UNI-T®

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User's Manual

UT5583 Insulation Resistance Tester

Foreword

Dear Users,

Hello! Thank you for choosing this brand new UNI-T instrument. In order to use this instrument safely and correctly, please read this manual thoroughly, especially the Safety Requirements part.

After reading this manual, it is recommended to keep the manual at an easily accessible place, preferably close to the device, for future reference.

Warranty Service

UNI-T warrants that the product will be free from defects for a three-year period. If the product is re-sold, the warranty period will be from the date of the original purchase from an authorized UNI-T distributor. Probes, other accessories, and fuses are not included in this warranty.

If the product is proved to be defective within the warranty period, UNI-T reserves the rights to either repair the defective product without charging of parts and labor, or exchange the defected product to a working equivalent product. Replacement parts and products may be brand new, or perform at the same specifications as brand new products. All replacement parts, modules, and products become the property of UNI-T.

The "customer" refers to the individual or entity that is declared in the guarantee. In order to obtain the warranty service, "customer" must inform the defects within the applicable warranty period to UNI-T, and to perform appropriate arrangements for the warranty service. The customer shall be responsible for packing and shipping the defective products to the designated maintenance center of UNI-T, pay the shipping cost, and provide a copy of the purchase receipt of the original purchaser. If the product is shipped domestically to the location of the UNI-T service center, UNI-T shall pay the return shipping fee. If the product is sent to any other location, the customer shall be responsible for all shipping, duties, taxes, and any other expenses.

This warranty shall not apply to any defects or damages caused by accidental, machine parts' wear and tear, improper use, and improper or lack of maintenance. UNI-T under the provisions of this warranty has no obligation to provide the following services:

a) Any repair damage caused by the installation, repair, or maintenance of the product by non UNI-T service

representatives.

b) Any repair damage caused by improper use or connection to an incompatible device.

c) Any damage or malfunction caused by the use of a power source which does not conform to the requirements of this manual.

d) Any maintenance on altered or integrated products (if such alteration or integration leads to an increase in time or difficulty of product maintenance).

This warranty is written by UNI-T for this product, and it is used to substitute any other express or implied warranties. UNI-T and its distributors do not offer any implied warranties for merchant ability or applicability purposes.

For violation of this guarantee, regardless of whether UNI-T and its distributors are informed that any indirect, special, incidental, or consequential damage may occur, UNI-T and its distributors shall not be responsible for any of the damages.

Trademark

UNI-T is the registered trademark of Uni-Trend Technology (China) Co., Ltd.

Statement

- UNI-T products are protected by patent rights in China and foreign countries, including issued and pending patents.
- UNI-T reserves the rights to any product specification and pricing changes.
- UNI-T reserves all rights. Licensed software products are properties of Uni-Trend and its subsidiaries or suppliers, which are protected by national copyright laws and international treaty provisions. Information in this manual supersedes all previously published versions.

1. Introduction

This manual includes safety requirements, installment and the basic operation of UT5583 insulation resistance tester.

2. Safety Requirements

This section contains information and warnings that must be followed to keep the instrument operating under safety conditions. In addition, user should also follow the common safety procedures.

Safety Precautions	
Warning	Please follow the following guidelines to avoid possible electric shock and risk to personal safety.
	Users must follow the following conventional safety precautions in operation, service and maintenance of this device. UNI-T will not be liable for any personal safety and property loss caused by the user's failure to follow the following safety precautions. This device is designed for professional users and responsible organizations for measurement purposes. Do not use this device in any way not specified by the manufacturer. This device is only for indoor use unless otherwise specified in the product manual.
Safety Statement	
Warning	"Warning" indicates the presence of a hazard. It reminds users to pay attention to a certain operation process, operation method or similar. Personal injury or death may occur if the rules in the "Warning" statement are not properly executed or observed. Do not proceed to the next step until you fully understand and meet the conditions stated in the "Warning" statement.
Caution	"Caution" indicates the presence of a hazard. It reminds users to pay attention to a certain operation process, operation method or similar. Product damage or loss of important data may occur if the rules in the "Caution" statement are not properly executed or observed. Do not proceed to the next step until you fully understand and meet the conditions stated in the "Caution" statement.

Note	"Note" indicates important information. It reminds users to pay attention to procedures, methods and conditions, etc. The contents of the "Note" should be highlighted if necessary.	
Safety Sign		
	Danger	It indicates possible danger of electric shock, which may cause personal injury or death.
	Warning	It indicates that you should be careful to avoid personal injury or product damage.
	Caution	It indicates possible danger, which may cause damage to this device or other equipment if you fail to follow a certain procedure or condition. If the "Caution" sign is present, all conditions must be met before you proceed to operation.
	Note	It indicates potential problems, which may cause failure of this device if you fail to follow a certain procedure or condition. If the "Note" sign is present, all conditions must be met before this device will function properly.
	AC	Alternating current of device. Please check the region's voltage range.
	DC	Direct current device. Please check the region's voltage range.
	Grounding	Frame and chassis grounding terminal
	Grounding	Protective grounding terminal
	Grounding	Measurement grounding terminal
	OFF	Main power off
	ON	Main power on
	Power Supply	Standby power supply: when the power switch is turned off, this device is not completely disconnected from the AC power supply.
CAT I	Secondary electrical circuit connected to wall sockets through transformers or similar equipment, such as electronic instruments and electronic equipment;	

	electronic equipment with protective measures, and any high-voltage and low-voltage circuits, such as the copier in the office.
CAT II	Primary electrical circuit of the electrical equipment connected to the indoor socket via the power cord, such as mobile tools, home appliances, etc. Household appliances, portable tools (e.g. electric drill), household sockets, sockets more than 10 meters away from CAT III circuit or sockets more than 20 meters away from CAT IV circuit.
CAT III	Primary circuit of large equipment directly connected to the distribution board and circuit between the distribution board and the socket (three-phase distributor circuit includes a single commercial lighting circuit). Fixed equipment, such as multi-phase motor and multi-phase fuse box; lighting equipment and lines inside large buildings; machine tools and power distribution boards at industrial sites (workshops).
CAT IV	Three-phase public power unit and outdoor power supply line equipment. Equipment designed to "initial connection", such as power distribution system of power station, power instrument, front-end overload protection, and any outdoor transmission line.

CE	Certification	CE indicates a registered trademark of EU
UKCA	Certification	UKCA indicates a registered trademark of UK
ETL Intertek 4007682	Certification	ETL indicates a registered trademark of Intertek.
	Waste	This product complies with the marking requirements of WEEE Directive (2002/96/EC). This additional label indicates that this electrical / electronic product must not be discarded in household waste.
	EFUP	This environment-friendly use period (EFUP) mark indicates that dangerous or toxic substances will not leak or cause damage within this indicated time period. The environment-friendly use period of this product is 40 years, during which it can be used safely. Upon expiration of this period, it should enter the recycling system.

Safety Requirements	
Warning	

Preparation before use	Please connect this device to AC power supply with the power cable provided. The AC input voltage of the line reaches the rated value of this device. See the product manual for specific rated value. The line voltage switch of this device matches the line voltage; The line voltage of the line fuse of this device is correct.
Check all terminal rated values	Please check all rated values and marking instructions on the product to avoid fire and impact of excessive current. Please consult the product manual for detailed rated values before connection.
Use the power cord properly	You can only use the special power cord for the instrument approved by the local and state standards. Please check whether the insulation layer of the cord is damaged or the cord is exposed, and test whether the cord is conductive. If the cord is damaged, please replace it before using the instrument.
Instrument Grounding	To avoid electric shock, the grounding conductor must be connected to the ground. This product is grounded through the grounding conductor of the power supply. Please be sure to ground this product before it is powered on.
AC power supply	Please use the AC power supply specified for this device. Please use the power cord approved by your country and confirm that the insulation layer is not damaged.
Electrostatic prevention	This device may be damaged by static electricity, so it should be tested in the anti-static area if possible. Before the power cable is connected to this device, the internal and external conductors should be grounded briefly to release static electricity. The protection grade of this device is 4 kV for contact discharge and 8 kV for air discharge.
Measurement accessories	Measurement accessories are of lower class, which are definitely not applicable to main power supply measurement, CAT II, CAT III or CAT IV circuit measurement.
Use the input / output port of this device properly	Please use the input / output ports provided by this device in a properly manner. Do not load any input signal at the output port of this device. Do not load any signal that does not reach the rated value at the input port of this device. The probe or other connection accessories should be effectively grounded to avoid product damage or abnormal function. Please refer to the product manual for the rated value of the input / output port of this device.
Power fuse	Please use power fuse of specified specification. If the fuse needs to be replaced, it must be replaced with another one that meets the specified specifications by the maintenance personnel authorized by UNI-T.

Disassembly and cleaning	There are no components available to operators inside. Do not remove the protective cover. Maintenance must be carried out by qualified personnel.
Service environment	This device should be used indoors in a clean and dry environment with ambient temperature from 0℃ to 40℃. Do not use this device in explosive, dusty or humid air.
Do not operate in humid environment	Do not use this device in a humid environment to avoid the risk of internal short circuit or electric shock.
Do not operate in flammable and explosive environment	Do not use this device in a flammable and explosive environment to avoid product damage or personal injury.
Caution	
Abnormality	If this device may be faulty, please contact the authorized maintenance personnel of UNI-T for testing. Any maintenance, adjustment or parts replacement must be done by the relevant personnel of UNI-T.
Cooling	Do not block the ventilation holes at the side and back of this device; Do not allow any external objects to enter this device via ventilation holes; Please ensure adequate ventilation, and leave a gap of at least 15 cm on both sides, front and back of this device.
Safe transportation	Please transport this device safely to prevent it from sliding, which may damage the buttons, knobs or interfaces on the instrument panel.
Proper ventilation	Poor ventilation will cause the device temperature to rise, thus causing damage to this device. Please keep proper ventilation during use, and regularly check the vents and fans.
Keep clean and dry	Please take actions to avoid dust or moisture in the air affecting the performance of this device. Please keep the product surface clean and dry.
Note	
Calibration	The recommended calibration period is one year. Calibration should only be carried out by qualified personnel.

3. Product Overview

UT5583 insulation resistance tester adopts high-performance controller, it has 4.3 inch TFT-LCD display. Output voltage can freely set 1V~1000V to meet most of the test requirements. Six range measurement, insulation resistance measurement range can reach to 10 kΩ~10 TΩ, sampling rate up to 30 ms/time. UT5583 has a wide range of communication interfaces, providing a preferred test solution for automated production.

