ITECH

IT-M7700 Demo Software
User Manual

Model: IT-M7700 series

Version: V1.0

Notices

Manual Part Number

IT-M7700 Demo-400000

Revision

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Itech Electronic, Co., Ltd.

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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 Software Introduction

IT-M7700 Demo Software is a kind of easy-to-use and practicable control software designed by Itech Electronics Co., Ltd. It is applicable to Itech IT-M7700 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 Software Initial Interface

1. Obtain the software installation package from the ITECH website.

2. Decompress the IT-M7700 Demo Software file to the local file folder.

3. Double click IT-M7700 Demo Software.exe in the file folder to run the program. The software initial interface is described as follows:

The interface is described as follows:

● Communication: Select the communication interface between the software and the device.

  ✧ RS232: select the RS232 communication interface.

  ✧ USB: select the USB communication interface.

  ✧ GPIB: select the GPIB communication interface.

  ✧ Ethernet: select the Ethernet communication interface.

● About: Check software information, such as name and version number.

● Scan：Scan communication interfaces for the device.

● Enter：When you first enter the main operation interface of the

software, click **[Enter]**, the following interface will appear to prompt the information about the connected instrument. This screenshot just for example, please refer to actually information.
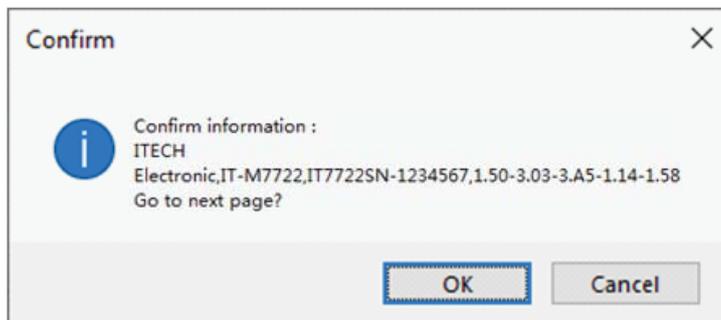
● Quick Enter: After the software and the instrument are successfully connected once, the connection information is recorded. When you re-enter the main operation interface of the software, you can directly click **[Quick Enter]**.

1.3 Configuring Interface of Device

IT-M7700 Demo 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. The user needs to connect the device to the computer. During hardware setting, select a hardware interface that is compatible with the one connected to the device, and set interface parameters based on different interface types.

Operation steps

1. Select the communication mode, and use the RS232 cable, USB cable, GPIB cable or Ethernet cable to connect the power supply and PC.

2. Configure the communication interface of the power supply end. For the configuration steps, please refer to Section 2.6 Connection Interface in the *IT-M7700 Series User Manual*.

3. Configure the communication interface of the software end.

    a) Select the required hardware interface type on the initial interface.
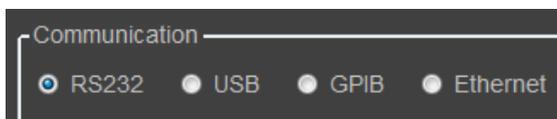
    b) After selecting the device interface, configure interface parameters at bottom. Click **[Scan]**.

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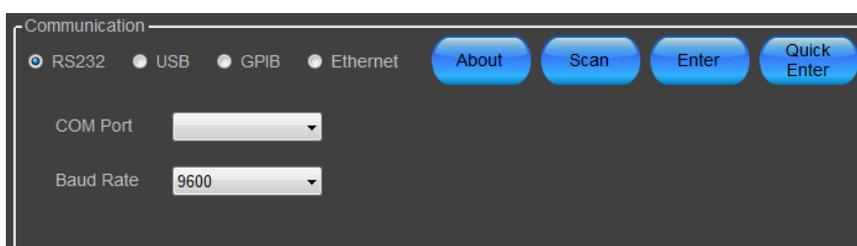
COM Port: to select serial interface, i.e., the serial interface number occupied by RS232 communication cable interface.

Baud Rate: Baud rate must be configured consistently with those in menu setup.

● USB Interface Parameter Configuration
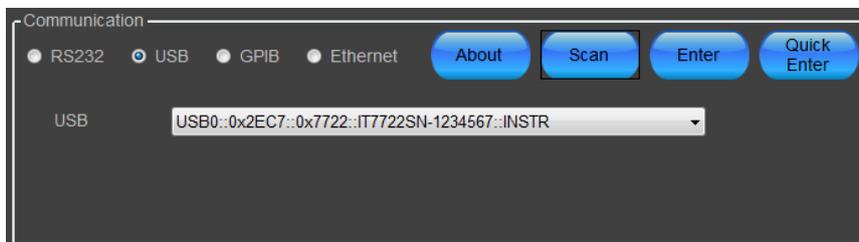
● GPIB Interface Parameter Configuration
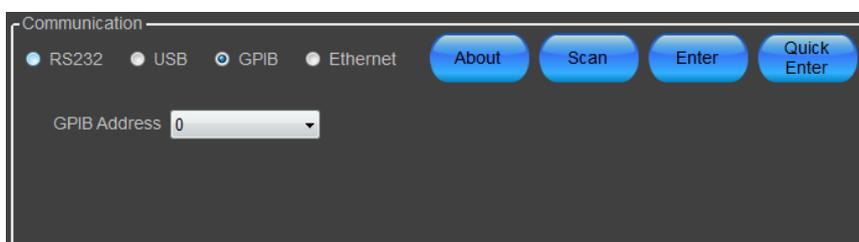
GPIB Address: Set GPIB address of device.

● Ethernet Interface Parameter Configuration
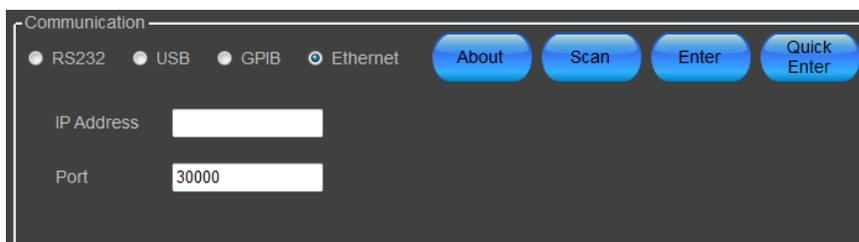
IP Address: Set Ethernet IP address of device.

