PV-N6900 Software

User Manual

Notices

Revision

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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.

Quality Certification and Assurance

We certify that IT-N6900 series instruments meet all the published specifications at time of shipment from the factory.

Warranty

ITECH warrants that the product will be free from defects in material and workmanship under normal use for a period of one (1) year from the date of delivery (except those described in the Limitation of Warranty below).

For warranty service or repair, the product must be returned to a service center designated by ITECH.

- The product returned to ITECH for warranty service must be shipped PREPAID. And ITECH will pay for return of the product to customer.
- If the product is returned to ITECH for warranty service from overseas, all the freights, duties and other taxes shall be on the account of customer.

Limitation of Warranty

This Warranty will be rendered invalid in case of the following:

- Damage caused by circuit installed by customer or using customer own products or accessories;
- Modified or repaired by customer without authorization;
- Damage caused by circuit installed by customer or not operating our products under designated environment;
- The product model or serial number is altered, deleted, removed or made illegible by customer;
- Damaged as a result of accidents, including but not limited to lightning, moisture, fire, improper use or negligence.

Safety Symbols

⎓	Direct current	|	ON (power on)
∼	Alternating current	○	OFF (power off)
⎓ ∼	Both direct and alternating current	⎍	Power-on state
⏚	Protective conductor terminal	⎕	Power-off state
⏚	Earth (ground) terminal	±	Reference terminal
⚠	Caution, risk of electric shock	+	Positive terminal
⚠	Warning, risk of danger (refer to this manual for specific Warning or Caution information)	−	Negative terminal

	Frame or chassis terminal	-	-

Safety Precautions

The following safety precautions must be observed during all phases of operation of this instrument. Failure to comply with these precautions or specific warnings elsewhere in this manual will constitute a default under safety standards of design, manufacture and intended use of the instrument. ITECH assumes no liability for the customer's failure to comply with these precautions.

WARNING

- Do not use the instrument if it is damaged. Before operation, check the casing to see whether it cracks. Do not operate the instrument in the presence of inflammable gasses, vapors or dusts.
- The electronic load is provided with a power line during delivery and should be connected to a socket with a protective earth terminal. Before operation, be sure that the instrument is well grounded.
- Make sure to use the power cord supplied by ITECH.
- Check all marks on the instrument before connecting the instrument to power supply.
- Use electric wires of appropriate load. All loading wires should be capable of bearing maximum short-circuit current of electronic load without overheating. If there are multiple electronic loads, each pair of the power cord must be capable of bearing the full-loaded rated short-circuit output current
- Ensure the voltage fluctuation of mains supply is less than 10% of the working voltage range in order to reduce risks of fire and electric shock.
- If you use the power supply to charge the battery, pay attention to the positive and negative polarity of the battery when wiring, otherwise the power supply will be damaged!
- Do not install alternative parts on the instrument or perform any unauthorized modification.
- Do not use the instrument if the detachable cover is removed or loosen.
- To prevent the possibility of accidental injuries, be sure to use the power adapter supplied by the manufacturer only.
- We do not accept responsibility for any direct or indirect financial damage or loss of profit that might occur when using the instrument.
- This instrument is used for industrial purposes, do not apply this product to IT power supply system.
- Never use the instrument with a life-support system or any other equipment subject to safety requirements.

CAUTION

- Failure to use the instrument as directed by the manufacturer may render its protective features void.
- Always clean the casing with a dry cloth. Do not clean the internals.

- Make sure the vent hole is always unblocked.

Environmental Conditions

The instrument is designed for indoor use and an area with low condensation. The table below shows the general environmental requirements for the instrument.

Environmental Conditions	Requirements
Operating temperature	0°C to 40°C
Operating humidity	20%-80% (non-condensation)
Storage temperature	-10°C to 70 °C
Altitude	Operating up to 2,000 meters
Pollution degree	Pollution degree 2
Installation category	II

Note

To make accurate measurements, allow the instrument to warm up for 30 min before operation.

Regulatory Markings

CE	The CE mark indicates that the product complies with all the relevant European legal directives. The specific year (if any) affixed refers to the year when the design was approved.
UKCA	The UKCA mark indicates that the product complies with all relevant UK legal regulations (if accompanied by a year, it indicates the year the design was approved).
	The instrument complies with the WEEE Directive (2002/96/EC) marking requirement. This affixed product label indicates that you must not discard the electrical/electronic product in domestic household waste.
	This symbol indicates the time period during which no hazardous or toxic substances are expected to leak or deteriorate during normal use. The expected service life of the product is 10 years. The product can be used safely during the 10-year Environment Friendly Use Period (EFUP). Upon expiration of the EFUP, the product must be immediately recycled.

Waste Electrical and Electronic Equipment (WEEE) Directive

This product complies with the WEEE Directive (2002/96/EC) marking requirement. This affix product label indicates that you must not discard the electrical/electronic product in domestic household waste.

Product Category

With reference to the equipment classifications described in the Annex I of the WEEE Directive, this instrument is classified as a “Monitoring and Control Instrument”.

To return this unwanted instrument, contact your nearest ITECH office.

