

HZDD-500

Battery Conductance Tester



Dear user:

Thank you for choosing HZDD-500 Battery Conductance Tester user manual.

We hope that this instrument can make your work easier and more enjoyable, so that you can get the feeling of office automation in the test and analysis work.

Before using the instrument, please read this manual, and operate and maintain the instrument according to the manual to prolong its service life. "Just a light press, the test will be completed automatically" is the operating characteristics of this instrument.

If you are satisfied with this instrument, please tell your colleagues; if you are not satisfied with this instrument, please call (0312) 6775656 to tell you to serve you at all times-Baoding Huazheng Electric Manufacturing Co., Ltd., our company will definitely make you satisfied !

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I. Summarize

1.1 General

This battery conductance tester is utilized color touch screen. It can be operated via finger or the touch pen with convenience and flexibility. It is portable and the data can be known soon exactly. This instrument can store and process data of battery voltage and battery conductance. It will alarm for any battery failure. We can check data, download data and delete data on the instrument. Software in PC can display and

1.2 The Main Functions And Features

- Data save mode: Internal save and external save
- The instrument has on test and retest function
- The instrument can save 999group test data(Max 500cells test data each group). User can check the data any time .
- The instrument itself can show the histogram analysis of voltage, conductivity and capacity of battery and judge status of battery, excellence, good or bad.
- The instrument has function of oscilloscope that can show Max and Min and Average of Voltage and Voltage ripple through graphical display (optional)
- Powerful data manage software. Friendly board. Provide the data management, printing, analysis, report, etc
- Over voltage protection and self-recover over current protection etc.
- Large capacity Lithium battery power supply
- Auto test mode

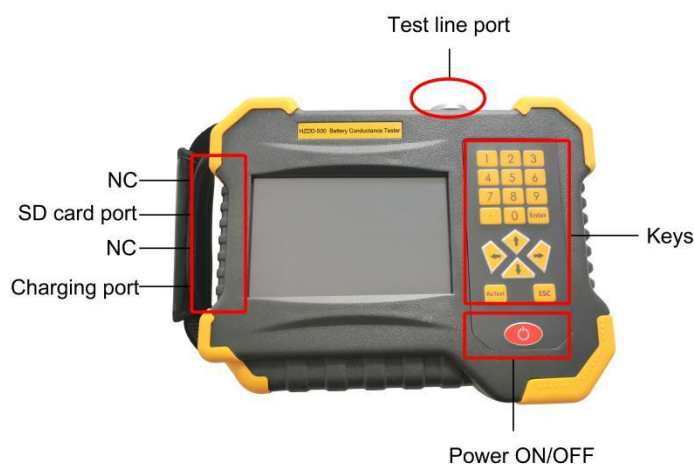
1.3 Specification

Measure range	Conductivity: 20 ~ 19990S Voltage: 0.000v--25v
Min. resolution	Conductivity: 1S Voltage: 1mV
Measure accuracy	Conductivity: $\pm 0.5\% \text{rdg} \pm 6 \text{dgt}$ Voltage: $\pm 0.2\% \text{rdg} \pm 6 \text{dgt}$

Power supply	12V, chargeable Li-battery
Consumption	8 hours standby mode
Storage volume	64Mbit Flash + 8G SD card
LCD	5"colour touch screen
Dim.	220 x 170 x 52mm
Weight	1.1Kg

II.Junction Port And Cables Instruction

2.1 Instrument Port



- Test line port: Open the cap and insert wire here
- SD card port: Insert the SD card here
- Charging port: Charge the instrument here
- Keys
 - a. ▲▼◀▶ Move the direction keys to select certain function
 - b. 0-9 number keys
 - c. Enter: Confirming. Start the test
 - d. ReTest: Test again. Do a test again
 - e. ESC: Back to last step

2.2 Wiring Instruction

2.2.1 Wiring Notices:

- During test please don't put test clip on bolts cap to avoid affecting test accuracy but can put it on pole bar or connection strip
- If we can't clip the test clips please turn to test pin (option part)
- Battery reference battery conductance ,please refer to information from manufacturer. If no supplied information please refer to instrument one. It will affect evaluation

2.2.2 battery connection diagram

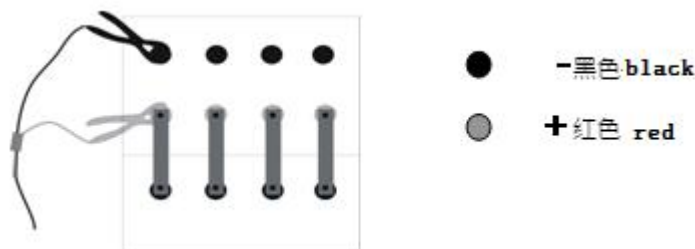


Fig 2.2 .2 Poles connection

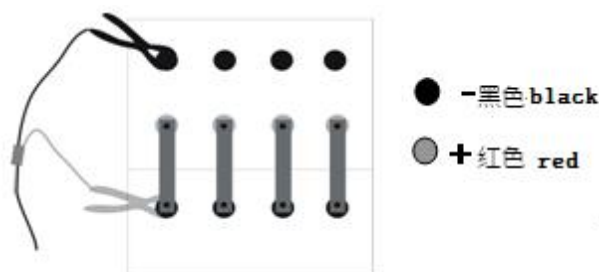


Fig 2.2.2 -1 Connect connection strip

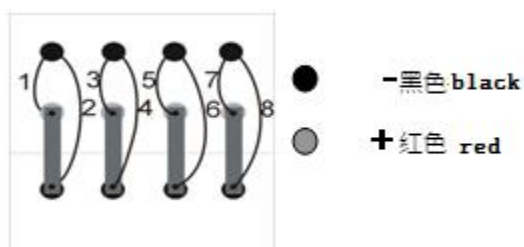


Fig 2.2 -2 Connection strip test

2.2.3 Test on the poles

- Before it is going to testing a battery bank, it has to finish all testing of poles and connectors of one battery, then start to testing next battery.

