



IT9000 Control Software

PV8600 User Manual



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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.



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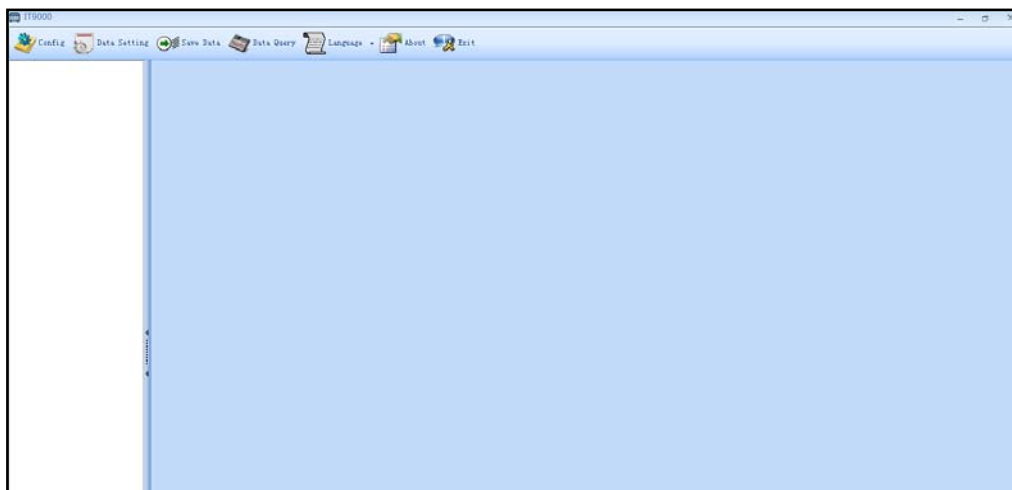
Chapter1 Brief Introduction

1.1 Software Introduction

IT9000-PV8600 is a kind of easy-to-use and practicable control software designed by Itech Electronics Co., Ltd. It is applicable to Itech IT8600 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.
- **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.

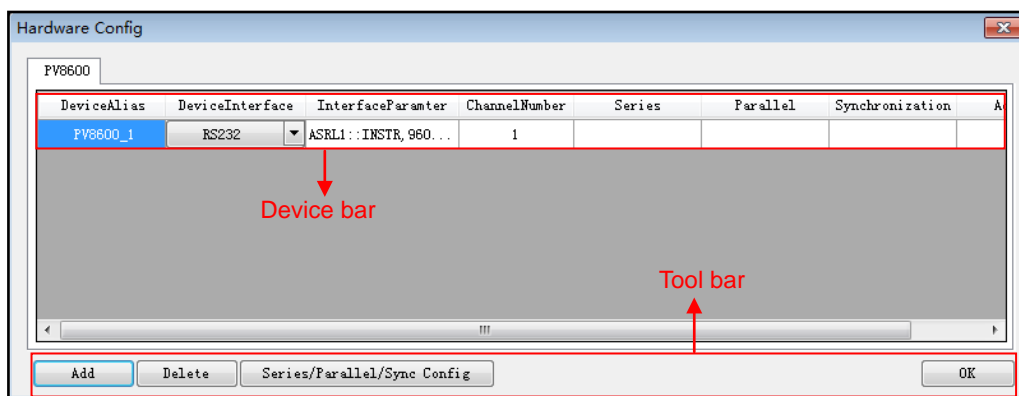
- **About**
To list related information of software, including Company website.
- **Exit**
To exit IT9000 software.

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.

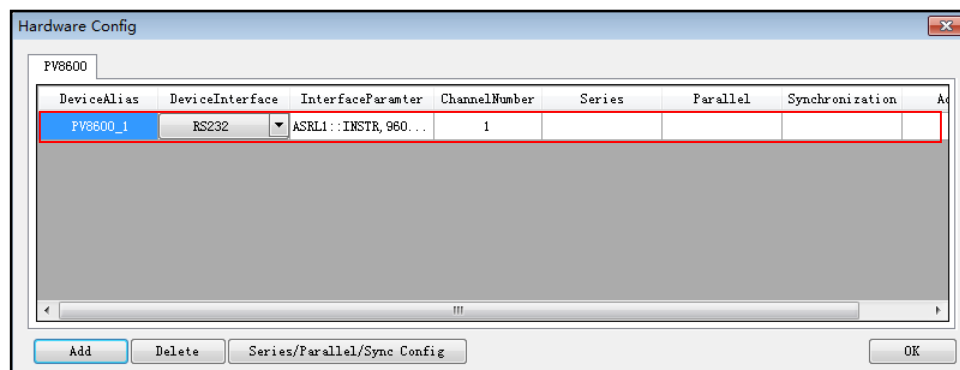
2.1.2 Configuring Hardware

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.

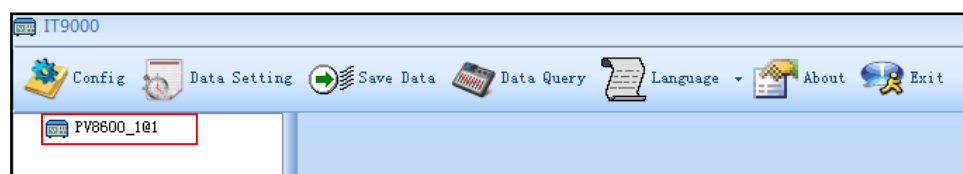
Operation steps

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.

3. Device Alias: double click to edit device alias.
4. Device Interface: to select from the drop-down box.
5. Interface Parameter: double click to configure in the Configure Dialog. For details, refer to Section 2.1.3 "Communication Interfaces of Configuration Device".
6. Channel Number: set the channel number of sub-device. The channel number is changeable.
7. 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.

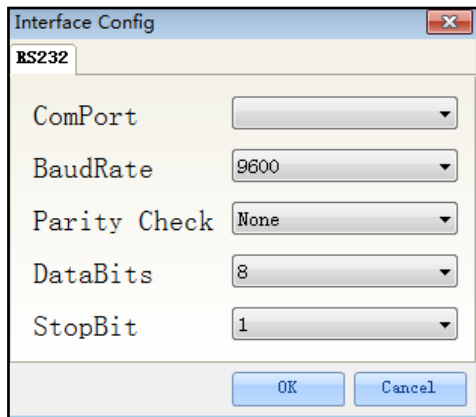
Operation steps

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.

