IT9000 Control Software

PV7600 User Manual

Notices

Manual Part Number

IT9000-PV7600-402773

Revision

1st Edition: Mar. 15, 2019

Itech Electronic, Co., Ltd.

Trademarks

Pentium is U.S. registered trademarks of Intel Corporation.

Microsoft, Visual Studio, Windows and MS Windows are registered trademarks of Microsoft Corporation in the United States and/or other countries and regions.

Warranty

Technology Licenses

Restricted Rights Legend

Safety Notices

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.

WARNING

A WARNING sign denotes a hazard. It calls attention to an operating procedure or practice that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING sign until the indicated conditions are fully understood and met.

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 Software Introduction

IT9000-PV7600 is a kind of easy-to-use and practicable control software designed by Itech Electronic Co., Ltd. It is applicable to Itech IT7600 Series power supply. With this software, you can take all operations for power supply 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:
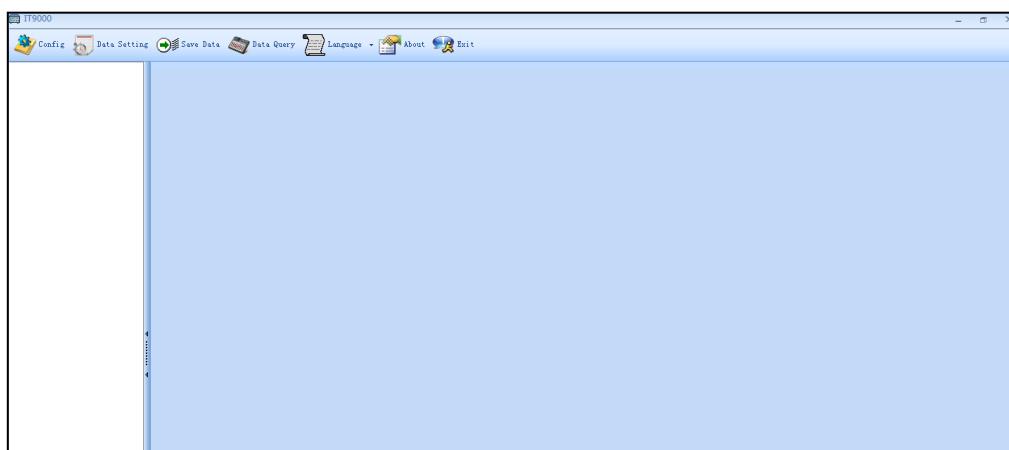
The interface is described as follows:

- **Config**

    Configuration function, to configure hardware information for control power device of IT9000 software control, including power 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.

  📖 NOTE

  For specific functions of Series IT7600, refer to the User Manual of corresponding power supply.

Chapter2 Basic Operation

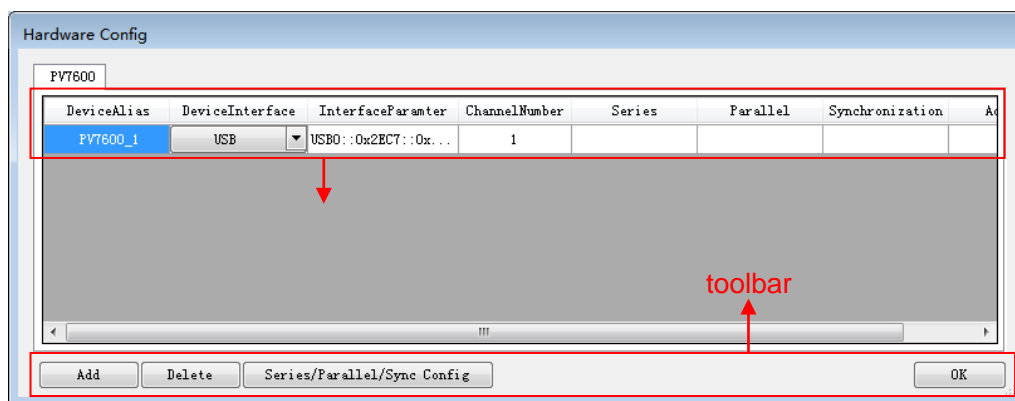## 2.1 Hardware Configuration

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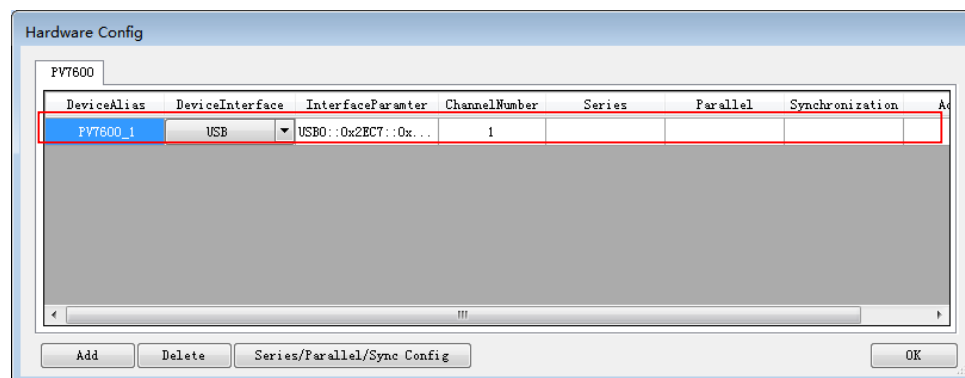
To change default parameter of hardware device (e.g., device interface, interface parameter and channel number), you may click the parameter for change.

- 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 "Configuring Interface of 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.
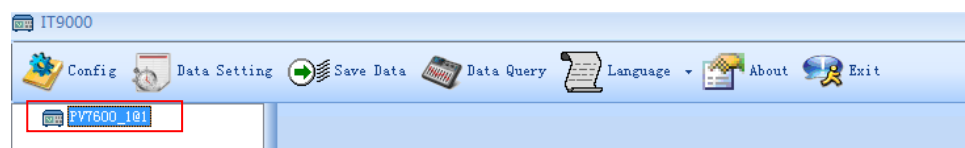
2.1.3 Configuring Interface of Device

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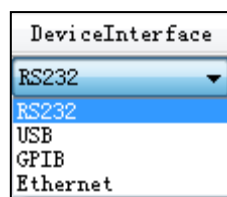
2. After selecting the device interface, double click corresponding "Interface Parameter" column. The system will pop up "Interface Configuration" window.

