

Battery health

Specification

Goal

- To provide a fast and reliable way to examine the healthiness of battery

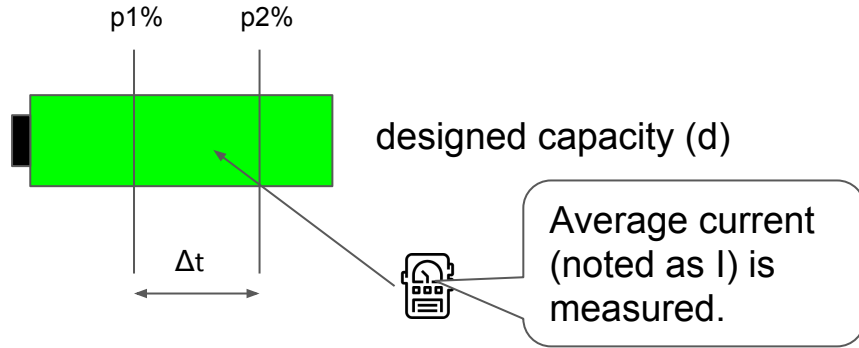
Use case

- One can read the latest healthiness of battery from phone, to tell if customer needs to replace the battery or not

Interface

- One can use terminal commands to check the healthiness of battery when phone is connected properly

Method (2019.04.16)



During a charging process that battery level changes from $p1\%$ to $p2\%$, and note the difference of battery level before and after charging as Δp , $\Delta p = p2 - p1$.

The electric charge according to design capacity is $\Delta t \times I$. And the estimated capacity of battery is $(\Delta t \times I) / \Delta p$.

If there is no loss in capacity, $(\Delta t \times I) / \Delta p$ should be very close to d , the designed capacity.

Thus, the healthiness of battery can be inferred as: $(\Delta t \times I) / \Delta p / d$.

Note:

1. The starting battery level ($p1$) of charge session should be **70%**, and the ending battery level ($p2$) is **100%**.
2. The estimation of " I ", aka average current (unit: mA) during charging, should be monitored **per second** continuously.
3. The estimated battery healthiness will be stored up to **20** records in the database.
4. The battery healthiness (raw) data **should be averaged with all previous records**. For example, if we get a new record (2nd record), before putting it into database, the raw data should be averaged with the first record in database, then update to database.
5. To be generalized, for i th new record, the raw data needed to be averaged with 1 to $(i-1)$ records existed in database.