

BFGS series

(GFGS-8128/8256/8512/9256)

BATTERY FORMATION、 GRADE AND TESTING SYSTEME

USERS' MANUAL

VERSION 6.04.03.16



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Preface

- Thanks for using the series NEWARE BTS (Battery Testing System).
- Please read the manual carefully before using the system to give full scope to the functions of system.
- Our company devotes to providing range of battery testing systems, battery formation & grading systems, internal resistance testers as well as battery cells. Our products have been passed through strict internal test procedures and are certified by the national quality inspection authority. With five years' continuous renovation, our products are rewarded as mature technology, stable quality and leading performance and widely accepted by both domestic & overseas customers.
- Our company registered trademark is "NEWARE". Company's management strategy is "technological innovation, sincere service". The company attaches great importance on constantly pursues the most superior performance price compared and consummation post-sale service to satisfy our customers various requests.
- Want to see more details of our company and software downloading, please visit <http://www.neware.com.cn>
- Our company customer service is: 800-830-8866, all expense is paid by our company. After receiving the requests, if you need on-site maintenance, our servicemen will get at in the first time to guarantee productions are carried out normally.
- We provide free maintenance during one year after the sales, and only charge for the cost after the guarantee period. We will constantly follow the status of our products by contacting our customers. Please also note that we will timely provide the latest upgraded software of our products to our customers all the time.
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Summarization

Neware BFGS-8512 batteries formation, grading and testing system is designed for Lithium-ion; nickel-hydrogen batteries formation and grading test, also can be used to batteries life cycle test.(BFGS-9526 batteries formation and grading test system is designed for Lithium polymer batteries formation and grading test system.

Advanced computer data centralize collection and control software (network connectivity and SQL database), with itself keyboard and Large LCD with Chinese characters (full Chinese man-machine conversation interface),digital current and voltage automatic calibration. This system is the ideal choose for large-scale battery factories.

The system is composed of upper, Middle and Lower computer .Above machine is composed of a computer and controlled software. Middle machine compose of Single Chip Microcomputer and screen. Each middle machine controls 8 or 23 low machine . Low machine is deviced by model. Each Low machine composes of independently 16 battery channel. One middle machine and 8 or 23 Low machine compose one battery case. Each battery case can sork not only in middle machine control but also in above machine.

Characters:

1. Adopting network connectivity and SQL database, concentrate control several machine (join 255 maximum; 65280 points.)
- 1.Absolute MPU for each channel, single-point control with quick-rate and high-accuracy
- 2.Independent constant-current source and constant-voltage source
- 3.Undisturbed switch between constant-current and constant-voltage
- 4.Automatically correct the digitized errors with high speed and accuracy
- 5.Large LCD with Chinese characters, easy operation
- 6.Combined with computer to integration control, data integrated analysis, statistic, report, print, etc.
7. Charge flat-roof grade and curve grade;
- 8.Module construction, high reliability, each module provides 16 independent channels, this function is convenient for the system's maintenance
- 9.Industrial programming design, all the operation carry out automatically according to the designed working steps
- 10.High accuracy, fit with small current grade(< 10mA)

Product compares:

	Neware BFGS Series	Other products
1	Testing accuracy is 0.4%	Testing accuracy 0.1%
2	Sampling voltage and current real-time	Just sampling a certain channel which lead other channels to run away temporarily