Port: Set Socket port of device, the default value is 30000.

1.4 Introduction of Main Interface

In the software initial interface, click **[Enter]** and enter the main interface of software operation.
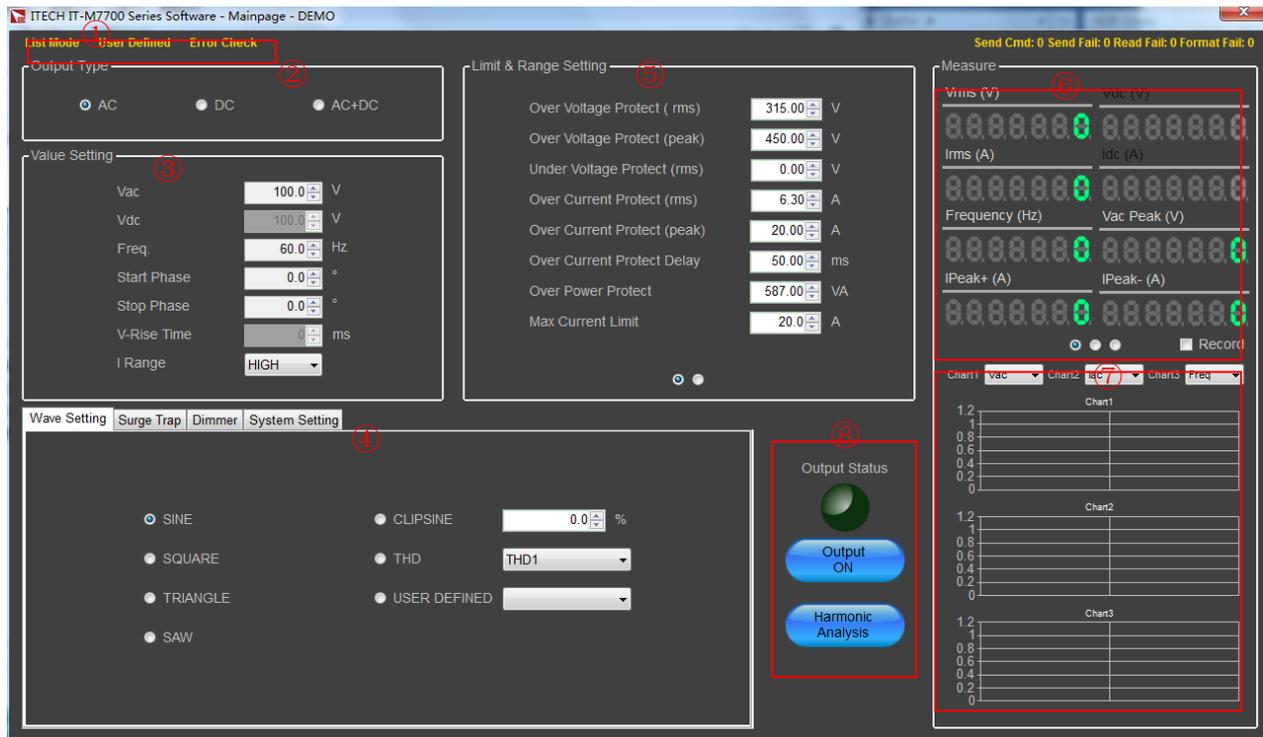
1. Function Bar

   List Mode

   User Defined

   Error Check

2. Select the output mode: AC, DC and AC+DC.

3. Output parameters setting zone.

4. Setting zone for wave setting, surge trap, dimmer, and system setting.

5. Protect function setting zone.

6. Measuring parameters display zone.

7. Measuring parameter chart display zone.

8. Output state display icon, output On/Off switch, and Harmonic Analysis button.

Chapter2 Function Operation

This chapter introduces specific function operation methods and procedures of IT-M7700 Demo Software.

2.1 Set the Output Parameters

Before setting the output parameters, please select the output mode. It is necessary to set different output parameters under different output modes.

```
┌─Output Type─────────────────────────┐
│                                     │
│   ◉ AC        ● DC        ● AC+DC   │
│                                     │
└─────────────────────────────────────┘
┌─Value Setting───────────────────────┐
│                                     │
│   Vac            100.0 ⬍  V         │
│   Vdc            100.0 ⬍  V         │
│   Freq.           60.0 ⬍  Hz        │
│   Start Phase      0.0 ⬍  °         │
│   Stop Phase       0.0 ⬍  °         │
│   V-Rise Time        0 ⬍  ms        │
│   I Range        HIGH    ▼          │
│                                     │
└─────────────────────────────────────┘
```
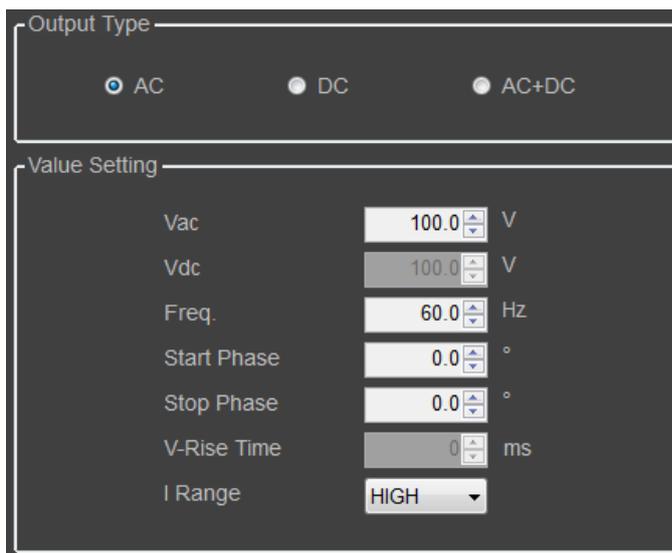
Output Parameters	Output Mode	Descriptions
Vac	AC/AC+DC	AC voltage setting value.
Vdc	DC/AC+DC	DC voltage setting value.
Freq	AC/AC+DC	Frequency setting value.
Start Phase	AC/AC+DC	Starting phase angle.
Stop Phase	AC/AC+DC	Ending phase angle.
V-Rise Time	DC/AC+DC	Voltage rising time.
I Range	AC/DC/AC+DC	Current measurement range.

