

IT9000 Control Software

PV8900 User Manual

Notices

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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.

Content

Chapter1	Brief Introduction	1
1.1	Software Introduction	1
1.2	IT9000 Interface Introduction	1
Chapter2	Basic Operation	3
2.1	Hardware Configuration	3
2.1.1	<i>Function Introduction</i>	3
2.1.2	<i>Configuring Hardware</i>	3
2.1.3	<i>Configuring Interface of Device</i>	4
2.1.4	<i>Series, Parallel and Synchronization Configuration</i>	6
2.2	Data Setting and Saving	9
2.3	Data Query	12
Chapter3	PV8900 Control Interface.....	13
3.1	Introduction of Control Interface	13
3.2	Setting Voltage, Current, Resistance, Power, LED V, LED A, LED C and VD	14
3.3	Fast Set	18
3.4	Program	23
3.5	GO/NG	28
3.6	Battery	31
3.7	Curve Zoom Out and Translation	34

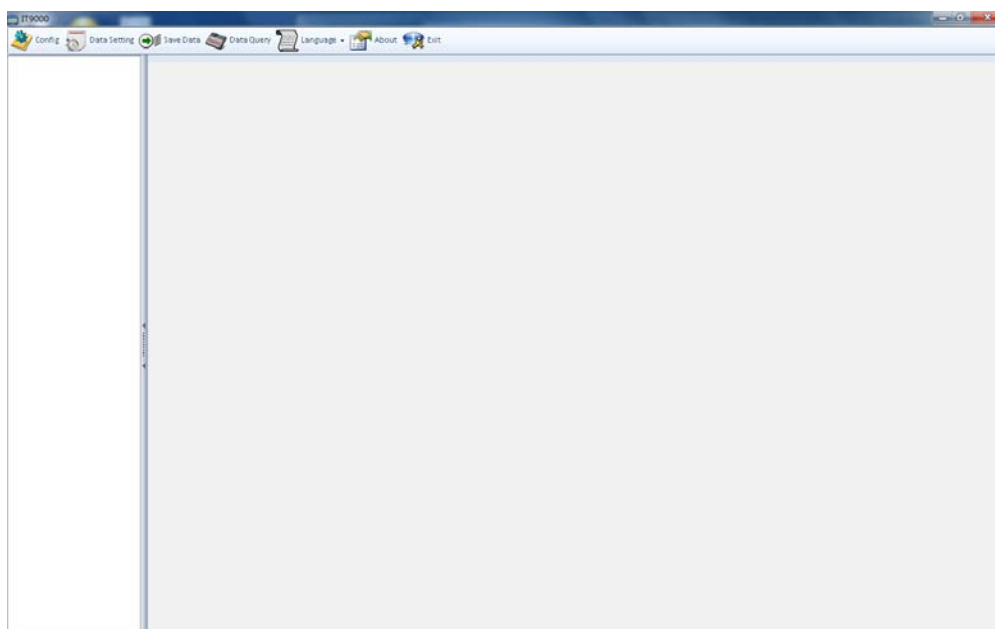
Chapter1 Brief Introduction

1.1 Software Introduction

IT9000-PV8900 is a kind of easy-to-use and practicable control software designed by Itech Electronics Co., Ltd. It is applicable to Itech IT8900AE/IT8900GL/IT8400 Series electronic loads. With this software, you can take all operations for load front panel via computer control and enjoy great convenience in remote control. This software supports RS232, USB, GPIB and Ethernet serial port communication.

1.2 IT9000 Interface Introduction

After run IT9000, the software will initialize, in about 2 seconds, the below interface will appear:



The interface is described as follows:



- **Config**
Configuration function, to configure hardware information for control load device of IT9000 software control, including load device alias, device interface and interface parameter, and to configure sub-devices (e.g., channels) for each device.
- **Multiple Devices**
Multiple devices, to select multiple devices connected to IT9000 and control them in the same interface.
- **Date Setting**
Data setting, mainly to select numeric field to be saved, device alias and save interval before data saving.
- **Save Date**

Data saving, mainly to save current test data. Before data saving, please set data at first.

- **Date Query**

Data query, to open the data file saved before.

- **Language**

To select software language version, including Simplified Chinese, Chinese-traditional and English.

- **About**

To list related information of software, including Company website.

- **Exit**

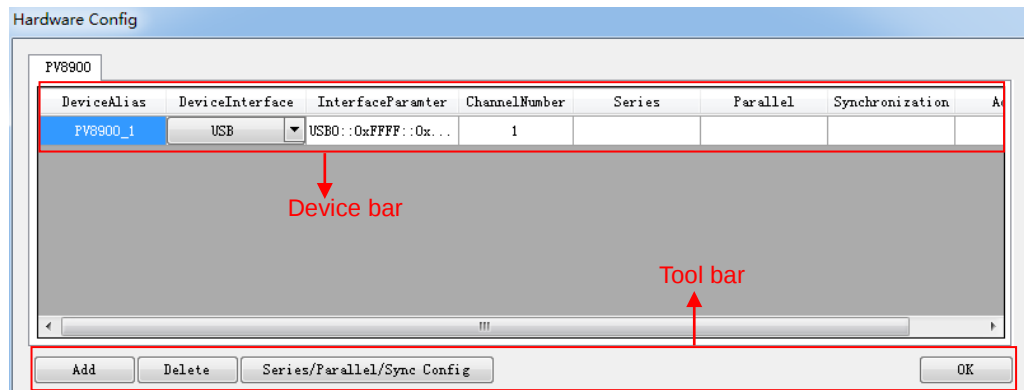
To exit IT9000 software.

Chapter2 Basic Operation

2.1 Hardware Configuration

2.1.1 Function Introduction

The hardware configuration interface of IT9000 software is as shown below.



- The “Device bar” includes settings for device alias, device interface, interface parameter and channel number:
 - ◆ Device Alias: the alias of a device, used to distinguish devices of same model.
 - ◆ Device Interface: drop-down options include RS232, GPIB, USB and Ethernet.
 - ◆ Interface Parameter: the interface parameter corresponding to device interface.
 - ◆ Channel Number: to set the channel number of sub-device.
 - ◆ Series: to display series configuration name in series connection of devices.
 - ◆ Parallel: to display parallel configuration name in parallel connection of devices.
 - ◆ Synchronization: to display synchronization configuration name in synchronization of devices.
 - ◆ Address: to set load communication address (used for devices with frame format protocol).
- Main toolbar functions:
 - ◆ Add: to add hardware device.
 - ◆ Delete: to delete specific device.
 - ◆ Series/Parallel/sync Config
 - ◆ OK: to confirm hardware configuration information.

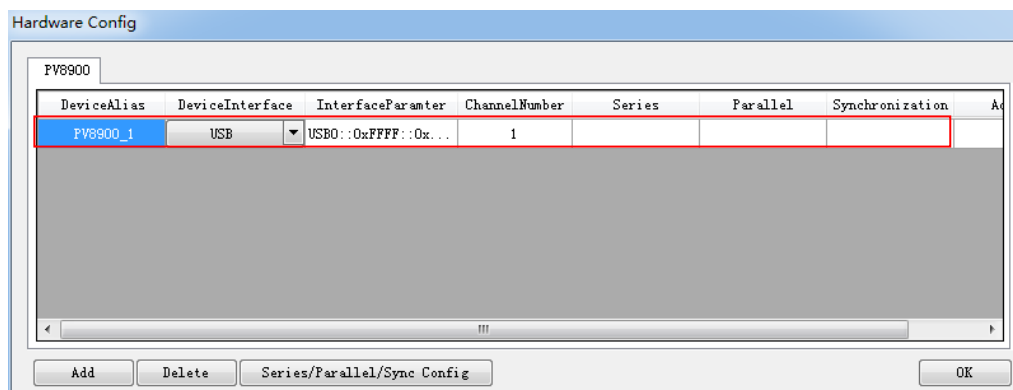
2.1.2 Configuring Hardware

This function enables the user to create new hardware information or modify existing hardware device information. Detailed operation steps will be given

below taking creation of new device information as example.

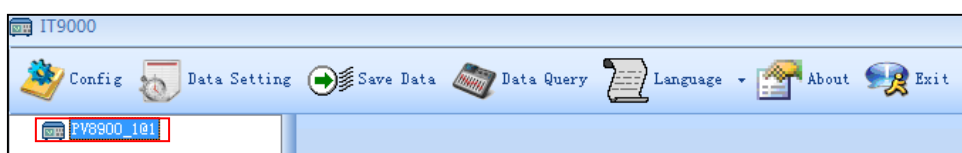
Operation steps

1. Run IT9000 software and click “Configure” icon.
2. Click “Add” button in the Configuration Interface and display the currently added hardware device information and default parameter of device in the “Device bar” at top. As shown below.



To change default parameter of hardware device (e.g., device interface, interface parameter and channel number), you may click the parameter for change.

- Device Alias: double click to edit device alias.
 - Device Interface: to select from the drop-down box.
 - Interface Parameter: double click to configure in the Configure Dialog. For details, refer to Section 2.1.3 “Communication Interfaces of Configuration Device”.
 - Channel Number: set the channel number of sub-device. The channel number is changeable.
3. Click “OK” to save the configuration information of current hardware device. At this time, the device name (device alias @ channel number) will be displayed at top left of the interface. To pop up the Control Interface, you need to double click the Device Name.



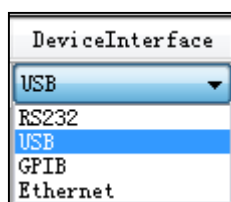
2.1.3 Configuring Interface of Device

IT9000 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 interface. When configuring the hardware device, configure different interface types based on actual needs and set corresponding interface parameters for different interfaces.

Operation steps

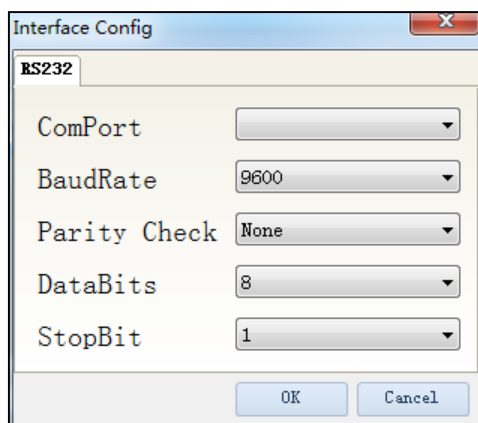
1. Select the device interface corresponding to the hardware device to be edited from the Hardware Configuration Interface, and select the interface

type from the drop-down list.