3.1 Measurement Application

Ultra high value resistor
A variety of insulation materials, devices and wires and cables
Automatic test system

3.2 Accuracy of Instrument

Measurement parameter	Insulation resistance, leakage current	
Output voltage	Range control 1V〜1000V (DC): When voltage ≥10V, adjusting step 1V When voltage <10V, adjusting step 0.1V	
Accuracy of voltage	When voltage≥10V, 1%±1V When voltage <10V, 10%±0.1V	
Measurement range	Resistance: 10 kΩ〜10 TΩ Current: 100 pA〜250 uA	
Accuracy of measurement	1V ≤ Voltage <10V	5% (less than 1M); 1% (1M~100M); 5% (100M~10G); 10% (greater than 10G)
	10V ≤ Voltage ≤1000V	5% (less than 1M); 1% (1M~1G); 3% (1G~10G); 5% (10G~100G); 10% (100G~1T); 15% (greater than 10G)
Test speed	Fast speed: 30 ms/time; Middle speed: 100 ms/time; Slow speed: 500 ms/time	
Range mode	Automatic, lock, nominal (select the best range according to the comparator setting)	
Maximum of charging current	25 mA ± 5 mA	
Display result	Voltage, current, resistance, sorting result, audible and visual alarm	
Trigger mode	Internal trigger, manual trigger, external trigger, bus trigger	
Charge time	0〜999s	
Test time	0〜999s	
Discharge time	0〜999s	
Comparator function	Record of 1 group, judge the upper limit (UFAIL), qualified (PASS), the lower limit (LFAIL)	
Calibration function	Full range open-circuit zero clearing	
Screen display	4.3 inch TFT-LCD	

Sotrage and Interface	
USB HOST	√ (support USB 128G)
File management	Save 100 test files, USB supports file access
USB data record	√
Control interface	HANDLER, FOOT
Communication protocol	SCPI, Modbus RTU
Communication interface	RS232C, USB HOST, LAN (option RS485)

3.3 Main Features

- 4.3 inch TFT-LCD, easy operation panel
- Real-time monitoring output voltage
- Dual display of insulation resistance and leakage current
- Charge time, test time and discharge time can be adjusted
- Calibration function, full range open circuit zero clearing
- Contact detection for capacitive materials
- Digit display function (5 digits/4 digits)
- Comparator function: sorting qualification and disqualification
- Sound setting of sorting judgement
- Quick discharge battery function
- USB data record
- Save 100 test files, USB supports file access
- Various interfaces, support two protocols, SCPI and MODBUS

3.4 Main Functions

3.4.1 Range

Use 6 range measurement, range divides into automatic, manual and nominal.
Nominal range: the instrument will select the best range according to the comparator setting.

3.4.2 Test Speed

Slow speed: 500 ms/time
Middle speed: 100 ms/time
Fast speed: 30 ms/time

3.4.3 Trigger Mode

Internal trigger: internal automatic cycle generates a measurement
Manual trigger: press [MAN] trigger key to generate a measurement

Bus trigger: use communication command [BUS] to generate a measurement
External trigger: Handler trigger

3.4.4 Basic Accuracy

Maximum accuracy of voltage source: 1% * Setting value ± 1V
Maximum accuracy of insulation resistance: 1%

3.4.5 Calibration Function

Full range open circuit zero clearing: eliminate the effect of stray impedance

3.4.6 Various Interfaces

HANDLER

UT5583 has sorting function.

The instrument has independent and separate power supply, so external power supply is not necessary.
Optoelectronic isolator
Input: start signal, stop signal, trigger signal, lock key signal; input port of built-in pull-up resistor
Output: all sorting comparison result signals; test completion signal (EOM); large current drive output can direct drive relay.

RS-232C Interface

Support the maximum baud rate of 115200 bps, and compatible with SCPI and Modbus RTU protocol.

LAN Interface

Support 100 Mbit/s transmission rate
The instrument has two ways to connect PC via LAN port.
Direct connect to PC via network cable
Connect to PC via router

USB Interface

Support record measurement data
Support file access
Support screenshot function
Support program update, convenient for personalized customization

FOOT.C Interface

Convenient for external connecting footswitch

RS-485 Interface (option)

Support the maximum baud rate of 115200 bps, and compatible with SCPI and Modbus RTU protocol.

4. Product Introduction

4.1 Front Panel

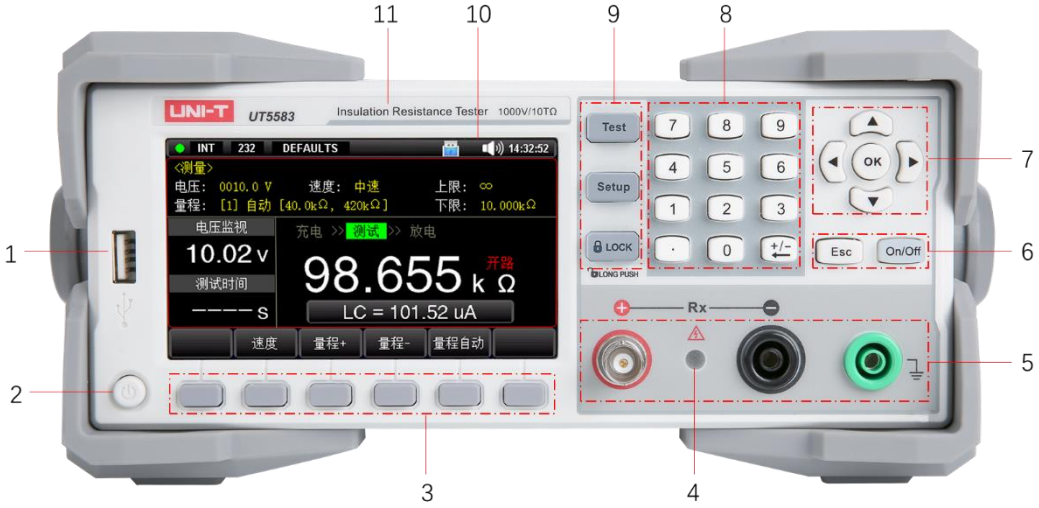


Figure 4-1 Front Panel

No.	Description
1	USB interface
2	Power switch
3	Functional keys (at the bottom of the screen)
4	High voltage indicator (It will illuminate with red when monitoring voltage is greater than 10V.)
5	Test terminal is used to connect test cable for measurement. (+) positive terminal (current sampling terminal) (-) negative terminal (voltage output terminal, dangerous high voltage!) GND Ground terminal (block the object to be test if the part under test is a cable or a capacitor, the end is not connected.) **Warning: Do not connect negative termainl with ground terminal.**
6	Exit and start/stop key (the key has indicator, it will will illuminate with green when it activated.)
7	Arrow keys and OK key
8	Numeric keyboard
9	Specific functional shortcut key
10	Screen
11	Emblem

4.2 Rear Panel

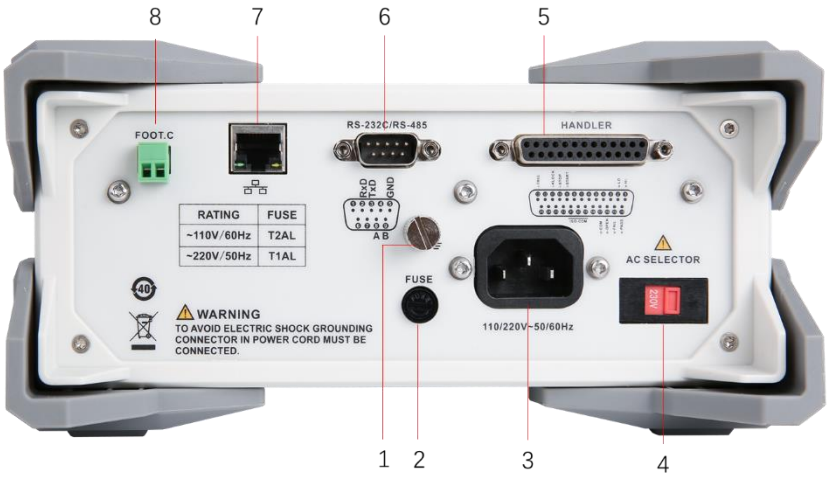


Figure 4-2 Rear Panel

No.	Description
1	Protective ground terminal
2	Fuse
3	Power socket
4	AC 220/110V adaptor
5	Handler interface
6	RS-232C /RS-485 interface (option)
7	LAN interface
8	Footswitch interface

4.3 Connection Method of Test Wire

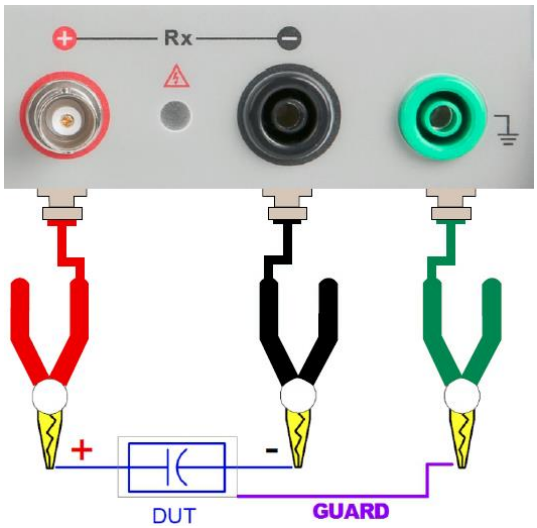
4.3.1 Front Panel Wiring

Figure 4-3-1 Front Panel Wiring

4.3.2 Connecting UNT with Shielded Terminal

UNT (unit under test) with shielded terminal, such as standard high resistance, device and equipment with shielded enclosure, and etc. Please measure it as the following method.

Figure 4-3-2 Measure UNT with Shielded Terminal

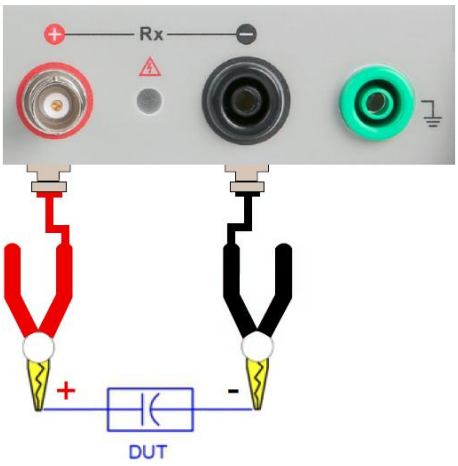


⚠	Note: If UNT has shielded enclosure, the shielded enclosure cannot connect to positive and negative.

4.3.3 Connecting UNT with Polarity

UNT (unit under test) with polarity, such as the capacitor with positve and negative polarity. It must be meaured as the following method and should distinguish the positvie and negative.

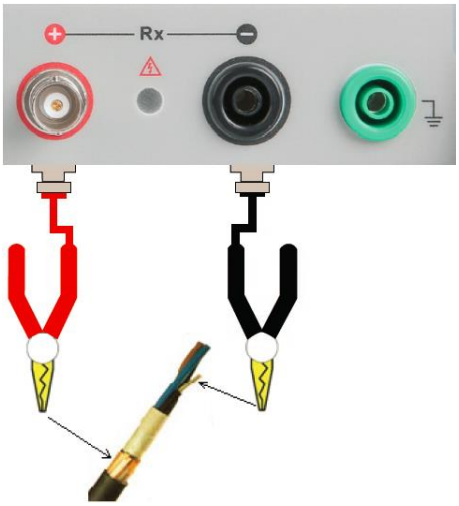
Figure 4-3-3 Measure UNT with Positive and Negative



4.3.4 Connecting UNT with Nonolarity and Unshielded Terminal

The device and material without polarity and shielded terminal, such as electric wire and cable. Please measure it as the following method. No special test requirements.

Figure 4-3-4 Measure UNT with Nonolarity and Unshielded Terminal



Warning

1. Negative terminal has high voltage. It is recommended that connect the UNT in discharge state to aviod electric shock.
2. Device with polarity (electroytic capacitor) should correctly connect to positive and negative. Otherwise, it may cause damage to personal safety. Please take off after dicharge a few seconds, to aviod electric shock.

Notes

3. Recommendation: Discharge the components in the instrument.
4. The instrument cannot short-circuit for long time, otherwise, the instrument will be damaged.
5. In order to guarantee the accuracy and stability of measurement, please ensure that the temperature and humidity of the environment meet the required conditions.