Compliance Information

Complies with the essential requirements of the following applicable European Directives, and carries the CE marking accordingly:

- Electromagnetic Compatibility (EMC) Directive 2014/30/EU
- Low-Voltage Directive (Safety) 2014/35/EU

Conforms with the following product standards:

EMC Standard

IEC 61326-1:2012/ EN 61326-1:2013 [1][2][3]

Reference Standards

CISPR 11:2015+A1:2016 Ed 6.1
IEC 61000-3-2: 2018 RLV
IEC 61000-3-3: 2013+A1:2017
IEC 61000-4-2:2008
IEC 61000-4-3 2006+A1:2007+A2:2010/ EN 61000-4-3 A1:2008+A2:2010
IEC 61000-4-4:2012
IEC 61000-4-5:2014+A1:2017
IEC 61000-4-6:2013+cor1:2015
IEC 61000-4-11:2004+A1:2017

1. The product is intended for use in non-residential/non-domestic environments. Use of the product in residential/domestic environments may cause electromagnetic interference.
2. Connection of the instrument to a test object may produce radiations beyond the specified limit.
3. Use high-performance shielded interface cable to ensure conformity with the EMC standards listed above.

Safety Standard

IEC 61010-1:2010+A1:2016

Content

Chapter 1 Introduction

1.1 Software Introduction

PV-N6900 software is a kind of easy-to-use and practicable control software designed by Itech Electronic Co., Ltd. It can work with IT-N6900 series power supplies. This software allows the user to control the computer to achieve all the operations on the front panel of the power supply, providing great convenience to the user when performing remote operations.

1.2 PV-N6900 Interface

After running the PV-N6900, the software initializes and the following screen will appear after about 2S.

The interface is described as follows.

- Bench Vue

  Add device channels and perform specific tests.

- Data Management

  View or export the data recorded and saved during the test.

- Start All

  Turn on all the outputs of the added channels.

- Stop All

Turn off all outputs of the added channels.

- 

  Configure device communication, add channels.

- **Language**

  Select the software language version, Simplified Chinese, Traditional Chinese and English.

- **About**

  Software related information, including company website.

- **Demo Mode**

  No need to connect PV-N6900 series power supply to enter the software demo interface.

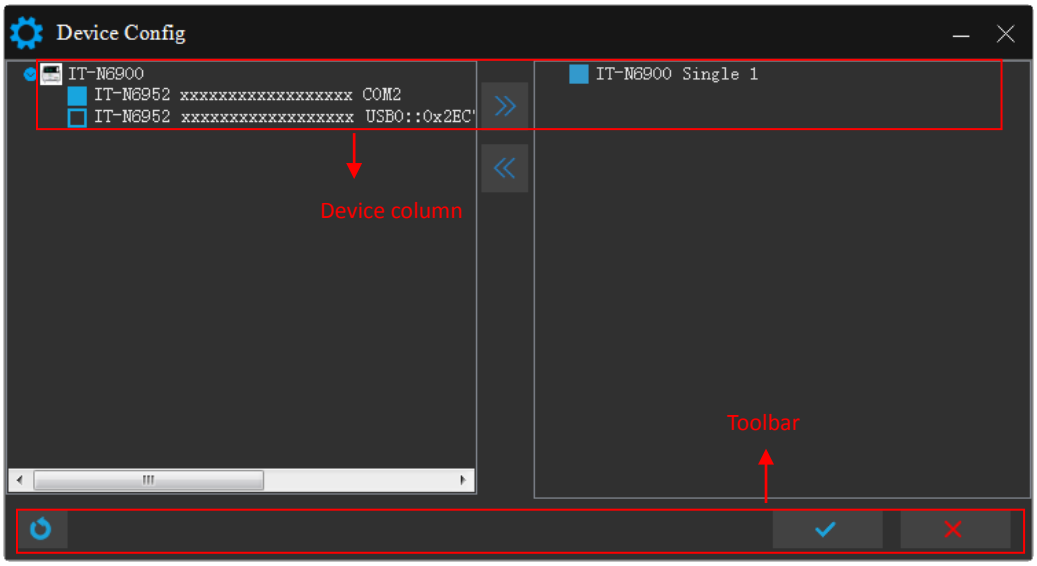
Note

For specific features of the IT-N6900 series power supply, please refer to the user's manual.

Chapter 2 Basic Operations

2.1 Hardware Configuration

The hardware configuration interface of PV-N6900 software is shown in the following figure.

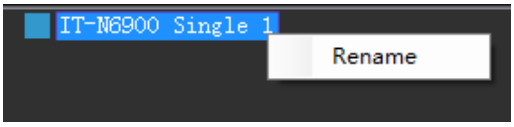


- **Device column**

  When the IT-N6900 series instrument is successfully connected to the PC communication cable and the driver is successfully installed, the device list will automatically scan out the successfully identified instruments. As shown above, COM2 (virtual serial port) and USBTMC interface are the ports scanned out by the same IT-N6962 device. Users can select one of the interfaces and click  to add to the device column on the right.

  Note: Only devices added to the right device bar can be controlled by the software.

  The name of the channel added to the right device bar can be customized (right click and select "Rename").

