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# Battery Simulation Software ITECH BSS2000 Operation Manual

# Notices



## Manual Part Number

BSS2000 Ver1.0.0

## Revision

1st Edition: June 10, 2020

Itech Electronic, Co., Ltd.

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**CAUTION**

A CAUTION sign denotes a hazard. It calls attention to an operating procedure or practice that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a CAUTION sign until the indicated conditions are fully understood and met

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NOTE

A NOTE sign denotes important hint. It calls attention to tips or supplementary information that is essential for users to refer to.

# Contents



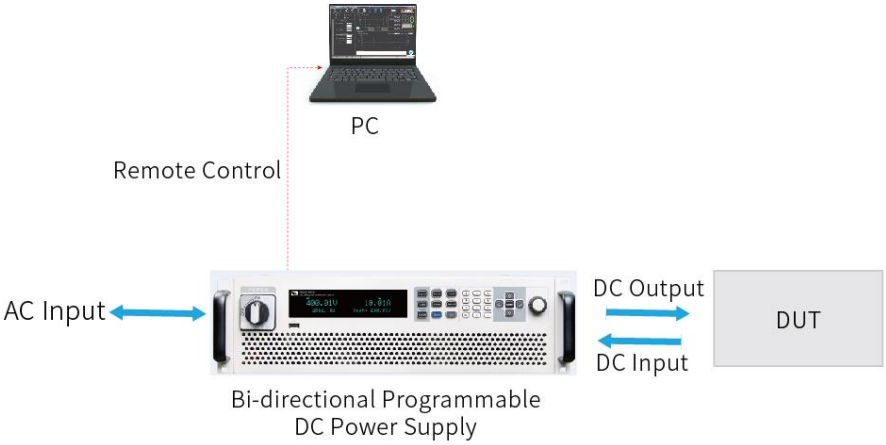
# Chapter1 Introduction

## 1.1 Software Introduction

IT6000B/IT6000C/IT-M3600/IT-M3400 series bidirectional programmable DC power supply comes with standard biquadrant function. The hardware output can stimulate the charging and discharging characteristics of various batteries as well as battery output characteristics, which can replace various real batteries in power supply test application. In battery simulation mode, this series of power supply allows users to select the type, number of cells in serial connection, number of cells in parallel connection and SOC indicators of simulation battery for overall simulation of battery output characteristics, including the change process of internal resistance characteristics during battery discharging process.

BSS2000 battery simulation software is specially designed to control battery simulation device, and comes with battery simulation function of bidirectional programmable DC power supply to visually realize all settings, tests and analysis functions of battery simulation function. The software interface is simple and easy-to-use where the user can check curve settings and running process data of existing test at the same time.

The wiring and schematic diagram are as follows:




## 1.2 Preparation before Operation

- Connect to Device

  This software need equipped with IT6000C/IT6000B/IT-M3600/IT-M3400. This software supports interfaces like USB, RS232, GPIB and Ethernet. Before using the software, the user needs to connect the device to computer by communication interface first, and enter the communication interface parameter to software interface. Please refer to 1.4 Configuring Interface of Device for the detailed information.

- Insert the Encryption Lock

  Insert the encryption lock provided by ITECH into the computer and the official software will be available to you.

# 1.3 BSS2000 Initial Interface

Double-click the ITECH_BSS.exe to run BSS2000 software, the software will initialize in about 2 seconds, and then the below interface will appear.


The interface is described as follows:

- Communication

  Select the communication interface between the software and the device.

- About

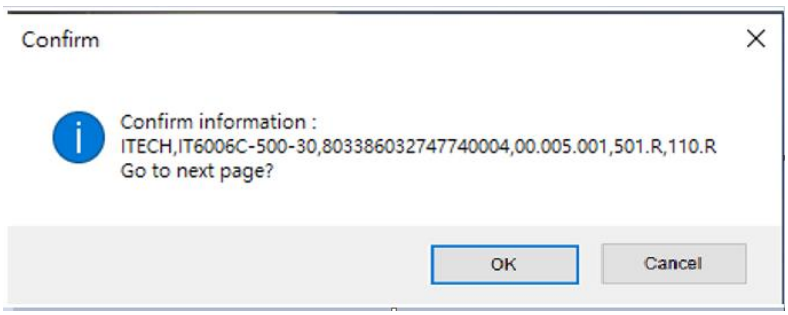
  Check BSS2000 information, such as name and version number.

