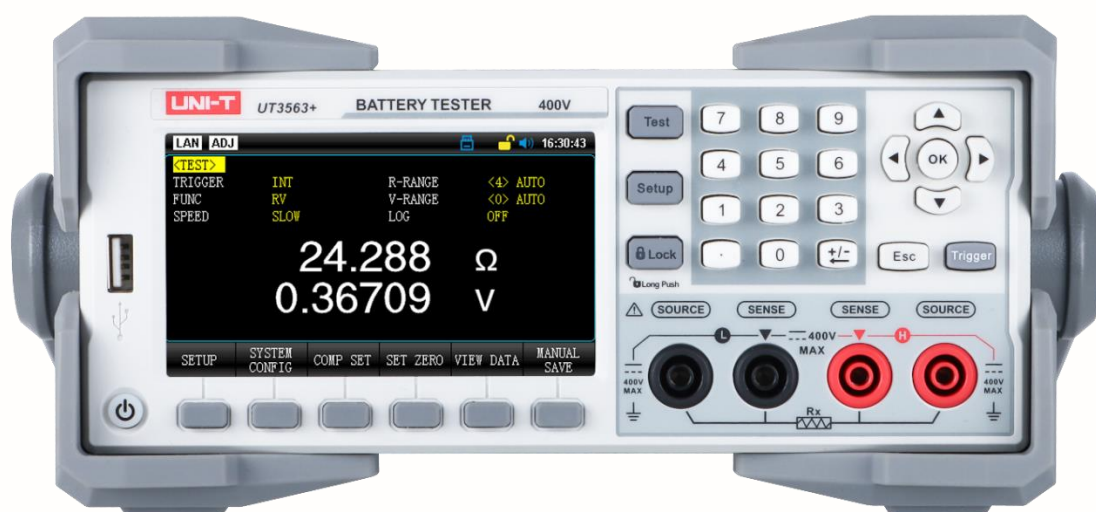


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User Manual

UT3560+ Series Battery Internal Resistance Tester

V1.0

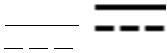
June 2026

1 Foreword

This user manual contains important safety information, installation guidelines, and basic operating instructions for the UT3560+ Series Battery Internal Resistance Tester.

2 Safety Information

Safety Precautions		
Warning		Please follow these guidelines to avoid possible electric shock and risk to personal safety.
		Users must adhere to standard safety precautions during the operation, servicing, and maintenance of this device. UNI-T will not be liable for any personal safety and property loss caused by the user's failure following the safety precautions. This device is designed for professional users and responsible organizations for measurement purposes. Do not use this device in any manner not specified by the manufacturer. This device is intended for indoor use only, unless otherwise stated in the product manual.
Safety Statements		
Warning		"Warning" indicates the presence of a hazard. It warns 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 warns 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 "Note" should be highlighted if necessary.
Safety Signs		
	Danger	It indicates danger of electric shock, which may cause personal injury or death.

	Warning	It indicates that there are factors you should be cautious of to prevent personal injury or product damage.
	Caution	It indicates 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	Standby power supply: When the power switch is turned off, this device is not completely disconnected from the AC power supply.
	Waste	Do not place equipment and accessories in the trash. Items must be properly disposed of in accordance with local regulations.
	EEUP	This environment-friendly use period (EFUP) indicates that dangerous or toxic substances will not leak or cause damage within this indicated time period. The environmentally 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. This device is not intended for measuring the main circuit.
Check all terminal rated values	Please check all rated values and marking instructions on the product to avoid fire and the impact of excessive current. Please consult the product manual for detailed rated values before connection.
Use the power cord properly	Users 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 designated as lower-grade, which are not applicable to main power supply measurement, CAT II, CAT III, or CAT IV circuit measurement. Probe subassemblies and accessories within the range of IEC 61010-031 and current sensors within the range of IEC 61010-2-032 can meet its requirements.
Use the input / output port of this device properly	Please use the input / output ports provided by this device in a proper 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 a power fuse of exact 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 for operators inside. Do not remove the protective cover. Qualified personnel must conduct maintenance.
Service environment	This device should be used indoors in a clean and dry environment with ambient temperature from 0 °C to +40 °C. Do not use this device in explosive, dusty, or high humidity conditions.
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	Insufficient 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 conducted by qualified personnel.

3 Introduction

The UT3560+ Series is a high-precision, wide-range benchtop battery internal resistance tester controlled by a high-performance microprocessor. It is capable of measuring resistance from 0.0001 mΩ to 3.3 kΩ, and DC voltage from 0.00001 V to 1500.00 V (UT3565+). The maximum display resolution reaches 33,000 counts for resistance and 600,000 counts for voltage.

The UT3560+ Series combines high accuracy, high resolution, and EXFAST measurement performance, offering 0.5% resistance accuracy and 0.01% voltage accuracy, with a maximum measurement speed of up to 100 readings per second.

Designed for professional sorting applications, the instrument is equipped with a Handler (PLC) interface as standard, providing independent HIGH/IN/LOW judgment outputs for both resistance and voltage. It fully supports high-speed automated sorting systems for fully automated production line testing, while the enhanced I/O signals can directly drive power relays and signal relays.

The instrument integrates RS-232C, RS-485, USB, and LAN interfaces, and supports two communication protocols: SCPI and Modbus-RTU, enabling efficient remote control and data acquisition.

With a newly improved AC resistance measurement principle, the UT3560+ Series is suitable for internal resistance testing of almost all types of batteries, including lithium batteries, NiMH batteries, NiCd batteries, button cells, cylindrical batteries, and pouch cells, making it ideal for production line inspection and quality control.

Model	Accuracy	Measuring Range
UT3562+	Resistance: 0.5% Voltage: 0.01%	Resistance: 0.0001 mΩ-3.3 kΩ Voltage: 0.00001-202.000 V
UT3563+	Resistance: 0.5% Voltage: 0.01%	Resistance: 0.0001 mΩ-3.3 kΩ Voltage: 0.00001-404.000 V
UT3564+	Resistance: 0.5% Voltage: 0.01%	Resistance: 0.0001 mΩ-3.3 kΩ Voltage: 0.00001-1010.00 V
UT3565+	Resistance: 0.5% Voltage: 0.01%	Resistance: 0.0001 mΩ-3.3 kΩ Voltage: 0.00001-1550.00 V

3.1 Technical Specifications

Model		UT3562+	UT3563+	UT3564+	UT3565+
Measurement Method		AC four-terminal method			
Current Frequency		1 kHz ±0.2 Hz			
Max. Input Voltage		DC ±100 V	DC ±400 V	DC ±1000 V	DC ±1500 V
Max. Rated Ground Voltage		DC ±100 V	DC ±400 V	DC ±1000 V	DC ±1500 V
Measurement Channel		Single Channel			
Resistance Measurement					
Resistance Test Range (Max. Display, Resolution, Measuring Current)	3 mΩ	3.3000 mΩ, 0.1 μΩ, 100 mA			
	30 mΩ	33.000 mΩ, 1 μΩ, 100 mA			
	300 mΩ	330.00 mΩ,10 μΩ, 10 mA			
	3 Ω	3.3000 Ω,100 μΩ, 1 mA			
	30 Ω	33.000 Ω, 1 mΩ, 100 μA			
	300 Ω	330.00 Ω, 10 mΩ, 10 μA			
	3 kΩ	3.3000 kΩ, 100 mΩ, 10 μA			
Resistance Test Accuracy	Slow	±0.5% rdg ±10 dgt (3 mΩ range), ±0.5% rdg ±5 dgt (above 30 mΩrange)			
	Normal	±0.5% rdg ±15 dgt (3 mΩ range), ±0.5% rdg ±7 dgt (above 30 mΩrange)			
	Fast	±0.5% rdg ±20 dgt (3 mΩ range), ±0.5% rdg ±7 dgt (above 30 mΩrange)			
	EXFAST	±0.5% rdg ±40 dgt (3 mΩ range), ±0.5% rdg ±8 dgt (30 mΩ above range)			
Temperature coefficient		(±0.05% rdg ±1 dgt)/°C (3 mΩ), (±0.05% rdg ±0.5 dgt)/°C (above 30 mΩrange)			
Voltage Measurement					
	6 V	6.06000 V,	6.06000 V,	-	-

Voltage Test Range (Max. Display, Resolution)		10 μ V	10 μ V		
	10 V	-	-	9.99999V, 10 μ V	9.99999V, 10 μ V
	60 V	60.6000V, 100 μ V	60.6000V, 100 μ V	-	-
	100 V	101.000V, 1 mV	-	99.9999V, 100 μ V	99.9999V, 100 μ V
	400 V	-	404.000V, 1 mV	-	-
	1000 V	-	-	1010.00V, 1 mV (Abobe 1000.00V, resolution: 10mV)	-
	1500 V	-	-	-	1550.00 V, 1 mV (Abobe 1000.00V, resolution: 10mV)
Voltage Test Accuracy	Slow	$\pm 0.01\%$ rdg ± 3 dgt			
	Normal	$\pm 0.01\%$ rdg ± 5 dgt			
	Fast	$\pm 0.05\%$ rdg ± 5 dgt			
	EXFAST	$\pm 0.1\%$ rdg ± 6 dgt			
Temperature coefficient		$(\pm 0.001\%$ rdg ± 0.3 dgt)/ $^{\circ}$ C			
Other Functions					
Test Speed		EXFAST: 100 readings/s Fast: 50 readings/s			