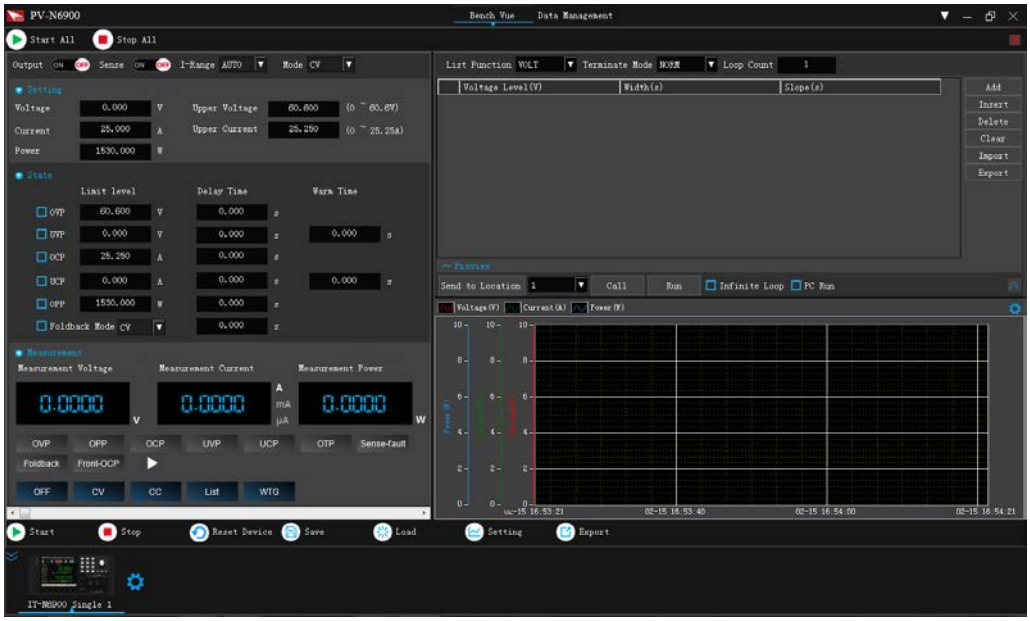
  

- The main functions of the toolbar include
  -  : Scanning hardware devices.
  -  : Confirm the hardware configuration information.
  -  : Exits the communication configuration interface.

2.2 Open the Channel's Main Interface

In the device list screen at the bottom of the software, double-click the icon of the channel (as shown below) to open the corresponding interface of the channel.

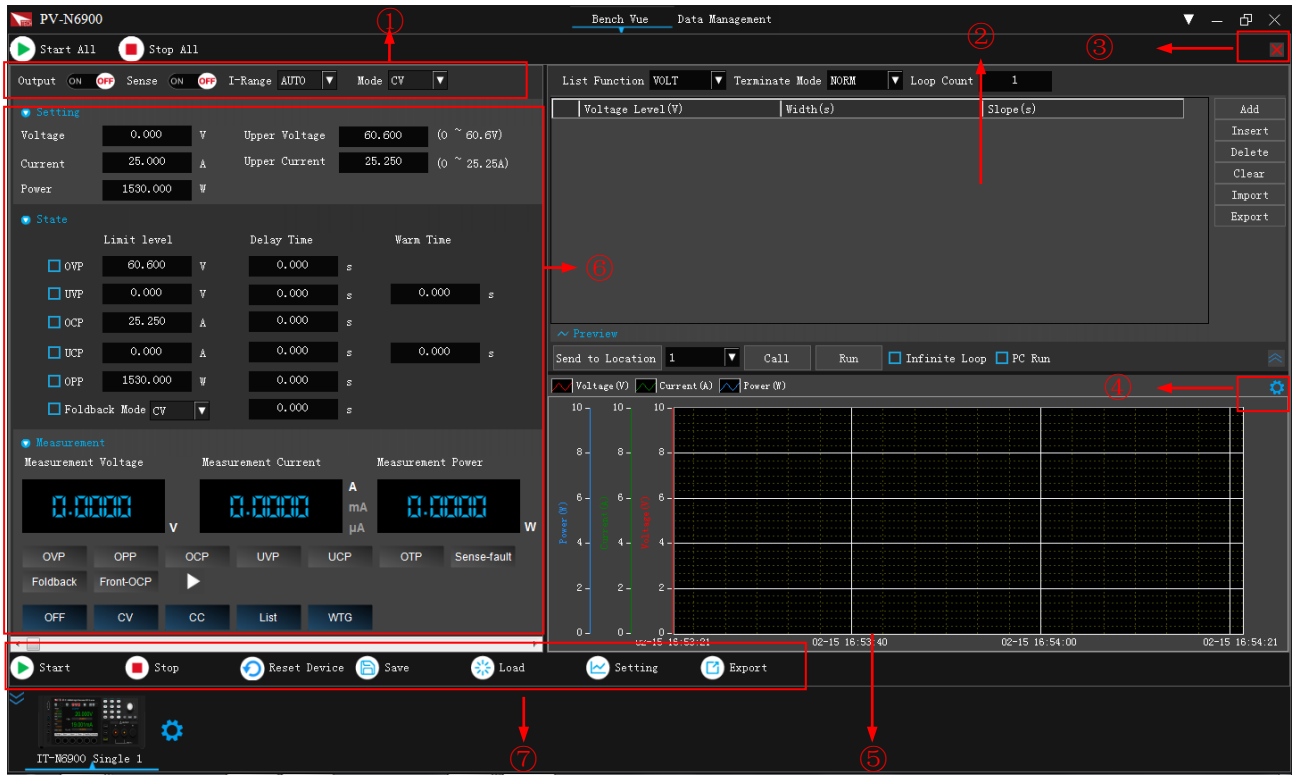
Double-click the icon in the red box to open the software control interface as shown below.



Chapter 3 Software Control Interface

3.1 Interface Introduction

The PV-N6900 software control interface is shown below.



1. Output control

   Output: Turns the output on or off.