2. After selecting the device interface, double click corresponding "Interface Parameter" column. The system will pop up "Interface Configuration" window.

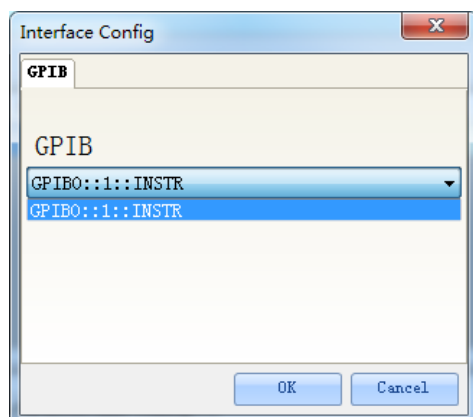
- RS232 Interface Parameter Configuration



Serial interface: to select serial interface, i.e., the serial interface number occupied by RS232 communication cable interface.

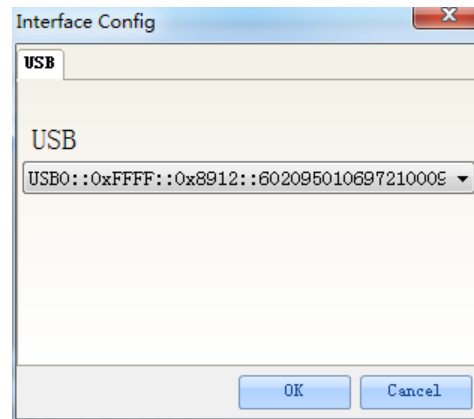
Baud rate, parity check bit, data bits and stop bit must be configured consistently with those in menu setup.

- GPIB Interface Parameter Configuration



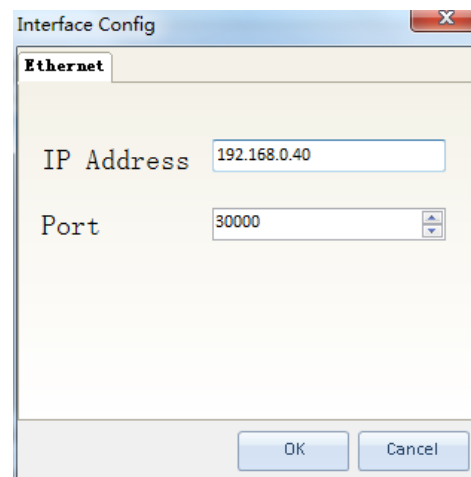
During GPIB communication of load device, the address setting range is: 1-30.

- USB Interface Parameter Configuration



- LAN Interface Parameter Configuration

If LAN interface is used for communication, both computers and device are connected via HUB (or, the device and computer are directly connected via cross network cable). The computer and device IP setting should be in a same network segment.



3. After interface parameter configuration, click "OK". Finish interface parameter configuration.

2.1.4 Series, Parallel and Synchronization Configuration

This configuration is used when several devices or several channels are connected. Setting types include series, parallel and synchronization. IT8900 Series can be configured with parallel and synchronization.

Parallel configuration

This series of electronic load supports parallel functions, and the parallel function does not need to be configured in the "Series / Parallel / Synchronous Configuration". The relevant instructions for paralleling are as follows:

- Before the software configuration, you must first confirm that the parallel connection between the instruments (same model) and the master / slave configurations are completed. For details, please refer to the product's User Manual.
- You only need to connect the master to the PC. In the "Hardware Configuration" interface, you only need to add the master, no need to add the slave device.

- The parallel function in the software interface enables: Take the parallel between two IT8902A-150-200 as an example, the settable range of the current setting value, in the software control interface is from 0 to 400A. Other functions (such as List) are the interaction between the PC and the master.

That is, the parallelization realizes the expansion of output current and output power. You still control one instrument (master) in the software interface, but the output capability is doubled compared to the single unit.

Operation steps

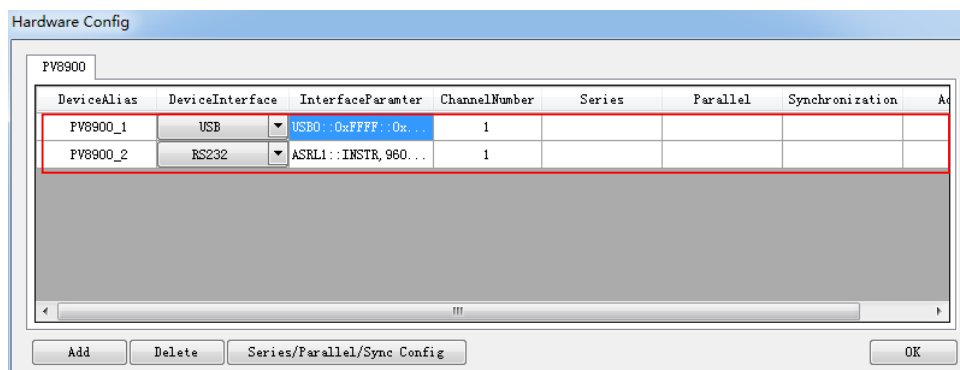
In the following, taking two single units in parallel as an example, the steps of parallel connection are as follows:

1. Connect the cables between the two single units, and configure the masterslave configuration. For details, see the User Manual.
2. Select the communication method of the master unit and connect the master unit to the PC using the communication cable.
3. In the Hardware Configuration interface, add the master device.

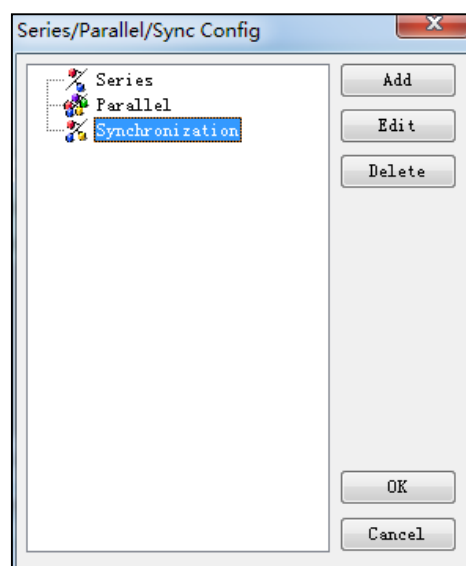
Synchronization Configuration

This configuration is used for multi-connection. For synchronized devices, when the voltage/current parameters and working mode of one device is set, the other devices will be automatically set in the same way. In addition, for scanning, program and test, you can trigger test synchronously.

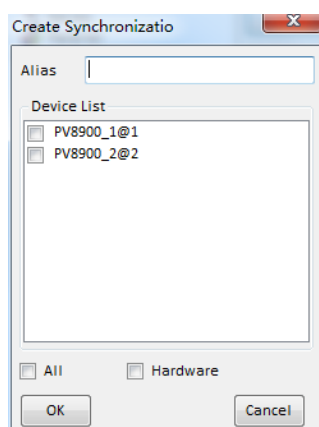
1. Follow the above steps to configure and connect 2 sets of IT8900 devices.



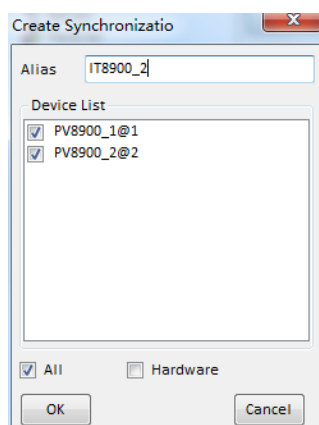
2. Click "Series/Parallel/Synchronization" button and click "Synchronization" in the figure below.



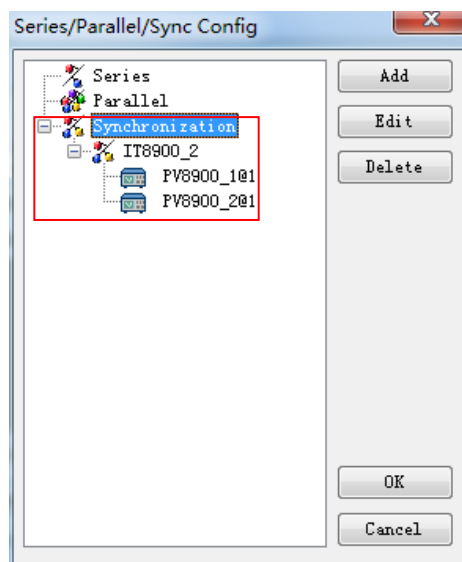
3. Click "Add" button to create Synchronization.



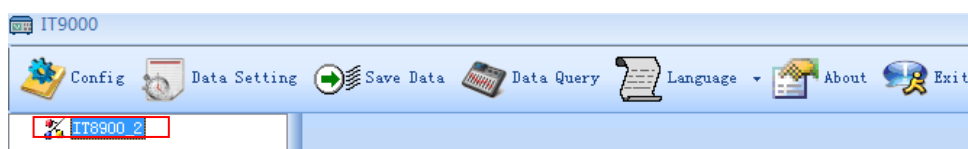
4. Name alias: IT8900_2. Click the box at front of PV8900_1 and PV8900_2 and select the devices for Synchronization.



5. Click "OK" button. The Synchronization Configuration Interface will display configured device.



6. Click "OK" to save the current Synchronization configuration information. At this time, the Synchronization configuration name "IT8900_2" will be displayed at the left top of the interface.