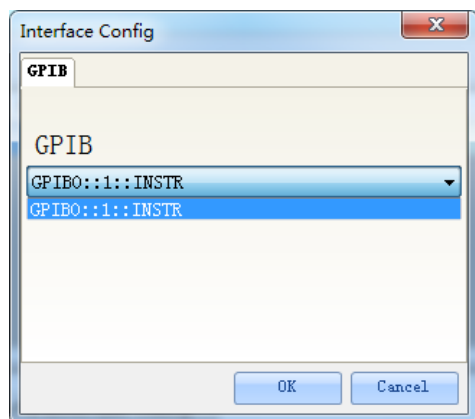
- RS232 Interface Parameter Configuration



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

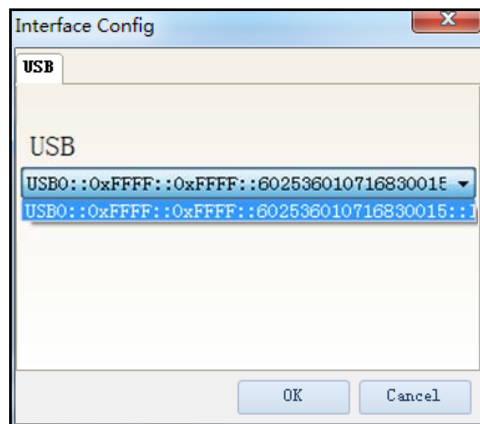
Baud rate, parity check bit, data bits and stop bit must be configured consistently with those in menu setup.

- GPIB Interface Parameter Configuration



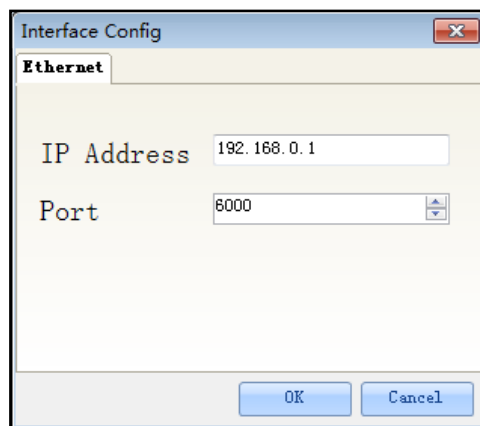
During GPIB communication of load device, the address setting range is: 1-30.

- 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.

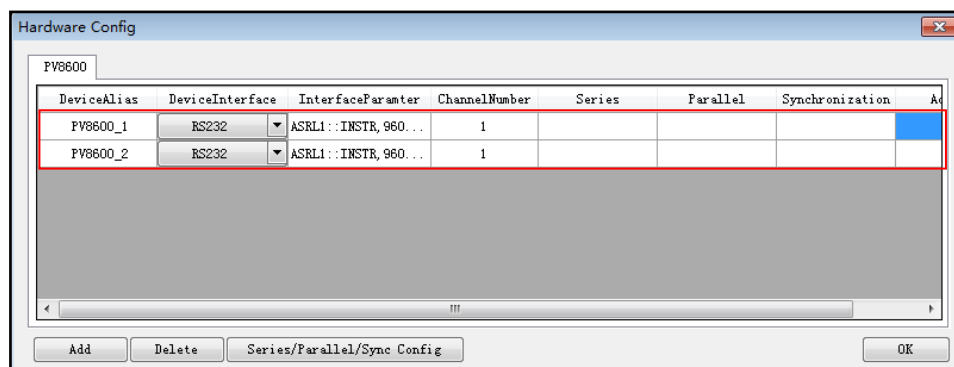


3. After interface parameter configuration, click "OK". Finish interface parameter configuration.

2.1.4 Synchronization Configuration

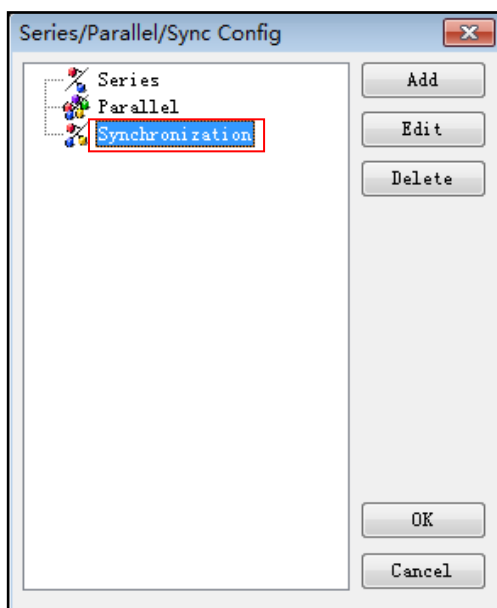
This configuration is used for multi-connection. For synchronized devices, when the voltage/current parameters and working mode of one device is set, the other devices will be automatically set in the same way.

1. Follow the above steps to configure and connect 2 sets of IT8600 devices.

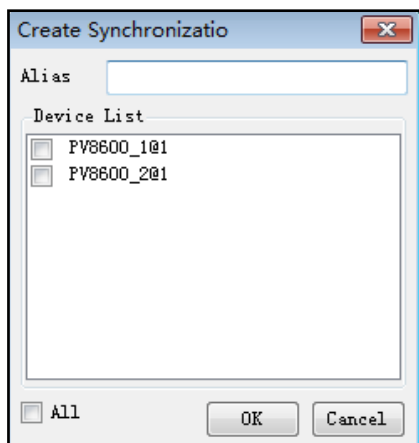


2. Click "Series/Parallel/Synchronization" button and click "Synchronization"

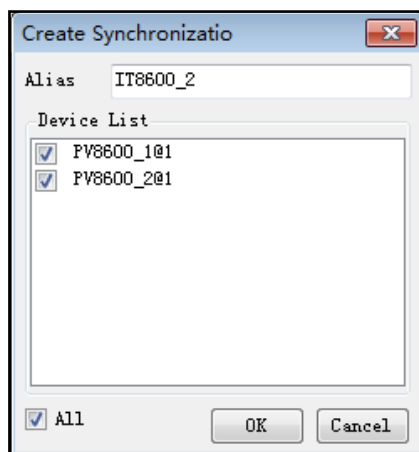
in the figure below.



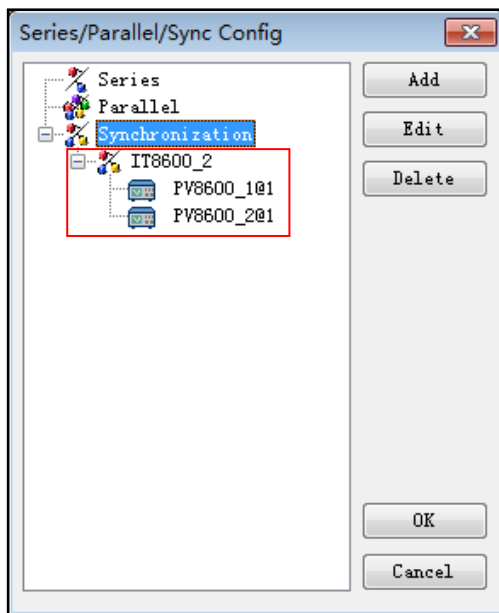
3. Click "Add" button to create Synchronization.