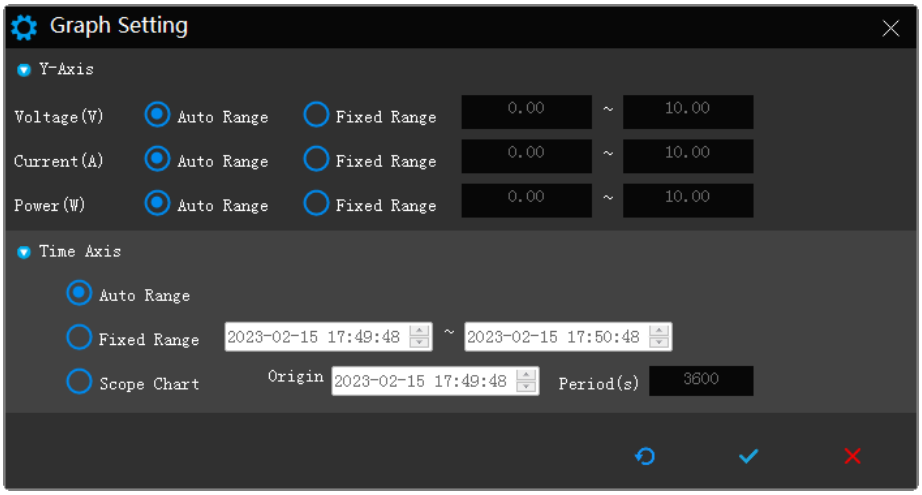
   Sense: Turns the remote measurement function on or off.

   I-Range: Set the current measurement range.

   Mode: Set the output mode. Select constant voltage priority or constant current priority.

2. List function
3. Close the control interface of the current channel
4. Curve setting function

   Click the  icon to display the interface as below.



Y-Axis: Select Auto range, i.e., scaling based on actual voltage, current, and power values. Or choose fixed range, i.e. fix the display interval of Y-axis.

Time Axis: Select Auto Range, which is scaled according to the test run duration. Select Fixed Range, i.e. user-defined time interval. Or select Scope Chart, i.e. user-defined start time and time period for curve grabbing.

5. Current, voltage, and power graphs.
6. Output parameter setting and output status display

   Setting: Set output parameters, including output voltage value, upper voltage limit value, output current value, upper current limit value, and output power value.

   State: Set output protection parameters, including OVP, UVP, OCP, UCP, OPP, and foldback protection settings.

   Measurement: Displays the actual output voltage value, current value and power value.

   OVP/OPP/OCP/UVP/UCP/OTP/Sense-fault/Foldback/Front-OCP: Protection status indication, including over voltage (OVP), over current (OCP), over temperature (OTP), over power (OPP), under voltage (UVP), under current (UCP), Sense fault protection, Foldback protection, front panel over current protection (protection is triggered immediately when the current detected on the front panel terminals exceeds 10.1A, **not configurable**).

    : Clear protection.

   OFF/CV/CC/List/WTG: Output status indication, including OFF (output off), CV (constant voltage output), CC (constant current output), List (list output mode), WTG (wait for trigger)

7. Test run start/stop and data logging function configuration

   Start: Start running the test of the channel.

   After clicking "Start", the software first sends the software control parameters such as voltage settings and current settings to the instrument, and then saves the data during the test run according to the configuration in the "Setting" interface.

   Stop: Stops the test run of the channel.

Reset Device: Restore to the default factory settings.

Save: Save the channel configuration parameters (parameter settings in Figure Note 1 and Figure Note 6) as a configuration file, which can be directly recalled next time without repeated configuration for ease of use.

Load: Loads the previously saved channel parameter configuration file.

Setting: Set the data saving interval and the naming of the data log file.

Export: Export the collected test data to a .csv format file.

3.2 Set Voltage and Current

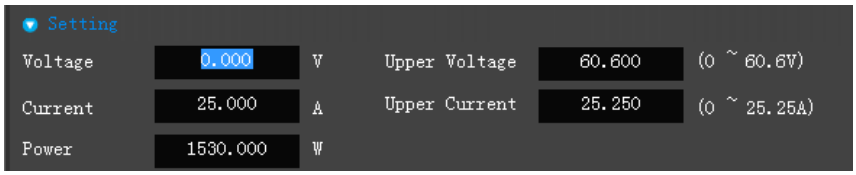
Refer to the following steps to set the output parameters of the power supply:

1. Double-click the channel icon in the device bar at the bottom of the screen to open the control interface of the channel.

2. Set the output mode and select voltage priority or current priority.

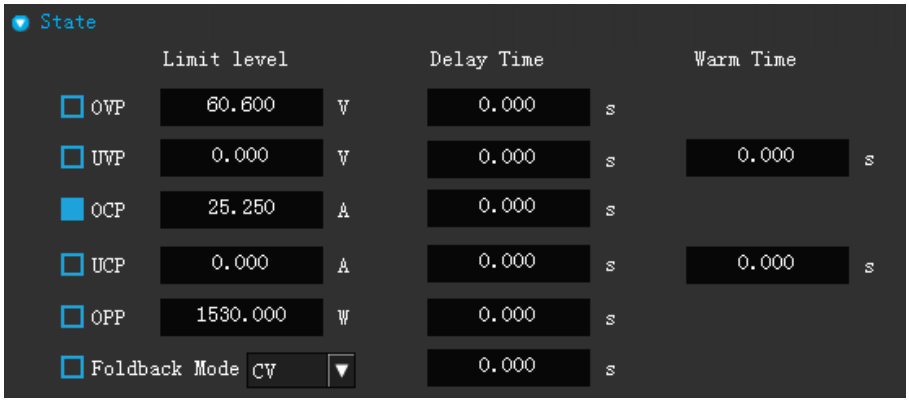
3. Set parameters such as voltage and current.