7. Double click IT8900_2 to display the Synchronization Control Interface.



Note

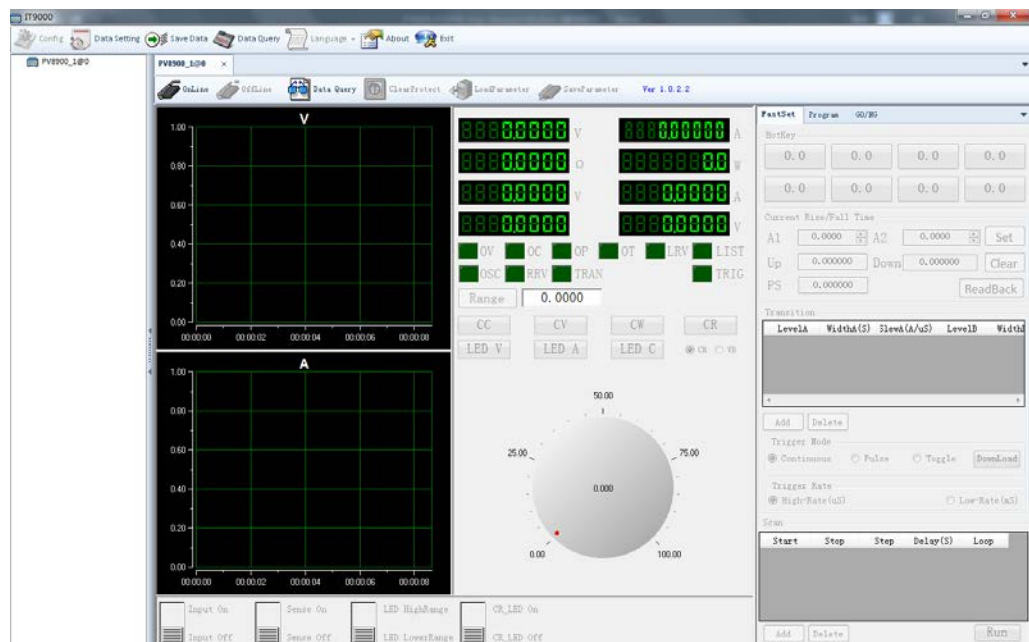
For parallel and synchronization of IT8900 Series, please note that parallel or synchronization operation is only applicable to devices with same model and status.

2.2 Data Setting and Saving

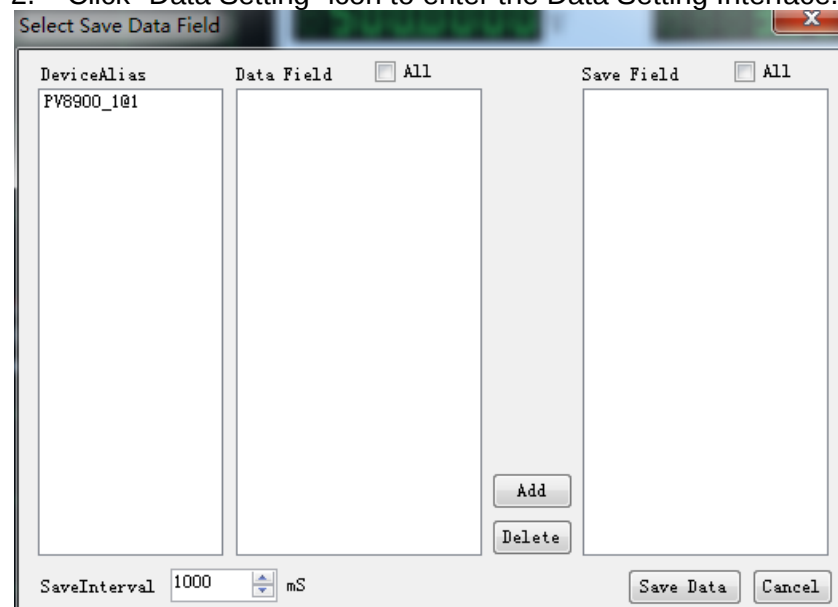
IT9000 can save test data. Before data saving, select the data field to be saved. Select the device alias for saving and the save interval.

Operation steps

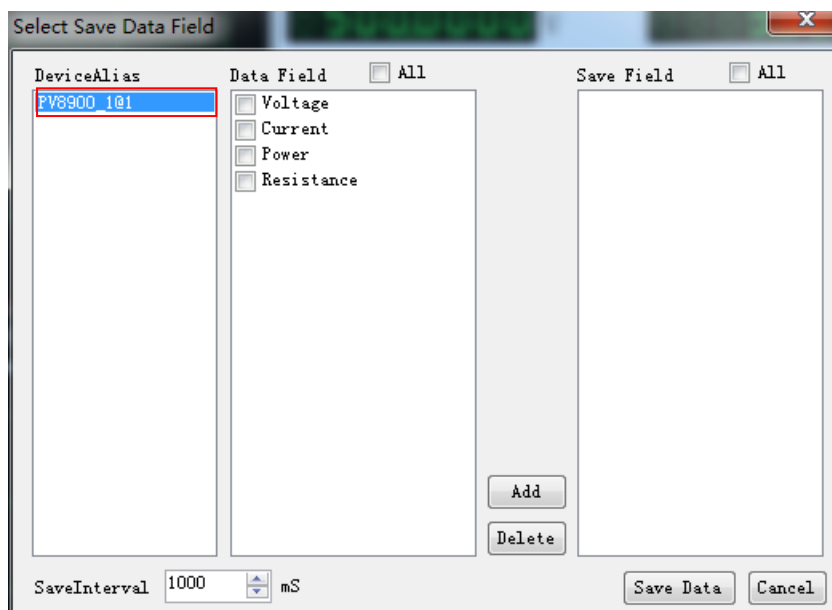
1. After device hardware configuration is finished, double click the device name (device alias @ channel number) displayed at top left of the interface. At this time, Device Control Interface will be displayed. As shown below.



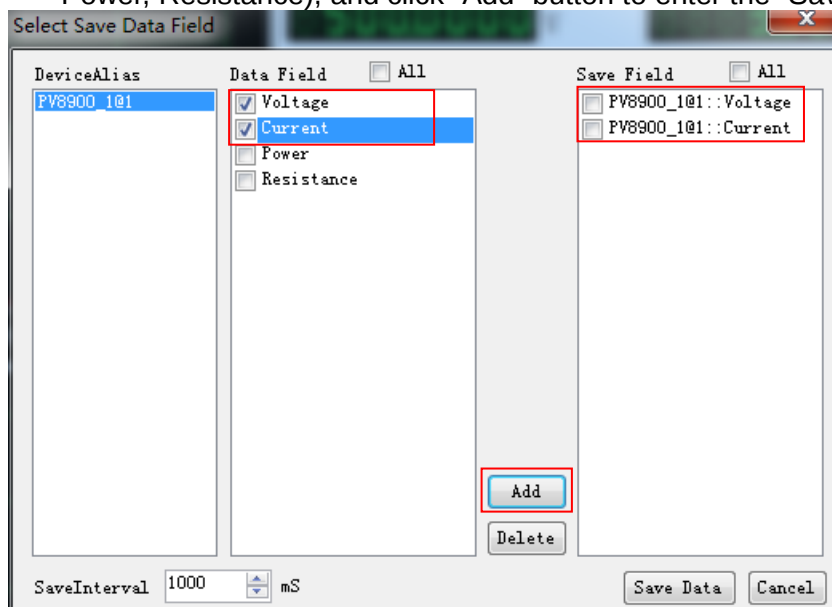
2. Click “Data Setting” icon to enter the Data Setting Interface.



3. Click the alias of the device requiring data saving.

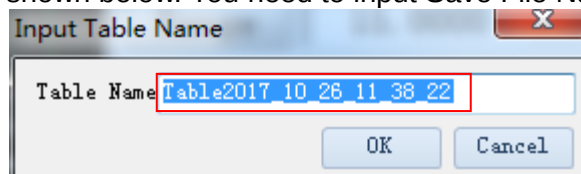


4. In "Data Field" bar, check the box at front of Data Field (Voltage, Current, Power, Resistance), and click "Add" button to enter the "Save Field" bar.



You may also click the Field Name in the Save Field bar. Click "Delete" button to delete the saved field.

5. Set "Save Interval".
6. Click "Save Data" button to save data setting.
7. In the Control Interface, click  icon to appear the interface as shown below. You need to input Save File Name.



8. Click "OK" button in the figure above to start data save. Then, the icon will change to , and "Data Setting" and "Data Query" will be grayed

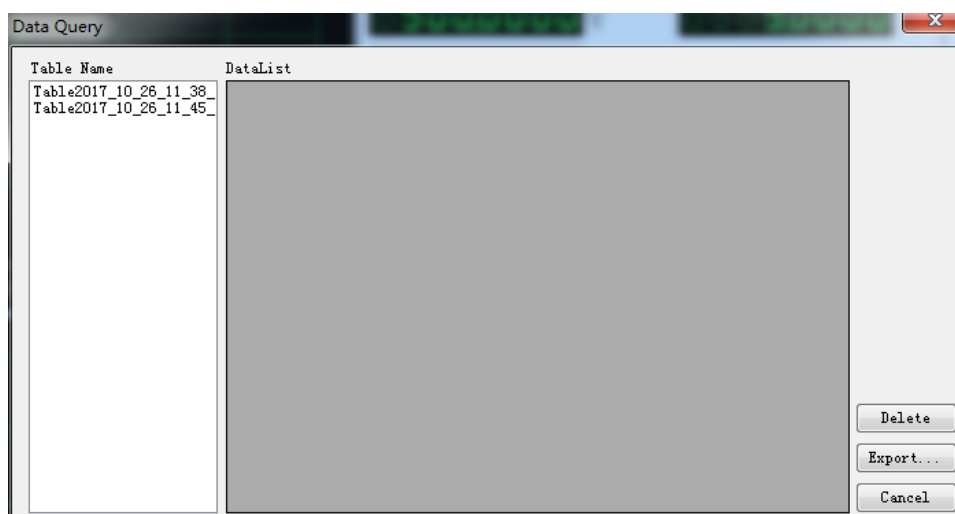
out. Click  icon to stop saving.

2.3 Data Query

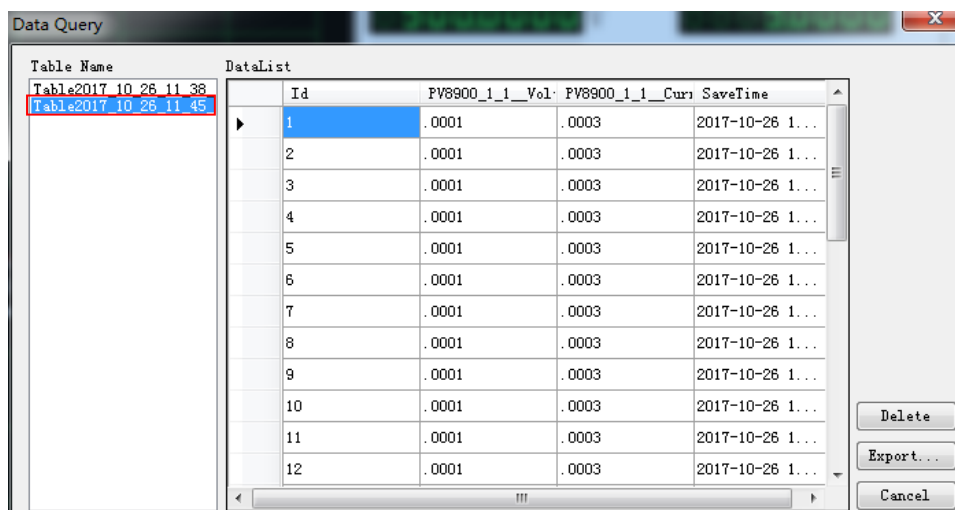
IT9000 software provides query function for measured data. You can query measured data at different periods of time and export and save these measured data.

