.00
```



Door Position Sensor

Reed switch used for door position sensor.

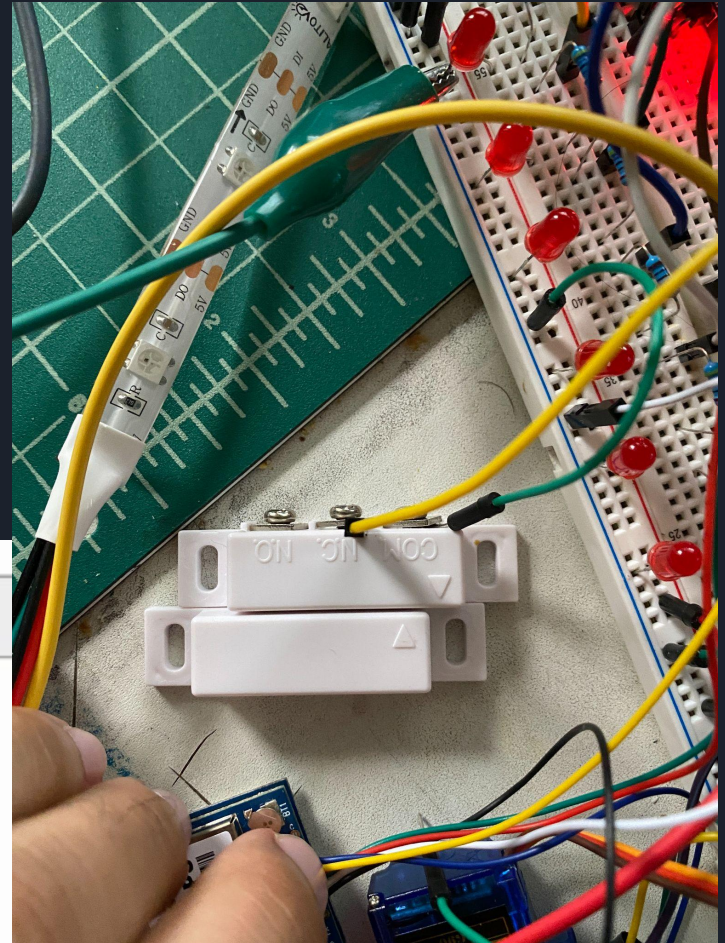
When together, GPIO detects complete circuit

Will be used for LED lights and lock

```
317 if(magnet_sensor.is_pressed):
```

Shell x

```
Light Sensor Reading=0.13      Voltage=0.44  
Battery Level Reading=0.38     Voltage=1.25  
Temp Sensor One: 24.81C  
Temp sensor two: 24.62C  
Magnet closed  
Light Sensor Reading=0.14     Voltage=0.45  
Battery Level Reading=0.38     Voltage=1.24
```



RFID

RFID now detects keychain and blank card.

RFID objects have unique ID

Only set to read ID

When door position sensor closed and RFID object detected, servo is activated to close lock.

