

# **PITE 3932T Battery Charger/Discharger**

## **User Manual**

P-120323-V1.1



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# 1. INTRODUCTION

This Users Manual gives full information on how to use PITE 3932T Battery Charger/Discharger safely and effectively. Please read the manual carefully so as to obtain maximum performance of the unit and its accessories.

**⚠ WARNING:** Read this manual completely before connecting and powering on the unit to avoid possible damage caused by improper use of this instrument.

## 1.1. Accessories

After receiving the PITE 3932T, please check it carefully as below:

- Ensure that no damage occurred during transportation. Upon any damage or failure of operation based on this instrument, please contact your supplier immediately.
- Make sure you have each items below

1. PITE 3932T main unit (1)
2. Carrying case (1)
3. Voltage testing lead with two clamps (1)
4. Load cable (black & red) (2)
5. User Manual (1)
6. Analyzing software CD (1)
7. AC power cord (1)



 <p>Analyzing Software CD</p>	 <p>AC power Cord</p>	 <p>Voltage testing lead with two clamps</p>
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## 1.2. Safety Information

For your protection, please read this safety information completely before operating the PITE 3932T. Carefully observe all warnings, precautions and instructions.

**⚠ WARNING:** Servicing described in this manual is to be done only by qualified personnel. To avoid electrical shock, do not service the instrument unless you are qualified to do so.

<p><b>⚠ DANGER</b></p>	<p>Safety testing has been done on this instrument thoroughly before shipment. However, mishandling during use could result in injury or other bad consequences, as well as damage to the instrument. Make sure that you understand the instructions and precautions in the manual before use. We disclaim any responsibility for accidents or injuries not resulted directly from instrument defects.</p>
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### Safety Symbols

Description of symbols used in this manual.

<p><b>⚠ DANGER</b></p>	<p>Indicates correct operation to prevent an extreme hazard that could result in serious injury or other bad consequences to users.</p>
<p><b>⚠ WARNING</b></p>	<p>Indicates correct operation to prevent a significant hazard that could result in serious injury or other bad consequences to users.</p>
<p><b>⚠ CAUTION</b></p>	<p>Indicates correct operation to prevent possible injury to users or damage to the instrument.</p>
<p><b>NOTE</b></p>	<p>Indicates advisory items related to performance or correct operation of the instrument.</p>

## 1.3 Precautions

To avoid electrical shock or fire, read these precautions first before using the unit:

- Except as explained in this manual, do not attempt to service this equipment yourself.
- Do not operate the PITE 3932T around explosive gas or vapor.
- Use only insulated load cables, and test leads as supplied with the PITE 3932T
- Before use, inspect the PITE 3932T, load cables, test leads and accessories for mechanical damage and replace when damaged. Look for cracks or missing plastic. Pay special attention to the insulation surrounding the connectors.
- Remove all clamps, test leads and accessories that are not in use.
- Do not apply input voltages above the rating of the instrument.
- Before use, check that the selected/indicated voltage ranges on the PITE 3932T matches the local line power voltage and frequency.
- Proper installation is essential to the correct functioning of your analyzing software CD. If you have any questions about installation, please contact us for assistance.
- After testing battery, there is high temperature inside the main body of PITE 3932T. Therefore, please keep the unit powered on to evaporate the heat for at least 5 minutes. Do not shut down the unit right after testing. This is very important ensure the good performance of all electronic parts inside the main body.

This manual describes the general installation and use of the test equipment. If your system has features or accessories not addressed in this manual, please contact us.

## 2. OVERVIEW

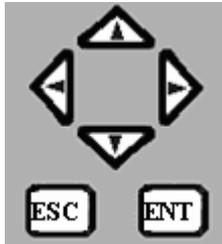
### 2.1 About PITE 3932T

PITE 3932T is a compact unit for daily maintenance of single cell, especially for old cells. It plays three roles: charger, discharger and activator, which will facilitate your maintenance for batteries. These three functions could be used individually or comprehensively. When used comprehensively, lag-out battery will experience low-volt constant current charging and discharging singly or in multi-circles (1~99). By activating the disabled active material on battery electrode plate, it amends the battery malfunction caused by chemical failure and thus boosts the capacity of old battery. Activation curve and certain parameters (e.g.: voltage and resistance) will display on screen as activation ends.

Battery activation is very significant for resources utilization and efficiency increasing. However, it is important to know that not all weak batteries could be activated by PITE 3932T. It can only amend the weak batteries whose bad condition is caused by chemical malfunction instead of physical failure such as short-circuit of electrode plate.

## 2.2 Display and Keypad

PITE 3932T main body has two ways of operation, by touch screen and keypad. Both ways have same operation effect. Operation of keypad will be as below:



Keys Operation:

Key	Functions
▼ ▲	Change the numbers of parameters
◀ ▶	Move to orient different options for changing.
ENT	<ol style="list-style-type: none"> <li>1. Confirm the selection or option</li> <li>2. Confirm input</li> </ol>
ESC	<ol style="list-style-type: none"> <li>1. Return to the previous page</li> <li>2. End testing.</li> </ol>

## 2.3 Features

- ✧ Portable device
- ✧ User friendly
- ✧ Well designed and easy-to-do
- ✧ Powerful functions with 3 in 1 (discharger, charger and activator)
- ✧ Accurate data results and vivid waveforms
- ✧ Integrated functions for displaying, controlling and loading
- ✧ Password management in key parts
- ✧ Safety circuits to prevent damage to cells
- ✧ Longtime monitoring of cell condition
- ✧ Direct USB drive for data transferring
- ✧ Convenient analysis software in PC
- ✧ Software system updatable

## 2.4 Specifications

Technical Specification	Measurement Mode	Resolution	Accuracy
<b>Charging Current</b>	1-100A (cell: 2V) 1-30A (cell: 12V) 1-30A(cell:6V)	1A	1A
<b>Discharging Current</b>	1-100A(cell:2V) 1-30A(cell:12V ) 1-30A(cell:6V)	1A	1A
<b>Charging Voltage</b>	1.7-2.4V(2V) 5.4-7.2V(6V) 10.2-15V(12V)	0.1V	0.25%

<b>Discharging Voltage</b>	1.7-2.4V(2V) 5.4-7.2V(6V) 10.2-15V(12V)	0.1V	0.25%
<b>Power Supply</b>	AC 220V±10%		
<b>LCD Display</b>	128*64 pixels		
<b>Operating Temperature</b>	5°C ~ 50°C		
<b>Operating Humidity</b>	5% ~ 90%RH		
<b>Dimension</b>	40x30x20cm		
<b>Net Weight</b>	10Kg		
<b>Communication Port</b>	USB		

## 2.5 Measurement Flowchart

The measurement workflow is described below

Measurement Preparations	<ol style="list-style-type: none"> <li>1. Connect AC power cord</li> <li>2. Connect testing leads</li> <li>3. Turn the power on</li> </ol>
Start Measurement	<ol style="list-style-type: none"> <li>1. Select measuring mode</li> <li>2. Read testing results</li> </ol>
Ending of Measurement	<ol style="list-style-type: none"> <li>1. Disconnect the testing leads from the testing cell</li> <li>2. Turn off the power</li> <li>3. Pulling out the AC power cord</li> </ol>
Data uploading	<ol style="list-style-type: none"> <li>1. To load the measuring data to PC, insert a USB drive in PITE 3932T and transfer the data</li> <li>2. Data system management on PC</li> </ol>

 **WARNING:** There are high voltage and current in the cell and PITE 3932T components. Only qualified personnel can perform all these measuring procedure. Pay attention to electrical and chemical safety precautions in cell installation and removing, testing leads connection and measurements.

