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TERMA BATTERY CELL TESTER – TBCT300

FOR TESTING HIGH-CAPACITY BATTERY CELLS USED IN ELECTRIC VEHICLES (EVS), INDUSTRIAL APPLICATIONS, AND LARGE-SCALE ENERGY STORAGE SYSTEMS.

TBCT300 Key Features Description

Self-Calibration Capability

Each channel in the system can self-calibrate the voltage measurement mechanism by utilizing a precision voltage reference in the device. This allows for automated voltage calibration on command without user intervention. Current calibration is done using a calibration kit and requires user intervention to perform.

Built-in Snapshot

Each channel has the capability of capturing quick snapshots of the output current and voltage to provide deep diagnostic capabilities of the battery cell. This snapshot is fully programmable and can be triggered automatically during the test run.

Built-in Direct Current Internal Resistance (DCIR)

Each channel has the capability to perform a DCIR function automatically and provide the calculated results. A minimum pulse of 2msec is guaranteed.

Built-in Electrochemical Impedance Spectroscopy (EIS)

The system can perform EIS to understand the internal workings of a battery cell, revealing its health, internal resistance, and how different components interact. EIS specifications:

- Plug and play integration with TBCT, integration to cell tester workflows
- AC Output Current range: 10A (p-p)
- Frequency range: 1 mHz – 10 kHz
- Battery Impedance: 0.1 mΩ– 100 mΩ
- Fast measurement with multi-sine excitation
- Accuracy of impedance measurement < 1% (of measured values)
- Voltage input resolution (AC) <2 mV
- Voltage input resolution (DC) <0.5 mV
- Voltage measurement accuracy (DC) <0.225 mV
- Cable impedance compensation

Built-in Cyber-Security

- Operating system updates (Debian based for Embedded controller)
- Authentication Authorization for GUI
- Encrypted sensitive information
- Security Related Telemetry
- Remote Connections
- User management
  - Configure user and passwords access
- Firewalling
- Accounts for different roles, Admin, Developer, Tester,
- Debug UART Protection
- Virus scanner installation and execution

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TBCT300 key features

	Standard	Upgrades
Current Accuracy	0.03% full scale / 180mA	Upgrade to 0.01% full scale / 60mA
Voltage Accuracy	0.01% full scale / 1mV	
Channel Count	8 / 16 / 24 / 32 channels	
Number of Possible Parallel Channels (parallel only possible with channels in same device)	4	up to 8
Local Data Storage	1 TB	Expandable on request
Safety Features	Standard interlocks	Enhanced compliance on request
Extended Warranty	1-year standard	Upgrade to 3 or 5 years
Remote Voltage Sense	Yes	
Dynamic Profiles Mode	Yes	
Analog IN Per Device	4	up to 8
Analog OUT Per Device	4	up to 8
Thermistors Per Device	32	
RS485 interfaces (Full Duplex) Per Device	4	up to 8
Snapshot per Channel	• Voltage and current measurement per channel • Up to 8192 samples per snapshot per signal • Fixed sampling rate of 10kHz • Configurable trigger	• Additional temperature, analog-in and analog-out measurement per channel • Configurable sampling rate from 100Hz up to 100kHz
Cyber Security Package	No	Yes
Self-Calibration Per Channel	No	Yes
DCIR Capability	Yes	
EIS Capability	No	Yes
Data Acquisition Rate	Up to 1 kHz	
Parallel Channel Operation	Supported	
Energy Efficiency	~95% regenerative	
Custom Software Plugins / API Extensions	Available on request	Available on request
Graphical User Interface	Included	
Open API for Automation	Yes	
Installation & Commissioning	Optional add-on service	
On-site Training	Optional service package	
Annual Calibration & Maintenance	Optional service contract	

Available Models

Model	300-8	300-16	300-24	300-32	12-64	12-128	12-192	12-256	Mix-1 to 6
Test channels	8	16	24	32	64	128	192	256	mix and match 300A and 12.5A versions
Voltage range	0 - 10 V	0 - 10 V	0 - 10 V	0 - 10 V	0 - 10 V	0 - 10 V	0 - 10 V	0 - 10 V	
Current range	±300 A	±300 A	±300 A	±300 A	±12.5 A	±12.5 A	±12.5 A	±12.5 A	
	Manual parallel connections of up to 8 channels increase the maximum current range of the system to either 2400 A for the 300 series or 100 A for the 12 series.								

Note: See separate data sheet for the 12.5A models detailed specifications.

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Detailed Specifications

Static Performance		
Operation Modes		CC, CV, CP
Max. Power per channel		1800W
Current range		±300A
Voltage Range		0V - 10V

Measurement		
Current	Resolution	4.5mA
	Accuracy	180mA - 60mA
Voltage	Resolution	150µV
	Accuracy	1mV
Temperature	Accuracy	0.1°C
Data acquisition	EtherCAT	up to 1kHz
	Ethernet	up to 1kHz (bandwidth dependent)

Waveform Measurement Built-in Snapshot	
Digitizing Rate Range	100 – 100KSamples/Sec
Default Digitizing Rate	10 KSamples/Sec
Memory	8192 samples

Dynamic Performance	
Current Rise/Fall Time (10-90%)	< 1.8msec
Time from Minus to Maximum Current	< 2.0msec

Safety	
Isolation AC Input	3.8 kV AC Input to Chassis / 3.8 kV AC to DC Output
Isolation UUT Input	600VDC Channel to Channel; 2.5kV Channel to Chassis for all channels
Internal Protection	Over-Current, Under-Voltage, Over-Voltage, Over-Power, Over-Temperature
Programmable Safety	Over/Under-Current, Over/Under-Voltage, Over/Under-Power, Over-Temperature
Emergency Stop	Yes
Mains over current protection	Yes
Internal Protection	Yes
Lamp	Yes
Safety lockout in the front for removing power to the outputs	In upgrade package
Safety lockout in the front for removing power to the devices	In upgrade package
Safety lockout in the back for total shutdown	Yes
Programmable Safety	Yes

If you have any questions, please contact our team terma.space@terma.com