7641

Hi-pot tester

User Manual

V1.01

MICROTEST

Microtest

Youtube

FaceBook

www.microtest.com.tw

First of all, thank you for choosing MICROTEST products. MICROTEST is committed to providing customers with a variety of instrument information and services. You can check the latest instrument information on the MICROTEST website: **https://www.microtest.com.tw/**

Important notes, please read thoroughly:

1. Before using the HI-POT tester, please read the user manual thoroughly.
2. For more detailed information, please refer to the user manual of the HI-POT tester.
3. While we have made every effort to ensure the accuracy of the content at the time of writing this manual, if you find any unclear or incorrect information, please contact the sales and marketing department of MICROTEST. We are always ready to assist you.
4. The specifications and content of this manual are subject to change without prior notice.
5. The content of this manual is protected by copyright. Unauthorized copying, reproduction, or modification of the content is prohibited.

Safety description

For professional use only: This product is designed for use by personnel with professional knowledge and technical training.

Safety classification: This instrument is classified as an IEC Class A instrument.

General safety precautions: At all stages of operation, you must follow these general safety instructions. Failure to operate the instrument in the manner explicitly described in this manual may compromise its protective functions. The customer shall be fully responsible for any consequences resulting from improper use or failure to comply with these instructions.

Important Information storage: This manual is an integral part of the product and contains essential safety and operating information. Keep this manual in a secure location near the instrument for quick reference. Ensure the manual is well-preserved and accessible before operating the instrument.

Symbols used in this instrument

	Power On
	Power Off
	Status On
	Status Off
	Indicates that improper operation or use by the user may result in personal injury or damage to the instrument.
	Warns of actions or conditions that may cause serious or fatal injury to the user and provides preventive measures that can be taken.
	Grounding point of the AC mains system.
	Do not dispose of electronic equipment as unsorted municipal waste. Please use designated collection facilities or contact the supplier from whom the instrument was purchased.
	CE (Conformity European). Indicates that the product complies with the regulations specified by European Union directives.
	Environmentally Friendly Use Period (EFUP): 10 years.
	UKCA（UK Conformity Assessed）. Indicates that the product complies with the regulatory requirements of the United Kingdom.

Safety guidelines

Scope of Application:

The 7641 Hi-Pot tester is suitable for safety compliance testing in industries such as electronics, electrical engineering, automotive, and household appliances. It is mainly used to evaluate the withstand voltage and insulation performance of the following equipment to ensure products meet international safety standards:

- Electronic components (transformers, inductors, capacitors, filters, etc.)
- Wires and cables (various conductors and insulation material testing)
- Motors (ensuring coil insulation will not be damaged by high voltage)
- Home appliances and power supplies (testing circuit insulation and safety)

Usage Limitations

To ensure safety and proper operation of the equipment, please observe the following restrictions:

1. **Human testing is strictly prohibited**
   During testing, do not touch the high-voltage terminal to avoid the risk of electric shock.
2. **Do not test batteries**
   This equipment is not suitable for testing rechargeable batteries. High voltage may cause the battery to overheat or explode.
3. **Do not place heavy objects on the instrument**
   This may affect heat dissipation and normal operation and could cause accidental damage.
4. **Use dedicated 7641 accessories**
   Please use original accessories for testing. If any accessory has exposed wires or is damaged, do not use it to avoid abnormal test results or safety risks.
5. **Do not attempt to repair the instrument yourself**
   If a malfunction occurs, return the equipment to the manufacturer for repair by qualified technicians to ensure proper operation.
6. **Emergency handling**
   In the event of an accident or abnormal equipment condition, immediately unplug the power cord to cut off the power and prevent further damage or danger.

Environmental Conditions:

1. **Location:** Indoors, with no direct sunlight, dust-free, minimal conductive pollution, at an altitude below 2000 m, Pollution Degree 2.
2. **Operating Temperature and Humidity Range:** 5°C to 40°C, 20–80% RH (non-condensing).
3. **Storage Temperature and Humidity Range:** –10°C to 70°C, 20–80% RH (non-condensing).

To obtain the most accurate measurement results, please operate the instrument under the following specified environmental conditions:

1. **Optimal Temperature:**
   The optimal temperature should be maintained within the range of 23 ± 5°C. This temperature range ensures the instrument operates within its specified accuracy.
2. **Anti-Static Measures in Low-Humidity Environments:**
   If the instrument is installed in an environment where the humidity is below 20%, please use anti-static mats or similar measures to prevent electrostatic interference.

Cleaning the Instrument:

- Disconnect the power cord before cleaning.
- It is recommended to use a soft cloth, microfiber cloth, or soft brush for cleaning. Wipe with a slightly damp cloth using a mild detergent mixed with water. Do not spray any liquid directly onto the instrument.
- Do not use organic solvents or chemicals containing strong chemical components, such as acetone, methanol, or acetic acid.

Chapter 1 Product Overview 7
1.1 Features 7
1.2 Specifications 8
1.3 About Calibration 10
1.4 Repair and Maintenance 10
Chapter 2 Package Contents and Accessories 11
2.1 Names and Functions of Each Key 12
Chapter 3 Basic Operation Instructions 14
3.1 Main Screen 15
3.2 SYSTEM MENU 16
3.3 FUNCTION MENU 21
3.4 SETUP MENU 24
3.5 FILE MENU 35
Chapter 4 Test Instructions 36
Chapter 5 Peripheral Ports and Interface Descriptions 40
5.1 REMOTE I/O Usage Instructions 40
5.2 RS-232/USB DEVICE Usage Instructions 42
Chapter 6 SCPI Commands 43
6.1 Common Commands 44
6.2 SCPI Commands: CONFigure 45
6.3 SCPI Commands: EDIT 48
6.4 SCPI Commands: MEASure 58
6.5 SCPI Commands: OPERation 59
6.6 SCPI Commands: other commands 60
6.7 SCPI Commands: SYSTem 60
6.8 SCPI Commands: TEST 62

Chapter 1 Product Overview

MICROTEST 7641 Hi-Pot tester supports AC/DC Hi-Pot and insulation resistance testing. This multifunctional, high-precision AC/DC standard source and measurement device is specifically designed for power instrument calibration, R&D testing, measurement verification laboratories, and educational research applications. The equipment provides highly stable AC/DC voltage and current outputs, and integrates high-accuracy resistance measurement capabilities, making it ideal for precise, traceable, and versatile measurement environments.

Under standard operating conditions (20°C–30°C), the 7641 offers excellent electrical performance, high reliability, and continuous output capability. Its dual-channel architecture and 150VA power output allow it to handle a wide range of testing applications, including high-voltage calibration, low-current applications, and high-impedance measurements, making it an ideal instrument for power electronics, instrument calibration, and precision experiments.

1.1 Features

- 8-Channel Testing
- 2U chassis with simultaneous AC/DC output and high-resistance measurement capabilities.
- High Voltage (6kV DC / 5kV AC) Output
- 150VA power, supports long-duration operation.
- Low distortion AC sine wave.
- Highly Stable DC PWM output
- Ultra-wide resistance measurement range (10kΩ ~ 100GΩ)
- High Safety: Built-in discharge, short-circuit protection, and ARC detection
- Suitable for instrument calibration, Hi-Pot testing, High-Resistance measurements, and R&D purposes

1.2 Specifications

Model			7641
Item			
Specifications applicable after at least 30 minutes of warm-up in an environment of +20 ~ +30°C			
Output Voltage/Current	AC	Output Voltage Range	0.000 ~ 5000V
		Resolution	1V
		Setting Accuracy	±（2% of setting ＋ 5V） No Load
		Maximum Rated Load	150VA（5kV /30mA）30 minutes
		Maximum Rated Current	30mA〔Output Voltage Above 200 V〕
		Voltage Waveform	Sine Wave
		Distortion	Below 2% (For Output Voltage Above 500 V, No Load or Pure Resistive Load)
		Frequency	50/60Hz
		Accuracy	±0.1%
		Voltage Variation Rate	Below 10V (Maximum Rated Load → No Load)
		Short-Circuit Current	Above 100mA (Output Voltage Above 0.5 kV)
		Output	PWM
	DC	Output Voltage Range DC/IR	0.000~ 6.000kV
		Resolution	1V
		Setting Accuracy	±（2% of setting ＋ 5V） No Load
		Maximum Rated Load	60W（6kV /10mA）
		Maximum Rated Current	10mA〔Output Voltage Above 500V〕
		Voltage Variation Rate	Below 10V (Maximum Rated Load → No Load)
		Discharge	End of Test – Forced Discharge（Discharge Resistance100kΩ）

Item			
Voltmeter	Digital	Measurement Range	0.000 ~ 5.500kV AC / 0.000 ~ 6.200kV DC
		Resolution	1V
		Measurement Accuracy	±（2% of reading ＋ 5V）
Ammeter	Digital	Measurement Range	0.000 ~ 31mA AC / 0.000 ~ 11mA DC
		Resolution	0.001mA
		Measurement Accuracy	±（1% of reading+5μA）
Insulation Tester	Measurement Range		200kΩ ~ 100.0GΩ
	Accuracy	≥1000 V	1MΩ < R ≦ 1GΩ (1μA < i ≦ 1mA)	±(2% of reading + 30kΩ）
			1GΩ < R ≦ 10GΩ (100nA < i ≦ 1μA)	±(5% of reading + 20MΩ）
			10GΩ < R ≦ 100GΩ (10nA < i ≦ 100nA)	±(20% of reading + 100MΩ）
		500V	500kΩ < R ≦ 500MΩ (1μA < i ≦ 1mA)	±(2% of reading + 30kΩ）
			500MΩ < R ≦ 10GΩ (1μA < i ≦ 50nA)	±(5% of reading + 20MΩ）
			10GΩ < R ≦ 50GΩ (10nA < i ≦ 50nA)	±(20% of reading + 80MΩ）
		100V	200kΩ < R ≦ 200MΩ (0.5μA < i ≦ 0.5mA)	±(2% of reading + 50kΩ）
			200MΩ < R ≦ 1GΩ (100nA < i ≦ 0.5μA)	±(5% of reading + 10MΩ）
			1GΩ < R ≦ 20GΩ (5nA < i ≦ 100nA)	±(25% of reading + 60MΩ）
		50V	200kΩ < R ≦ 500MΩ (0.1μA < i ≦ 250μA)	±(5% of reading + 100kΩ）
			500MΩ < R ≦ 1GΩ (50nA < i ≦ 0.1μA)	±(10% of reading + 20MΩ）
			1GΩ < R ≦ 10GΩ (5nA < i ≦ 100nA)	±(25% of reading + 15MΩ）
Ramp-Up Time				0.1-99.9s
Ramp-Down Time				0 0.1-99.9s (0 = OFF)
Test Time				0, 0.1-999s (0 = continuous)
ARC				9

1.3 About Calibration

To ensure that the measuring instrument provides accurate results within the specified accuracy range, it is recommended to perform calibration once a year.

1.4 Repair and Maintenance

Repair:

When the instrument requires servicing, please contact MICROTEST for repair. Do not disassemble or replace parts by yourself to avoid potential danger.

Maintenance:

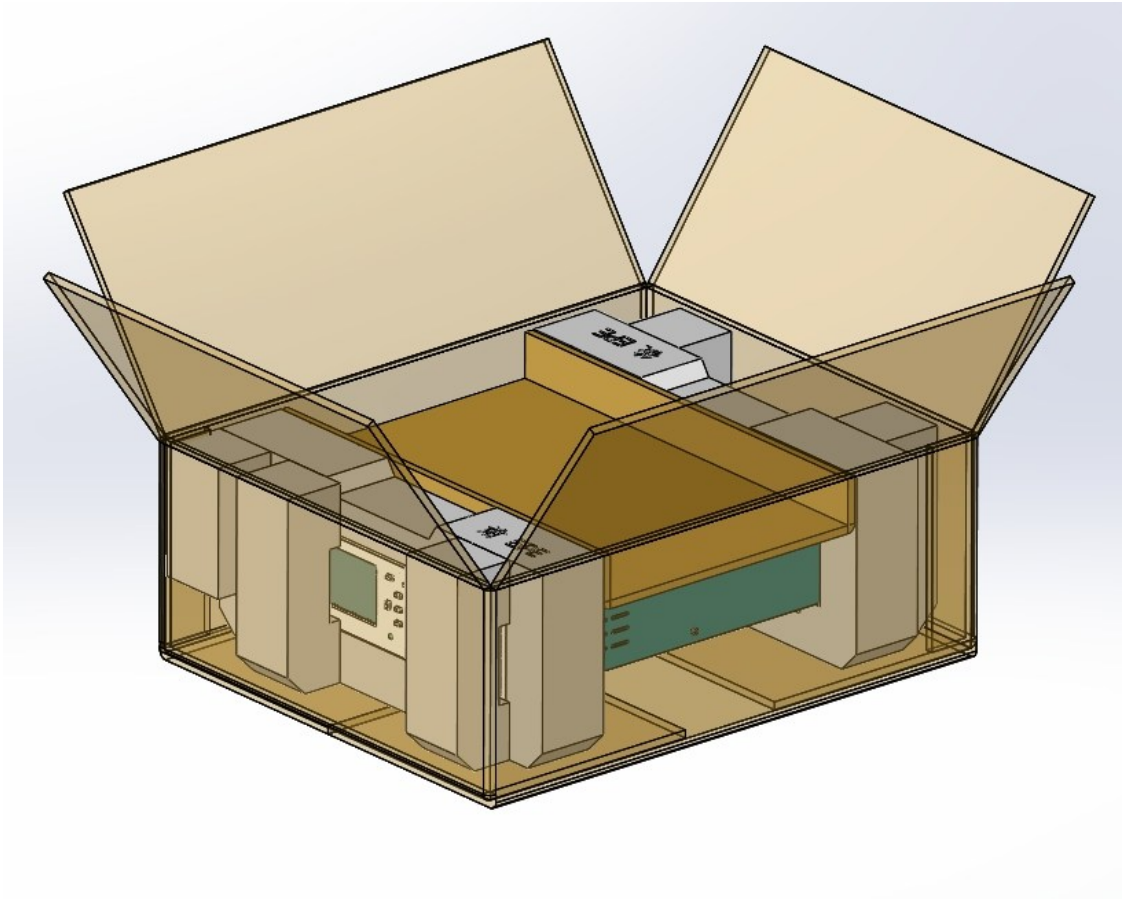
i. **Power-Off Operation:**
   Before performing any maintenance on the instrument, be sure to unplug the power cord from the instrument to ensure that the power is completely disconnected.

ii. **Dry Hands:**
   Do not plug in or unplug the power cord when your hands are wet to avoid the risk of electric shock.

iii. **Check the Power Cord Condition:**
   If the power cord or plug is found to be damaged or loose, stop using the instrument immediately. Continued operation may result in leakage, burning, short circuits, or electric shock.