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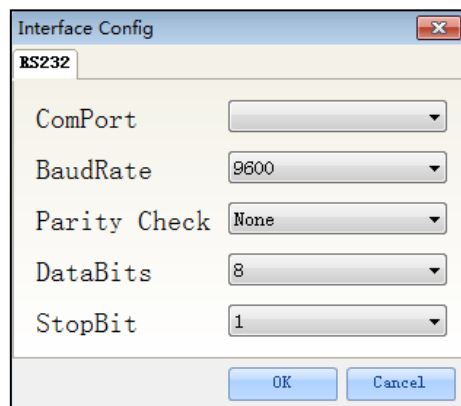
Serial interface: to select serial interface, i.e., the serial interface number occupied by RS232 communication cable interface.

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

● GPIB Interface Parameter Configuration
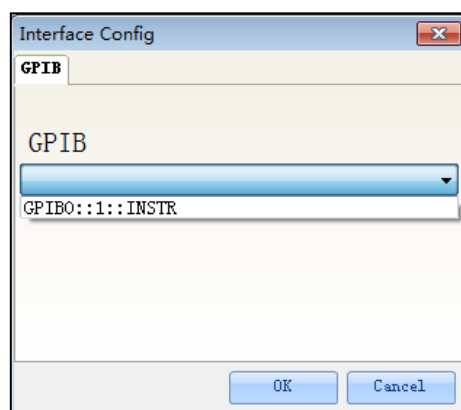
During GPIB communication of power device, the address setting range is: 1-30.

● USB Interface Parameter Configuration
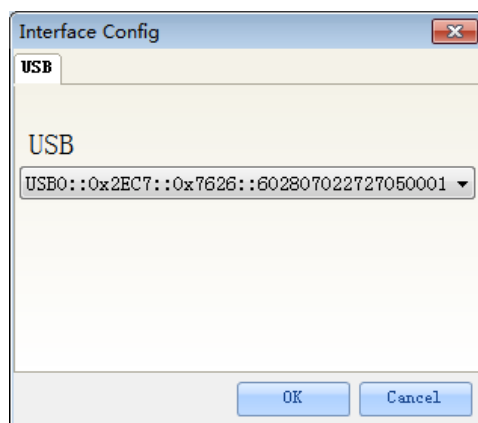
● LAN Interface Parameter Configuration

If LAN interface is used for communication, both computer 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.
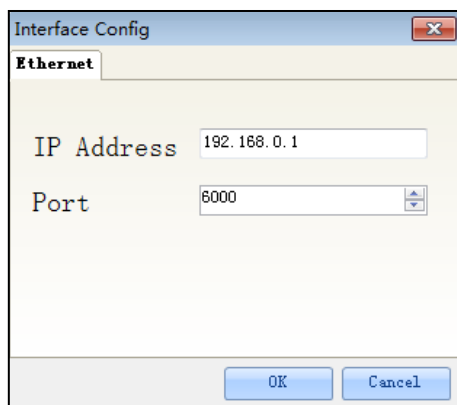
3. After interface parameter configuration, click "OK". Finish interface parameter configuration.

2.2 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.
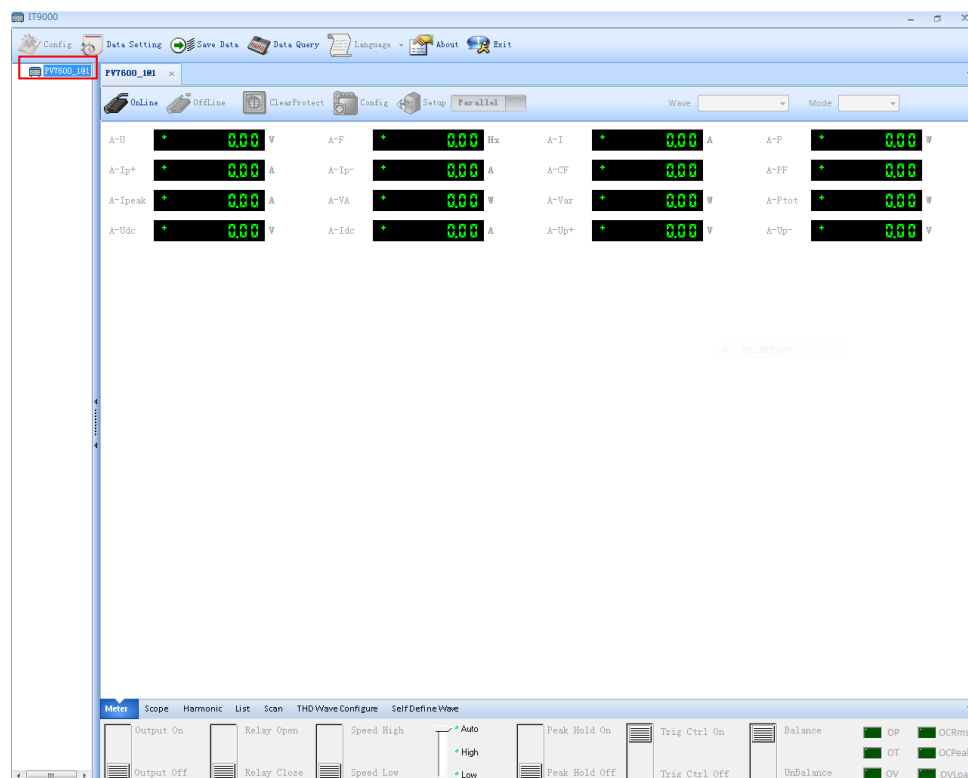
2. Click "Data Setting" icon to enter the Data Setting Interface.
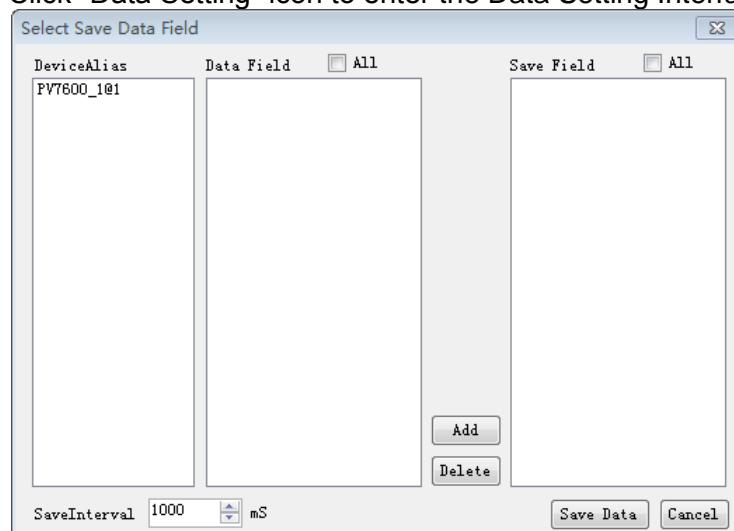
3. Click the alias of the device requiring data saving.
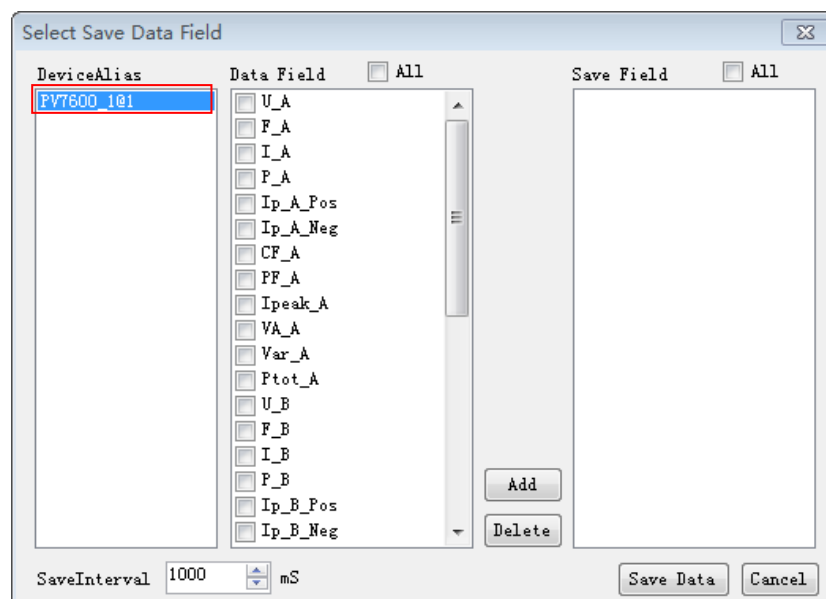
4. In "Data Field" bar, check the box at front of Data Field (U_A, F_A, I_A), and click "Add" button to enter the "Save Field" bar.
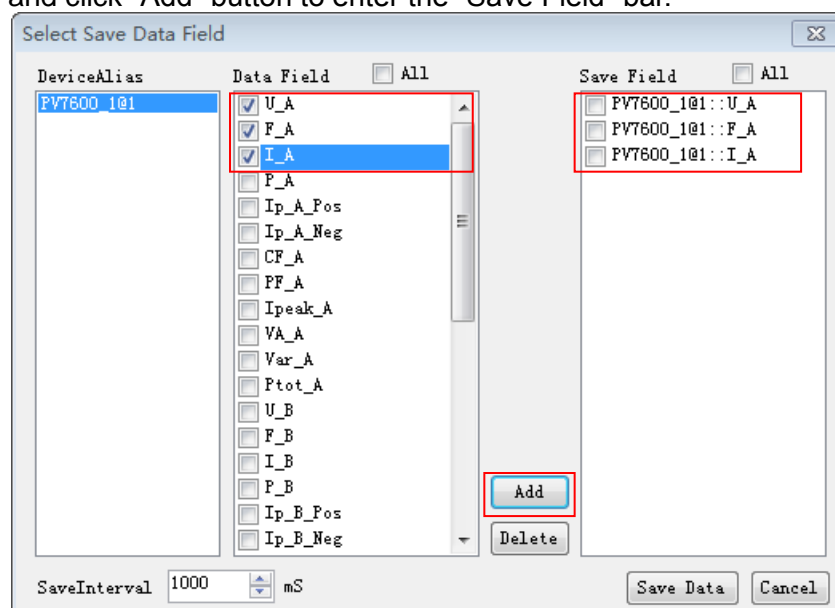
   You may also click the Field Name in the Save Field bar. Click "Delete" button to delete the saved field.