2.2 Select the Output Waveform

In the main interface of software operation, click the **[Wave Setting]** option to enter the output waveform setting zone.
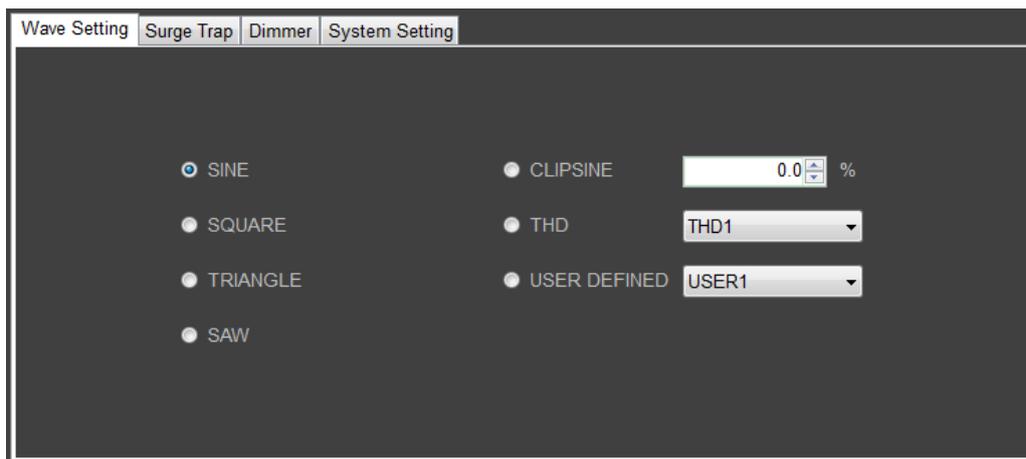
Parameters	Descriptions
Sine	Sinusoidal
Square	Square
Triangle	Triangle
Saw	Sawtooth
Clip Sine	Clipped Sinusoidal. When the Clip Sine output waveform is selected, you can set the clipped percentage.
THD	30 sets of built-in waveforms.
User Defined	5 sets of user-defined waveforms.

📖 Note

For detailed built-in THD waveform, please refer to Chapter A.1 Built-in Waveform in the *IT-M7700 Series User Manual*.

For the operation method of user-defined waveform, please refer to 2.9 Self-defined Waveform.

2.3 Protection Function

The protection function setting zone is shown below. You can switch display by clicking the lower two circle buttons.

Limit & Range Setting

Over Voltage Protect (rms)	440.00	V
Over Voltage Protect (peak)	440.00	V
Under Voltage Protect (rms)	10.00	V
Over Current Protect (rms)	0.61	A
Over Current Protect (peak)	20.00	A
Over Current Protect Delay	50.00	ms
Over Power Protect	600.00	VA
Max Current Limit	0.0	A

Limit & Range Setting

Vac - Maximum	305.00	V
Vac - Minimum	10.00	V
Vdc - Maximum	405.00	V
Vdc - Minimum	-405.00	V
Freq. - Maximum	1000.00	Hz
Freq. - Minimum	45.00	Hz
OCP - Maximum	6.00	A
OCP - Minimum	0.00	A

Parameters	Descriptions
Over Voltage Protect (rms)	Set the OVP(rms) point.
Over Voltage Protect (peak)	Set the OVP(peak) point.
Under Voltage Protect (rms)	Set the UVP(rms) point.
Over Current Protect (rms)	Set the OCP(rms) point.
Over Current Protect (peak)	Set the OCP(peak) point.
Over Current Protect Delay	Set the OCP delay time.
Over Power Protect	Set the OPP point.
Max Current Limit	Set the max current limit.
Vac-Maximum	Set the maximum value of the AC voltage setting value.
Vac-Minimum	Set the minimum value of the AC voltage

Function Operation

Parameters	Descriptions
	setting value.
Vdc-Maximum	Set the maximum value of the DC voltage setting value.
Vdc-Minimum	Set the minimum value of the DC voltage setting value.
Freq -Maximum	Set the maximum value of the frequency setting value.
Freq -Minimum	Set the minimum value of the frequency setting value.
OCP -Maximum	Set the maximum value of the OCPrms setting value.
OCP -Minimum	Set the minimum value of the OCPrms setting value.

2.4 Turning the Output On and Off

You can press the **[Output]** button in the main interface to control instrument output switch. Press **[Output On]**, and the output button displays , indicating that the real-time output is turned on; press **[Output Off]** again, and the output button displays , indicating that the real-time output is turned off.
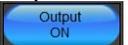
2.5 Measurement Function

In addition to basic measurement functions, IT-M7700 Demo Software also provides harmonic analysis and waveform monitoring function.

Basic Measurement

When the power supply output is On, it will measure the V, I, F, and P parameters of the DUT. These parameters are displayed in the measuring parameter display zone and measuring parameter chart display zone of the software main interface.

● Measuring parameter display zone: the measuring parameters are directly displayed in values. The zone is shown below. You can switch the display of measuring parameters through the bottom white circle button.

Parameters	Descriptions	Parameters	Descriptions
Vrms(V)	Voltage effective value	Vdc(V)	Average voltage
Irms(A)	Current effective value	Idc(V)	Average current
Frequency(Hz)	Frequency	Vac Peak(V)	Voltage peak-to-peak value
IPeak+(A)	Positive current peak value	IPeak-(A)	Negative current peak value
I Peak Max(A)	Maximum current peak-to-peak	PF(%)	Power factor
vTHD(%)	Total voltage harmonic distortion	Real Power[P] (W)	Real Power
Apparent Power[S](VA)	Apparent Power	Reactive Power[Q](var)	Reactive Power
Vac	AC voltage component	Iac	AC current component
iTHD(%)	Total current harmonic distortion	-	-

In this zone, the user can check Record to save the real-time measuring data under the Report file folder of software installation directory in csv format. The data file name is named with the file creation time.

