

Engineering Excellence in Testing Applications



UNICO BATTERY CELL TESTERS

BAT100 SERIES

Ultra High Performance and Compact Cell Testing for R&D



Unico's R&D Cell Tester is a ultra-high performance cell testing solution in an incredibly small package. It leads the industry with the highest energy density in the smallest footprint with up to (64) 300A channels in a single system. Built-in advanced features on each channel like EIS, DCIR, self-calibration, and waveform capture allows you to perform all your R&D testing without additional devices, saving significant space in your lab. If high performance testing with built-in advance functionality and a small footprint is your need, this is the solution.

HIGHEST PERFORMANCE, SMALLEST FOOTPRINT 75% SMALLER THAN COMPARABLE SYSTEMS

MODULAR CELL TEST SYSTEM

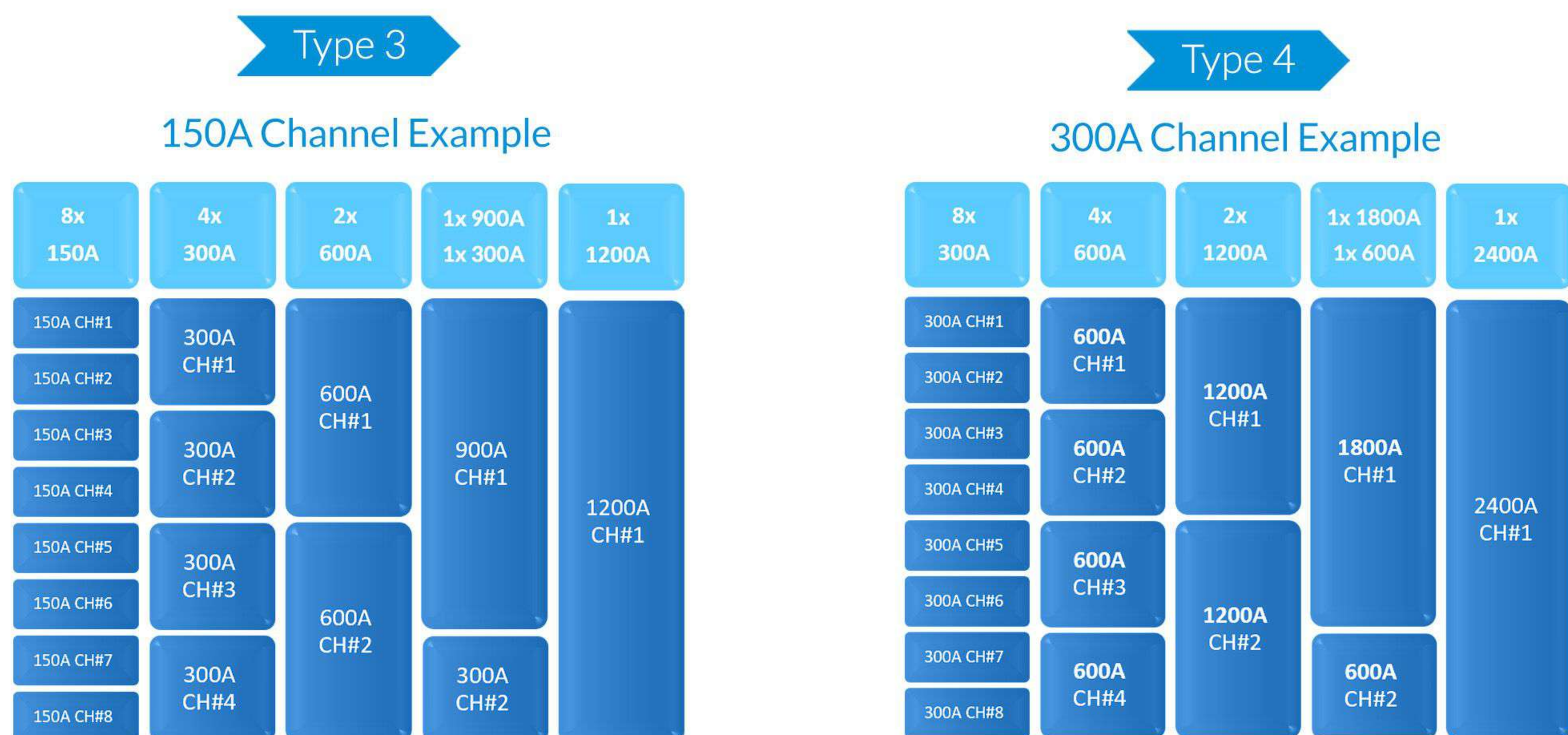
CELL TEST PLATFORM YOU CAN GROW WITH

Key Features:

- › Modular Design
- › Standard and Custom Configurations
- › Fully Regenerative
- › >95% Overall Efficiency
- › 4 Available Current Range Configurations
- › 3 Performance and Feature Levels
- › Built-In Automation
- › Open API for 3rd Party Automation
- › Future Features Available with SW Upgrade
- › Channel-to-Channel Isolation
- › Parallel and Series Operation
- › Built-in Oscilloscope Each Channel
- › Built-in EIS Each Channel
- › Built-in DCIR Each Channel
- › Built-in Self-Calibration Each Channel
- › Built-in Temperature, Analog, Digital I/O