## 2.6 Definition of Abbreviation

Below are the definitions of all the abbreviated words used in the operating software of PITE 3932T Battery Charger/Discharger.

Abbreviation	Full name	Abbreviation	Full name
Act-res	activation result	I	current
adj	adjust	imin	short time
Alr	already	M	minute
C	capacity	Paral	Parallel
calib	calibration	param	parameter
Case	acquisition case	pls	please
CHG	charge	S	second

comm	communication	span	time span
cyc	cycling	StableU	voltage-stabilization
del	delete	strg/stg	string
dir	direction	syst	system
DIS	discharge	T	time
EX	exit	tot	total
Factory	Factory parameter	U	voltage
H	hour		

### 3. MEASURE PREPARATION

This section describes how to connect testing leads and AC power cord properly in correct sequence:

1. Connect the PITE 3932T to an appropriate AC power supply via power cord.
2. Connect the black load cable with PITE 3932T main unit and negative pole of cell, and red cable the positive pole. Please DO NOT connect them reversely.
3. Connect one end (one-port-one-cable) of the voltage testing lead with unit. And connect the other two ends with cells: the black clamp with negative pole and red with positive.



Fig.3.1.1



Fig.3.1.2



Fig.3.1.3

**⚠ WARNING:** Make sure that these cables are correctly connected; otherwise the PITE 3932T may not work properly and may become significant damage.

### 4. MEASUREMENT

#### 4.1 Power On and Off

Press power switch to **ON**. After initialization of about 10 seconds, you will come to the main menu as below:



Fig. 4.1

### 4.2 Cell Charge

To charge one single battery, please connect the testing leads well and select **[Charge]** in main menu to enter cell charge mode. Press **ENT** to confirm:

**NOTE:** The PITE 3932T has 3 options for different battery types: 2V, 6V and 12V.



Fig. 4.2.1

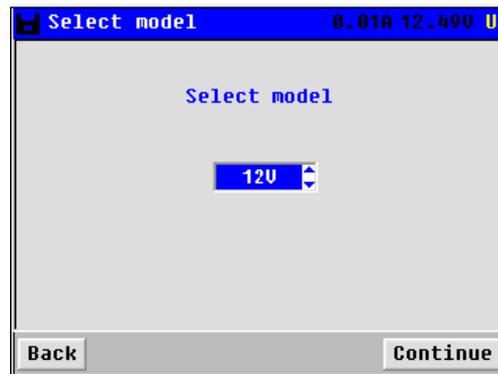


Fig. 4.2.2

Press **ESC** to go back to upper menu, or press **[continue]** to continuing charge mode, screen will display as below:

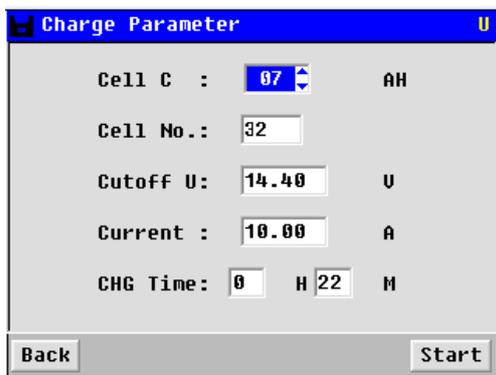


Fig. 4.2.3

Use the arrow keys for different parameters setting. Charge time should not exceed 48 hours. Press **ENT** or **[Start]** to start charging, or press **ESC** to go back.

**NOTE:**

- Setting of cutoff voltage is for the protection of cell. Correct setting of cutoff voltage value will prevent the cell from over charging or over discharging and thus avoid damage to the cell. Following settings are for your reference:  
 2V cell---Cutoff discharge voltage:1.8 V; cutoff charge voltage: 2.45V  
 12V cell---Cutoff discharge voltage:10.8 V; cutoff charge voltage: 14.5V
- Also pay attention to the current setting for cell of small capacity. You are suggested to charge and discharge it with speed of 0.1C, which means that working current is 0.1 time of cell capacity.

After pressing **[ENT]**, the PITE 3932T will enter charging status as below:

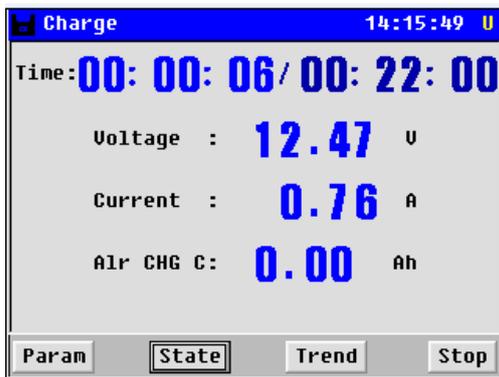


Fig. 4.2.4

You can click **[Param]** to check the charging parameter. Or you can click **[Trend]** to check the current & voltage charging curve

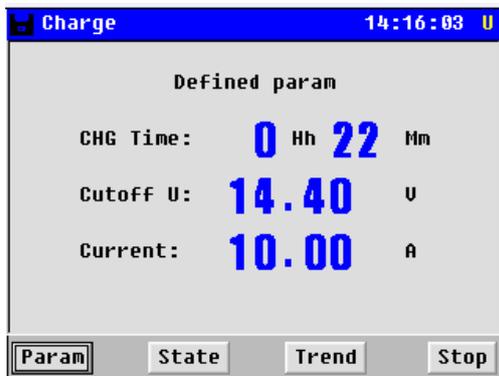


Fig. 4.2.5

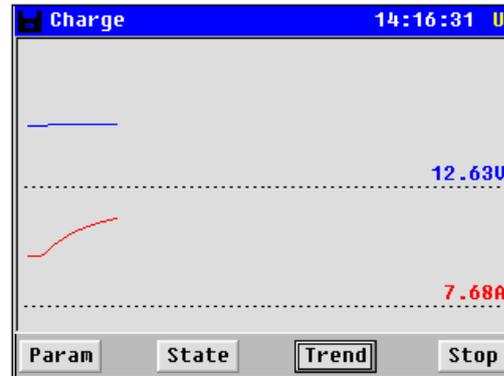


Fig. 4.2.6

After charging is done, wait for 5 minutes for resistance testing and then it will show the charging result to you as below screen. Press ← or → arrow key to choose the item you want to check, such as **[Param]**, **[Trend]** , Press **[ESC]** or **[Back]** to go back to cell charge menu.