2.2.4 Test connection strip Add connectors testing (testing on the poles, and then test the

connectors.)

- Before you choose “add connectors testing”, please add line like Chart 2.2-2. When you finished pole testing of one battery
- Before it is going to testing a battery bank, it has to finish all testing of poles and connectors of one battery, then start to testing next battery. First, test the poles, and then test the connectors. When finished testing of all poles and connectors of one battery, test the next cell battery poles and connectors as the same direction.

III.Operation Rules

3.1 Test Procedure

First step: Press power button long time and release it until enter into interface



Second setting:



main interface “[Test Setup](#)” —“[New Batt](#)”, enter into new battery parameters setting interface

New parameter Set					
		23.5v		27%	
10-12-2015 15 09					
Set Parameters					
RoomNo.	0001	Tech-ID	0001	PileNo.	0001
CellNum	0002	B.Brand	2V-1	CellType	2V
Cnormal	100Ah	Gi-ref	1000S	Ulowlim.	2.100V
OperMode	Manual	PoleNum	2		
Test Options					
TestMode	Pole only				
TestPlan	Volt & Conductance resistance				
Input Options					
U-float	0.00V	I-float	0.000A	Temp.	25v
Start Test			ESC		
Prompt: The touch screen. please click.					

Fig 3.1 Set test specification

- RoomNo: 0001-9999
- Tech-ID: 0001-9999
- PileNo:Battery group number: 0001-9999
- CellNum:Battery quantity: 1-500cells (continuing test for Max 500cells)The continuous test can be made for 500 pcs battery at most
- B.Brand:

1. after selecting "USER", the single body voltage, battery capacity and reference conductance are set according to the battery parameters;
 2. choose other battery manufacturers, set the single voltage, battery capacity, internal resistance selection through the menu reference.
- CellType: **Cell** Voltage type
 - Cnormal: Nominal capacity
 - Gi-ref: Reference conductance
 - Ulowlim: During test if voltage is lower than this level device will send alarm but won't affect test
 - OperMode: Two kinds of manual mode and auto mode
 1. select the manual mode, in the test process, after changing the test folder, need to click "start test" to test the next battery.
 2. select the auto method, in the test process, after changing the test folder, the instrument will automatically test, do not need to manually click "start test".
 - Polenum: The pole set number, select the number of battery pole according to the requirement.
 - Test mode:
 1. Test on the poles, don't test the connector's conductance between the poles
 2. Add connectors testing, after testing battery conductance, and then change test clip and test connector's conductivity between the poles
 - Testplan:
 1. Test voltage and conductivity at the same time .
 2. Only test voltage
 3. Firstly test all the voltage and then test conductivity.
 - It's unnecessary to set float charging voltage, current, temperature won't affect test
 - Start test: After setting specifications the clip instrument test clips on battery and click "Start test"
 - ESC: Return to last interface

Third step: Ready test

- Finish setting. Connect instrument and test line. Clip the test clips on battery (pay attention on pole. Red is positive and black is negative) Click "Start test" Click "Yes"

Forth step: test process

- After finishing test of first battery, remove test clip to next battery (firstly remove test clip on the negative pole and then remove test clip on the positive pole ; Or remove two clips simultaneously .)
- OperMode:
 1. “ Manual”, click “Start “ test next battery
 2. “ Auto” the instrument test automatically after 1-2s , user don’t click “ start “

The screenshot shows a software interface titled "New parameter Set". At the top, it displays environmental data: 20.6°C, 41%, and the date/time 10-13-2015 10:10. Below this is a table with the following parameters:

Set Parameters					
RoomNo.	0001	Tech-ID	0001	PileNo.	0001
CellNum	0500	B.Brand	USER	CellType	2V
Cnormal		Information prompt			m. 2.100V
OperMode	M	External storage, please check the test line. start?			
TestMode					
TestPlan		Yes No			
Input Options					
U-float	0.00V	I-float	0.000A	Temp.	25°C
Start Test			ESC		

Below the table, a yellow prompt bar reads: "Prompt: The touch screen, please click."

Fig.3.1-1 Start test

Fifth step: end of test

- Finish the test. Click “Esc” to the main interface. If the whole battery group test was not finished when return but want to go on test click “Test battery” the test will be continued as per last test

Sixth step: data check

- “Data Mgmt” Select certain files and click “View” We’ll find detail data

Seventh step: Generation of report

- Print test report. External storage. SD card can transfer data to computer by card reader. Just open the software in the computer will be ok. If it’s internal storage click “Data Mgmt” and click “Exp-ALL” the data will be transferred to SD card. Then repeat first operation we’ll read all information

3.2 Test Parameters Setting

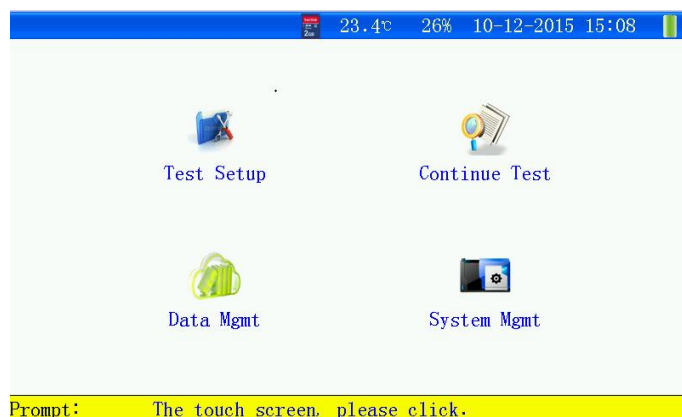


Fig.3.2 Instrument main interface

- Test Setup: Set specifications of battery to be tested
- Continue Test: Continue test of last un-finished battery group
- Data Mgmt: Check and analyze test data
- System Mgmt: Including time setting, touch accuracy calibration, reference internal battery conductance etc.