5. Set "Save Interval".
6. Click "Save Data" button to save data setting.
7. In the Control Interface, click [Save Data] icon to appear the interface as shown below. You need to input Save File Name.
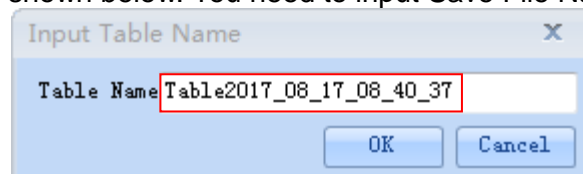
8. Click "OK" button in the figure above to start data save. Then, the icon will change to [Stop Save], and "Data Setting" and "Data Query" will be

grayed out. Click [Stop Save] 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 [Data Query] icon to enter the Data Query Interface.
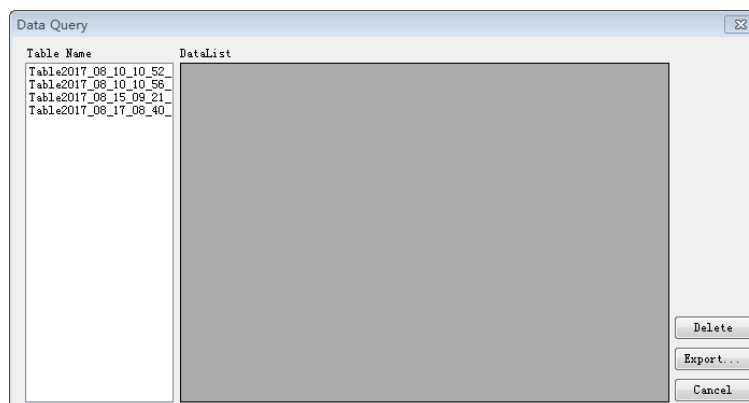
2. In Data Query Interface, select and click the "Table Name" of data saving, and the test data will be displayed in the data list. As shown below.
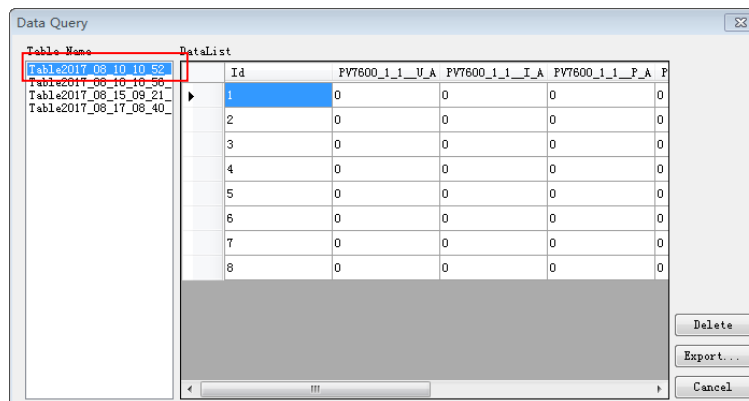
- Delete: to delete the data in current data list.
- Export: Click Export to export the data in current data list to EXCEL table. Saving path is optional.
- Cancel: to exit the Data Query Interface.