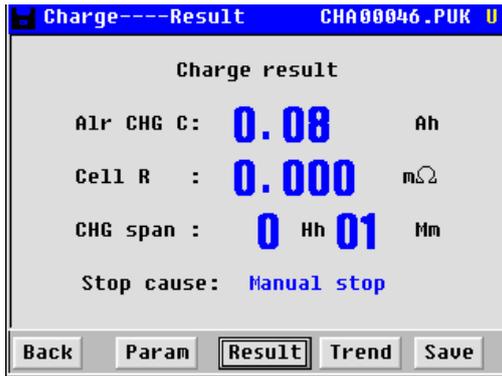


Fig. 4.2.7

### 4.3 Cell Discharge

To have a discharge testing, please connect the testing leads well and go to main menu and choose **[Discharge]** as below:



Fig. 4.3.1

Press **[ENT]** to go to parameters setting screen as below, choose the cell voltage type first:

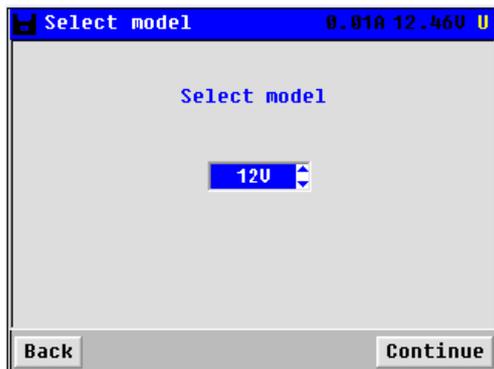


Fig. 4.3.2

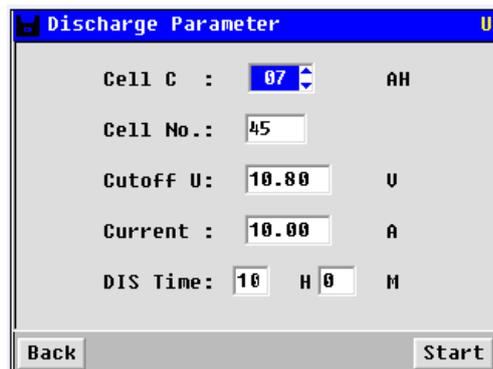


Fig. 4.3.3

There are five parameters for setting including cell capacity, cell number, cutoff voltage, discharge current and discharge time. Press ←/→ to orient different parameters and ↑/↓ to change the setting values.

NOTE: Total discharge time should not exceed 48 hours.

After the above setting, please press **[ENT]** or **[Start]** for discharge confirmation. You will see the discharge status as below:

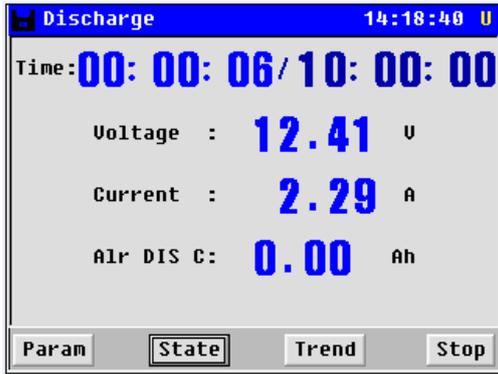


Fig. 4.3.4

You can click **[Param]** to check the discharging parameter. Or you can click **[Trend]** to check the current & voltage discharging curve

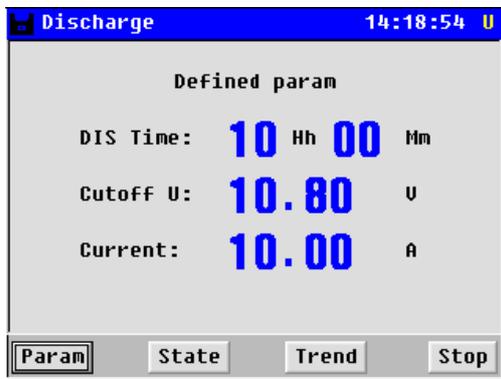


Fig. 4.3.5

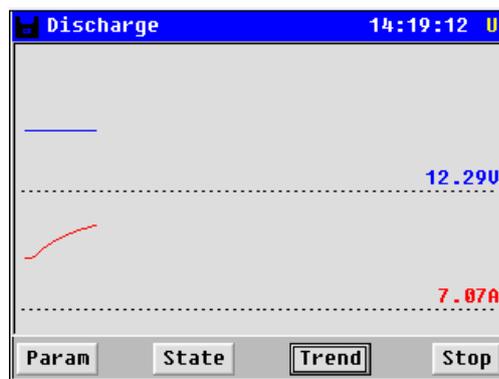


Fig. 4.3.7

When discharging finished, wait 5 minutes for resistance testing as in the below screen



Fig. 4.3.8

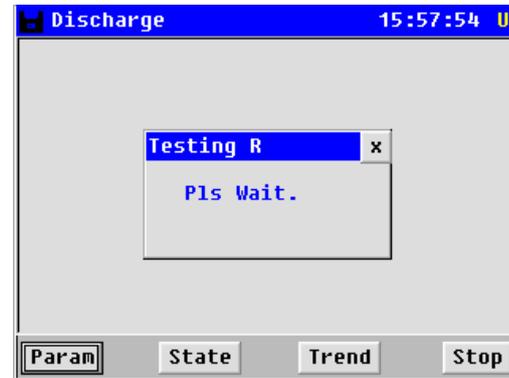


Fig. 4.3.9

After testing resistance, press **[OK]** to view discharging result in the below screen:

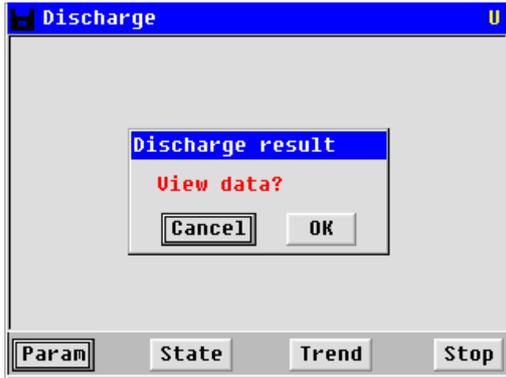


Fig. 4.3.10

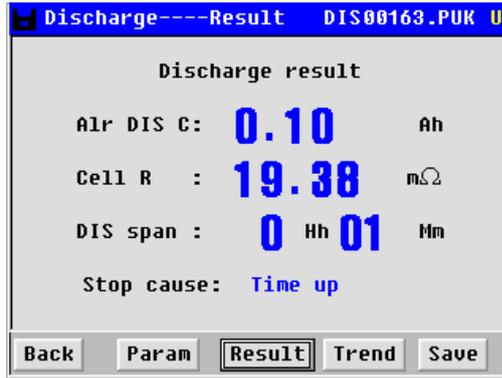


Fig. 4.3.11

Press ↓ arrow key to page down, you will see changing curve of current. Press **[ESC]** to return back to the upper menu.

### 4.4 Cell Activation

Like the function of charge and discharge, setting for activation parameters is necessary before operation of activation. Selection of cell type could be 2V, 6V or 12V. Also set cell serial number, discharge voltage lower limit, charge voltage upper limit and cycle times in the same way by using arrow keys. Maximum activation cycle is 9.

Activation process is:

Test battery resistance→Discharging→Test battery resistance→Charging

Highlight and select **[Activate]** in main menu by using the arrow keys. Press **[ENT]** to confirm. PITE 3932T allows 3 options: 2v, 6v and 12v, choose the right model for the battery.



Fig. 4.4.1

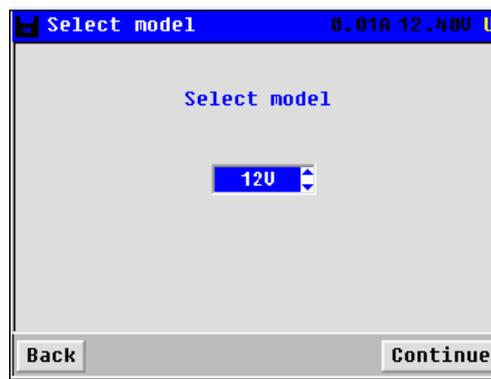


Fig. 4.4.2

Press **[Continue]** to next step, it will show the below page, Use the arrow keys for setting different parameters. After parameter setting , press **[Continue]**.

