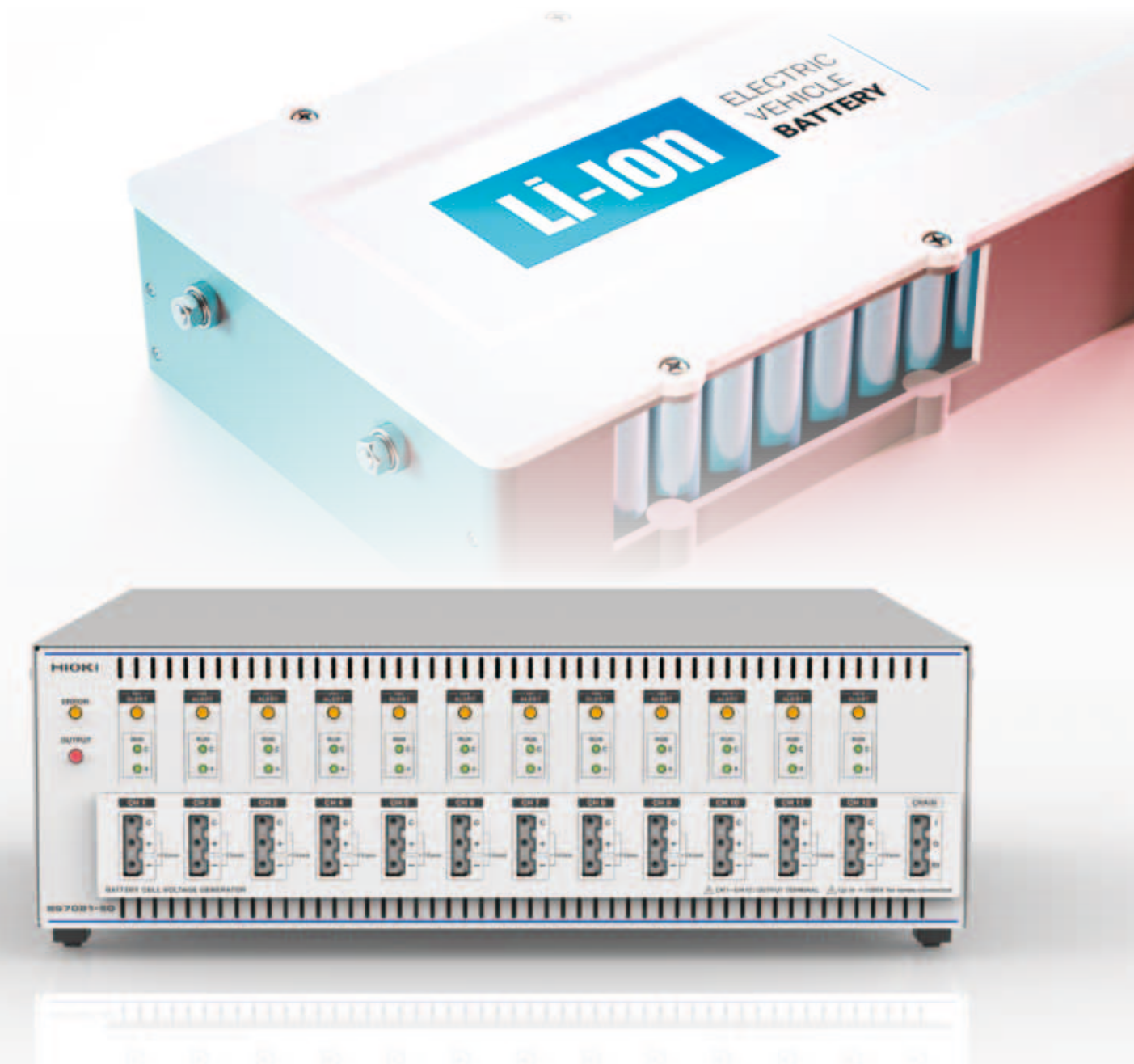


HIOKI

BATTERY CELL VOLTAGE GENERATOR SS7081-50

NEW



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

^{*1} BMS: Battery Management System

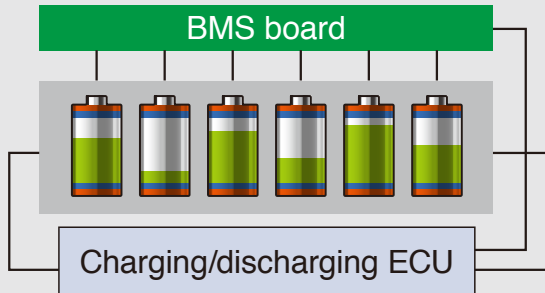
Introducing a 12-channel battery cell voltage generator that delivers power supply, electronic load, and DMM functionality in a single package.