3.2.1 New battery specification setting

Main interface” **Test Setup** ” —“**New Batt**” enter into parameters setting interface



Fig.3.2.1 Specifications setting

- New Batt: Custom setting on battery test specification
- Old Batt : Specifications of former test battery

New parameter Set 23.5℃ 27% 10-12-2015 15 09

Set Parameters					
RoomNo.	0001	Tech-ID	0001	PileNo.	0001
CellNum	0002	B.Brand	2V-1	CellType	2V
Cnormal	100Ah	Gi-ref	1000S	Ulowlim.	2.100V
OperMode	Manual	PoleNum	2		
Test Options					
TestMode	Pole only				
TestPlan	Volt & Conductance resistance				
Input Options					
U-float	0.00V	I-float	0.000A	Temp.	25℃
Start Test			ESC		

Prompt: The touch screen, please click.

Fig.3.2.1-1 New battery specification setting

- RoomNo: 0001-9999
- Tech-ID: 0001-9999
- PileNo: Battery group number: 0001-9999
- CellNum: Battery quantity: 1-500cells (continuing test for Max 500cells)The continuous test can be made for 500 pcs battery at most
- B.Brand:
 - 1) after selecting "USER", the single body voltage, battery capacity and reference conductance are set according to the battery parameters;
 - 2) choose other battery manufacturers, set the single voltage, battery capacity, internal resistance selection through the menu reference.
- CellType: Voltage type
- Cnormal: Nominal capacity
- Gi-ref: Reference conductance
- Ulowlim: During test if voltage is lower than this level device will send alarm but won't affect test
- OperMode: Two kinds of manual mode and auto mode
 - 1) select the manual mode, in the test process, after changing the test folder, need to click " start test" to test the next battery.
 - 2) select the auto method, in the test process, after changing the test folder, the instrument will automatically test, do not need to manually click "start test".
- PoleNum: The pole set number, select the number of battery pole according to the requirement.
- Test mode:
 - 1) Test on the poles, don't test the connector's conductance between the poles

2) Add connectors testing, after testing battery conductance, and then change test clip and test connector's conductivity between the poles

- Testplan:
 - 1) Test voltage and conductivity at the same time .
 - 2) Only test voltage
 - 3) Firstly test all the voltage and then test conductivity.
- It's unnecessary to set float charging voltage, current, temperature won't affect test
- Start test: After setting specifications the clip instrument test clips on battery and click "Start test"
- ESC: Return to last interface

3.2.2 Existing battery specification

- **Main interface** "Test Setup" —"Old Batt", choose setting parameters



Old parameter Set					
87.7℃ 28% 10-12-2015 15:13					
TestTemplate 1/1					
ID.	B.Brand	RoomNo.	CellType	Cnormal	Gi-ref
1	2V-1	0001	2V	100Ah	1000S
2	2V-1	0001	2V	100Ah	1000S
3	12V1	0001	12V	10Ah	53S
4	12V1	0001	12V	10Ah	53S
5	12V1	0001	12V	10Ah	53S
6	2V-1	0001	2V	100Ah	1000S
7	2V-1	0001	2V	100Ah	1000S
8	2V-1	0001	2V	100Ah	1000S
9	USER	0001	2V	100Ah	1000S
Del-All	Del	UpPage	DownPage	ViewSet	ESC

Prompt: The touch screen, please click.

Fig.3.2.2 Existing battery specification

- "Del-All": Click it will delete all modular record
- "Del": Select certain record and then click it will delete present record
- "UpPage", "DownPage": Find out record
- "ViewSet": Select certain record click "ViewSet" enter the specification setting board.

3.3 Start Test

Parameters setup interface click "Start Test", ready enter into test interface

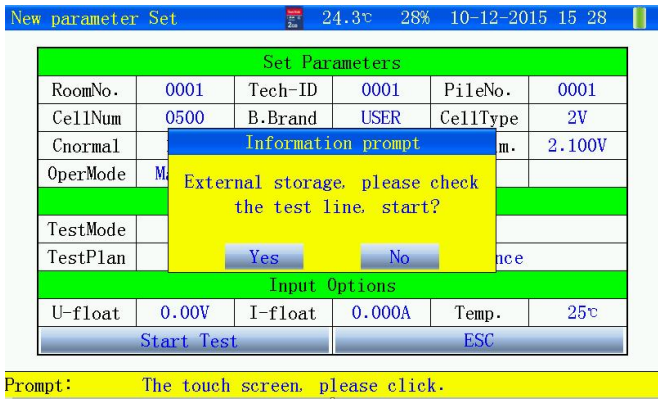


Fig.3.3 Start test

- Connecting test line
- Select “Yes” enter the test interface

3.3.1 test interface

- Test item is different from test mode , different interface, see below figure .