4.4 Open Circuit Zero Clearing

It is used to perform open circuit zero clearing for instrument. In order to achieve high precision measurement, zero clearing calibration is a must.

Note: Test wire must be open circuit and suspended. Do not contact any object.

In the stop state, press **[zero clearing]** key at the bottom of the screen to enter zero clearing page.

Entity Key	Function
OK	The instrument exeutes open circuit for all ranges. If zero clearing is successfully performed, data will be recorded in storage.
Esc	Exit zero clearing, the instrument will return to the stop state.

4.5 Start Test

Set the parameter---Correctly connect test wire---Press **[On/Off]** key to start test.

5. Inspection and Installation

5.1 Packing List

Before using the instrument,

1. Check the appearance whether is damaged or scratched;
2. Check the packing list if has loss.

If the product is damaged or accessory is missing, please contact UNI-T sales department or distributor.

Article	Quantity	Remarks
Insulation resistance tester	1 piece	
Power cord	1 piece	
RS232 communication line	1 piece	
Test line	1 set	1 piece of red, green and black
Spare fuse	2 pieces	T1AL for 220V Or T2AL for 110V
Pluggable wiring terminal	1 piece	Footswitch
Download manual	1 piece	
User's manual	0 piece	Electronic user's manual can download from the official website.

5.2 Power Requirements

The instrument is deign to use under CAT Ⅱ, do not use under CAT Ⅲ and CAT Ⅳ.

Befor boot the power, please make sure the power voltage and fuse is consistent with the voltage selected by the AC SELECTOR switch on the back panel of the instrument.

Input Voltage	Frequency Range	Fuse (slow-blow)	Rated Power
110V	47-63Hz	2A	30VA
220V		1A	

Warning: To prevent electric shock, please make sure that the power line is securely connect to the ground.

5.3 Operation Environment

UT5583 insulation resistance tester is recommended for use under the following environmental conditions.

Environmental Requirements

Operating temperature	0℃～40℃, 20%～80%RH (non-condensing)
Temperature and humidity range for guarantee the accuracy	23℃ ±5℃, 30%～65% R.H.
Storage temperature	-10℃～60℃, non-condensing below 80% R.H.
Altitude	≤2000 meters

5.4 Cleaning

To prevent electric shock, unplug the power line before cleaning.

Use clean cloth with slight water to wipe outer shell and panel and keep it dry. Avoid water enters the instrument.

Do not clean the internal of the instrument.

⚠ Note: Do not use solvent (alcohol or gasoline) to clean instrument.

5.5 Handle

Handle is adjustable and can adjust to four positions, hold two sides of the handle to pull or rotate as shown in the following figure.

Figure 5-1 Original Position

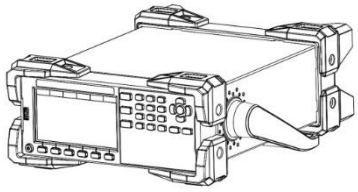


Figure 5-2 Test Position

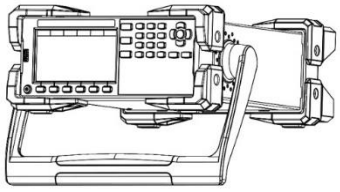


Figure 5-3 Remove Handle

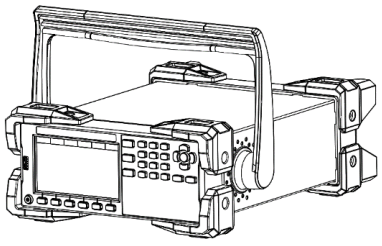
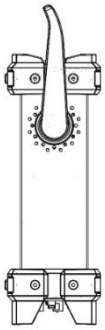


Figure 5-4 Lift Position



5.6 Daily Checking

To avoid the accident, please checking the instrument before using.

1. The instrument's input power should conform to the specification and the power configuration should be correct.
2. The instrument should be securely connecte to the ground.
3. Test line material is sound, no crack, break and damage.

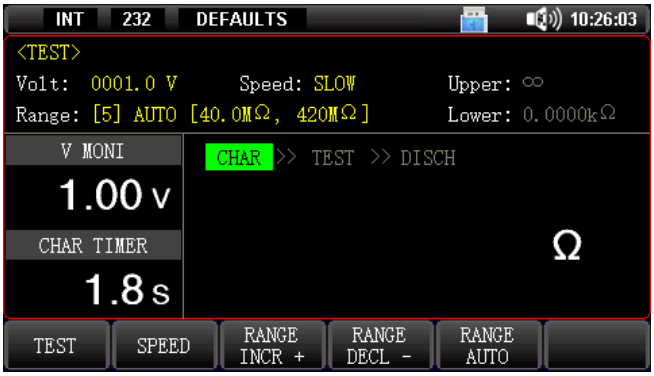
6. <Test> Display Page

6.1 <Test> Display Page

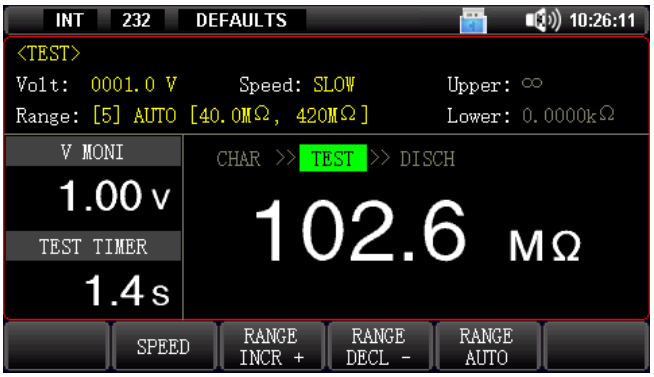
Boot-up or press [Test] key to enter [Test] page; Test can only be started at test page.
<Test> display page is mainly used to display measured results, test state and sorting results.
5 common function can be set at this page, including
Voltage — output voltage setting
Speed — test speed setting
Range — measuring range setting
Upper limit, lower limit: it can set when comparator function is enabled, refer to Section 8 comparator setting.

Figure 6-1<Test> Page

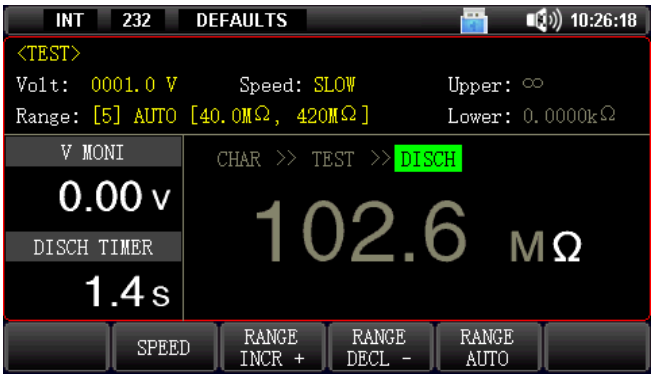
- Charge State



- Test State



- Discharge State



6.1.1 [Voltage] Setting

Meauring volatge of UT5583 is 1.0V~1000VDC, when voltage <10V, the voltage step is 0.1V; when voltage ≥10V, the voltage step is 1V.

Setting Steps of Voltage

1. In the stop state, press **[Test]** key to enter the test page or press **[Setup]** key to enter the main setting page.
2. Use the arrow key to select the **[Voltage]** field.
3. Use the function key at the bottom of the screen to direct select the pre-set voltage or use numeric keyboard to input voltage value.

6.1.2 Test [Speed]

The instrument provides three test speed (slow, middle and fast). The slower the speed, the more accurate and stable the test result.
Usually, when the user manually tests the device, use slow speed. If used for PLC and other automation equipment online test, please choose middle or fast speed.
In general, use slow speed when test device

Setting Steps of Test Speed

1. Press **[Test]** key to enter the test page or press **[Setup]** key to enter the main setting page.
2. Use the arrow key to select the **[Speed]** field.
3. Use the function key at the bottom of the screen to select **[Speed]**.

Function Key	Setting
Slow	500 ms/time
Middle	100 ms/time
Fast	30 ms/time

6.1.3 Test [Range]

Refer to section 14 Specification to learn more about the resistance range in different voltage and scale.
The accurate range is relate to the accuracy of measurement. The wrong range will make the measurement results unable to achieve the required accuracy.
There are three ways of measuring range.

Table 6-1 Description of Measuring Range

Measuring Range	Description	Pros	Cons
Automatic	The instrument will automatically select the best measuring range according to the	User participation is not required.	The automatic range needs to predict the range and the test speed

	resistance nominal value, measuring range number will automatically set in range filed.		will be lower than the manual range way.
Lock	The instrument will always perform the test by user-specified range.	Test speed reaches to the fast.	User need to select the proper range.
Nominal	The instrument will automatically select the best range for testing based on the nominal value.	The best way for sorting test. Test speed reaches to the fast.	Only for sorting test.

Setting Steps of Measuring Range

1. Press **[Test]** key to enter the test page or press **[Setup]** key to enter the main setting page.
2. Use the arrow key to select the **[Range]** field.
3. Use the function key at the bottom of the screen to select **[Range]**.

Function Key	Setting
Automatic Range	The instrument will automatically select the range.
Locked Range	The instrument will be locked at the current range.
Nominal Range	The instrument will automatically select the best range based on the nominal value.
Increase +	Increase the measuring range number, and in the meanwhile, the measuring range will change to locked range.
Decrease -	Decrease the measuring range number, and in the meanwhile, the measuring range will change to locked range.

1. In automatic range, some component (such as CBB capacitance) cannot correctly select the measuring rang. This kind of condition is normal. Change the measuring range to locked range can aviod such situations.
2. It is recommeded to use locked range when measuring leakage current.
3. Automatic range is not situable for sorting measurement.
4. For sorting, please select the nominal range.

6.2 Measurement Result

6.2.1 Display Page of Measurement Result

Figure 6-2 Status Icon (Test Page)

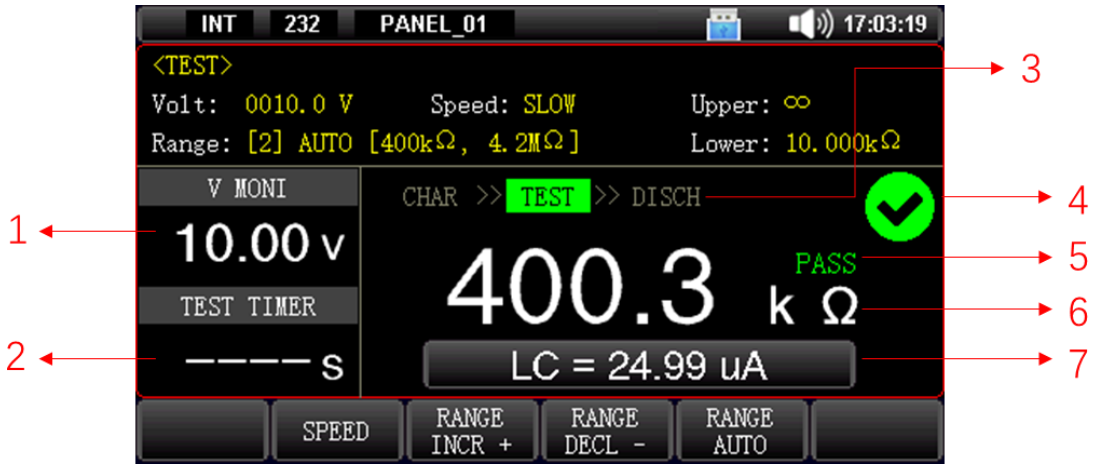
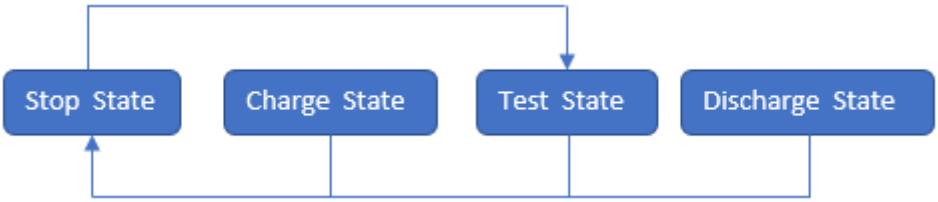