● Measuring parameter chart display zone: The measuring parameters are displayed in charts. Include Chart1, Chart2 and Chart3. Click the drop-down arrow at the right side of Chart, and select the measuring parameters to be displayed in the chart.
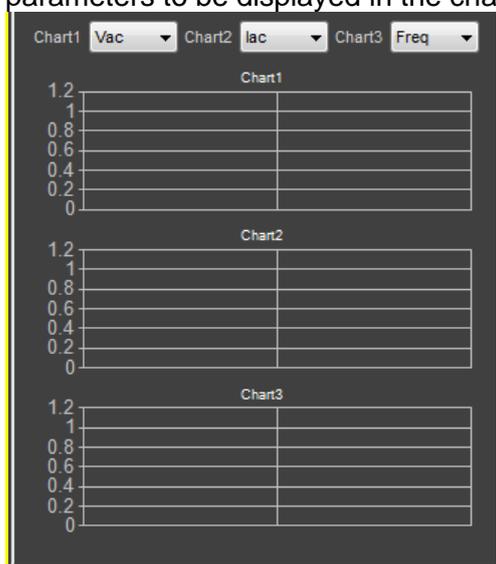
Harmonic Analysis

When the power supply output is On, IT-M7700 Demo Software can display the harmonic component of the output voltage/current with bar chart or list for a clearer analysis of test results. In the software main interface, click the Harmonic Analysis button to display the harmonic analysis window below.

● Harmonic bar interface
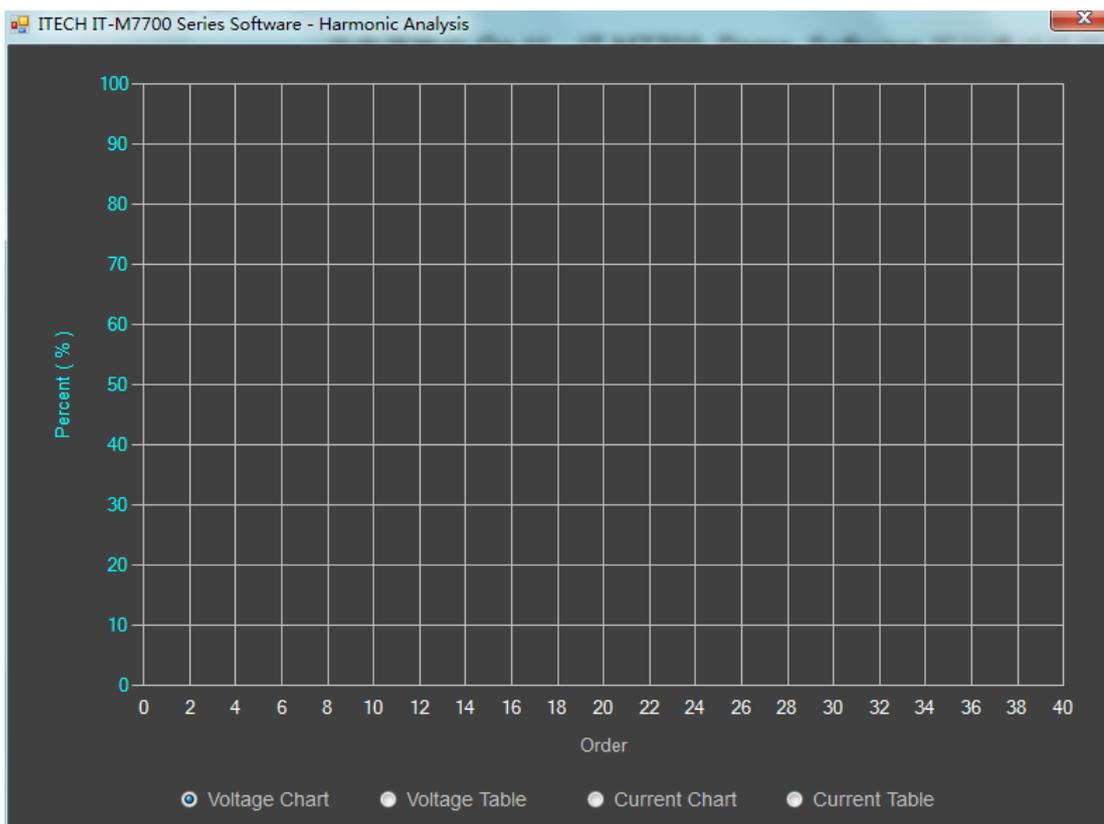
In the figure, the x-coordinate is the harmonic wave order axis; and the y-coordinate is the percentage axis, indicating the percentage of each harmonic wave in the fundamental wave (1 time).

- Harmonic list interface

1. Harmonic wave order column: this list can display the data of all harmonic signals of Orders 1-40.

2. Harmonic content: this list can display all harmonic contents of single harmonic wave.

2.6 Surge/Trap Function

IT-M7700 Demo Software provide surge and trap wave simulation function. User can add surge/trap wave to the output sine wave accordingly, to simulate voltage frequent fluctuation. Thus to simulate the real testing environment.

1. In the Output Type zone, set the power supply to AC output mode.

2. In the Value Setting zone, set the related parameters of fundamental sine wave.

3. In the main interface of software operation, click the **Surge Trip** option to enter the surge trip setting zone. Set parameters related to surge trip.
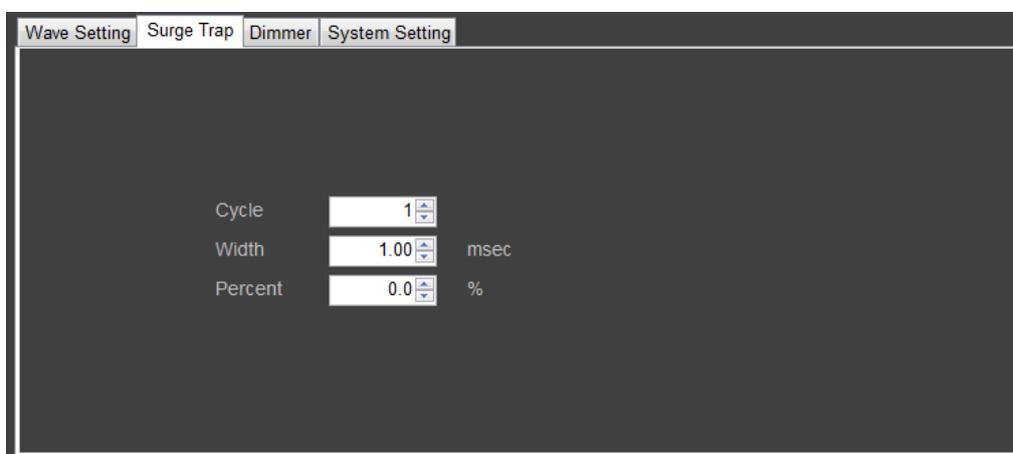
- Cycle: Set the period of the surge/trap.
- Width: Set the surge/trap width.
- Percent: Set the percentage of the surge/trap amplitude to AC signal amplitude(rms).