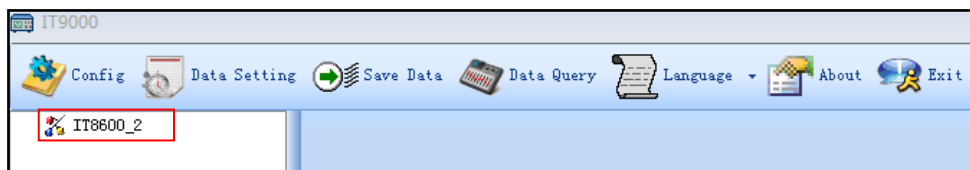
4. Name alias: IT8600_2. Click the box at front of PV8600_1 and PV8600_2 and select the devices for Synchronization.



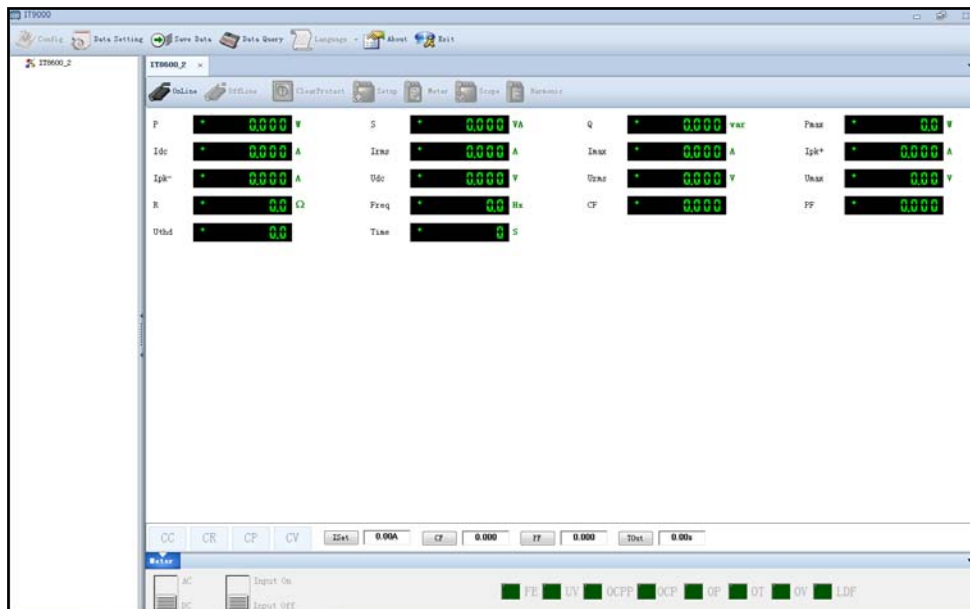
5. Click "OK" button. The Synchronization Configuration Interface will display configured device.



- Click "OK" to save the current Synchronization configuration information. At this time, the Synchronization configuration name "IT8600_2" will be displayed at the left top of the interface.



- Double click IT8600_2 to display the Synchronization Control Interface.



Note

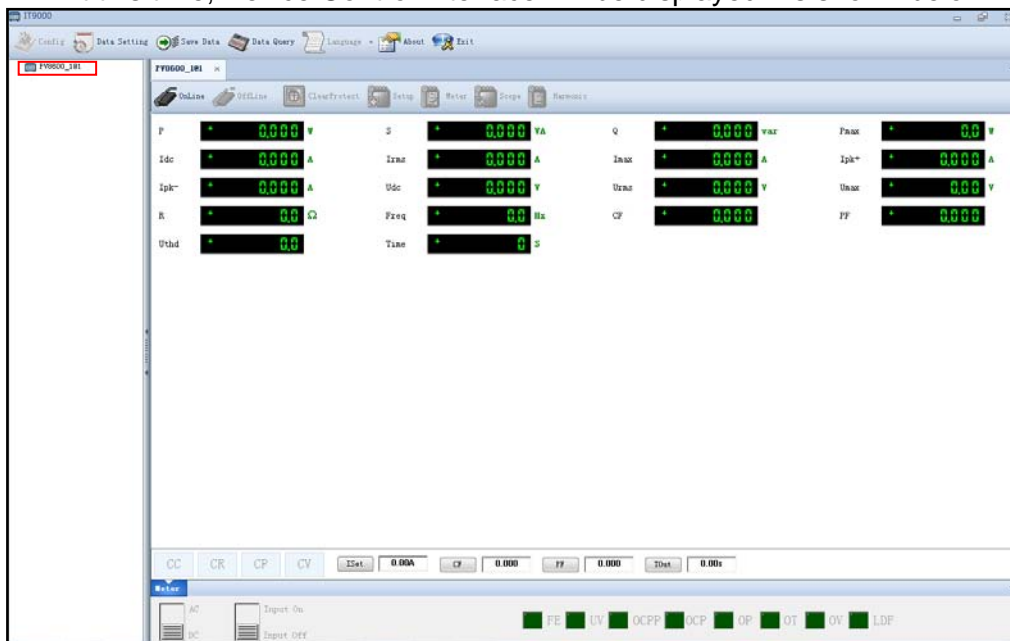
For synchronization of IT8600 Series, please note that synchronization operation is only applicable to devices with same model and status.

2.2 Data Setting and Saving

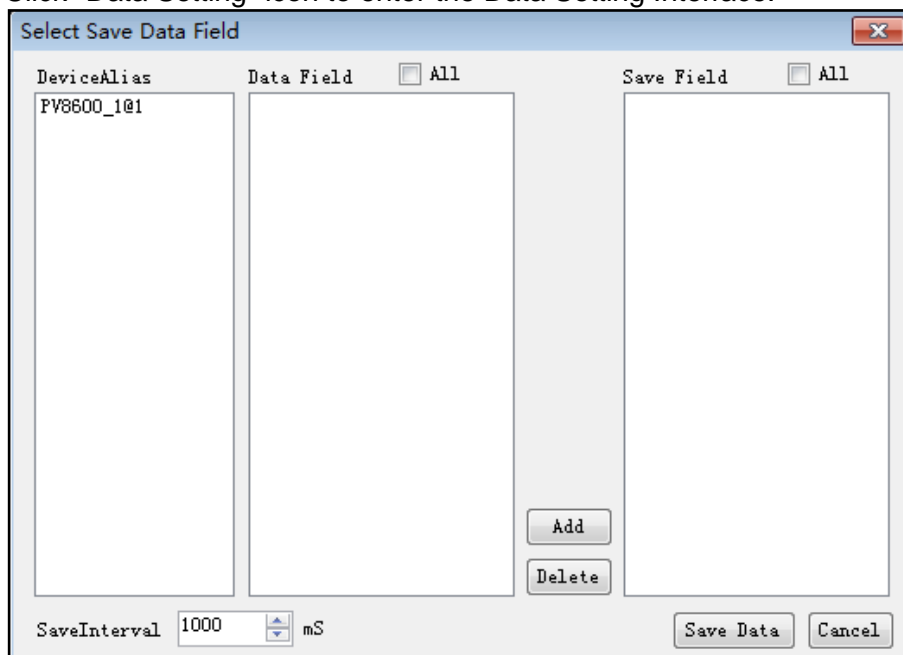
IT9000 can save test data. Before data saving, select the data field to be saved. Select the device alias for saving and the save interval.

