

Standard Operating Procedure: Multi-Point Temperature & Cell Voltage Sense Harness Calibration

Scope and Objective

This Standard Operating Procedure defines the annual calibration, drift assessment, and validation protocol for high-precision voltage sense taps and multi-point NTC thermistor wiring harnesses installed inside **Megapack X-7000**, **PowerStation G-3500**, and **CompactGrid C-1200** systems.

Required Calibration Test Equipment

- 6.5-digit precision digital multimeter (Fluke 8846A or Keysight 34465A with valid NIST-traceable calibration certificate).
- Calibrated decade resistance box (Range: 100 Ω to 100 k Ω , 0.05% accuracy) or certified thermistor simulator **SIM-TH-100**.
- Gigavolt Service Tool v4.1 with Automated Calibration Routine Module.

Voltage Sense Harness Verification & Tolerance Limits

1. **Physical Inspection:** Inspect wiring harness **HAR-VOLT-SENS** for micro-fretting, loose pin crimps, or chemical oxidation on gold-plated Molex connectors.
2. **Measurement Comparison:** Connect precision reference multimeter across each cell terminal pair (Cell 1 through Cell 24). Read open-circuit voltage simultaneously via service software telemetry and reference meter.
 - **Allowable Voltage Deviation:** The delta between the BMS software reading and the reference meter must not exceed ± 2.0 mV.
 - If deviation is between 2.0 mV and 5.0 mV, execute software offset calibration in BMS EEPROM.
 - If deviation exceeds 5.0 mV, replace the slave BMS balancing board (**BMS-CAS-LFP**).

Thermistor Resistance & Temperature Verification

1. Disconnect thermistor harness connector **CONN-THM-01** from the slave board.
2. Connect decade resistance box to channel 1. Set resistance values corresponding to standard operating temperatures:
 - **0 °C:** 32,650 Ω
 - **25 °C:** 10,000 Ω
 - **50 °C:** 3,603 Ω
 - **75 °C:** 1,480 Ω
3. Verify that telemetry display reads within ± 0.5 °C of target reference temperature at each test step.
4. If temperature error exceeds 1.5 °C, inspect harness wiring for strain degradation or moisture wicking; replace harness assembly if sensor probe resistance is out of tolerance.