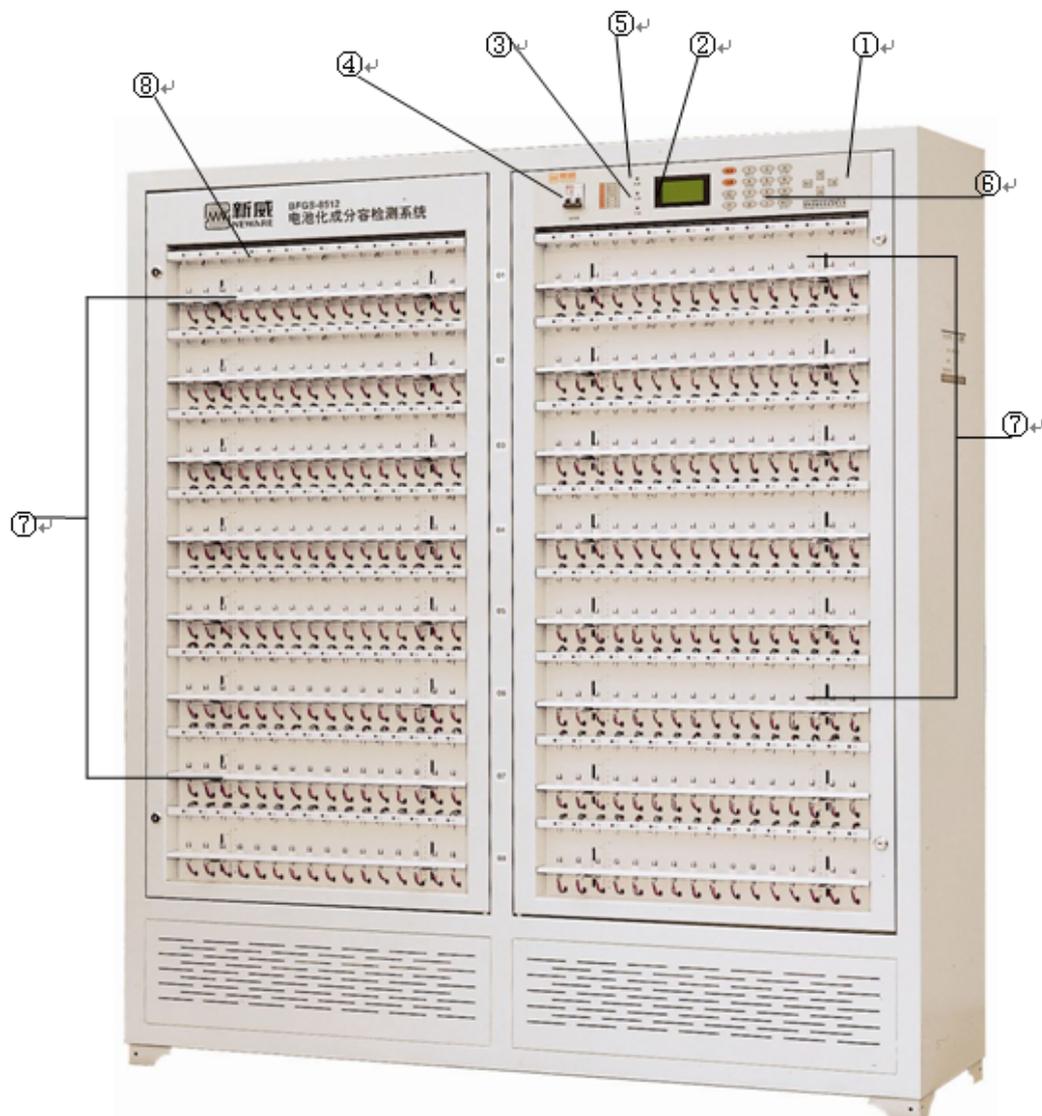
3	LCD with Chinese display with big screen directly and easy-to-operate	LED display, operation is complex
4	maintain and debug with software, easy-to-operate, steady accuracy	Maintain and debug with hardware, the accuracy is easy to float
5	Industrialized program design, all the operation carry out automatically	Need change running status artificially
6	With import air-switch, cut switch when over load automatically	Without

Technical criteria

Type	BFGS-8512	BFGS-9256
Input power	220 V \pm 10% / 50 Hz	The same as left
Current output ranges	\pm 2000 mA	The same as left
Voltage measure ranges	0.1-5V	The same as left
Power	8300 W	4100W
Current measure accuracy	\pm (0.2% reading + 0.2% ranges)	The same as left
Voltage measure accuracy	\pm (0.2% reading + 0.2% ranges)	The same as left
Timing ranges	0~9999 minute/work step	The same as left
Constant voltage cut-off current	5mA minimum	The same as left
Polling time	Real time	The same as left
Separation conditions	Time/capacity/platform	The same as left
Clamp adjustable ranges	80mm maximum, space between clamp is 34mm	The space between two electrode is 30mm
Cycle ranges	250	The same as left
Numbers of each channel	512	256
Port	RS232/network port	The same as left
Volume	1450 (W) x 380 (D) x 1700 (H)	1450 (W) x 340 (D) x 1700 (H)
Weight	350Kg	200kg

2. Formation and grading equipment

Diagram of Battery Cupboard



① Controlled Panel

In it include Display Screen, Keyboard, Power on/off, Indication lamp and other fittings, all operations are accomplished by it, and can be real-time monitored and manage by the computer. Each computer can control more than 255 battery cupboard.