Chapter3 PV7600 Control Interface

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

IT7600 series support two modes: parallel mode and three-phase mode. IT7622, IT7624 and IT7626 are single instruments and only support parallel mode. IT7625, IT7627 and IT7628 support both parallel mode and three-phase mode. IT7628L, IT7630, IT7632, IT7634 and IT7636 only support three-phase mode.

The screenshots in this chapter are based on parallel mode and similar to that on three-phase mode. The screenshots varies from different models, so please take the actual interfaces of instrument and software.

3.1 Introduction of Control Interface

The PV7600 Control Interface of IT9000 software is as shown below.
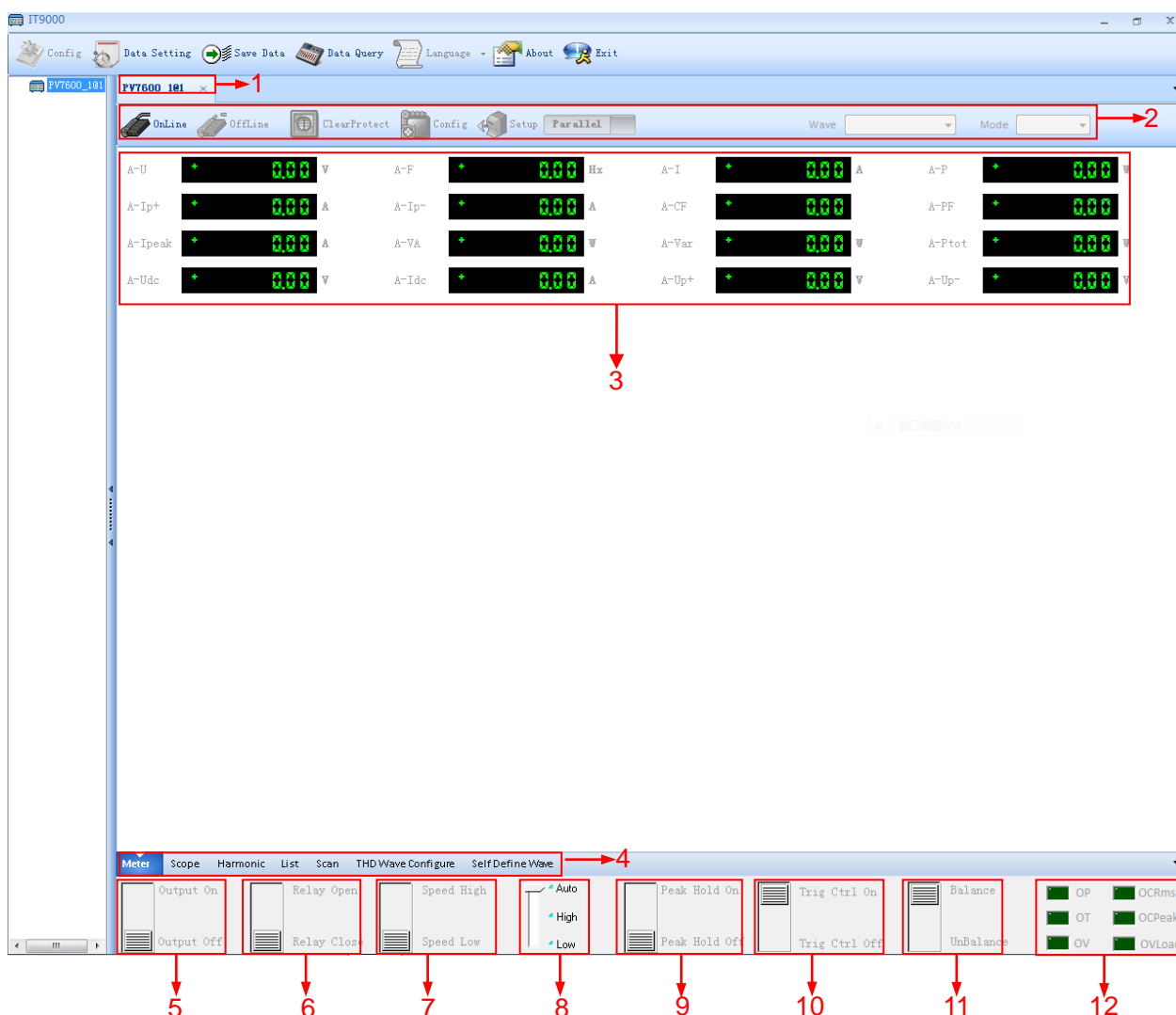
1. Tab bar, to switch the display of Control Interfaces of different devices.

2. Toolbar, main functions include:

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

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

Clear Protect: to clear power protection status.

Config: Trigger source, External simulation control, Current root mean square, Current peak, Immediate protection/Delay protection, Delay time.

Setup: AC/DC voltage value, Frequency, Start phase angle, Stop phase angle.

Parallel/3-phase: to switch parallel or 3-phase mode.

Wave: to choose waveform.

Mode: to switch AC/DC/ACDC mode.

3. Display real-time value.

4. Function bar: Measurement function, Oscilloscope function, Harmonic function, List function, Sweep function, THD Wave configure, Self-defined wave function.

5. Switch output status of power supply: Output on / Output off

6. Relay control: Relay Open / Relay Close.

7. Output loop speed control: Speed High / Speed Low.

8. Selection of output range: Auto range / High range / Low range.

9. Peak holding mode: Peak Hold On / Peak Hold Off.

10. Trigger control: Trig Ctrl On / Trig Ctrl Off.

11. 3-phase mode: Balance / UnBalance.

12. Status indicator: Over-power protection, Over-temperature protection, Over-voltage protection, Over-current protection (Peak OCP, Root mean square OCP), Over-load protection, List, Step, Digital signal generate protection.

3.2 Meter

IT9000-PV7600 has rich functions of basic metering of electric energy and can accurately measure the parameters such as U、F、I、P、IP+、IP-.

In the case of parallel mode, the software interface is shown in the next figure. In three-phase mode, the measuring parameters display zone will display the parameters of phase A, B and C. Please refer to the actual instrument for detailed information.