4. Press **[Output On]** key, and the power supply outputs the set surge/trap waveform. Press **[Output On]** again to stop output.

2.7 Dimmer Function

The Dimmer Function aims to adjust the light illuminance intensity by setting the phase angle and concealing the leading edge or trailing edge waveform. This IT-M7700 series power supply supports front and rear phase angle dimmer or speed adjustment test to verify whether the product has potential quality problem when the end user uses dimmer or the speed controller.

1. In the Output Type zone, set the power supply to AC output mode.

2. In the Value Setting zone, set the related parameters of fundamental sine wave.

3. In the main interface of software operation, click the **Dimmer** option to enter the dimmer setting zone. Set parameters related to dimmer.
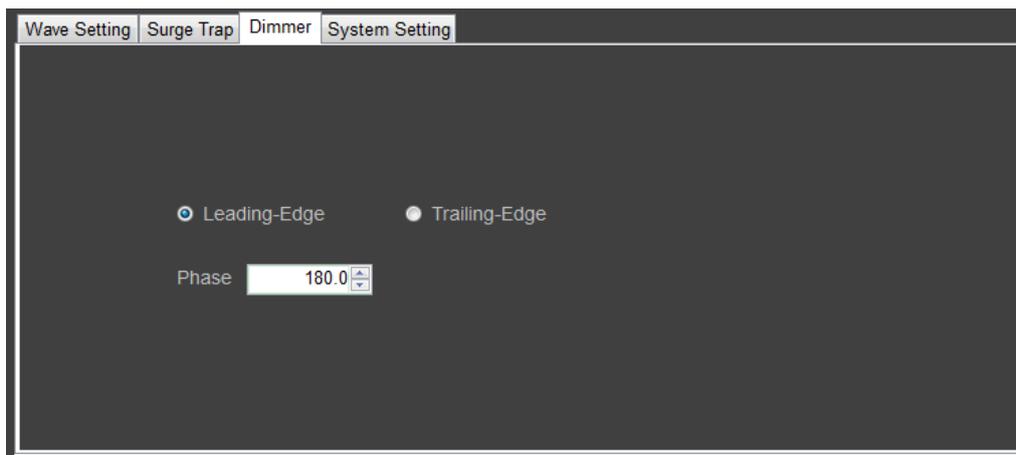
- **Leading-Edge**: indicate the leading-edge phase dimmer.
- **Trailing-Edge**: indicate the trailing -edge phase dimmer.
- **Phase**: dimmer phase angle.

4. Press **[Output On]** button, and the power supply outputs the set phase dimmer waveform. Press **[Output On]** again to stop output.

2.8 System Setting

In the main interface of software operation, click the **[System Setting]** option to enter the output system setting zone.

Parameters	Descriptions
Beep	Set the beeper status: On/Off.
Power On	Set the power-on state. - Reset: When the power source is powered on, recalls the fixed settings at power-on. For details about the fixed settings of the instrument are as shown in the following table. {{TABLE}}

Parameter	Fixed Value
Vac	50V
Vdc	0V
OCP	Max
Freq	50.0Hz

Parameters	Descriptions		
	AC + DC	Off	
	Output Mode	AC	
	[On/Off] status	Off	
	● Last: When the power source is powered on, the power source will remain the same settings and output state as last time you turned off the power source. ● Last+Off: When the power source is powered on, the power source will remain the same settings as last time you turned off the power source, but the output state is OFF state.		
Output Relay	Set the relay control. ● Sync Output: The relay is linked with Output. When the instrument output is On, the relay is closed; when the instrument output is Off, the relay is open, and the instrument and the load are electrically separated. ● Normal Close: The relay is normally closed. Whether the instrument out is On or Off will not affect the operation of relay.		

2.9 List Function

The user can use list function to create a test program made of multiple steps. Up to 5 programs (List1 to List5) can be created in the list mode for IT-M7700 series power supplies. Each list program can be made of up to 50 steps. The user need to set voltage, frequency and dwell time for each step. The user also can set repeat times, end state and so on for each list program.

Introduction of List Interface

In the main interface of software operation, click the **[List Mode]** to enter the List function interface.

The interface is described as follows:

1. The setting zone of List file configuration parameters. The parameters are described as follows.

Parameters	Descriptions
List	Set the name of the List file: List 1 to List 5.
Repeat	Set the number of list repetitions within the range from 1 to 50000.
End State	Set the running state after the list program is running over. ● Off: the instrument output is turned off after the execution is completed; ● On: keep the output status in last step when the dwell time is over.
Jump	Set the step where the real-time List starts execution: 1-50.

2. The List display zone displays the edited List files. You can scroll through and browse them through the upper-lower/left-right scroll bar.

3. List edit button. The functions are described as follows.

Button	Descriptions
Create Step	Create one step.
Delete	Delete one step.
Up	Select the previous step of the present step by pressing the Up button.
Down	Select the next step of the present step by pressing the Down button.
Export	To export the list file into computer. The user can export the list file to computer after editing. The exported file is

Button	Descriptions
	saved as *.csv excel format.
Import	To import the list file into the software. The user can edit list file in Excel, then import into the software.
Clear	Clear the List under editing.
Read LIST	Read List file from the IT-M7700 instrument.
Write LIST	Write the real-time List file into the IT-M7700 instrument.
Step Trigger	Set the trigger mode to run the List. Off: After the Trigger key is pressed, the instrument will automatically run the real-time List file. On: After the Trigger key is pressed, the instrument will run the real time List file in single step.
Output	Turning the output On and Off.
Trigger	Trigger key.