* Please operate the instrument properly to ensure the safety of personnel and equipment.

Chapter 2 Package Contents and Accessories

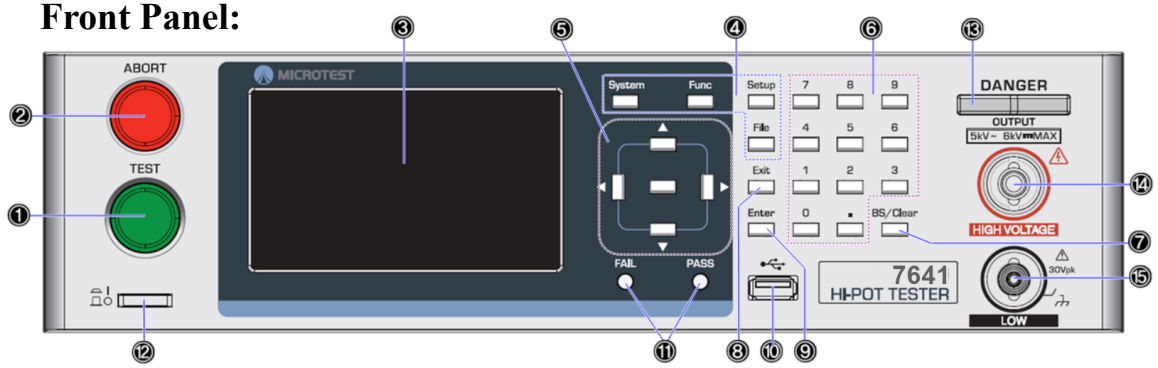


Standard Accessories

☐ Power Cord
☐ High-Voltage Cable (Banana Plug + Alligator Clip), 120cm (Black) TL-HP0008
☐ High-Voltage Cable (Banana Plug + Alligator Clip), 120cm (Red) TL-HP0009

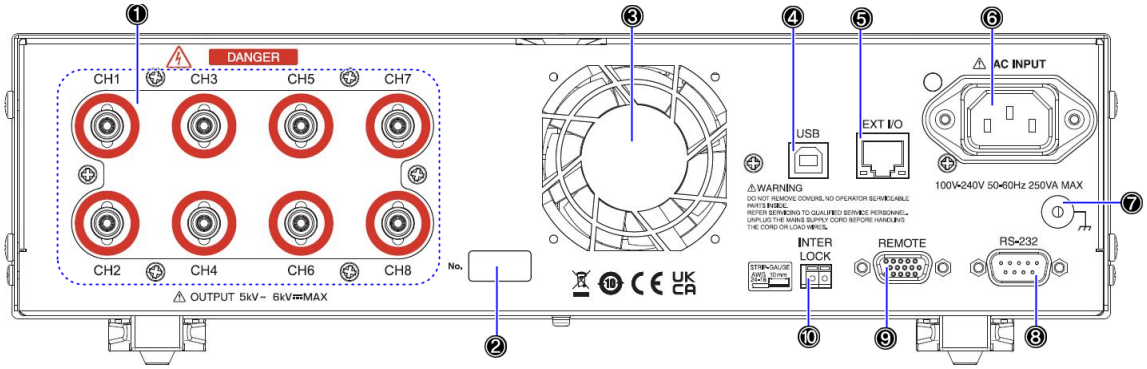
2.1 Names and Functions of Each Key

Front Panel:



Number	Name	Descriptions
1	TEST	Pressing this key to start the test.
2	ABORT	In the testing state, press this key to stop the test and turn off the high-voltage output.
3	Color LCD Display	Displays various settings and test results.
4	Function Key	Includes the System, Func, Setup, and File. Each key corresponds to different functions and menus.
5	Arrow Key	Used to move the cursor for editing. The center key functions basically the same as the Enter key.
6	Numeric Key	Used to input numbers 0–9 and the decimal point.
7	BS/Clear Key	Press once to delete one character to the left.
8	Exit Key	Exits the current screen, menu, or mode.
9	Enter Key	Press this key on an option to enter the selected menu item. When entering numeric values, press this key to confirm and save the value.
10	USB HUB	Insert a portable storage device to save test results, access setting files, or update firmware. Note: Only FAT format is supported. When using a storage device to save test results, keep it at least 30 cm away from the high-voltage output terminal to prevent interference.
11	PASS FAIL	When the test result is PASS, the PASS indicator lights up. When the test result is FAIL, the FAIL indicator lights up.
12	Power Switch	Turns the instrument power on or off.
13	DANGER	When voltage is present at the high-voltage output terminal, the warning indicator lights red. Do not touch the output terminal while the high-voltage warning light is on.
14	HIGH VOLTAGE Termenal	High-voltage output terminal used for high-voltage testing.
15	LOW VOLTAGE Termenal	Low-voltage output terminal used for test voltage output.

Rear Panel:

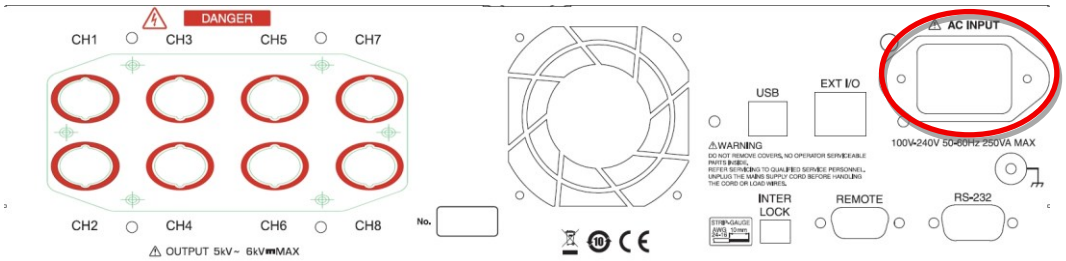


Number	Name	Descriptions
1	HIGH/LOW VOLTAGE Output Termenal	Determine which terminals will output through configuration settings.
2	Serial Number Label	Records the machine's serial number.
3	Ventilation Outlet	Cooling exhaust vent.
4	USB Device Port	Used when connecting to a computer. The instrument can be controlled via commands.
5	Expansion Box Connection Port	When connecting an expansion box, connect the cable from this port to the expansion box.
6	AC Power Socket	AC 100–240 V power input port.
7	Chassis Ground Terminal	Ground terminal. **To ensure more stable operation of the instrument, please connect this terminal to ground.**
8	RS-232 Interface Port	Used when connecting to a computer. The instrument can be controlled via commands.
9	Remote Control Interface	External control signals. Can output test results and testing status signals, and can also receive external input signals to control the instrument to start or stop testing.
10	Inter Lock Port	High-voltage output safety switch. During testing, the two pins of this port must be shorted in order to output the test voltage. If the port becomes open during testing, the instrument will immediately stop the test and display an INTER LOCK message on the screen.

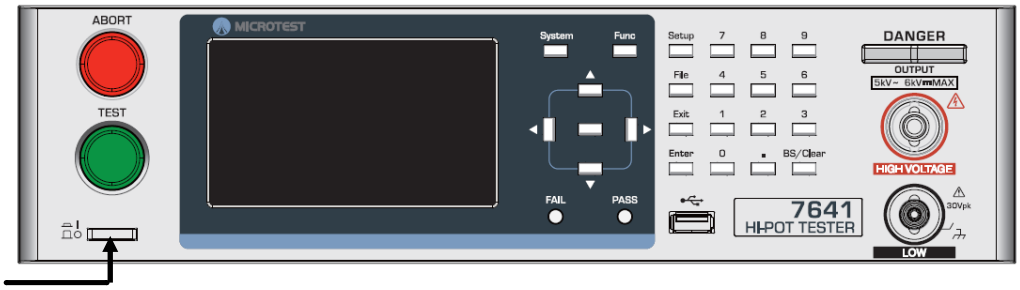
Chapter 3 Basic Operation Instructions

Follow the steps below to ensure that the power supply voltage is within the AC 100–240V range in order to properly start the 7641:

1. First, ensure that the power cord is properly connected to the power socket on the rear panel of the instrument.



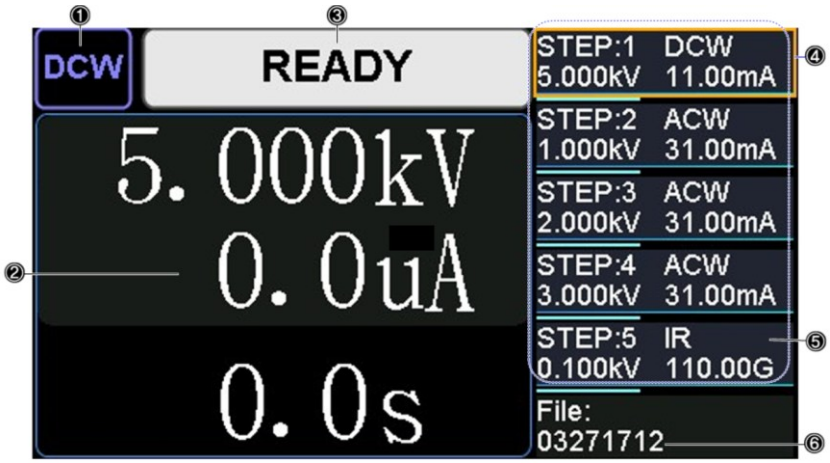
2. Press the power key.



3. The LCD will display the following image.



3.1 Main Screen



1. Displays the current test mode: ACW for AC Hi-Pot testing, DCW for DC Hi-Pot testing, and IR for insulation resistance testing.
2. Displays the measured voltage and current at the output terminals (in IR mode, it shows the resistance value) and the test time. If no test has been performed, it shows the currently set voltage and test time.
3. Displays the current status of the instrument. The table below provides detailed explanations of each status display.

Status	Descriptions
READY	The instrument is ready. Press the TEST key to start testing immediately.
TEST	Testing in progress.
WAIT	Wait Time: Press the Func key and set this under the Trig Wait Time option.
WAIT KEY	Waiting for the next test trigger signal.
PASS	Test Result: PASS
Break Down	Leakage current exceeds the maximum measurable value.
Arcing	Arc exceeds the upper limit.
Lo-Limit	Measured value is below the lower limit.
Hi-Limit	Measured value is above the upper limit.
FAIL	During multi-step testing, one or more steps are judged as FAIL.
INTER-	High-voltage safety interlock activated.
VOLT-	Voltage output error.
OPEN	Test leads disconnected or error.

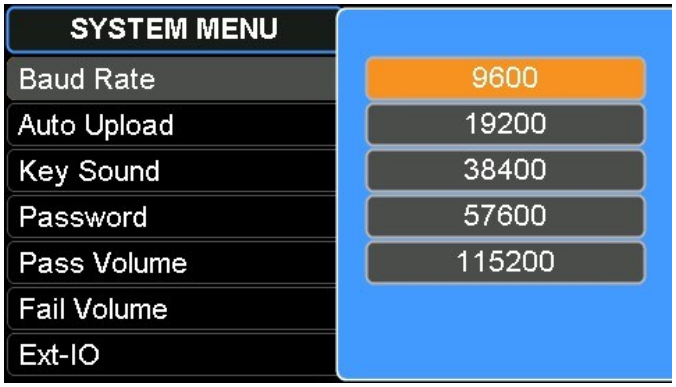
4. The orange frame indicates the current test step and its test specifications. Use the down arrow key to move the cursor to the desired step. Press ENTER to enter the settings for that step.
5. Displays the first five test steps of the current file.
6. Displays the current file name. If an asterisk (*) appears after the file name, it indicates that the file has been edited but not yet saved. Unsaved files cannot have their current settings copied to external storage devices.

