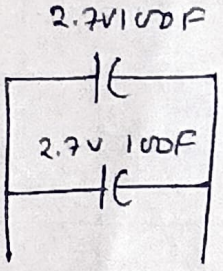
Supercapacitor specifications ;

2.7V, 100F

configuration used in our project is a serial connection.



$$C_{equivalent} = \left(\frac{1}{C_1} + \frac{1}{C_2}\right)^{-1}$$

$$= \left(\frac{1}{100} + \frac{1}{100}\right)^{-1}$$

$$= \left(\frac{2}{100}\right)^{-1}$$

$$= \underline{\underline{50\,F}}$$

Output voltage = 2.7×2

$= 5.4\,V$

configured design

$\Rightarrow$ $2.7 \times 2 \Rightarrow$ $\underline{\underline{5.4V \quad 50F}}$ (equivalent capacitance of both capacitors)

current consumption of prototype bus = 2000mA

$$t_{discharge} = \frac{(V_f - V_i)}{I} \times C$$

$$t_{discharge} = \frac{(5.1 - 2.5)}{0.2} \times 50$$

$$= 650 \text{ sec}$$

$$t_{mins} = \frac{t_{discharge}}{60} = 10.833 \text{ mins}$$

charging time calculations :-

Assuming R (charging resistor) value very small. suppose $R = 10\ m\Omega$

τ = charging constant $= RC = 10 \times 10^{-3} \times 50$

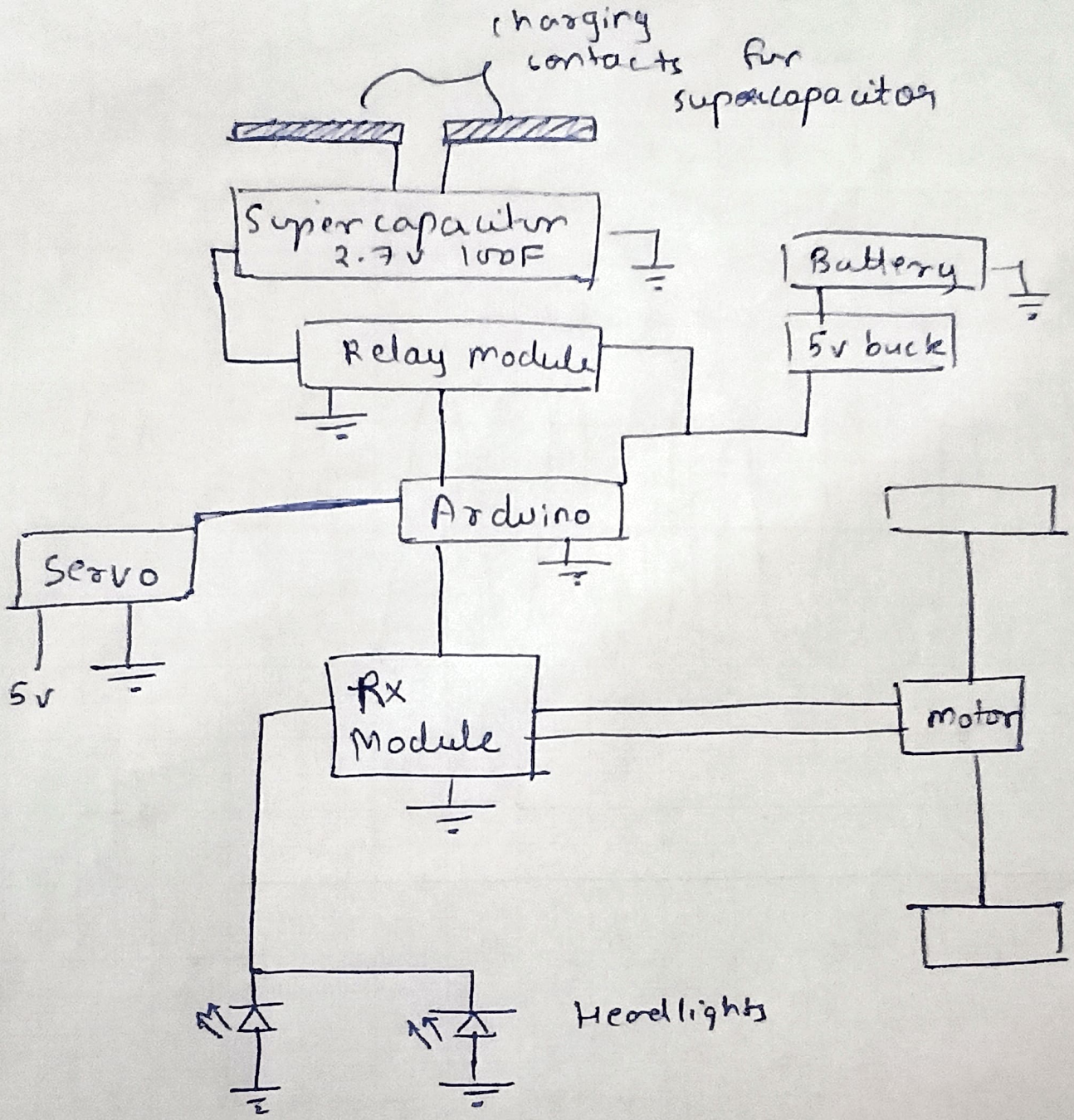
$= 0.5$

charging time $= 5\tau = 2.5$ sec

→ Ideal condition.

practically it will depend on lot of factors like charging current, resistance of wires, capacitor technology used, etc.

∴ through practical testing and observation charging time of model is found about to be 1.2 min



Block diagram of Supercap Bus