		Normal: 14 readings/s Slow: 3 readings/s
Range Mode		Automatic, Manual
Open Terminal Voltage		<25 V
Calibration Method		Short circuit full range reset
Contact Inspection		Supported
Pulse Test Function		Supported
Comparator		ABS, PER, and SEQ
Handler		Resistance HI/IN/LO, Voltage HI/IN/LO Total unqualified grade
Beep		Off, Pass, Fail
Trigger		Internal, External (Manual and Remote) Trigger
Data Logging		Up to 10,000 data points
Manual Storage		500 sets of measurement data
File Management		Save test conditions, up to 30 files
Key Lock		Supported
General Specifications		
Display		4.3-inch LCD display
Language		English/ Simplified Chinese
Communication Interfaces		RS232, RS485, USB, LAN, Handler, USB Host
Communication Protocols		SCPI, Modbus-RTU
Rated Performance Temperature / Humidity		18 to 28°C / 30 to 65% RH (no condensation)
Operating Temperature / Humidity		0 to 40°C / 20 to 70% RH (no condensation)
Storage Temperature / Humidity		-20 to 70°C / 90% RH or less (no condensation)
Input Power	Voltage (AC)	100 – 120 VAC / 200 – 240 VAC
	Frequency	50/60 Hz ± 5%

	Apparent Power	25 VA, Fuse: T1A/250VAC slow-blow (internal)
Dimensions (W × H × D, mm)		215 x 88 x 350
Weight		2.4 kg

- Temperature conditions: 23°C ± 5°C
- Humidity conditions: 35% – 65% RH
- Zero adjustment: Zero calibration before test
- Warm-up time: > 30 minutes
- Recommended calibration cycle: 1 year

3.2 Key Features

- 4.3-inch LCD display with simultaneous readout of battery internal resistance and voltage.
- Wide measuring range: Resistance 0.0001 mΩ to 3.3 kΩ. Voltage 0.00001 V to 1500 V.
- Basic resistance accuracy: 0.5%; minimum resolution: 0.1 μΩ.
- Voltage accuracy: 0.01%; minimum resolution: 10 μV.
- AC four-terminal (Kelvin) measurement to improve accuracy and minimize the impact of test-lead impedance.
- Simultaneous resistance and voltage measurement with a maximum test rate of 100 readings/s.
- Contact check function to detect whether the test leads maintain good contact during measurement.
- Zero adjustment function: Full-range short-circuit zeroing.
- Comparator (sorting) function with multiple comparison modes, enabling PASS/FAIL sorting and buzzer indication.
- Recording function: Up to 10,000 readings in the data buffer; manual storage of up to 500 measurement records.
- Rich I/O and communication interfaces: Supports SCPI and Modbus-RTU protocols for easy integration into automated test systems.

4 Product Overview

4.1 Front Panel

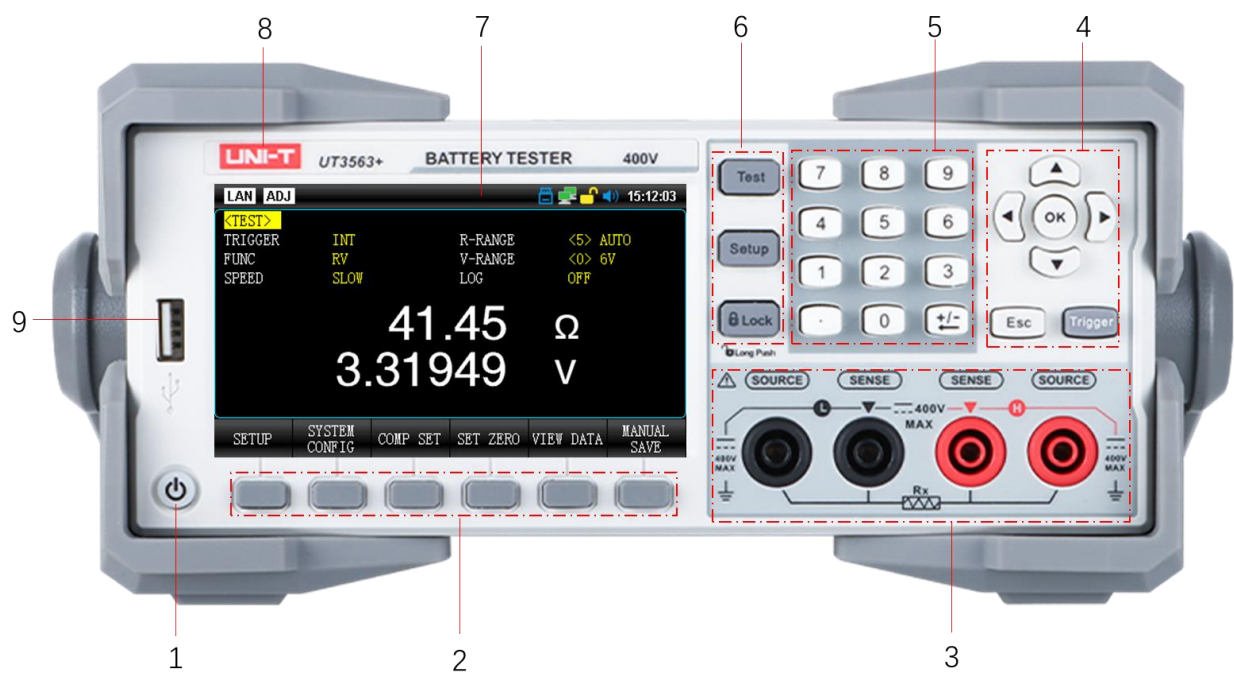


Figure 4-1 Front Panel of Battery Internal Resistance Tester

No.	Item	Description
1	Power Switch	Controls power status: OFF / Standby (red) / ON (green)
2	Soft Keys	Function changes according to on-screen menu
3	Test Terminals	Four terminals, source and sense
4	Arrow Keys	Cursor movement (up/down/left/right)
	OK Key	Confirm input; long press to capture screenshot to USB
	Esc Key	Cancel/Return
	Trigger Key	Manual trigger when external trigger is selected
5	Numeric Keypad	Input values; includes +/- and delete
6	Test Key	To display results of measured objects and so on
	Setup Key	Enter parameter settings
	Lock Key	Lock/unlock keyboard (long press 1s to unlock)

7	Display	4.3-inch LCD
8	Nameplate	Logo and model information
9	USB Port	USB storage for upgrade and data saving

4.2 Rear Panel

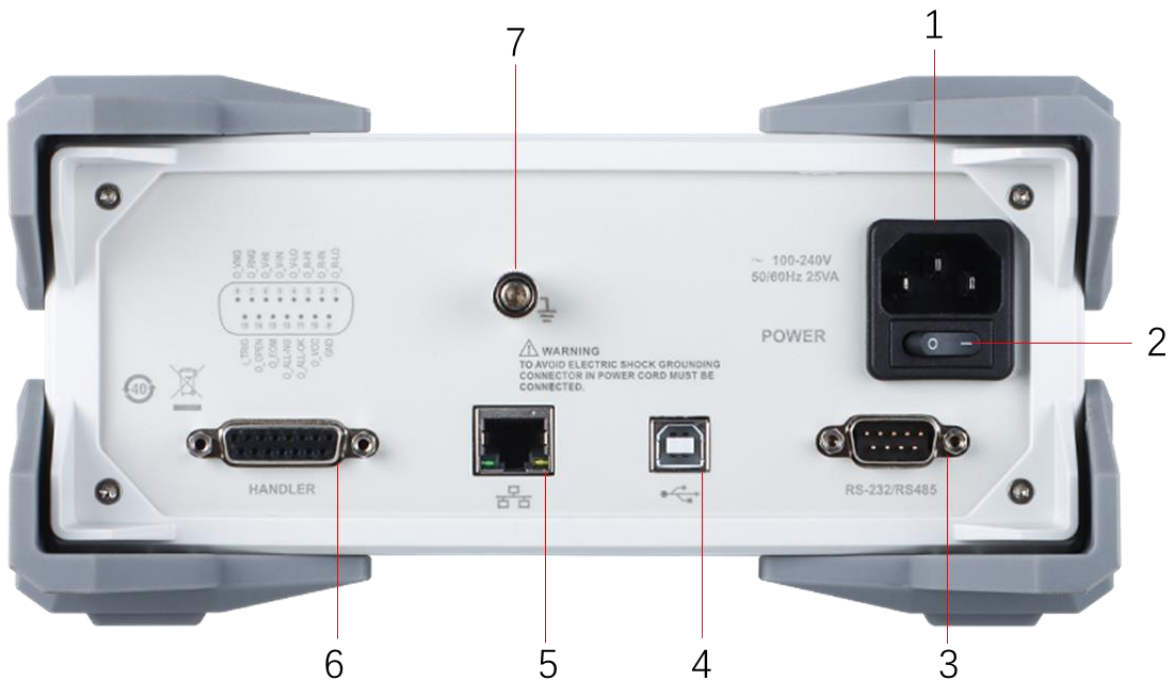


Figure 4-2 Rear Panel

No.	Item	Description
1	AC Power Inlet	AC power input
2	Main Power Switch	ON/OFF main power
3	RS232/RS485 Port	Serial communication interface
4	USB Device Port	USB communication
5	LAN Port	TCP communication
6	Handler Interface	15-pin D-sub interface for automation control
7	Ground Terminal	Chassis grounding. Ensure the device is properly grounded before operation.

5 Inspection and Installation

5.1 Package Inspection

- Check if there are defects such as damage and scratches on the product appearance;
- Verify accessories against packing list

If any issue is found, contact UNI-T or distributor immediately.

5.2 Power Requirements

- Voltage: AC 100-240 V
- Frequency: 50/60 Hz
- Power: ≤ 25 VA
- Ensure correct connection of Live (L), Neutral (N), and Ground (E)

This instrument is carefully designed to reduce clutter interference from AC power input. Nevertheless, it should be used in a low-noise environment whenever possible. If such conditions cannot be avoided, please install a power filter.

Warning: Proper grounding is required to avoid electric shock. If the user replaces the power cord, ensure its ground connection is reliable.