Table 6-1 Descriptio of Measurement Result

No.	Description
1	Real-time monitoring output voltage
2	Timer of charge, test or discharge
3	State display Display the dicharge state during stop test or discharge timing.
4	Total comparative results Qualified result displays tick with green, unquailied result displays in red fork.
5	Comparator state display Qualified: PASS Over the upper limit: UFAIL Over the lower limit: LFAIL Open circuit (poor contact): OPEN
6	Insulation resistance display It displays in white character during the test and in gray character during discharge/stop state. Note: The instrument will direct display measuring range for each scale. As shown in Figure 6-2, measuring range displays [1] Auto [40.0 kΩ,420 kΩ], it represents the measuring range number is 1, the measuring range mode is automatic and the measuring range of resistance test is 40.0 kΩ~420 kΩ. If range displays [1] Lock [40.0 kΩ, 420 kΩ], the tested resistance is lower than 40.0 kΩ, it displays Under.F, which means the range is over the lower limit; the tested resistance is higher than 420 kΩ, it displays Over.F, which means the range is over the upper limit.
7	Leakage current display It only display when display mode sets to resistance/current.

6.2.2 Switching State

Figure 6-3 Switching State



- Stop state: the state displays discharge and the test indicator is not illuminate.
  In this state, discharge circuit of the terminal under test is always connected, so the stored charge of the devices connected to the two-sided of terminal under test will be discharged to 0V by the machine.
  In charge state, test state and discharge state, press **[On/Off]** key to direct enter the stop state.

- Charge state: the state displays charge and the test indicator is illuminated with green. Test terminal has voltage output.
  In <Setup> page, set **[Charge Time]** to timing, and then set **[On/Off]** key to enter the charge state.
  During the charge process, press **[Test]** key display at the bottom of the screen to jump to the test state.
  After charge timing is completed, the instrument will automatically turn to the test state.
  If **[Charge time]** sets to OFF, press **[On/Off]** key to direct enter the test state.

- Test state: the state displays test and the test indicator is illuminated with green. Test terminal has voltage output.
  In <Setup> page, set **[Test Time]** to continuous, the instrument will always stay at the test state until press **[On/Off]** key or external input HANDLER discharge signal.
  In <Setup> page, set **[Charge Time]** to pre-set time, the instrument will measure one end of time before moving from the test state to the next state.
  1) If **[Discharge Time]** sets to OFF, the instrument will direct return to the stop state.
  2) If **[Discharge Time]** sets to pre-set discharge time, the instrument will enter the discharge state.

- Discharge state: the state displays test and the test indicator is illuminated with green. Test terminal will stop voltage output.
  In this state, discharge state of the terminal under test is always connected.
  After dicharge timing is completed, the instrument will automatically turn to the stop state.

6.2.3 Status Bar

Figure 6-4 Icon on Status Bar

Table 6-2 Icon of Status Bar

No.	Picture	Description
1	INT	Internal trigge: internal automatic cycle generate test.
	MAN	Manual trigge: press [MAN] key to generate a measurement.
	BUS	Bus trigge: press communication command [BUS] to generate a measurement.
	EXT	External trigge: Handler trigge
2	232	The selected communication mode is RS-232.
	485	The selected communication mode is RS-485.
	LAN	The selected communication mode is LAN.
3	DEFAULTS	The filename of the current test file (filename can change).
4		The key is locked.
5		USB is ready.
6		The network is connected.
7		Sorting sound and key sound is enabled.
		Sorting sound and key sound is disabled.
		Only key sound is enabled.
		Only sorting sound is enabled.
8		Time display

6.3 Screenshot

The instrument has screenshot function. Insert USB to the port on the front panel. When USB icon display on the screen, long press [OK] key on the panel, that is to capture the current screen image and save to USB for late use.save

It is recommended to use branded USB.

USB format is FAT32, the maximum capacity is 128G.

6.4 Lock Key

The instrument has lock key function for preventing change the test conditions by accident.

Short press [Lock] key to turn on the function; long press [Lock] key for 1s to turn off the function.

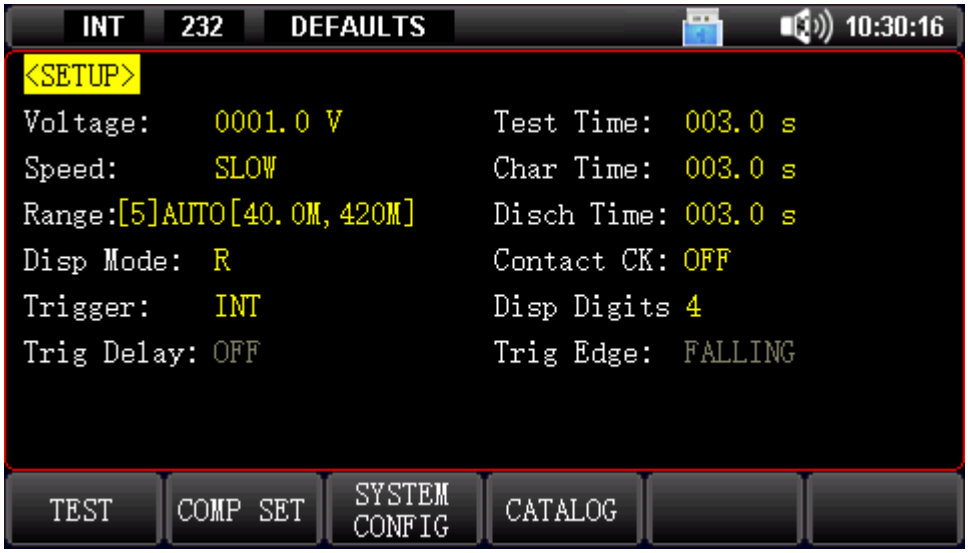
When the lock key is activated, the instrument only responds to [On/Off] key and [Lock] key.

7. Test <Setup> Page

In the stop state, press [Setup] key to enter setup page;

In <Setup> page, the instrument is not perform test.

Figure 7-1 <Test> Setup Page



The setting of output voltage, test speed and measuring range refers to section 6.

Parameter setting: press [Setup] key to enter <setup> page, use arrow key to move the cursor to the setting item, press the function key at the bottom of the screen or us numeric keyboard and [OK] key to select the parameter.

Table 7-1 Description of <Setup> Page

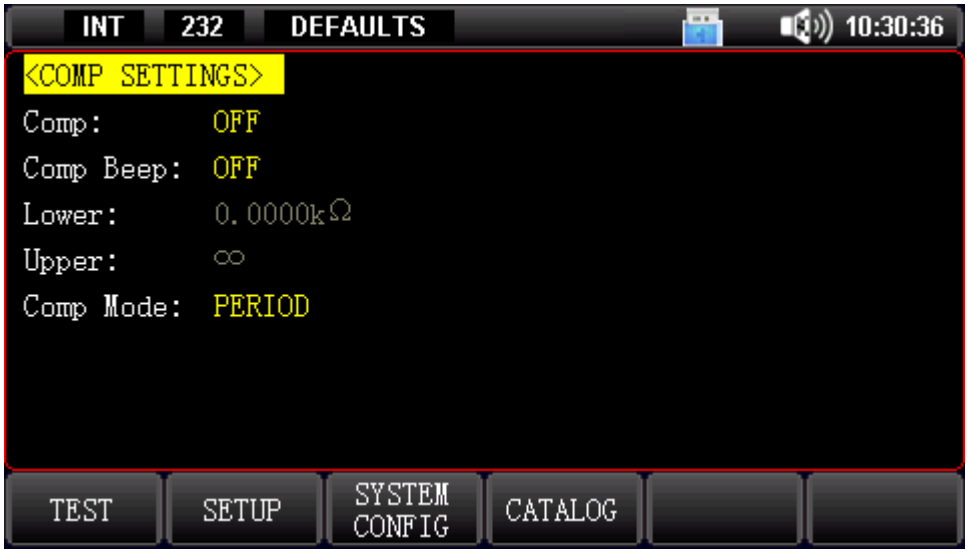
Item	Setting	Default Setting	Description
Test Time	Continuous, 0.5s, 2s, 10s, 30s, 60s	Continuous	In continous, the instrument enters continuous test state.
Charge Time	OFF, 2s, 5s, 10s, 30s, 60s	OFF	Or use numeric keyboard to input arbitrary time.
Discharge Time	OFF, 2s, 5s, 10s, 30s, 60s	OFF	Or use numeric keyboard to input arbitrary time.
Display Mode	Resistance, resistance and current	Resistance	Resistance ---- only display insulation resistance value in test page. Resistance and current ---- only display insulation resistance and leakage current value in test page.
Contact Inspection	ON, OFF	OFF	Whether perform the contact inspection or not

Trigger Mode	Internal, manual, bus, external trigger	Internal trigger	Internal trigger --- also called continuous test, trigger singal is continuous generated to perform test by internal fixed period; Manual trigger --- the instrument will perform a measurement after receive signal command, and stay in the wait state in other time; Bus trigger --- the instrument will perform a measurement after receive signal command, and stay in the wait state in other time; External trigger --- the instrument will perform a measurement when receive an edge pulse (the detail refer to Trigger Edge Setting) from Handler interface on the rear panel. The instrument will perform a measurement after receive signal command, and stay in the wait state in other time. Refer to Handler Interface (only valid when the comparator is enabled.)
Display Digit	5, 4	4	Insulation resistance and leakage current value displays 5 digits or 4 digits.
Trigger Delay	OFF, 50ms, 100ms, 200ms, 500ms,1000ms	OFF	It can only be set when trigger mode is not internal trigger and can arbitrarily input arbitrary time by numeric keyboard.
Trigger Edge	Rising edge, falling edge	Falling edge	Rising edge --- it will be generated when external trigger sets to rising edge; Falling edge --- it will be generated when external trigger sets to falling edge. Only for external trigger.

8. Comparator Setting

In the stop state, press [Test] key or [Setup] key and press [Comp] key at the bottom of the screen to enter <Comparator Setting> page.

Figure 8-1 <Comparator Setting> Page



Comparator	ON, OFF
Beeper Mode	OFF, qualified (it will sound when the comparative result is qualified), disqualified (it will sound when the comparative result is disqualified)
Lower Limit of Resistance	The lower limit of resistance can be set when the comparator is enabled. Use numeric keyboard and [OK] key to input.
Upper Limit of Resistance	The upper limit of resistance can be set when the comparator is enabled. Use numeric keyboard and [OK] key to input.
Comparative Mode	Single ---- comparison for each sample in the test state; **when it sets to single, the test time will set to continuous.** Period ---- After a test period is complete, perform a comparison.

Compartor Operation

Compare the measured value and the pre-set limit value.