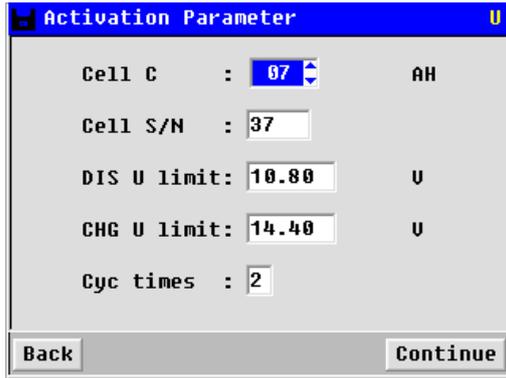


Fig. 4.4.3

If the cycles are more than 1, press **[Continue]** to set the parameters of each cycle after the previous setting (In the below screen, I have set the cycle time). Parameters in each cycle include discharge current, discharge time, charge current and charge time. In all cycles of activation, charge time and discharge time should not exceed 18 hours. And total cycle time should not exceed 100 hours.

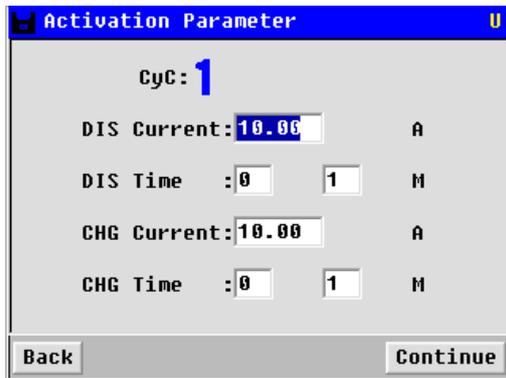


Fig. 4.4.4

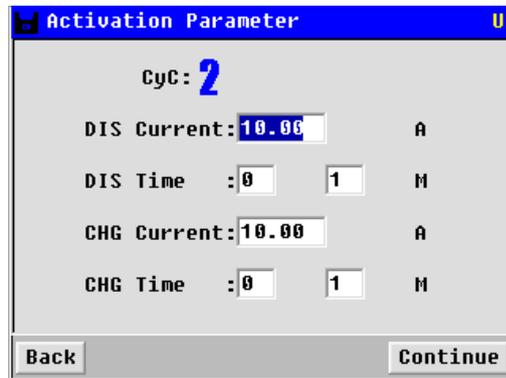


Fig. 4.4.5

After all the settings are confirmed, Press **[Continue]** and please wait 5 minutes, it is testing resistance of the battery. When finishing resistance testing, it begin to discharging, it will show the testing state as below.

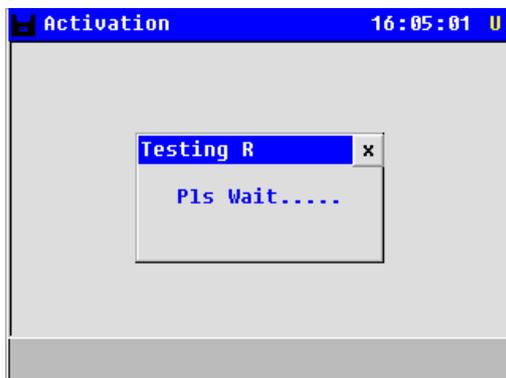


Fig. 4.4.6

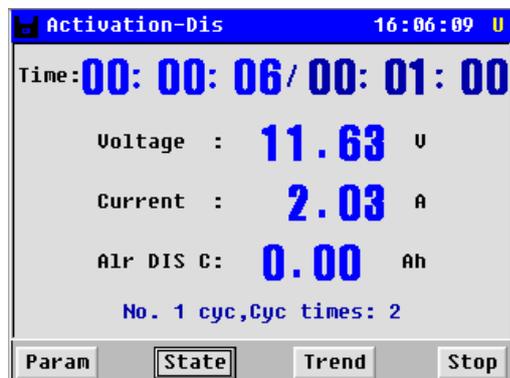


Fig. 4.4.7

You can press **[Param]** to check the activation-discharge parameters, or you can press **[Trend]** to check the Voltage&Current curve.

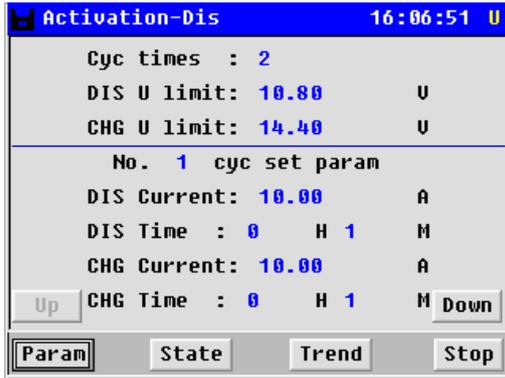


Fig. 4.4.8

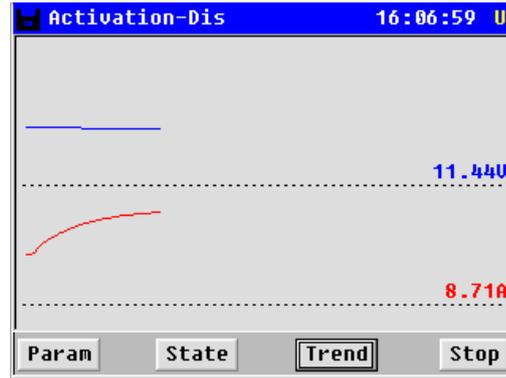


Fig. 4.4.9

When finishing activation-discharging, please wait for 5 minutes, it will test the battery resistance again, when finished resistance testing, it begin to activation-charging, below shows the charging state

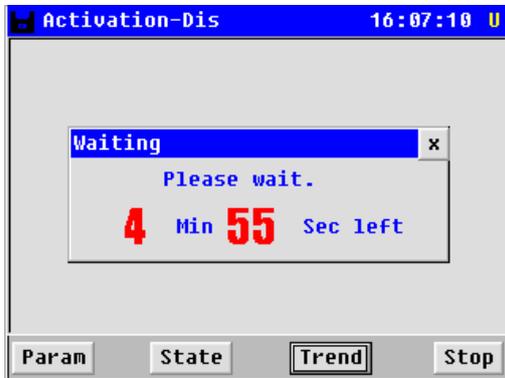


Fig. 4.4.10

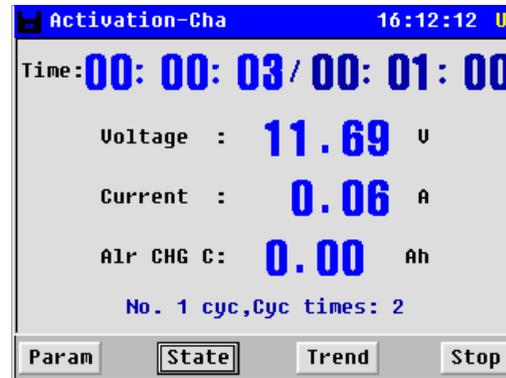


Fig. 4.4.11

You can press **[Param]** to check the activation-charge parameters, or you can press **[Trend]** to check the Voltage&Current curve.