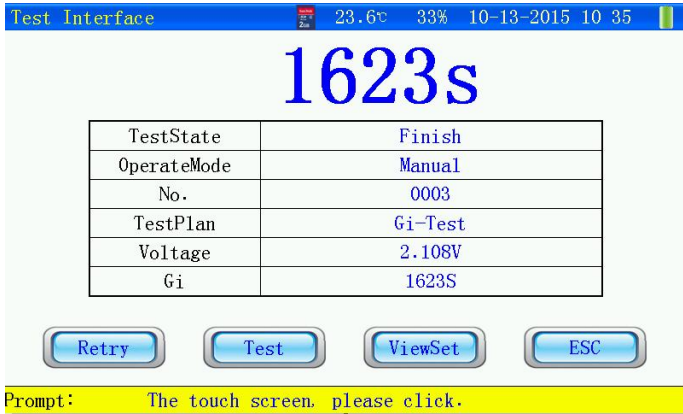


Fig. 3.3.1 Test voltage and
Battery conductance together

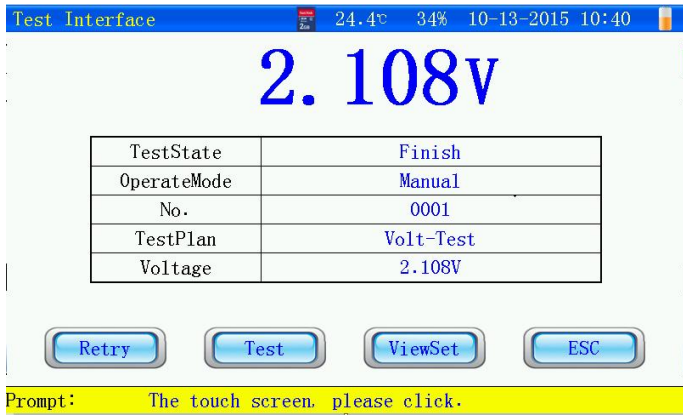


Fig.3.3.1-1 Just measure voltage



Fig. 3.3.1-2 More than 2 poles voltage and battery conductance test



Fig. 3.3.1-3 More than 2 poles and connection strip test on voltage and battery conductance

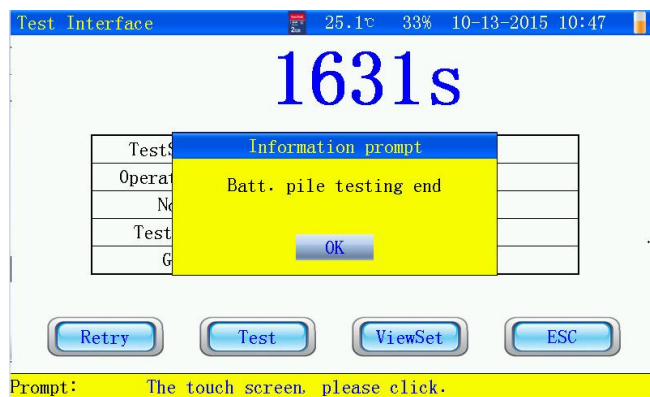


Fig. 3.3.1-4 All battery group after tested

- TestState: In the test or soon to finish
- OperateMode: Select manual test or automatic when set specification
- No: Testing battery number
- Testplan: The test result we will get
- Voltage: Present battery voltage
- Gi: Present battery conductance

- Rc: Test conductivity of connection strip between the poles
- Retry: Test battery again and replace last data when save new data
- Test: to choose manual test will request us to click “Test” for next test. If automatic test every time change on test clip the instrument will test automatically don’t need manual click
- ViewSet: View setting parameters
- ESC: Stop testing, return

3.4 Continue Test

3.4.1 Continue test mode: unfinished test battery bank and historical unfinished battery bank

3.4.2 Unfinished test battery bank

- main interface”  “enter into continue test



Fig 3.4.2 Test battery

- Main interface”  “Data Mgmt” — “choose test record” — “View” — “DataTest” — “Con-Test”



Figure 3.4.2-1 test battery interface

- Connect test line

- Click “Yes” and start test and enter into test interface (see 3.3)

3.5 Data Management

3.5.1 Data save: internal storage and external storage (SD Card)



- Main interface “Data Mgmt”, enter into data management interface

3.5.2 external storage

Data Mgmt Interface		24.7℃	32%	10-13-2015	11 11
FileData.		1/3			
ID.	File name				
1	R00001-01-151006141240.NZY				
2	R00001-01-151006143155.NZY				
3	R00001-01-151006143437.NZY				
4	R00001-01-151006144632.NZY				
5	R00001-01-151006144913.NZY				
6	R00001-01-151006145142.NZY				
7	R00001-01-151006145327.NZY				
8	R00001-01-151006145348.NZY				
9	R00001-01-151006145651.NZY				
Del-All		Del	UpPage	DownPage	View ESC
Prompt: The touch screen. please click.					

Fig.3.5.2 External storage interface

- Name the file: R machine room number-battery group number-test date
- Every page displays 9-record. Read them by clicking “UpPage” “DownPage”
- “Del-All” Click it to delete all record
- “Del”: Select certain record and then click it will delete present record
- “View”: Select certain record click “View” enter the specification setting board.

Data Mgmt Interface		24.7℃	32%	10-13-2015	11 11
FileData.		1/3			
ID.	File name				
1	R00001-01-151006141240.NZY				
2	R00001-01-151006143155.NZY				
3	R00001-01-151006143437.NZY				
4	R00001-01-151006144632.NZY				
5	R00001-01-151006144913.NZY				
6	R00001-01-151014110957.NZY				
7	R00001-01-151006145327.NZY				
8	R00001-01-151006145348.NZY				
9	R00001-01-151006145651.NZY				
Del-All	Del	UpPage	DownPage	View	ESC
Prompt: The touch screen. please click.					

