# **BTS4000: The One for All Batteries**



BTS4000 is the upgrade version of the most popular battery test equipment series of BTS3000. Comparing with BTS3000, BTS4000 greatly improved the hardware response time, data acquisition frequency and result accuracy. BTS4000 provides higher data acquisition frequency up to 10Hz to enable you get more data in the same time period, this is pretty helpful in C-Rate or DCIR (Direct Current Internal Resistance) tests. And it also has a faster system output response and better accuracy when compared with BTS3000.

BTS4000 applies various applications of battery tests: charge, discharge, OCV, DCIR, Pulse, Driving simulation, Cycle-life, etc. The output ranges of BTS4000 for cells start from 5V1mA up to 5V50mA, 5V6A, 5V10A, and highest 5V3000A. And the BTS4000 models for battery modules and packs start from 10V1A up to 10V10A, 20V50A, 50V60A, 60V100A, and highest 100V100A.

Due to the wide output range and powerful functions of BTS4000, it can be used to test cells, battery modules and packs, super capacitors.

By the end of year 2017, Neware sold more than 140,000 sets of BTS4000. Battery manufactures use it in their large scale automated lines for battery formation, grading, OCV and capacity check; research institutes and universities use it for cycle-life, capacity and DCIR tests; battery importers and exporters use it to do the sample quality check; laboratories use it to do material research and certificates.

## **Features and Applications**

- Extremely high accuracy( $\pm 0.05\%$  of FS, some of the models)
- Min pulse width: 500ms
- Up to 10Hz data record frequency
- Adaptable to a wide range of products: cells, super-capacitors, battery modules and packs, etc.
- Wide range of applications : Charge, Discharge, Pulse, DCIR, Cycle-life, C-Rate, HPPC, etc;

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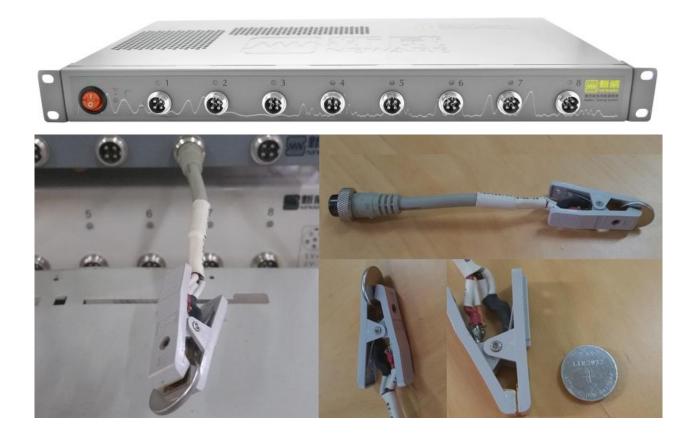
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- Multi-current range available(2 ranges per channel for some models), great for from low to high C-rate test on one machine.
- Every channel can be user programmed to operate in steps of CCC(Constant Current Charging), CVC(Constant Voltage Charging), CC&CVC(Constant Current & Constant Voltage Charging), CPC(Constant Power Charging), CCD(Constant Current Discharging), CPD(Constant Power Discharging), Pulse, DCIR, etc.
- Completely independent channels allow users to run multiple independent tests simultaneously without affecting other channels
- With the BTS client software, data is easily viewed both in plain text and plot/graph
- Diverse alligators and probe connection accessories for choose
- Modular design, testers can be easily stack/mount together
- Ranges, colors and even functions(Discharge battery to 0V, Cell voltage and temperature monitor, etc) can be customized.

# **Typical BTS4000 Tester Models**

#### 1. BTS4000 For coin cells: 5V10mA, 5V20mA, 5V50mA



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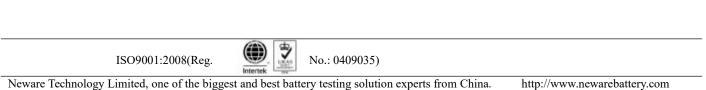


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#### 2. BTS4000 For cylindrical and small pouches: 5V6A, 5V12A