4. Measuring parameter display zone. You can switch the display through the bottom white circle button. The measuring parameters are described in the table below:

Parameters	Descriptions	Parameters	Descriptions
Vrms(V)	Voltage effective value	Vdc(V)	Average voltage
Irms(A)	Current effective value	Idc(V)	Average current
Frequency(Hz)	Frequency	Vac Peak(V)	Voltage peak-to-peak value
IPeak+(A)	Negative current peak value	IPeak-(A)	Positive current peak value
I Peak Max(A)	Maximum current peak-to-peak	PF(%)	Power factor
vTHD(%)	Total voltage harmonic distortion	Real Power[P] (W)	Real Power
Apparent Power[S](VA)	Apparent Power	Reactive Power[Q](var)	Reactive Power
Vac	AC voltage component	Iac	AC current component
iTHD(%)	Total current harmonic distortion	-	-

In this zone, the user can check Record to save the real-time measuring data under the Report file folder of software execution directory in csv format. The data file name is named with the file creation time.

5. Measuring parameters waveform display zone. Include Chart1, Chart2 and Chart3. Click the drop-down arrow at the right side of Chart, and select the measuring parameters to be displayed in the chart.

Edit List

1. In the List function interface, click the drop-down arrow at the right side of List to set the List file name.

2. Fill in corresponding parameters in the Repeat, End State and Jump items, and set the configuration parameters of the List file.

   Repeat = 3

   End State = Off

   Jump = 2

3. Click Create Step button to enter the Step parameter setting interface.
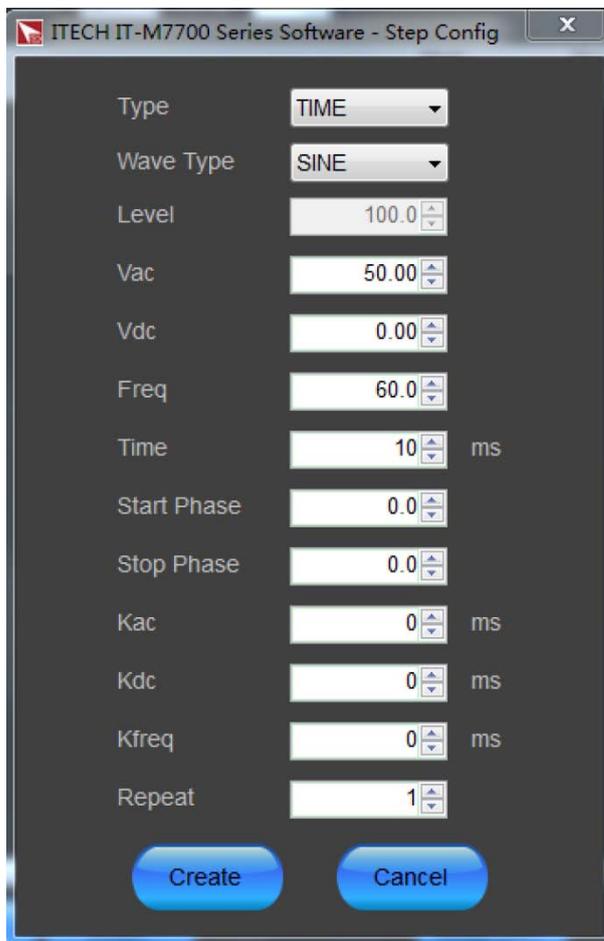
The interface parameters is described as follows:

Parameters	Descriptions
Type	Set the single step type: TIME.
Wave Type	Set the single-step waveform type: Sine, Square, Triangle, Saw, Clip Sine, THD1~THD30 and USER1~USER5.
Level	Set the clipping percentage. This option is only valid when the Clip Sine output waveform is selected.
Vac	The AC voltage value set in a single step.
Vdc	The DC voltage value set in a single step.
Freq	The frequency value set in a single step.
Time	Dwell time for single step: 0~100000000ms.
Start Phase	Start phase angle of single-step waveform.
Stop Phase	Stop phase angle of single-step waveform.

Parameters	Descriptions
Kac	AC rising slope of single step.
Kdc	DC rising slope of single step.
Kfreq	Frequency rising slope of single step.
Repeat	Set the number of repeats for the step: 1-50,000.
Create	Confirm to add the real-time setting as the single-step of the List.
Cancel	Cancel the single-step adding operation.

4. Fill in corresponding parameter in the Step Config interface and click Create to create Step1.

   Repeat step 4 to continue the creation of other Steps for the List file. Click Cancel, and return to the List function interface. The List display zone displays the edited List file.
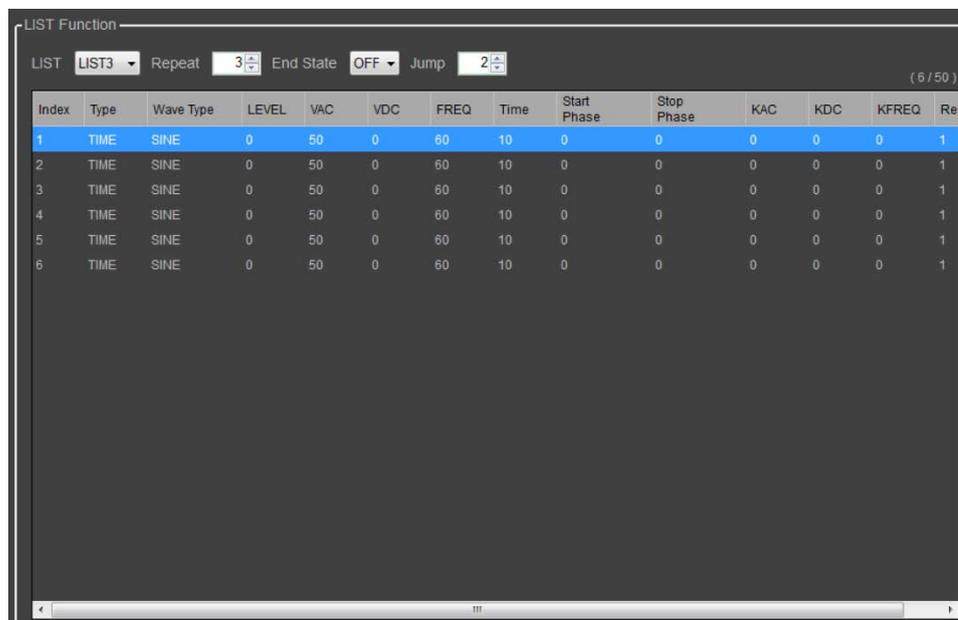
5. After editing the List steps, click Write LIST to write the real-time List file into the IT-M7700 power supply. And the IT-M7700 power supply will conduct test based on the List.