3.2 SYSTEM MENU

Press the System key to enter the SYSTEM MENU.



1. **Baud Rate:** Set the RS-232 transmission baud rate. The available options are 9600, 19200, 38400, 57600, and 115200. The selected baud rate must match the rate of the controlling device.



2. **Auto Upload:** Automatic upload of test results; selectable options include Off, RS-232, Flash, or Both.
   Off: Disable this function.
   RS232: The instrument will automatically return its current status. The statuses include:

- Returns the string “POWER ON” when the unit is powered on.
- Returns the string “START” when a test begins.
- Returns the current test step and result when the test is completed.

The content within [ ] represents a returned result [**01, ACW, 1.001e+03, 7.169e-06, PASS**], which is described as follows:

01	Indicates the test step number.
ACW	Indicates the test mode.
1.001e+03 (1001 V)	Indicates the output voltage during the test, expressed in scientific notation.
7.169e-06 (7.169 µA)	Indicates the current value during the test, expressed in scientific notation (for IR mode, the resistance value is returned instead).
PASS	Indicates that the test result is acceptable (pass).

Other test result indications are described as follows:

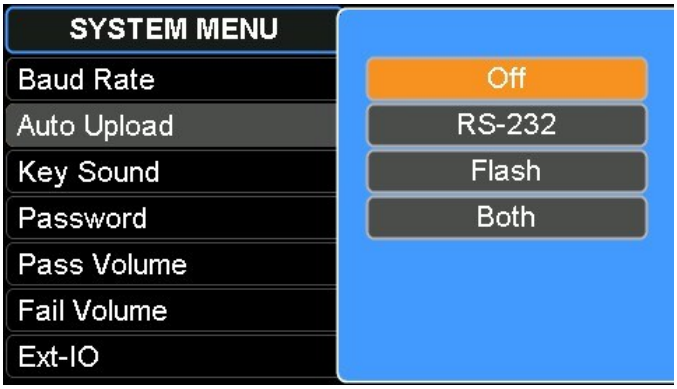
HI-Limit	Exceeds the upper limit of the set value.
Lo-LIMIT	Below the lower limit of the set value.
INTER-LOCK	High-voltage safety interlock activated.
ABORT	Test aborted.
BREAKDOWN	Breakdown point detected.
ARCING	Arc discharge detected.
VOLT ERR	Abnormal voltage output.
OPEN	Connection error of the device under test.

For multi-step testing, the final judgment result will be appended after the test is completed.

Flash: After the instrument completes the test, it will automatically save the test results to the portable storage device. The format is the same as the RS-232 output. The data storage path is: \7640\STAT\current test file name.csv

Both: RS-232 and Flash operations are performed simultaneously.

When both RS-232 and Flash functions are enabled, data transmission requires some time (depending on the selected baud rate and the portable storage device). This may cause delays in continuous or multi-step testing.



3. **Key Sound:** Key Sound switch.



4. **Password:** Modify keyboard lock password. When the keyboard lock is enabled, the correct password must be entered to unlock it. This function allows you to change the password. The factory default password is 7641.



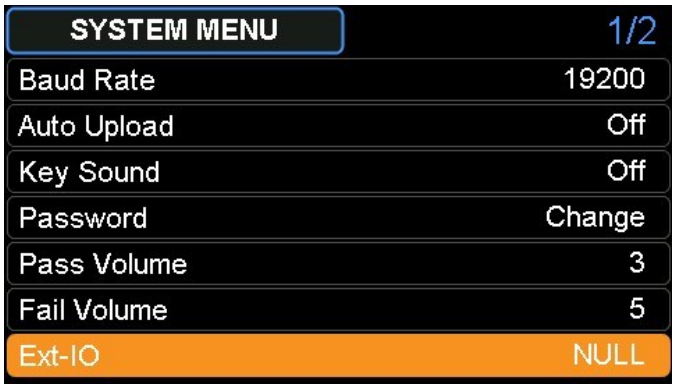
5. **Pass Volume:** Pass result buzzer volume. The volume can be set from 1 to 9 (adjust using the left/right arrow keys), where 1 is the lowest volume and 9 is the highest. To mute the buzzer, adjust the setting in the FUNCTION MENU → Alarm Mode → Off.



6. **Fail Volume:** Fail result buzzer volume. The volume can be set from 1 to 9 (adjust using the left/right arrow keys), where 1 is the lowest volume and 9 is the highest. To mute the buzzer, adjust the setting in the FUNCTION MENU → Alarm Mode → Off.

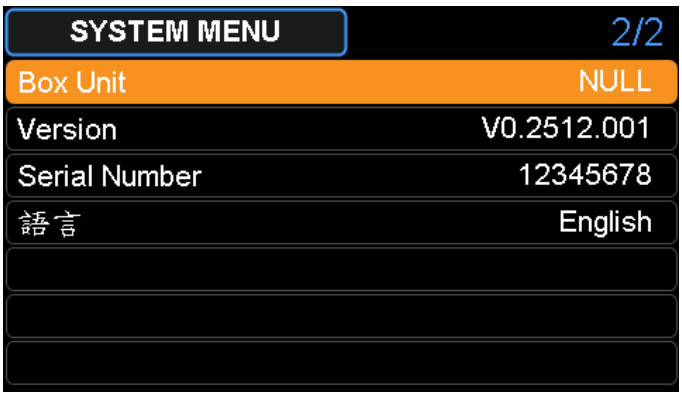


7. **Ext-IO:** External expansion I/O board.
   NULL: no expansion I/O board is connected.
   EXIST: expansion I/O board is connected.

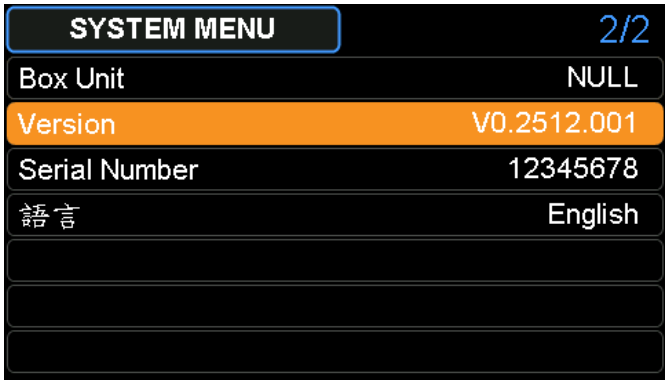


Press the arrow key ( ) to page 2/2.

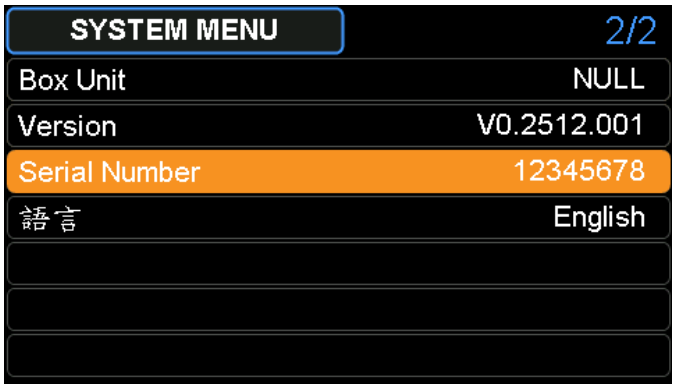
8. **Box Unit:** Number of scanners. Each 7641 can connect up to 4 scanners.
   Null: no scanner is connected.



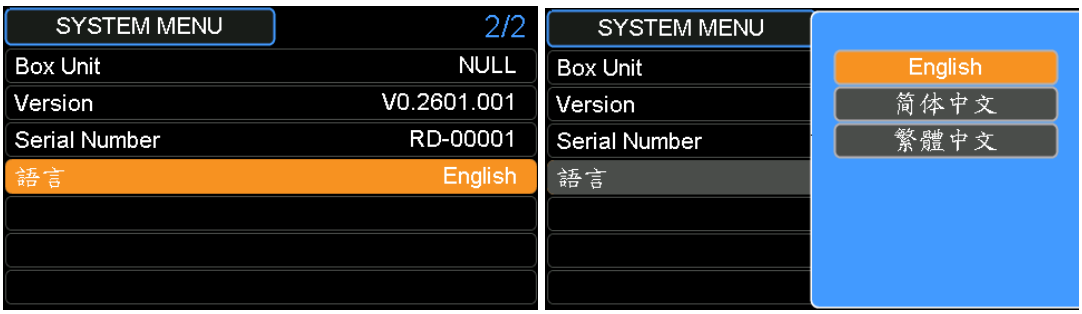
9. **Version:** Current firmware version.



10. **Serial Number:** Machine serial number.



11. **Language:** English, Simplified Chinese, and Traditional Chinese are available for selection.



3.3 FUNCTION MENU

Press the Func key to enter the FUNCTION MENU.



1. **Key Lock:** When On, the user can only start and stop tests and cannot modify any settings. To disable this function, the originally set password must be entered (the factory default password is 7641).



2. **Pass Hold Time:** The setting range is 0.1 to 10 seconds or Infinity (0). If set to Infinity, the test result will remain displayed until the ABORT key is pressed.



3. **Trig Wait Time:** After pressing the TEST key, the instrument enters the test screen (the status will display WAIT). High voltage will be output only after the set wait time has elapsed. Typically used in applications where, after triggering the test fixture, it is necessary to wait for the fixture to reach its positioning point before testing.



4. **Alarm Mode:** Can be set to Off, Fail Only, Pass Only, or All.



5. **Status Lock:** When On, the instrument can only perform a test when the screen displays READY. If the screen shows PASS, FAIL, or other statuses, pressing TEST will not start a next test. Press the ABORT key to display the READY screen before testing can be performed again.



6. **Instant:** When On, the instrument will only perform a test while the TEST key is held down. Releasing the key will stop the test.

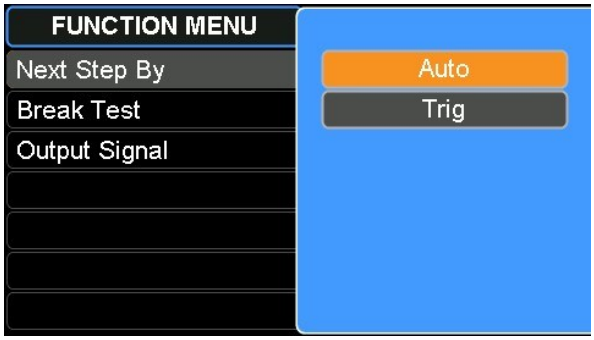


7. **Test Mode:** Single Step and Multi Step are available for selection.
   Single Step: On the READY screen, use the up/down arrow keys to select the test step you want to perform.
   Multi Step: The instrument will sequentially perform tests from the first step to the last step as set in the SETUP MENU.



Press the arrow key ( ) to page 2/2.

8. **Next Step By:** This setting is effective only in Multi Step.
   Auto: Proceeds to the next step and continues testing automatically.
   Key: After completing each step, you must press the TEST key to proceed to the next step.



9. **Break Test:** This setting is effective only in Multi Step.
   1 Fail: When a FAIL is detected, the instrument will immediately stop the test.
   Off: Continue testing all steps until the end.

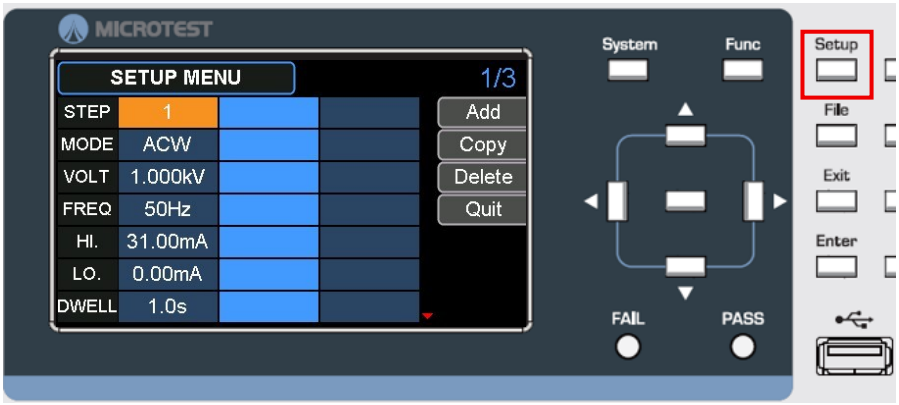


10. **Output Signal:** This setting is effective only in Multi Step.
    Total: Each step will have an output signal indicating the test result.
    Each: A PASS or FAIL output signal will be generated only after all steps have been completed.