   To set the voltage value for example, select the parameter setting area with the mouse (as shown in the figure below), then enter the desired voltage value via the keyboard, and press **[Enter]** to confirm after the setting is completed.

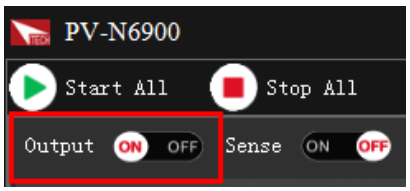


4. According to the test requirements, select whether to start the protection function and set the protection point.

   Take OCP as an example, check the box (shown below) to set the OCP protection point.



5. Click the "ON" button to turn on the power output, as shown in the figure below.



6. Click the "Start" button to start the test.

3.3 List

Users can edit and run a List file by following the steps below.

Edit the List

1. Set "List Function", "Terminate Mode", and "Loop Count".

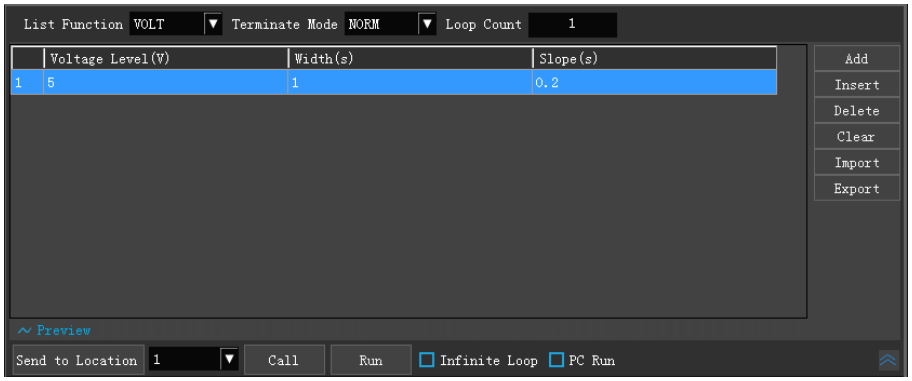
   List Function: Select CV priority (VOLT) or CC priority (CURR).

   Terminate Mode: Return to normal output mode (NORM) or maintain output at the last step of the List (LAST) or turn off output (OFF) after the List has finished running.

   Loop Count: The number of cycles for List running. Setting range: 1~65535.

2. Click "Add" to add a new single step.

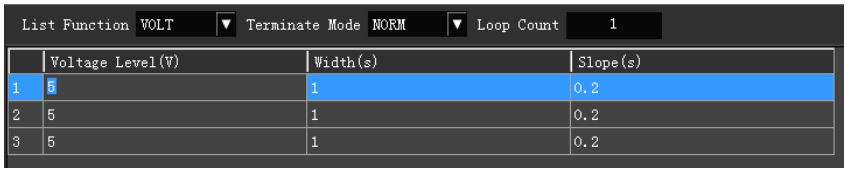
   The successful addition is shown in the figure below.



3. Edit the single step.

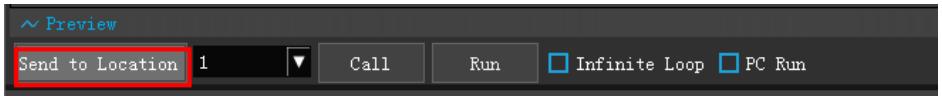
   Level/Width/Slope: The voltage or current value of a single step, the pulse width of a single step, and the slope of a single step.

   Setting method: Double-click the cell and modify the value.



4. Repeat the above steps to edit multiple single steps according to the test requirements.

5. After editing, select the save address as shown below, and then click "Send to Location" to save the edited List to the storage address specified in the instrument memory.

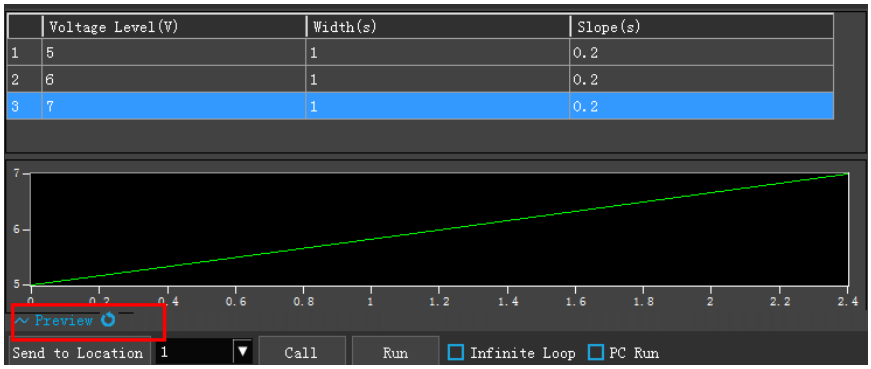


- After selecting the address in the drop-down list, click "Call" to load the List file stored in the instrument's memory into the software interface.

- Check "Infinite Loop" to repeat the List until the List is manually stopped.

- Check "PC Run" to control List operation through software; uncheck it to control List operation through the built-in List function of the instrument, which can output custom waveforms in a more realistic way.