Measuring parameters display zone
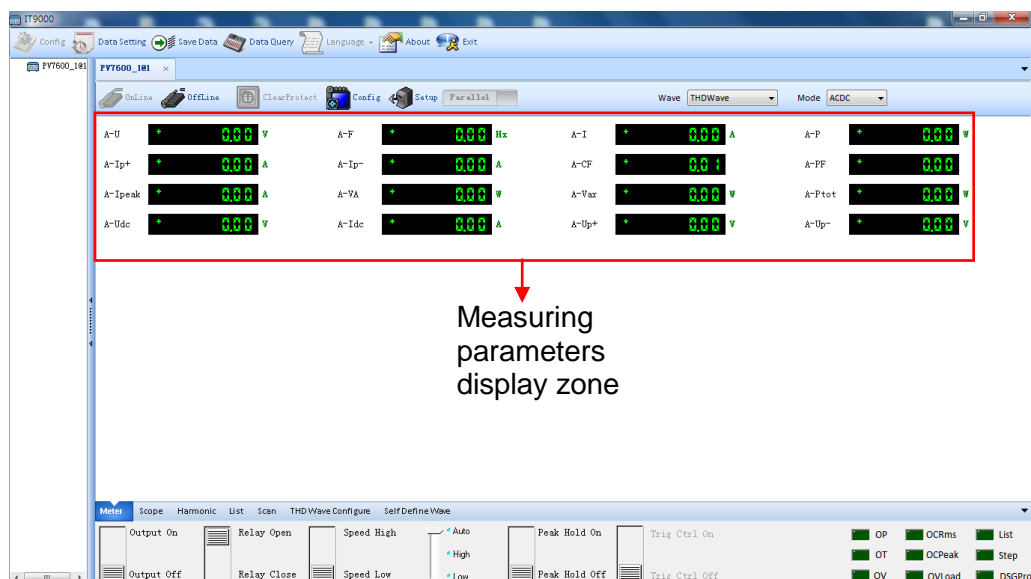
3.3 Scope

IT9000-PV7600 has the function of displaying the waveform based on sampling data. The user can select to display or hide the voltage and current waveform of the input unit. Only the necessary waveform is displayed, which can facilitate observation. The waveform display interface includes the vertical axis and horizontal axis. In the case of parallel mode, click "scope". The interface of scope is shown in the next figure.
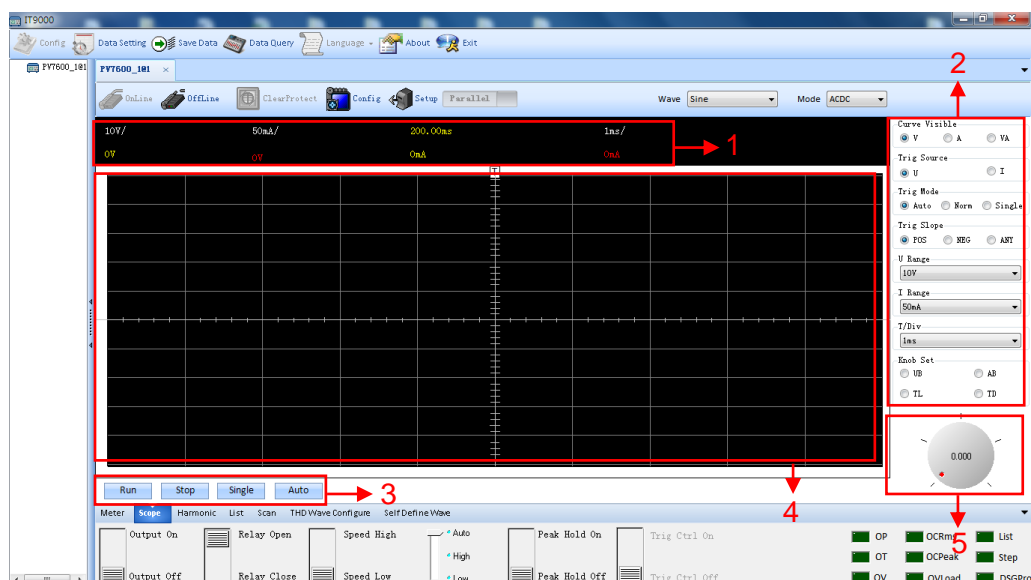
1. Variables of scope: Voltage grid, Current grid, Trigger delay, Time grid, Voltage base, Trigger level (trigger source: U), Current base, Trigger level (trigger source: I).

2. Adjust the scope and set the trigger.

    Run: click Run to read wave; click Stop to stop reading.

    Curve visible: to select the waveform to display on the interface: voltage, current and voltage/current.

Trigger source: to select trigger source: Voltage/Current.

Trigger mode: to select the Auto, Normal or Single mode.

Trigger slope: to select POS (rising edge), NEG (falling edge) or ANY (rising/falling).

U range: to set the voltage range.

I range: to set the current range.

T/Div: time grid, to set the horizontal calibration.

3. Toolbar.

**Run/Stop:** click this button to run/stop wave.

Single: single measurement key: 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 key: when the corresponding soft key is pressed, the input signal of the power meter will be calibrated automatically

to display the best effects of input signals.

4. Waveform display zone: right click in the waveform display zone, "Save to BMP" will display on the interface. You can save the wave diagram to computer in the form of .png /.gif /.jpg /.tif /.bmp.

5. Knob Select: set the parameters to be adjusted by the Knob. When the Knob is rotated, corresponding parameter value on the interface will be changed. The following four types of parameters can be adjusted by Knob: UB (Voltage base), AB (Current base), TL (Trigger level), TD (Trigger delay).

In the three-phase mode, the following options will display beneath the waveform zone. You can select the waveform of phase A/B/C/All to display on the interface.
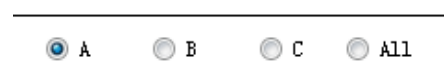
3.4 Harmonic