Fig. 4.4.12

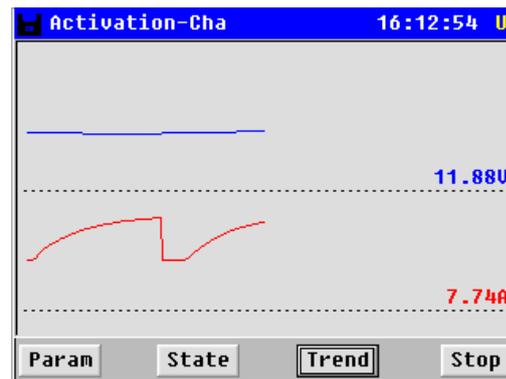


Fig. 4.4.13

When cycle 1 finished, it begins cycle 2. It will test the battery resistance first

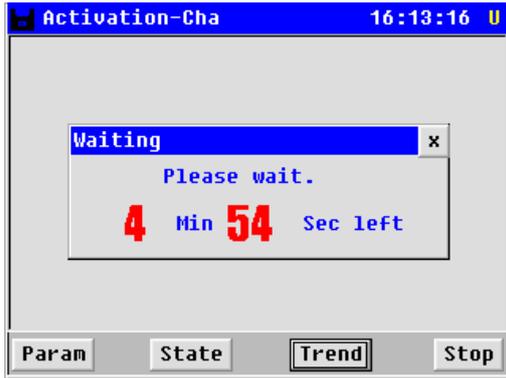


Fig. 4.4.14



Fig. 4.4.15

Then it will proceed with discharge→resistance testing→ charge → resistance testing as the same in cycle 1.

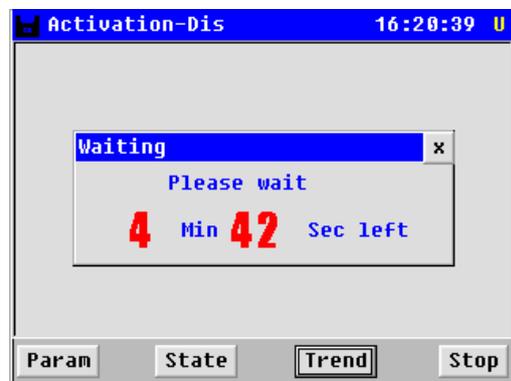
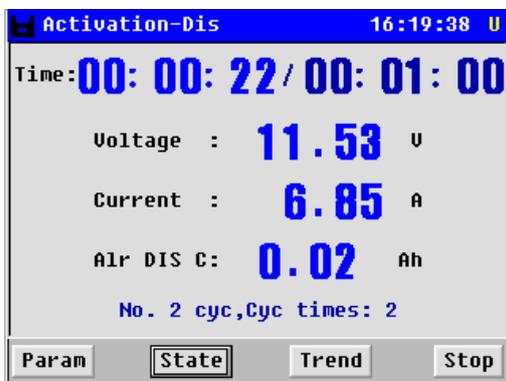


Fig. 4.4.16

### 4.5 Cell Resistance

It is for testing internal resistance of battery. Select [Test InRes] in the main menu, and Press **ENT** to confirm. It will show the below screen. Setting of capacity and current is for the calculation of testing resistance. After inputting the capacity value, press [Test] or **ENT** to begin resistance test. Resistance value will come out in 15 to 20 seconds.

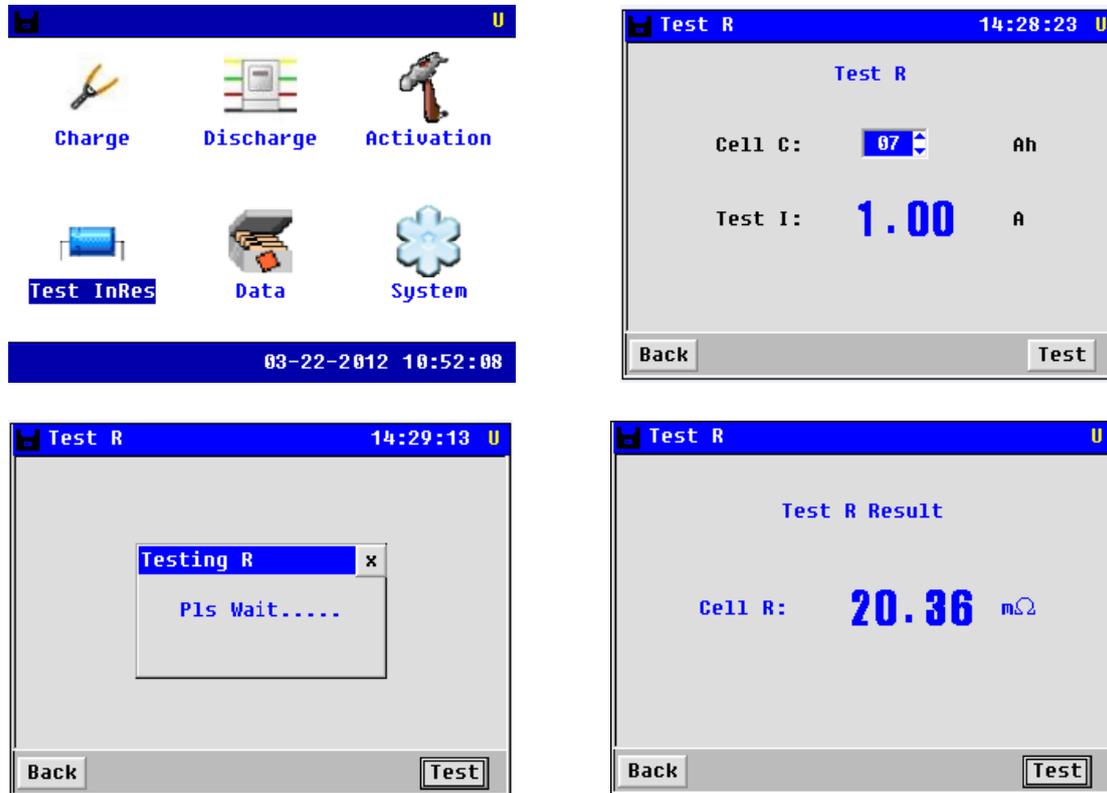


Fig. 4.5

### 4.6 Data Management

Please return to the main menu as below for data management: Choose the item in "Data for" option, it has three choices: charger, discharger and activator

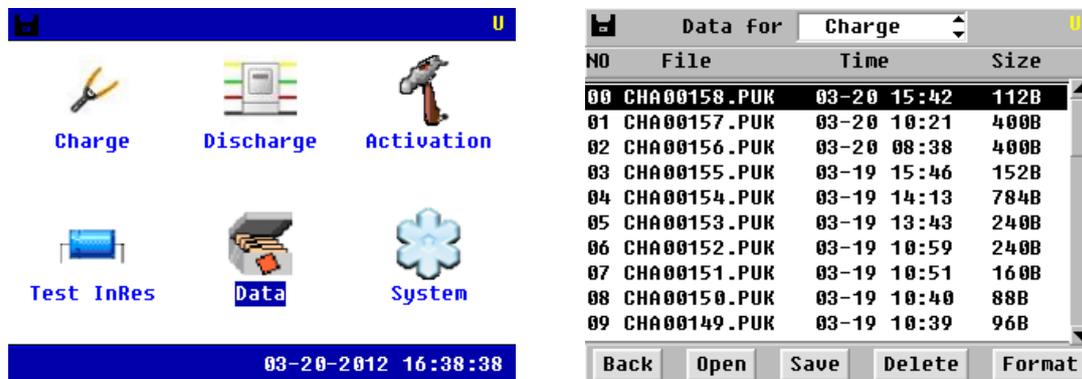


Fig. 4.6.1

Use arrow keys to select data, and double click what you choose, you will see data for previous operations:

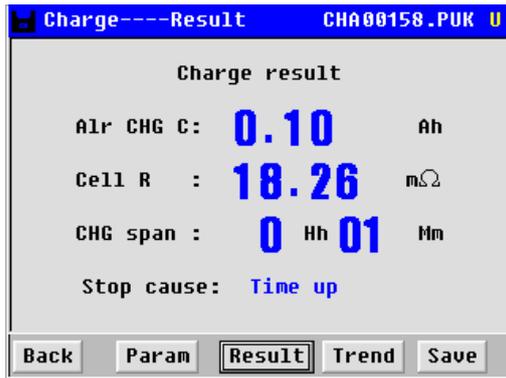


Fig. 4.6.2

If you want to save the data to USB, you can click **[save]** button, it will transfer the data to USB. Make sure that the USB drive has already been inserted in the PITE 3932T main unit.