Operation steps

1. Click  icon to enter the Data Query Interface.



2. In Data Query Interface, select and click the "Table Name" of data saving, and the test data will be displayed in the data list. As shown below.



- Delete: to delete the data in current data list.
 - Export: Click Export to export the data in current data list to EXCEL table. Saving path is optional.
 - Cancel: to exit the Data Query Interface.
3. Click "Cancel" in the Data Query Interface to exit.
 4. Click "Export" to export the current data to EXCEL table. Saving path is optional.

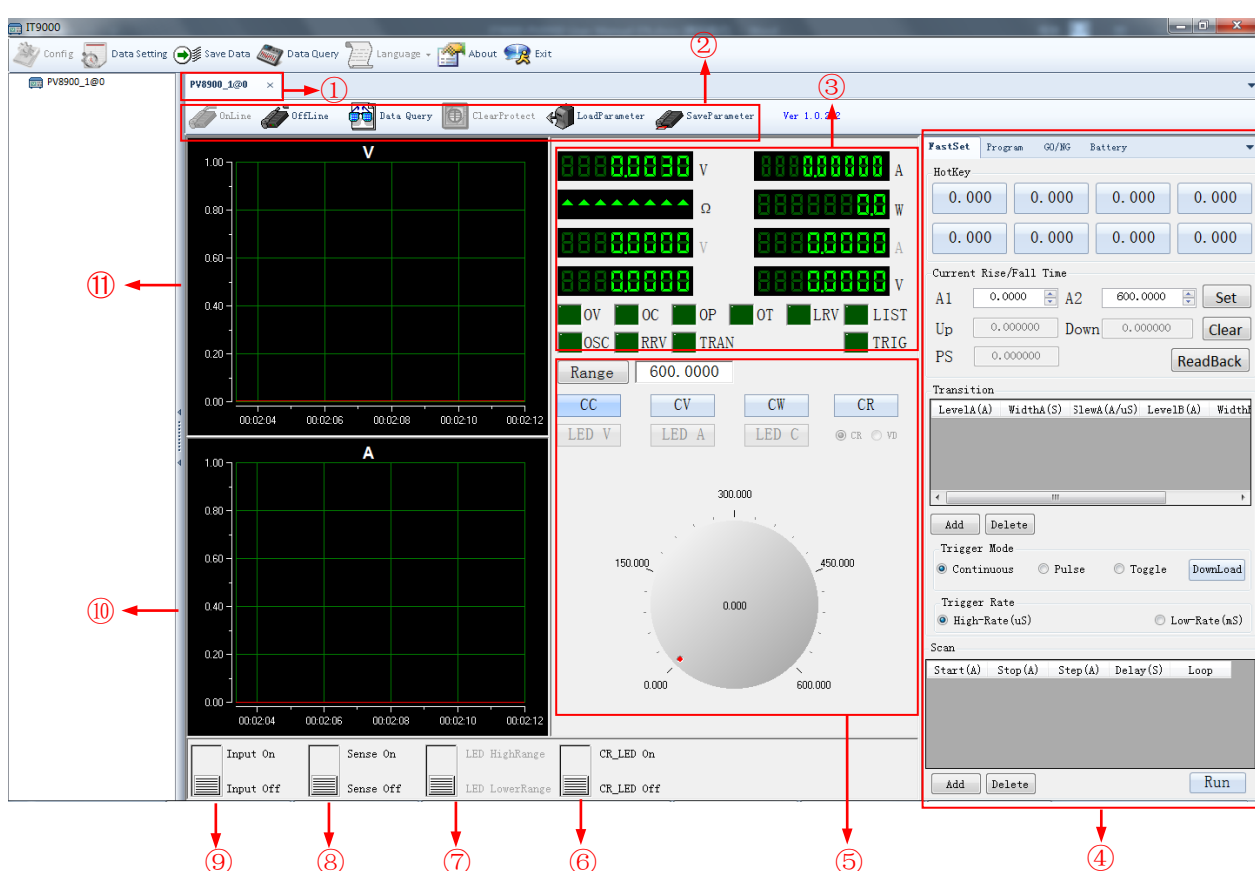
Chapter3 PV8900 Control Interface

IT9000 software can automatically identify instrument model and display model-based functions. For specific functions, refer to user manual of corresponding instrument.

This chapter provides description of control functions of IT9000 software based on IT8904A. The screenshots varies from different models, so please take the actual interfaces of instrument and software.

3.1 Introduction of Control Interface

The PV8900 Control Interface of IT9000 software is as shown below.



1. Tab bar, to switch the display of Control Interfaces of different devices.
2. Toolbar, main functions include:

Online: remote control, to set the load to Remote Control mode.

Offline: local switch, to return the load back to Local Mode from Remote Mode.

Data Query: query the test data saved when the Battery function is running.

Clear Protect: to clear load protection status.

Load Parameter: to call test parameters saved before, including fast setting, dynamic, scan, program and test parameters.

Save Parameter: to save fast setting, dynamic, scan, program and test

parameters, for fast access and usage by the user.

3. Display real-time value and load status (over voltage (OV), over current (OC), over power (OP), over temperature (OT), local reverse voltage. (LRV), program test (LIST), current oscillation protection (OSC), remote reverse voltage. (RRV), dynamic test (TRAN), Trigger(TRIG)) of the load voltage/current/resistance/power/LED V/LED A/LED C/VD.
4. Fast setting, program, test and battery operation area.
5. Load working mode switch (CV/CC/CR/CW/CR-LED), range setting under each mode and knob adjustment of setting values under each mode.
6. CR-LED function: On/ Off.
7. LED High Range/ LED Lower Range.
8. Remote measurement: On/ Off.
9. Input status: On/ Off.
10. Current curve graph.
11. Voltage curve graph.

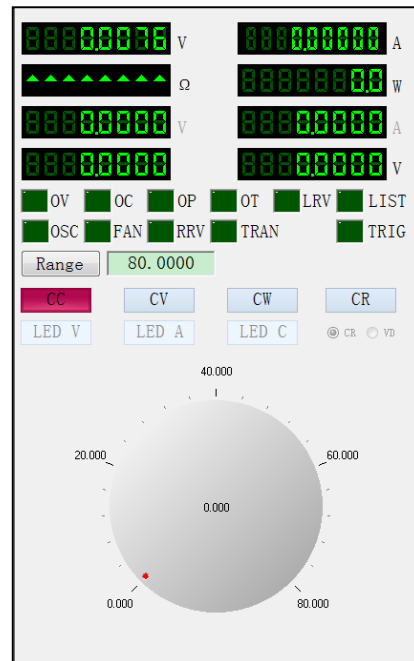
3.2 Setting Voltage, Current, Resistance, Power, LED V, LED A, LED C and VD

You can set voltage, current, resistance, power, LED V, LED A, LED C and VD via Simulated Pulsating Knob (not so accurate setting) or Fast Setting Function (accurate setting).

When you set CR-LED function of IT8912E, you need to set the load LED voltage value (LED V), the load LED current value (LED A) and the load LED coeff value (LED C). IT8900A series load CR-LED mode requires setting two parameters: CR value and VD value. Please refer to the corresponding chapter in user manual for detailed information about CR-LED function.

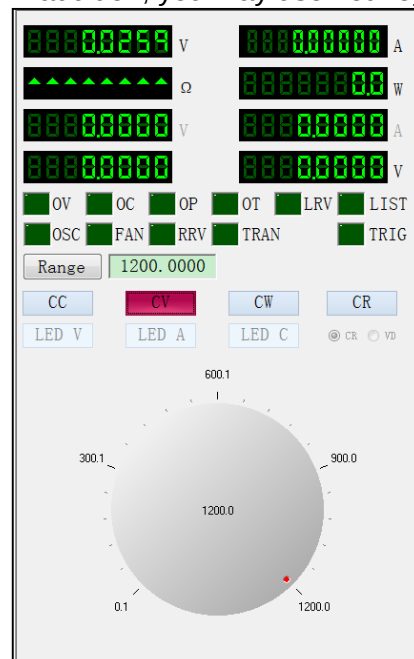
Setting Current

1. Select the operation mode as CC mode, and click "CC" button with mouse.
2. Move the mouse to Simulated Pulsating Knob. Click and rotate the mouse to set the load current value.
3. In addition, you may use hot key (described latter) for accurate setting.



Setting Voltage

1. Select the operation mode as CV mode, and click “CV” button with mouse.
2. Move the mouse to Simulated Pulsating Knob. Click and rotate the mouse to set the load voltage value.
3. In addition, you may use hot key (described latter) for accurate setting.



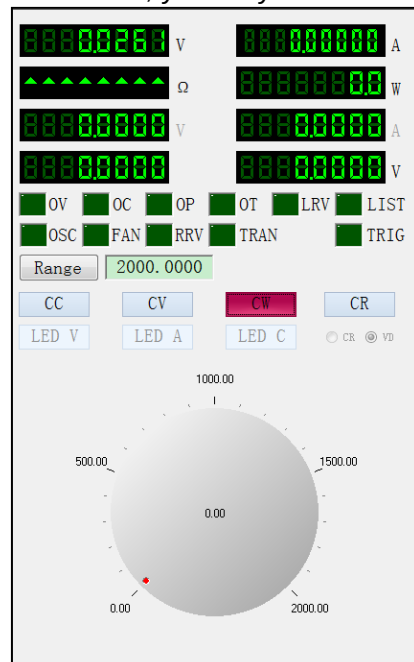
Setting Resistance and VD

1. Select the operation mode as CR mode, and click “CR” button with mouse.
2. Click the circle in front of “CR” or “VD”.
3. Move the mouse to Simulated Pulsating Knob. Click and rotate the mouse to set the load resistance value or VD value.
4. In addition, you may use hot key (described latter) to set the resistance value accurately.