Operation steps

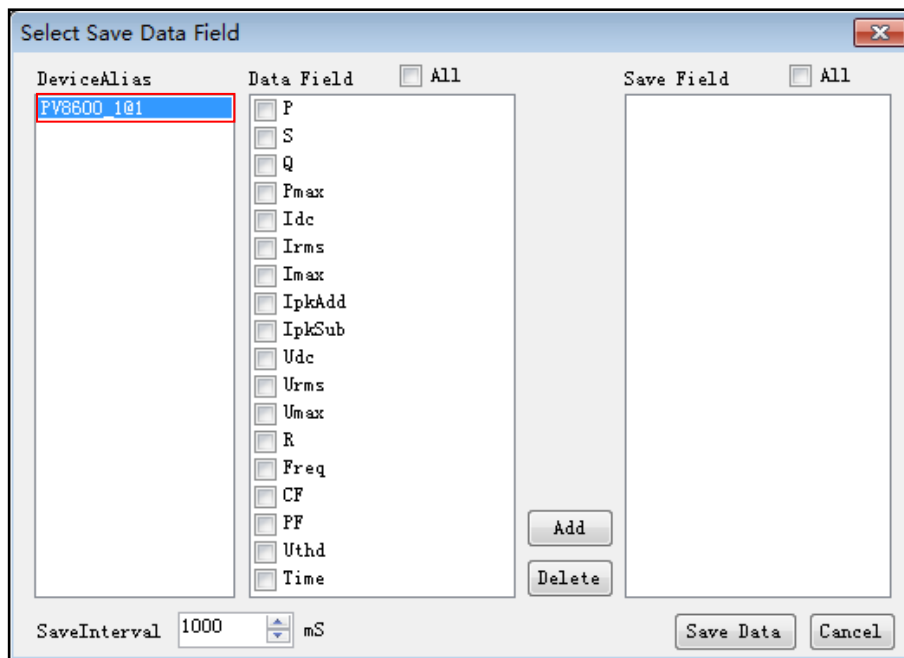
1. After device hardware configuration is finished, double click the device name (device alias @ channel number) displayed at top left of the interface. At this time, Device Control Interface will be displayed. As shown below.



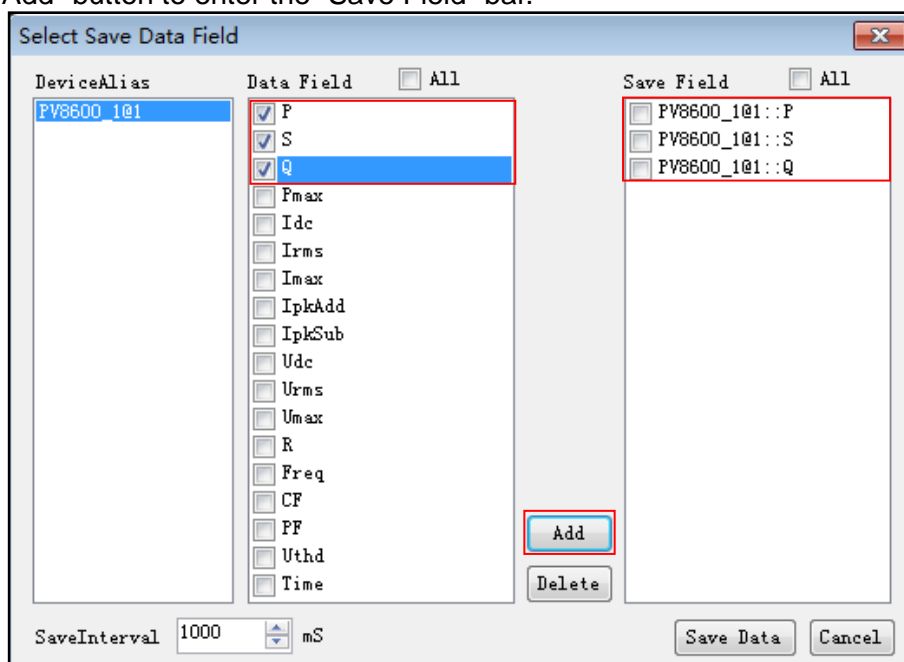
2. Click "Data Setting" icon to enter the Data Setting Interface.




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

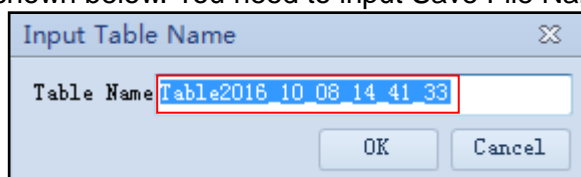


- In "Data Field" bar, check the box at front of Data Field (P, S, Q), and click "Add" button to enter the "Save Field" bar.





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

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




- Click "OK" button in the figure above to start data save. Then, the icon will

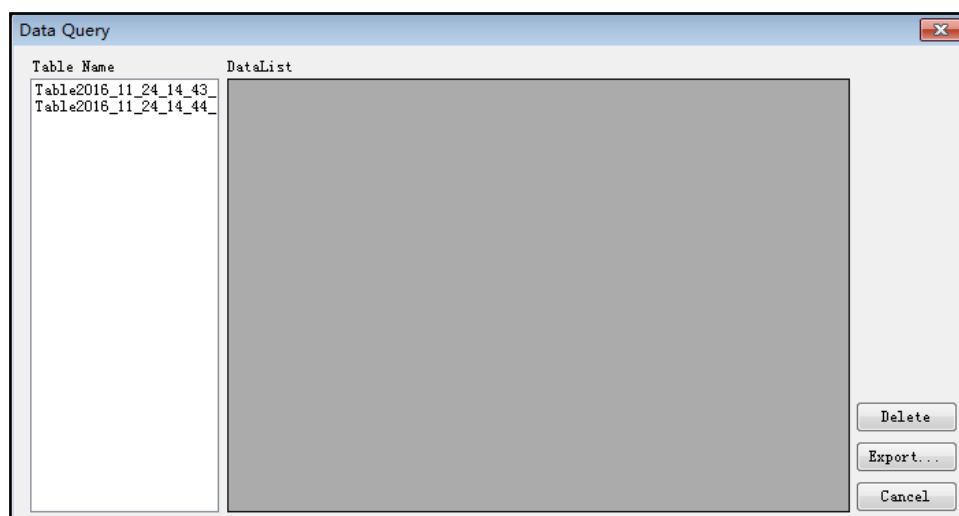
change to , and "Data Setting" and "Data Query" will be grayed out. Click  icon to stop saving.