In the same screen as above, select **[Delete]** and relevant testing date for data deleting.

### 4.7 System Management

Please return main menu, you will see the option **[System]** for management.



Fig. 4.7

#### 4.7.1 Time Setting

After enter **[System]**, select **[Time]** as below, Use arrow keys on main unit and orient and change the numbers and press **[ENT]** to save the numbers as below:



Fig. 4.7.1

### 4.7.2 System Update

Save the updating program (PITE3932.bin and SCRIPT00.TXT) got from PITE in USB drive and insert the USB drive in the PITE 3932T main unit. After restarting the main unit, the program will be updated automatically. It is simple and convenient.

### 4.7.3 System Language

Please return to system menu and choose **[Language]**, change the language you need.



Fig. 4.7.3

## 5. ANALYZING SOFTWARE

Testing data saved in the PITE 3932T could be transferred to a personal computer via USB drive for data analyzing. Before the analyzing, please install the following software first. **NOTE:** You are recommended to run this software in Operation System of Windows XP.

### 5.1 Installing the Software

1. Start the PC.
2. Stop all applications that are running on the PC (recommended).
3. Insert the CD for analyzing software of PITE 3932T into the CD-ROM drive.  
Note: If the **[install]** dialog is not displayed automatically, run the installation program in the following location: X:\ setup.exe. ("X" indicates the CD-ROM drive. "X" may vary by computers.)
4. Once the computer detects the CD-R, screen of **[install]** will pop up. Follow the screen instructions to install the program. After installation, you will find PITE 3932T program icon



Analyzing system of Battery Activator4.02.Ink

on the PC desktop.

### 5.2 Software Startup

- A. Double click the software icon on desktop. A window will pop up to remind you connecting the central database first. This database will be used to save the data when this analyzing software is running. Click **[OK]** to start in the following step.
- B. Click **[Data Management]** → **[Connect central database]:**

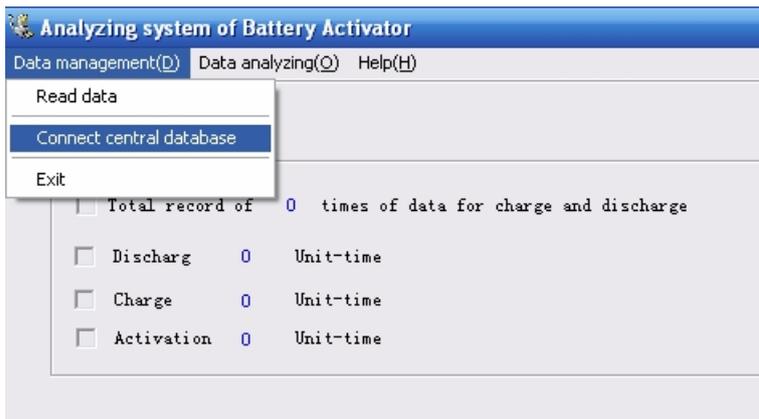


Fig.5.2.B

C. Select **[Create new central database]** and follow the screen instructions to install the default database

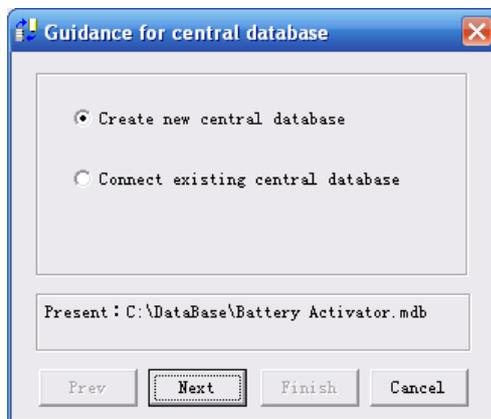


Fig.5.2.C1

Note: Click **[Change Path]** to change the installation path for database, click **[Next]** and then **[Finish]** to complete the setting.



Fig.5.2.C2

D. Or you could select **[Connect existing central database]**, click **[Next]** and then **[Finish]** to confirm the path setting.

### 5.3 Main Operation

The main screen and definition of main menu are as below:

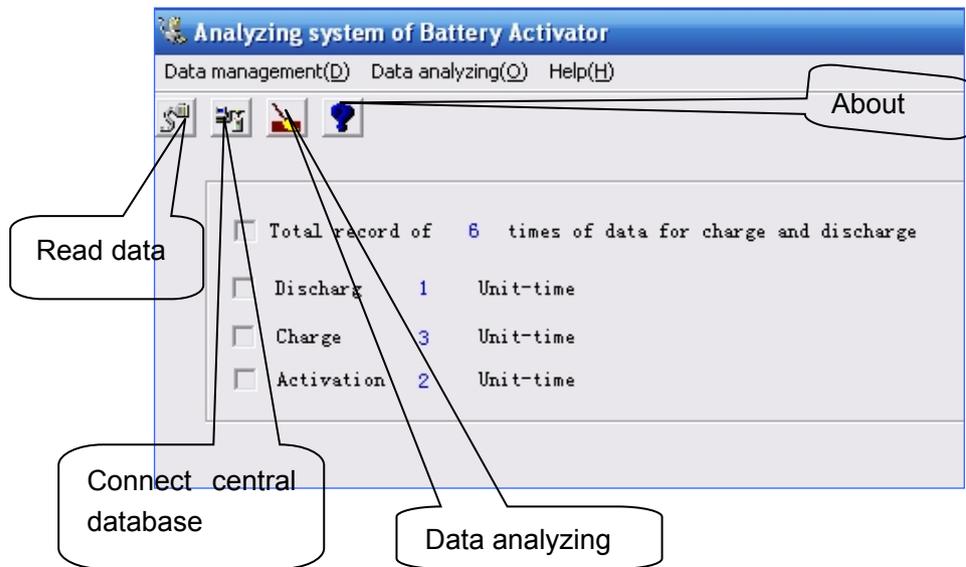
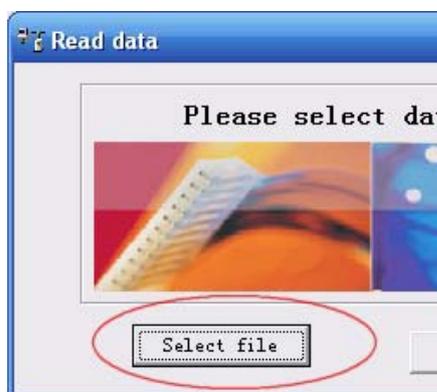
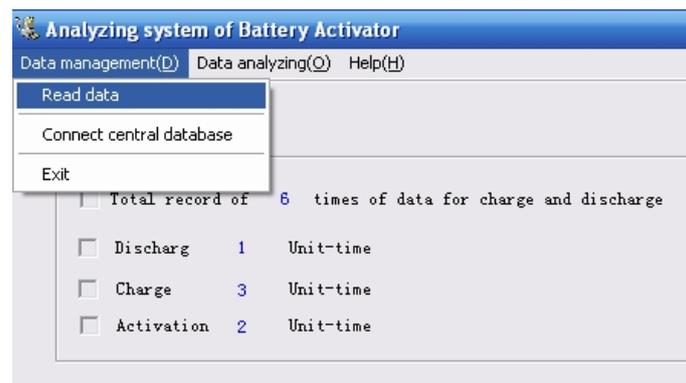