IT9000-PV7600 can display harmonic parameters in the list or bar chart form to make the analysis of test result clear. In the case of parallel mode, click "Harmonic". The interface of scope is shown in the next figure.
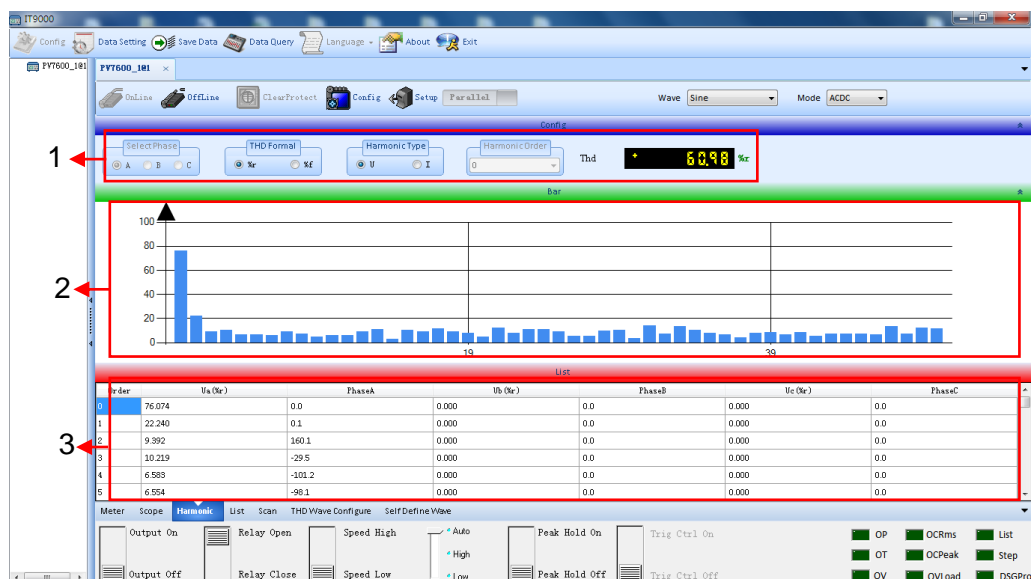
1. Configure the harmonic.

   Select Phase: to select the phase A/B/C to display in the bar chart (only in the three-phase mode).

   THD Formula: Distortion factor calculation formula: %r (displaying harmonics in the form of percentage to the overall voltage amplitude of all harmonics) / %f (displaying harmonics in the form of percentage to the fundamental voltage).

   Harmonic Type: to select the voltage/current harmonic. When "U" is selected, the list will display the voltage and phase values under various harmonics. When "I" is selected, the current and phase values will be displayed.

   Harmonic Order: to select the harmonic order to display in the bar chart (only in the three-phase mode).

   Thd: total harmonic distortion (THD) factors.

2. Harmonic bar chart. The vertical coordinate shows the percentage of each harmonic measurement and the horizontal ordinate shows the harmonic order. Right click in the harmonic bar chart, "Save to BMP" will display on the interface. You can save the diagram to computer.

3. Harmonic list. Under parallel mode, the list only displays measurement results for Phase A, and displays 0 for the other two phases. Under three-phase mode, display effective values for the three phases. Right click in the harmonic list, "Export to Excel" will display on the interface. You can save the list to computer.

3.5 Vector

The vector diagram is another kind of demonstration of parameters in the harmonic function. The vector function is valid only in the three-phase mode. The vector diagram displays the maximum U, I or UI values of the phase A, B and C. The phase A, B and C are respectively in yellow, green and red.
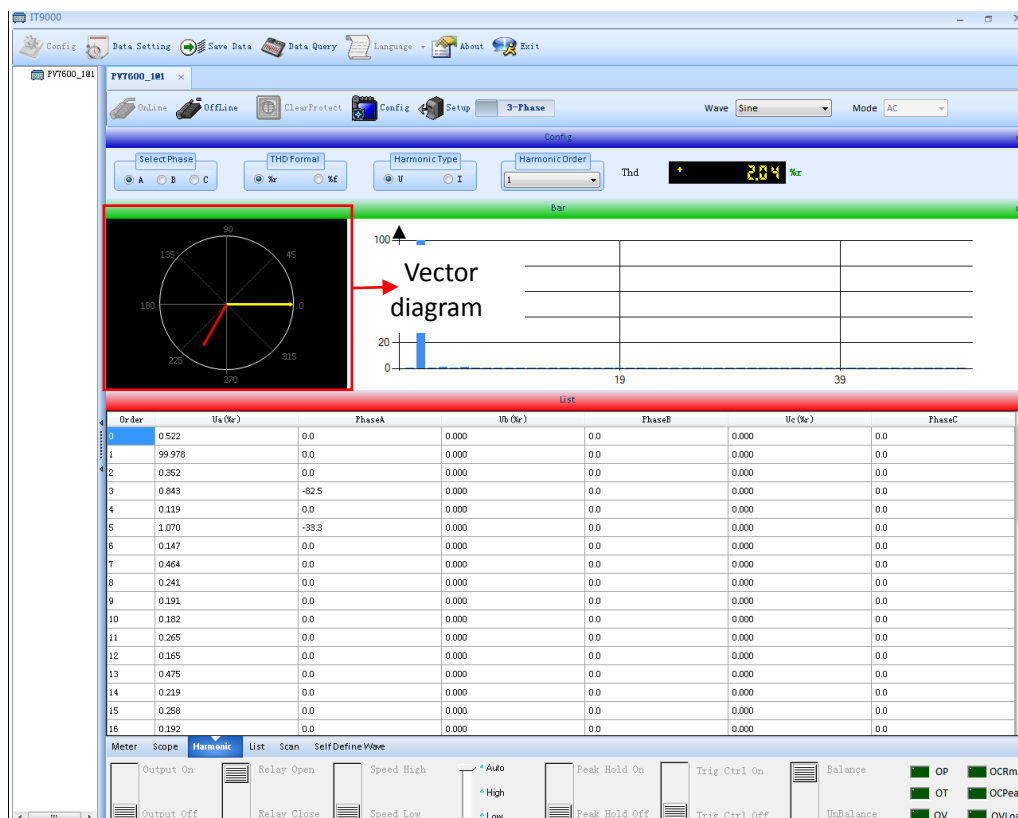
3.6 List

IT9000-PV7600 has the list function. Under List mode, at maximum of 50 steps can be edited for each List file. The user can choose any waveform from existing 11 waveforms. Or, the user can choose a waveform file stored in the device through self-define function (see 3.8 Self-defined Waveform for details) and combine the waveform files into a List file based on required order. Meanwhile, the user can set the starting steps of the List file, run count and end state of the waveform, and edit parameters such as frequency, amplitude, running time and rising slope of each waveform.