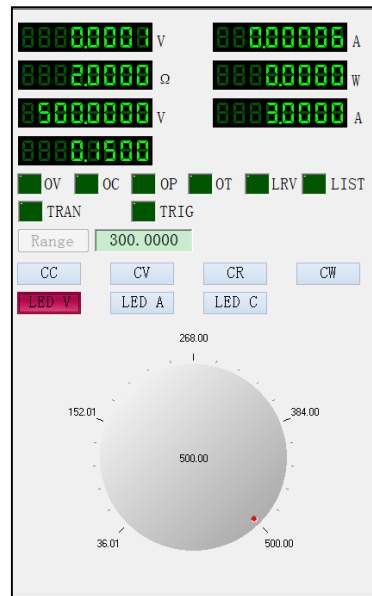
Setting Power

1. Select the operation mode as CW mode, and click “CW” button with mouse.
2. Move the mouse to Simulated Pulsating Knob. Click and rotate the mouse to set the load power value.
3. In addition, you may use hot key (described latter) for accurate setting.



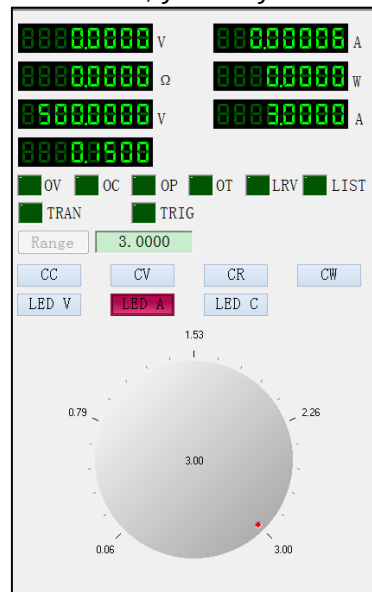
Setting LED V

1. Click “LED V” button with mouse.
2. Move the mouse to Simulated Pulsating Knob. Click and rotate the mouse to set the load LED voltage value.
3. In addition, you may use hot key (described latter) for accurate setting.



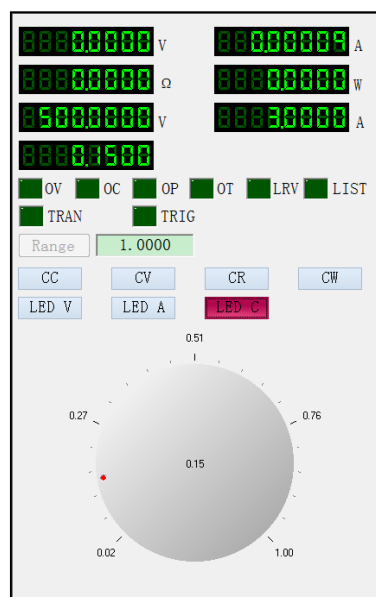
Setting LED A

1. Click "LED A" button with mouse.
2. Move the mouse to Simulated Pulsating Knob. Click and rotate the mouse to set the load LED current value.
3. In addition, you may use hot key (described latter) for accurate setting.



Setting LED C

1. Click "LED C" button with mouse.
2. Move the mouse to Simulated Pulsating Knob. Click and rotate the mouse to set the load LED coeff value.
3. In addition, you may use hot key (described latter) for accurate setting.



Note

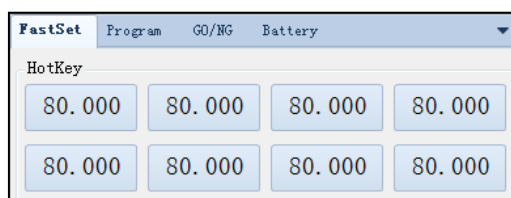


When setting the set value with software, be sure that you have clicked  icon to make it gray out. Set the load to Remote Control status.

When IT9000 software is in online state, it can automatically identify whether the instrument model connected supports CR-LED function.

3.3 Fast Set

Hotkey (under CV, CC, CW, CR operation modes)

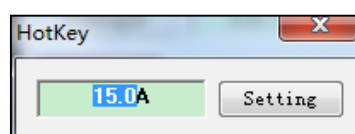


Hotkey:

This is a fast setting convenient for usage. Under each mode, there are 8 setting values available for fast selection. Under different operation modes, you only need to set required value and click mouse to execute corresponding operation. When executing operation, be sure to select operation mode.

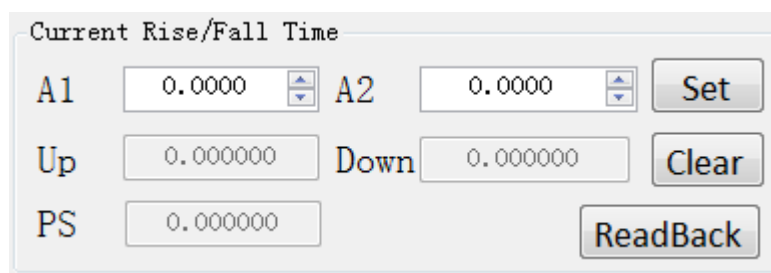
Change data:

1. Right click the area for data change to pop up the dialog as shown below.



2. You may change the fast setting value for voltage/current/resistance/LED V/LED A /LED C or power based on requirements.

Current Rise/Fall Time



Current Rise/Fall Time

A1 0.0000 A2 0.0000 Set

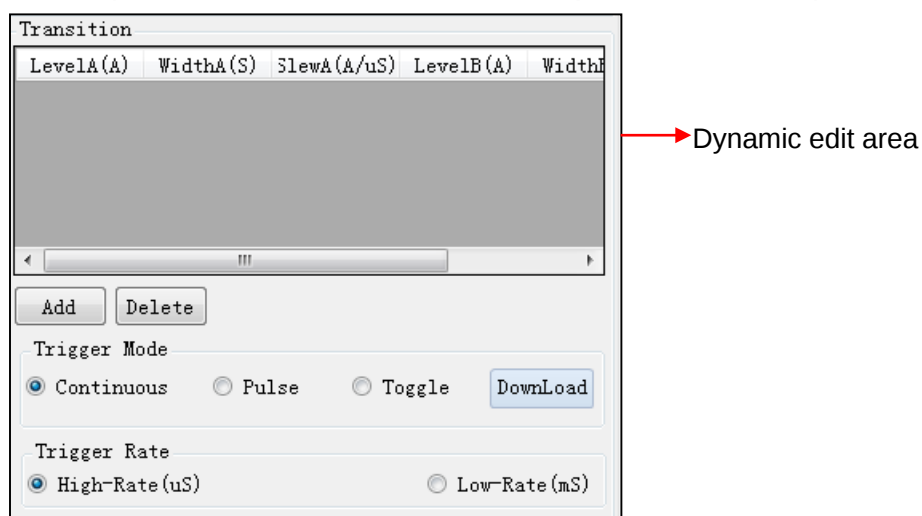
Up 0.000000 Down 0.000000 Clear

PS 0.000000 ReadBack

Description of test parameters:

Parameters	Description
A1	Set low current value.
A2	Set high current value.
Up	Current rising time.
Down	Current falling time.
PS	Current positive/negative pulse time.
ReadBack	Click "ReadBack" to start the test.

Dynamic operation (under CV, CC, CW, and CR operation modes)



Transition

LevelA(A)	WidthA(S)	SlewA(A/uS)	LevelB(A)	WidthB(S)

Add Delete

Trigger Mode

☒ Continuous ☐ Pulse ☐ Toggle Download

Trigger Rate

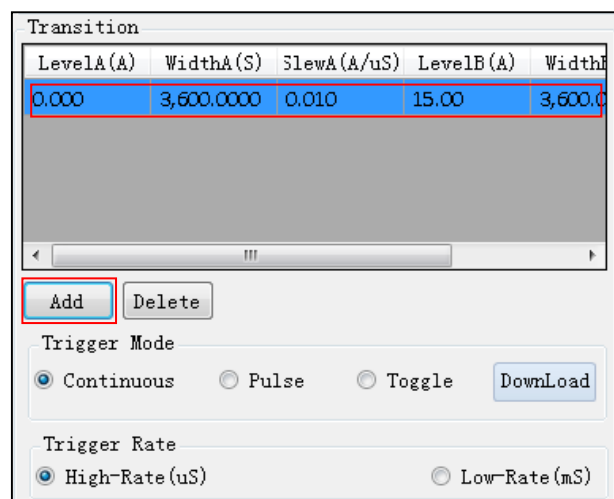
☒ High-Rate (uS) ☐ Low-Rate (mS)

Dynamic edit area

Dynamic operation:

Under dynamic operation, be sure to select one operation mode (CC, CV, CR, CW). Dynamic operation steps will be described below taking CC mode as an example.

1. Click "Add" button and add a group of dynamic data in the dynamic edit area.



Transition

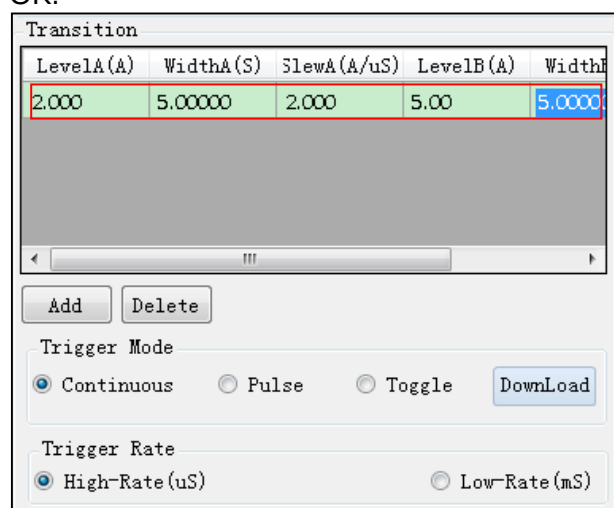
LevelA(A)	WidthA(S)	SlewA(A/uS)	LevelB(A)	WidthB(S)
0.000	3,600.0000	0.010	15.00	3,600.0000

Buttons: Add, Delete

Trigger Mode: ☒ Continuous ☐ Pulse ☐ Toggle Download

Trigger Rate: ☒ High-Rate (uS) ☐ Low-Rate (mS)

- Double click the value corresponding to dynamic data (Level A, Width A, Slew A, Level B, Width B, Slew B). Set them to required values and click OK.