3.4 SETUP MENU

Press the Setup key to enter the SETUP MENU.



1. **STEP:** Each file supports a maximum of 16 steps. Press the center key to enter the right-side menu for settings.
   Add: Add a new step.
   Copy: Copy the current step's settings to the next step.
   Delete: Delete the current step (each file must retain at least one step).
   Quit: Exit the right-side menu.

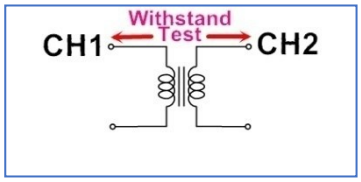


2. **Mode:** The test modes are ACW, DCW, IR, CON, ACW-P, DCW-P, and IR-P. Use the center key with the arrow keys to select the desired mode.

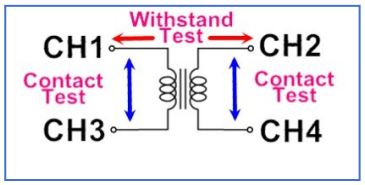


   ACW: Test using AC voltage and measure the current on the device under test (DUT).
   DCW: Test using DC voltage and measure the current on the DUT.
   IR: Test using DC voltage and measure the resistance on the DUT.
   IR Usage Notes:
   1. For measurement ranges below 100nA, the total Rise Time (RAMP) or Test Time (DWELL) must be set to more than 5 seconds.
   2. Relative humidity must be below 70% (non-condensing), and the test leads must be secured without external vibration interference.
   3. If the ambient humidity exceeds 70%, the lower limit of measurable current is 100nA (compensation must be enabled).

CON: Use an AC voltage (approximately 10V) to measure whether the resistance on the configured channel is greater than 100kΩ (R＞100kΩ → PASS, Otherwise → FAIL). This is generally used in multi step testing to first verify whether the wiring is correct before performing the withstand voltage test, ensuring that the test leads are properly connected to the device under test (DUT).



→ Typical Withstand Test Setup Diagram



→ Perform a connection test first, then proceed with the withstand test:

1. Set STEP 1 to CONTACT, and configure the channels as follows: CH1 ⟷ CH3
2. Set STEP 2 to CONTACT, and configure the channels as follows: CH2 ⟷ CH4
3. Set STEP 3 to ACW, and configure the channels as follows: CH1 ⟷ CH2

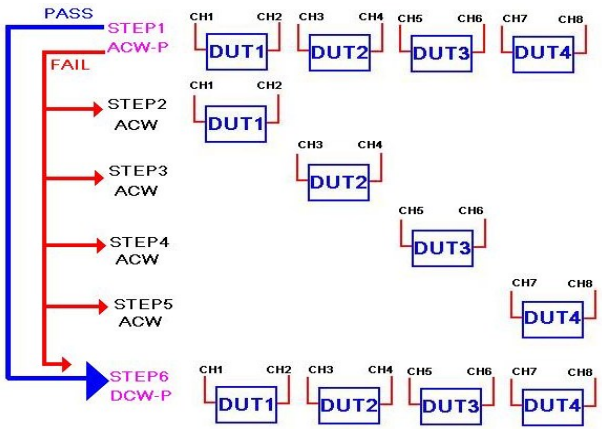
The ACW-P, DCW-P, IR-P operate the same as ACW, DCW, IR. The difference is that when Parallel is set:

- If the test result for that step is PASS, the instrument will search for the next step also set to Parallel mode and perform the test.
- If the test result is FAIL, the instrument will proceed to the next step in sequence.

This mode is generally used for testing multiple DUT in parallel.

The testing flow for Parallel is shown in the diagram below. STEP1 to STEP6 are set to Parallel.

- During testing, if STEP1 results in FAIL, the instrument will perform the tests for STEP2, 3, 4, 5 to determine which DUT is defective.
- If STEP1 results in PASS, the instrument will skip STEP2 to STEP5 and directly test the next step set to Parallel mode (STEP 6) to save test time.



3. **VOLT:** Set the test voltage level; numeric keys can be used for input.
   Adjustable Range: ACW(0~5.5kV); DCW(0~6.2kV); IR(0~6.2kV)



4. **FREQ:** This setting is effective only in ACW mode. Available options: 50Hz, 60Hz



5. **HI. :** Upper limit reference value. If the measured value exceeds this setting, the test will be judged as FAIL and immediately stopped.
   Maximum value: ACW (31mA); DCW (11mA); IR (110GΩ)



6. **LO. :** Lower limit reference value. If the measured value less than this setting, the test will be judged as FAIL and immediately stopped.
   If set to OFF or 0, no lower limit judgment will be performed.



7. **DWELL:** The time to continue testing after the voltage reaches the set value.
   OFF: For continuous testing, the test will continue until the ABORT key is pressed or a FAIL is detected.



Press the arrow key ( ) to page 2/3.

8. **RAMP:** The time required to ramp up from 0 to the set voltage. Adjustable time range is 0.1~99.9 seconds. During the voltage ramp-up phase, DCW mode does not perform low limit judgment, and IR mode does not perform high limit judgment.



9. **FALL:** When set to ON, the time required for the voltage to ramp down to 0 V. Adjustable time range is 0.0~99.9 seconds.



10. **ARC:** Arc detection sensitivity setting. When set to ON, the sensitivity can be adjusted from 1 to 9, where a higher value means lower sensitivity. When set to OFF, any arc occurrence will not affect the test result judgment.



11. **OFSr:** Offset the real current at the test terminal. To prevent external test fixtures from affecting measurement accuracy, the leakage current caused by the fixture can be subtracted in advance, so that the displayed current reflects only the leakage current of the device under test (DUT). This value can be entered manually or set to AUTO, allowing the instrument to automatically detect and subtract the fixture leakage.



12. **OFSi:** Offset the imaginary current at the test terminal. This setting is effective only in ACW mode. To prevent external test fixtures from affecting measurement accuracy, the leakage current caused by the fixture can be subtracted in advance, so that the displayed current reflects only the leakage current of the device under test (DUT). This value can be entered manually or set to AUTO, allowing the instrument to automatically detect and subtract the fixture leakage.



13. **When to Use OFSr/i:**
    1. When using an optional scanner (7508A/7516A), leakage current to ground may occur depending on the wiring. The leakage current can range from tens of nanoampere (nA) to several microampere (μA), which can seriously affect measurement accuracy.
    2. Switching the built-in channel.
    3. Changing the output voltage value.

    For all of the above situations, it is strongly recommended to enable the Offset Compensation function to minimize this effect.

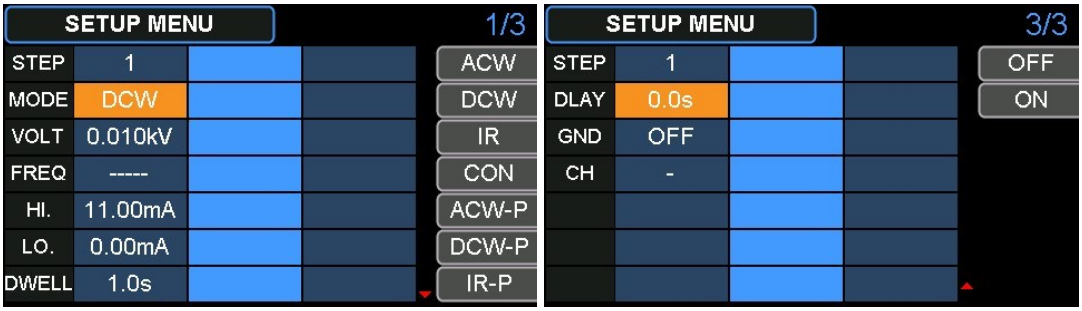
14. **OPEN:** Open circuit detection sensitivity. When this function is enabled (setting value is not 0), the instrument will first use a low voltage to measure the capacitance of the device under test (DUT) during high voltage testing (measurement time is approximately 200ms). If the measured capacitance is lower than the set value, it may indicate that the test leads are not properly connected to the DUT. In this case, the instrument will display OPEN and stop the test. The value can be entered manually, or set to AUTO, allowing the instrument to measure based on the configured output channel.



Note: If the measured values with and without the DUT connected are similar (difference less than 20), it indicates that the capacitance of the DUT is very small, and this method is not suitable for open circuit detection.

Press the arrow key ( ) to page 3/3.

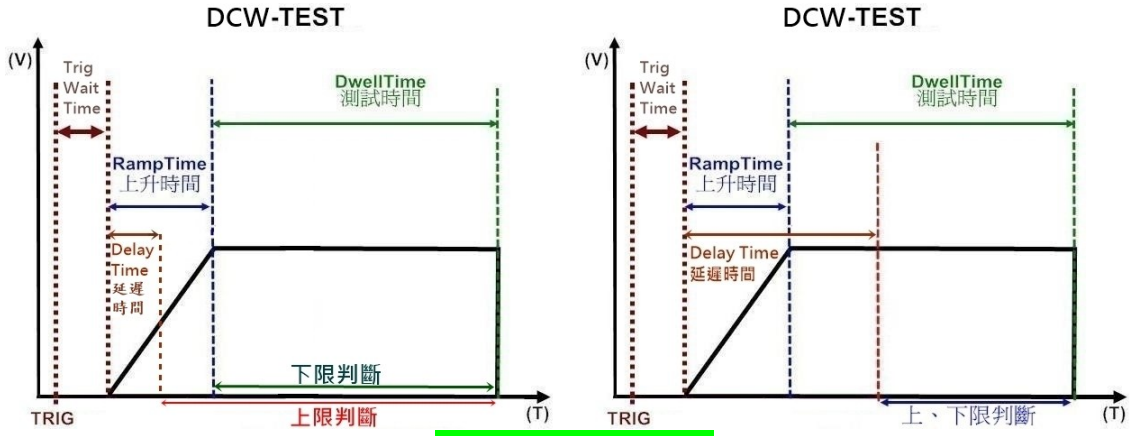
15. **DLAY:** Judgment delay time. This setting is effective in DCW and IR mode. When performing tests using DC high voltage, if the device under test (DUT) has capacitive characteristics, it is necessary to wait until the capacitor is fully charged before making a judgment. The DLAY is included in the total test time (DWELL). Please ensure that the DLAY is not set longer than the DWELL.



16. **High-Voltage Output Time and Result Judgment Timing:** The list below shows the timing of result judgment after the user presses the TEST key.

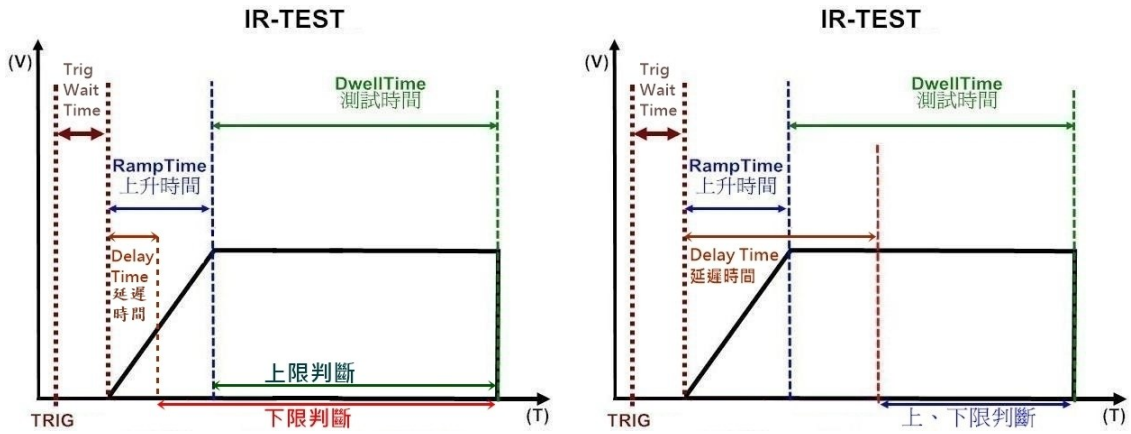
	Mode	Low Limit Judgment	High Limit Judgment
Ramp Time	ACW	Disable	Enable
	DCW	Disable	Enable = Ramp Time > Delay Time
	IR	Enable = Ramp Time > Delay Time	Disable
Dwell Time	ACW	Enable	Enable
	DCW	Enable = (Ramp Time + Dwell Time) > Delay Time	Enable = (Ramp Time + Dwell Time) > Delay Time
	IR	Enable = (Ramp Time + Dwell Time) > Delay Time	Enable = (Ramp Time + Dwell Time) > Delay Time

DCW: During ramp time, only the upper limit is evaluated (as shown in the DCW timing diagram).



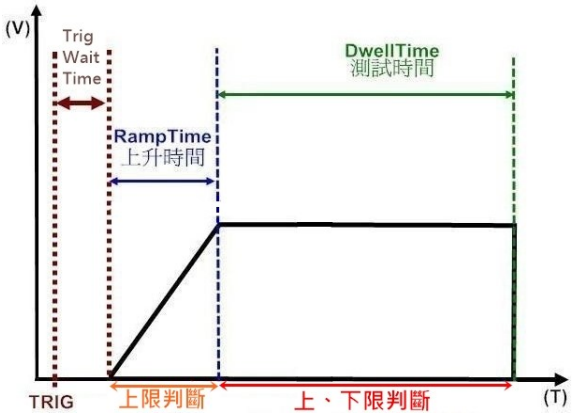
DCW timing diagram

IR: During ramp time, only the lower limit is evaluated (as shown in the IR timing diagram).



