HIOKI

BATTERY CELL VOLTAGE GENERATOR
SS7081-50

NEW

Building an environment for validating BMS*1 functionality has never been easier

*1 BMS: Battery Management System

Introducing a 12-channel battery cell voltage generator that delivers power supply, electronic load, and DMM functionality in a single package.

The SS7081-50's simple architecture makes building an environment for validating BMS functionality more affordable and productive than ever before.

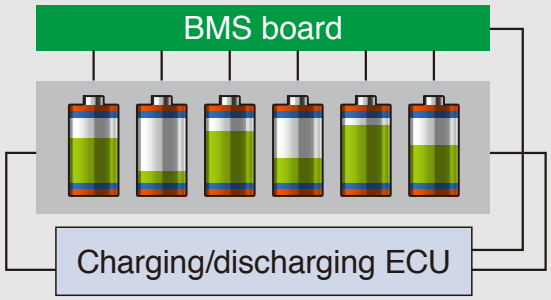
CE **ISO/IEC 17025***2

*2 Calibration is performed according to customer-specified calibration points within the scope of certification. Calibration is not available for the entire specification range of the product.

Issues with Conventional BMS Validation Environments

Using Actual Batteries

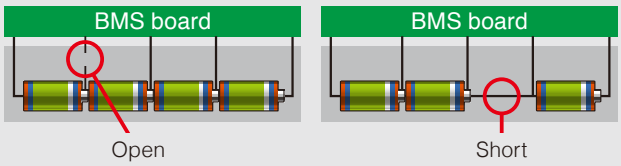
- Typical test environment using batteries



Issues

· Difficult to set the voltage of individual cells as desired
· Charging and discharging take time
· When reproducing an error state with actual batteries, critical-region use poses the risk of battery degradation or fire

- Reproduction of open BMS-cell connections and shorts between cells

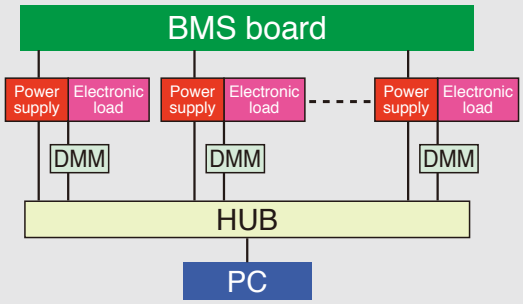


Issues

· Setup requires relay control in order to reproduce open connections and shorts

Using Multiple Power Supplies

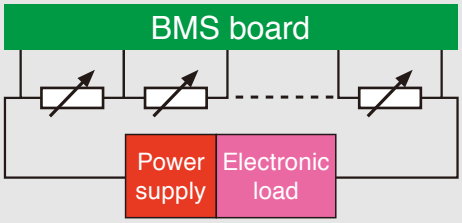
- Typical test environment using multiple power supplies and DMMs



Issues

· Challenging to control multiple power supplies and DMMs separately

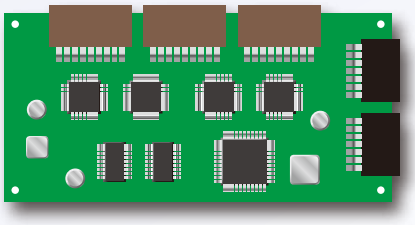
- Using a single power supply and resistance voltage divider



Issues

· Impossible to balance cells across channels
· Significant time required to set the variable resistance for each channel

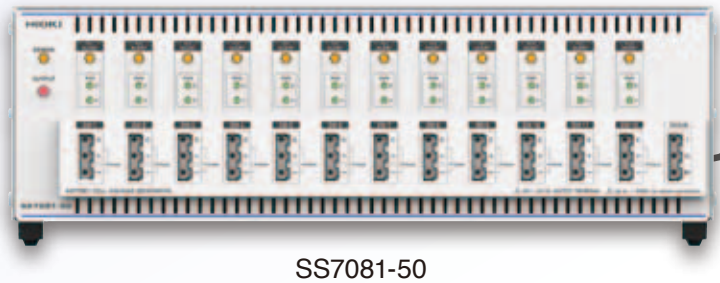
Battery Cell Voltage Generator SS7081-50 resolves all of these issues



BMS board

SS7081-50

Build an environment using a single instrument that simulates battery voltages for 12 cells



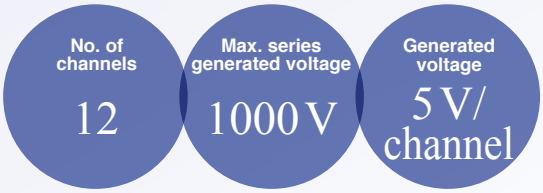
SS7081-50

Easily build your own system to control the SS7081-50 on site, or use the bundled PC application.

