BTS9000: The Most Cutting-edge equipment for Battery Material Research



BTS9000 is based on Neware 6th-generation testing system. It's designed for battery material research, high-precision tests, pulse charge/discharge tests, DCIR test, and cycle life test.

As the most cutting-edge equipment for battery material research, BTS9000 comes with extremely high accuracy(\pm 0.02% of FS), amazing hardware response speed(\leq 100 μ s), wide range of applications, high-speed testing data acquisition and many other industry-proven characteristics, it's your ultimate choice for battery material research!

Comes to the pulse tests, BTS9000 supports GSM(Global System for Mobile Communications), GPRS(General Packet Radio Service), CDMA-standby, CDMA-talk(Code Division Multiple Access), IDEN(Integrated Digital Enhanced Networks), etc. It characterized with a data acquisition frequency up to 1000Hz, an accuracy of 0.02% FS and a minimum pulse width of 400us (microsecond) which can be utilized for GSM or some other rapid pulse tests.

Features and Applications

- Extremely high accuracy($\pm 0.02\%$ of FS)
- Hardware Response Time: $\leq 100 \ \mu s$
- Min pulse width: 400 µ s
- Up to 1000Hz data record frequency
- Adaptable to a wide range of products: cells, super-capacitors and samll battery modules, etc.
- Wide range of applications : Charge, Discharge, High frequency pulse, DCIR, Cyce-life, C-Rate, HPPC, etc;
- Multi-current range available(4 ranges per channel), 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.

ISO9001:2008(Reg.

No.: 0409035)

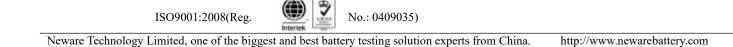
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- Completely independent channels allow users to run multiple independent tests simultaneously without affecting other channels
- With the BTS client software, data is easily viewed both in plain text and plot/graph
- Diverse alligators and probe connection accessories for choose
- Modular design, testers can be easily stack/mount together
- Online support and upgrade support, just in case the software or hardware is out of working, Neware engineers can help customers to locate and fix the problem by remote desktop, and the firmware of BTS9000 can be upgraded by customers themselves whenever there's new version released.







Available Clamps/Jigs



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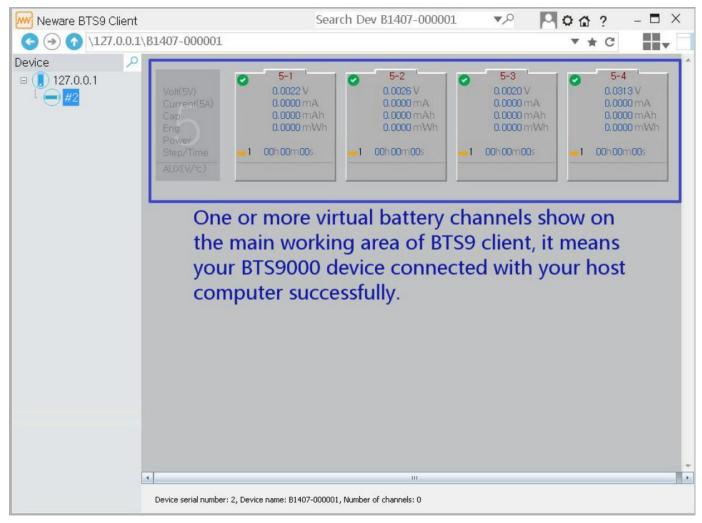
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Software UI and Settings



User friendly interface.

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| Default Style 🖌 | | | | | File Nam | e | | | | | • | |
|-----------------|-------|--|---------|--------------|----------|--------------|----|--------------|-----------|---------------------------|---------------|---------|
| Neware \Steps \ | # | | Туре | Mode | Value | End Type | Op | Value | Goto | Main Chl Re | cord | |
| - D B | 1 | | Rest | | | Time | >= | 00:10:00.000 | Next step | Time Inval | 10 | sec |
| | | | | | | | | | • | Volt Inval | | V |
| Step file list | 2 | | CCDChg | Current (mA) | 20 | Volt (V) | <= | 2.65 | Next step | Curr Inval Main Chl Pr | | mA |
| - | | | Rest | | | Time | >= | 00:10:00.000 | | Start_V Up | | V |
| | 3 | | | | | | | | Next step | Start_V Up | | v |
| | | | | | | | | | | Volt Upper | 4.25 | v |
| | ▶ 4 | | CCCVChg | Current (mA) | 20 | Current (mA) | <= | 2 | Next step | Volt Lower | 2.6 | - v |
| | | | | Volt (V) | 4.2 | | | | | Curr Upper | 2 | mA |
| | 5 | | Cycle | Start Step | 1 | Cycles | - | 100 | | Curr Lower | | mA |
| | | | Cycle | Start Step | 1 | Cycles | | 100 | | Cap Prct | | mAh |
| | 6 | | End | | | | | | | Inspect Bia | 5 | V |
| | | | | | | | | | | Delay Time | | sec |
| | | | | | | | | | | BFGS Rate | Protect | |
| | | | | | | | | | | Det Time | | sec |
| | | | | | | | | | | Volt | | V |
| | | | | | | | | | | End Format | ion | - |
| | | | | | | | | | | Cap Upper | | mAh |
| | | | | | | | | | | Cap Lower | | mAh |
| | | | | | | | | | | | | |
| | | | | | | | | | | | Copy Paramete | r |
| | | | | | | | | | | Applys 3 | • All CCCVCH | g Steps |
| | | | | | | | | | | App. | .ys To All St | eps |
| | | | | | | | | | | - Advanc | ed AuxCl | l/Extr |
| Model: | Batch | | | Test Name: | | | | | | | | |

