Over 1000 projects since 1997

- Offices in Silicon Valley, USA and Waterloo, Canada
- Electronic product design division founded in 1997
- Battery management solutions since 2008
  - High-Voltage BMS: 12-1250VDC
  - Low-Voltage BMS: 11-60VDC
  - Stack Switchgear
  - Grid Battery Controller
- Custom energy management solutions
- ESS systems design
Cell Management

Cell Voltage

<table>
<thead>
<tr>
<th>Voltage</th>
<th>MAX: 3.224 V</th>
<th>AVG: 3.22 V</th>
<th>MIN: 3.215 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell 1:</td>
<td>C11:C11</td>
<td>C11:C2</td>
<td>C11:C12</td>
</tr>
</tbody>
</table>

Temperature

<table>
<thead>
<tr>
<th>Temperature</th>
<th>MAX: 25 °C</th>
<th>AVG: 20 °C</th>
<th>MIN: 15 °C</th>
</tr>
</thead>
<tbody>
<tr>
<td>°C</td>
<td>C11:C2</td>
<td>C11:C1</td>
<td>C11:C1</td>
</tr>
</tbody>
</table>

Battery Management Solutions
Battery Management Solutions

Stack Management

Stack Voltage
Stack Current
BMS Status

State of Charge
Depth of Discharge

Name | Value
--- | ---
Cells Balancing | 0
Charge Limit | -100 A
Discharge Limit | 100 A

Updated 13:16 22/11/2019
Battery Management Solutions

ESS Management

NUVATION ENERGY
The Nuvation Energy High-Voltage BMS Power Interface, Stack Controller, and Cell Interface modules are UL Recognized for use in UL 1973 and UL 9540 certifiable energy storage systems.
Battery Management System Clients
NUVATION GARAGE: TECHNOGECKO

2\textsuperscript{nd} Life Hybrid ESS and Mutant EV

- Now two vehicles, added Dance Floor with pair of 14’ stainless steel poles
- Vehicles split apart to get through city streets and then recombine on playa
- Spiers provided second life Nissan leaf modules
- Motive pack: 80kwhr 8 stack system of 14s8p, 52V, Nuvation Low Voltage BMS
- Plug in hybrid: onboard 100G propane tank for generator and fire effects
- Under harsh environment testing in Black Rock desert, managed charge and discharge current within temperature and voltage limits