Transition

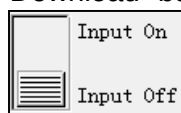
LevelA(A)	WidthA(S)	SlewA(A/uS)	LevelB(A)	WidthB(S)
2.000	5.00000	2.000	5.00	5.0000

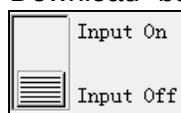
Buttons: Add, Delete

Trigger Mode: ☒ Continuous ☐ Pulse ☐ Toggle Download

Trigger Rate: ☒ High-Rate (uS) ☐ Low-Rate (mS)

- Select the trigger mode of dynamic operation, including Continuous/Pulse/Flip-flop.
- Select dynamic operation rate, including high rate/low rate.
- Click "Download" button to download dynamic data.



- Click  icon to open load input.

Transition

LevelA(A)	WidthA(S)	SlewA(A/uS)	LevelB(A)	WidthB(S)
2.000	5.00000	2.000	5.00	5.00000

Add
Delete
Trig

Trigger Mode

☒ Continuous
☐ Pulse
☐ Toggle

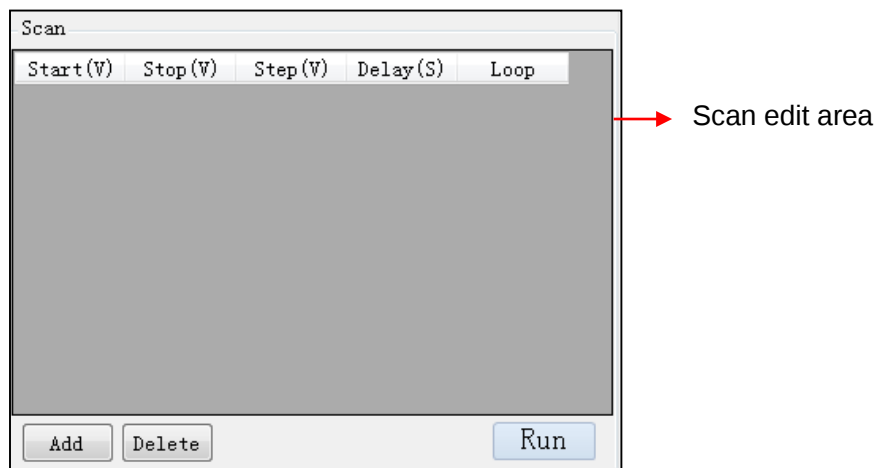
Stop

Trigger Rate

☒ High-Rate (uS)
☐ Low-Rate (mS)

7. Click “Trig” button to run dynamic operation.
8. Click “Stop” button to stop dynamic operation.

Scan (under CV, CC, CW, and CR operation modes)

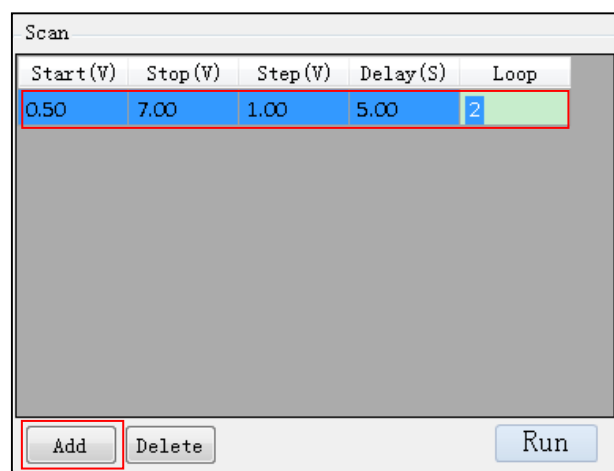


Scan Voltage:

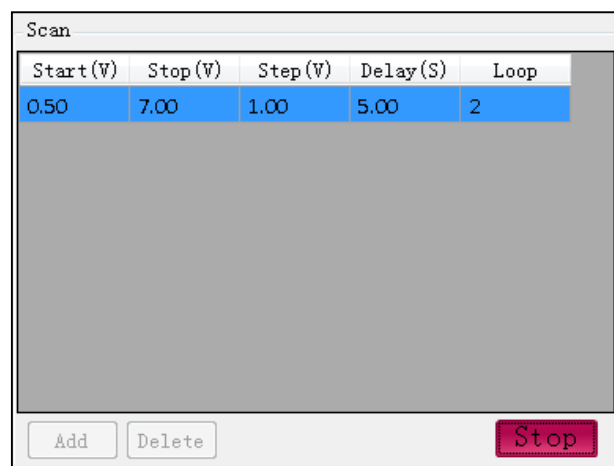
Set a series of voltage values. For example: Start value=1V, stop value=10V, step value=1V, delay=2s. Click “Run” and load will be run based on those scan values.

Under scan operation, be sure to select one operation mode (CC, CV, CR, CW). Scan operation steps will be described below taking CV mode as an example.

1. Click “Add” button and add a group of scan data in the scan edit area.



2. Double click the value corresponding to scan data (Start, Stop, Step, Delay, Loop). Set them to required values and click OK.
3. Click “Run” button to execute scan operation.



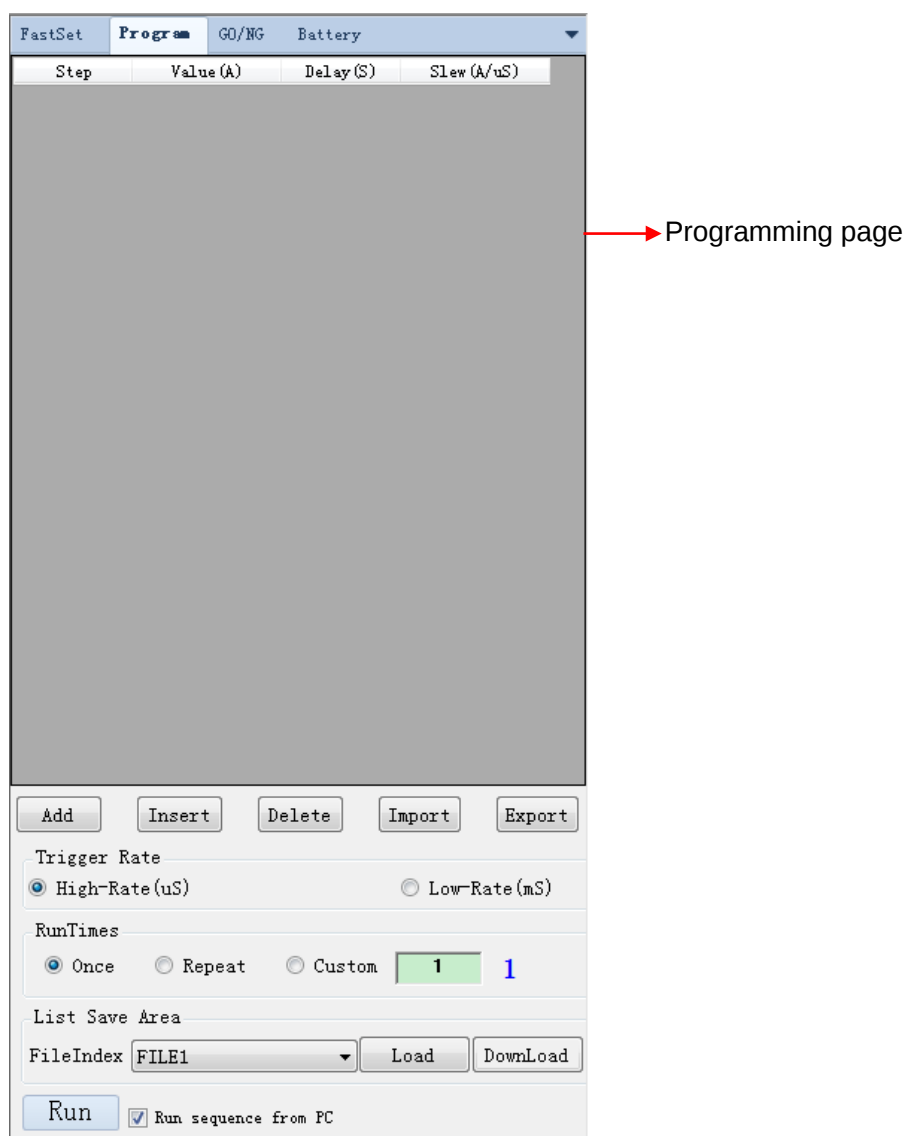
Start (V)	Stop (V)	Step (V)	Delay (S)	Loop
0.50	7.00	1.00	5.00	2

Buttons: Add, Delete, Stop

- Click "Stop" button to stop scan operation.

3.4 Program

The User can edit the test procedures composed of several steps through the application (List) function.



FastSet **Program** GO/NG Battery

Step	Value (A)	Delay (S)	Slew (A/uS)
------	-----------	-----------	-------------

Buttons: Add, Insert, Delete, Import, Export

Trigger Rate
☒ High-Rate (uS) ☐ Low-Rate (mS)

RunTimes
☒ Once ☐ Repeat ☐ Custom 1 1

List Save Area
 FileIndex: FILE1 Load Download

Run ☒ Run sequence from PC

→ Programming page

Introduction of List display

Add: Add a step. Click this button to add 1 step.

Insert: Insert a step. Click this button to insert 1 step before current step.

Delete: Delete a step. Click this button to delete current step.

Import: Import external List documents.

Export: Export List file being edited.

Run Times: Run times of List programs, which can be set as Once/Repeat or Custom.

File Index: Select List file number (FILE1-FILE5), for loading and downloading.

Load: Call the edited List file content from the device based on selected file number and display it on the software interface for PC operation.

Download: Download the editing List file on the current Software Interface to the selected number file for local running by load.

Run: Run List program.

Edit List

1. Select operation mode (CC, CV, CW or CR).
2. Click "Program" tab to enter Fast Programming page.
3. At the bottom of Programming page, click "Add" button to add the first step of program.

Step	Value (A)	Delay (S)	Slew (A/(μ S/mS)
1	15.0000	1.00000	2.0000

4. Double click the value corresponding to program step (Value, Delay, Slew). Set them to required values and click OK.
5. Repeat step 3-4 to set other four steps in List file.

Step	Value (A)	Delay (S)	Slew (A/(μ S/mS)
1	1.0000	2.00000	2.0000
2	2.0000	2.00000	2.0000
3	2.5000	2.00000	2.0000
4	1.5000	2.00000	2.0000
5	0.5000	2.00000	2.0000

Import List file from externals

IT9000 software supports import function of list files. The user can finish the editing of List file in Excel and import it into the software. This function simplifies the List file edit and facilitates user operation. Detailed operation steps are as below:

1. Create a new Excel document on local PC and name it List 1.
2. Open the Excel document and save it as in "other formats" i.e. "(*.csv)".