Fig. 3.5.2-1 Record selection

Select certain record and click “View” read every battery detail information

3.5.3 Internal storage

Data Mgmt Interface			 23.8℃	 28%	10-12-2015 15:14	
PileData.				1/2		
ID.	RoomNo.	PileNo.	Test Time			
1	0001	01	2015-10-06 14:12			
2	0001	01	2015-10-06 14:31			
3	0001	01	2015-10-06 14:34			
4	0001	01	2015-10-06 14:46			
5	0001	01	2015-10-06 14:49			
6	0001	01	2015-10-06 14:51			
7	0001	01	2015-10-06 14:53			
8	0001	01	2015-10-06 14:53			
9	0001	01	2015-10-06 14:56			
Del-All	Del	Exp-All	Export	UpPage	DownPage	View
			ESC			
Prompt: The touch screen. please click.						

Fig.3.5.3 Internal storage interface

- Select a record direct click.
- “Del-All” Click it to delete all record
- “Del”: Select certain record and then click it will delete present record
- “Exp-All” the data will be transferred to SD card.
- “Export”: Select certain record click “Export” to transfer it into SD card
- “UpPage” “DownPage” : Page view records.
- “View”: Select certain record click “View” to find every battery detail information

3.5.4 check test data

TestInfo					23.1℃	39%	10-13-2015	10:29	
File content					1/56				
NO.	Voltage	Gi	Cap	Decide					
1	2.157V	981S	98%	Best					
2	2.157V	978S	98%	Best					
3	-----								
4	-----								
5	-----								
6	-----								
7	-----								
8	-----								
9	-----								
ViewSet		Chart		DataTest		UpPage		DownPage	ESC
Prompt: The touch screen. please click.									

Fig.3.5.4 Read information

- No: Testing battery number
- Voltage: Present battery voltage
- Gi: Present battery internal resistance Current battery conductance
- Rc: Connection resistance value (Only test battery on pole there is no connection resistance)
- Cap: Left volume percentage Capacity percentage
- Decide: Better, good, bad, worse, problem

- “-----”means this item has not been tested
- “ViewSet”: Set the check specifications
- “Chart”: All data of test battery displayed via column chart.
- “DataTest”: View detailed test data
- UpPage/DownPage: to check other battery data

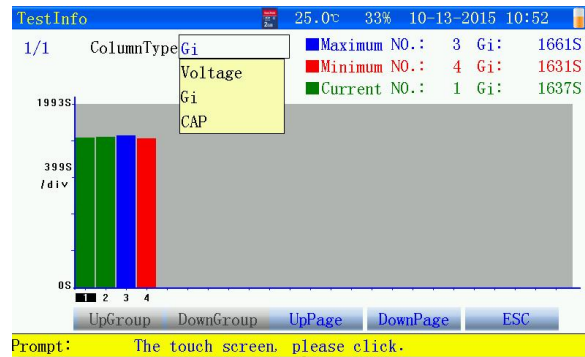


Fig.3.5.4-1 Battery data column chart

- “ColumnType”: Select different column to check different information. Such as voltage, volume, etc.
- If check certain battery information click the column of that battery will display value accordingly

Concrete Data

23.5℃

35%

10-13-2015 10:34

Total NO: 500				
N0.	1			
Voltage	2.157V			
Gi	981S			
Con-Test	ReTest	Up-No.	Down-No.	ESC

Prompt: The touch screen, please click.

Fig.3.5.4-2 One battery test data

- Certain battery detail data and specification
- Con-Test: If present battery group test was not finished click it for continue test
- ReTest: Test present battery again
- Up-NO/Down-No: to check other battery information

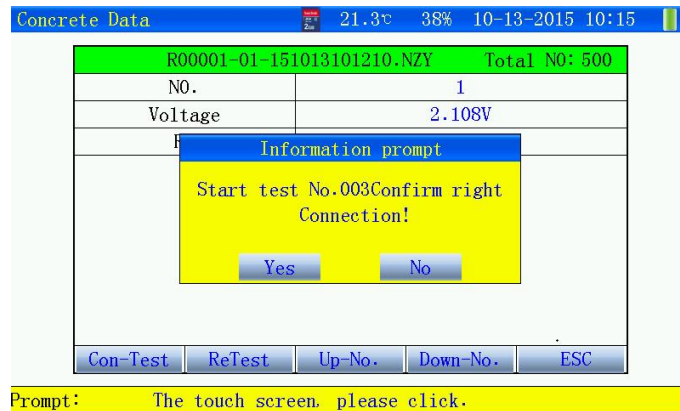


Fig. 3.5.4-3 Continue test

- Battery group test was not finished. Start any battery test connect test strip. Click "Yes" start the test

3.6 Re-test

Retest the battery

- Main interface "Data Mgmt" — "choose test record" — "View" — "DataTest" — "ReTest"