In the case of parallel mode, click "List". The interface of list is shown in the next figure. In three-phase mode, you can edit the parameters of phase A, B and C. Please refer to the actual instrument for detailed information.
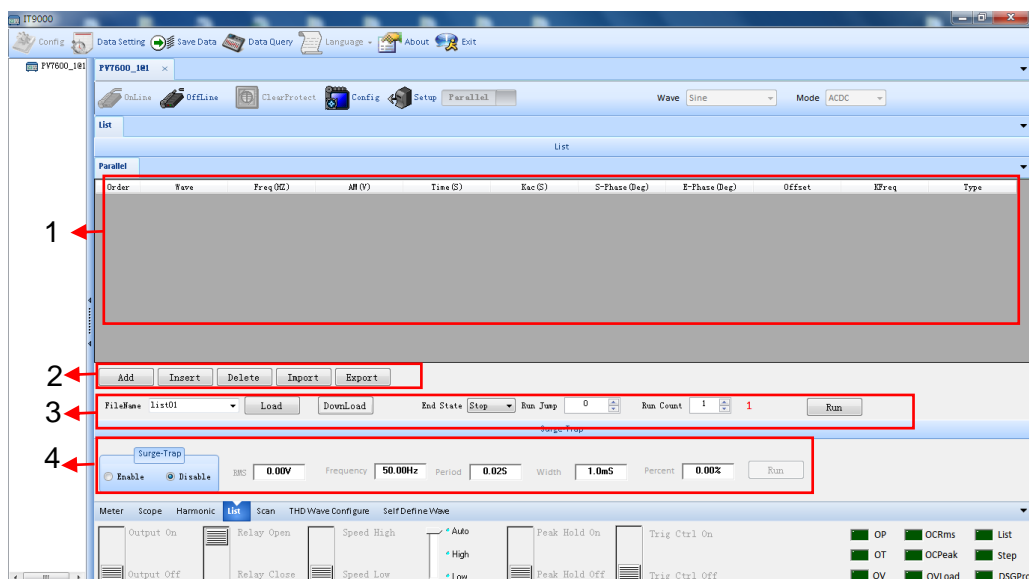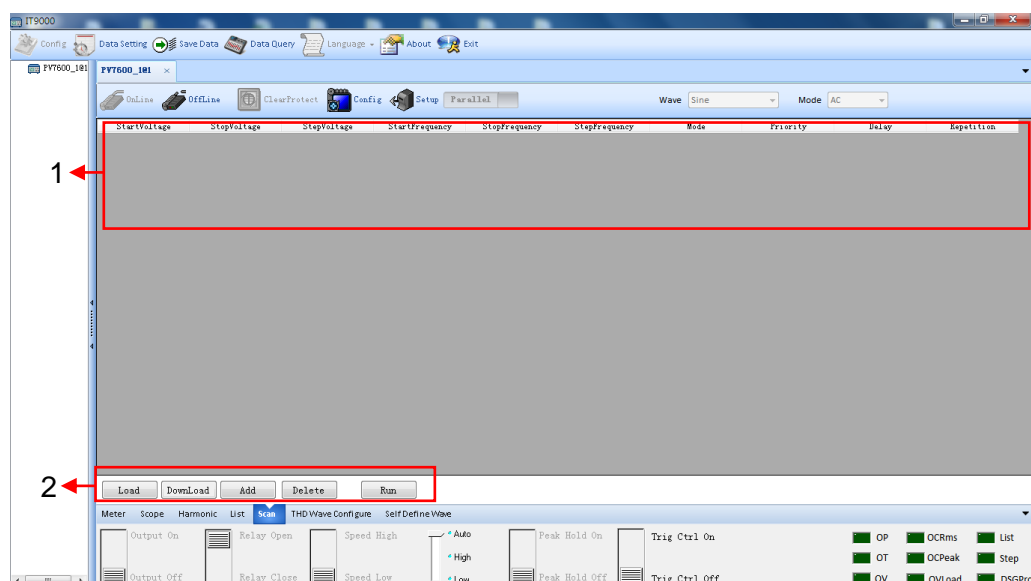
1. List file editing and display zone. Double click the column or select in the drop-down list to edit the single step.

2. Toolbar.

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

   Import: to import the list file into the software. The user can edit list file in Excel, 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.

3. Configure the List file.

   FileName: to name the list file.

   Load: to load the list file into software.

   DownLoad: to download the list file into instrument.

   End State: to set the end state of the final waveform: Stop (directly stop the waveform output after operation)/Last (keep the last waveform output unchanged after operation)。
   Run Jump: to edit the starting step of the list file in the loop.
   Run Count: to edit the cycles of the list file.
   "1": to display the number of the loop.
   Run: to run the selected list file.
4. Configure the Surge-Trap. Enable/Disable the Surge-Trap and set the AC signal amplitude (RMS), frequency, period, width and the percentage of the surge/trap amplitude to AC signal amplitude.

3.7 Scan

The Scan function is used to test efficiency of switching power supply and capture the voltage and frequency at the maximum power point. The voltage and frequency of power may be altered in the form of step ladder by setting the initial voltage, final voltage, step voltage, initial frequency, final frequency, step frequency and one-step time. As the test closes, voltage and frequency at the maximum power point may be displayed. Scan function is not applicable under DC mode and ACDC mode. And the sweep waveform can only be sine wave.

In the case of parallel mode, click "Scan". The interface of scan is shown in the

next figure.

1. Scan file editing and display zone. You can add more than one scan file in the zone. Double click the column or select in the drop-down list to edit the file. Only one scan file can be run each time.

2. Toolbar.

   Load: to load the selected scan file into software.

   **DownLoad:** to download the selected scan waveform file into instrument.

   Add/Delete: to add/delete the selected scan waveform file**.**

   Run: to run the selected scan waveform file.

3.8 Self-defined Waveform

Self-defined Wave Edit is mainly used for selecting corresponding waveform during List operation. The new waveform file, after saving, will be added after the original waveform file. The user can self-define five waveform files at maximum.

In the case of parallel mode, click "Self Define Wave". The interface is shown in the next figure.
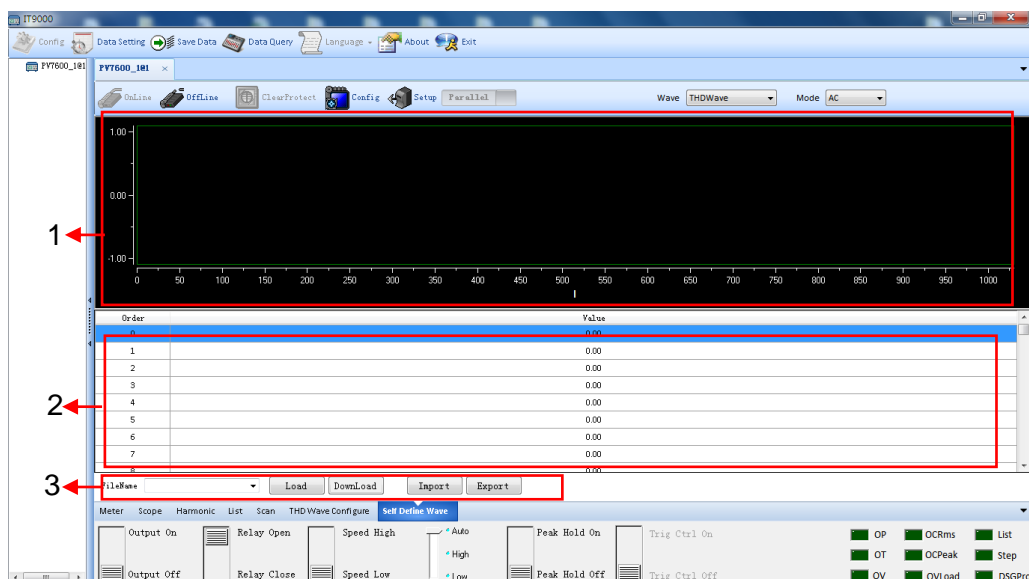
1. Self-defined waveform display zone.