- Scan

  Scan communication interfaces for the device.

- Enter

  When you first enter the main operation interface of the software, click [Enter], the following interface will appear to prompt the information about the connected instrument. This screenshot just for example, please refer to actually information.

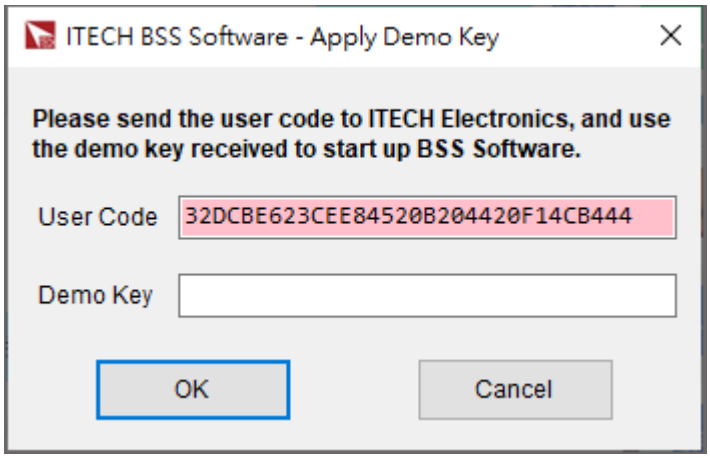



- Quick Enter

  After the software and the instrument are successfully connected once, the connection information is recorded. When you re-enter the main operation interface of the software, you can directly click **[Quick Enter]**.

### Troubleshooting

If the interface below appears during the operation, you need to check the device connection.




The reasons for the above interface:

- Error in the communication connection

  In this instance, you need to check the communication connection between the SAS software and the device, and the device model.
- Loss of the encryption lock

  The interface will also appear without inserting the encryption lock. Please check the encryption lock delivered with box has insert to PC.
  If encryption is missed, the user can contact ITECH and convey the user code to us. Then you will receive the demo key offered by ITECH. Input it, click **[OK]** and if the demo key matches, the demo software will be available to you for 14 days.

NOTE

When using the demo software, if you connect the device to PC, the software will enter the TRIAL mode. The software function in TRIAL mode is the same as that of the official software; if you do not connect the device to PC, the software will enter the DEMO mode. In DEMO mode, all functions can be simulated.

## 1.4 Configuring Interface of Device

BSS2000 software is installed in PC and interacts with matching hardware devices via different communication interfaces. This software supports interfaces like USB, RS232, GPIB and Ethernet. (At the time of start-up scan, in default, RS232 scans at Baud rate of 9,600). The user needs to connect the device to the computer. During hardware setting, select a hardware interface that is compatible with the one connected to the device, and set interface parameters based on different interface types.

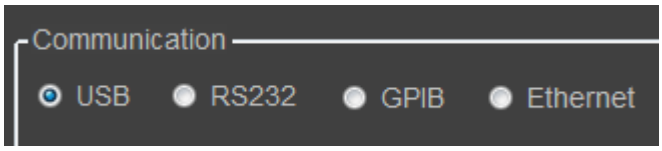
### Precondition

1. Before configuring hardware, you need to check whether the device communication method is consistent with the realistic application or not.

   The detailed steps refer to corresponding User Manual of device.
2. Connect the power supply and PC by communication cable.

## Operation steps

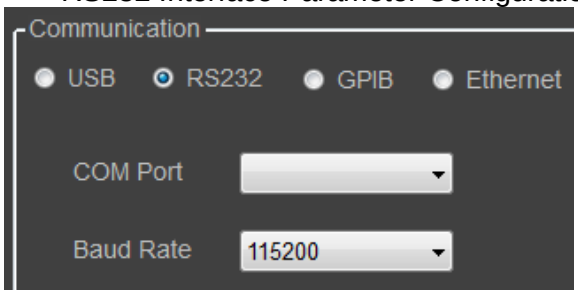
1. Select the required hardware interface type on the initial interface.