Available Current Ranges	Type 1	Type 2	Type 3	Type 4
	Coin Cell	Low	Med	High
Voltage Range	10VDC	10VDC	10VDC	10VDC
Current Range	20mA	10A	150A	300A
Power Per Channel	200mW	100W	1500W	2000W
Channels Per Device	128	64	8	8
Channels Per Cabinet	1024	512	64	64
				

FOR HIGHER CURRENT TESTS, CHANNELS CAN BE USED IN PARALLEL



THREE PERFORMANCE AND FEATURE LEVELS AVAILABLE - CAN BE UPGRADED ANYTIME

Description	Basic	Standard	Premium
Max. Voltage Per Channel	10V	10V	10V
Min. Output Voltage	850mV	650mV	250mV
Voltage Accuracy (@ 6V)	0.05%	0.03%	0.01%
Current Accuracy (@ 10A)	0.05%	0.03%	0.01%
Voltage Resolution	150µV	150µV	150µV
Current Resolution (300A version)	4.5mA	4.5mA	4.5mA
EtherCAT	Yes	Yes	Yes
EtherNet	Yes	Yes	Yes
Self-Tests Per Channel	Yes	Yes	Yes
Cards Parallelization	Yes*	Yes*	Yes*
CC,CV, CP Modes	Yes	Yes	Yes
Remote Voltage Sense	Yes	Yes	Yes
Dynamic Profiles Mode	Yes	Yes	Yes
Analog IN Per Device	-	4	8
Analog OUT Per Device	-	4	8
Thermocouple Per Device	-	4	8
Thermistors Per Device	-	16	32
RS485 (Full Duplex) Per Device	-	4	8
Relay Outputs Per Device	8	8	8
GUI	Yes	Yes	Yes
Remote Access	No	Yes	Yes
Snapshot/Oscilloscope Per Channel	Basic	Basic	Full
Cyber Security Package	No	No	Yes
Self-Calibration Per Channel	Yes	Yes	Yes
DCIR Capability	Yes	Yes	Yes
EIS Capability (Available Q4/2024)	No	No	Yes

* only with same type of cards in the same device

Basic

- › Covers all cycling testing scenarios
- › High voltage and current accuracy
- › Minimum output voltage lower than one volt
- › EtherCAT and EtherNET

Standard

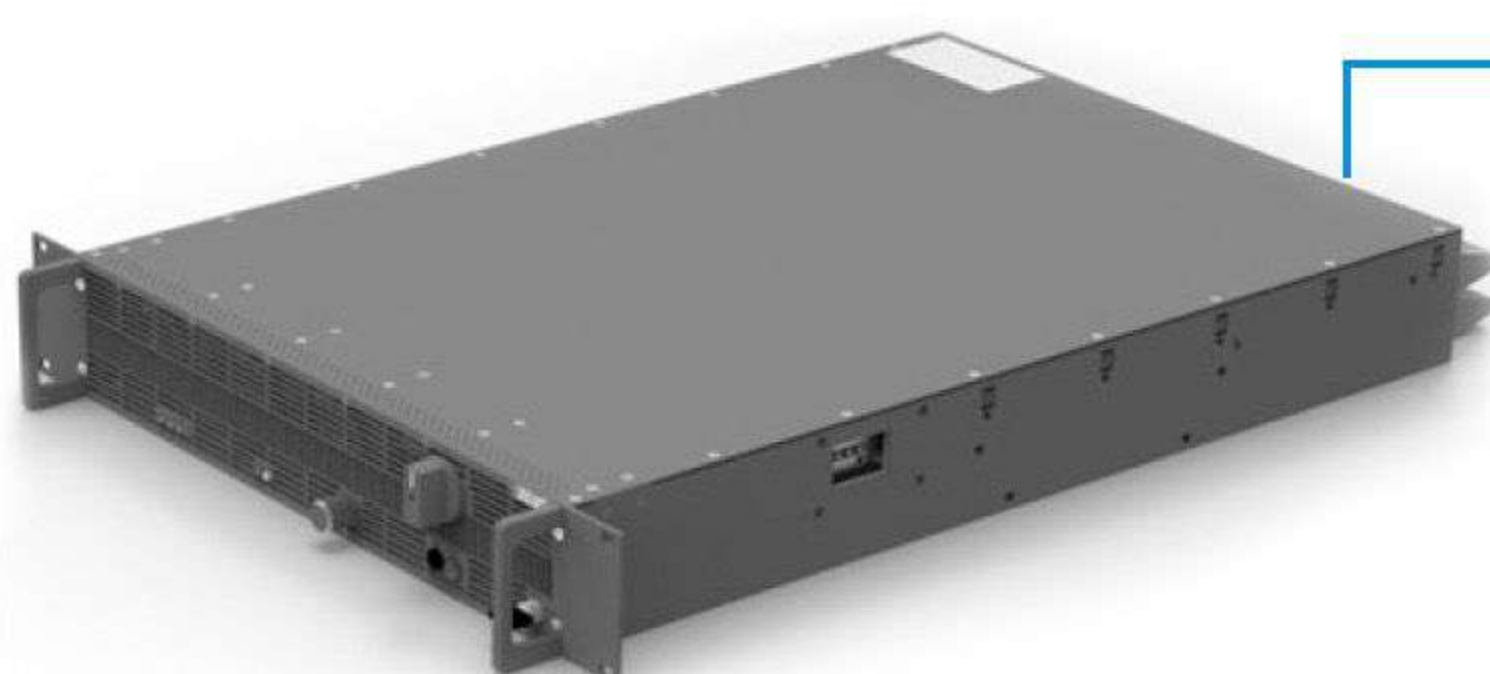
All Basic features plus:

