

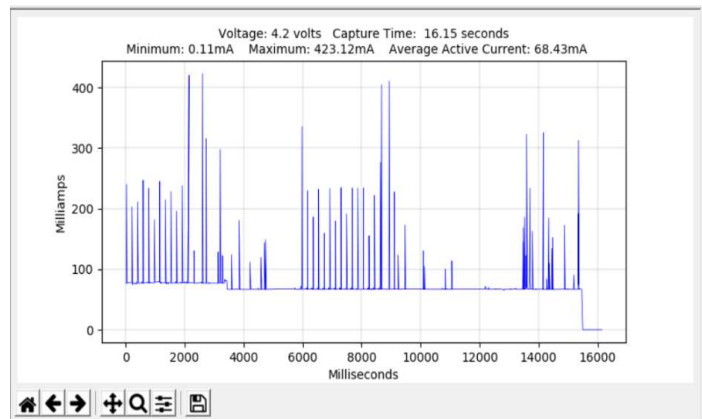


# BattLab-One

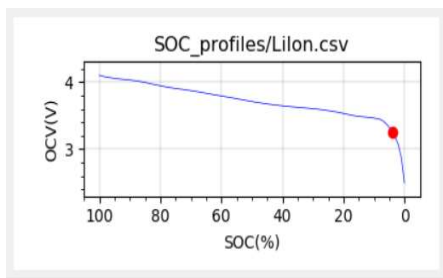
The BattLab-One simulates standard battery voltages and captures the current consumption profile of your device. Then use the BattLab-One software to optimize battery life using “what-if” analysis.

## Current Profiler

- Captures both active event and sleep current from 10uA to 500mA
- Trigger input to capture firmware states and their impact on overall battery life
- 1kHz Sample rate, 16-bit delta sigma ADC
- Long active event capture duration from seconds to hours
- Low/no burden voltage across all ranges (BattLab-One provides PSU output)
- Interactive/detailed active current plot



## Battery Simulation



- MSP430 microcontroller-based device that simulates standard batteries for Li-Ion, LiFePO4, Alkaline, NiMH, NiCd
- Provides voltages of 1.2V, 1.5V, 2.4V, 3.0V, 3.2, 3.6V, 3.7V, 4.5V at up to 450 mA, perfect for measuring your ESP8266 devices power demands.
- State of charge (SOC) curves and Cutoff voltage display

# Battery Life Optimization

**Step4 - Results and Optimization**

Parameter	Captured	Optimized
Active Event Current	71.77 mA	65.4 mA
Active Event Duration	0.015 S	0.01 S
Sleep Current	0.15 mA	0.15 mA
Sleep Duration	60.0 S	3600 S
DUT Cutoff Voltage	3.2 volts	3.2 volts
Effective Battery Capacity	2496 mAh	2496 mAh
Average Current Profile	0.17 mA	0.1502 mA

**Statistics**

Average Active Event Current (mA) =	71.77
Max active event current captured (mA) =	73.08
Min active event current captured (mA) =	69.73
Estimated Battery Life (hours)	Captured: 14656.78, Optimized: 16619.89
Estimated Battery Life (days)	Captured: 610.7, Optimized: 692.5

Buttons: Optimize, Reset, Save Results, Export Active Data, Export Sleep Data

- “What-if “analysis to optimize the battery life of your product
- Save profiles so you can compare your device under test (DUT) current profiles
- Export captured data to CSV file

- USB 2.0 Type B connection to PC
- BNC Trigger Input to capture firmware events
- USB power and data isolated from PSU output to avoid ground loops
- Support for Windows 7,8,10
- Open-source hardware and software



**BattLab One Version 1.1.1**

BattLab Connected (COM163)

**Step1 - Battery Info and PSU Output**

Battery Chemistry: Li-Ion  
 Number of Cells: 1 cells  
 Battery Capacity (1 cell): 2600 mAh  
 DUT Cutoff Voltage: 3.2 volts  
 PSU Voltage Output: 4.2 volts  
 PSU Output: On

**Step2 - Active Event Current** Complete  
 DUT Active Duration: 10 Sec -OR- Est Trig  
 ARM Trigger: 71.77 mA

**Step3 - Sleep Event Current** Complete  
 DUT Sleep Duration: 60 Sec  
 Capture Sleep: 152.4 uA  
 Show Sleep Current Plot:  Persist Sense Resistor:

**Step4 - Results and Optimization**

Active Event Current: 71.77 mA (Captured), 65.4 mA (Optimized)  
 Active Event Duration: 0.015 S (Captured), 0.01 S (Optimized)  
 Sleep Current: 0.15 mA (Captured), 0.15 mA (Optimized)  
 Sleep Duration: 60.0 S (Captured), 3600 S (Optimized)  
 DUT Cutoff Voltage: 3.2 volts (Captured), 3.2 volts (Optimized)  
 Effective Battery Capacity: 2496 mAh (Captured), 2496 mAh (Optimized)  
 Average Current Profile: 0.17 mA (Captured), 0.1502 mA (Optimized)

**Statistics**

Active Event Profile: Voltage: 4.2 volts, Capture Time: 0.01 seconds  
 Minimum: 69.73mA, Maximum: 73.08mA, Average Active Current: 71.77mA

Estimated Battery Life (hours): 14656.78 (Captured), 16619.89 (Optimized)  
 Estimated Battery Life (days): 610.7 (Captured), 692.5 (Optimized)

Buttons: Optimize, Reset, Save Results, Export Active Data, Export Sleep Data

**Graphs:**

- Active Event Profile: Milliamperes vs Milliseconds
- SOC\_profiles/Lilon.csv: dC(V) vs SOC(%)



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