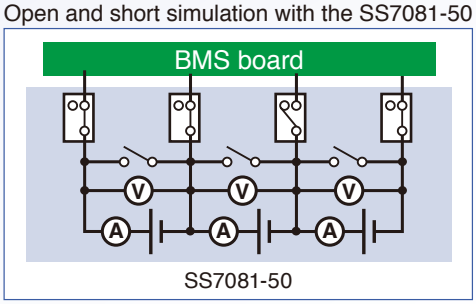
Build a highly accurate BMS validation environment easily and safely

Safer than using actual batteries and separate power supplies

- Simulate cell behavior in individual channels, with 12 channels per SS7081-50 unit
- Build a large-scale module environment with a series voltage of 1000 V
  (5 V/channel × 200 channels = 1000 V)
- Simulate cell anomalies that would pose the risk of fire if using actual batteries
- Simulate open-wire malfunctions between channels and the BMS
- Simulate cell shorts



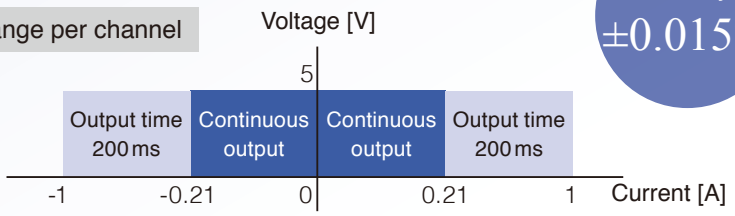
Open and short simulation with the SS7081-50

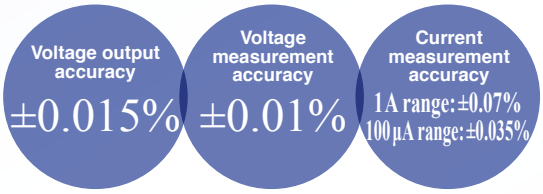


High-accuracy, high-precision output and testing

- Simulate cell behavior using high-accuracy voltage output
- Take advantage of cell balancing from -1 A to 1 A with two-quadrant output voltages

Output range per channel

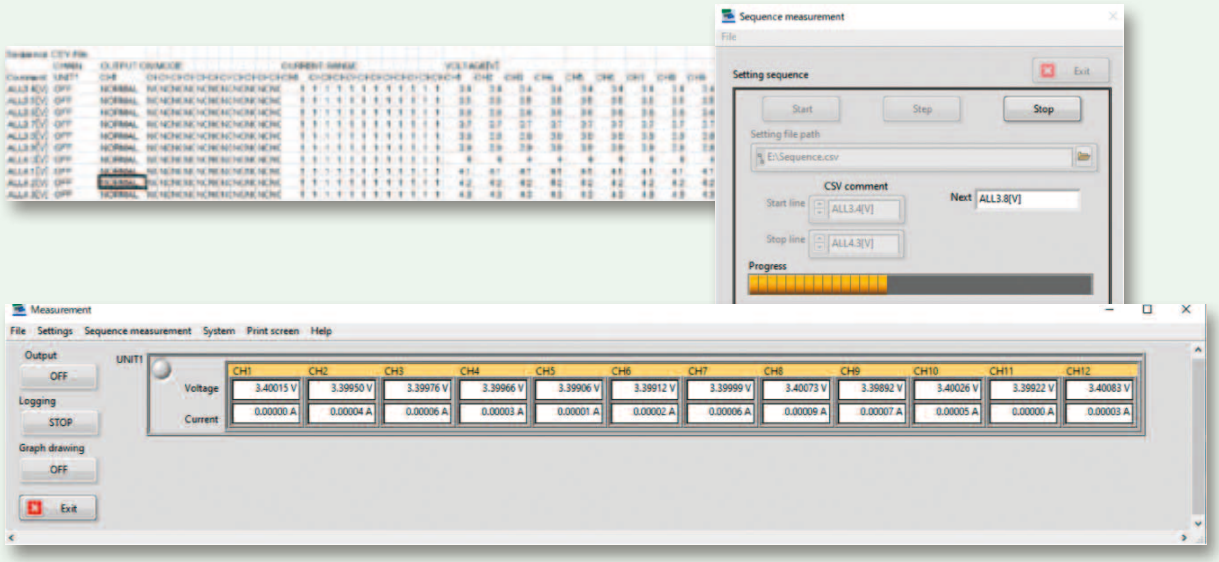




- High-accuracy, high-precision voltage and current measurement
- Measure minuscule currents using the 100 µA range
  (for BMS dark current and cell balancing circuit leakage current)

