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 traditional 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 EIS

The system can also perform EIS to give detailed data on the state of health of the cell. This powerful Feature can be used without adding any additional external testing hardware. 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

TBCT300 performance and feature levels

The TBCT 300 model is available in three feature level: Basic, Standard and Premium.

Basic

- Covers all cycling testing scenarios
- High voltage and current accuracy
- EtherCAT and Ethernet
- Basic Snapshot per channel included
  - Voltage and current measurement per channel
  - Up to 8192 samples per snapshot per signal
  - Fixed sampling rate of 10kHz
  - Voltage and current setpoints for triggering snapshot

Standard

All Basic features plus:

- Minimum output voltage reduced to 650mV
- RS485 interface

Premium

All Standard features plus:

- Minimum output voltage reduced to 250mV
- Full Snapshot per channel included
  - Voltage, current, temperature, analog-in and analog-out measurement per channel[1]
  - Up to 8192 samples per snapshot per signal
  - Configurable sampling rate from 100Hz up to 100kHz
  - Voltage, current, temperature, analog-in and analog-out setpoints for triggering snapshot[2]
- Built in self-calibration, increasing the lifetime of the accuracy
- Cybersecurity package

[1] Available in Q2 2025
[2] Available in Q2 2025

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TBCT300 key features

	Basic	Standard	Premium
Max. Voltage Per Channel	Up to 10VDC	Up to 10VDC	Up to 10VDC
Voltage Accuracy	1mV	1mV	1mV
Current Accuracy	0.05% FS 300mA	0.03% FS 180mA	0.01% FS 60mA
Voltage Resolution	150µV	150µV	150µV
Current Resolution	4.5mA	4.5mA	4.5mA
EtherCAT	Yes	Yes	Yes
Ethernet	Yes	Yes	Yes
Cards Parallelization[3]	Yes	Yes	Yes
CC, CV, CP Modes	Yes	Yes	Yes
Remote Voltage Sense	Yes	Yes	Yes
Dynamic Profiles Mode	No	Yes	Yes
Analog IN Per Device	-	4	8
Analog OUT Per Device	-	4	8
Thermistors Per Device	-	16	32
RS485 (Full Duplex) Per Device	-	4	8
Relay Outputs Per Device	8	8	8
Graphical User Interface and open API	Yes	Yes	Yes
Snapshot per Channel	Basic	Basic	Full
Cyber Security Package	No	No	Yes
Self-Calibration Per Channel	No	No	Yes
DCIR Capability	Yes	Yes	Yes
EIS Capability[4]	No	No	Yes

[3] same type of channels in the same device only
[4] Available not earlier than Q1/2025

Detailed Specifications

Static Performance	
Maximum Number of Channels Per Cabinet	32
Number of Possible Parallel Channels (parallel only possible with channels in same device)	8
Operation Modes	CC, CV, CP
Max. Power per channel	1800W
Current range	±300A
Voltage Range	0V - 10V
Efficiency	Up to 95%

Measurement		Basic	Standard	Premium
Current	Resolution	4.5mA	4.5mA	4.5mA
	Accuracy	300mA	180mA	60mA
Voltage	Resolution	150µV	150µV	150µV
	Accuracy	1mV	1mV	1mV
Temperature	Accuracy	0.1°C	0.1°C	0.1°C
Data acquisition	EtherCAT	up to 1kHz	up to 1kHz	up to 1kHz
	Ethernet	up to 1kHz (bandwidth dependent)	up to 1kHz (bandwidth dependent)	up to 1kHz (bandwidth dependent)

Waveform Measurement (Oscilloscope Function)	
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
Safety Interlocks	Emergency Stop, External User Input
Internal Protection	Over- Current (OC) Under-Voltage (UV) Over-Voltage (OV) Over-Power (OP) Over-Temperature
Programmable Safety	Over/Under- Current (OC/UC) Over/Under-Voltage (OV/UV) Over/Under-Power (OP/UP) Over-Temperature