Sorting Procedure:

① Lower limit ≤ Current value ≤ Upper limit Qualified product, [Qualified]

② Current value < Lower limit Defective product, [LFAIL]

③ Current value > Upper limit Defective product, [UFAIL]

9. System

9.1 <System Configuration> Page

<System Configuration> page can set language, date and time and communication setting.

In the stop state, press [System] key to enter <System Configuration> page.

Figure 9-1 <System Configuration> Page

Table 9-1 Description of <System Configuration> Page

Item	Setting	Default Setting	Description
Language	English, simplified Chinese	simplified Chinese	Language setting of instrument
Date and Time		Current date and time	Instrument uses 24 hour system, change the date and time by function keys
Volume	Low, middle, high	Low	Beeper's volume
Sound Key	ON, OFF	ON	The switch of key sound
Backlight Brightness	10%, 30%, 50%, 70%, 90%, 100%	100%	Backlight brightness of LCD
Communication Mode	RS232, RS485, LAN	RS232	Instrument supports three remote control interfaces, RS232, RS485 and LAN interface.
Communication Protocol	SCPI, MODBUS	SCPI	Instrument supports two communication protocols, SCPI and Modbus (RTU). It is usually convenient to use SCPI to communicate with computers. Communication with PLC and other industrial control equipment, Modbus protocol is easier to use. TFor more details on protocol, refer to "UT5583 Insulation Resistance Tester – Programming Manual".

Baud Rate	9600, 19200, 38400, 57600, 115200	115200	Baud rate of serial bus
Station Number	0~32	01	Modbus (RTU) requires the station address ① Instrument allow to use station number 00 to perform broadcast communication. ② 1~32: the address of the instrument when connect to the bus.
Result Send	FETCH? , automatic	Automatic	This function is only for SCPI. The instrument supports automatically send data to the host computer. The data will be automatically sent to the host computer after each test is completed without the need for the host to send the FETCH? command.
IP Address	192.168.030.036		It can set by numeric keyboard, it will be used when select LAN interface.
Port Number		502	It is default setting and not easy to change. It will be used when select TCP interface.
Power Frequency	50 Hz, 60 Hz	50 Hz	Power frequency is selected based on the power supply.
Factory Setting	Restore		All settings of the instrument will restore to the factory setting. <File Mangement> page presets to file 1.

9.2 <System Information> Page

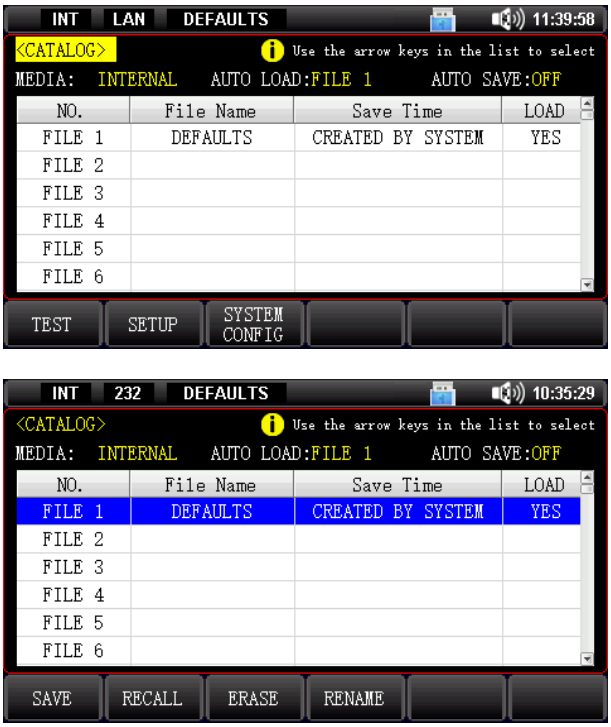
Enter <System Configuration> page and press function key to select [System Information].
This part inculdes model'name, serial number and version of the instrument.
This page does not require user involvement.

Figure 9-2 <System Information> Page

10. File Management

In the stop state, press [Test] key or [Setup] key, and press function key [CATALOG] at the bottom of the screen. The instrument will enter <CATALOG> page.
The file can save the test setting.
File management can save the setting to 100 files for boot-up use or read the change when change the specification.

Figure 10-1 <File Management> Page



Item	Description
MEDIA	Internal memorizer USB memorizer User can quickly set batch setting for the instrument and support save the setup parameter to external USB. Other instrument can read the test setup parameter from USB.
AUTO LOAD	File 1: boot-up to load data of the file 1 Current file: boot-up to load data of the current file
AUTO SAVE	ON: automatically set the current setup parameter to the current file OFF: automatic save is forbidden
File Operation	SAVE: save the setup to the selected file RECALL: read the parameter from the selected file ERASE: delete the file data. If the instrument want to reload the current file when boot up, the system will usethe default setting to creat a file. RENAME: change filename

11. USB Storage

The instrument supports save the test data to USB in real time.

Befor the test, inserting USB on the front panel of the instrument (USB requirements refere to Screenshot function).

After the test is finished, the instrument will automatically save the test data to USB.

11.1 USB Data Storage Mechanism

The instrument only supports set comparator mode to period, and when the test time is non-continuous, the test data will be stored once at the end of the test.

Figure 11-1 Comparator Mode: Period

11.2 USB Format

Figure 11-2 Data Folder in USB

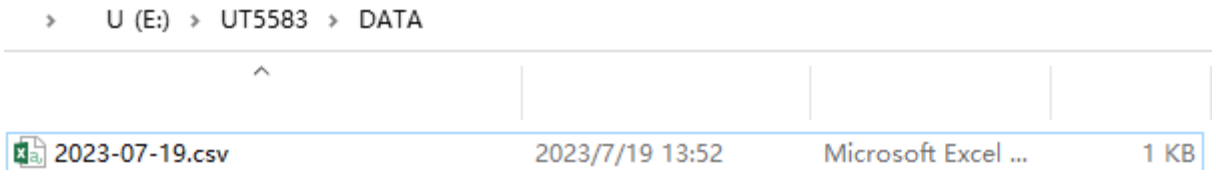


Figure 11-3 Example of Test Data

A	B	C	D	E
DATA TIME	R(OHM)	I(A)	VOLT(V)	COMP
2023/7/19 13:52	1.02E+08	9.81E-08	10	PASS
2023/7/19 13:52	1.02E+08	9.81E-08	10	PASS
2023/7/19 13:52	1.02E+08	9.81E-08	10	PASS
2023/7/19 13:52	1.02E+08	9.81E-08	10	PASS

No.	Function
A--DATA TIME	Record time
B—R(OHM)	Insulation resistance value in scientific notation (unit is Ω).
C—I(A)	Leakage current in scientific notation (unit is A).
D—VOLT(V)	Monitoring voltage value
E—(COMP)	Comparative Results OFF: no comparison PASS: qualified UFAIL: over the upper limit LFAIL: over the lower limit OPEN: open circuit (poor contact)

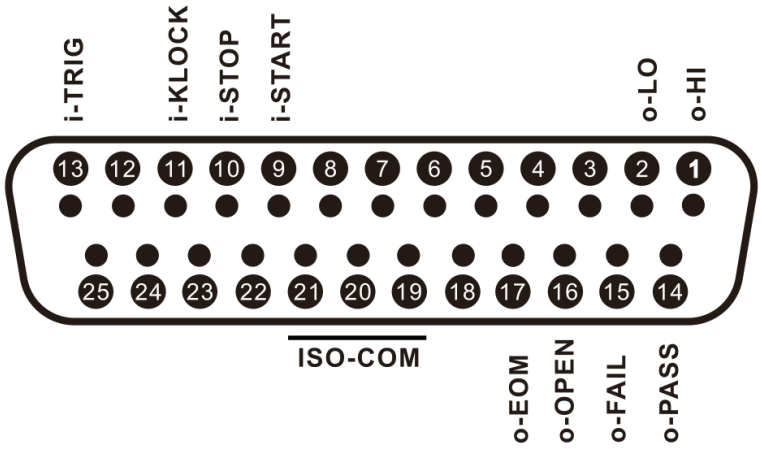
12. Handler Interface

The instrument provides a full-featured handler interface that includes the signals of sorting output PASS/FAIL, EOM (test completion signal) and TRIG (external trigger initiation) input. Depending on the comparator mode (single and period), the instrument provides two sets of handler interface test solutions. Through this interface, the instrument can be easily connected to the user's system control components to complete the automatic control functions.

- ✓ Comparator modes (single and period), for the difference between the two modes, see **[8 Comparator Settings]** section for details.
- ✓ Normal use of Handler interface, **[Comparator]** select **[Open]**, **[Trigger Mode]** select **[External]**.

12.1 Wiring Terminal

Figure 12-1 Wiring Terminal



Note: The signal name prefixed with **"I"** denotes the input signal, and the signal name prefixed with **"O"** denotes the output signal.

12.2 Handler Interface — Single Comparison Mode

Figure 12-2 Comparator Mode: Single

12.2.1 Wiring Signal of Single Comparison Mode

Table 12-1 Pin Definition of Output Terminal in Single Comparison Mode

Pin	Name	Description
17	EOM	0: read 1: wait *In test page, it is high level valid when sampling, and turn to low leven when sampling is finished.*
14	PASS	Qualified output of comparator 0: PASS (Low level is valid.)
15	FAIL	Total disqualified output of comparator 0: FAIL (Low level is valid.)
1	HI	Over the upper limit disqualified output of comparator 0: HI (Low level is valid.)
2	LO	Over the lower limit disqualified output of comparator 0: LO (Low level is valid.)
16	OPEN	Poor contact (open circuit) 0: OPEN (Low level is valid.) *In opern circuit, all sorting signals (PASS, FAIL, HI LO) are restore to high level.*

Table 12-2 Pin Definition of Intput Terminal in Single Comparison Mode

Pin	Name	Description
9	START	Charge/test signal (it is valid in the stop state.) *Pulse signal, low level maintains 10~50 ms (typical value is 30 ms.)*
10	STOP	Stop test *Pulse signal, low level maintains 10~50 ms (typical value is 30 ms.)*
11	KLOCK	Lock Key *Pulse signal, low level maintains 10~50 ms (typical value is 30 ms.)* *This signal is only for lock, unlock should operate on the instrument.*

13	TRIG	Test trigger input terminal *Edge signal, trigger edge tyoe can select in <Setup> page, the default is falling edge.* *Low level maintains 1ms.*

Table 12-3 Pin Definition of Voltage Terminal in Single Comparison Mode

Pin	Name	Description
19	ISO-COM	Common ground, not allow to float. Be sure to be reliably connected to the ground (COM) port of the power supply of an external controller (such as a PLC).
20		
21		
24	Internal ISO-VCC Output	Positive output of internal VCC power supply Internal isolation power voltage: 5V, 0.2A, 1Wmax **Do not connect if it is not necessary.**
25		

1. Pin P24/P25 is output terminal of internal isolation power.
2. Warning: Set pin P24/P25 to be floating when normal connecting to PLC.
3. Internal power voltage is limited (5V， 0.2A, 1Wmax), it cannot drive the power relay or high power LED.
4. Pin P24/P25 has built-in automatic self-recovery fuse, it will cut off the connecting of ISO-VCC when it excceds 0.5 A, long short circuit will cause the fuse to burn out.