IR timing diagram

ACW does not have a DLAY setting, making its judgment timing simpler compared to DCW and IR.



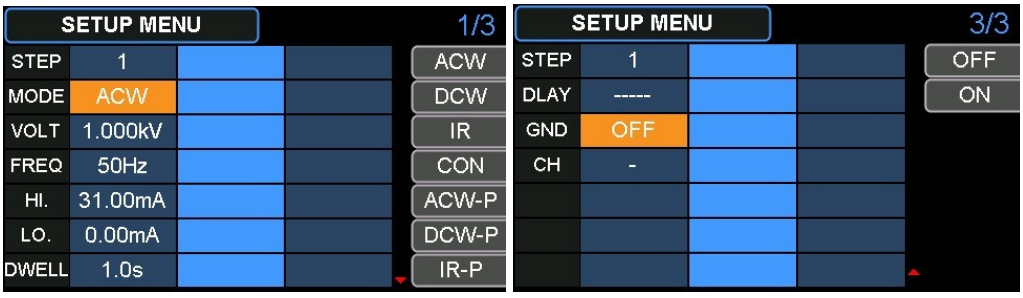
ACW timing diagram

17. **GND:** Ground fault detection. This setting is effective in ACW and DCW.

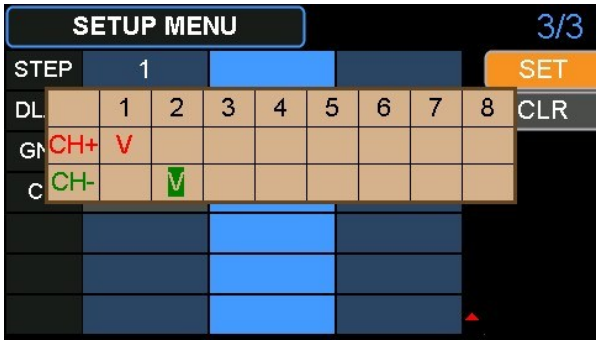
OFF: Monitors abnormal current flowing through the instrument chassis (ground line) to prevent electric shock hazards. During high voltage output, if current flows through the human body to the instrument chassis (instead of returning through the normal circuit) or if the ground current is ≥ 3.5mA, the system will detect an electric shock risk. The instrument will forcibly cut off the high voltage output and exit the test state within 0.3 seconds, and the system will display "Ground Fault".

⚠Safety Warning: The high-voltage output of this instrument can exceed 30mA. Without this protection, electric shock may cause unconsciousness or even death. Unless the product has special characteristics, always enable (OFF) this ground current detection function to ensure operational safety.

ON: This function is not enabled.

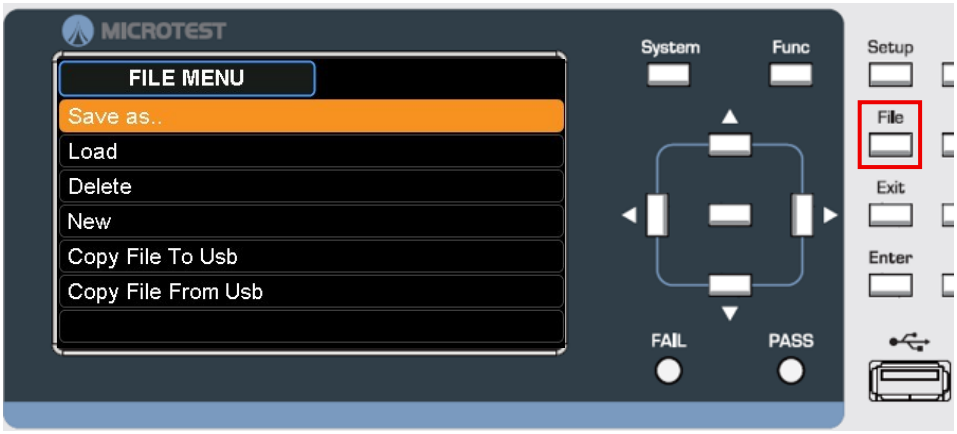


18. **CH:** This setting is used to assign the output channels for the high-voltage or low-voltage terminal. A total of 8 channels that can be configured according to the user's requirements. If a channel is not selected, it will remain disabled.

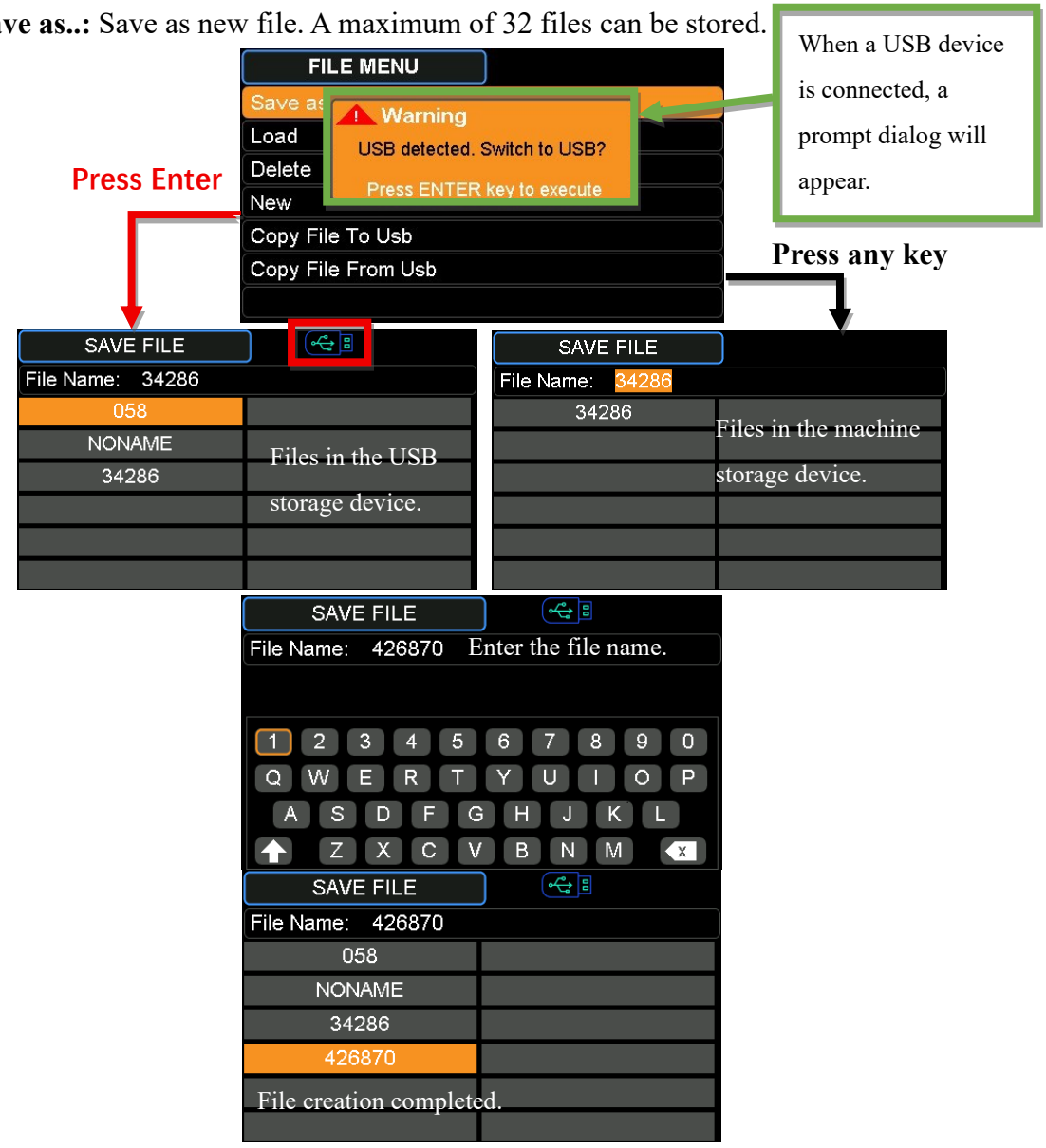


3.5 FILE MENU

Press the File key to enter the FILE MENU.

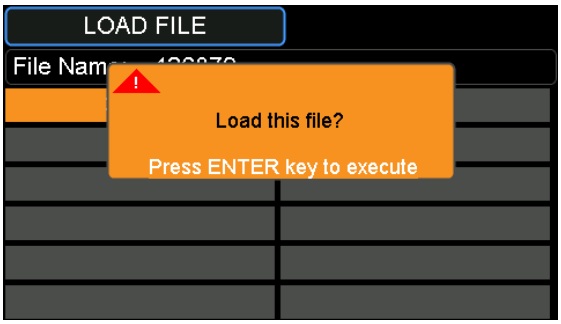


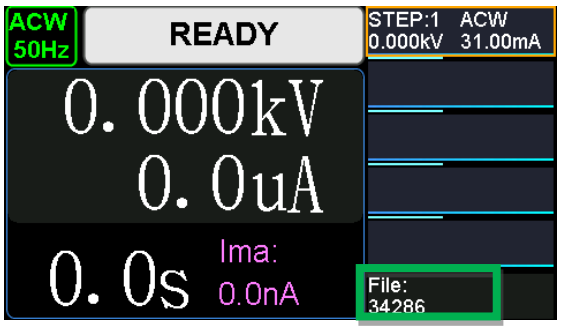
1. **Save as..:** Save as new file. A maximum of 32 files can be stored.



2. **Load:** Load the file.

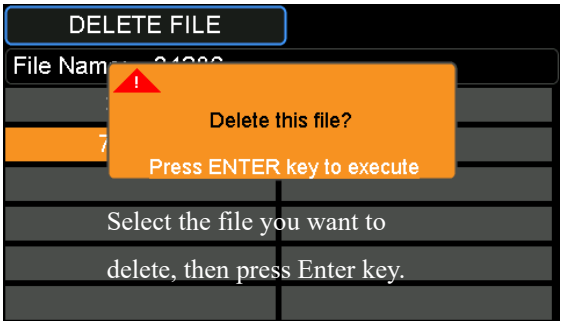
Note: All configuration files must be generated by the instrument itself. Do not modify the files externally, as this may cause data corruption or improper operation of the instrument.

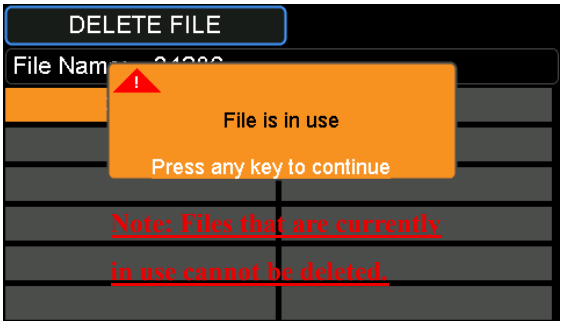




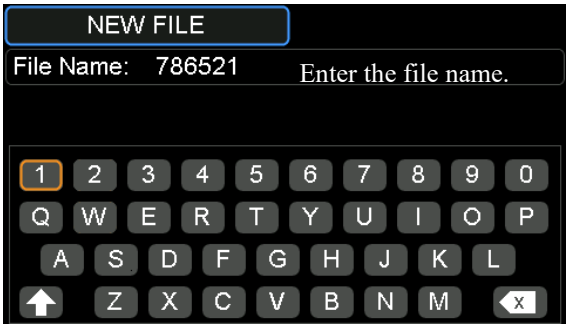
Loading successful

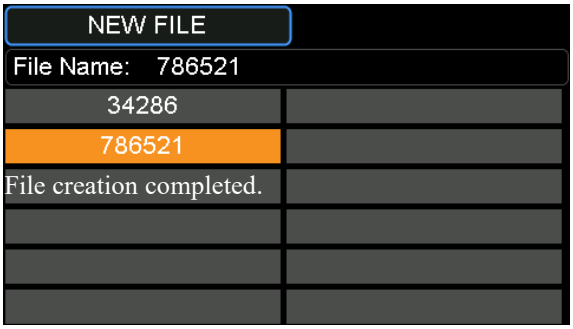
3. **Delete:** Delete the file.