- Open the List 1.csv document and edit the List. Set every step of the List and corresponding parameters.

	A	B	C	D	E
1	Value(A)	Delay(S)	Slew(A/(uS/mS))		
2	2	3	2		
3	1.5	2	1		
4	1	8	2		
5	2.5	5	1		
6	0.5	1	2		
7					

- Click "Import" button. Select and open List 1.csv file. Finish import of the List file.

Step	Value(A)	Delay(S)	Slew(A/(uS/mS))
1	2.0000	3.00000	2.0000
2	1.5000	2.00000	1.0000
3	1.0000	8.00000	2.0000
4	2.5000	5.00000	1.0000
5	0.5000	1.00000	2.0000

Load local List

IT9000 software supports loading local List file of the device. The user can load the local List file to the software. Detailed operation steps are as below:

- Manually edit the List file in load local and save it under List5.

Step	Dynamic Rate	Value(A)	Delay(S)	Slew(2A/uS)	Run Times
1	High-Rate	0.5	5	2	3
2		0.8	5	2	
3		1.3	5	2	
4		2.1	5	2	

- In the List Save area of Program Interface, click the drop-down arrow at right of file name and select FILE5.
- Click "Load" button, and the Programming Interface will display the load local List5 file.

Step	Value (A)	Delay (S)	Low (A/(uS/mS))
1	0.5000	5.00000	2.0000
2	0.8000	5.00000	2.0000
3	1.3000	5.00000	2.0000
4	2.1000	5.00000	2.0000

Add
Insert
Delete
Import
Export

Trigger Rate
☒ High-Rate (uS)
☐ Low-Rate (mS)

RunTimes
☐ Once
☐ Repeat
☒ Custom

3

1

List Save Area
FileIndex FILE5
Load
DownLoad

Run
☒ Run sequence from PC

Run List

- Follow the steps above to edit List file.
- Select dynamic rate, including high rate/low rate.
- Set Run Times, including Once/Repeat or Custom. When Custom is selected, you may set the repetition count of programs.

RunTimes
☒ Once
☐ Repeat
☐ Custom

1

1

- Select PC or Local Running LIST program.

- Run sequence from PC

If the box in front of “Run sequence from PC” is checked, it means that test is done via PC. You may record the run times.

- Local Run

If the box in front of “Run sequence from PC” is not checked, it means that List is run via local device. At first, select the number of current editing List file (FILE1~FILE5) and click “Download” button to download the editing List file on the current Software Interface to the

selected number file for local running by load.

5. Click **“Run”** to run program file. Click **“Stop”** to stop operation.

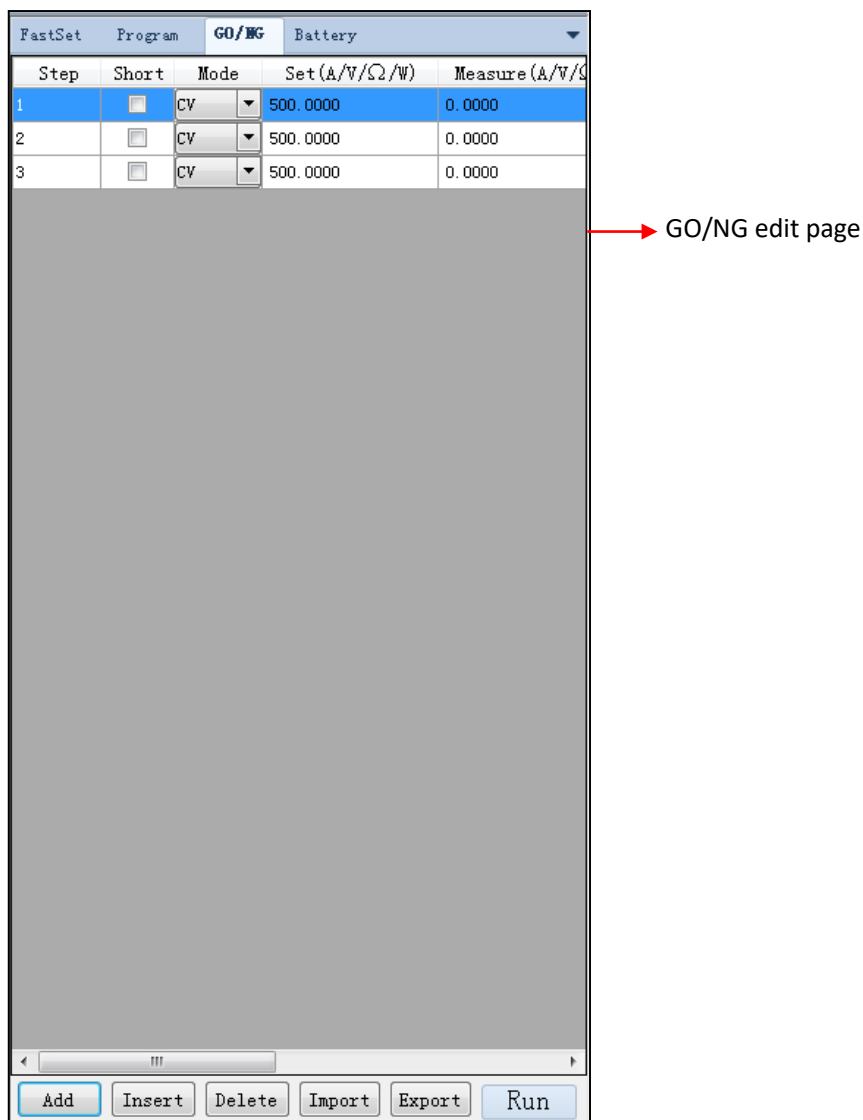


Note

Only under CC mode can you download the LIST program file for local operation by device.

3.5 GO/NG

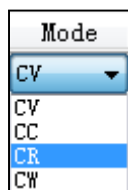
With this function, you can test whether the selected electronic load meets required specifications.



Introduction of GO/NG interface

Short: to select whether short circuit test is required. If so, click the box.

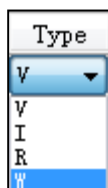
Mode: to select load mode. Click the drop-down arrow in Mode bar to pop up the mode list as shown below. Select the required mode.



Set(A/V/Ω/W): to set the set value under specific mode, like CC 3A.

Measure(A/V/Ω/W): this option is a read-back value and requires no setting.

Type: This option is measured value type. Setting method is same as mode selection. Options include V, I, R, W.



Max(A/V/Ω/W): to set maximum read-back value.

Min(A/V/Ω/W): to set minimum read-back value.

Delay(S): to test the delay time of each step.

Pass: to judge test results. This option cannot be set.

Edit GO/NG program

1. Click "GO/NG" tab to enter Test page.
2. At the bottom of Test page, click "Add" button to add the first step of Test procedure.

Step	Short	Mode	Set (A/V/Ω/W)	Measure (A/V/Ω)
1	☐	CV	500.0000	0.0000

3. Set short circuit, mode and type.
4. Double click the value corresponding to test program step (Set, Max, Min, Delay). Set them to required values and click OK.
5. Repeat steps 2-4 to set other four steps of Test Procedure.

Step	Short	Mode	Set (A/V/Ω/W)	Measure (A/V/Ω)
1	☒	CV	1.0000	0.0000
2	☐	CC	2.0000	0.0000
3	☐	CV	4.0000	0.0000
4	☐	CC	1.0000	0.0000
5	☐	CW	5.0000	0.0000

External import of GO/NG program

1. Create a new Excel document on local PC and name it Test 1.
2. Open the Excel document and save it as in "other formats" in "(*.csv)".
3. Open the Test 1.csv document and edit the Test. Set every step of the Test and corresponding parameters.

	A	B	C	D	E	F	G	H	I	J
1	Short	Mode	Set(A/V/Ω	Measure(A	Type	Max(A/V/Ω	Min(A/V/Ω	Delay(S)	Pass	
2	TRUE	CC	1	0	I	1.01	0.99	5		
3	FALSE	CV	2	0	V	2.01	1.99	5		
4	FALSE	CC	1.5	0	I	1.51	1.49	5		
5	FALSE	CV	1	0	V	1.01	0.99	5		
6	FALSE	CW	5	0	W	5.01	4.99	5		
7										
8										

- Click "Import" button. Select and open Test 1.csv file. Finish import of the Test file.

Step	Short	Mode	Set(A/V/Ω/W)	Measure(A/V/Ω
1	☒	CC	1.0000	0.0000
2	☐	CV	2.0000	0.0000
3	☐	CC	1.5000	0.0000
4	☐	CV	1.0000	0.0000
5	☐	CW	5.0000	0.0000

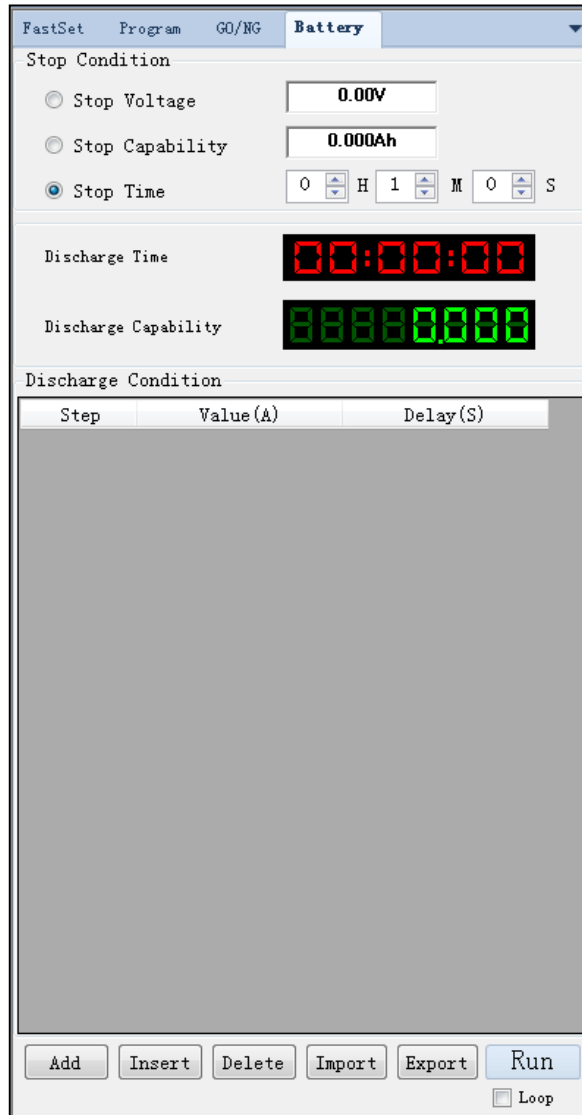
Run GO/NG Program

- Follow the steps above to edit Test file.
- Click "Run" to run program file. Click "Stop" to stop operation.
- After running is completed, click "Export" to save the test results to Excel.
- Name the file as **Test**. Open **Test** to display measured value and test result.