12.2.2 Time Sequence of Single Comparison Mode

Figure 12-1 Time Squence of Start/Stop in Single Comparative Mode

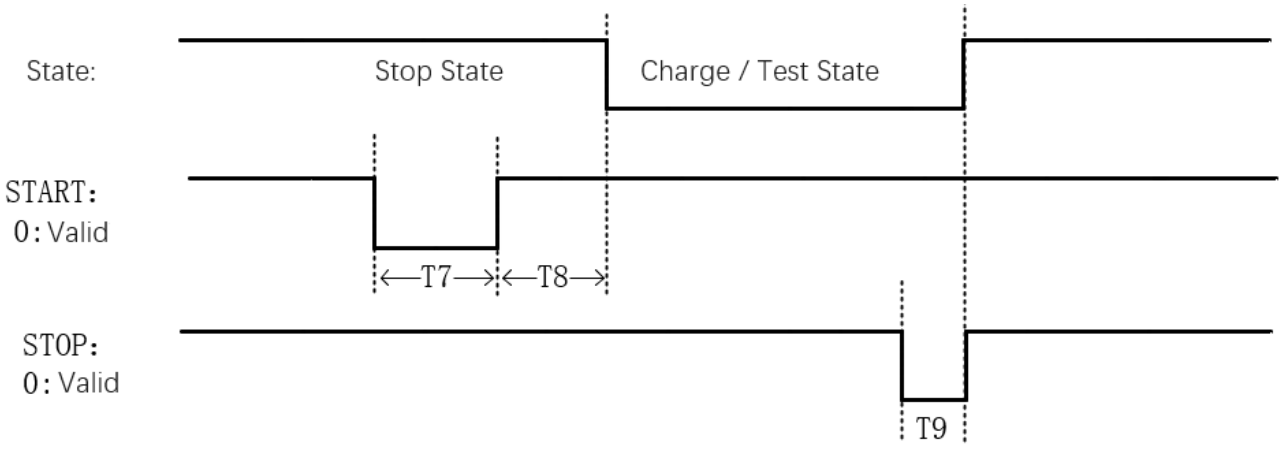


Figure 12-2 Time Squence of Sampling Data during the Test State in Single Comparison Mode, BIN is Comparsion Output

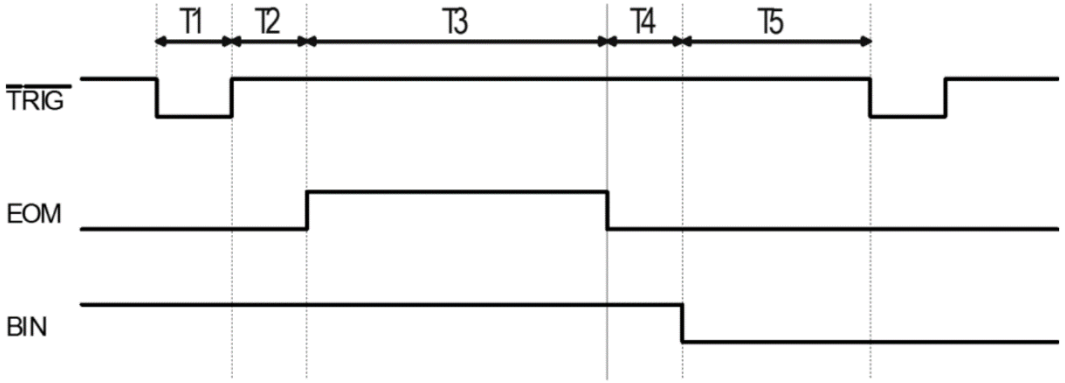


Table 12-2 Time Squence of Single Comparison Mode

Description				Typical Value
T7	Charge/test signal valid and low level holding time			*30ms*
T8	Time delay before the instrument enters charge/test state			30ms
T9	Stop signal valid and low level holding time			30ms
T1	Trigger pulse width			1ms
T2	Measurement period	Trigger delay		*Relate to Setup, refer to section 7- Trigger Delay*
T3		AD conversion time (EOM[BUSY])	Fast	*30ms*
			Middle	*100ms*
			Slow	*500ms*
T4	Delay output of sorting results			*1ms*
T5	Wait time after triggered			*0s*

Single Comparison Mode

In the test state, each time the insulation resistance value is sampled, the current measurement value will compared with the preset limit reference value.

This mode can improve the test efficiency and meet the needs of high-speed sorting test.

12.3 Handler Interface — Period Comparison Mode

Table 12-5 Period Comparison Mode

In addition, period comparison mode requires normal output the sorting results, so **[Test Time]** in <Setup> page should set to the sepecified time

12.3.1 Wiring Signal of Period Comparison Mode

Table 12-3 Pin Definition of Output Terminal in Period Comparison Mode

Pin	Name	Description
17	EOM	0: read 1: wait *In test page, it is high level valid when sampling, and turn to low leven when sampling is finished.*
14	PASS	Qualified output of comparator 0: PASS (Low level is valid.)
15	FAIL	Total disqualified output of comparator 0: FAIL (Low level is valid.)
1	HI	Over the upper limit disqualified output of comparator 0: HI (Low level is valid.)
2	LO	Over the lower limit disqualified output of comparator 0: LO (Low level is valid.)
16	OPEN	Poor contact (open circuit) 0: OPEN (Low level is valid.) *In opern circuit, all sorting signals (PASS, FAIL, HI LO) are restore to high level.*

Table 12-4 Pin Definition of Intput Terminal in Period Comparison Mode

Pin	Name	Description
13	TRIG	Test trigger input terminal ● *Edge signal, trigger edge tyoe can select in <Setup> page, the*

		default is falling edge. Low level maintains 1ms. ● *After receive this signal, the instrument will perform a complete period test (Charge --> Test --> Discharge --> Stop).*
10	STOP	Stop test *Pulse signal, low level maintains 10~50 ms (typical value is 30 ms.)*
11	KLOCK	Lock Key *Pulse signal, low level maintains 10~50 ms (typical value is 30 ms.)* *This signal is only for lock, unlock should operate on the instrument.*

Table 12-5 Pin Definition of Power Terminal in Period Comparison Mode

Pin	Name	Description
19	ISO-COM	Common ground, not allow to float. Be sure to be reliably connected to the ground (COM) port of the power supply of an external controller (such as a PLC).
20		
21		
24	Internal ISO-VCC Output	Positive output of internal VCC power supply Internal isolation power voltage: 5V, 0.2A, 1Wmax **Do not connect if it is not necessary.**
25		

1. Pin P24/P25 is output terminal of internal isolation power.
2. Warning: Set pin P24/P25 to be floating when normal connecting to PLC.
3. Internal power voltage is limited (5V, 0.2A, 1Wmax), it cannot drive the power relay or high power LED.
4. Pin P24/P25 has built-in automatic self-recovery fuse, it will cut off the connecting of ISO-VCC when it excceds 0.5 A, long short circuit will cause the fuse to burn out.

12.3.2 Time Sequence of Period Comparison Mode

Figure 12-5 Time Squence of Sampling Data during the Test State in Period Comparison Mode, BIN is Comparsion Output

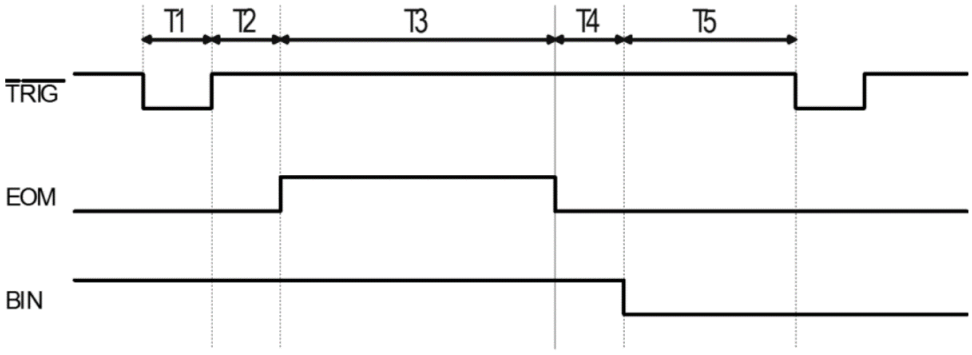


Table 12-6 Time Squence of Period Comparison Mode

Description			Typical Value
T1	Trigger pulse width		1ms
T2	Measurement period	Trigger delay	*Relate to Setup, refer to section 7-Trigger Delay*

T3		Test time	*Relate to Setup* *Test time = Charge time + Test Time + Discharge Time*
T4	Delay output of sorting results		*1ms*
T5	Wait time after triggered		*0s*

Period Comparison Mode

After a complete period test Charge --> Test --> Discharge --> Stop is finished, then compare the measured results with the preset limit reference.

This mode is safer because there is no voltage output at the test end after testing.

12.4 Wiring Method

- Power Supply

  Built-in isloation power supply, external power is no need, but common ground ISO-COM is a must.

  ISO-COM: P19~P21

- Output Signal

  Optoelectronic isolation with drive core, leakage open circuit output

  The maximum of load voltage is 30V, it is commended to use 24V.

  The maximum of output current: 50 mA

  Note: When using the osiclloscope or multimeter to confirm the ouput level, the output signal should pull up to power (count KΩ) and then to start measurement.

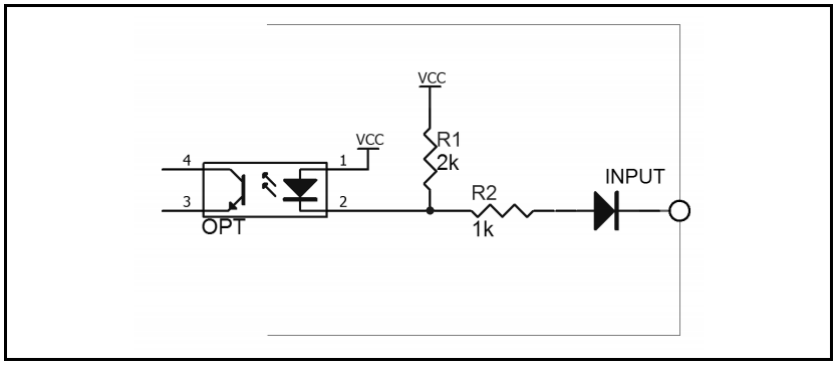
- Input Signal

  Optoelectronic isolation, low level valid.