5.3 Operating Environment

It is recommended to use the UT3560+ series battery internal resistance tester under the following environmental conditions:

- Avoid dust, vibration, direct sunlight, corrosive gases.
- The instrument shall operate normally at a temperature ranging from 0 °C to 40 °C and a relative humidity no more than 70%.
- If the instrument is not to be used for a long time, please store it in the original packaging box or a similar box in a well-ventilated room with a temperature ranging from -20 °C to 60 °C and a relative humidity not exceeding 70% RH. The air should not contain harmful impurities that corrode the measuring instrument, and it should be kept away from direct sunlight.
- The instrument, especially the test leads connecting the parts under test, should be kept away from strong electromagnetic fields to avoid interference with the measurement.

5.4 Cleaning

- Disconnect power before cleaning
- Use soft cloth slightly dampened with water
- Do not allow liquid inside the instrument
- Do NOT use solvents (alcohol, gasoline, etc.)

5.5 Handle Adjustment

The instrument handle is adjustable. Grasp both sides of the handle with both hands, pull them slightly outward, then rotate the handle. The handle can be adjusted to four positions, as shown in the figures below:

Figure 5-1 Instrument handle position (factory default)

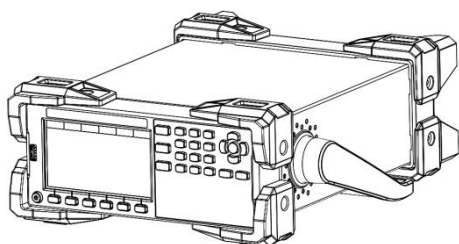


Figure 5-2 Testing mode

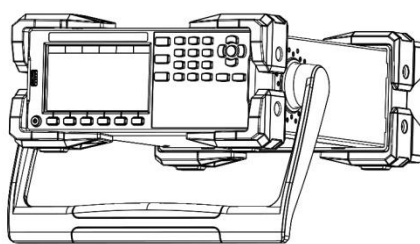


Figure 5-3 Handle stowed position

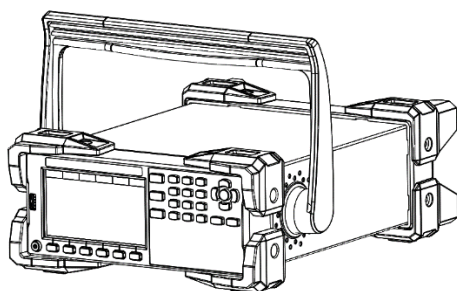
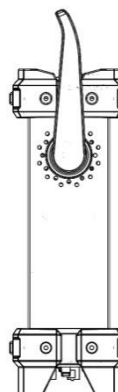


Figure 5-4 Handle carrying position



5.6 Daily Inspection

To avoid accidents, at least the following points should be ensured before use begins:

- Verify power supply
- Ensure proper grounding
- Check test leads for damage

5.7 Warm-up and Continuous Operation

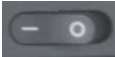
To ensure the accurate measurement of the instrument, the preheating time after startup should be no less than 30 minutes. The continuous working time should not exceed 16 hours.

5.8 Use Dedicated Fixture

Please use the test cables provided by our company. Test cables made by users themselves or from other companies may lead to incorrect measurement results. The test cable of the instrument should be kept clean, and the pins of the device under test should also be kept clean to ensure good contact between the device under test and the test cable. Connect the test cable to the aviation plug on the front panel of this instrument. For the test piece with a shielding housing, the shielding layer can be connected to the instrument ground "⊥".

6 Pre-Test Preparation

6.1 Power-On

- Connect the power cord and insert the power plug into a socket with a protective ground. Press the switch on the rear panel  , Put the instrument in standby mode, and the soft switch on the front panel will turn orange.
- Press the soft switch on the front panel. When the soft switch turns green, the instrument starts up.
- To ensure that this instrument performs better, it is recommended that you preheat it for 30 minutes after turning it on.

Warning: Please make sure that the power supply voltage matches the supply voltage before turning on the power. Otherwise, the instrument may be burned out. Plug the main power plug into a power socket with a protective ground. Do not use a power strip without a protective ground. Before operating the instrument, you should first ensure that it is well grounded.

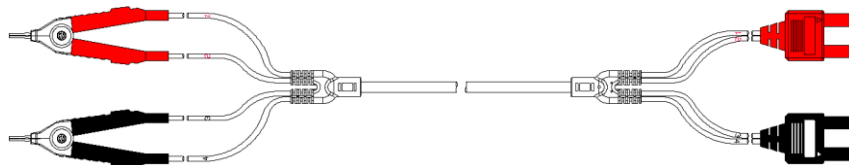
6.2 Test Lead Connection

6.2.1 Introduction to the Test Line

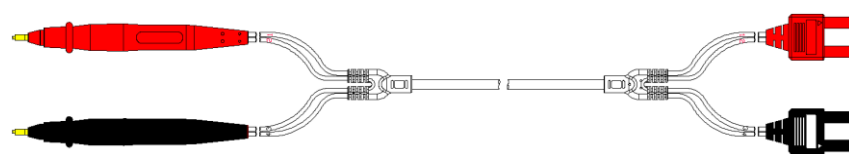
The UT3560+ series battery internal resistance tester is equipped with test connection wires UT-L87 and UT-L86 specifically designed for battery internal resistance testing, facilitating users to conduct more professional measurements. The following is the relevant information about the test leads.

The contact surface of the test leads is gold-plated. Long-term operation (for example, 1 to 2 years) may cause wear on the electroplated surface. It is recommended that you replace the test leads with new ones in time when you find obvious deviations in several tests.

UT-L87 Kelvin clip



UT-L86 probe



6.2.2 Connection Steps

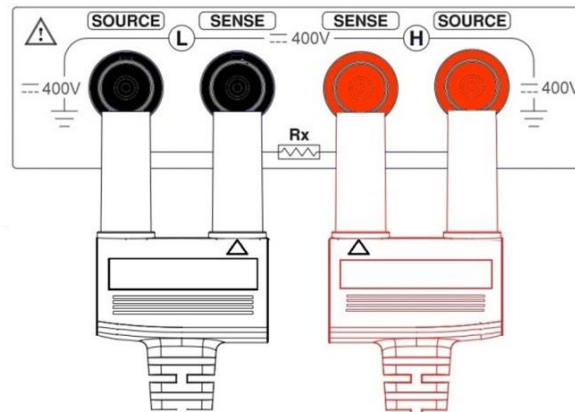
It is recommended to use the standard test leads provided with the instrument. Before measurement, connect the test leads to the instrument terminals as follows:

Ensure the power switch of the instrument is in the OFF position before connection.

- Ensure that the four-terminal test leads are not connected to any object.

Connect the four-terminal test leads to the instrument input terminals as shown:

- Black test leads → black terminals
- Red test leads → red terminals:
- Match the ▲ mark on the black test lead with the black SENSE terminal on the front panel.
- The ▲ mark on the red test lead must match the red SENSE terminal on the front panel.



Note: To ensure measurement accuracy, always use the supplied test leads.

Warning: Do NOT connect any AC current or voltage source directly to the test terminals.

6.2.3 DUT Measurement

After properly connecting the test leads to the instrument's **SOURCE** and **SENSE** terminals, connect the leads to the DUT as follows:

- The red probe or clip should be connected to the positive terminal of the battery.
- The black probe or clip should be connected to the negative terminal of the battery.

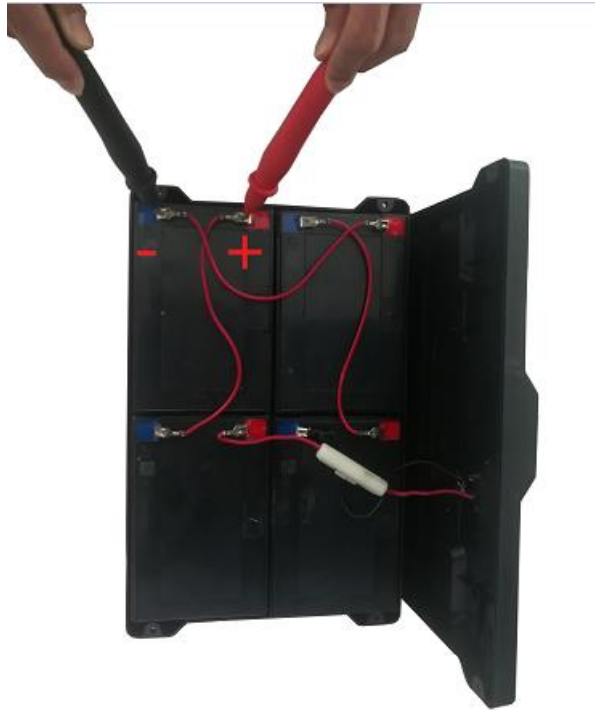
If the polarity is reversed, the measured voltage will be displayed as negative. Swap the red and black test leads to correct the polarity.

Figure 6-2-1 Connect the test line to the DUT



- When using Kelvin clips, clamp the test leads directly onto the DUT terminals for four-wire measurement.
- When using probe tips, place the probes firmly on the corresponding positive and negative terminals. As shown in Figure 6-2-2.

Figure 6-2-2 Probe Test Probe Measurement



Note: Negative voltage readings indicate reversed polarity. Swap the red and black test leads to correct it.

6.3 ZERO Adjustment

Zero adjustment (short-circuit calibration) should be performed in the following cases:

- Residual readings caused by EMF or other factors
- After replacing test leads
- When abnormal readings occur
- When ambient temperature or humidity changes

After zero adjustment, if environmental conditions or test leads change, perform zero adjustment again.

Notes:

- Perform zero adjustment across all measurement ranges.
- In manual range mode, zero adjustment is applied only to the currently selected range.
- In auto range mode, zero adjustment is applied to all ranges.
- If the measured resistance is smaller than the resistance value used during zero adjustment, the

displayed reading will be negative.