2. After selecting the device interface, configure interface parameters at bottom. Click **[Scan]**.

- USB Interface Parameter Configuration


- RS232 Interface Parameter Configuration

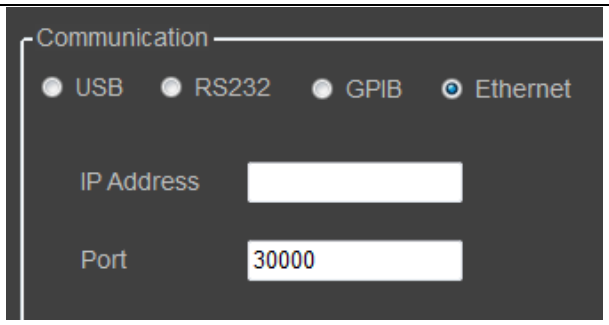



COM Port: to select serial interface, i.e., the serial interface number occupied by RS232 communication cable interface.
Baud Rate: Baud rate must be configured consistently with those in menu setup.

- GPIB Interface Parameter Configuration


GPIB Address: Set GPIB address of device.

- Ethernet Interface Parameter Configuration



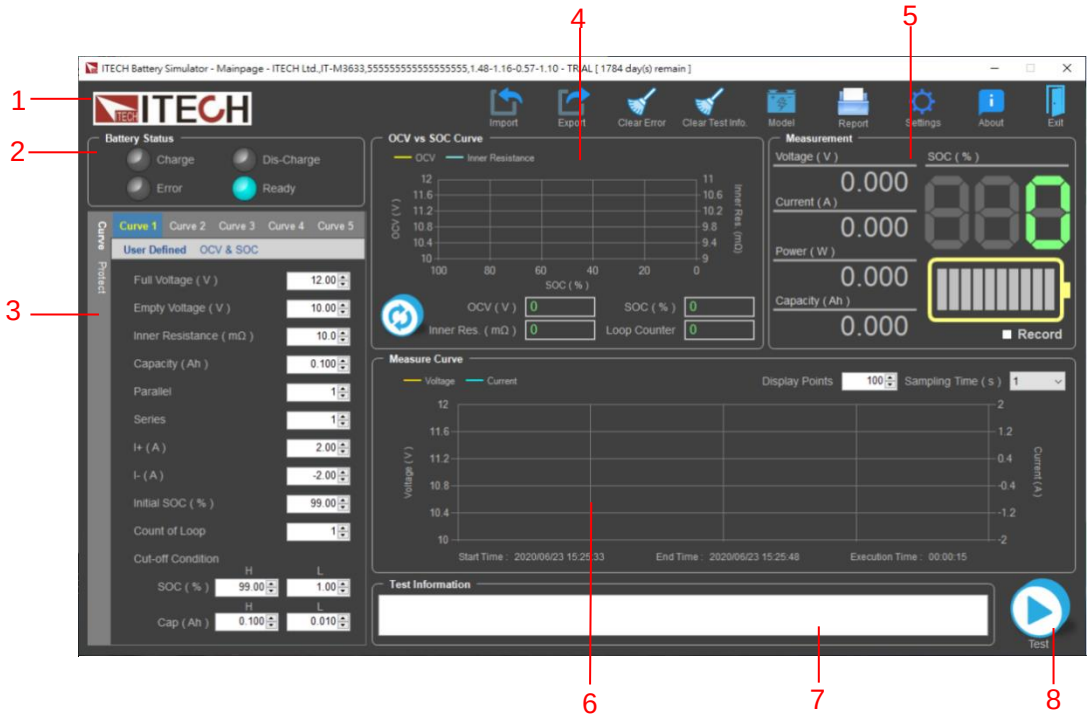

IP Address: Set Ethernet IP address of device.
Port: Set Socket port of device, the default value is 30000.