  The maximum of current: 50 mA

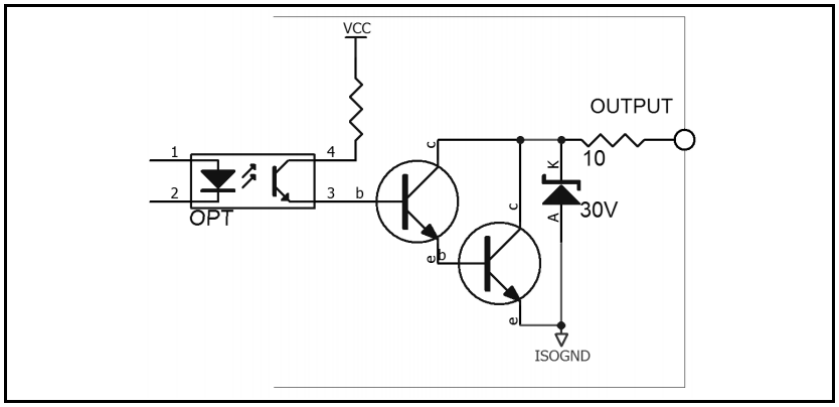
12.4.1 Schematic Diagram of Input Terminal

Figure 12-1 Schematic Diagram of Input Terminal



12.4.2 Schematic Diagram of Output Terminal

Figure 12-5 Schematic Diagram of Output Terminal



12.4.3 Connection of Input Circuit

Figure 12-2 Connect to Switch

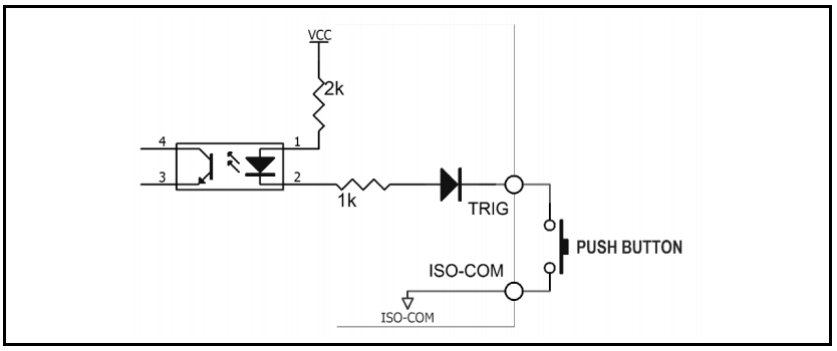


Figure 12-7 Relay Control

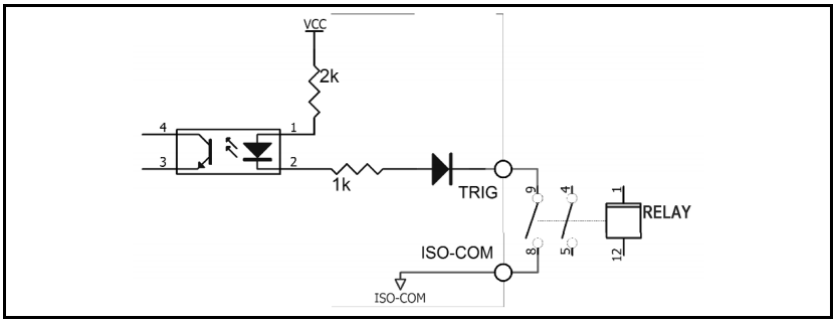
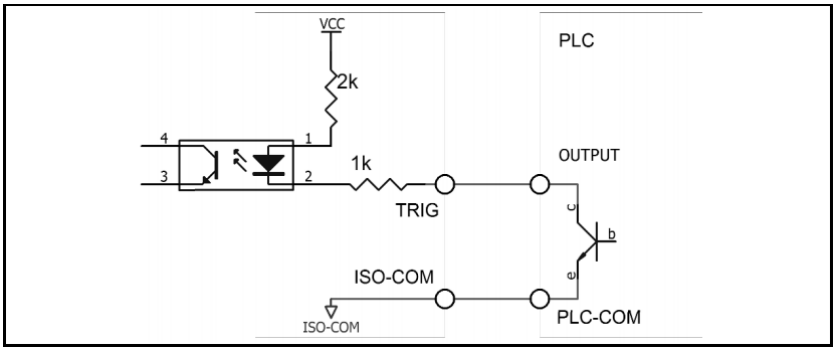
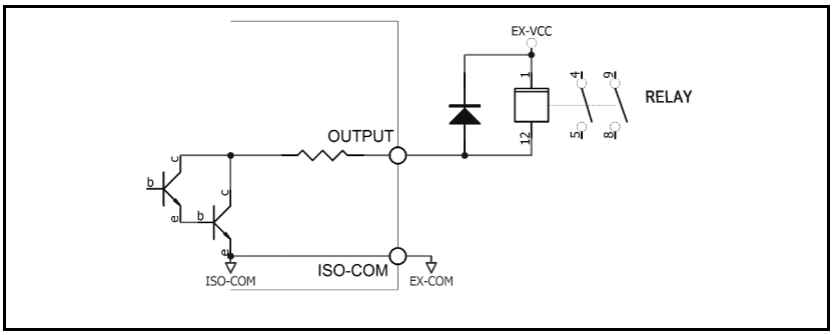


Figure 12-8 PLC Negtaive Common Terminal Control



12.4.4 Connection of Output Circuit

Figure 12-9 Control Relay



The maximum of EX-VCC is 30V !

Figure 12-10 Control Luminous Diode or Optoelectronic Isolator

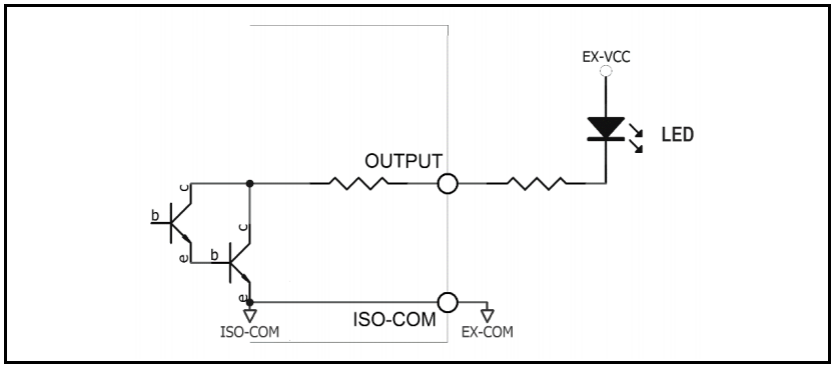


Figure 12-11 Negative Logic Output

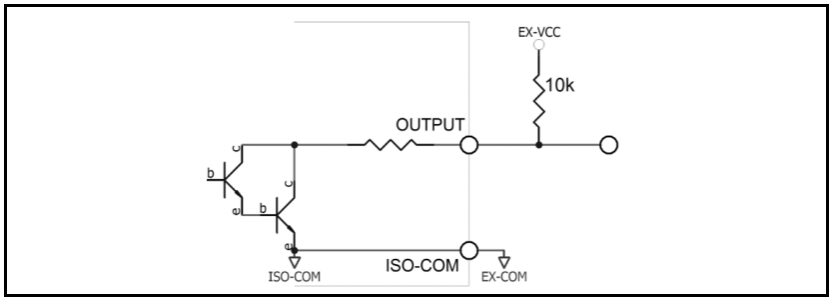


Figure 12-12 Dual Teminal Form a Logic or Circuit

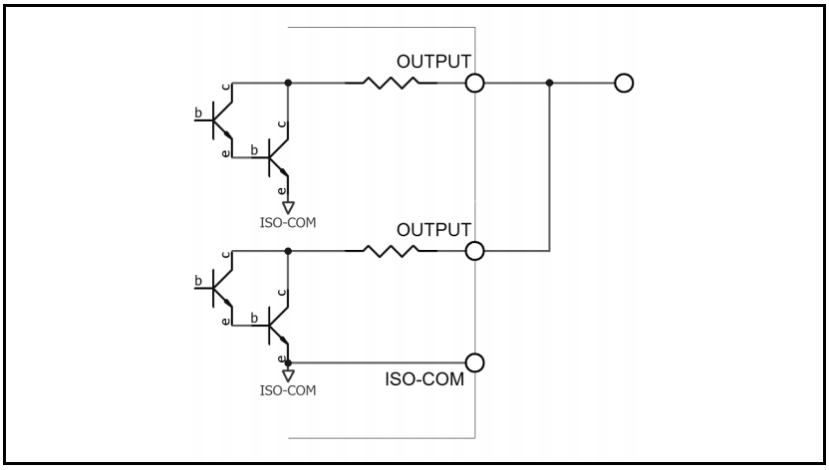
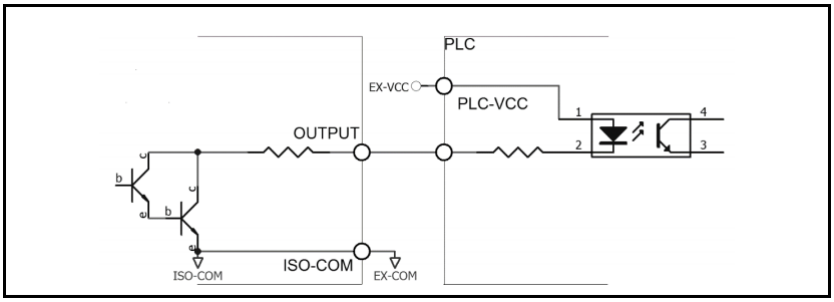


Figure 12-13 Output to PLC Negative Common Terminal



12.5 External Connecting Footswitch

Figure 12-14 Wiring Terminal of Footswitch

- Installation Method
  Connect the switch between the two terminals of FOOT.C.

- Instructions
  [Comparison Mode] select to **[Period]**, **[Trigger Mode]** select to **[Internal]**, other setting to set according to the actual.
  Press the switch, the instrument will start to test.

13. Remote Communication

13.1 RS-232C Interface Setting

13.1.1 RS-232 Introduction

RS-232 is widely used serial communication standard, it's also called asynchronous serial communication standard. It's used to to realize data communication between computers and peripherals. RS is English abbreviation of "Recommended Standard", 232 is standard number. The criterion is officialy published by Electronic Industries Alliance (EIA) in 1969. It requires that each bit should via a data line to transmit.
But the configuration of most serial ports is usually not strictly based on the RS-232 standard: a 25-core connector is used in each port (today's computers basically use a 9-core connector). The common RS-232 signal as shown in the following table.

Table 13-1 Common RS-232 Signal

Signal	Symbol	Pin number of 25-core connector	Pin number of 9-core connector
Request to send	RTS	4	7
Clear to send	CTS	5	8
Data set ready	DSR	6	6
Data carrier detect	DCD	8	1
Data terminal ready	DTR	20	4
Transmit data	TXD	2	3
Receive data	RXD	3	2
Ground	GND	7	5
Request to send	RTS	4	7

In addition, there is a minimal subset of RS232, which the connecting way of the instrument.

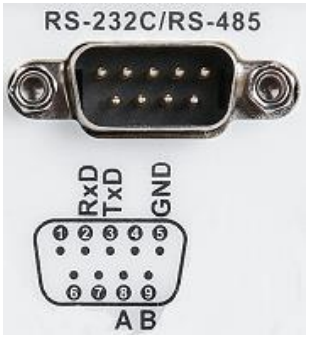
Table 13-2 Standard Minimum Subset of RS-232

Signal	Symbol	Pin number of 9-core connector
Transmit data	TXD	2
Receive data	RXD	3
Ground	GND	5

13.1.2 RS-232 Connection

Suggestion: In order to prevent electric shock, please turn off the power when plug the connector.

Figure 13-1 RS-232 Connector, D-sub 9 Pin Male Head



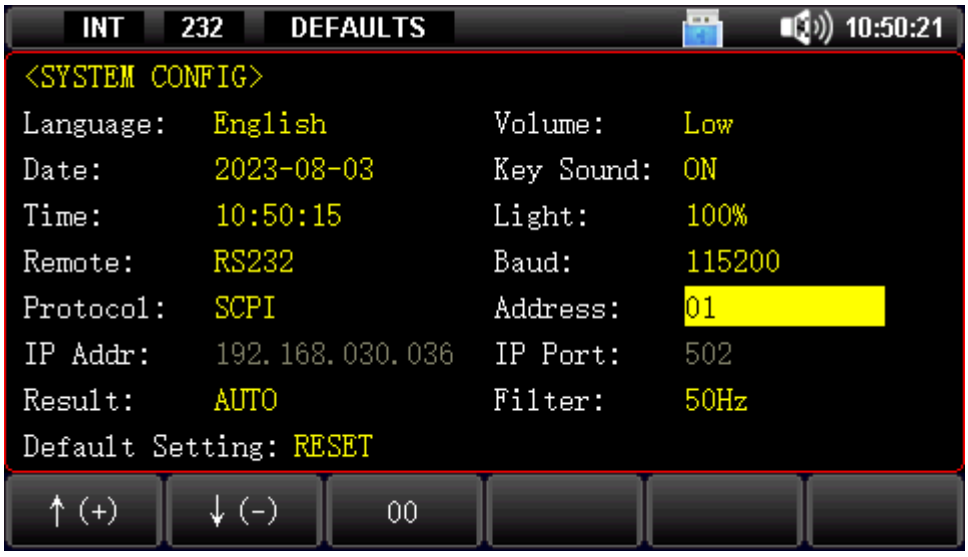
Use the crosswire of D-sbu 9 pin femal head to connect the instrument to PC.

