**COULOMB’S COUNTING**

**Coulomb Counting:**

It is a technique used to track the State of Charge of a battery pack. It works by integrating the active flowing current (measured in amps) over time to derive the total sum of energy entering or leaving the battery pack. This produces a capacity that is typically measured in Amp-hours.

**Current Sensor:**

A current sensor is a device that is used in order to calculate (observe) how much electric current is flowing through a given wire. This is very important for calculating [state of charge](https://www.orionbms.com/manuals/utility/acc_soc.html) as well as determining battery limits.

Every current sensor has a given range that it can measure (say -100 amps to 100 amps). It is essential that an appropriately sized current sensor is selected for the given application to maximize accuracy.

**Discharge Current Limit:**

The discharge current limit (sometimes referred to as DCL for short, or load current limit) represents the maximum amount of current (measured in amps) that can be pulled or drawn from the battery pack without damaging or exceeding system ratings. This value can change due to a number of reasons including temperature, voltage, [internal resistance](https://www.orionbms.com/manuals/utility/acc_intres.html) and age.

**How to Incorporate Coulomb Counting for Our Car:**

* Since we wish to know the proper indication of the strength of a battery, we will be using coulomb counting only for the output of the battery.
* For this we will connect a current sensor in series with the battery and output of current sensor to the Arduino.
* Now for a time period of say 1 hours, the current sensor will give the output of the battery in amps and using the integration function in Arduino this will then be used to calculate the charge of the battery at different times.
* This data can then be stored in an SD Card and be analysed which will give indication of the State of Charge of the battery and hence tell us how strong our battery is.

**Links:**

* <https://arduino.stackexchange.com/questions/37120/determining-state-of-charge-using-current-sensor-acs758-with-arduino-uno>
* https://arduino.stackexchange.com/questions/9436/integrating-an-analog-signal-using-arduino-uno-smd

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