Example: In the 300 mΩ range, connect a 1 mΩ resistor and perform zero adjustment.

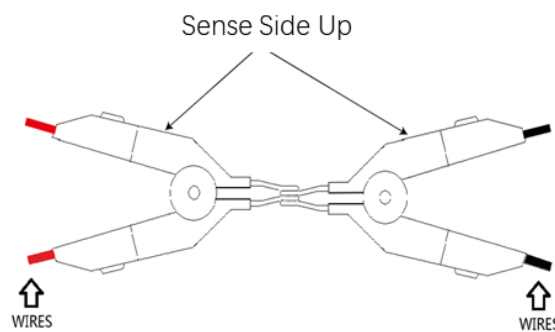
After zeroing is completed, if the test leads are short-circuited again, the display will show -1 mΩ.

6.3.1 Shorting the Test Leads

For very low resistance measurements (e.g., 3 mΩ and 30 mΩ ranges), the generated voltage signal is extremely small (only a few mV). Therefore, the position, length, and shape of test leads affect measurement accuracy.

Zero adjustment should be performed in the same configuration used for measurement.

Kelvin Clip Shorting Method, as shown in the following figure.



Probe Shorting Method

1. The center pin of the crown-type test probe serves as the Sense terminal, and the outer cylindrical barrel serves as the Source terminal. First, align the two probes as shown in Figure 3-3-1-a. Ensure proper contact at the marked red points: center pin to center pin (Sense-to-Sense) and center pin to outer barrel (Sense-to-Source).

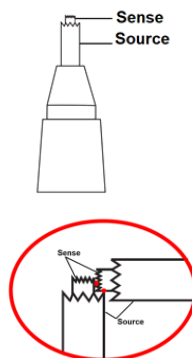


Figure 6-3-1-a Crown Test Leads Short Circuit

2. Apply force in the direction indicated by the arrow in Figure 3-3-1-b to establish the third contact point:

outer barrel to outer barrel (Source-to-Source).

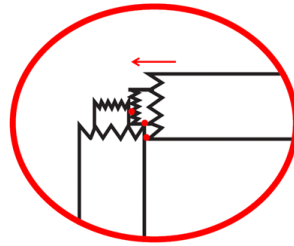


Figure 6-3-1-b Crown Test Leads Short Circuit

3. Perform zero calibration only after stable and reliable contact has been confirmed at all three marked contact points.

6.3.2 Zero Adjustment Procedure

1. Shorting the test leads.



2. Press the **Test** key to return to the page.
3. Press the soft key **SET ZERO**. Move the cursor to **SHORT ZERO**.
4. Press the soft key **SHORT ZERO**.

Function key	Function
OFF	Disable zero correction
SHORT ZERO	Execute short-circuit zeroing

5. Follow on-screen instructions and press **OK** to complete.

7 TEST Page

7.1 TEST Page

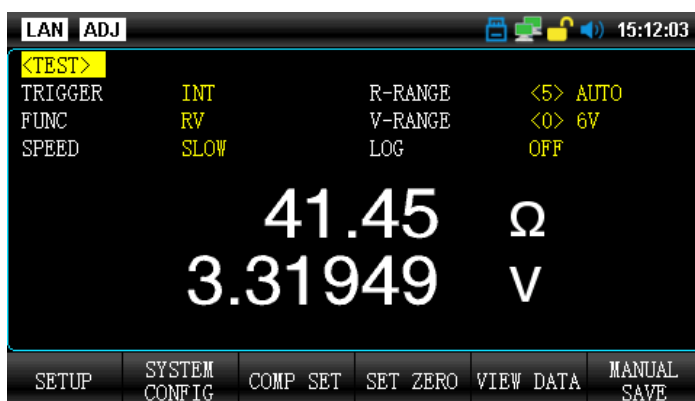
Press the **Test** key to enter the page. The measurement display page shows:

- Measurement results
- Sorting(comparator) results

The following parameters can be configured:

- TRIGGER: Measurement triggering mode
- FUNC: Measurement function
- RANG: Resistance/voltage range
- SPEED: Measurement speed
- LOG: See Data Log section

Figure 7-1 Test Page



7.1.1 TRIGGER Mode

Trigger Mode	Description
INT	The internal trigger mode, also known as continuous testing, has the trigger signal continuously tested by the instrument according to its inherent cycle.
EXT	Manual: Each time the Trigger key is pressed, the instrument executes one measurement cycle. At other times, the instrument is in a waiting state.

	HANDLER: A rising edge pulse is received from the Handler interface on the rear panel, and the instrument performs one measurement cycle. At other times, the instrument is in a waiting state. Please refer to the Handler interface.
	Remote: Send the instruction TRG to perform a measurement.

Test procedure

1. Press the **Test** key to enter the main measurement page.
2. Use the arrow keys to select the **TRIGGER** field.
3. Use the function keys at the bottom of the screen to select the trigger method.

7.1.2 FUNC Mode

Three test functions:

Function	Description
RV	Simultaneously measure and display the resistance and voltage values
R	Only measure and display the resistance value
V	Only measure and display voltage values

Test procedure

1. Press the **Test** key to enter the main measurement page.
2. Use the arrow keys to select the **FUNC** field.
3. Use the function keys at the bottom of the screen to select the measurement function.

Function	Description
RV	Simultaneously measure and display the resistance and voltage values
R	Only measure and display the resistance value
V	Only measure and display voltage values

7.1.3 R-RANGE Mode

The UT3560+ series resistors have 7 ranges, and the variation range of each range is as follows:

Table 7-1 The range of resistance measurement variation

No.	Resistor	Range
-----	----------	-------

6	3 k Ω	0.3200 k Ω -3.3000 k Ω
5	300 Ω	32.00 Ω -330.00 Ω
4	30 Ω	3.200 Ω -33.000 Ω
3	3 Ω	0.3200 Ω -3.3000 Ω
2	300 m Ω	3.200 m Ω -330.00 m Ω
1	30 m Ω	3.200 m Ω -33.000 m Ω
0	3 m Ω	0.0001 m Ω -3.3000 m Ω

Two range modes Table 7-2

Mode	Description	Advantage	Disadvantage
AUTO	The instrument automatically selects the best test range based on the nominal resistance value, and the range number in the range field will be automatically set.	No user intervention is required.	The instrument predicts the measurement range, which results in a lower test speed compared to manual range mode.
MANUAL	The instrument performs measurements only within the user-specified range.	The test speed has reached the fastest.	User intervention is required to select the measurement range.

Test procedure

1. Press the **Test** key to enter the measurement page or press the **Setup** key to enter the Settings page.
2. Use the arrow keys to select the **R-RANGE** field.
3. Use the function keys at the bottom of the screen to select the range: automatic, manual or select the range.

Key	Function
AUTO	The instrument will automatically select the range
MANUAL	The instrument is locked at the current range
INC +	Increase the range number and change the range to locked at the same time
DEC -	Reduce the range number and change the range to lock at the same time

Notes:

1. When the range is automatic, the instrument will predict the range in each measurement cycle, so the test speed will be slightly slower than when the range is locked.
2. Moreover, during automatic measurement, frequent changes in the measurement range will cause a slowdown in response.
3. Generally, when the instrument is used for high-speed sorting measurement, the automatic range mode is not suitable. For users using sorting, please manually select the appropriate range.

7.1.4 V-RANGE Mode

The UT3560+ series voltages have three ranges, and the variation range of each range is as follows:

Table 7-3 Voltage Range

UT3562+

No.	Voltage	Range
2	200 V	0.001 V-202.000 V
1	60 V	0.0001 V-60.6000 V
0	6 V	0.00001 V-6.06000 V

UT3563+

No.	Voltage	Range
2	400 V	0.001V-404.000V
1	60 V	0.0001V-60.6000V
0	6 V	0.00001V-6.06000V

UT3564+

No.	Voltage	Range
2	1000 V	0.001V-1010.00V
1	100 V	0.0001V-99.9999V
0	10 V	0.00001V-9.99999V

UT3565+

No.	Voltage	Range
2	1500 V	0.001V-1550.00V
1	100 V	0.0001V-99.9999V
0	10 V	0.00001V-9.99999V

Three test modes

Table 7-4 Test Range

Mode	Description	Advantage	Disadvantage
AUTO	The instrument automatically selects the best test range based on the nominal resistance value, and the range number in the range field will be automatically set.	No user intervention is required.	The instrument predicts the measurement range, which results in a lower test speed compared to manual range mode.
MANUAL	The instrument performs measurements only within the user-specified range.	The test speed has reached the fastest.	User intervention is required to select the measurement range.

Test procedure

1. Press the [Test] key to enter the measurement page or press the Setup key to enter the Settings page.
2. Use the arrow keys to select the V-RANGE field.
3. Use the function keys at the bottom of the screen to select the range: automatic, manual or select the range.

Key	Function
AUTO	The instrument will automatically select the range
MANUAL	The instrument is locked at the current range
INC +	Increase the range number and change the range to locked at the same time
DEC -	Reduce the range number and change the range to lock at the same time

7.1.5 Test SPEED

The UT3560+ series offers four test speeds (SLOW, MED, FAST, EXFAST). The slower the speed, the more accurate and stable the test results will be. The sampling time when the comparator is turned on under the R-V function and manual range mode is as follows:

SLOW: 3 readings/s (300ms)

MED: 14 readings/s (70ms)

FAST: 50 readings/s (20ms)

EXFAST: 100 readings/s (10ms)

Test procedure

1. Press the **Test** key to enter the measurement page or press the **Setup** key to enter the Settings page.
2. Use the arrow keys to select the **SPEED** field.
3. Use the function keys at the bottom of the screen to select **SLOW/MED/FAST/EXFAST**.

7.2 Measurement Result

7.2.1 Measurement Result Area

RV Function: The upper section of the screen displays the resistance measurement value, and the lower section displays the voltage measurement value.