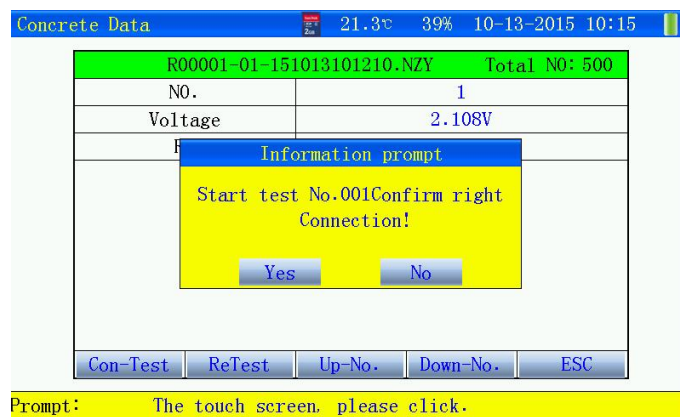


Figure 3.6 the test data of retested battery

3.7 Time Setting



Main interface "System Mgmt"—"Date&Time", enter into date and time setting



Figure 3.7 date and time setting interface



Fig. 3.7-1 System setting/data setting interface

3.8 Touch Screen Calibration

Main interface “System Mgmt” — “TP Calculate” enter into calibration interface

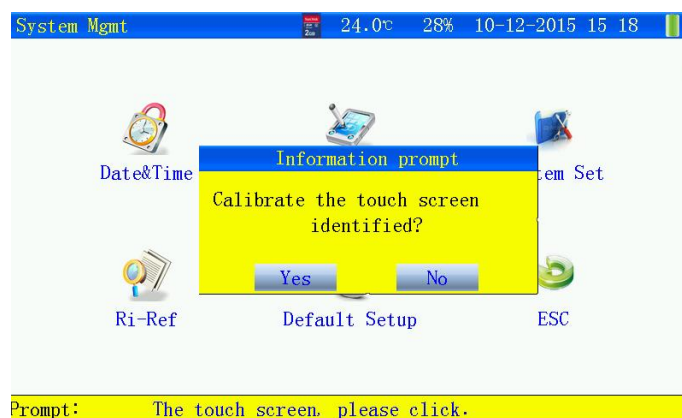


Fig. 3.8 Touch screen calibration

- Click “Yes” Touch screen calibration utilized 5 points mode click the “+” orderly. When finish calibration it will return automatically. If any calibration mistake touch screen is not smart we can

enter the interface again to calibrate it

3.9 Back Light Memory Setting When It's Off



Fig. 3.9 System setting

- Auto off time: Maximum value is 120 minutes, 0 means no automatic off
- Backlight time: Maximum value is 120 minutes, 0 means no automatic off
- Alarm: Close-voltage lower than minimum level won't alarm; Open-alarm user
- StorageLocation:

Internal storage. Test data will be stored internal it can store maximum 99 group. Transfer it to PC

External storage. The data is held in SD card. Maximum is 999 group

- Finish setting click "Save"

3.10 Save Setting (see 3.9)

main interface" [System Mgmt](#) —"[System Set](#)", enter into parameter setting interface

3.11 Reference Battery Conductance Maintenance

- main interface "[System Mgmt](#) "—" [Gi-Ref](#) ", enter into, enter into battery conductance maintenance

Ref value Maintain				24.1℃	28%	10-12-2015 15 22
B.Brand	2V-1	Del B.Brand	Add B.Brand			
ID.	CellType	CAP	Gi-ref			
1	2V	100Ah	1000S			
2	2V	150Ah	1205S			
3	2V	170Ah	1316S			
4	2V	200Ah	1429S			
5	2V	250Ah	1471S			
6	2V	300Ah	1538S			
7	2V	350Ah	1667S			
8	2V	400Ah	2000S			
9	2V	420Ah	2083S			
Add B.Brand Data		Save	ESC			

Prompt: The touch screen, please click.

Fig. 3.11 Reference battery conductance edition

- If we need to add or modify battery conductance value form manufacturer please enter this interface
- “Del B.Brand”: Click it to delete battery data from present manufacturers
- “Add B.Brand”: Click it will create a new manufacturer
- “Add B.Brand Data”: Add battery information

Ref value Maintain				24.1℃	28%	10-12-2015 15:23
B.Brand	2V-1	Del B.Brand	Add B.Brand			
ID.	CellType	CAP	Gi-ref			
Add B.Brand. Max 4 Char				X		
In: BATT		Del		OK		
A	B	C	D	E	F	
G	H	I	J	K	L	
M	N	O	P	Q	R	
S	T	U	V	W	X	
Y	Z	/	-	123	CAP	
9	2V	420Ah	2088S			
Add B.Brand Data		Save	ESC			

Prompt: The touch screen, please click.

Fig. 3.11-1 Add new manufacturer

- Battery manufacturer name contains 4 letter or number at most

Ref value Maintain				22.2℃	38%	10-13-2015 10:22
B.Brand	BATT	Del B.Brand	Add B.Brand			
ID.	CellType	CAP	Gi-ref			
1	2V	100Ah	1000S			
Input Cnormal				X		
In:		Del		OK		
1	2	3	4			
5	6	7	8			
9	0	.	:			
Add B.Brand Data		Save	ESC			

Prompt: The touch screen, please click.

Fig. 3.11-2 dd manufacturer data

- CellType: Select it according to battery type

- CAP: Input battery volume
- Gi-ref: Input the battery conductance from manufacturer
- Save above specification in test data specification select manufacturer will display battery information automatically

3.12 Initialization Setting

main interface “System Mgmt—Default Setup—Recovery”, enter into initialization setting interface

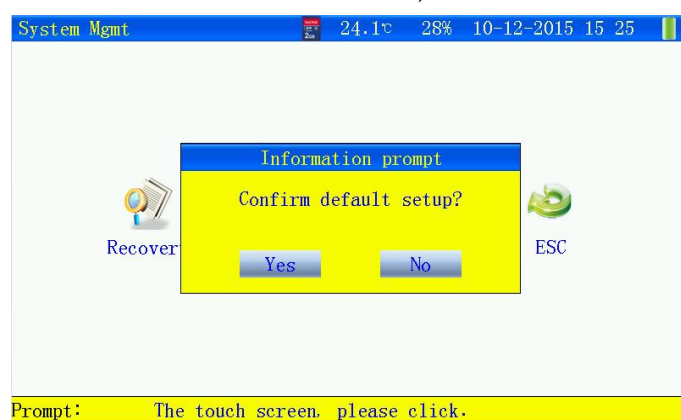


Fig. 3.12 Initialization

- Initialization: Initialize all specifications as factory setting
- Product information: The instrument info.