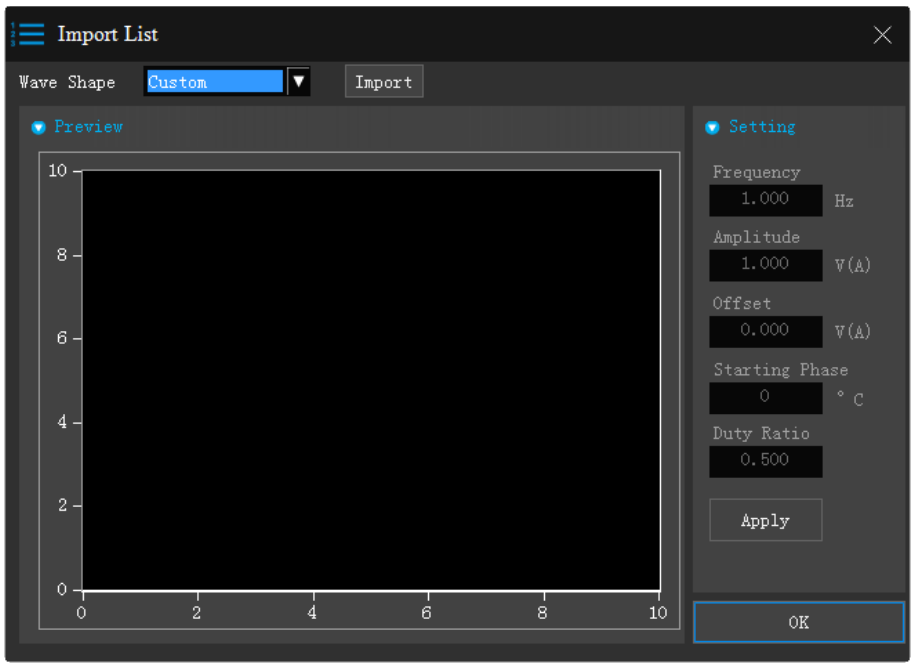
6. Click "Preview" and "Refresh" in the following position to preview the List custom waveform.



Import/Export

Click the "Import" button to import the waveform file in .csv format into the software interface for quick recall and operation.

Users can first click the "Export" button to export a "Custom" type .csv template file, edit it on the computer, and then "Import" the software interface.



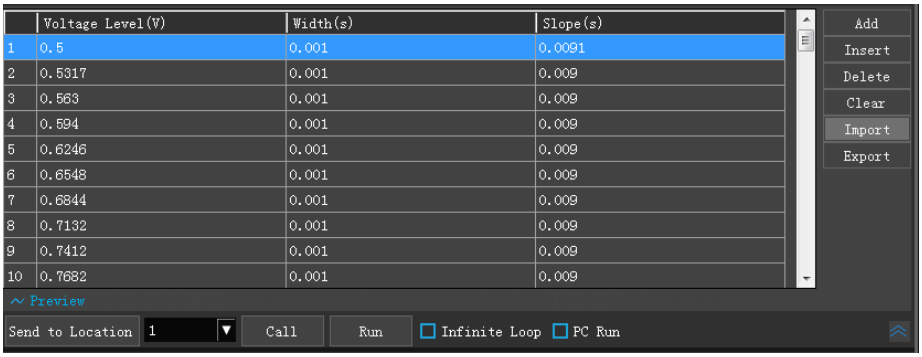
- **Wave Shape:** You can select "Custom", "Sine", "Square" and "Triangle" types. The "Custom" type is imported from .csv format file, and the "Settings" item on the right side cannot be set. "Sine", "Square", "Triangle" can be set by the "Settings" parameter on the right.

- **Import:** Select a List file in .csv format that already exists on your computer.

- **Setting:** Set the waveform parameters.

- **Apply:** Make the modified waveform setting parameters take effect.

- **OK:** Import the waveform into the List edit area, taking a sine wave as an example, as shown in the figure below.

