



Cadex Electronics Inc.
22000 Fraserwood Way, Richmond, BC Canada V6W 1J6
Tel: 604 231-7777 Fax: 604 231-7755
Toll-Free: 1 800 565-5228 (USA & Canada)
E_mail: service@cadex.com Web: www.cadex.com

Determining the capacity offset

By: George Mathew
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Prerequisite: this document assumes that the user is familiar with viewing and editing C-Codes on the C7000 series battery analyzer.

The Capacity Offset parameter in the C-code is used for SLA batteries and it compensates for capacity changes due to higher or lower discharge rates. It is only a convenient means to calculate a battery capacity that differs from the normal due to a different discharge rate. Most users simply change the mAh setting in the basic C-Code instead of changing the capacity offset. We recommend changing the mAh instead of changing the capacity offset.

On the analyzer, displayed capacity = the calculated capacity + capacity offset. In the Extended C-code, Capacity Offset is shown as:

```
S2 *C1  Capacity Offset      :+00%
        Temperature Sensing: Disabled
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Capacity Offset has available settings from -50% to +49%. Capacity Offset can be left at 00% which is the default setting for all batteries. So the displayed capacity = calculated capacity.

Use the capacity offset for large SLA (Sealed Lead Acid) batteries. A battery specification sheet, which can be obtained from the battery supplier or manufacturer, is required to calculate the accurate capacity offset.

Most battery manufacturers determine the capacity of a SLA battery by discharging a battery for 20 hours. This is specified as a 0.05C (or 1/20) discharge where C is the capacity. Another less common discharge rate is a 10 hour discharge specified as 0.10C (1/10). Others may use different discharge times to determine the capacity. Due to the nature of batteries, the higher the discharge rate, the lower the battery capacity.

In the Extended C-code for a SLA battery, the C7000 has a default discharge rate of 0.10C since it is often not practical to discharge a battery for 20 hours.

```
S2 *C1  CHARGE RATE: 0.30C (2100mA)
        DISCHARGE RATE: 0.10C (700mA)
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Do the following to determine the capacity offset:

First determine the discharge time. Enter the basic C-code (chemistry, voltage and mAh) on the battery analyzer. Then press [→] or [S4] key to go to the Extended C-code. In the extended C-code, the Charge and Discharge rates are represented by a 'C'-rate and it's related mA rate in brackets. The discharge time is approximately 1/C-rate.

Using a 12V, 7.0Ah (7000mAh) SLA battery as an example, the basic C-code is SLA, 12.00V, 7000mAh. In the extended C-code, the battery analyzer by default sets the Discharge rate to 0.10C (700mAh). So the approximate discharge time will be 1/(0.10C) = 10 hours.

Next, refer to the specification sheet provided by the battery manufacturer. The battery specifications will show capacities either as a table or as a graph. They are typically given for a 20-hour discharge, 10-hour discharge, and 5-hour discharge. For example, most manufacturers will state that a 7000mAh SLA batteries discharged in 10 hours gives a capacity of 6.3Ah (6300mAh). So the capacity offset is 6300mAh/7000mAh = 10%. Use +10% in the capacity offset field of the Cadex Analyzer to give a 20-hour discharge reading.

An important note: *Adding a capacity offset merely corrects the readings to reflect a faster or slower discharge time. It will not affect the battery in any way. Most users simply change the mAh rate instead.*