# Chapter2 Battery Simulation Test

BSS2000 software control interface is simple where all operations can be completed in a single interface, including setting, running and observation of test data. This chapter introduces the specific test operation method and process of BSS2000 software.

## 2.1 Overview of Main Interface

The main interface of BSS2000 software is introduced as follows:




1. Menu bar
   - Import: Import curve data.
   - Export: Export setting data of existing curve.
   - Clear Error: Clear error status.
   - Clear Test Info.: Set configuration functions.
   - Model: Select battery model.
   - Report: Open the test data file folder.
   - Settings: Set voltage slope.
   - About: Inquire software-related information.
   - Exit: Exit the software interface.
2. Display bar for battery simulation test status
3. Test curve setting area for battery simulation test and protection setting area
4. Display curve for battery simulation test
5. Measurement data display area

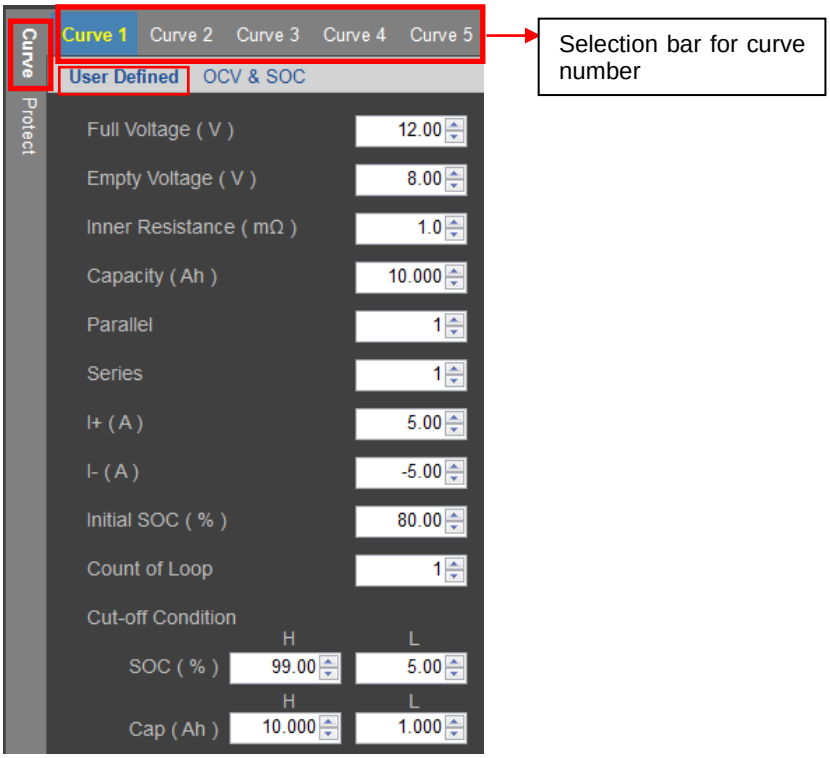
6. Voltage/current measurement curve
7. Information display area during test process
8. Test key

# 2.2 Editing Curve

BSS2000 software has two editing methods for battery simulation curve. The user can select User Defined on the interface for manual setting, or select VOC&SOC to directly import curve data.

## User-defined Curve

Select corresponding curve number in the curve editing bar. For example, click “Curve1”, and click User Defined. Set battery specification parameters at first.