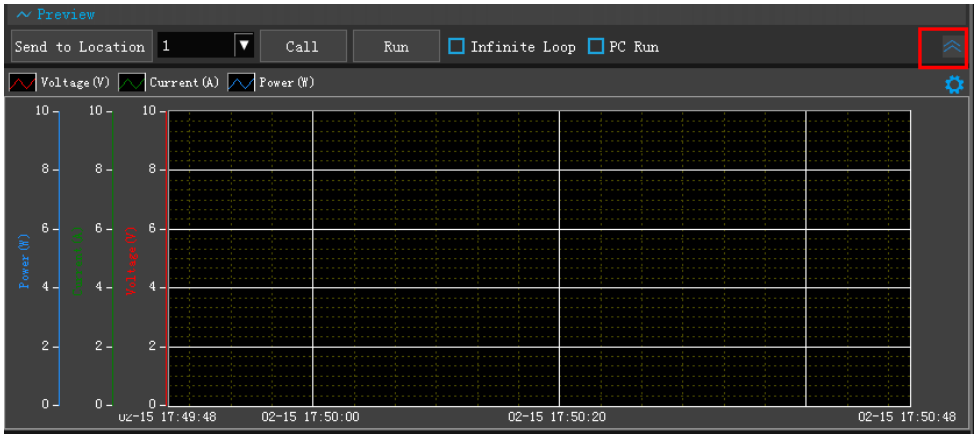


Run the List

1. Edit a List or recall a stored List file.
2. Click "Run".

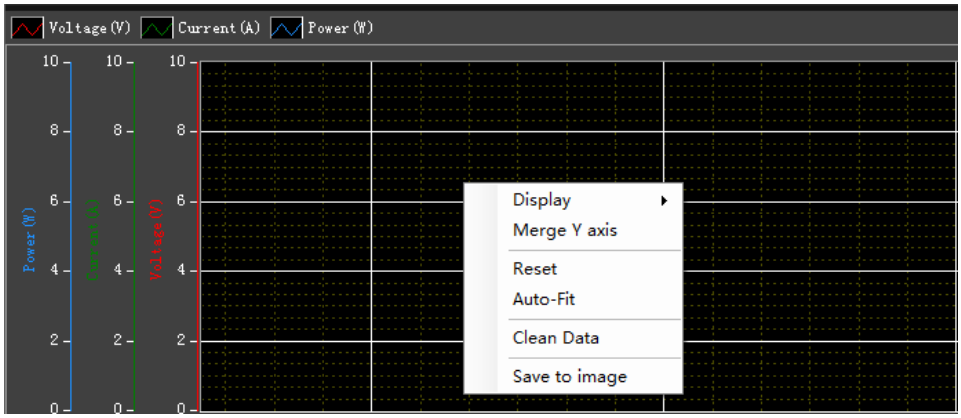
   The output waveform and run results can be displayed below.

3. Click the shrink button at the location shown below to enlarge the waveform display area.



3.4 Graphics Reset and Adaptive

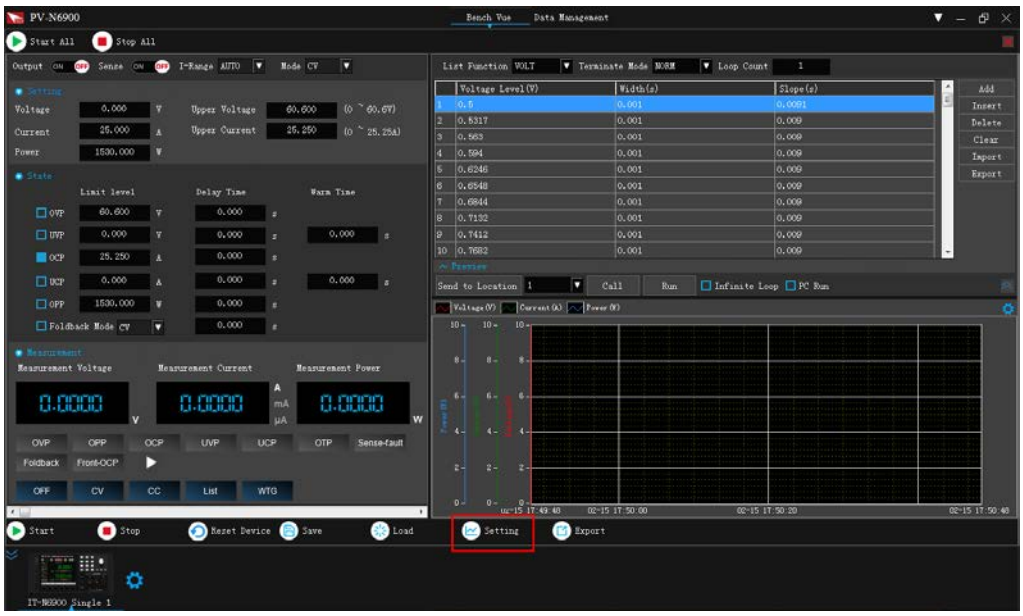
The PV-N6900 software voltage, current and power graphs have the functions of reset, adaptive, clear data, and save as picture format file, which can be done by right-clicking on the graph, as shown below.



Chapter 4 Data Saving and Querying

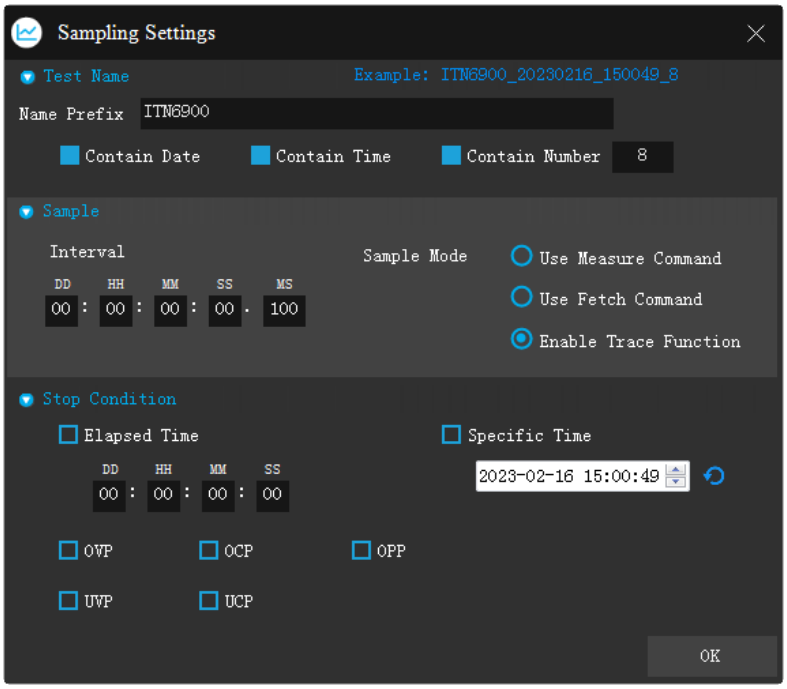
4.1 Data Logging Settings

Under the channel control interface of PV-N6900, you can save the data after "Start" operation until "Stop" test, and you can set the sampling interval and specific saving cut-off conditions before saving the data.



Operation steps

1. Click "Setting" to enter the following screen.



Test Name: Customizable name of the data saving file.