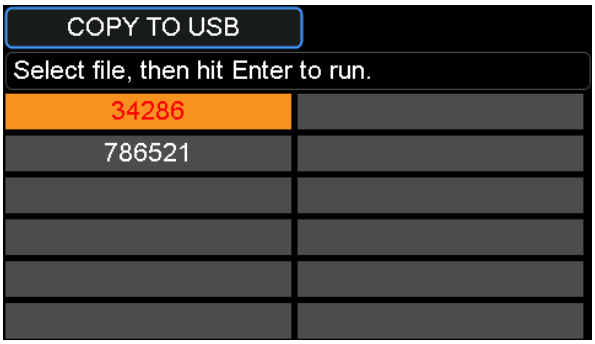


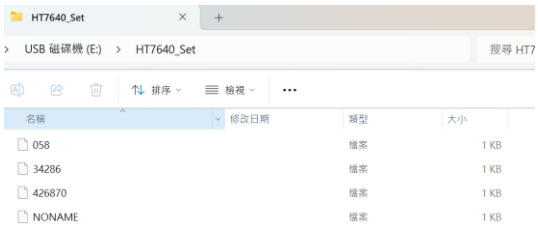
4. **New:** Create a new file: initialize all configuration files and create a new file.





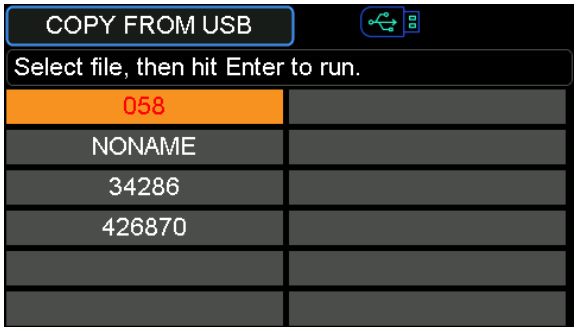
5. **Copy File To USB:** Copy the configuration files stored in the instrument to the USB. Multiple files can be selected and copied at once. If a file with the same name already exists, it will be overwritten.

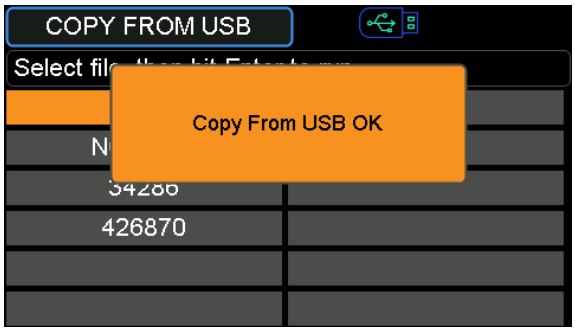




The copied file will be saved in the "HT7640_Set" folder on the USB.

6. **Copy File From USB:** Copy the configuration files from the USB to the instrument. Multiple files can be selected and copied at once. If a file with the same name already exists, it will be overwritten.

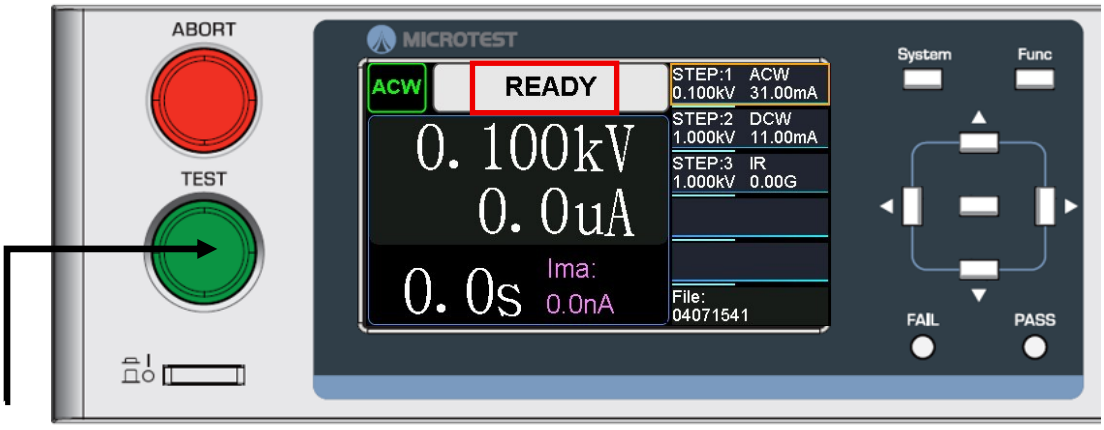




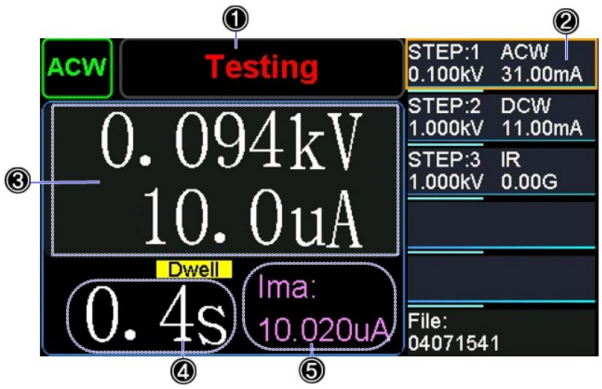
Chapter 4 Test Instructions

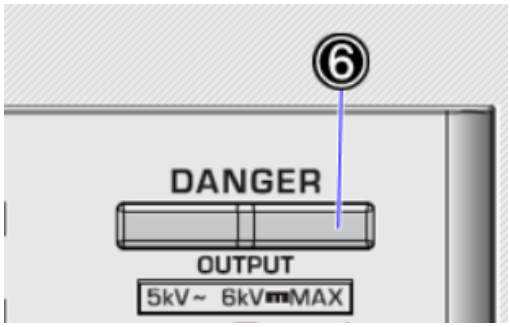
⚠ Risk of electric shock. During testing, do not touch the test leads or the device under test.

Before performing the test, ensure that the specification settings are correct and that the connections between the instrument and the device under test (DUT) are secure. Then, check whether the status bar displays READY. Once the system is confirmed to be ready, press the TEST key to start the test.



The following is a description of various data during testing.





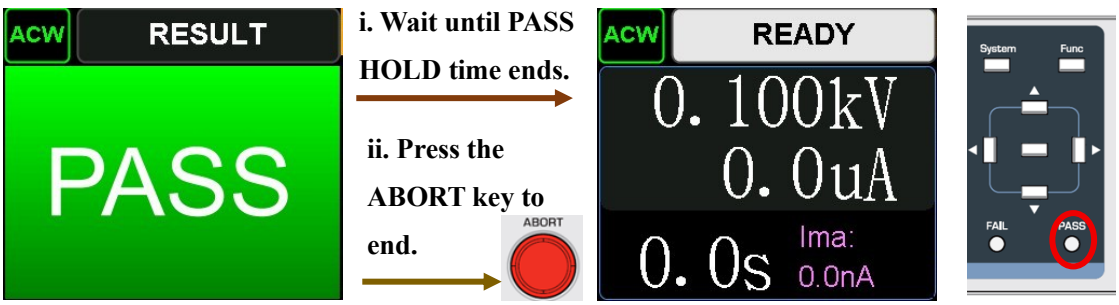
Number	Descriptions
1	Status bar. Displays the current condition.
2	Current test step. Indicates the step being executed.
3	Output voltage and leakage current measurement.
4	Test time counter. If the test time exceeds 100 seconds, only the integer part is displayed (no decimals). If the time exceeds 999 seconds, timing stops; the display remains at 999 seconds and continues flashing.
5	Shows the imaginary current value.
6	Front panel high voltage warning indicator.

After the test is completed, if the result is PASS, the green indicator will light up and the screen will display PASS.



i. When the set PASS HOLD time ends, the screen will automatically return to the READY state, and the PASS indicator will turn off.

ii. If the PASS HOLD time is set to Infinity, the operator must press the ABORT key to clear the result status.



If the test result is FAIL, the red indicator will light up and the screen will display FAIL. Press the ABORT key to clear the failure status.





During testing, if any of the following conditions occur, the system will automatically stop the test or trigger a protection mechanism:

1. The user manually presses the ABORT key to stop the test.
2. The measured current or resistance exceeds the set upper limit (Hi-Limit).
3. The measured result is below the set lower limit (Lo-Limit).
4. The detected leakage current exceeds the maximum measurable value (Breakdown).
5. Arc discharge exceeds the set threshold (Arcing).
6. The output safety switch (Inter Lock) is activated, triggering safety protection.
7. An open circuit (OPEN) is detected at the test terminal, preventing normal measurement.
8. The test reaches the preset test time and ends.

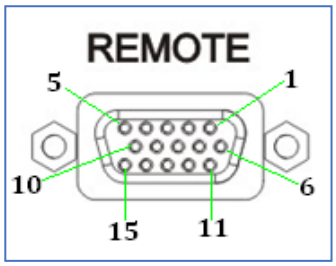
For conditions 2–8, a judgment result will be displayed on the screen when the test ends.

Chapter 5 Peripheral Ports and Interface Descriptions

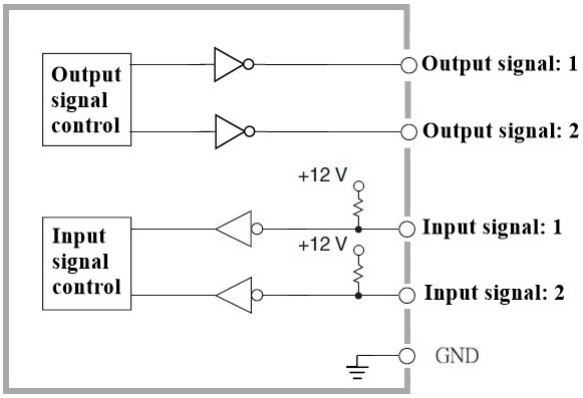
5.1 REMOTE I/O Usage Instructions

The rear panel of the high voltage tester is equipped with a REMOTE connector. When external signals are required to control the instrument output, connect the control cable to this connector. Since the output will be triggered by external signals, to ensure personnel safety, avoid contact with the high voltage output terminals during testing to prevent danger.

Pin Assignment



Internal Wiring Diagram



Pin Assignment	Name	I/0	Functions
1	CTL1	OUT	Reserved.
2	CTL2	OUT	Reserved.
3	CTL3	OUT	Reserved.
4	CTL4	OUT	Reserved.
5	TESTING	OUT	Testing.
6	PASS	OUT	Result: Pass
7	FAIL	OUT	Result: Fail
8	HV-ON	OUT	High Voltage Output Active.
9	GND	---	Instrument Ground Point.
10	TRIG	IN	Test Trigger.
11	ABORT	IN	Abort Test.
12			
13			
14	+12V	---	DC +12V Output.
15	GND	---	Instrument Ground Point.

Control Interface Description:

Pins 1–8 are Open Collector (OC) outputs and do not provide any voltage or signal by themselves.

Note: The current through each pin must not exceed 50 mA to prevent component damage.

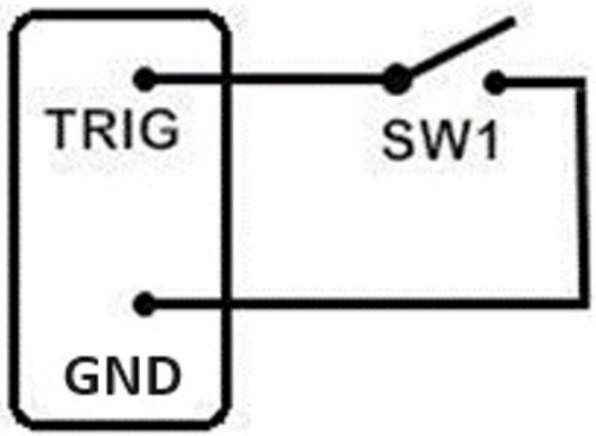
Pin Function Description:

TRIG (PIN 10): When shorted to PIN 9 or PIN 15 (GND), functions the same as the

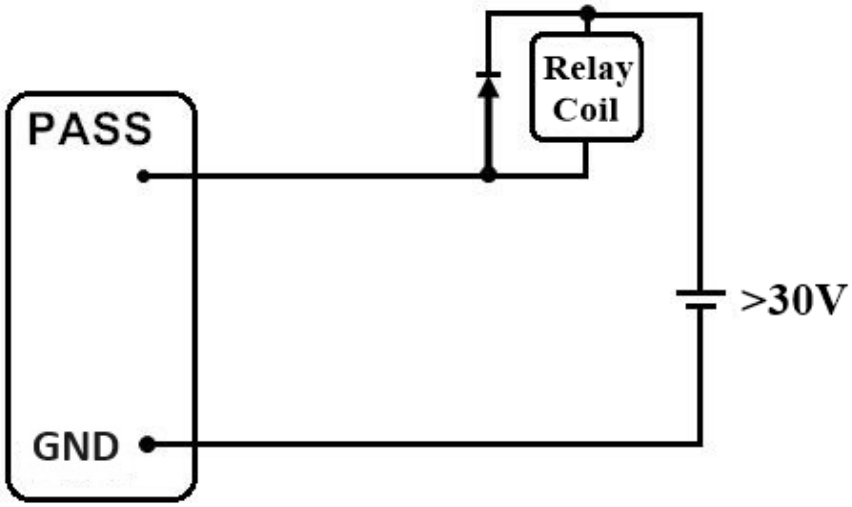
TEST key on the front panel.
ABORT (PIN 11): When shorted to PIN 9 or PIN 15 (GND), functions the same as the ABORT key on the front panel.
PASS (PIN 6): Conducts to PIN 9 or PIN 15 (GND) when the device under test (DUT) is judged PASS.
FAIL (PIN 7): Conducts to PIN 9 or PIN 15 (GND) when the DUT is judged FAIL.
TESTING (PIN 5): Conducts to PIN 9 or PIN 15 (GND) while the instrument is in the testing state.
H.V. ON (PIN 8): Conducts to PIN 9 or PIN 15 (GND) when the instrument outputs high voltage.