- › Voltage and current accuracy improved to 0.03%
- › Minimum output voltage lower reduced to 650mV
- › Automated dynamic test profiles
- › RS485 interface
- › Graphical User Interface (GUI)

Premium

All Standards features plus:

- › Voltage and current accuracy improved to 0.01%
- › Minimum output voltage lower reduced to 250mV
- › Snapshot (Oscilloscope feature) per channel included
- › Built in self calibration, increasing the lifetime of the accuracy
- › Cybersecurity



Single Device



Half Rack



Full Rack

DETAILED SPECIFICATIONS

Static Performance		20mA	10A	150A	300A
AC Grid Voltage in V		3 phase - 400 - 480Vrms - 50/60Hz			
Maximum Number of Channels Per Rack	Full Rack	1024	512	64	64
	Half Rack	512	256	32	32
Number of Possible Parallel Channels (parallel only possible with channels on same device)		128	64	8	8
Serial Mode		Up to 30VDC		Up to 80V	
Operation Modes		CC, CV, CP, CR			
Max. Power		200mW	125W	1500W	2000W
Current	Range	20mA	10A	150A	300A
Voltage	Range	10 V	10V	10V	10V
Efficiency		95%			
Measurement		Basic	Standard	Premium	
Current	Resolution	18 bit			
	Accuracy	0.05% Full Scale	0.03% Full Scale	0.01% Full Scale	
Voltage	Resolution	18 bit			
	Accuracy	0.05% Full Scale	0.03% Full Scale	0.01% Full Scale	
Waveform Measurement (Oscilloscope Function)					
Waveform Bandwidth		1 MHz			
Measurement		Voltage & Current			
Digitizing Rate Range		10K - 1 MSample/Sec			
Default Digitizing Rate		100 K/Sample/Sec			
Memory		8000 samples			
Dynamic Performance					
Current Rise/Fall Time		Better than 1.8ms (10-90%)			
Time from Minus to Maximum Current		Better than 2.0ms			
Ripple		≤ 25 mV			
Built-in Interfaces Specifications					
Network		EtherCAT		EtherNET	
Sampling Rate		1kHz		Up to 100kHz	
Safety					
Isolation AC Input		3.8 kV AC Input to Chassis / 3.8 kV AC to DC Output			
Isolation UUT Input		600V Channel to Channel, 2.5kV Channel to Chassis			
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 Limits		Over- Current (OC) Under-Voltage (UV) Over-Voltage (OV) Over-Power (OP)			
Internal Watchdog Timer		Continuously Control and Monitoring			
Mechanical Specifications					
Rack Size (WxDxH)	Full Rack	32 x 48 x 87" / 2200 x 800 x 1200 mm			
	Half Rack	32 x 48 x 55" 1400 x 800 x 1200 mm			
Rack Weight		3086lbs/1400kg per full rack 1763lbs/800 kg per full rack			
Cooling Method		Forced Airflow			
Operating Noise		< 60dB			
Color		Light Grey (RAL7035)			

ADVANCED FEATURES

EDITION DEPENDENT

✓ 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 OSCILLOSCOPE

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 snap-shot is fully programmable and can be triggered automatically during the test run.

✓ BUILT-IN DCIR

Each channel has the capability to perform a DCIR function automatically and provide the calculated results. This saves in the complexity of trying to program it in the automation system.

✓ BUILT-IN EIS

Each channel in the system can also perform Electrochemical Impedance Spectroscopy (EIS) to give detailed data on the state of health of the cell. Because the system can perform this on every channel automatically during test runs, this powerful process can be used without adding any additional testing hardware.

✓ BUILT-IN CYBER-SECURITY

The system is capable of meeting strict cyber-security requirements which disables all the external data ports on the device to protect the boot sector from malicious attacks. This is accomplished with a manual key switch on the front of the device.

✓ BUILT-IN CELL EMULATION

Once the battery cells have been characterized utilizing the testing functions of the battery tester, the system can also be used as a battery cell emulator. In particular, the 128 channel 20mA device could be used to simulate the battery cells to a BMS system to test the BMS functionality including cell balancing (up to 20mA).



Specifications are subject to change without notice

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