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

Issues with Conventional BMS Validation Environments

Using Actual Batteries

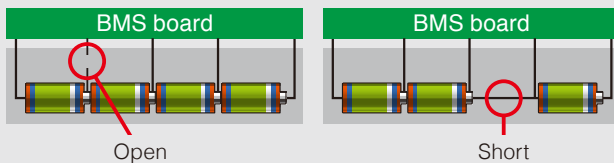
- Typical test environment using batteries



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

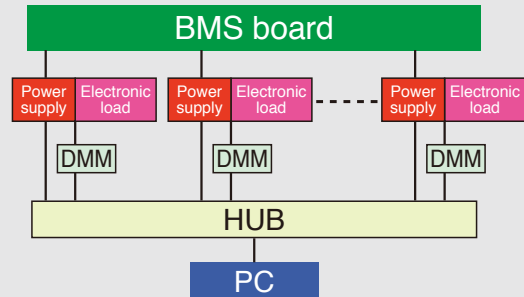


Issues

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

Using Multiple Power Supplies

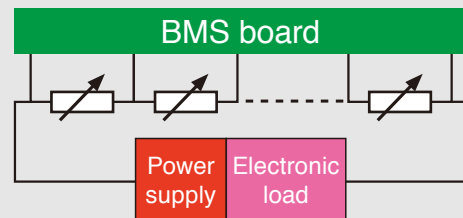
- Typical test environment using multiple power supplies and DMMs



Issues

- Challenging to control multiple power supplies and DMMs separately

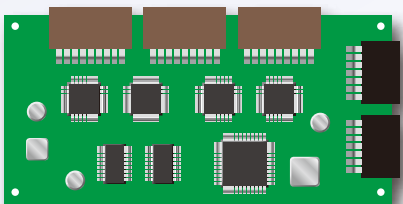
- Using a single power supply and resistance voltage divider



Issues

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

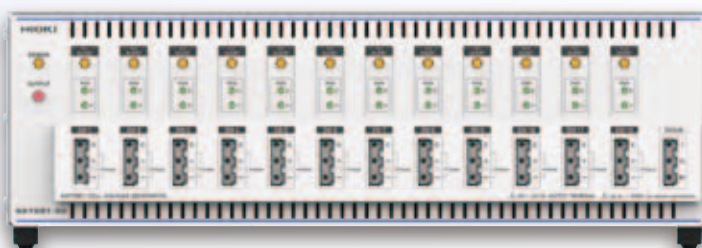
Battery Cell Voltage Generator SS7081-50 resolves all of these issues