② LCD with Chinese display with big screen

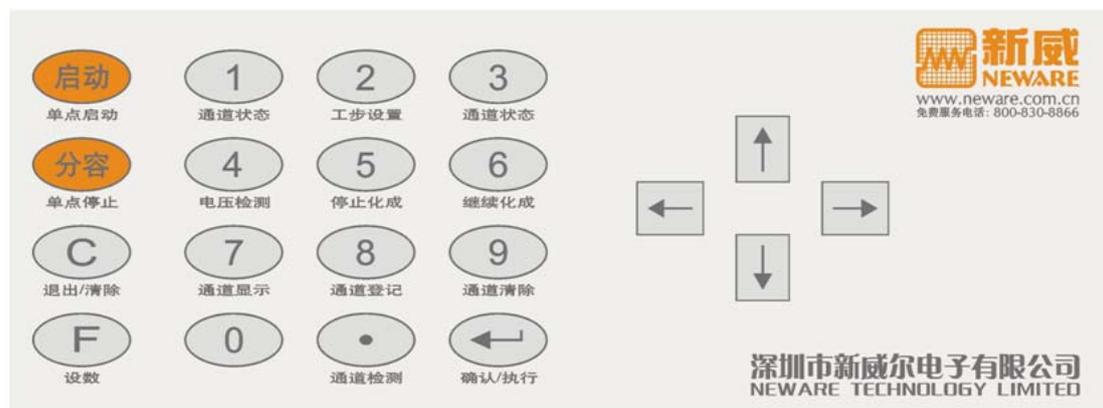
③ Passes up and down LED

Display the battery cupboard adopt the data and real-time control through it's circulate.

③ Power On/Off

⑤ Power LED

⑥ Pellicle keyboard



0-9, **Number Key** Ensure the input content **↑ ↓ ← →** Up、Down、Left、Right move current position **Start** Start the process for working **Grade** Go to Grading statement **C** Quit the process and clear the mistake **F** Press this button before input digital.

⑦ Battery channel

Used to install that is formation & grade deal with the second battery.

⑧ Channel state LED

Light on/off has different meaning in different working state, the details as followed:

● Using main menu

The main menu is a system display in the screen, through this get into the second or three stage menu. For the **↑ ↓** is switched with each main menu, the **←** is switched in the second or three grade menu and the **C** is switched for quit.



Press the “↑” “↓” for switching menu

● List Menu

With full Chinese display, no matter when using main, secondary or third menu, it is convenience for searching and easy to use. The menu is consistent with switch manner and operation method, easy to use. Very menu catalog as follows:

<p>Setting step parameter②</p> <p>64 Platform set</p> <p>Platform 1</p> <p>Platform 2</p> <p>Platform 3</p> <p>0 Initialization</p> <p>Start Step</p> <p>Voltage Upper Limit</p> <p>Voltage Lower Limit</p> <p>1 Constant-charging</p> <p>Constant current</p> <p>Cut-off time</p> <p>Cut-off voltage</p> <p>2 Ni-MH Charging</p> <p>Constant current</p> <p>Cut-off Minute</p> <p>-Δv</p> <p>3 Li-ion charging</p> <p>Constant Current</p> <p>Constant Voltage</p> <p>Cut-off Minute</p> <p>Cut-off Voltage</p> <p>4 Constant Current Charge</p> <p>Constant Current</p> <p>Cut-off Minute</p> <p>Cut-off Voltage</p> <p>5 Rest</p> <p>Cut-off Minute</p> <p>6 Circulation</p> <p>Circle Step</p> <p>Circle Times</p> <p>7 Ending</p>	<p>Display Channel State (Viewing) ①</p> <p>Display channel working parameter</p> <p>Display channel grading parameter</p> <hr/> <p>System Operation</p> <p>Forcedly Jump ③</p> <p>Voltage detect ④</p> <p>Stop (formation)⑤</p> <p>Continue (formation)⑥</p> <hr/> <p>Channel Number Operate</p> <p>Channel Number Display⑦</p> <p>Channel Number Register⑧</p> <p>Channel Number Clear⑨</p> <p>Address Distribute</p> <hr/> <p>Channel repair Operation</p> <p>Channel Zero</p> <p>Channel full range</p> <p>Repair detction</p> <p>Repair Parameter</p> <hr/> <p>Startup</p> <hr/> <p>Formation</p>
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* ② The number in circle is represent the shortcut key ,see details about Shortcut Key

Explain in the first chapter; “1 constant current charge” the number without circle is represent work step number, see details in work step set chapter.