Sample Interval: Set the saving interval of data recording, i.e. how long to save the data every time, it is recommended to set the saving interval of 1 second or more. If the sampling method is "Enable Trace Function", it means that the data is saved by the built-in Recorder function of the instrument, and the recommended setting interval is 500ms and above.

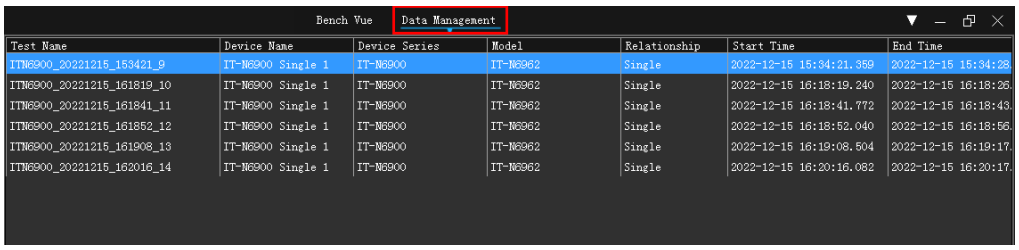
Sample Mode: "Use Measure Command" means data acquisition by sending Measure command in real time, "Use Fetch Command" means data acquisition by sending Fetch command in real time, and "Use Trace Function" means saving by the built-in Recorder function of the instrument.

Stop Condition: Set the stopping conditions for data saving. You can specify the length of saving or a specified time point, and you can also select to stop data saving when the protection status is triggered.

2. When the settings are complete, click "OK".

4.2 Data Management

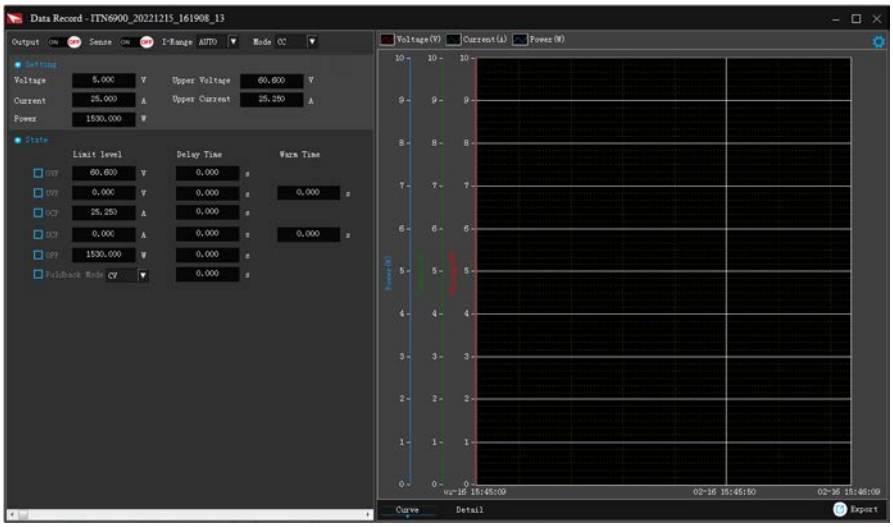
PV-N6900 software provides measurement data query function, users can query the measurement data of different time periods, and export and save the measurement data.



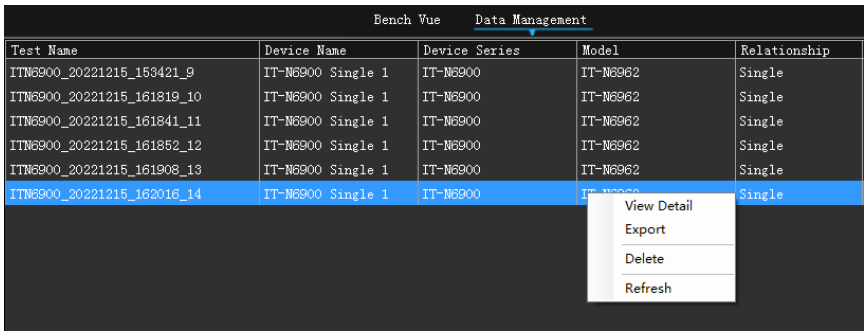
Test Name	Device Name	Device Series	Model	Relationship	Start Time	End Time
ITN6900_20221215_153421_9	IT-N6900 Single 1	IT-N6900	IT-N6962	Single	2022-12-15 15:34:21.359	2022-12-15 15:34:28
ITN6900_20221215_161819_10	IT-N6900 Single 1	IT-N6900	IT-N6962	Single	2022-12-15 16:18:19.240	2022-12-15 16:18:26
ITN6900_20221215_161841_11	IT-N6900 Single 1	IT-N6900	IT-N6962	Single	2022-12-15 16:18:41.772	2022-12-15 16:18:43
ITN6900_20221215_161852_12	IT-N6900 Single 1	IT-N6900	IT-N6962	Single	2022-12-15 16:18:52.040	2022-12-15 16:18:56
ITN6900_20221215_161908_13	IT-N6900 Single 1	IT-N6900	IT-N6962	Single	2022-12-15 16:19:08.504	2022-12-15 16:19:17
ITN6900_20221215_162016_14	IT-N6900 Single 1	IT-N6900	IT-N6962	Single	2022-12-15 16:20:16.082	2022-12-15 16:20:17

Operation steps

1. Click "Data Management" to enter the data query interface.
2. Set filter conditions to filter by "Date Range", "Model", and "Test Name".
3. Click the search icon to query the saved data log files.
4. Double-click on the specific test name to view the test data and curves.



5. Right-click on a specific test name to export the data to a csv file.



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