List Export/Import List from Computer

● Export List

   The user can export the List file contents in the software to the computer.

   1. Refer to "Edit List File" above, and edit the List file to be exported.

   2. Click the Export button in the List function interface, and set the file name and storage location of the export file, and click Save. Finish the export of the List file.

- Import List

  IT-M7700 Demo 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. Refer to "Export List" operation to export an Excel template of List file and name it List 01.xlsx.

  2. Open the List 01.xlsx file, and edit List. Based on requirements, re-define each step of List and related parameter values.

  3. In the List function interface, click the drop-down arrow at the right side of List to set the List file name.

  4. Click the Import button, and select the List 01.xlsx file in the computer. Click and open it. Finish import of the List file.

  5. Click Write LIST, and write the real-time List into the IT-M7700 power supply. And the IT-M7700 power supply will conduct test based on the List.

Run List File

1. Refer to "Edit List File" or "Export/Import List from Computer", and edit the List file.

2. Click the List Trigger button to set the trigger mode to run the List.

3. Click the Output button to turn on the instrument output.

4. Click the Trigger button to run the selected List file.

   - When List Trigger = On, press the Trigger key once, and the instrument will run one step of List output.

   - When List Trigger = Off, the instrument will output based on defined List

2.10 Self-defined Waveform

Users can self define arbitrary waveforms through IT-M7700 Demo Software and download to power supply so as to simulate or duplicate the real waveforms.

In the main interface of software operation, click the **[User Defined]** to enter the Self-defined waveform interface.

1. Self-defined waveform display zone: display the waveform graph of the real-time self-defined waveform.

2. Self-defined waveform edit button. The functions are described as follows.

Parameters	Descriptions
User Defined	Set the name of the waveform file: USER1 to USER 5.
Write	Write the real-time Self-defined waveform into the IT-M7700 instrument.
Read	Read Self-defined waveform from the IT-M7700 instrument.
Import	To import the waveform file into the software. The user can edit waveform file in Excel, then import into the software.
Export	To export the waveform file into computer. The user can export the waveform file to computer after editing. The exported file is saved as *.csv format.
Save Image	Save the waveform graph of the real-time self-defined waveform.
Synthesize	Synthesize the waveform. Check the box before the option, and the user can quickly edit the self-defined harmonic distortion waveform.

3. Waveform synthesizing and editing zone.

Edit a self-defined waveform file

1. Create a new Excel document on local PC and name it USER1.

2. Open the Excel document and save it as in "other formats" in "(*.csv)".

3. Open the USER1.csv file and edit the waveform. Set every step of the List and corresponding parameters (1,024 coordinate points can be set, and only first 35 coordinate points are displayed below) and save the file.

	A	B	C	D	E	F	G
1	0						
2	0.018813						
3	0.037365						
4	0.055402						
5	0.072681						
6	0.088972						
7	0.104068						
8	0.117784						
9	0.129966						
10	0.140491						
11	0.149269						
12	0.156245						
13	0.161405						
14	0.164768						
15	0.166392						
16	0.16637						
17	0.164828						
18	0.161924						
19	0.157842						
20	0.152792						
21	0.147001						
22	0.140712						
23	0.134177						
24	0.127653						
25	0.121394						
26	0.115651						
27	0.110662						
28	0.106647						
29	0.103807						
30	0.102319						
31	0.10233						
32	0.103957						
33	0.107281						
34	0.112351						
35	0.119176						

4. In the User Defined function interface, click the drop-down arrow at the right side of User Defined and name it USER1.

5. Click the Import button, and select USER1.csv file in the computer. Click and open it. Finish import of the file. The display zone displays the USER1 self-defined waveform.
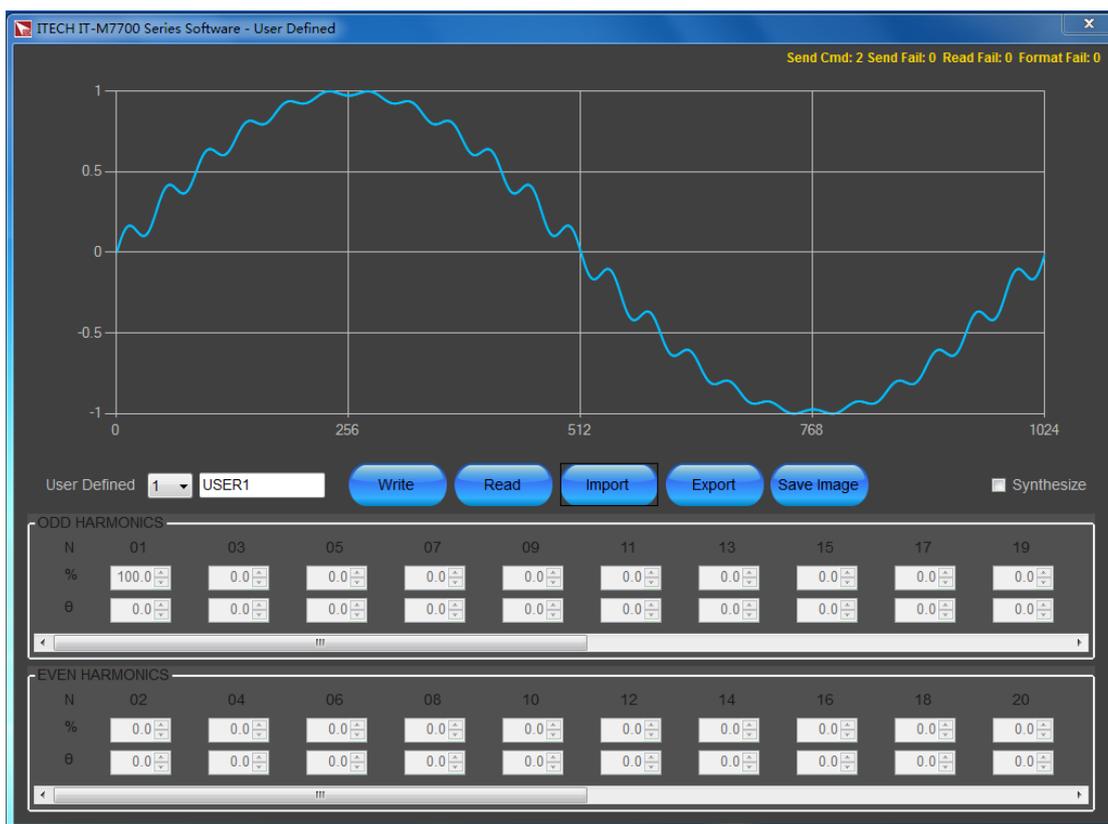
6. Click the Write button, and write the real-time USER1 into the IT-M7700 power supply. It is used for IT-M7700 power supply test.