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

No. of channels

12

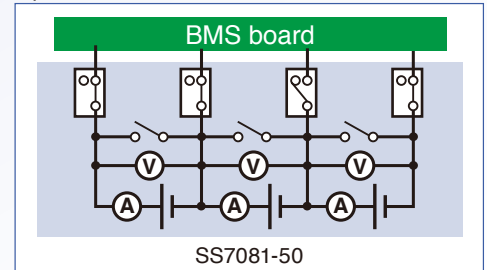
Max. series generated voltage

1000 V

Generated voltage

5 V/
channel

Open and short simulation with the SS7081-50

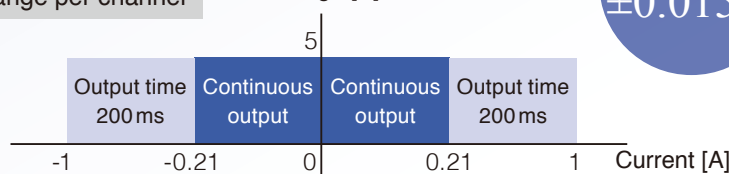


• High-accuracy, high-precision output and testing

- 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

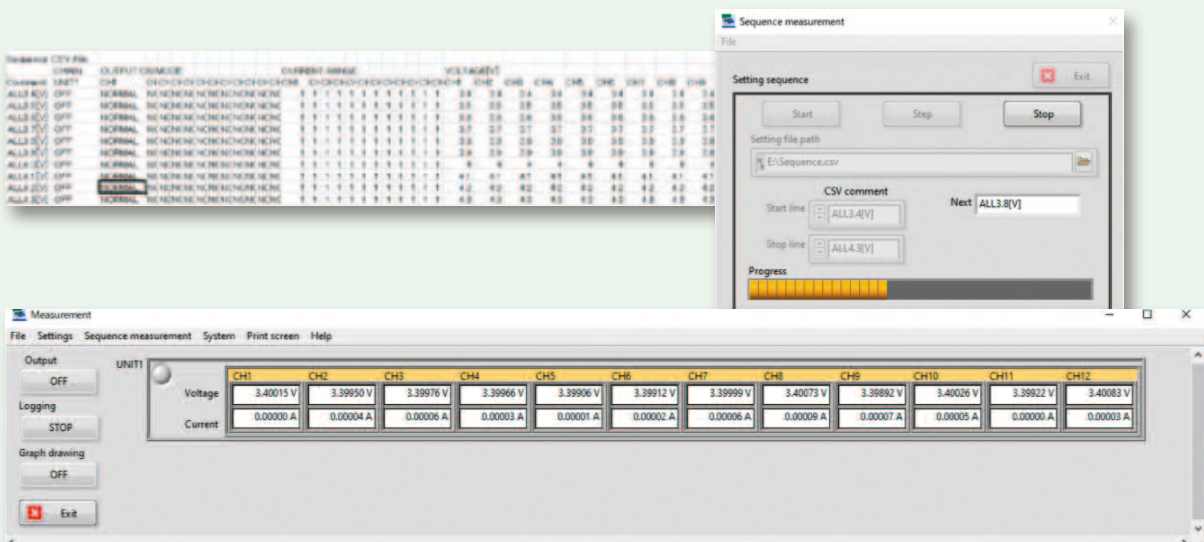
Voltage [V]

Voltage output accuracy
±0.015%Voltage measurement accuracy
±0.01%Current measurement accuracy
1 A range: ±0.07%
100 μA range: ±0.035%

- 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)

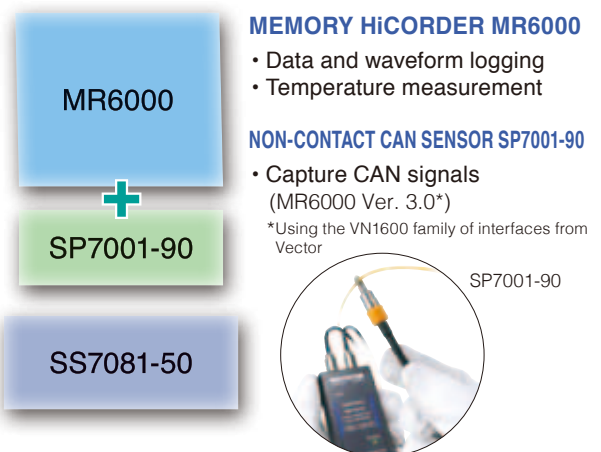
Simplify evaluation with the bundled PC application

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



Example system architecture

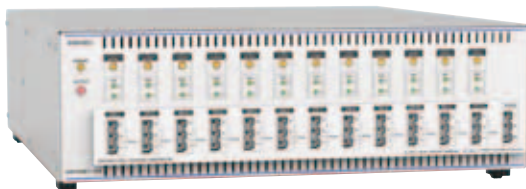
System based on a HIOKI Memory HiCorder and Non-Contact CAN Sensor



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

Number of channels	12		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
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)		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
	Maximum output current	±1.00000 A (set independently for all channels) Continuous output: -210mA to 210mA Continuous output of currents greater than 210mA or less than -210mA is subject to limitations*. *Continuous output limitations Max. output time: 200ms Time to next output (reference value): If outputting 1 A at 5 V for 200ms, 5 s			
Measurement range	DC voltage	-0.00100V to 5.10000 V	Accuracy guarantee temperature and humidity range	23°C ±5°C, 80% RH (with warm-up time of at least 30 min.)	
	DC current (2-range architecture)	±1.20000 A (1 A range) ±120.0000 μA (100 μA range)			
Integration time	1 PLC (50Hz: 20 ms; 60Hz: 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				
			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 ±3mm (0.12 in) × 132 (5.20 in)H ±3mm (0.12 in) × 483 (19.02 in)D ±3mm (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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