2.3 Data Query

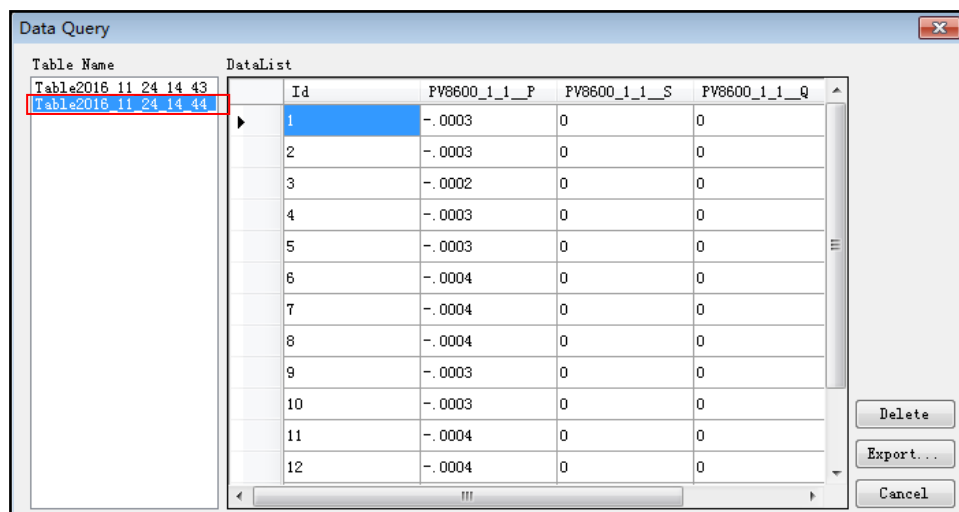
IT9000 software provides query function for measured data. You can query measured data at different periods of time and export and save these measured data.

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.

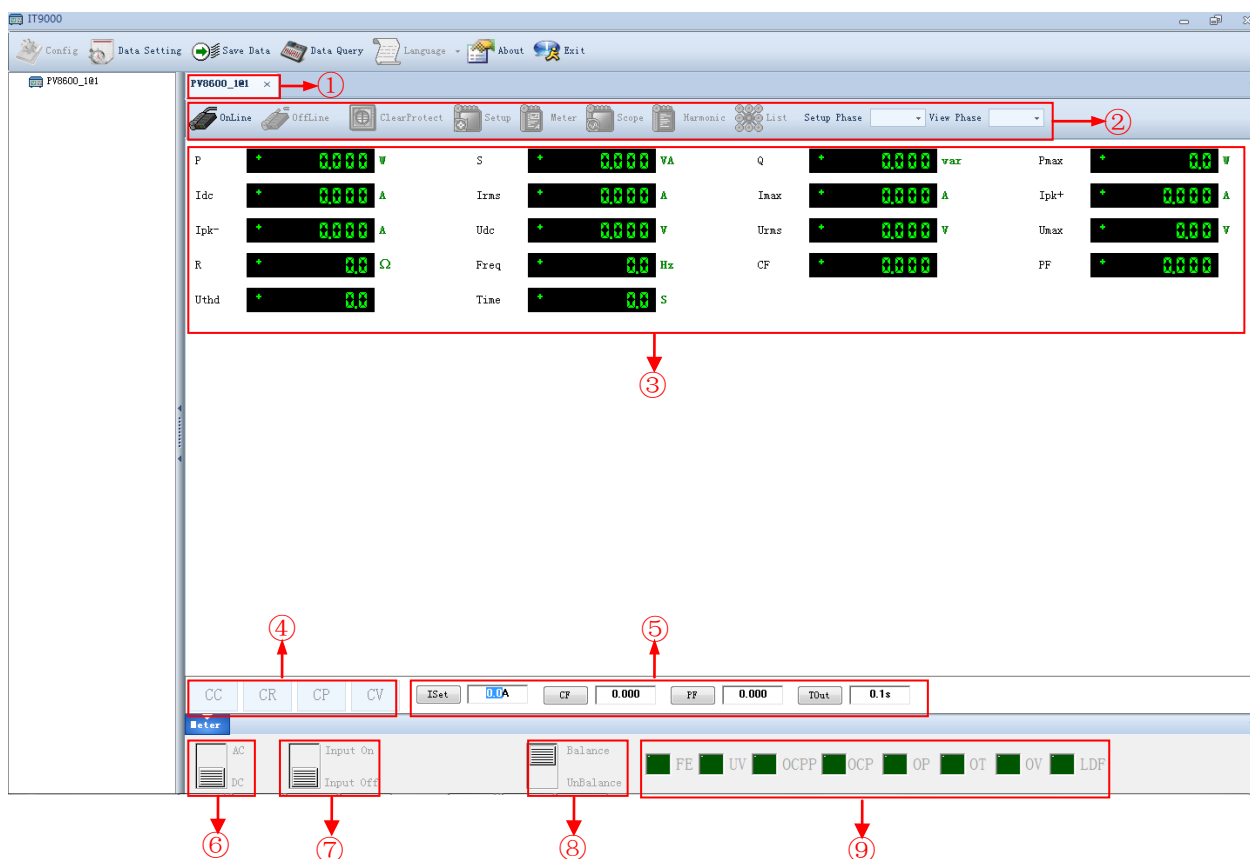


- Delete: to delete the data in current data list.
- Export: Click Export to export the data in current data list to EXCEL table. Saving path is optional.
- Cancel: to exit the Data Query Interface.

Chapter3 PV8600 Control Interface

3.1 Introduction of Control Interface

The PV8600 Control Interface of IT9000 software is as shown below.