Synthesize the waveform

IT-M7700 Demo Software allows the user to edit different harmonic components to synthesize harmonic distortion waveform.

1. In the User Defined function interface, check the box before Synthesize to display the synthetic waveform editing zone shown below.
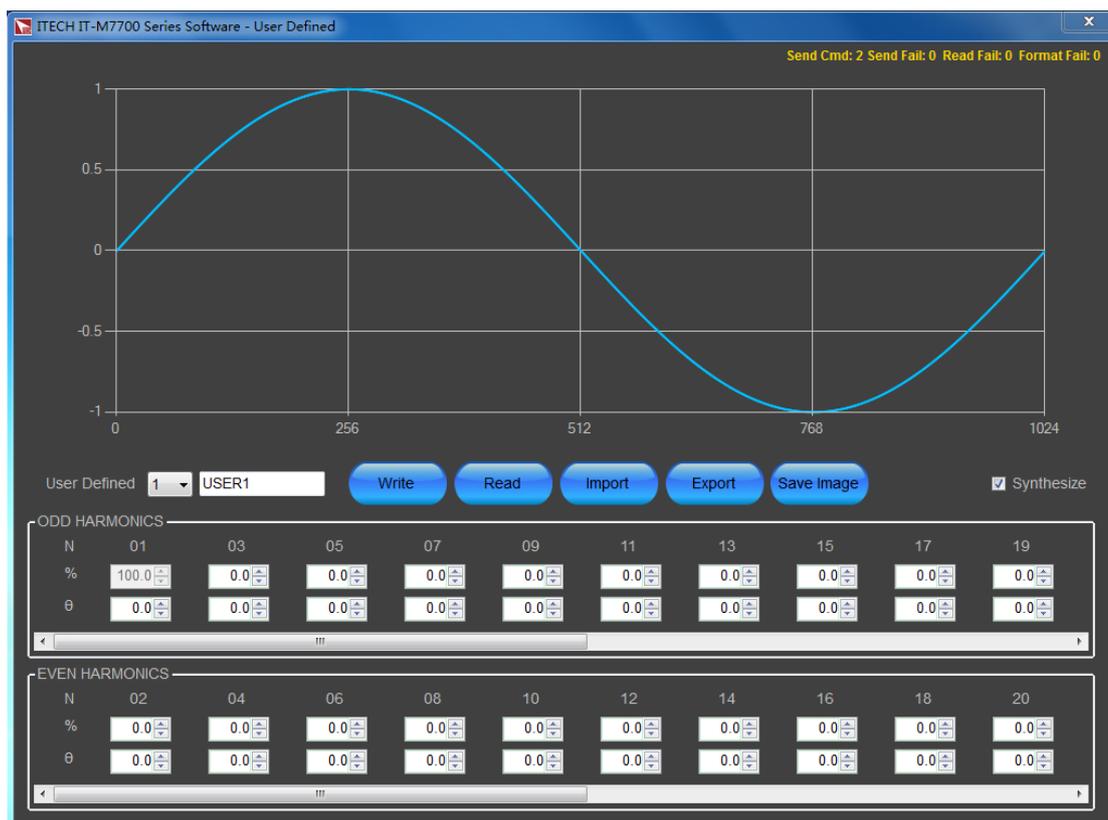
Parameters	Descriptions
ODD HARMONICS	Odd harmonic editing area.
EVEN HARMONICS	Even harmonic editing area.
N	The number of harmonic waves
%	The percentage of this time of harmonic wave in the base waveform (1 time) components.
θ	Set the phase of this harmonic wave.

2. Click the drop-down arrow at the right side of User Defined to set the Self-defined harmonic waveform name to USER1.

3. In the harmonic wave editing zone, set the size and phase of each harmonic wave.

4. Click **Write** button to write the real-time Self-defined waveform into the IT-M7700 instrument. And the IT-M7700 power supply will conduct test based on the Self-defined waveform.

2.11 Error Check

Error check mainly indicates whether the software has a transmission error during use to understand whether the communication is stable.

In the upper right corner of the software interface, the user can intuitively see the number of the sending command (Send Cmd), sending fail command (Send Fail), read fail command (Read Fail), and format errors (Format Fail) for each function during the operation. As shown below.

The user can also click **[Error Check]** in the main interface to entry the error check page.

Function Operation
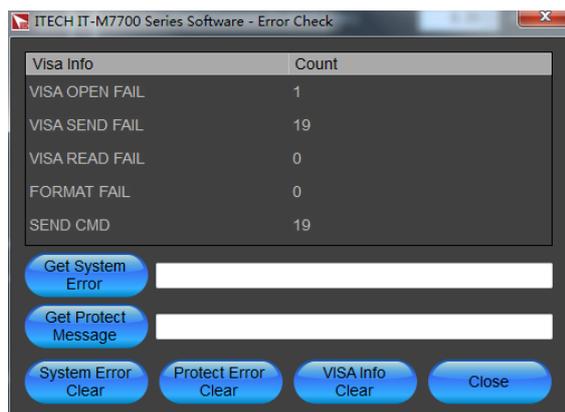
- VISA OPEN FAIL: determine whether there is an error when opening the communication interface.
- VISA SEND FAIL: sending fail commands.
- VISA READ FAIL: read fail commands.
- FORMAT FAIL: format errors.
- SEND CMD: sending commands.

  The sending commands here is different from that in the upper right corner of the software interface. One is the total number of the sending commands during the operation, and the other is the number of the sending commands under the specific function.

- Get System Error: get the error information in the instrument.
- Get Protect Message: get the protection information in the instrument.
- System Error Clear: clear all error information in the instrument.
- Protect Error Clear: clear all protection information in the instrument.
- VISA Info Clear: clear all transformation records about VISA in the software.
- Close: close the error check window.

Contact US

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

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.