R Function: The screen displays only the resistance measurement value.



V Function: The screen displays only the voltage measurement value.



Contact Check

Used to determine if the test leads are properly connected to the DUT

Check items

- Open-circuit detection between SOURCE HI and SOURCE LO
- Open-circuit detection between SENSE HI and SENSE LO

Display: "-----"

Figure 7-1 Contact Check, Error Display "a"

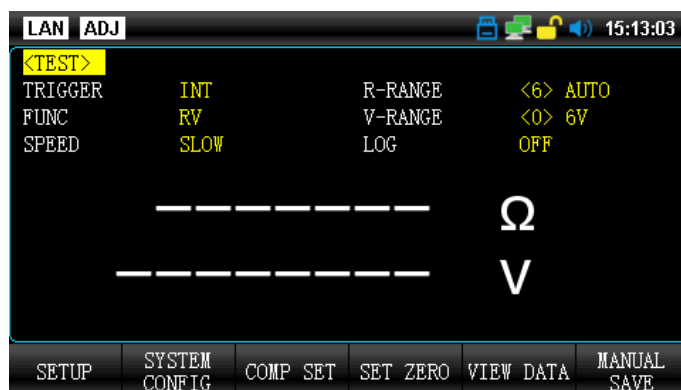


Figure 7-3 Contact Check, Error Display "b"



Notes:

An open-circuit condition will be detected in the following cases:

- The test leads are not connected to DUT.
- The test leads are broken.
- The contact resistance is excessively high due to wear, dirt, or other issues with the test leads.
- The wiring resistance of the test leads is excessively high.
- The resistance of the DUT is far greater than the selected range.

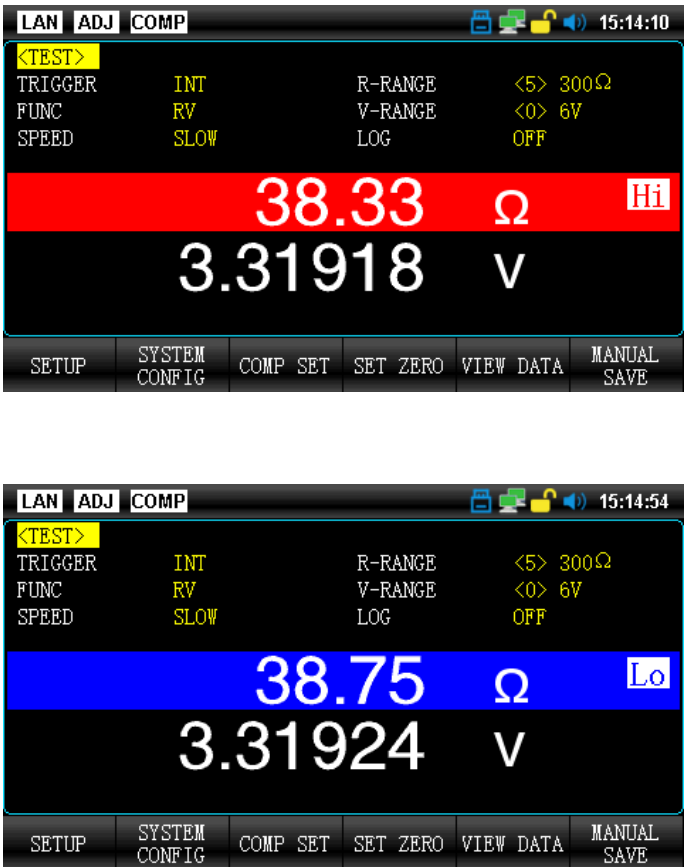
Example: Measuring 100 Ω with the 300 m Ω range.

Over-range Indication: When **+OVER** or **-OVER** is displayed on the screen, it means the measured value is outside the test range of the currently selected range. Please select an appropriate range.



Comparator ON / Sort Judgment Display: Judgment results: **Hi**, **Lo**, **In**, separate judgments are available for the RV (resistance and voltage) modes.

- When the result is judged as **High**, the background color turns red.
- When the result is judged as **Low**, the background color turns blue.



- When the comparator function is OFF, no judgment is performed. If the contact check detects an abnormality, "-----" is displayed and no judgment is made.

7.2.2 Status Bar

Figure 7-2 Status Bar Icons



Table 7-5 Status Bar Icon Description

No.	Icon	Description
1	232	Remote control is set to RS-232
	485	Remote control is set to RS-485
	USB	Remote control is set to USB
	LAN	Remote control is set to LAN
2	ADJ	Short-circuit zero adjustment is enabled

3		USB flash drive ready indicator
4		Internet connection established
5		Keypad unlocked
		Keypad locked
6		Keypad tone enabled
		Keypad tone disabled
7		Time display

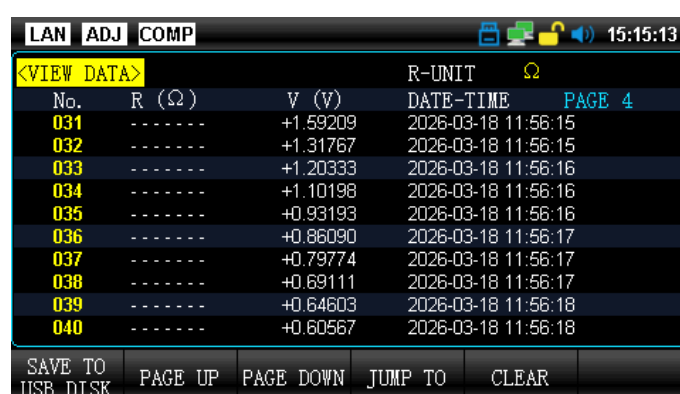
7.3 Manual Data Save and Data Review

Users can manually save measurement readings (up to 500 data sets) and quickly review saved data locally on the instrument.

Press the **MANUAL SAVE** soft key at the bottom of the screen to perform a manual save. Each press saves one additional data record.

Use the **VIEW DATA** soft key at the bottom of the screen to review the manually saved measurement data on the instrument's display.

Figure 7-3 <View Data> Page



LAN ADJ COMP 15:15:13				
<VIEW DATA>				
No.	R (Ω)	V (V)	DATE-TIME	R-UNIT Ω
031	-----	+1.59209	2026-03-18 11:56:15	
032	-----	+1.31767	2026-03-18 11:56:15	
033	-----	+1.20333	2026-03-18 11:56:16	
034	-----	+1.10198	2026-03-18 11:56:16	
035	-----	+0.93193	2026-03-18 11:56:16	
036	-----	+0.86090	2026-03-18 11:56:17	
037	-----	+0.79774	2026-03-18 11:56:17	
038	-----	+0.69111	2026-03-18 11:56:17	
039	-----	+0.64603	2026-03-18 11:56:18	
040	-----	+0.60567	2026-03-18 11:56:18	
SAVE TO USB DISK PAGE UP PAGE DOWN JUMP TO CLEAR				

On this page, users can also use the soft keys at the bottom of the screen to perform the following operations on the data:

Key	Function
Save To USB Disk	When a USB drive is inserted, this key saves the

	data to the USB drive.
Page Up	Navigate up and down through multiple pages of data.
Page Down	
Jump To	
Clear	Clear all saved data.

Setting the **R-UNIT** Display Mode: Use the right arrow key to move the cursor to **R-UNIT**. There are five display modes to choose from: **Auto**, **MΩ**, **Ω**, **kΩ**, **SCI.NOTE**.

Deleting a Single Row of Data: To delete a specific row of data, move the cursor to that row using the arrow keys, then press the **DELETE** function key at the bottom of the screen to delete the selected row.

7.4 Screenshot Function

The instrument provides a screenshot function. Insert a USB storage device into the USB interface on the front panel of the instrument, then long press the **OK** key on the panel. This will capture the current screen and save the screenshot to the USB storage device for later review.

Note: USB flash drive formatted as FAT32, with a maximum capacity of 128GB is recommended.

7.5 Keypad Lock Function

To prevent accidental modification of test conditions, the instrument is equipped with a keypad lock function.

- Short press the **Lock** key on the panel to lock the keypad.
- Long press the **Lock** key for 1 second to unlock the keypad.

8 Setup Page

8.1 Measurement Settings

All measurement-related settings are performed on the **Setup** page. On the **Setup** page, the instrument does not display test results or comparison results, but the test continues to run in the background.

Trigger – Trigger mode for measurement

Func – Measurement function parameters

Range – Resistance and voltage measurement range

Speed – Test speed

AVG – Number of averages for measurement results

Delay – Pre-delay before external trigger measurement

DCV ABS – Absolute value conversion for DC voltage

Current – Test current output mode

Self-Cal – Whether the instrument performs calibration procedures periodically

The settings for **Trigger**, **Func**, **Range**, and **Speed** can also be configured on the “Test page”. For details on these parameter settings, refer to the “Test Measurement Main Page” section.

Figure 8-1 Setup Page



8.1.1 AVG

Average is one of the most commonly used digital filter functions. **Count** refers to the depth of the filter. Its purpose is to perform multiple measurements and use the averaged result as the final displayed value, thereby improving the stability and reliability of the measurement results. The averaging count range is an integer from 1 to 256.

1. Press the **Setup** key to enter the main setup page
2. Use the arrow keys to select the **AVG** field
3. Use the function keys at the bottom of the screen to select, or directly enter the value using the keyboard and press the **OK** key to confirm.

Key	Function
INC +	Increase the average count in steps of 1, 2, 4, 8, 16, 32, 64, 128, 256.
DEC -	Decrease the average count in steps of 256, 128, 64, 32, 16, 8, 4, 2, 1.

8.1.2 Delay

The instrument can set the delay time before each test through the **Trigger Delay** timer, which is used to wait for the workstation to be ready before the test. Maximum delay time of 10000 ms, minimum delay time of 1 ms.