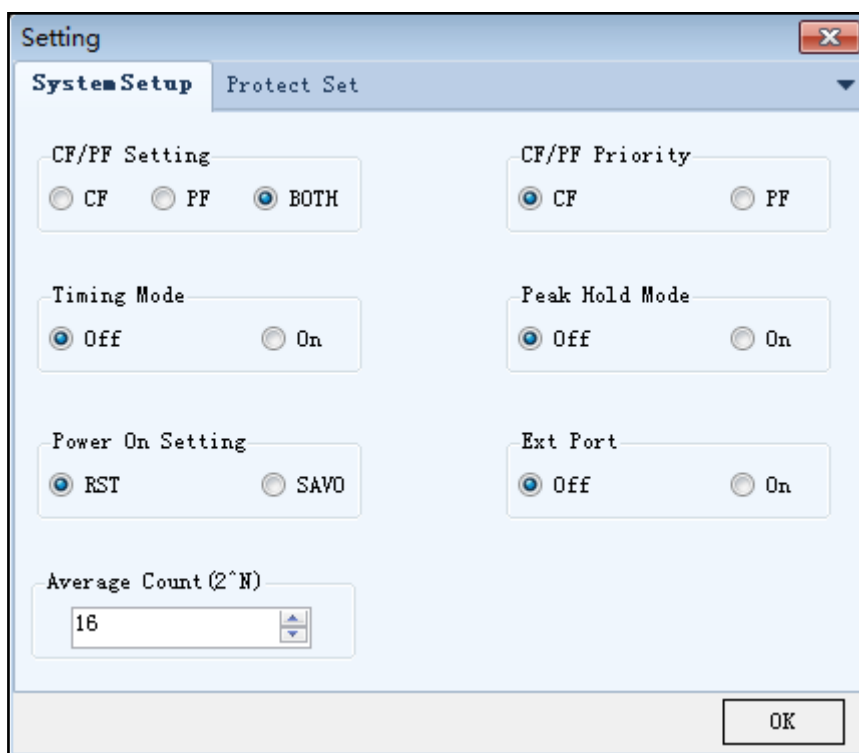
1. Tab bar, to switch the display of Control Interfaces of different devices.
2. Toolbar, main functions include:
 - Online:** remote control, to set the load to Remote Control mode.
 - Offline:** local switch, to return the load back to Local Mode from Remote Mode.
 - Clear Protect:** to clear load protection status.
 - Setup:** set-up function tab.
 - Meter:** measurement function tab.
 - Scope:** wave function tab.
 - Harmonic:** harmonic function tab.
 - List:** list function tab.
 - Setup Phase:** to select phase A, B, C or ABC. You can set ABC phase only in three-phase balance mode.
 - View Phase:** to select the phase A, B or C to display.
3. Display real-time value.

4. Display constant operation mode of load (constant current (CC), constant resistance (CR), constant power (CP) and constant voltage (CV)).
5. Setting values of (constant current ISet), peak factor (CF), power factor (PF), time to load (TOut) under load working mode.
6. Load working mode: AC mode /DC mode.
7. Input status: On/ Off
8. Three-phase balance status: Balance/ Unbalance.
9. Display load status: frequency failure (FE), under-voltage protection (UV), over-current peak protection (OCPP), over-current protection (OCP), over-power protection (OP), over-temperature (OT), over-voltage protection (OV), load failure (LDF).

3.2 Setting Function

Click "Setup" tab to perform system and protection settings.

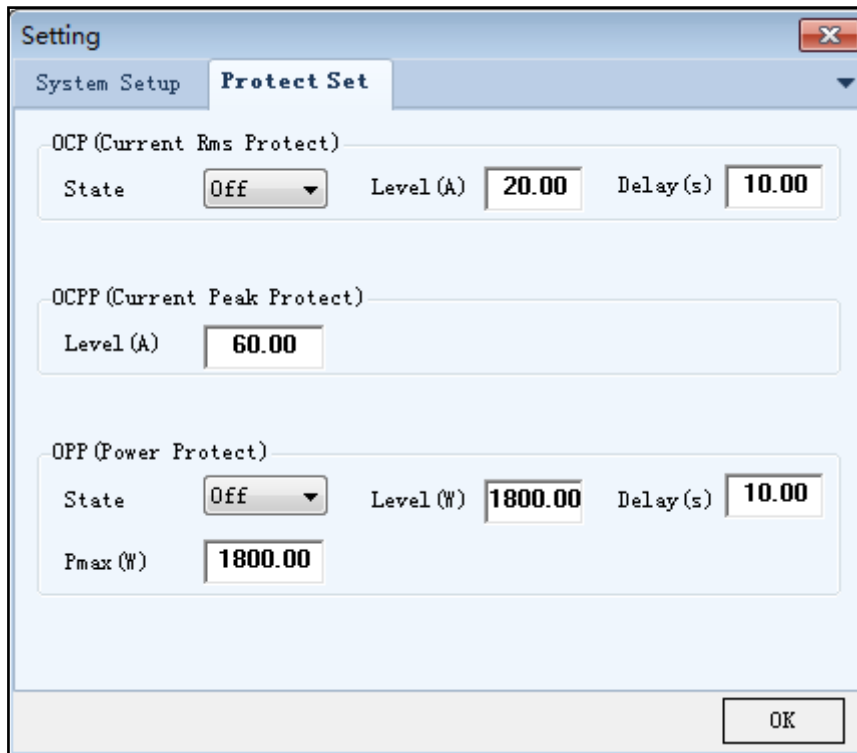
System setup



Character	Function description
CF/PF setting	CF/PF setting options include: CF mode, PF mode and BOTH mode. When BOTH is selected, you need to set the CF/PF priority.
CF/PF Priority	Set the CF/PF priority.
Timing Mode	Set the timing mode: off/on.
Peak Hold Mode	Set the peak holding mode: off/on.
Power On Setting	Set the Power-on status: SAV0/RST If Rst is selected, factory settings are recovered after each start-up. If Sav0 is selected, the voltage and current are the values in the file FILE0.
Ext port	Set the ext port: off/on.

Character	Function description
Average Count (2^n)	Set the average times (1-16).

