

Description of Simulated Small Satellite Operation Data Sets

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Experiment Description

A set of two BP930 batteries (Identified as PK31 and PK35) were operated continuously for a simulated satellite operation profile completion for single cycle. The battery packs were charged to an initial voltage of around 8.35 V for 100% SOC before the experiment was started. An reference simulated current profile for the small satellite operation is detailed in the provided spread sheet.

This document explains the structure of the battery data sets. Please cite this paper when using this dataset.

- Z. Cameron, C. Kulkarni , A. Guarneros, K. Goebel, S. Poll , "A Battery Certification Testbed for Small Satellite Missions" , IEEE AUTOTESTCON 2015, Nov 2-5, 2015, National Harbor, MA

Files:

PK31.mat -> A Matlab data structure for BP930 Battery Pack #31

PK35.mat -> A Matlab data structure for BP930 Battery Pack #35

Data Structure:

Each of the .mat files contains a Matlab data structure called "data".

The top level of this structure contains 3 fields:

1. **procedure** (A string naming the experimental procedure)
2. **description** (A more detailed text description of the experimental procedure)
3. **step** (An array of structs containing cycling data)

Within the **step** array you will find a struct with the following fields:

1. **comment** (string description of step)
2. **type** (one character identifier of step: 'C' = Charging, 'D' = Discharging, 'R' = Resting (current = 0))

3. **relativeTime** (vector of sample time in seconds, referenced to the beginning of the current step)
4. **time** (vector of sample time in seconds, referenced to the beginning of the experiment)
5. **voltage** (vector of sample voltage in units of Volts)
6. **current** (vector of sample current in units of Amps)
7. **temperature** (vector of sample temperature in units of degrees C)
8. **date** (date and time at which the current step was started in dd-Mon-yyyy HH:MM:SS format)