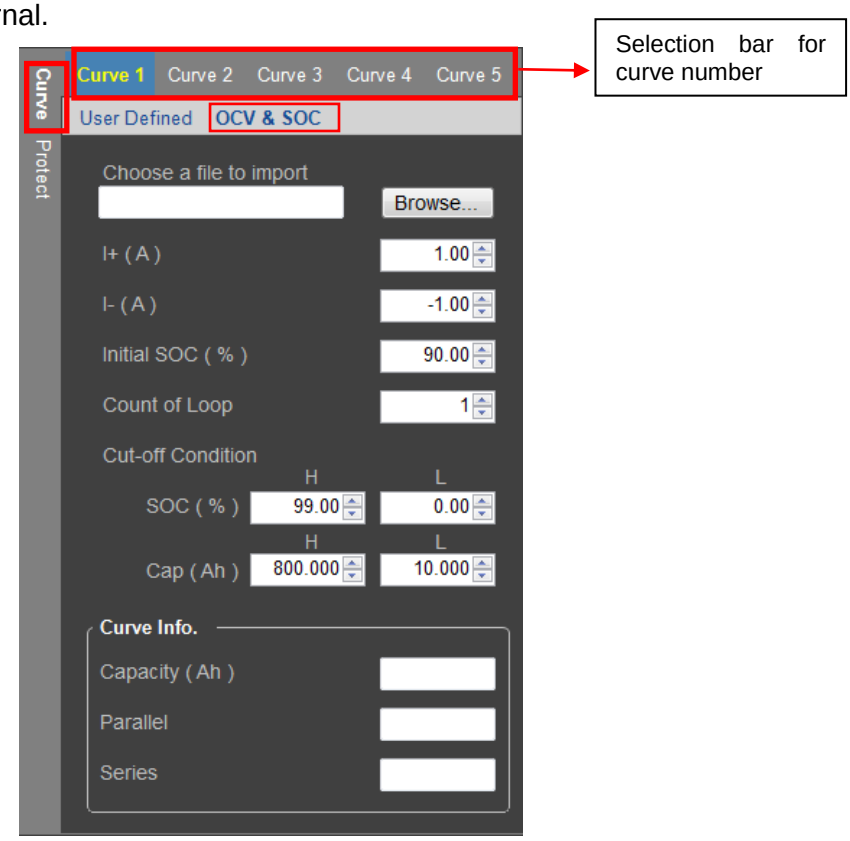



- Full Voltage: Simulate the voltage value when a single battery is in full-voltage status.
- Empty Voltage: Simulate the voltage value when a single battery is in empty-charge status.
- Inner Resistance: Simulate the internal resistance of a single battery.
- Capacity: Simulate the capacity of a single battery.
- Parallel: Simulate the settings for the number of batteries in parallel connection.
- Series: Simulate the settings for the number of batteries in serial connection.
- I+: Positive current limit, which simulates the maximum discharging current of the battery pack.
- I-: Negative current limit, which simulates the maximum charging current of the battery pack.

- Initial SOC: Set the initial state of charge (SOC) of the battery 0~100% corresponds to the voltage range from empty voltage to full voltage.
- Count of Loop: Number of cycles
- Cut-off Condition: Cut-off conditions, including state of charge (SOC) and battery capacity.

### Importing Curve from External

Select corresponding curve number in the curve editing bar. For example, click "Curve1", and click OCV&SOC. Choose to import curve file from external.

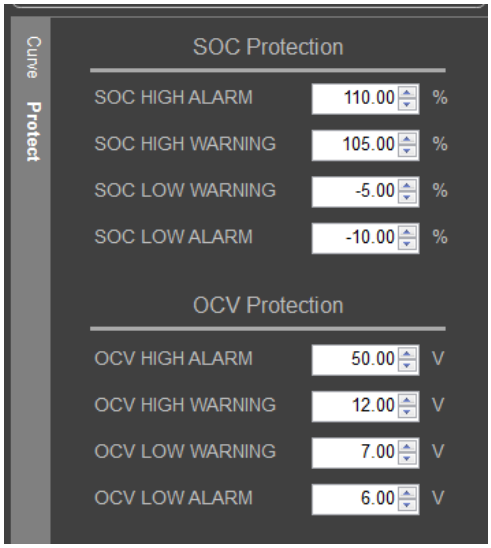



- Choose a file to import: Select the battery characteristic curve file to be imported.
- I+: Positive current limit, which simulates the maximum discharging current of the battery pack.
- I-: Negative current limit, which simulates the maximum charging current of the battery pack.
- Initial SOC: Set the initial state of charge (SOC) of the battery 0~100% corresponds to the voltage range from empty voltage to full voltage.
- Count of Loop: Number of cycles
- Cut-off Condition: Cut-off conditions, including state of charge (SOC) and battery capacity.
- Curve Info.: imported curve capacity and serial/parallel connection information.