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

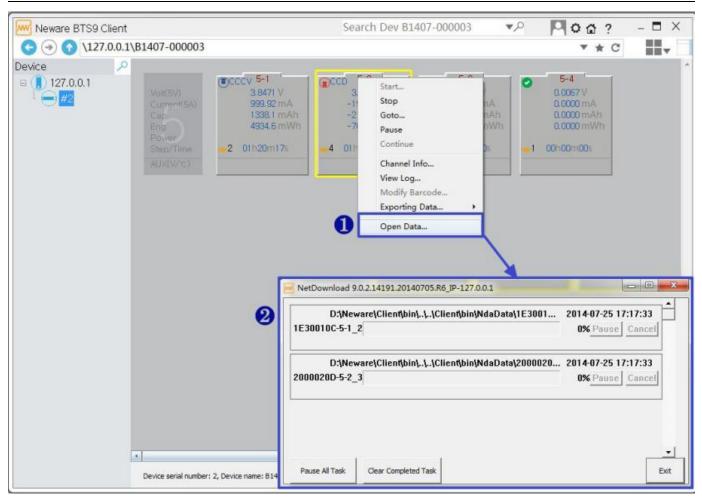
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During and after the test, you can always check the testing result.

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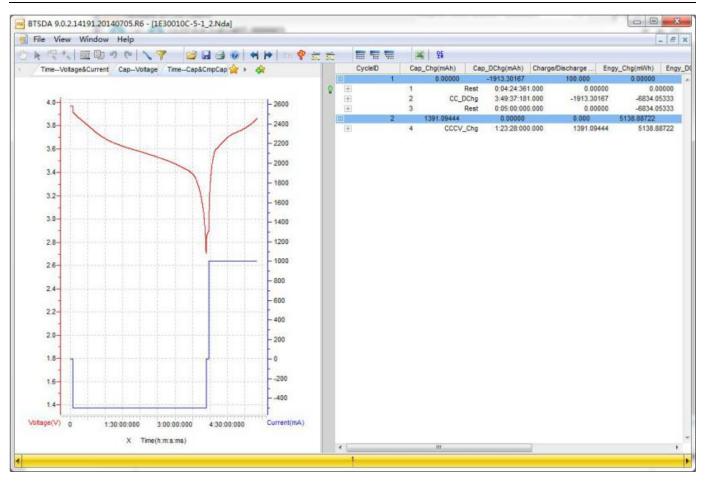
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Data shows both in plain text and graph.

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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 | | |
| 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 | |
| | 77076 | 747 Dect | 7-21-24-165 | 3 86440 | 0.000 | | ▼ Report Setting |
| nΩ) 70- | | | ** | Refresh | Delete | Delete All | Generate Report Max Resistance = 73.36 (m |
| 65 | | | | چندینی این این این این این این این این این | the way of the second second | Museuman | Min Resistance=51.97 (mΩ Offset=21.38 (mΩ) |
| 60 | | | | | | | |
| 55 | Ministricture | | | | | | |