Test procedure

1. Press the **Setup** key to enter the main setup page.
2. Use the arrow keys to select the **Delay** field.
3. Use the function keys at the bottom of the screen to select, or directly enter the value using the keyboard and press the **OK** key to confirm.

Key	Function
OFF	Turn off the trigger delay
10 ms, 50 ms, 100 ms, 500 ms, 1000 ms	Quickly select the delay time

8.1.3 DCV ABS

The DC voltage absolute value conversion function converts a negative DC voltage measurement value into an unsigned value.

Example: -4.00000 V to 4.00000 V

Use this function when the DUT, such as a battery, needs to be treated as a positive measurement value even if it is connected to the test leads with reversed polarity.

V-ABS Setting Steps:

1. Press the Setup key to enter the main setup page.
2. Use the arrow keys to select the DCV ABS field.
3. Use the soft keys at the bottom of the screen to select the setting.

Key	Function
OFF	Disable the V-ABS function.
ON	Enable the V-ABS function.

8.1.4 Current

When multiple identical instruments perform parallel measurements at the same time, their measurement signals may interfere with each other, causing sudden fluctuations in measured values. To prevent measurement errors, the instrument allows the **Current** output mode to be set to **PULSE**. In this mode, the current signal source is turned off after the test is completed, minimizing interference between multiple instruments.

Current Mode Setting Steps:

1. Press the **Setup** key to enter the main setup page.
2. Use the arrow keys to select the Current field.
3. Use the soft keys at the bottom of the screen to select the mode.

Key	Function
CONT	Continuous current output.
PULSE	Output current only during measurement, and turn off the signal source after measurement is completed.

8.1.5 SELF-CAL

The self-calibration function removes offset voltage and gain drift from the instrument's internal circuits to improve measurement accuracy.

The instrument always performs self-calibration in Slow mode, regardless of whether this switch is turned on. At medium speed or above, if the SELF-CAL switch is enabled, the instrument automatically performs calibration every 30 minutes.

Self-Calibration Setting Steps:

1. Press the **Setup** key to enter the main setup page.
2. Use the arrow keys to select the SELF-CAL field.
3. Use the soft keys at the bottom of the screen to select the setting.

Key	Function
OFF	Disable self-calibration.
ON	Enable self-calibration. The instrument will perform self-calibration every 30 minutes.

Note:

- During self-calibration, measurement is briefly paused while the instrument performs calibration.
One self-calibration operation takes 40 ms.
- For high-speed measurement, self-calibration should be disabled.
- To ensure accuracy, the instrument performs self-calibration once every time it is powered on.

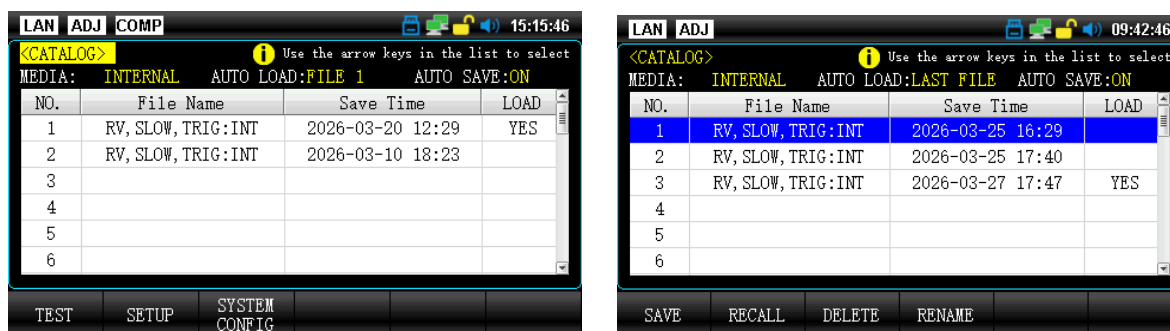
8.2 File Management

Press the **CATALOG** soft key at the bottom of the screen to enter the **CATALOG** page. File management allows users to save settings to **30 local files**, making it convenient to recall settings at startup or when changing specifications.

On the **CATALOG** page, the following items can be configured:

- **AUTO LOAD** – Specify the file to be recalled at power-on
- **AUTO SAVE** – Allow modified parameters to be saved in real time to the current file
- **MEDIA** – Select internal storage or USB storage

Figure 8-2 CATALOG Page



8.2.1 MEDIA

The MEDIA option allows setting files to be stored in the internal Flash memory or on an external USB drive.

Storage Setting Steps:

1. Enter the CATALOG page.
2. Use the arrow keys to select the MEDIA field.
3. Use the soft keys at the bottom of the screen to select the storage medium.

Key	Function
INTERNAL	Store files in the internal Flash memory. Files 1–30 can be stored.

USB	Store files on an external USB storage device. Files 31–40 can be stored. To use USB storage, make sure a USB drive is inserted into the front-panel USB port.
-----	--

8.2.2 AUTO LOAD

The **AUTO LOAD** option specifies which file is recalled when the instrument is powered on.

Auto Load Setting Steps:

1. Enter the CATALOG page.
2. Use the arrow keys to select the **AUTO LOAD** field.
3. Use the soft keys at the bottom of the screen to select the file.

Key	Function
LAST FILE	Load the settings of the current file number at power-on.
FILE 1	Load the settings of File 1 at power-on.

8.2.3 AUTO SAVE

When power-off saving is enabled, the parameters set by the user will be automatically saved to the current file when the instrument is switched to standby mode by pressing the front-panel power key.

Auto Save Setting Steps:

1. Enter the CATALOG page.
2. Use the arrow keys to select the **AUTO SAVE** field.
3. Use the soft keys at the bottom of the screen to select the setting.

Key	Function
OFF	User-defined parameters can only be saved manually to a file.
ON	When the instrument is switched to standby mode by pressing the front-panel power key, user-defined parameters are automatically saved to the current file.

8.2.4 No. 1 to No. 30

Users can specify any of the 30 files from No. 1 to No. 30 for saving, recalling, and deleting settings.

File Operation Setting Steps:

1. Enter the CATALOG page.
2. Use the arrow keys to select the No. 1 to No. 30 field.
3. Use the soft keys at the bottom of the screen to select the required operation.

Key	Function
Save	Save all settings to the current file.
Recall	Recall the file parameters into the system.
Delete	Delete the file data.
Rename	Rename the file. The file name can be customized.

8.2.5 No. 31 to No. 40

When a USB drive is inserted, 10 files from No. 31 to No. 40 can be saved to the USB drive.

File Operation Setting Steps:

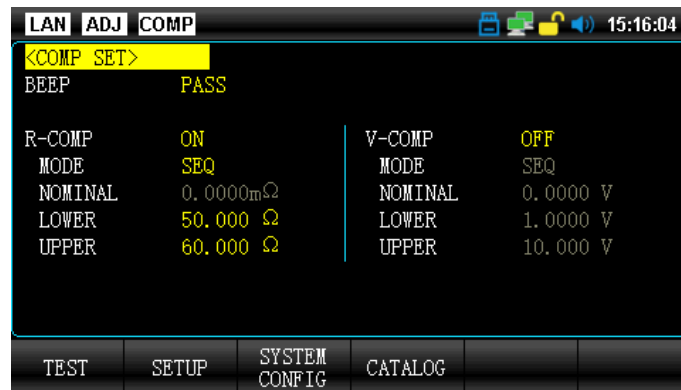
1. Enter the CATALOG page.
2. Use the arrow keys to select the No. 31 to No. 40 field.
3. Use the soft keys at the bottom of the screen to select the required operation.

Key	Function
Save	Save all settings to the current file.
Recall	Recall the file parameters into the system.

9 Comparator Settings

Press the **Test** or **Setup** key, then select Comparator using the soft keys at the bottom of the screen to enter the **comparator settings** page.

Figure 9-1 COMP SET Page



9.1 BEEP Settings

The beep function is valid only when the comparator function is enabled.

The beep setting allows the instrument to beep for pass results, fail results, or disable the beep.

Beep Setting Steps:

1. Enter the **TEST** page.
2. Use the arrow keys to select the **BEEP** field.
3. Use the soft keys at the bottom of the screen to select the setting.

Key	Function
OFF	Disable the beep.
PASS	The buzzer sounds when the sorting result is PASS.
FAIL	The buzzer sounds when the sorting result is FAIL.

9.2 Comparator Settings

The instrument can compare resistance and voltage simultaneously or separately.

Three comparison methods are available:

- Direct reading comparison (SEQ)
- Percentage comparison (PER)
- Absolute value comparison (ABS)

The calculation methods are as follows:

- Absolute value = Measured value – Nominal value
- Percentage = (Measured value – Nominal value) / Nominal value × 100%

Note: Direct reading comparison uses the direct measured value for comparison against the upper and lower limits of the selected range, so the nominal value is not involved in the calculation.

Comparator Setting Steps:

1. Enter the Setup page.
2. Use the arrow keys to select the Resistance Compare or Voltage Compare field.
3. Use the soft keys at the bottom of the screen to select the comparison mode.

Key	Function
OFF	Disable the comparator for the current parameter.
ABS	Switch the comparator to absolute value comparison mode.
PER	Switch the comparator to percentage comparison mode.
SEQ	Switch the comparator to direct reading comparison mode.

9.3 NOMINAL Input

For ABS and PER comparison modes, the **NOMINAL** value must be entered. In SEQ comparison mode, the **NOMINAL** value is not used in the calculation.

Entering the NOMINAL Value:

1. Enter the COMP SET page.
2. Use the arrow keys to select the resistance or voltage **NOMINAL** field.
3. Enter the data using the numeric keypad, and select the unit using the soft keys at the bottom of the screen.