Common Usage Methods:

1. Input Signal: Use the normally open contact of a relay to control the instrument and start testing.



2. Output Signal: Use the output signals to control a relay. For safer operation, connect a flyback diode across the relay coil.



5.2 RS-232/USB DEVICE Usage Instructions

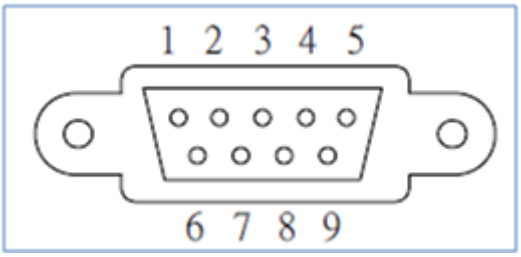
1. **RS-232 Interface Specifications:**
   - ➢Baud Rate: 9600 / 19200 / 38400 / 57600 / 115200, configurable in SYSTEM MENU.
   - ➢Data Format: 1 start bit, 8 data bits, 1 stop bit

2. **Command Format:**
   The RS-232 interface of the instrument uses ASCII coded command strings to achieve remote control and configuration. Each command string consists of [Command + Parameter]. Two commands are separated by a semicolon (;), and the string ends with a termination code.
   There are two types of termination codes: LF (0x0A) and CR (0x0D) + LF (0x0A)

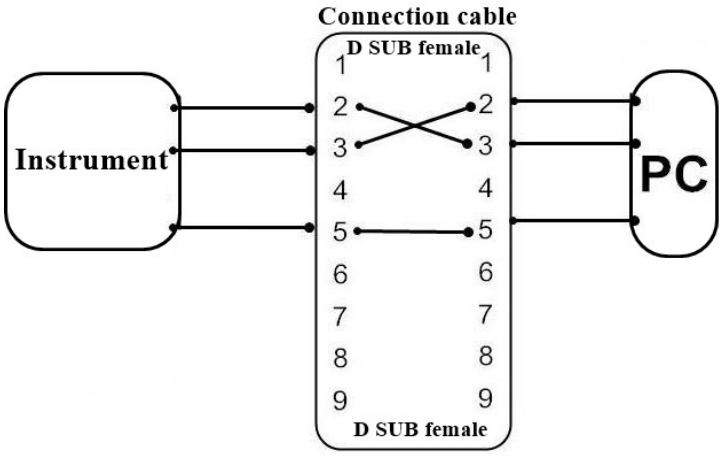
3. **Connector:**
   The instrument uses a 9-pin male connector.

Pin Assignment	Name	Descriptions
1	CD	Not Used
2	RxD	Transmit Data
3	TxD	Receive Data
4	DTR	Not Used
5	GND	Signal Ground
6	DSR	Not Used
7	RTD	Not Used
8	CTS	Not Used
9	RI	Not Used

RS232 Pin Assignment



4. **Connection Cables and Methods:**



5. USB DEVICE Interface Specifications:

Interface I/O	USB Specification 2.0 Self-powered Transfer rate: MAX 12Mbps (Full Speed)
Command String Termination Code	When receive: LF or EOM When transport: LF + EOM
Vendor ID	0x1FC9
Product ID	0x811D

Chapter 6 SCPI Commands

SCPI Error Messages:

Code	Name	Additional Notes
-100	Command error	
-102	Syntax error	
-103	Invalid separator	
-108	Parameter not allowed	
-109	Missing parameter	
-112	Program mnemonic too long	Program header exceeds 12 characters.
-113	Undefined header (query a command only command or query command missing '?'	
-141	Invalid character data	
-211	Trigger ignored	No valid trigger state available.
-221	Settings conflict	Command conflicts with the device state and cannot be executed.
-222	Data out of range	
-223	Too much data	Command exceeds 64 characters
-292	Reference name does not exist	
-410	Query interrupted	A new query was received before the previous response was returned.
-420	Query unterminated	A request for output data was received when no data was available in the queue.

Symbol Description:

Symbol	Descriptions	For example
< >	Defined Value	:CONF:TGWA <NRF>
{ }	Select one option from {}.	:CONF:KLOC {ON|OFF|1|0}
|	OR	
[]	Can be omitted.	:SYST:ALAR[:VOLU]:PASS?

6.1 Common Commands

Title	Parameter	Descriptions
*CLS		Clear all register values.

Title	Parameter	Descriptions
*IDN?		Read the basic information of the device. The output format is comma-separated (,) and includes: Manufacturer, Model, Serial Number, Firmware Version.

Return: MICROTEST,1234567,HT7640,V0.2504.005

Title	Parameter	Descriptions
*OPC		Operation complete command.

Title	Parameter	Descriptions
*OPC?		Query operation complete. Returns 1 when the operation is complete; otherwise returns 0.

Return: 1

Title	Parameter	Descriptions
*OPT?		Query Optional Equipment Installed on the Device

Return: 0

Title	Parameter	Descriptions
*RCL	String	Read file from instrument command. Enter the file name in ASCII as the parameter.

Example: *RCL 26983877

Descriptions: Read the file named 26983877.

Title	Parameter	Descriptions
*SAV	String	Save current settings to file command. Enter the file name in ASCII as the parameter.

Example: *SAV 26984089

Descriptions: Save the current settings to a file named 26984089.

6.2 SCPI Command: CONFigure

Title	Parameter	Descriptions
:CONF:KLOC {ON|OFF|1|0}	Boolean	Enable or disable the key lock.

ON=1, OFF=0

Example: :CONF:KLOC ON

Descriptions: Lock the keyboard

Title	Parameter	Descriptions
:CONF:KLOC?		Query keyboard lock status.

Example: :CONF:KLOC?

Return: 1

Title	Parameter	Descriptions
:CONF:STAT:LOCK {ON|OFF|1|0}	Boolean	Enable or disable the trigger lock.

ON=1, OFF=0

Example: :CONF:STAT:LOCK ON

Descriptions: Enable the trigger lock.

Title	Parameter	Descriptions
:CONF:STAT:LOCK?		Query the current status of the trigger lock.

Example: :CONF:STAT:LOCK?

Return: ON

Title	Parameter	Descriptions
:CONF:INST {ON|OFF|1|0}	Boolean	Whether instant test mode is enabled.
1=ON,0=OFF Example: :CONF:INST ON Descriptions: Enable the instant test mode.		
Title	Parameter	Descriptions
:CONF:INST?		Query the current status of instant test mode.
Return: ON		
Title	Parameter	Descriptions
:CONF:ALAR {ALL|PASS|FAIL|OFF}	String	Set the conditions for alarm triggering.
Example: :CONF:ALAR FAIL Descriptions: Trigger alarm when the result is FAIL.		
Title	Parameter	Descriptions
:CONF:ALAR?		Query the current alarm trigger settings.
Return: FAIL		
Title	Parameter	Descriptions
:CONF:PHOL <NRF>	NRF	Set how long the PASS result will be displayed.
0=INF, <NRF>=0~10 Example: :CONF:PHOL 0.1 Descriptions: Set display duration to 0.1 seconds.		
Title	Parameter	Descriptions
:CONF:PHOL?		Query how long the PASS result will be displayed.
Return: +1.00000E-01 (0.1 seconds)		

Title	Parameter	Descriptions
:CONF:TGWA <NRF>	NRF	Set the delay time after triggering before the test starts.

<NRF>=0~10。

Example: :CONF:TGWA 1

Descriptions: Set the wait time to 1 second.

Title	Parameter	Descriptions
:CONF:TGWA?		Query the delay time after triggering before the test starts.

Return: +1.00000E+00

Title	Parameter	Descriptions
:CONF:TMOD {SINGLE|MULTI}	String	Set the test mode.

Example: :CONF:TMOD MULTI

Descriptions: Set the test mode to multi step.

Title	Parameter	Descriptions
:CONF:TMOD?		Query the current test mode.

Return: MULTI

Title	Parameter	Descriptions
:CONF:TMOD:MULT:TSOU {AUTO|TRIG}	String	Trigger method between steps in multi step.

Example: :CONF:TMOD:MULT:TSOU AUTO

Descriptions: In multi step, after completing each step, the test automatically proceeds to the next step.

Title	Parameter	Descriptions
:CONF:TMOD:MULT:TSOU?		In multi step, query the current trigger method between steps.

Return: AUTO

Title	Parameter	Descriptions
:CONF:TMOD:MULT:BREA {FAIL|OFF}	String	Set the stop-on-fail condition in multi step.

Example: :CONF:TMOD:MULT:BREA FAIL

Descriptions: In multi step, if any step is judged as FAIL, the test will stop.

Title	Parameter	Descriptions
:CONF:TMOD:MULT:BREA?		In multi step, query the current stop-on-fail condition.

Return: 1FAIL

Title	Parameter	Descriptions
:CONF:TMOD:MULT:SIGN {EACH|TOTAL}	String	In multi step, set the method of signal output.

Example: :CONF:TMOD:MULT:SIGN TOTAL

Descriptions: In multi step, output all judgment signals only after all steps are completed.

Title	Parameter	Descriptions
:CONF:TMOD:MULT:SIGN?		In multi step, query the current signal output method.

Return: TOTAL

6.3 SCPI Commands: EDIT

Title	Parameter	Descriptions
:EDIT:STEP <NR1>	NR1	Select the step to be edited.

Example: :EDIT:STEP 1

Descriptions: Edit the data for Step 1.

Title	Parameter	Descriptions
:EDIT:STEP?		Query which step is currently selected as the target.

Return: 1

Title	Parameter	Descriptions
:EDIT:FUNC {ACW|DCW|IR}	String	Edit the test mode.

Example: :EDIT:FUNC ACW

Descriptions: Edit the test mode to ACW.

Title	Parameter	Descriptions
:EDIT:FUNC?		Query the current test mode.

Return: ACW

Title	Parameter	Descriptions
:EDIT:VOLT <NRF>	NRF	Edit the voltage.

Example: :EDIT:VOLT 1000

Descriptions: Edit the voltage to 1kV.

Title	Parameter	Descriptions
:EDIT:VOLT?		Query the current voltage.

Return: +1.00000E+03 (1kV)

Title	Parameter	Descriptions
:EDIT:FREQ <NR1>	NR1	Edit the ACW operating frequency.

<NR1>=50、60

Example: :EDIT:FREQ 50

Descriptions: Edit the frequency to 50Hz.

Title	Parameter	Descriptions
:EDIT:FREQ?		Query the ACW operating frequency.

Return: 50

Title	Parameter	Descriptions
:EDIT:HILI <NRF>	NRF	Edit the high limit judgment value.
Example: :EDIT:HILI 1mA Descriptions: Edit the high limit to 1mA.		Please note the judgment values and units that can be set for each mode. ACW: 31mA, DCW: 10mA, IR: 110GΩ

Title	Parameter	Descriptions
:EDIT:HILI?		Query the current high limit judgment value.
Return: +1.00000E-03 (1mA)		

Title	Parameter	Descriptions
:EDIT:LOLI <NRF>	NRF	Edit the low limit judgment value.
Example: :EDIT:LOLI 0.5mA Descriptions: Edit the low limit to 0.5mA.		Please note the units that can be set for each mode. ACW/DCW: Ampere, IR: Ω (Ohm)

Title	Parameter	Descriptions
:EDIT:LOLI?		Query the current
Return: +5.00000E-04 (0.5mA)		

Title	Parameter	Descriptions
:EDIT:RAMP <NRF>	NRF	Edit the time to ramp up to the output voltage.
<NRF>=0.1~99.9 Example: :EDIT:RAMP 0.5 Descriptions: Edit the ramp up time to 0.5 seconds.		