IV.PC Software Instruction

4.1 System Setting

- This software requests following basic requirement
 - The PENTIUM/100% compatible computer or note book with standard USB port
 - A hard disc drive (Such as C) holding 80M volume at least
 - Over 64M volume
- a. The screen resolution is larger than 1024*768
- b. Computer system is higher than WINDOWS 7

4.2 Software Installation

- Install the SD card backup software to the computer, run the setup software “ setup.exe.

4.3 Open Test Data

- Open SD card data

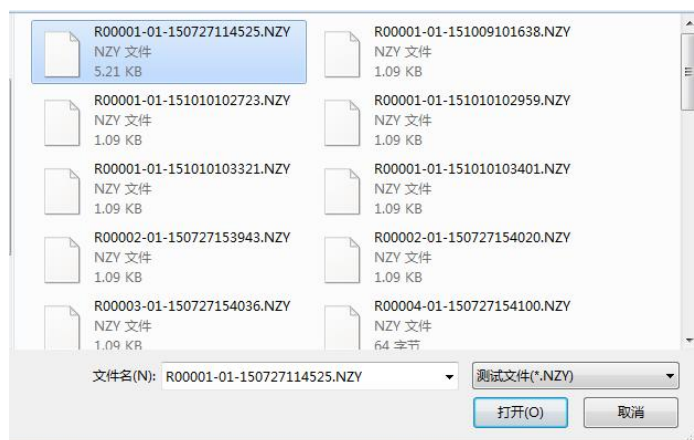


Fig. 4.3 Open SD card data

4.4 Data Analysis

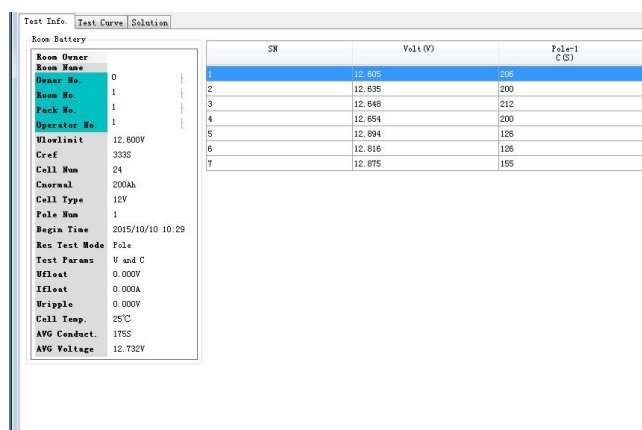


Figure 4.4 battery bank parameters and test data

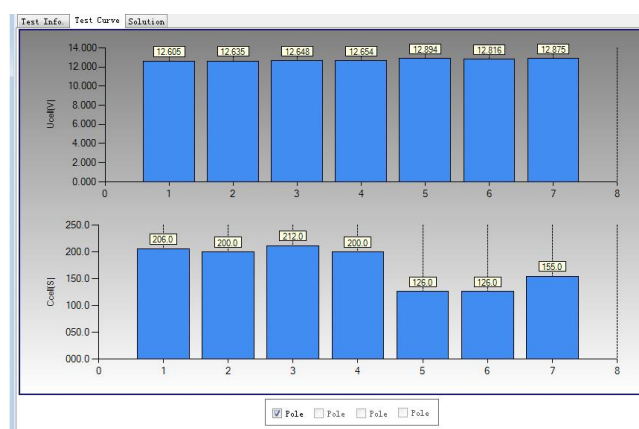


Figure 4.4-1 Graphic Correlation of cell

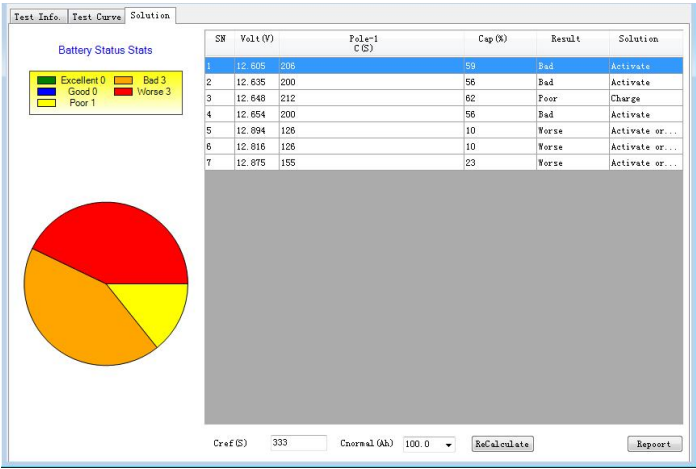


Fig.4.4-2 Maintenance interface

- Reference internal resistance: It can be re-set and restart the computer to analyze the test data again
- Test report: Click it to create excel report

4.5 Generation Of Report

Battery Conductance Test Report

Room Owner:

Room Name:

Test Site:

Reporter:

图 4.5 Test report

Battery Conductance Test Report							
Room Owener			Room No.	00001			
Pack No.		01	Operator No.	00001			
Cell Type	12V	Cell Num	24	Ulowlimit	12.600V	Cref	333S
Ufloat	0.000V	Ifloat	0.000A	Uripple	0.000V	Tcell	25°C
Begin Time		2015/10/10 10:29		Cavg	175S	Uavg	12.732V
Test Results							
Result	Solution		Num	Cell Detail			
Excellent	Rules		0				
Good	Rules		0				
Poor	Charge		1	3			
Bad	Activate		3	1,2,4			
Worse	Activate or Replace		3	5,6,7			

Fig. 4.5-1 Test report

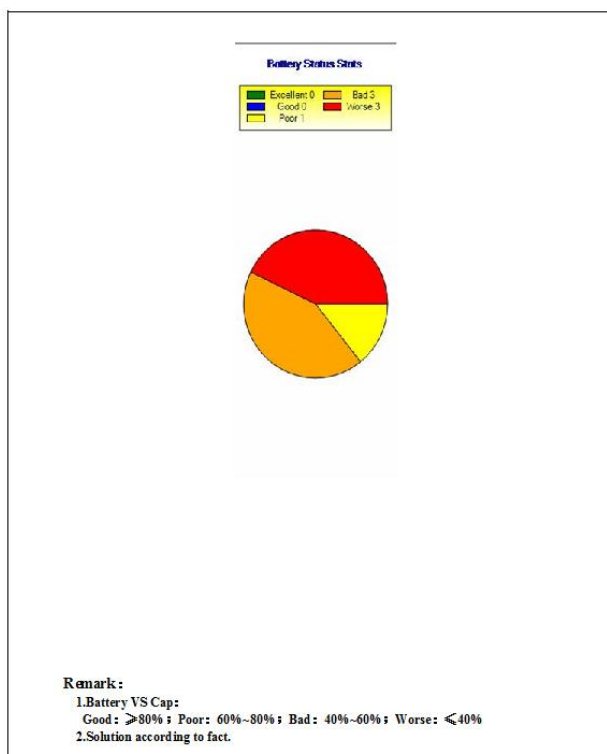
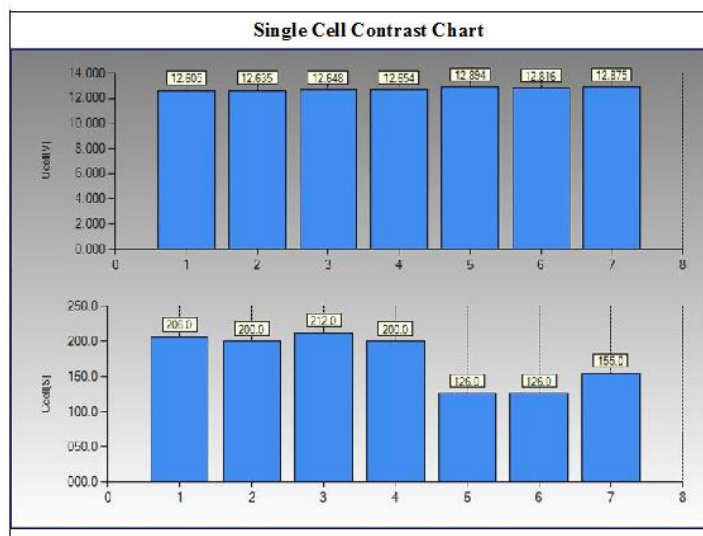


Fig. 4.5-2 Battery status summarize



ig. 4.5-3 Singles comparison

Test Result										
SN	Ucell(V)	Cinner(S)			Rlink(mΩ)			Cap(%)	Result	Solution
1	12.605	206						59	Bad	Activate
2	12.635	200						56	Bad	Activate
3	12.648	212						62	Poor	Charge
4	12.654	200						56	Bad	Activate
5	12.894	126						10	Worse	Activate or Replace
6	12.816	126						10	Worse	Activate or Replace
7	12.875	155						23	Worse	Activate or Replace

Fig. 4.5-4 Test result

V.Maintenance And Notices

5.1 Failed To Be Turned On

- Check the connection between instrument and Li-battery. The voltage may be too low to open the device. We may need to replace or charge battery in the instrument
- Instrument screen will display battery volume in the center. When there is  we need to charge the instrument. Charging:
 - 1) Insert the adapter to battery charging port. Connect adapter power to AC power socket
 - 2) When adapter light is green means finish charging
- Note: Longest charging time is 6-8 hour please don't charge it over
- If instrument doesn't reflect anything failed to turn off please open back cover get off the battery and

insert it again then turn on the device

- If touch screen is not smart please calibrate it in “System management”
- When screen display “Insert storage card again” please get off the SD card and insert it again or replace SD card
- If we don't operate it for a long while during test the instrument will close LCD or whole device automatically. Click the touch screen or press any key will wake it up. We can set the back light and off time ourselves

5.2 Display “Inspect batter clip”

Firstly ensure battery clips and pole are connected well and testing battery voltage should be not less than 1.5V

5.3 Test Pin Probe Bent Or Can't Withdraw

- Replace the probe:
- Clip the probe on sleeve top by pincher
- Warning: Don't clip the sleeve holding probe to avoid damaging pin
- Pull out the pin probe straightly
- Clip new probe into sleeve
- Push the probe to a soft surface. Such as cardboard until the probe reach the sleeve top

VI. Packing List

No.	Item	Qty
1	Host	1
2	Rechargeable Battery	1
3	Power Charger	1
4	Test line	1
5	SD Card/ Card Reader	1
6	Touch Pen	1
7	Meter Soft Pack	1