9.4 LOWER and UPPER Settings

Entering the Limit Value:

1. Enter the COMP SET page.
2. Use the arrow keys to select the resistance or voltage **LOWER** field.
3. Enter the data using the numeric keypad.
 - For PER mode, select **%** using the soft keys at the bottom of the screen.
 - For ABS and SEQ modes, select the unit using the soft keys at the bottom of the screen.
4. Use the arrow keys to select the resistance or voltage **UPPER** field.

5. Enter the data using the numeric keypad in the same way as Step 3.

9.5 Comparator Beep Function

When both resistance and voltage are within the **IN** range, the overall result is judged as **PASS**. If the pass alert is enabled, the buzzer will sound. This is consistent with the Handler's PASS judgment.

When either resistance or voltage is outside the **IN** range, the overall result is judged as **FAIL**. If the fail alert is enabled, the buzzer will sound. This is consistent with the Handler's FAIL judgment.

RV Function		Voltage Assessment			
			Hi	In	Lo
Resistance Assessment			FAIL	PASS	FAIL
	Hi	FAIL	FAIL	FAIL	FAIL
	In	PASS	FAIL	PASS	FAIL
	Lo	FAIL	FAIL	FAIL	FAIL

R Function		Result
Resistance Assessment	Hi	FAIL
	In	PASS
	Lo	FAIL

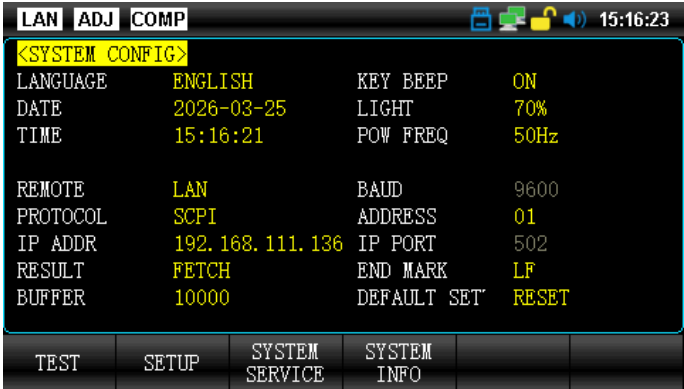
V Function		Result
Voltage Assessment	Hi	FAIL
	In	PASS
	Lo	FAIL

10 System Config

10.1 System Config Page

Press the **Test** or **Setup** key, then select **System Config** using the soft keys at the bottom of the screen to enter the **System Config** page.

Figure 10-1 SYSTEM CONFIG Page



10.1.1 LANGUAGE Page

The instrument supports two languages: Chinese and English.

Language Switching Procedures

1. Navigate to the <System Config> page.
2. Use the arrow keys to select **LANGUAGE**.
3. Select the desired language via the function keys at the bottom of the screen.

Key	Function
Chinese	Chinese
ENGLISH	English

10.1.2 Date and Time Settings

The instrument adopts a 24-hour clock format.

Date Setting Steps:

1. Navigate to the <System Config> page.
2. Use the arrow keys to select the **Date** field.
3. Set the date via the function keys at the bottom of the screen.

Key	Function
Year INCR+	+1 Year
Year DECR-	-1 Year
MONTH INCR+	+1 Month
MONTH DECR+	-1 Month

Day+	+1 Day
Day-	-1 Day

Time Setting Steps:

1. Enter the <System Config> page.
2. Use the arrow keys to select the **TIME** field.
3. Use the soft keys at the bottom of the screen to set the time.

Key	Function
HOUR INCR+	+1 Hour
HOUR DECR-	-1 Hour
MINUTE INCR+	+1 Minute
MINUTE DECR-	-1 Minute
SECOND INCR+	+1 Second
SECONDD DECR+	-1 Second

10.1.3 KEY BEEP Setting

Key Sound Setting Steps:

1. Enter the <System Config> page.
2. Use the arrow keys to select the KEY BEEP field.
3. Use the soft keys at the bottom of the screen to select the setting.

Key	Function
ON	Key tone enabled
OFF	Key tone disabled

10.1.4 LIGHT Settings

Backlight Brightness Setting Steps:

1. Enter the <System Config> page.
2. Use the arrow keys to select the LIGHT field.
3. Use the soft keys at the bottom of the screen to select the brightness level.

Key	Function
10%	
30%	
50%	
70%	Default
90%	
100%	

10.1.5 POW FREQ Selection

The measurement stability of the instrument depends on the power line frequency. Select the correct power frequency according to the local power grid frequency.

The power frequency can be set to 50 Hz or 60 Hz. Correctly setting the power frequency helps suppress external interference and improve measurement accuracy.

Power Frequency Setting Steps:

1. Enter the <System Config> page.
2. Use the arrow keys to select the POW FREQ field.
3. Use the soft keys at the bottom of the screen to select the frequency.

Key	Function
50 Hz	Set the power frequency to 50 Hz (China).
60 Hz	Set the power frequency to 60 Hz.

10.1.6 Communication Settings

Table 10-1 Communication Settings

Item	Input Range	Default	Description
REMOTE	RS232, RS485, LAN, USB	RS232	Supports four remote control interfaces: RS232, RS485, LAN, and USB.
PROTOCOL	SCPI, MODBUS	SCPI	The instrument supports two communication protocols: SCPI and Modbus RTU. SCPI is generally more convenient

			for computer communication, while Modbus is easier to use with PLCs and other industrial control equipment.
BAUD	9600, 19200, 38400, 57600, 115200	9600	Serial bus baud rate selection. Data bits: 8 Stop bit: 1 Parity: None.
ADDRESS	1- 32	1	When using the Modbus RTU protocol, set the local station address. Address 0 can be used for broadcast communication. Addresses 1-32 are used as instrument addresses when connected to the bus.
IP ADDR	192.168.030.036		It can be modified via the numeric keypad, which is used when TCP is selected as the communication mode.
IP PORT		502	Default port. Normally does not need to be modified. Used when TCP communication mode is selected.
RESUTL	FETCH, AUTO	FETCH	This function is only valid for the SCPI protocol. The instrument supports automatic data transmission to the host. Data will be sent to the host automatically upon completion of each test, without requiring the host to send the FETCH? command.
END MARK	LF(0x0A) CR(0x0D), CR+LF	LF(0x0A)	This function is only valid for the SCPI protocol. All commands communicated between the instrument and the host must end with a terminator, so that both sides can identify the end of a command.

Note: For detailed communication operation procedures, refer to **Chapter 13**

10.1.7 BUFFER

The instrument provides a data logging function and can record up to 10,000 data sets. The data can be directly saved to a USB drive as a CSV text file.

Logging Buffer Setting Steps:

1. Enter the <System Config> page.
2. Use the arrow keys to select the **BUFFER** field.
3. Use the soft keys at the bottom of the screen to select the maximum value, or directly enter the required buffer size using the numeric keypad.

10.1.8 DEFAULT SET

After executing the factory default setting, all instrument settings will be restored to the preset factory parameters.

10.2 System Info Page

Press the **Test** or **Setup** key to enter the main page. Then press the **SYSTEM CONFIG** soft key at the bottom of the screen to enter the **SYSTEM CONFIG** page, and press the **SYSTEM INFO** soft key.

The <**System**> **Info** page has no user-configurable options. It displays the instrument model, serial number, and software version.

Figure 10-2 SYSTEM INFO Page



11 Data Logging

11.1 Data Logging Function

The instrument allows measurement data to be logged. The data logging function can only run and be displayed on the <TEST> page.

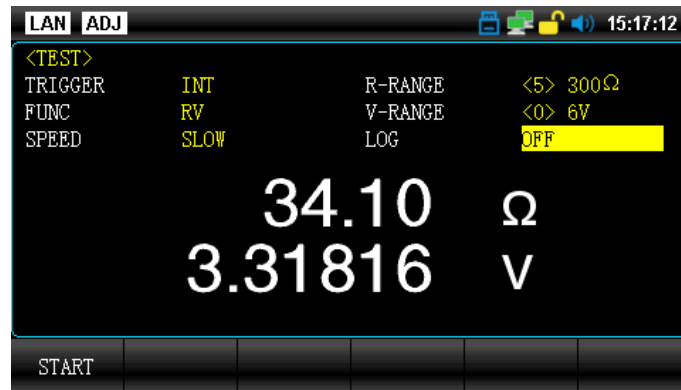
The instrument provides a data logging function and can record up to 10,000 data sets. The BUFFER size is set on the <SYSTEM CONFIG> page.

With the data logging function, measurement data can be stored in real time in the instrument buffer.

11.1.1 Starting Data Logging

After the data logging function is enabled, the logging field will be displayed on the <TEST> page.

Figure 11-1 Starting Data Logging



The methods for starting data logging are different for internal trigger and external trigger modes

1. When the trigger mode is **INT**, press the **START** soft key at the bottom of the screen to start continuous logging.
2. When the trigger mode is **EXT**
 - Press the front-panel **Trig** key to perform one logging operation.
 - Use the **HANDLER** external trigger input port to perform one logging operation.

Note: Once data logging starts, the measurement page will be locked and cannot be switched to other pages.

To switch to another page, data logging must be stopped first.

11.1.2 STOP LOG

After automatic data logging starts, users can stop logging at any time using the soft key at the bottom of the screen.