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

2. Cycle Life Test Result

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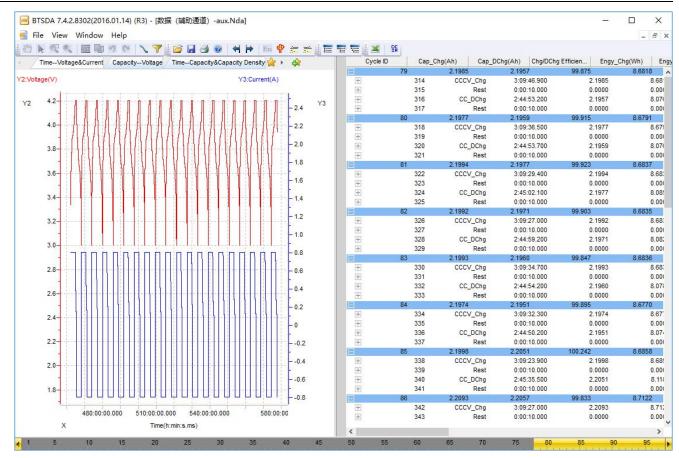
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| B T | TSDA 7.4.2.8302(2016.01.14) (R3) - [数据 (辅 | 助通道)-aux.Nda] | | | | | <u>116</u> | |
|------------|---|----------------------------------|------------------|-------------|---------------|----------------------------|-----------------|-------------|
| 📄 Fil | ile View Window Help | | | | | | | - 8 × |
| | | u 👍 💿 💘 🕨 🖦 🥊 🚝 🗮 🖿 | 1 × 1 | | | | | |
| 100 | | | Cycle ID | Can | Chg(Ah) Cap_D | Chg(Ah) Chg/DChg | Efficien Enov (| hg(Wh) Engy |
| * <u>L</u> | TimeVoltage&Current CapacityVoltage Time- | -Capacity&Capacity Density 🙀 🕨 🎲 | | | 2.1985 | 2.1957 | 99.875 | 8.6818 |
| Y2:Volta | age(V) | Y3:Current(A) | Ŧ | 314 | CCCV_Chg | 3:09:46.900 | 2.1985 | 8.68 |
| | | View Construction V | + | 315 | Rest | 0:00:10.000 | 0.0000 | 0.001 |
| Y2 | 4.2 | 1 1 1 1 1 1 1 1 T Y3 | Ŧ | 316 | CC_DChg | 2:44:53.200 | 2.1957 | 8.071 |
| 6.53 | | -2.4 | Ŧ | 317 | Rest | 0:00:10.000 | 0.0000 | 0.001 |
| | 4.0 | Export | 0 | 0 | 2.4077 X | 2.1959 | 99.915 | 8.6791 |
| | - <u> </u> | - export | | | ^ | 3:09:36.500 0:00:10.000 | 2.1977 | 8.671 |
| | | Export Type | | | | 2:44:53.700 | 2.1959 | 8.07 |
| | 3.8 | ○Visible Report | Eormai | tion Report | | 0:00:10.000 | 0.0000 | 0.001 |
| | | O visible report O table report | Oronia | doin Report | | 2.1977 | 99.923 | 8.6837 |
| | 3.6 | ◯ General Report ◯ Custom Report | O Atl Sim | Report | 1 | 3:09:29.400 | 2.1994 | 8.68; |
| | | | | | k | 0:00:10.000 | 0.0000 | 0.001 |
| | 3.4 | Export File | | | 1 | 2:45:02.100 | 2.1977 | 8.08 |
| | | Export File | | | t | 0:00:10.000 | 0.0000 | 0.001 |
| | | | | | | 2.1971 | 99.903 | 8.6835 |
| | 3.2 | Path C:\Users\neware\Desktop | ~ | | | 3:09:27.000 | 2.1992 | 8.68 |
| | | | | | | 2:44:59.200 | 2.1971 | 8.08; |
| | 3.0 | File Name | ~ | | | 0:00:10.000 | 0.0000 | 0.001 |
| | | | | | | 2.1960 | 99.847 | 8.6836 |
| | 2.8 | File Format OTXT EXCEL | | ⊙ csv | | 3:09:34.700 | 2.1993 | 8.68: |
| | | | | | 1 | 0:00:10.000 | 0.0000 | 0.001 |
| | | Export Way | O With EXCEL In: | stalled | 1 | 2:44:54.200 | 2.1960 | 8.071 |
| | 2.6 | Export setting Export Aux data | | | t | 0:00:10.000 | 0.0000 | 0.001 |
| | | | | | | 2.1951 | 99.895 | 8.6770 |
| | 2.4 | | | | | 3:09:32.300 0:00:10.000 | 2.1974 | 8.67 |
| | | | | | Canaal | 2:44:50.200 | 2.1951 | 0.001 |
| | 2.2- | | Export | | Cancel | 0:00:10.000 | 0.0000 | 0.001 |
| | | | 8 | 5 | 2.1998 | 2.2051 | 100.242 | 8.6858 |
| | 2.0 | 0.4 | Ŧ | 338 | CCCV_Chg | 3:09:23.900 | 2.1998 | 8.68 |
| | 2.0- | | | 339 | Rest | 0:00:10.000 | 0.0000 | 0.001 |
| | | 0.6 | Ŧ | 340 | CC_DChg | 2:45:35.500 | 2.2051 | 8.11 |
| | 1.8 | | Ŧ | 341 | Rest | 0:00:10.000 | 0.0000 | 0.001 |
| | | | 8 | Sec. | 2.2093 | 2.2057 | 99.833 | 8.7122 |
| | 480:00:00.000 510:00:00.000 | 540:00:00.000 580:00:00 | ± | 342 | CCCV_Chg | 3:09:27.000 | 2.2093 | 8.71; |
| | X Time(h:min:s. | ms) | + | 343 | Rest | 0:00:10.000 | 0.0000 | 0.001 |
| | a international | ine) | < | | | | | > |
| 1 | 5 10 15 20 2 | 5 30 35 40 45 | 50 55 | 60 | 65 70 | 75 80 | 85 90 | 95 |

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

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