## 2.3 Setting Protection and Alarm Functions

The user can set protection and alarm functions before testing. When the test reaches protection or alarm conditions, corresponding alarm or protection will

be triggered.




SOC Protection:

SOC HIGH ALARM/SOC LOW ALARM: Set high or low alarm protection for SOC. When battery SOC reaches the protection value during test, this protection will be triggered and the test will be stopped.

SOC HIGH WARNING/SOC LOW WARNING: Set high or low warning for SOC. When battery SOC reaches the protection value during test, this protection will be triggered and warning information will be displayed in Test Information area of the software.

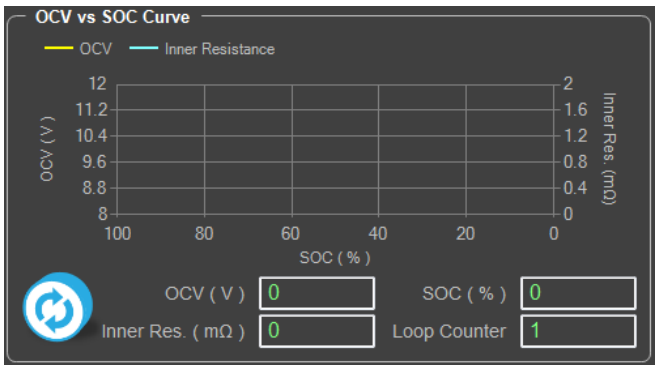
OCV Protection:

OCV HIGH ALARM/OCV LOW ALARM: Set high or low alarm protection for open-circuit voltage (OCV). When battery OCV reaches the protection value during test, this protection will be triggered and the test will be stopped.

OCV HIGH ALARM/OCV LOW ALARM: Set high or low warning for OCV. When battery OCV reaches the protection value during test, this protection will be triggered and warning information will be displayed in Test Information area of the software.

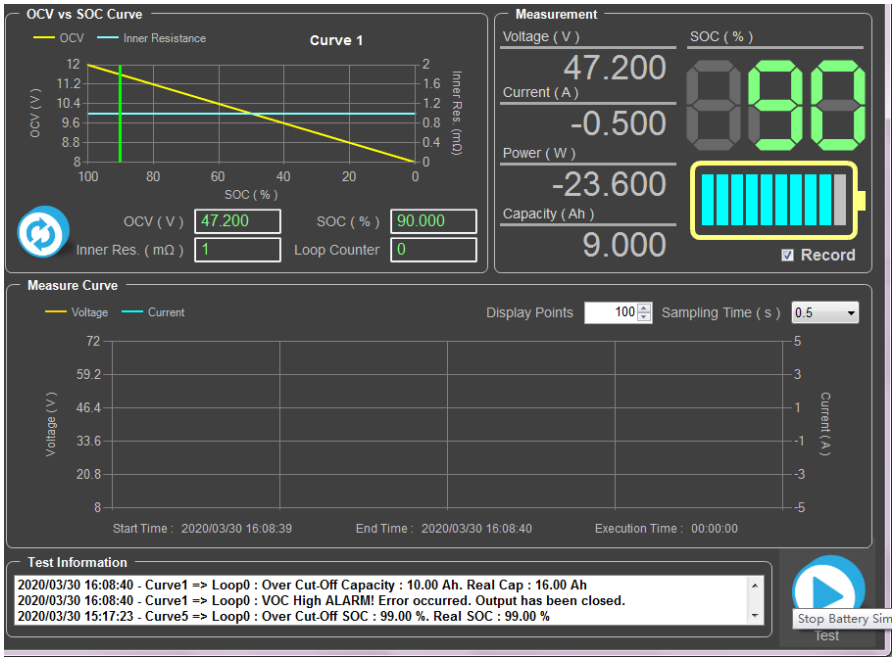
## 2.4 Previewing Curve

After setting related characteristics of the battery, the user can preview battery characteristic curve on the interface. In the box shown below, click  to display the set battery curve.