Title	Parameter	Descriptions
:EDIT:RAMP?		Query the edit time to ramp up to the output voltage.
Return: +5.00000E-01 (0.5 seconds)		

Title	Parameter	Descriptions
:EDIT:DWEL <NRF>	NRF	Edit the test time.
<NRF>=0.1~999 Example: :EDIT:DWEL 1 Descriptions: Edit the test time to 1 second.		
Title	Parameter	Descriptions
:EDIT:DWEL?		Query the edit test time.
Return: +1.00000E+00 (1 second)		
Title	Parameter	Descriptions
:EDIT:ARC <NR1>	NR1	Edit the arc sensitivity.
<NR1>=1~9 Example: :EDIT:ARC 5 Descriptions: Edit the arc sensitivity to 5.		Please note that a higher value means lower sensitivity. This setting is not applicable when configuring IR.
Title	Parameter	Descriptions
:EDIT:ARC?		Query the current arc sensitivity.
Return: 5		
Title	Parameter	Descriptions
:EDIT:OFFS:IMAG <NRF>	NRF	Edit the offset value for the imaginary current.
<NRF>=0~30 (Up to three decimal places can be set.) Example: :EDIT:OFFS:IMAG 0.002mA Descriptions: Edit the imaginary current to 2.000μA.		
Title	Parameter	Descriptions
:EDIT:OFFS:IMAG?		Query the offset value for the imaginary current.
Return: +2.00000E-06 (2.000μA)		

Title	Parameter	Descriptions
:EDIT:OFFS:REAL <NRF>	NRF	Edit the offset value for the real current.
<NRF>=0~29.999 Example: :EDIT:OFFS:REAL 0.002mA Descriptions: Edit the real current to 2.000μA.		

Title	Parameter	Descriptions
:EDIT:OFFS:REAL?		Query the offset value for the real current.
Return: +2.00000E-06 (2.000μA)		

Title	Parameter	Descriptions
:EDIT:OPEN <NR1>	NR1	Edit the open circuit detection sensitivity.
<NR1>=0~10000 Example: :EDIT:OPEN 200 Descriptions: Edit the sensitivity to 200.		

Title	Parameter	Descriptions
:EDIT:OPEN?		Query the open circuit detection sensitivity.
Return: 200		

Title	Parameter	Descriptions
:EDIT[:JUDG]:DELA <NRF>	NRF	Edit the delay time. The content in [ ] can be omitted.
Example: :EDIT:DELA 2 Descriptions: Edit the delay time to 2 seconds. **(This command can only be used in IR and DCW.)**		

Title	Parameter	Descriptions
:EDIT[:JUDG]:DELA?		Query the delay time editing. The content in [ ] can be omitted.

Return: +2.00000E+00 (2 seconds) **(This command can only be used in IR and DCW.)**

Title	Parameter	Descriptions
:EDIT:JUDG:DELA:STAT {ON|OFF|1|0}	Boolean	Edit whether the delay time is enabled.

1=ON,0=OFF

Example: :EDIT:JUDG:DELA:STAT 1

Title	Parameter	Descriptions
:EDIT:JUDG:DELA:STAT?		Query whether the delay time is enabled.

Return: ON

Title	Parameter	Descriptions
:EDIT:ACW:LO:JUDG {ON|OFF|1|0}	Boolean	Edit whether the ACW low limit is enabled.

1=ON,0=OFF

Example: :EDIT:ACW:LO:JUDG 1

Title	Parameter	Descriptions
:EDIT:ACW:LO:JUDG?		Query the current status of ACW low limit.

Return: ON

Title	Parameter	Descriptions
:EDIT:DCW:LO:JUDG {ON|OFF|1|0}	Boolean	Edit whether the DCW low limit is enabled.

1=ON,0=OFF

Example: :EDIT:DCW:LO:JUDG 1

Title	Parameter	Descriptions
:EDIT:DCW:LO:JUDG?		Query the current status of DCW low limit.

Return: ON

Title	Parameter	Descriptions
:EDIT:IR:HI:JUDG {ON|OFF|1|0}	Boolean	Edit whether the IR high limit is enabled.

1=ON,0=OFF

Example: :EDIT:IR:HI:JUDG 1

Title	Parameter	Descriptions
:EDIT:IR:HI:JUDG?		Query the current status of IR high limit.

Return: ON

Title	Parameter	Descriptions
:EDIT:IR:LO:JUDG {ON|OFF|1|0}	Boolean	Edit whether the IR low limit is enabled.

1=ON,0=OFF

Example: :EDIT:IR:LO:JUDG 1

Title	Parameter	Descriptions
:EDIT:IR:LO:JUDG?		Query the current status of IR low limit.

Return: ON

Title	Parameter	Descriptions
:EDIT:GND:STAT {ON|OFF|1|0}	Boolean	Edit whether the GND is enabled.

1=ON,0=OFF

Example: :EDIT:GND:STAT 1

Title	Parameter	Descriptions
:EDIT:GND:STAT?		Query whether the GND is enabled.

Return: ON

Title	Parameter	Descriptions
:EDIT:STEP:COUN?		Query the total number of test steps.

Return: 2 (This file contains a total of 2 steps.)

Title	Parameter	Descriptions
:EDIT:STEP:DEL <NR1>	NR1	Delete the test step.

Example: :EDIT:STEP:DEL 2

Descriptions: Delete the STEP2.

Title	Parameter	Descriptions
:EDIT:STEP:ADD <NR1>	NR1	Add the test step.

Example: :EDIT:STEP:ADD 2

Descriptions: Add the STEP2.

Title	Parameter	Descriptions
:EDIT:STEP:COND? <NR1>	<NR1>	Query the editing for each item within the test step.

Example: :EDIT:STEP:COND? 2

Descriptions: Query the editing for the STEP2.

Return: ACW, 1.00kV, 50HZ, 31.00mA, 0.00mA, 0.1s, 1.0s, 0, 0.00mA, OFF

Description of returned content: modes, voltage, frequency, high limit, low limit, ramp up time, test time, arc sensitivity, offset value, delay time status

Title	Parameter	Descriptions
:EDIT:FALL <NRF>	NRF	Edit the voltage fall time.

<NRF>=0~99.9

Example: :EDIT:FALL 1

Descriptions: Edit the fall time to 1 second.

Title	Parameter	Descriptions
:EDIT:FALL?		Query the voltage fall time.
Return: +1.00000E+00 (1 second)		

Title	Parameter	Descriptions
:EDIT:CHAN:POSI <NR1>	NR1	Edit the 7641 rear panel channel output (+).
<NR1>=1~8 Example: :EDIT:CHAN:POSI 1,2,3,4		

Title	Parameter	Descriptions
:EDIT:CHAN:POSI?		Query the current rear panel channel output (+) status of the 7641.
Example: :EDIT:CHAN:POSI? Return: 1,2,3,4		

Title	Parameter	Descriptions
:EDIT:CHAN:NEGA <NR1>	NR1	Edit the 7641 rear panel channel output (-).
<NR1>=1~8 Example: :EDIT:CHAN:NEGA 5,6,7,8		

Title	Parameter	Descriptions
:EDIT:CHAN:NEGA?		Query the current rear panel channel output (-) status of the 7641.
Example: :EDIT:CHAN:NEGA? Return: 5,6,7,8		

Title	Parameter	Descriptions
:EDIT:CHAN:CLOS <NR1|ALL>	NR1|ALL	Clear rear panel channel output status of the 7641.
Example: :EDIT:CHAN:CLOS 1,5 :EDIT:CHAN:CLOS ALL		

Title	Parameter	Descriptions
:EDIT:CHAN:CLOS?	NR1	Query the channels that are closed.

Example: :EDIT:CHAN:CLOS?

Return: 1,2,3,4,5,6,7,8

External SCANNER Channel Command Settings:

Up to 4 SCANNERs can be connected in parallel. BOX1–BOX4 correspond to the 1st to 4th SCANNER, respectively. Commands can be issued as follows: :EDIT:BOX4:CHAN:POSI 1,2,3,4 (This sets the 4th SCANNER to output +CH1, CH2, CH3, CH4.)

Title	Parameter	Descriptions
:EDIT:BOX1:CHAN:POSI <NR1>	NR1	Edit the channel output (+) of the first scanner.

Example: :EDIT:BOX1:CHAN:POSI 1,2,3,4

Title	Parameter	Descriptions
:EDIT:BOX1:CHAN:POSI?		Query the channel output (+) of the first scanner.

Example: :EDIT:BOX1:CHAN:POSI?

Return: 1,2,3,4

Title	Parameter	Descriptions
:EDIT:BOX1:CHAN:NEGA <NR1>	NR1	Edit the channel output (-) of the first scanner.

Example: :EDIT:BOX1:CHAN:NEGA 9,10,11,12

Title	Parameter	Descriptions
:EDIT:BOX1:CHAN:NEGA?		Query the channel output (-) of the first scanner.

Example: :EDIT:BOX1:CHAN:NEGA?

Return: 9,10,11,12

Title	Parameter	Descriptions
:EDIT:BOX1:CHAN:CLOS {NR1|ALL}	NR1	Clear the channel output status of the first scanner.
Example: :EDIT:BOX1:CHAN:CLOS 1,2,3,4,9,10,11,12		

Title	Parameter	Descriptions
:EDIT:BOX1:CHAN:CLOS?	NR1	Query the channels that are closed on the first scanner.
Example: :EDIT:BOX1:CHAN:CLOS? Return: 1,2,3,4,9,10,11,12		

6.4 SCPI Commands: MEASure

Title	Parameter	Descriptions
:MEAS:VOLT?		Query the voltage value being measured.
Return: +1.00000E+03 <1kV>		

Title	Parameter	Descriptions
:MEAS:CURR?		Query the current value being measured.
Return: +2.00000E-06 <0.002mA>		

Title	Parameter	Descriptions
:MEAS:CURR:IMAG?		Query the imagery current value being measured.
Return: 6.35345E-06 <6.35μA>		

Title	Parameter	Descriptions
:MEAS:CURR:REAL?		Query the real current value being measured.
Return: +4.92378E-07 <49.23μA>		

Title	Parameter	Descriptions
:MEAS:RES?		Query the resistance value being measured.

Return: +1.20000E+10(12GΩ)

Title	Parameter	Descriptions
:MEAS:TIME?		Query the elapsed time since the test started.

Return: +1.0000E+0 (1 second)

6.5 SCPI Commands: OPERation

Title	Parameter	Descriptions
:OPER:STEP <NR1>	NR1	Select the step for single step. In multi step, testing always starts from STEP1.

Example: :OPER:STEP 2

Descriptions: Select the STEP2.

Title	Parameter	Descriptions
:OPER:STEP?		Query the current step.

Return: 2

Title	Parameter	Descriptions
:OPER:FILE?		Query the current file name.

Return: 26983877

6.6 SCPI Commands: other commands

Title	Parameter	Descriptions
:STAR		Start the test, functioning the same as the TEST key on the front panel.
:STOP		Stop the test, functioning the same as the ABORT key on the rear panel.

Title	Parameter	Descriptions
:RESU?		Query the test result.

Example: :RESU?

Return: 01, +9.01235E+00, +7.52562E-07, +1.19756E+07, 2

Order of returned content: step number, measured voltage value, measured current value, measured resistance value, judgment result

The judgment result is displayed as a code, with the corresponding codes as follows:

Code	Descriptions
1	Test Aborted
2	Judged PASS
3	Measured result exceeds high limit. (FAIL)
4	Measured result below lower limit. (FAIL)
5	Arc Sensitivity (FAIL)
6	Breakdown Voltage Reached (FAIL)
7	Output Voltage Error
8	Open Circuit Failure

6.7 SCPI Commands: SYSTem

Title	Parameter	Descriptions
:SYST:AURE {OFF|0|ON|1|RS232|FLASH|BOTH}	String	Settings for automatic upload function.

0=OFF、1=ON=RS232、FLASH、BOTH

Example: :SYST:AURE ON

Descriptions: Enable RS-232 auto reply function.

Title	Parameter	Descriptions
:SYST:AURE?		Query the current status of the automatic upload function.
Return: RS232		

Title	Parameter	Descriptions
:SYST:KYSO {ON|OFF|1|0}	Boolean	Set whether the key sound is enabled.
1=ON,0=OFF Example: :SYST:KYSO ON Descriptions: Key sound is enabled.		

Title	Parameter	Descriptions
:SYST:KYSO?		Query whether the key sound is enabled.
Return: ON		

Title	Parameter	Descriptions
:SYST:ALAR[:VOLU]:PASS <NR1>	NR1	Set the PASS alert volume. The content in [ ] can be omitted.
<NR1>=1~9 Example: :SYST:ALAR:PASS 1 Descriptions: Set the PASS alert volume to 1.		The value is proportional to the volume.

Title	Parameter	Descriptions
:SYST:ALAR[:VOLU]:PASS?		Query the PASS alert volume. The content in [ ] can be omitted.
Return: 1		

Title	Parameter	Descriptions
:SYST:ALAR[:VOLU]:FAIL <NR1>	NR1	Set the FAIL alert volume. The content in [ ] can be omitted.
<NR1>=1~9 Example: :SYST:ALAR:FAIL 5 Descriptions: Set the FAIL alert volume to 5.		The value is proportional to the volume.

Title	Parameter	Descriptions
:SYST:ALAR[:VOLU]:FAIL?		Query the FAIL alert volume. The content in [ ] can be omitted.

Return: 5

Title	Parameter	Descriptions
:SYST:ERRO?		Query the messages in the error message queue.

Return: 0 (Indicates that there are no error messages in the queue.)

6.8 SCPI Commands: TEST

Title	Parameter	Descriptions
:TEST:EXEC		Start the test, functioning the same as the TEST key on the front panel.
:TEST:ABOR		Stop the test, functioning the same as the ABORT key on the rear panel.