The default communication setting of the instrument
Transmit mode: full duplex asynchronous communication with start and stop bit
Baud rate: **[Baud Rate]** setting in **<System Configuration>** page
Data bit: 8 bits
Stop bit: 1 bit
Parity bit: no

13.2 RS-485 Interface Setting

The option RS485 interface of instrument and support ModBus RTU protocol.
The standard interface of instrument is RS-232C. User can can also purchase a matching RS232 to RS485 interface converter to achieve RS485 functions.

Figure 13-1 Station Setting of RS485



The instrument's station number can set to 1~32 in <System Configuration>, station number of multi-salve is different;
RS485 is a communication interface support multi-machine communication, it can connect multi-machine via one host.

RS485 of the instrument and RS232 shares a DB9 terminal, as shown in Figure 11-1.

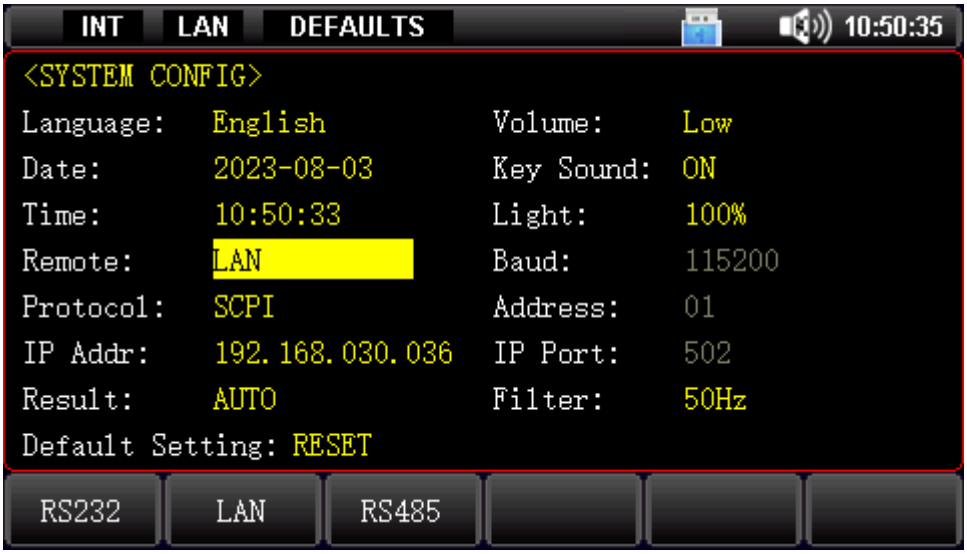
Pin	Function
8	A
9	B

13.3 LAN Interface Setting

Figure 13-3 LAN Connector on the Rear Panel

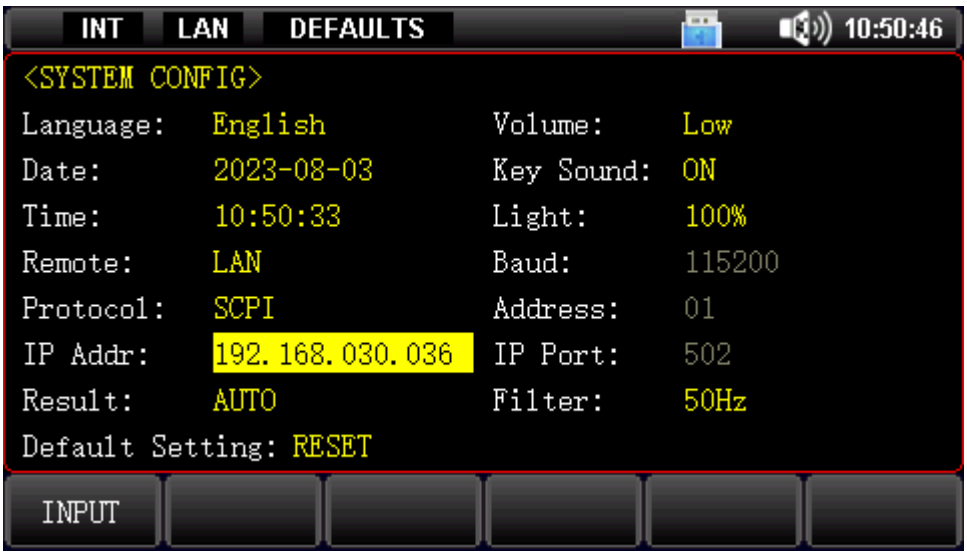
Connect LAN cable to the LAN connector of the instrument.
Green LED — illumed: connecting blinking: communicating
Orange LED — extinguished: 10M BASE-T illumed: 100M BASE-TX

13.3.1 Select LAN Communication Mode



Move cursor to **[Communication Mode]** field, use function key to select LAN.

13.3.2 Set IP Address



Move cursor to [IP Address] field, use function key to select;
Input box will be pop out, use numeric keyboard or use rotary knob and left and right cursor to adjust IP address.
And then press [OK] key to confirm the change; press [Esc] key to cancle the change.

14. Specification

14.1 Technology Index

Measurement parameter	Insulation resistance, leakage current	
Output voltage	Range control 1V～1000V (DC): When voltage ≥ 10V, adjusting step 1V When voltage < 10V, adjusting step 0.1V	
Accuracy of voltage	When voltage ≥ 10V, 1% ± 1V When voltage < 10V, 10% ± 0.1V	
Measuring range	Resistance: 10 kΩ～10 TΩ Current: 100 pA～250 uA	
Accuracy of measurement	1V ≤ Voltage < 10V	5% (less than 1M); 1% (1M~100M); 5% (100M~10G); 10% (greater than 10G)
	10V ≤ Voltage ≤1000V	5% (less than 1M); 1% (1M~1G); 3% (1G~10G); 5% (10G~100G); 10% (100G~1T); 15% (greater than 10G)
Test speed	Fast speed: 30 ms/time; Middle speed: 100 ms/time; Slow speed: 500 ms/time	
Range mode	Automatic, lock, nominal (select the best range according to the comparator setting)	
Maximum of charging current	25 mA ± 5 mA	

Display result	Voltage, current, resistance, sorting result, audible and visual alarm
Trigger mode	Internal trigger, manual trigger, external trigger, bus trigger
Charge time	0～999s
Test time	0～999s
Discharge time	0～999s
Comparator function	Record of 1 group data, judge the upper limit (UFAIL), qualified (PASS) and the lower limit (LFAIL)
Calibration function	Full range open-circuit zero clearing
Screen display	4.3 inch TFT-LCD
Sotrage and Interface	
USB HOST	√ (support USB 128G)
File management	Save 100 test files, USB supports file access
USB data record	√
Control interface	HANDLER, FOOT
Communication protocol	SCPI, Modbus RTU
Communication interface	RS232C, USB HOST, LAN (option RS485)
Weight	3.32 kg
Size	382.3*215*88mm

14.2 Accuracy of Resistance Test

The data is measured by the following condition.

Temperature condition: 23℃±5℃

Humidity condition: 65% R.H.

Zero clearing: open circuit befor test

Preheating time: >15 minutes

Calibration period: 12 months

Insulation resistance take 11 points of typical voltage value, corresponding to the measuring range of range test:
1V ≤ V <10V, accuracy: 5 % (less than 1M); 1 % (1M~100M); 5 % (100M~10G); 10 % (greater than 10G)
10V ≤ V ≤1000V, accuracy: 5 % (less than 1M); 1 % (1M~1G); 3 % (1G~10G); 5 % (10G~100G); 10 % (100G~1T); 15 % (greater than 1T)

Range / Voltage	1	2	3	4	5	6
1V	10k~42k	40k~420k	400k~4.2M	4M~42M	40M~420M	400M~10G
10V	40k~420k	400k~4.2M	4M~42M	40M~420M	400M~4.2G	4G~100G

25V	100k~1.1M	1M~10.5M	10M~105M	100M~1.1G	1G~10.5G	10G~250G
50V	200k~2.1M	2M~21M	20M~210M	200M~2.1G	2G~21G	20G~500G
75V	300k~3.2M	3M~31.5M	30M~315M	300M~3.2G	3G~31.5G	30G~750G
100V	400k~4.2M	4M~42M	40M~420M	400M~4.2G	4G~42G	40G~1T
125V	500k~5.3M	5M~52.5M	50M~525M	500M~5.3G	5G~52.5G	50G~1.25T
250V	1M~10.5M	10M~105M	100M~1G	1G~10.5G	10G~105G	100G~2.5T
500V	2M~21M	20M~210M	200M~2.1G	2G~21G	20G~210G	200G~5T
750V	3M~31.5M	30M~315M	300M~3G	3G~31.5G	30G~315G	300G~7.5T
1000V	4M~42M	40M~420M	400M~4.2G	4G~42G	40G~420G	400G~10T

15. Appendix

15.1 Appendix A Maintenance and Cleaning

(1) General Maintenance

Keep the instrument away from the direct sunlight.

Caution

Keep sprays, liquids and solvents away from the instrument or probe to avoid damaging the instrument or probe.

(2) Cleaning

Check the instrument and probe frequently according to the operating condition. Follow these steps to clean the external surface of the instrument.

a. Please use a soft cloth to wipe the dust outside the instrument.

b. When cleaning the LCD screen, please pay attention and protect the transparent LCD screen.

c. When cleaning the dust screen, use a screwdriver to remove the screws of the dust cover and then remove the dust screen. After cleaning, install the dust screen in sequence.

d. Please disconnect the power supply, then wipe the instrument with a damp but not dripping soft cloth. Do not use any abrasive chemical cleaning agent on the instrument or probes.

15.2 Appendix B Warranty Overview

UNI-T (UNI-TREND TECHNOLOGY (CHINA) CO., LTD.) ensures the production and sale of products, from authorized dealer's delivery date of three years, without any defects in materials and workmanship. If the product is proven to be defective within this period, UNI-T will repair or replace the product in accordance with the detailed provisions of the warranty.

To arrange for repair or acquire warranty form, please contact the nearest UNI-T sales and repair

department.

In addition to permit provided by this summary or other applicable insurance guarantee, UNI-T does not provide any other explicit or implied guarantee, including but not limited to the product trading and special purpose for any implied warranties.

In any case, UNI-T does not bear any responsibility for indirect, special, or consequential loss.

15.3 Appendix C Contact Us

If the use of this product has caused any inconvenience, if you in mainland China you can contact UNI-T company directly.
Service support: 8am to 5.30pm (UTC+8), Monday to Friday or via email. Our email address is infosh@uni-trend.com.cn

For product support outside mainland China, please contact your local UNI-T distributor or sales center. Many UNI-T products have the option of extending the warranty and calibration period, please contact your local UNI-T dealer or sales center.

To obtain the address list of our service centers, please visit our website at URL: http://www.uni-trend.com