# 2.5 Running Test

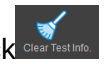
After the user sets various parameters of the battery simulator, directly click Test key on the main interface to start battery simulation test.




- Measurement: Real-time display of electrical performance parameters and SOC status of the existing simulated battery. During the test process, click “Record” to record the existing test data in the CSV file under report file folder. The user can click 

in the menu to directly open the report file folder.
- Measure Curve: Real-time display of voltage/current test curve.

  The user can set the number of data points displayed and data sampling interval in Measure Curve area.

- Test Information: Display test information. The user can click 

in the menu to clear test information.

# 2.6 Observing Test Status

During test, the software main interface displays four test statues: charge, discharge, error and ready.

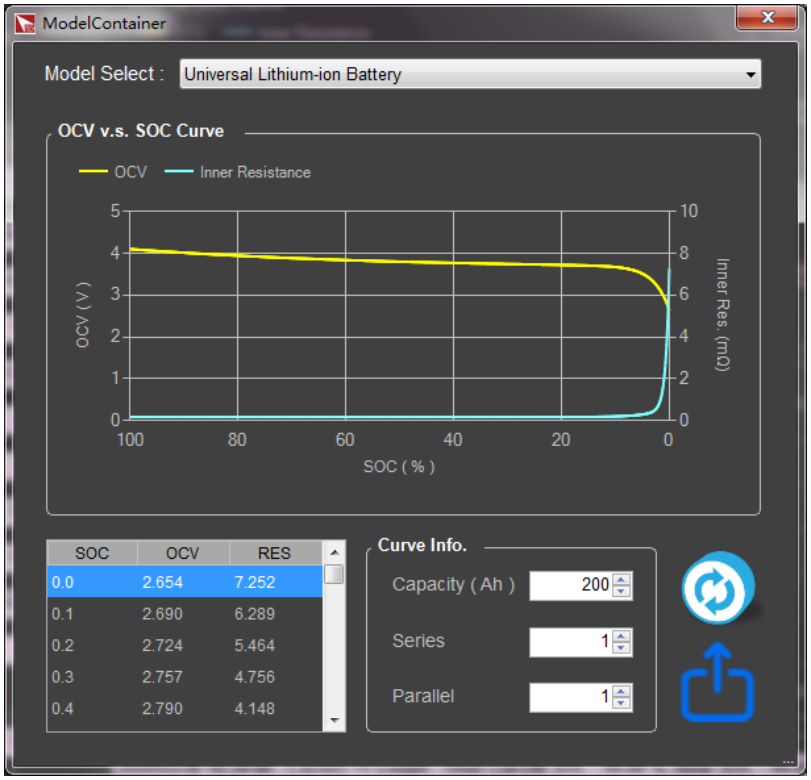

- Charge: The battery is in charging status.
- Dis-Charge: The battery is in discharging status.
- Error: There is an error, and the test stops. The test can be run again only

when the error status is released. The user can click  in the menu to clear error status.

- Ready: The battery is in ready status for test.

# 2.7 Selecting Battery Model

The user can click  in the menu to select common battery types built in the software. The user only needs to select the battery type and configure parameters for serial and parallel connection to simulate characteristic curves of battery models in different types and capacities.




Model Select: Select the battery type from the drop-down list. There is only one type now.

OCV&SOC Curve: Curve previewing area

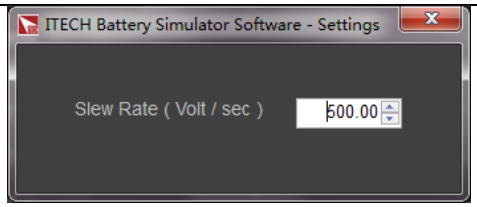
Curve Info.: Setting area for battery capacity and serial/parallel connection.

 : Update curve

 : Export battery characteristic curve. The user can import the curve in the Curve editing bar on the main interface and run the test.

# 2.8 Setting Voltage Slope

Click  in the menu to set the voltage change slope. When the test is ended, voltage will be recovered to initial voltage status based on set slope.




## 2.9 Checking Software Version Information

Click 

in the software menu to check the existing software version information.

## Contact US

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