3. BTS4000 For big cells, modules and packs: 5V50A, 5V100A, 20V50A, 50V50A, 60V100A, 100V100A, etc.





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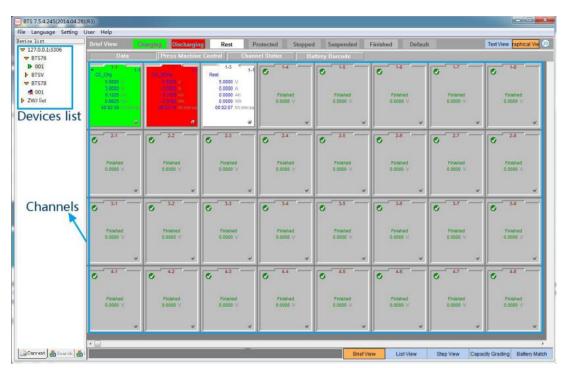
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# Software UI and Settings



Main window, easily to operate(start up,pause,stop tests) and manage all devices and channels in graphic UI.

D	Step name	Tir	me(hh:m	m:ss:ms)	Voltage(V)	Current(A)		Capacity(Ah)		Energy(Wh)		-ΔV(m ^
1	CC_Chg		00	:05:00:000			0.5000					
2	Rest		00	:05:00:000							U.	
3	CC_DChg						1.0000					
4	End											
6												+ -
Rec	t Step ID 1 ord Condition			Safety Lim		_		fety Limit			Remarks	
Property .	Time 0.	1	sec	Volt L		V		t Lower		V	Creator	_
			mV	Volt U		V		t Upper		v	P/N	
Curr mA Delay Protect		mA	Curr L	7337E	A	Temp Lower		ີ ວີ	Remarks			
	Step Delay		sec	Curr L	2.5 (2.5)	A				1	Hemarks	
	Continue Delay		sec	Cap U		Ah	Diff	Volt		V		
	Main and Aux Delay		sec	Delay	Time	sec	Act	ve Material		mg		
Bgfs Protect Condition				Plateau Volt			Aux Record Condition					
Bgfs Rate		Platea	w1	v	Tim	ie 🗌		sec				
Dete	ection Time		sec	Platea	w2	v	Vol	t		mV		
	E E		mV	Platea	3	v	Ter	700	- 1	'C		

Users can create their own tests scripts, easy and intuitive.

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### **Typical Tests Results Overview**

## 1. DCIR test

NO	Record ID	StepID	Time(h:m:s:ms)	Voltage(V)	Current(mA)	DCIR(mΩ)		Step DCIR
	27737	740 Test IR	7:17:40:165	3.84412	-399.8933		-	Step Start
740	27751	741 Rest	7:17:51:165	3.86572	0.0000	54.01		
	27751	741 Rest	7:17:51:165	3.86572	0.0000			Pulse DCIR
741	27812	742 Test IR	7:18:51:165	3.84371	-399.9754	55.02		
	27812	742 Test IR	7:18:51:165	3.84371	-399.9754			
742	27826	743 Rest	7:19:02:165	3.86531	0.0000	54.00		Copy Data
	27826	743 Rest	7:19:02:165	3.86531	0.0000			
743	27887	744 Test IR	7:20:02:165	3.84338	-399.8933	54.83		
	27887	744 Test IR	7:20:02:165	3.84338	-399.8933			
744	27901	745 Rest	7:20:13:165	3.86490	0.0000	53.81		
	27901	745 Rest	7:20:13:165	3.86490	0.0000			
745	27962	746 Test IR	7:21:13:165	3.84290	-400.0576	55.01		
	27962	746 Test IR	7:21:13:165	3.84290	-400.0576			
746	27976	747 Rest	7:21:24:165	3.86449	0.0000	53.99		
	27076	747 Dert	7-21-24-165	3 86440	0 0000		-	Report Setting
nΩ) 70-		v .*•* /	<u>*</u>	Refresh	Delete	Delete All		Generate Report
65				and a set of the set o	A Watt Play and a straight and a str	Manager	1	Max Resistance=73.36 (m Min Resistance=51.97 (mΩ Offset=21.38 (mΩ)
60-				and a second			1412	
55	Para and a second							

The DCIR test in BTS9000 is based on IEC standard. As the discharge process goes on, the DCIR of the cell increases gradually.

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#### 2. Cycle Life Test Result



Data can be export to xls/csv/txt format for further using.

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