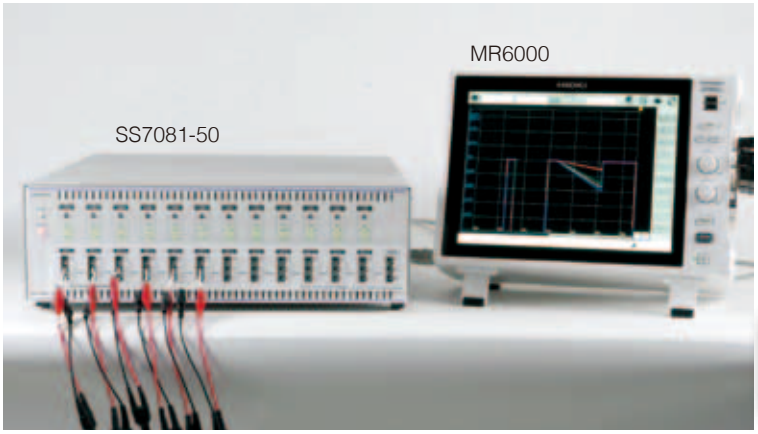
Simplify evaluation with the bundled PC application

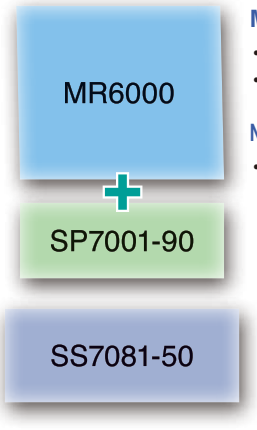
- Control up to ten SS7081-50 units
- Automate testing by creating sequences of the simulated states you wish to reproduce



Example system architecture

System based on a HIOKI Memory HiCorder and Non-Contact CAN Sensor





MEMORY HiCORDER MR6000

- Data and waveform logging
- Temperature measurement

NON-CONTACT CAN SENSOR SP7001-90

- Capture CAN signals
  (MR6000 Ver. 3.0*)

*Using the VN1600 family of interfaces from Vector

Specifications

(Accuracy guaranteed for 1 year, accuracy after adjustment guaranteed for 1 year)

Number of channels	12	
Maximum in-series connections	In-series connections of instrument up to and including a maximum in-series output voltage of 1000 V	
Output range	DC voltage	0.0000 V to 5.0250 V (set independently for all channels)
	Maximum output current	±1.00000 A (set independently for all channels) Continuous output: -210 mA to 210 mA Continuous output of currents greater than 210 mA or less than -210 mA is subject to limitations*. *Continuous output limitations Max. output time: 200 ms Time to next output (reference value): If outputting 1 A at 5 V for 200 ms, 5 s
Measurement range	DC voltage	-0.00100 V to 5.10000 V
	DC current (2-range architecture)	±1.20000 A (1 A range) ±120.0000 µA (100 µA range)
Integration time	1 PLC (50 Hz: 20 ms; 60 Hz: 16.7 ms) × number of smoothing iterations (user-configured)	
Voltage output accuracy	±0.0150% of setting ±500 µV Additional error (temperature coefficient) 0°C to 18°C, 28°C to 40°C: Add the following value per 1°C: ±0.05 × output accuracy/°C Output resistance: 3 mΩ or less (not including terminal contact resistance)	
Voltage measurement accuracy	±0.0100% of reading ±100 µV Additional error (temperature coefficient) 0°C to 18°C, 28°C to 40°C: Add the following value per 1°C: ±0.05% × measurement accuracy/°C	

Current measurement accuracy	1 A range	±0.0700% of reading ±100 µA Additional error (temperature coefficient) 0°C to 18°C, 28°C to 40°C: Add the following value per 1°C: ±0.05% × measurement accuracy/°C
	100 µA range	±0.0350% of reading ±10 nA Additional error (temperature coefficient) 0°C to 18°C, 28°C to 40°C: Add the following value per 1°C: ±0.05% × measurement accuracy/°C
Accuracy guarantee temperature and humidity range	23°C ±5°C, 80% RH (with warm-up time of at least 30 min.)	
Power supply	Universal (100 V to 240 V AC)	
Power supply frequency range	50 Hz / 60 Hz, ±2 Hz	
Interfaces	LAN Supported standard: IEEE 802.3 Transmission method: 10Base-T/100Base-TX, automatic detection, full duplex Protocol: TCP/IP Connector: RJ-45 Functionality: Configuration of settings and acquisition of device status and measured values using communications commands Settings: IP address: 192.168.1.xxx (only the xxx portion is user-configured) Subnet mask: 255.255.255.0 (fixed) Default gateway: None (fixed) Communications command port: 1024 (fixed) Default setting: IP address: 192.168.1.1	
Dimensions and mass	430 (16.93 in)W ±3 mm (0.12 in) × 132 (5.20 in)H ±3 mm (0.12 in) × 483 (19.02 in)D ±3 mm (0.12 in), 10.3 kg (363.3 oz.) ±0.5 kg (17.6 oz.)	
Accessories	User manual, power cord, rack frame, disk with computer application	

Model

Model: BATTERY CELL VOLTAGE GENERATOR SS7081-50

Model No. (Order Code) : SS7081-50

Please contact your HIOKI distributor for a demonstration unit and further specifications.

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