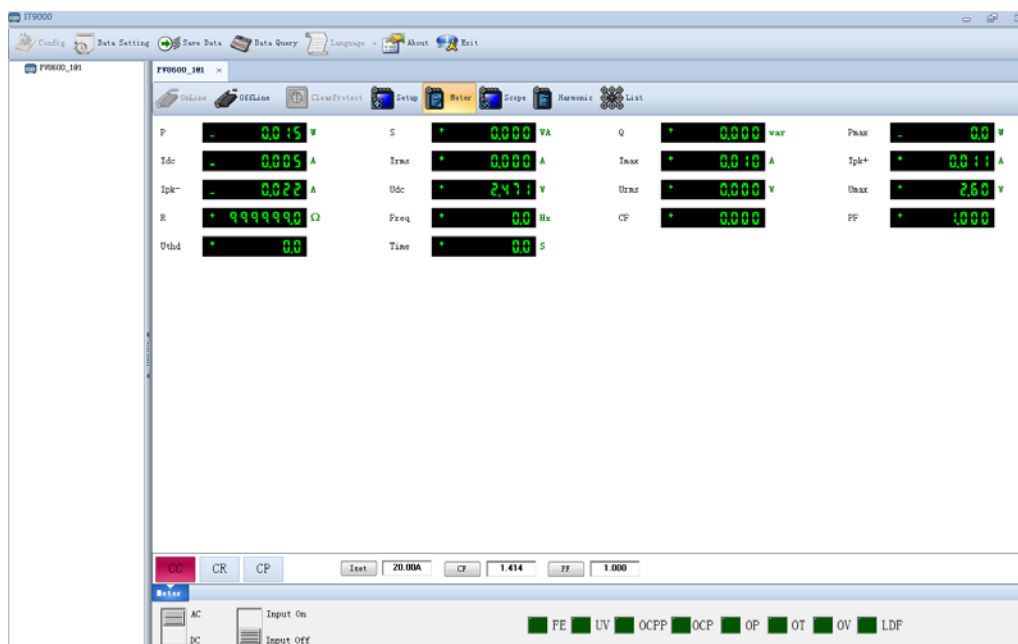
Protection setup



Character	Function description
OCP (current RMS protect)	Set over-current protection (OCP). Status: Enable/disable protection Level (A): Current at the time of OCP Delay (s): Over-current time. When this delay time value is exceeded, protection occurs.
OCPP (current peak protect)	Set over-current peak protection (OCPP) Level (A): Peak current when protection occurs
OPP (power protect)	Set over-power protection (OPP). Status: Enable/disable protection Level (A): Power when OPP occurs. Delay (s): Over-current time. When this delay time value is exceeded, protection occurs. Maximum power (W): Set maximum power.

3.3 Measurement Functions

Click "Measure" tab to display Measurement function interface.

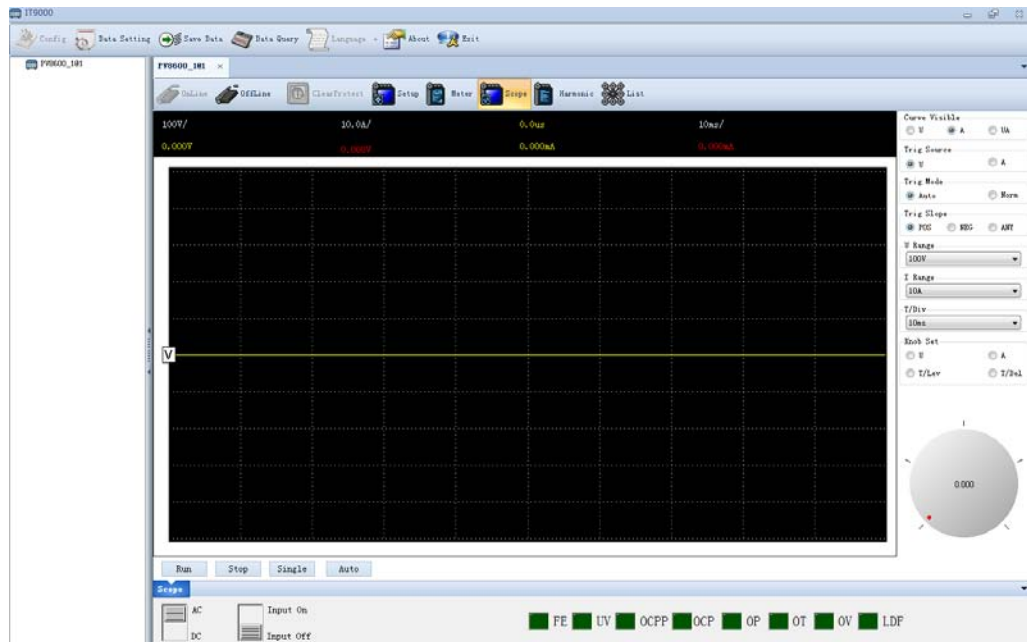


Parameter Measurement

Parameter	Description	Parameter	Description
P	Active power [W]	Udc	Average voltage [V]
S	Apparent power [VA]	Urms	Voltage effective value [V]
Q	Reactive power [var]	Umax	Maximum voltage
Pmax	Maximum power	R	Resistance
Idc	Average current	Freq	Frequency
Irms	Current effective value [A]	CF	Crest factor
Imax	Maximum current	PF	Power factor
Ipk+	Positive current peak value [A]	Uthd	Voltage total harmonic distortion
Ipk-	Negative current peak value [A]	Time	When Timing mode is enabled, the timer starts to count time after the load state is ON. When Timing Mode is Off, Time has been 0.

3.4 Oscilloscope function

Click "Wave" tab to display Oscilloscope function interface.



Curve Visible: select wave, voltage (U) and current (A) displayed on the interface.

Trig Source: select trigger source, voltage signal and current signal.

Trig Mode: select trigger mode: Auto or Normal.

Trig Slope: select trigger slope: Positive, Negative or Any.

U Range: set voltage range of each grid.

I range: set current range of each grid.

T/Div: horizontal (time/scale) setting.

Knob set: set parameters that can be adjusted by knob. Rotate the knob to change corresponding value of the parameter in the parameter. Use Knob to adjust the four parameters below:

- U: voltage benchmark.
- A: current benchmark.
- T/Lev: trigger level.
- T/Del: trigger delay.

Run: Select this button to run Wave status.

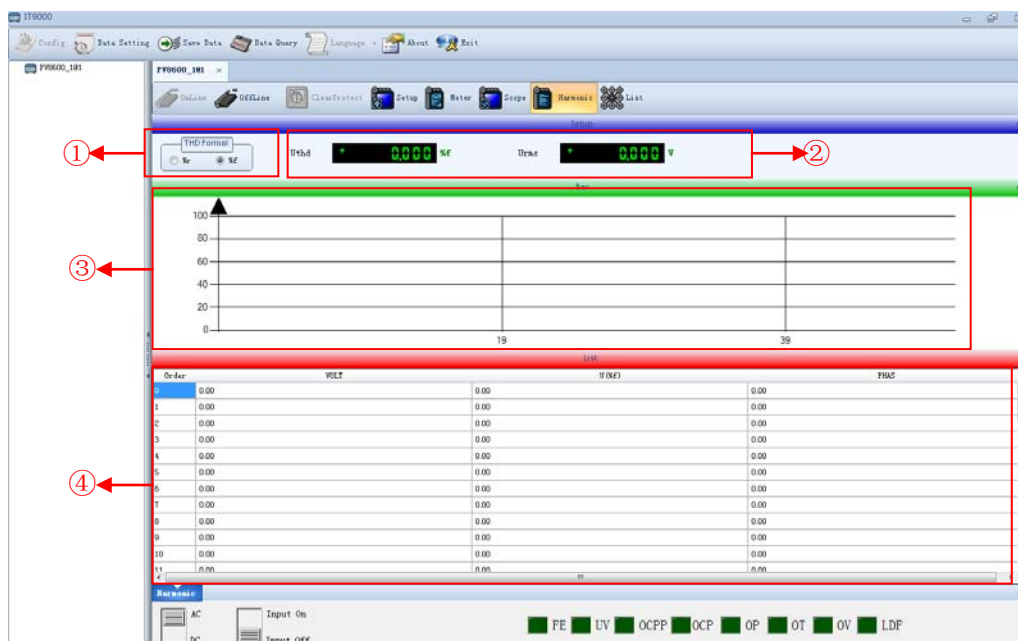
Stop: Select this button to stop Wave status running.