```
317 if(magnet_sensor.is_pressed):
```

Shell x

```
Temp Sensor One: 24.62C
```

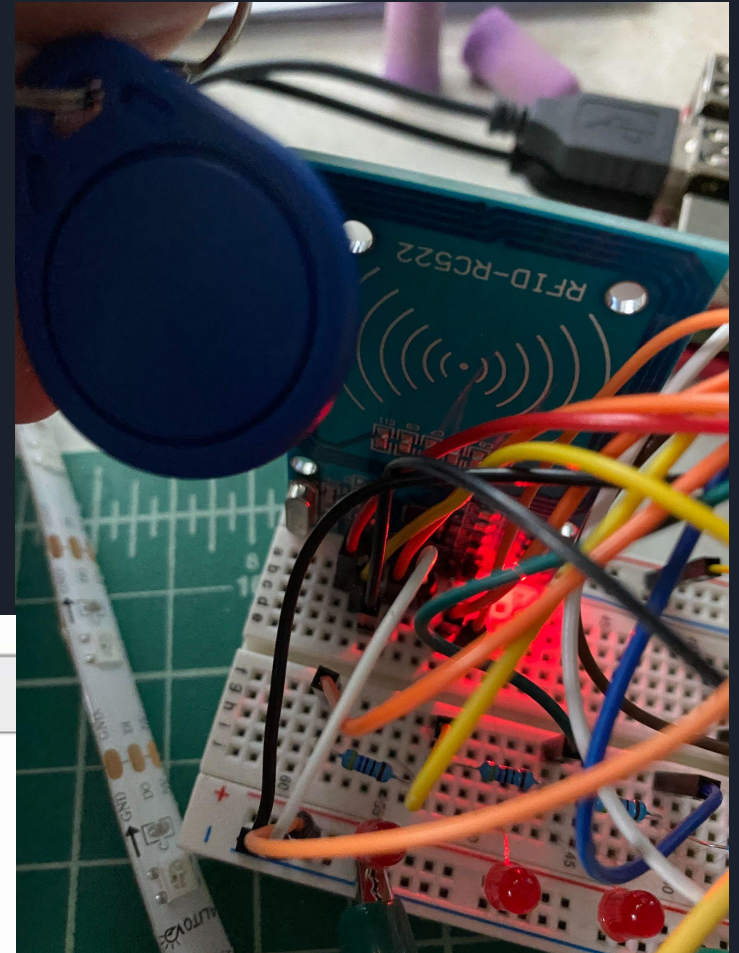
```
Temp Sensor Two: 24.50C
```

```
ID: 994070803484
```

```
Text: .....
```

```
Light Sensor Reading=0.11 Voltage=0.27
```

```
Battery Level Reading=0.38 Voltage=1.26
```



Battery Level Indicator

Uses voltage divider to read battery level voltage

Using arbitrary $R_2 = 22k\Omega$ resistor for about .6mA max

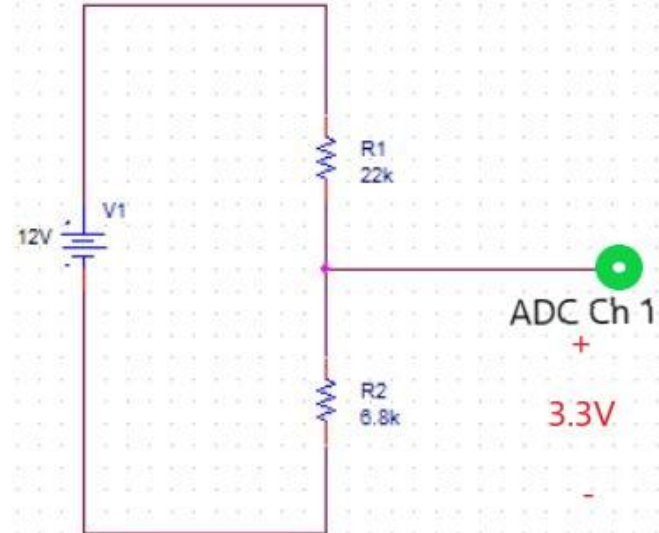
Goal was to use voltage divider to convert 12V battery to 3.3V voltage level to use with ADC converter.

Max voltage charge $\approx 14V$

$$R_2 = 22k\Omega$$

$$14V \frac{R_1}{R_1 + 22k\Omega} = 3.3V$$

$$R_1 = 6785\Omega = 6.8k\Omega$$



```
309 textTemp2Reading.value = "{0:0.1f}F ".format(convertCelsiusToFah
```

Shell x

```
24.437
Light Sensor Reading=0.11      Voltage=0.36
Battery Level Reading=1.00     Voltage=3.30
24.562
24.437
Light Sensor Reading=0.11      Voltage=0.36
Battery Level Reading=1.00     Voltage=3.30
```



Goals for next week

Here are the priorities for next week:

- Mount external Sensors and Switches
- Mount Internal Temperature Sensors
- Reattach top and complete connect Wireless chargers
- Mark out Wireless Chargers on top
- Get servo, RFID and position sensor working together
- Settings Screen