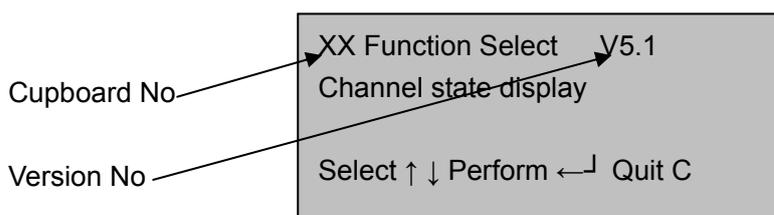
● **Channel Number Definition**

The battery cupboard include 8 rows channel, from up to down is the first row – the eighth row, each row has 16/32/48 channel, each channel number include three data. The first one is row number; the others show the place that in the channel. For example: when some channel number is 325 so it means this channel is in the third row, from left to right the twenty-fourth channel.

3. Operation

● **Startup**

Turn the battery cupboard power on/off, the power pilot lamp light, the screen display picture as follow:



● **Battery Installation**

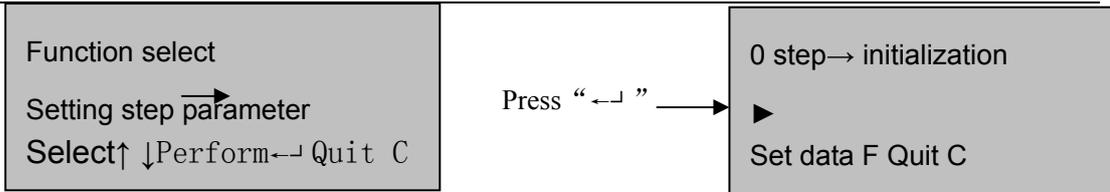
Before install the battery, ensure if the place of clamp suit the battery style. If not , through control handspike to adjust the place of clamp ,then screw the control handspike and put the battery as each channel in order.

● **Setting Step Parameter (shortcut key 2)**

The system imply flexible step configuration for suiting different battery. The system can set more than 63 steps, in it ,The"0"means "initialization", the last one "64"means "platform setup".

0 work step	initialization	64 work step	platform setup
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Press the key“↓” “↑” to step parameter setup picture:



Though press the key “↑” “↓” to select step serial number, when display “▶”, the setting working content as follows:

1	Constant current charge
2	Ni-MH charge
3	Li-ion charge
4	Constant current discharge
5	Rest
6	Circulation
7	Ending

Notice: After press the number key to select step working content, ensure by “←→”.

After selecting the step working content, press “→” “←” to go to the current step. Each step parameter as follows:

0 Initialization:

The parameter as follow:



“→”“←”: Switch between each menu

In above picture, “upper limit voltage、 lower limit voltage” is system protection voltage, to insure the battery voltage not exceed the set ranges. For the Li-ion battery, generally, set upper limit voltage as set 4.3V and the lower limit voltage as 2.6V.

“Start Step” is using appointed the startup of the battery cupboard. The user can set numerous working processes within 63 steps. From “ Start Step” to set which step to carry out.

64 Platform Setting



“→”“←”: Switch each menu

As “step setting” ”0 step →Initialization”, press”↑”get into “platform setting”. The user can set three group of follow big to small platform parameter.

① **Constant current charge**

The parameter as follow:



“→”“←”: Switch each menu

② **Ni-MH Charge**

The parameter as follow:



“→” “←”: Switch each menu

③ **Li-ion Charge:**

The parameter as follow:

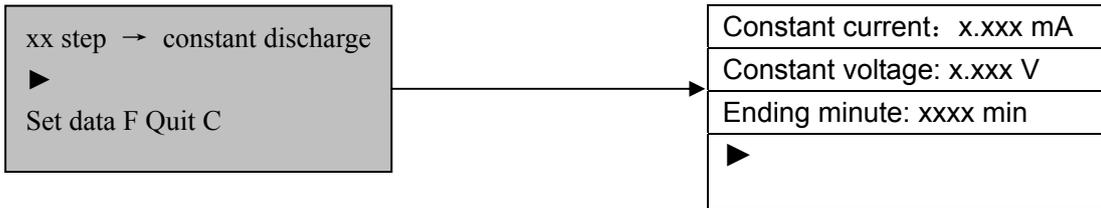


“→”“←”: Switch the menu

In “Li-ion charge”, set the constant voltage general as 4.20v, the cut-off current as 20-50mA, the cut-off time is refer to the charge/discharge times-rate, delay the minutes adequate. As battery for 1CmA to test, the charge minute can set 90~120 min.