Single: Single measurement button: when single measurement is enabled in the Stop status, the stop status is enabled again after one measurement based on the current data updating rate. When single measurement is enabled in the Run status, the instrument immediately restarts one measurement and then enters the Stop status.

Auto: Automatic adjustment button, the input signal of the power meter will be calibrated automatically to display the best effects of input signals.

3.5 harmonic function

Click "Harmonic" tab to display Harmonic function interface.



1. **THD formula:** Distortion factor calculation formula.

%r: using all harmonic measurement data from the minimum harmonic order (0^{th}) to the maximum harmonic order (within the upper limit of analysis orders) as the denominator.

%f: using the data of fundamental wave (1-order) components as the denominator.

2. **Harmonic measurement parameter:** Uthd/Urms.

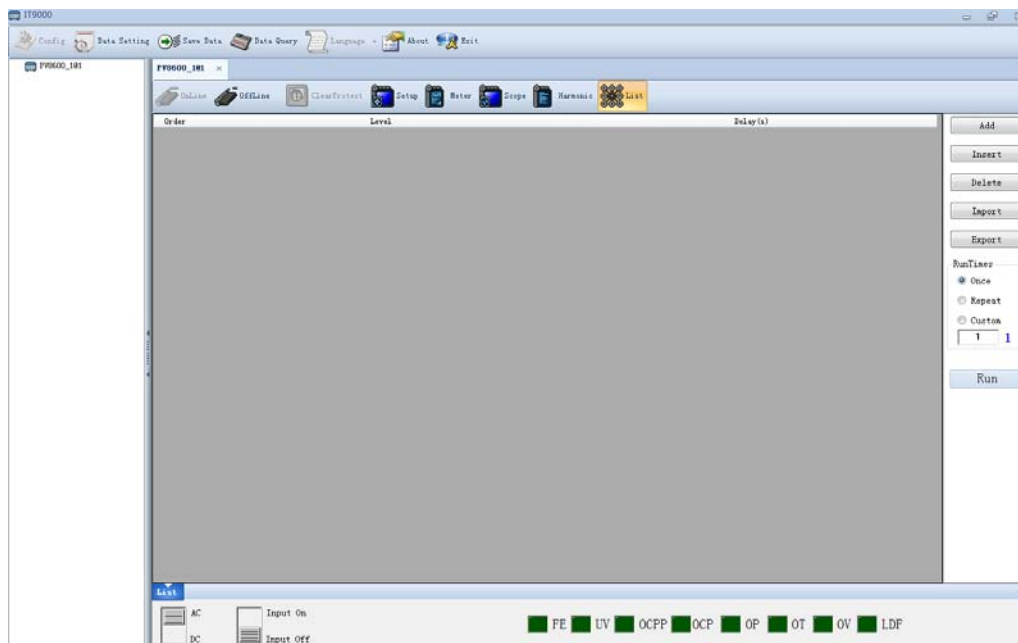
3. **Harmonic bar chart:** display percentage of each harmonic.

4. **Harmonic list:** display voltage, phase and voltage harmonic distortion factor (UTHD) of each harmonic.

3.6 List function

IT9000-PV8600 has the list function. You can edit the List file based on actual requirement, making the instrument to realize complicated load change.

Click "List" tab to display List function interface.



Add/Insert/Delete: to add/insert/delete one step.

Import: to import the list file into the software from computer. The user can edit list file in Excel and save as *.csv format, then import into the software.

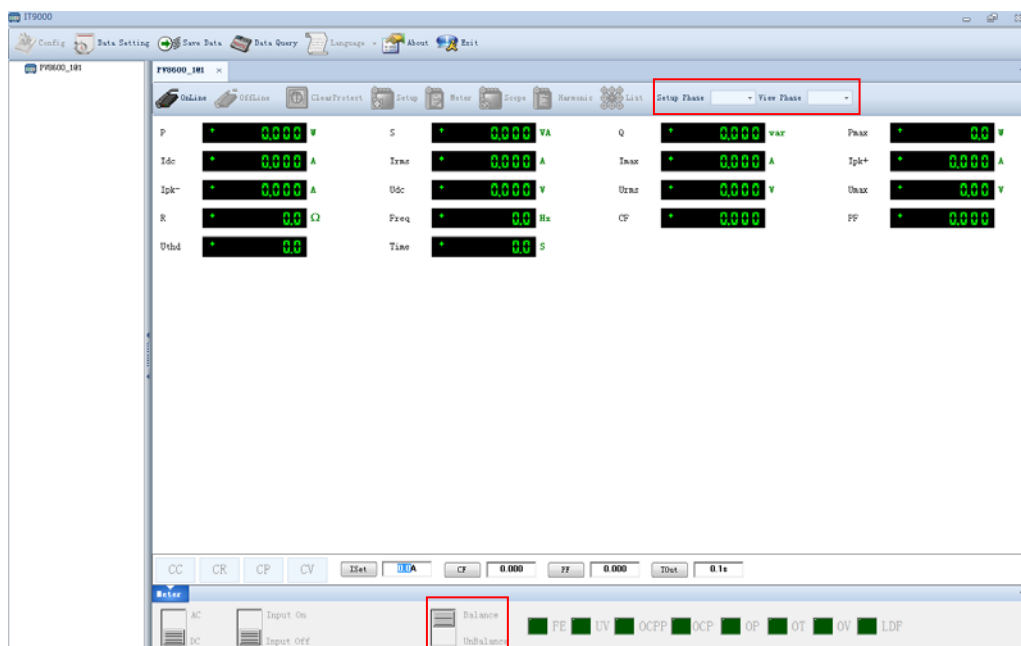
Export: to export the list file into computer. The user can export the list file to computer after editing. The exported file is saved as *.csv format.

RunTimes: to edit the cycles of the list file.

Run: to run the list file.

3.7 Three-phase setup

You can set the three-phase parameters on the IT9000-PV8600 software interface only if the connected instrument has three-phase function.



Setup Phase: to select phase A, B, C or ABC. You can set ABC phase only in three-phase balance mode.

View Phase: to select the phase A, B or C to display.

Three-phase balance status: Balance/ Unbalance.

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