Fig.5.3

### 5.3.1 Read the Data

To view the data saved in USB drive, please firstly insert the USB drive in the PC, select **[Read data]** on analyzing software and select the data with format of “.PUK” (Charge, Discharge and Activation data). Screens are as below:



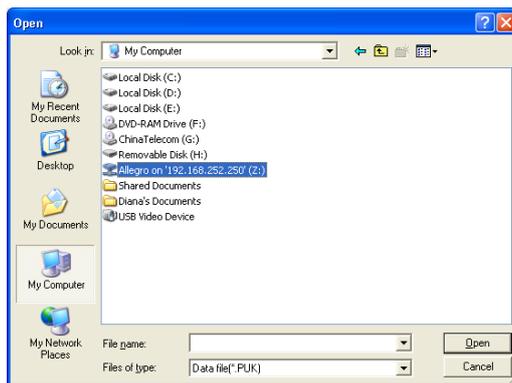


Fig.5.3.1

### 5.3.2 Analyzing for Discharging

To begin analyzing the data of Discharging, firstly select **[Data analyzing]**, select **[DIS]** and then cell number in the drop-down option as below:

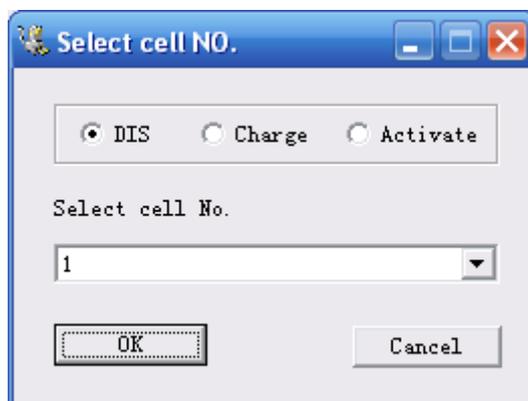


Fig.5.3.2

After the above selection, click **[OK]** to go the following step:

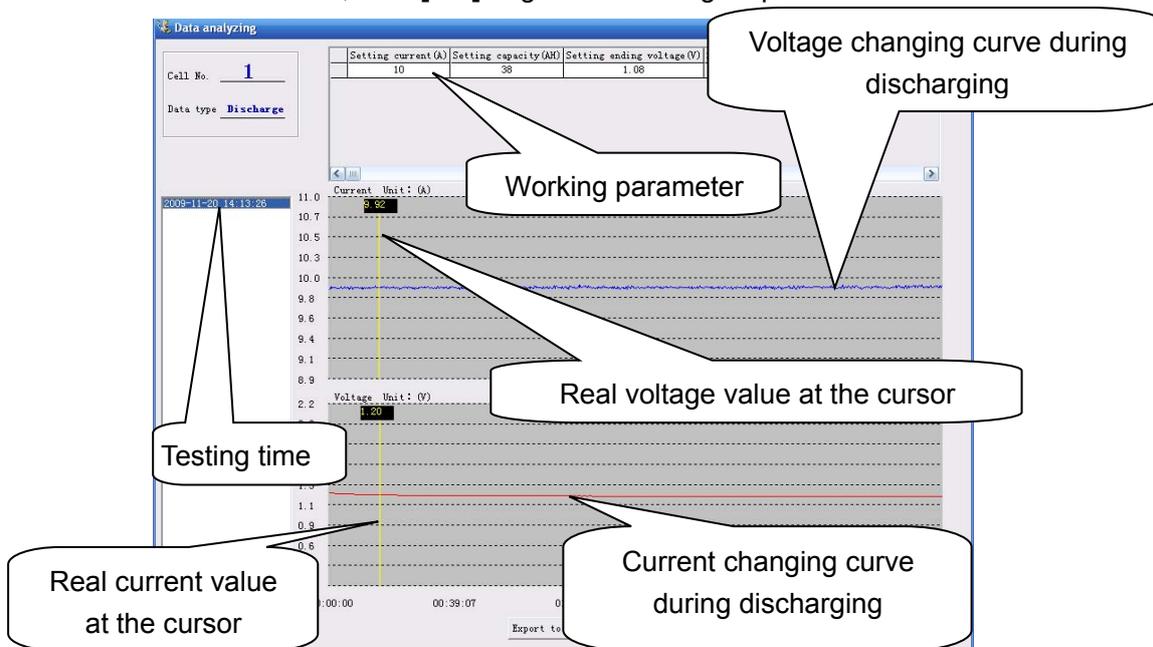


Fig. 5.3.2

To export the testing data in a report, please click the button **Export to Word** at the bottom.

Input necessary for station number, string number and so on to continue, the testing data will be generated as a report in the format of Microsoft word. This is same operation for testing data of charging and activation mentioned below.

### 5.3.3 Analyzing for Charging

To begin analyzing the data of Charging, firstly select **[Data analyzing]**, select **[Charge]** and then cell number in the drop-down option as below:

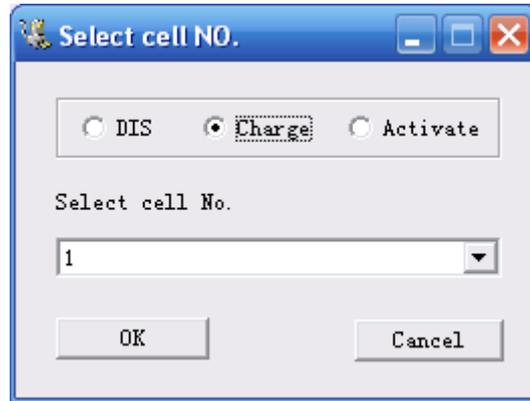


Fig.5.3.3.1

After the above selection, click **[OK]** to go the following step:

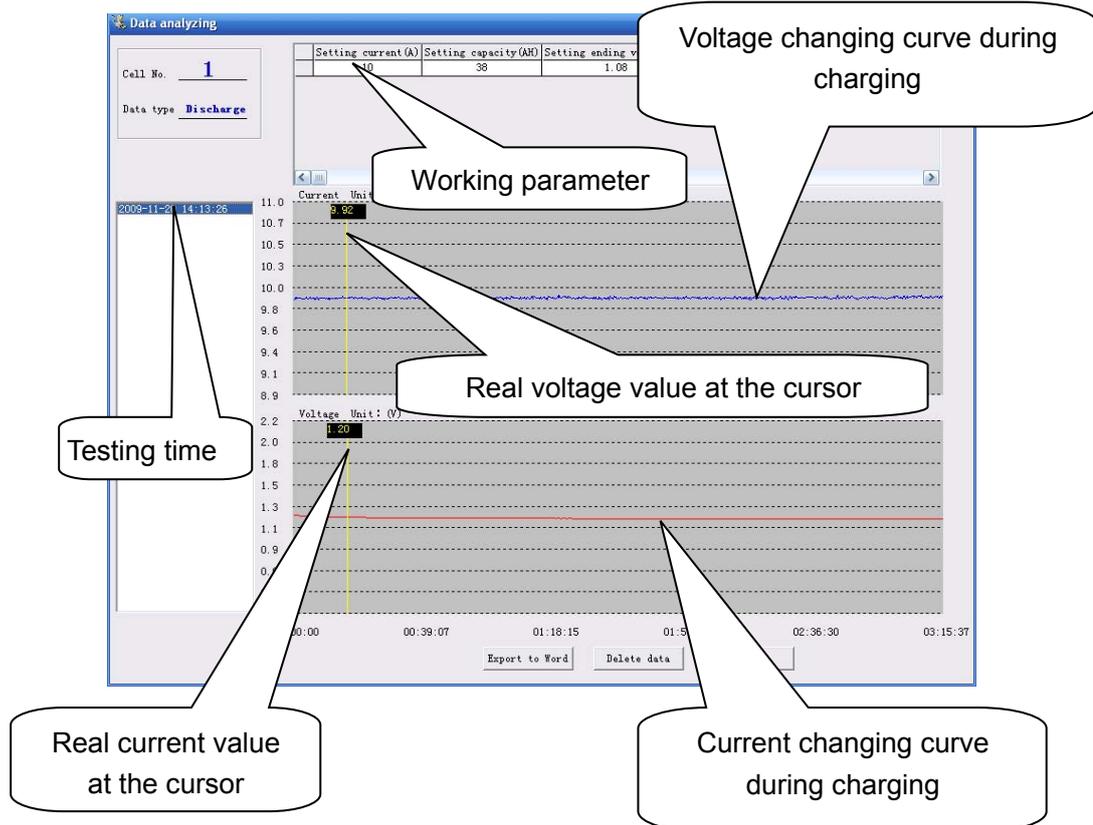


Fig.5.3.3.2

### 5.3.4 Analyzing for Activation

To begin analyzing the data of Activation, firstly select **[Data analyzing]**, select **[Activate]** and then cell number in the drop-down option as below:

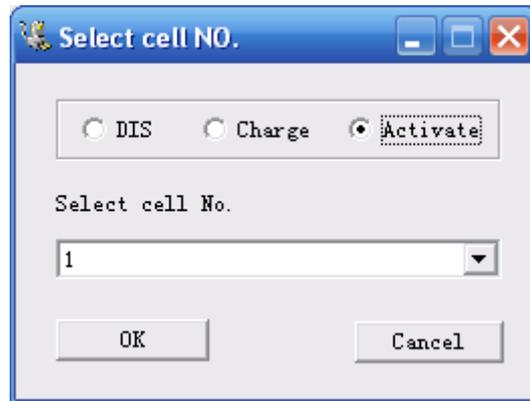


Fig.5.3.4.1

After the above selection, click [OK] to go the following step:

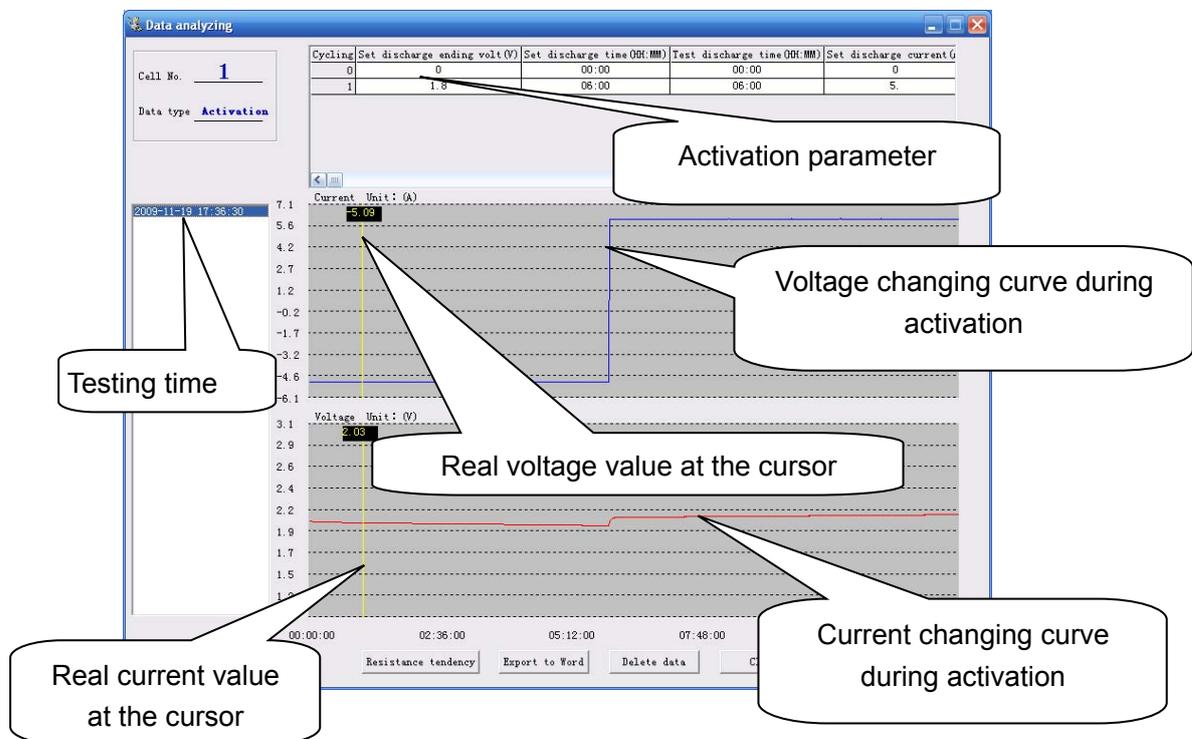


Fig.5.3.4.2

## 6. SERVICE AND MAINTENANCE

### 6.1. Cleaning

Clean PITE 3932T main unit and its accessories with damp cloth and a mild soap. Do not use abrasives, solvents, or alcohol, as they can deform or discolor the PITE 3932T and the accessories.

**⚠ WARNING:** For your own safety, make sure that the main unit and accessories are not

working and disconnected with the power supply before cleaning.

## 6.2 Storage

After using PITE 3932T, put the main unit and all its accessories into the carrying case, store the case in ventilating place under proper temperature and humidity. Never expose the PITE 3932T and its accessories to water, high humidity, or dampness.

## 6.3 Trouble-shooting

If the PITE 3932T appears to be operating unusually try the following solutions:

- **The PITE 3932T can not start up**  
The PITE 3932T may not be connected to the power supply. If so, connect it with the AC power cord.
- **The PITE 3932T keeps on beeping when powering up**  
The AC power cord may not be correctly connected. If so, try to connect it properly
- **No signals after the PITE 3932T is on**  
The PITE 3932T may not be properly connected. If so, make sure it is well connected.
- **The PITE 3932T can not communicate to PC**  
The interface cables may not properly be connected. If so, check them and connect them again to ensure they are well connected.
- **The buttons of the PITE 3932T can not work**  
The buttons may be stuck in the button holes. If so, check and press it to let them work properly.
- **The charge/discharge/activation functions cannot be executed after setup**  
The time setup may be incorrect. If so, check and make sure the setup time is no more than 48 hours
- **The USB drive can not be detected after it is inserted to the PC**  
The USB drive may not be well inserted. If so, reinsert it correctly.  
The USB drive may not be in FAT format. If so, format the USB drive.  
And if other problems occurred, contact your dealer or our representatives.

## 7. CONTACT PITE

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