④ **Constant discharge**

The parameter as follow:

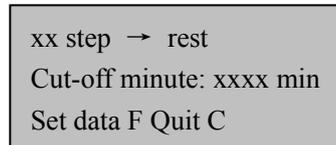


“→”“←”: Switch the menu

In “constant discharge”, such as the channel end the discharge as some reason suddenly, the restart the channel can press the “start ”key at “channel state display”.

⑤ **Rest**

The parameter as follow:



⑥ **Circulation**

Adopt this manner can circulate over again between you setting, more than 250 times for circulate.

The parameter as follow:



“→”“←”: Switch each menu

● **Startup**

Press “C” to quit the default mune after set each parameter, press ”startup” and light

wink over on the control panel, displayed:

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System perform operate
Success
Quit C
    
```

And the channel pilot lamp off, all the step order as follows.

● **Channel state display(shortcut key 1 or 3)**

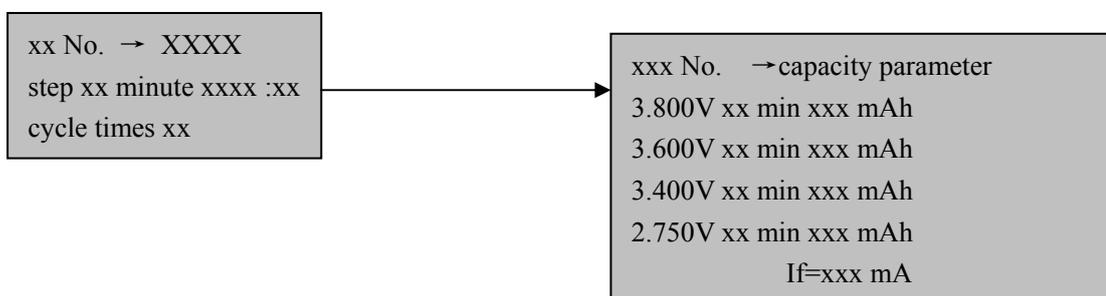
Press “←”as system default and displayed:

Channel number	xxx No. → XXXX Step xx minute xxxx :xx Cycle times xx U=x.xxxV I=xxxx mA	Working state
Circulate step serial number		Circulate
minutes		
Display the cycle times		Channel current
Channel voltage		

Enter “Channel state display”, the channel No. display”000”, all the parameter is total parameter. Time is Middle’s time, cycle times is current circulate state; As the Li-ion charging, the voltage set “constant voltage”, the current set “constant current”. As discharging, the voltage set “ending voltage”, the current set “constant current”.

Though press“→”“←”at “channel state”, the channel add or reduce 1, or input the channel code by the keyboard to display channel’s parameter.

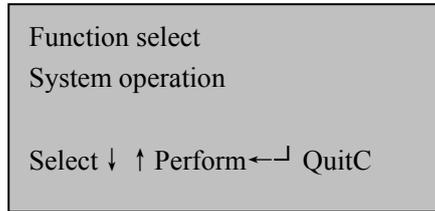
Press the “↓” “↑” to select other working parameter.



Formation time is the last constant current charge time. I_f is the constant current discharge value, U_k is starting discharge voltage. U_z is the discharge ending 3 minutes voltage value.

● **System operation**

At the function select, press “↓” “↑”to “system operation”:

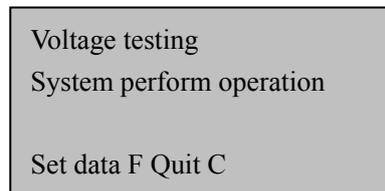


① **Voltage testing(shortcut key4)**

At system operate, press “←”, display:



Enactment the testing voltage value, press “←” ensure, displayed:



If the channel measure voltage between testing voltage ,the channel pilot lamp light.

② **Stop (formation) (shortcut key5)**

At stop, press “→”“←”at “system operation” to stop (formation) , point “← ”to ensure



③ **Continue (formation)(shortcut key5)**

Press “→”“←”to “Continue (formation)”at “system operation”, point “← ”to continue the operation as “stop(formation)”or unfinished (formation) operate.

● **Formation**

As all the channel pilot lamp light or “channel state display” is waiting for operate, explain (formation) end operation, formation and assort battery.

The system formation the battery according constant current discharge.. Formation timing-area follow >=Lower time value and <Upper area value to plot. The operation:

As system default, “formation”, displayed:

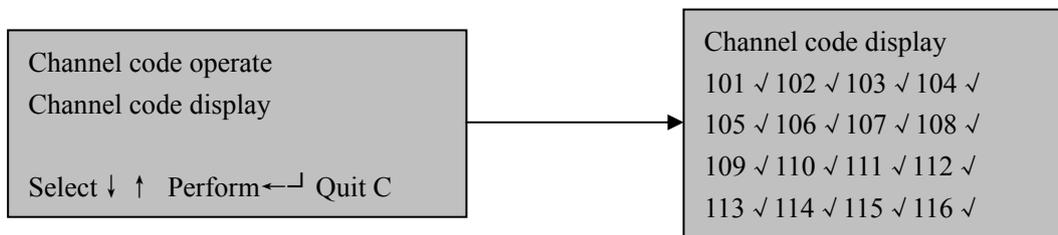


After enactment formation time interval, press “←⏏” to ensure, to apart all the battery at constant current discharge time.

● **Channel code operate**

At function select press “↓”“↑” to “channel code operate”:

① **Channel code displayed(shortcut key7)**



The “✓” render channel code register, the “×”render channel code unregister, unregistered channel can’t process (grade) and formation operation .

② **Channel code register(shortcut key8)**

At “channel code operation” submenu press “→”or“←”to “channel code register”:



Input the unregistered channel, press “←⏏” and register channel. At the “channel code is

901 "state press "←" directly, to register whole cupboard automatically, success displayed on the screen, that is register successful. Finish it and press "C" to quit.

③ **Channel number clear (shortcut key9)**

At "channel code operation" submenu press



Input dealing with channel code, press" Press"←" and clear the channel. Also can press" Press"←" directly at channel code "901".

④ **Address Distribution**

put the short clump into the "J1" at the Middle circuit board signed, electrify again and switch the menu to "channel code register", input the channel and press "←". Touch the clamp of two poles ,the channel distribute address again.

Notice: Before distribute address, all the channel no battery.

● **Channel adjust operation(shortcut key 0)**

Use for adjust the error channel, generally use for needed. The detail is adjusting operation explain.

● **Cupboard number setting**

Insert the short circuit into middle computer where has "J1" typeface. Then cut back main menu, press "F" key, input the registered cupboard number, press "←" key, then this cupboard number is reset.

Notice: Cupboard number can't repeat.

● **Shortcut key explain:**

Press "0" enter into "adjust testing"

Press "1" enter into "channel state"

Press "2" enter into "work step setting"

Press "3" enter into "forcibly jump"

Press"4" enter into "voltage testing" , press again to perform "voltage testing" operation

Press"5" enter into "stop (formation)",press again to perform" stop (formation)" operation

Press "6" enter into "continue (formation)", press again to perform "continue (formation)" operation

Press "7" enter into "channel number display", press again to perform "channel number display" operation

Press "8" enter into "channel code register", press again to perform "channel number register" operation

Press "9" enter into "channel number clear", press again to perform "channel number clear" operation

Formation & Grade Monitored System Operate Software Explain

- **Basic function:**

1. Display function: real-time display battery cupboard charge/discharge current, voltage, minute, capacity, battery working state and charge/discharge real-time curve and data, etc.
2. Data stored function: Each battery testing data can store hard soft, easy to look over, keep in the archives, statistic, table, print, etc.
3. Print function: Print every data needed momentarily.

- **Software ,hardware condition:**

Operation system

Microsoft Windows 98

Hardware

P5/200 or higher

64MB or higher internal memory

1.2G or higher hard disk space

- **Installation**

Get into Windows operation system; double click the "setup" at driver file.

- **Basic operation:**

Main interface introduction:

1. *Toolbar explain*

- Control button explain
- Protection parameter setting and Alarm channel display:
- Look over button---main working area