2. Self-defined waveform edit zone. Double click the value column to edit the corresponding parameter. Set each coordinate point of the waveform. At maximum of 1,024 coordinate points can be set.

3. Configure the self-defined waveform.

    FileName: to name the waveform file.

    Load: to load the Self-defined waveform file into software.

    DownLoad: to download the Self-defined waveform file into instrument.

    Import: to import the self-defined waveform file into the software.

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

3.9 THD Wave Configure

The distorted waveform can simulate voltage harmonic wave in the circuit. The user can set the extent to which the output voltage waveform deviates from the Sin wave voltage and test the usage of the DUT under this circumstance.

In the case of parallel mode, click "THD Wave Configure". The interface is shown in the next figure.
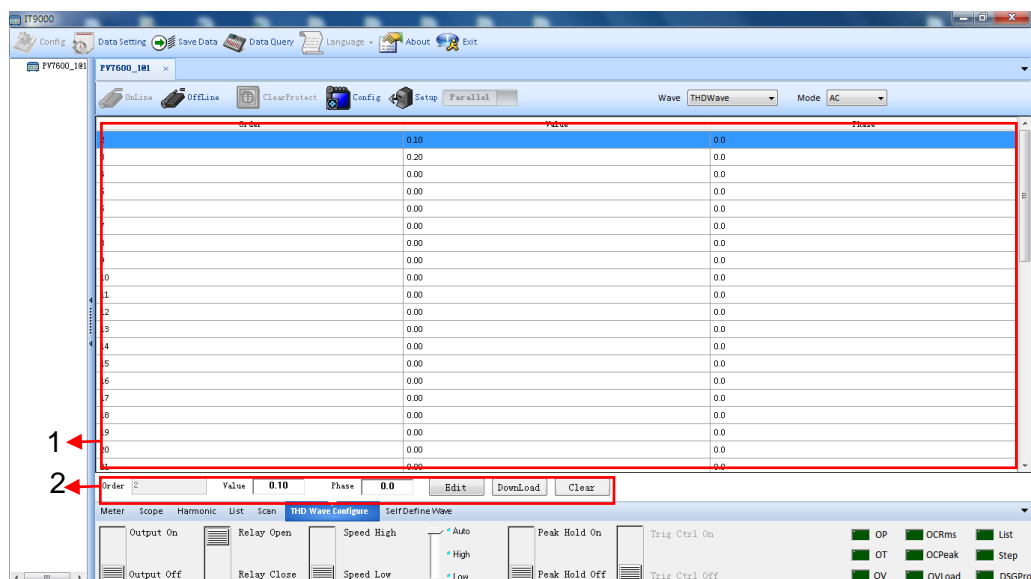
1.   Distortion waveform parameter display zone.

2.   Configure the harmonic distortion waveform.

Order: to display the above selected order number.

Value: to set the corresponding harmonic distortion factor within the range 0-0.3. Max Total Harmonic Distortion≤0.3 if multiple set.

Phase: to set the corresponding harmonic phase within the range 0°-360°.

**Edit:** to make the set parameters valid and display in above zone after setting.

DownLoad: to download the configured THDwave file into instrument.
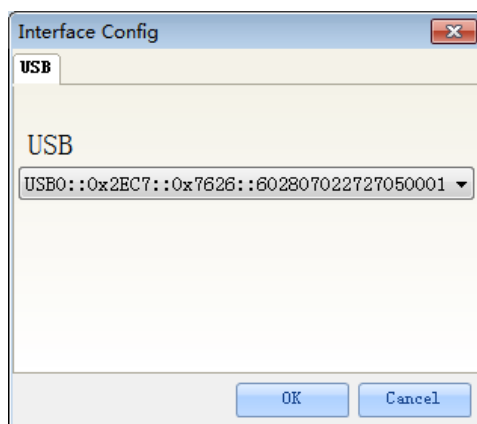
Clear：to clear the table.

Chapter4 Troubleshooting

Judgment Method of Standard USB Interface

If a standard USB interface is used for connecting instrument, with MAX query, a device serial number will appear. Check the appearing device serial number conformed to actual device.
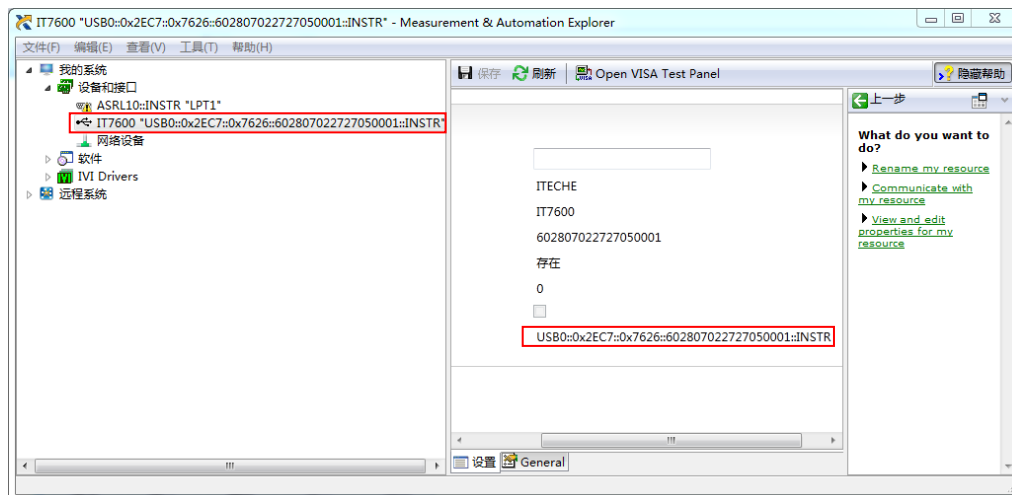
You may visualize it in IT9000 hardware configuration:

Contact US

Thank you for purchasing ITECH products. If you have any doubt about this product, please contact us as follows.

1. Please refer to the CD-ROM of related user's manual in package.
2. Visit ITECH website www.itechate.com.
3. Select the most convenient contact for further consultation.