	A	B	C	D	E	F	G	H	I	J
1	Short	Mode	Set(A/V/Ω	Measure(A	Type	Max(A/V/Ω	Min(A/V/Ω	Delay(S)	Pass	
2	TRUE	CC	1	0.300186	I	1.01	0.99	5	NoPass	
3	FALSE	CV	2	1.99445	V	2.01	1.99	5	Pass	
4	FALSE	CC	1.5	0.300186	I	1.51	1.49	5	NoPass	
5	FALSE	CV	1	0.981613	V	1.01	0.99	5	NoPass	
6	FALSE	CW	5	0.016566	W	5.01	4.99	5	NoPass	
7										
8										

3.6 Battery

When the DUT is a battery, the electronic load will discharge the battery in constant current, constant power or constant resistance mode. The user needs to set the stop voltage, stop capacity and stop time. The interface will display discharge time and discharge capacity. Details are as shown below.




Note

This battery configuration interface is not applicable for parallel and sync setting.

Introduction of Battery display

Stop Condition:

- Stop Voltage: stop when the current battery voltage reaches set value.
- Stop Capability: stop when the battery capacity reaches set value.
- Stop Time: stop when the battery runs to the set time.

Discharge Time: display the battery discharge time.

Discharge Capability: display the battery discharge capacity.

Add: Add a step. Click this button to add 1 step.

Insert: Insert a step. Click this button to insert 1 step before current step.

Delete: Delete a step. Click this button to delete current step.

Import: Import external discharge documents.

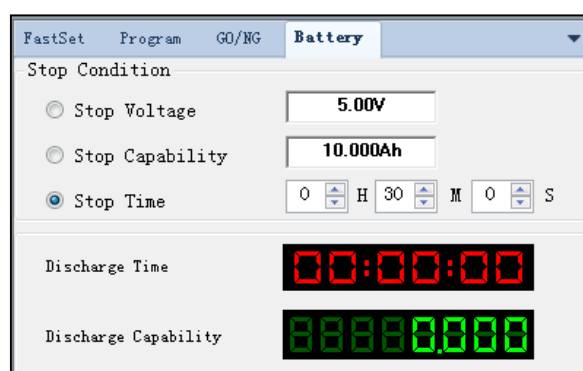
Export: Export discharge file being edited, the suffix name is .csv.

Run: Run discharge program.

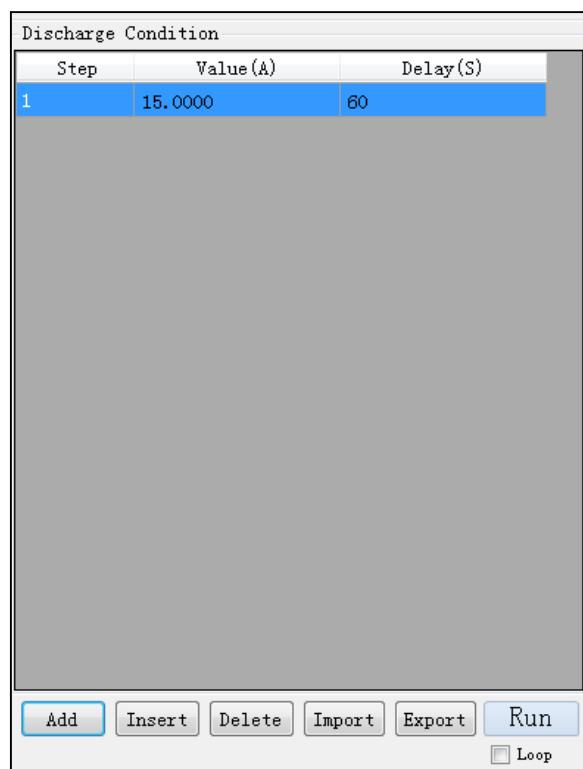
Loop: Loop all the steps until researching the end of stop condition.

Edit Discharge File

1. Select operation mode (CC, CW or CR).
2. Click "Battery" tab to enter Fast Programming page.
3. Set stop condition, including Stop Voltage, Stop Capability and Stop Time.



4. Under the Discharge Condition, click "Add" button to add the first step of discharge procedure.



Step	Value (A)	Delay (S)
1	15.0000	60

5. Double click the value corresponding to test program step (Value, Delay). Set them to required values and click OK.

6. Repeat steps 4-5 to set other three steps of Discharge Procedure.

Discharge Condition		
Step	Value (A)	Delay (S)
1	5.0000	60
2	4.0000	60
3	2.0000	60
4	1.0000	60

☐ Loop

Import discharge file from externals

IT9000 software supports import function of discharge files. The user can finish the editing of discharge file in Excel and import it into the software. This function simplifies the discharge file edit and facilitates user operation. Detailed operation steps are as below:

1. Create a new Excel document on local PC and name it Discharge.
2. Open the Excel document and save it as in "other formats" i.e. "(*.csv)".
3. Open the Discharge.csv document and edit the file. Set every step of the discharge and corresponding parameters.

	A	B	C
1	Value (A)	Delay (S)	
2	4	60	
3	3	90	
4	2	60	
5	1	20	
6			

4. Click "Import" button. Select and open Discharge.csv file. Finish import of the Discharge file.

Step	Value (A)	Delay (S)
1	4.0000	80
2	3.0000	90
3	2.0000	60
4	1.0000	20

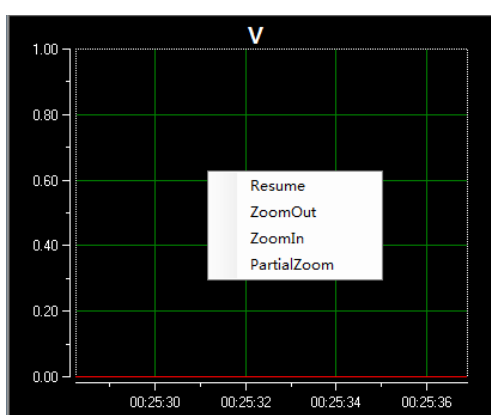
☐ Loop

Run Discharge File

1. Follow the steps above to edit Discharge file.
2. Click **“Run”** to run program file. The user can check the **“Loop”** at bottom to run the entire step in cycle till the stop condition is met.

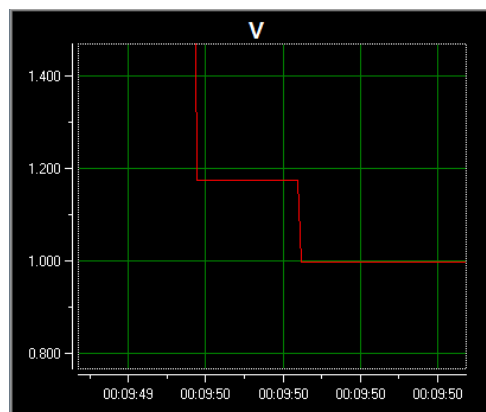
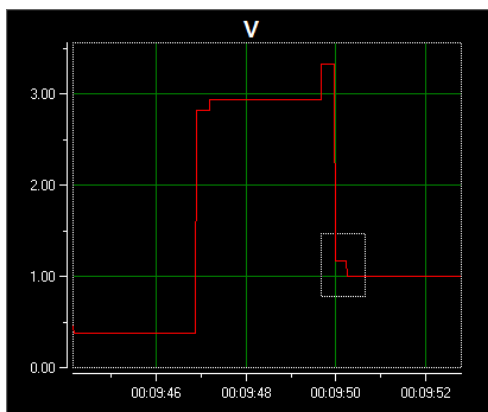
3.7 Curve Zoom Out and Translation

In the IT9000 software, voltage and current curve graphs have such functions as Resume, Zoom Out, Zoom In and Partial Zoom. Right click any one at the curve graph, as shown below.



Curve zoom out

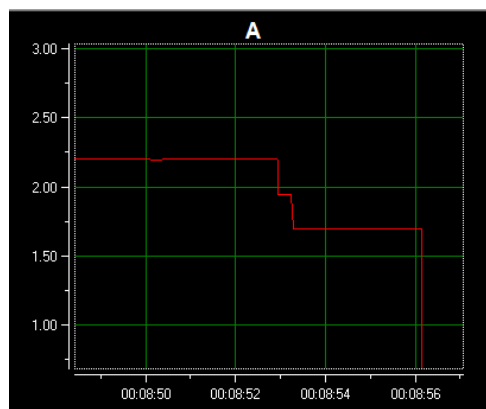
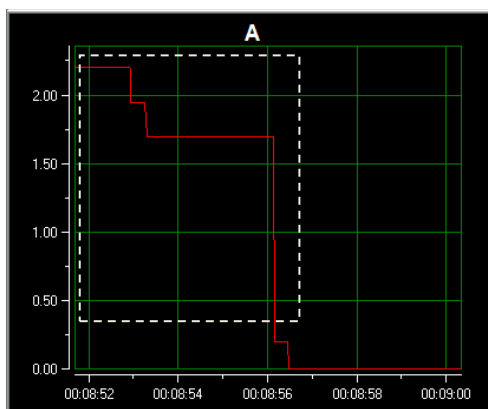
1. Right click the curve graph and select **“Partial Zoom”**. At the bottom of cursor will display a small rectangle box.
2. Move the cursor of small rectangle box to pull out a bigger rectangle box to define the location which you need enlarge the partial wave.
3. Release the mouse left key and the image will be promptly zoomed out.



4. To resume dynamic records, right click the curve graph and choose "Resume".

Translation view

1. Move the cursor shape to any position of the horizontal coordinate axis (Time Axis) and the mouse will change to be a hand.
2. Hold down the mouse left key to move the mouse. When moving left, you will see the curve after the current time; when moving right, you will see the curve before the current time.
3. Similarly, you can translate the voltage/current coordinate to view curve.



4. To resume dynamic records, right click the curve graph and choose "Resume".

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