

NovaCarts Battery Cell Emulation Board

The "NovaCarts Battery Cell Emulation Board" (NC-BEB1001) simulates the electrical behavior of lithium-ion battery cells and fuel cells, thus making the board the ideal solution for validating battery control units and charging systems.

Compared to the "NovaCarts Cell Simulation Board" (NC-BEB1000), it offers a number of new functions. The most important ones include:

- » improved voltage range also for small negative voltages
- » increased accuracy
- » increased equalization current up to 5 A
- » exact measurement of charge and discharge currents
- » exact measurement of charge flow to and from battery management systems
- » measurement of leakage currents
- » simulation of impedance spectroscopy up to 10 kHz due to extremely high dynamics and accuracy

These unique features facilitate the testing of the next generation of battery management systems. Due to its high dynamics and enormous computing power, the NovaCarts Battery Cell Emulation Board offers optimal conditions for the development of innovative, future battery management functions as well as new battery types (e.g. solid state lithium cells) ranging up to fuel cells.

Due to its high flexibility and computing power, the board can be easily and cost-effectively extended with new functions by means of firmware updates. One option is an electrochemical cell model for lithium-ion cells developed by Fraunhofer IEE. This model simulates the exact behavior of Li-ion cells over the entire range of the battery life cycle, including state of charge (SOC) and state of health (SOH). It can be used to simulate the state of a battery in any condition - with μ s resolution for electrical simulations that even enable impedance spectroscopy for control devices.

Connectors

- » 4 x Cell channels
- » 1 x High speed inter-connection on backplane

Galvanic isolation

- » Galvanic isolation between channels and system

Diagnostics and maintenance

- » Easy maintenance through automatic self-detection and configuration
- » Advanced diagnosis capability

Ethernet interface

- » Plug and Play capability
- » Connection to Windows PC or to RT system

Data Sheet

 Module name: **NC-BEB1001**

 Data sheet version: **1V1**

Features

Simulated battery voltages	4 channels
Supply voltage	24 V
Operating temperature	0 to +55 °C
Storage temperature	-20 to +70 °C
Humidity	10 to 90 % (no condensation)
Dimension	Height: 4 U, Width: 8 U
Connection to RT system	Realtime Ethernet

Specifications

Output voltage	
Voltage range	-1,25 V to +8,25 V
Accuracy	±0,5 mV
Current range	±5 A
Resolution	8 µV
Update rate	up to 10 MHz
Current measurement	
Current range (+/-5 A)	Resolution 161 µA
	Accuracy +/-1 mA
Current range (+/-10 mA)	Resolution 0,5 µA
	Accuracy +/-10 µA
Coulomb measurement	
Current range	+/-5 A
Charge range for measurement	+/-250 mAs
Max. time for one measurement	50 ms
Sampling rate for current	500 kHz

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