Figure 11-2 Logging

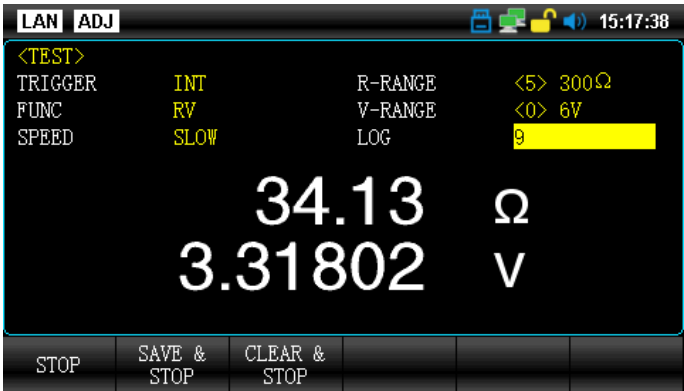
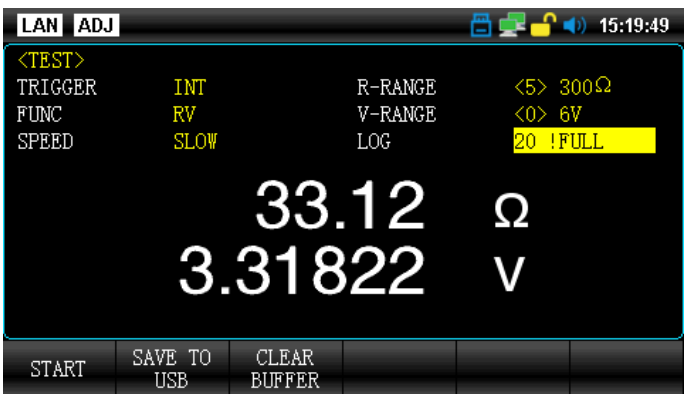


Figure 11-3 Logging Stopped or Buffer Full



11.2 Saving Logged Data to a USB Drive

After data logging is enabled, the data can be saved to a USB drive at any time.

Figure 11-4 Data Folder on USB Drive



The saved file is a **CSV** text file. In the Windows operating system, open the file with **Excel**.

Figure 11-5 Opening the **Log File** with Excel

MEAS DATA		
FILE	MEAS0001.csv	
MODEL	UT3563+	REV A1.6
TIME	2026/3/18 13:37	
FUNC	RV	
NO.	AC-R(OHM)	DC-V(V)
1	3.5146e+01	3.32E+00
2	3.5105e+01	3.32E+00
3	3.5064e+01	3.32E+00
4	3.5023e+01	3.32E+00
5	3.4944e+01	3.32E+00
6	3.4865e+01	3.32E+00
7	3.4783e+01	3.32E+00

Due to Excel's default formatting, the cell properties must be modified correctly to display the data properly

The time field 7B must be changed to the following format:

- Select the resistance field and set the cell format to: **Scientific notation, 4 decimal places**
- Select the voltage field and set the cell format to: **Scientific notation, 5 decimal places**

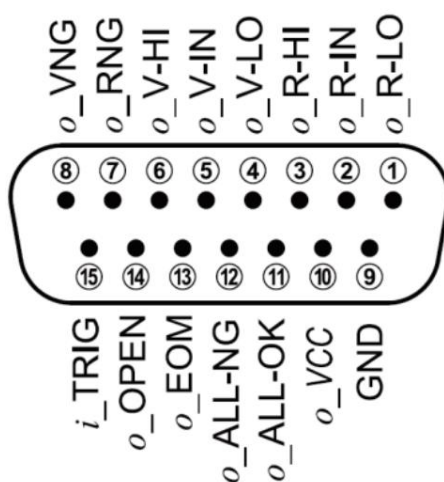
MEAS DATA		
FILE	MEAS0001.csv	
MODEL	UT3563+	REV A1.6
TIME	2026/3/18 13:37	
FUNC	RV	
NO.	AC-R(OHM)	DC-V(V)
1	3.5146e+01	3.31910E+00
2	3.5105e+01	3.31910E+00
3	3.5064e+01	3.31910E+00
4	3.5023e+01	3.31910E+00
5	3.4944e+01	3.31910E+00
6	3.4865e+01	3.31900E+00
7	3.4783e+01	3.31900E+00
8	3.4702e+01	3.31900E+00

12 Handler Interface

The instrument provides users with a fully functional Handler interface. This interface includes sorting outputs such as **PASS**, **HI/IN/LO**, **EOM** (end-of-measurement signal), and **TRIG** external trigger input. Through this interface, the instrument can easily work with the user's system control components to implement automatic control functions.

12.1 Terminals and Signals

Figure 12-1 Terminals



Output Terminals: All output signals are active-low

Table 12-1 Output Pin Definitions

Pin	Name	Description
1	o_RLO	0:RLO
2	o_RIN	0:RIN
3	o_RHI	0:RHI
4	o_VLO	0:VLO
5	o_VIN	0:VIN
6	o_VHI	0:VHI
7	o_RNG	0:RNG
8	o_VNG	0:VNG
11	o_ALLOK	0:RV-ALL OK (Overall PASS output)
12	o_ALLNG	0:RV-ALL NG (Overall FAIL output)

13	o_EOM	1:ON MEASING 0:READY
14	o_OPEN	0:OPEN (Lead-off detection)

Table 12-2 Input Pin Definitions

Pin	Name	Description
15	i_TRIG	Trigger input terminal, active on rising edge.

Table 12-3 Pin Definition of Power Terminals

Pin	Name	Description
9	GND	Power GND
10	o_VCC	Internal VCC positive power terminal (5V, 500mA)

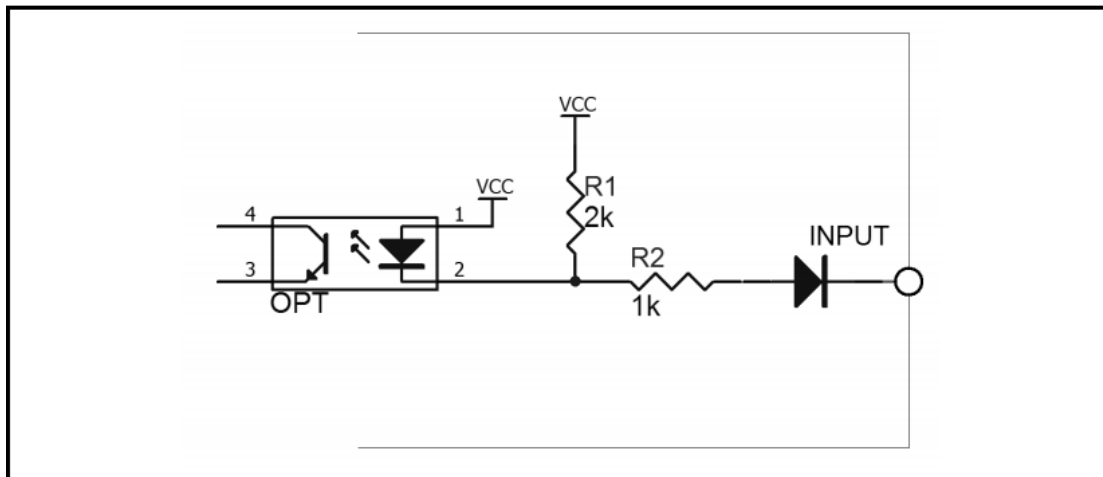
1. Pin 10 is the output terminal of the isolated internal power supply o_VCC.
2. Warning: Keep Pin 10 unconnected when normally connecting to a PLC.
3. The internal power supply has limited power rating (5 V, 0.5 A, max 2.5 W). Do not use the internal power supply in scenarios with unknown or uncertain power requirements; otherwise, the instrument will fail to operate properly.

12.2 Connection Method

- Power Supply: The instrument provides a built-in, fully isolated power supply. No external power supply is required; however, the external system must share the same ground (GND).
GND: Pin 9 (P9)
- Output Signals: Optocoupler-isolated outputs with a driver IC; open-collector (open-drain) outputs.
Maximum load voltage: 30 V. Recommended: 24 V.
Maximum output current: 50 mA.
Note: When verifying output logic levels using an oscilloscope or multimeter, pull up the output signal to the power supply through a resistor (typically several kΩ) before measuring.
- Input Signal: Opto-isolated input; active at low level.

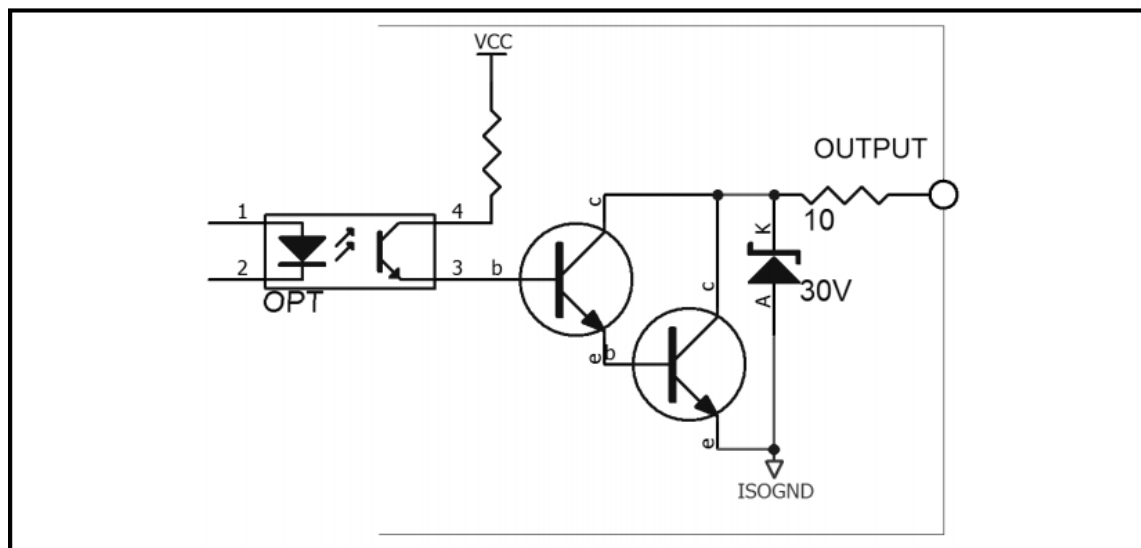
Input Circuit Schematic

Figure 12-2 Input Circuit Schematic



Output Circuit Schematic

Figure 12-3 Output Circuit Schematic



Input Circuit Connection

Figure 12-4 Connection to a Switch

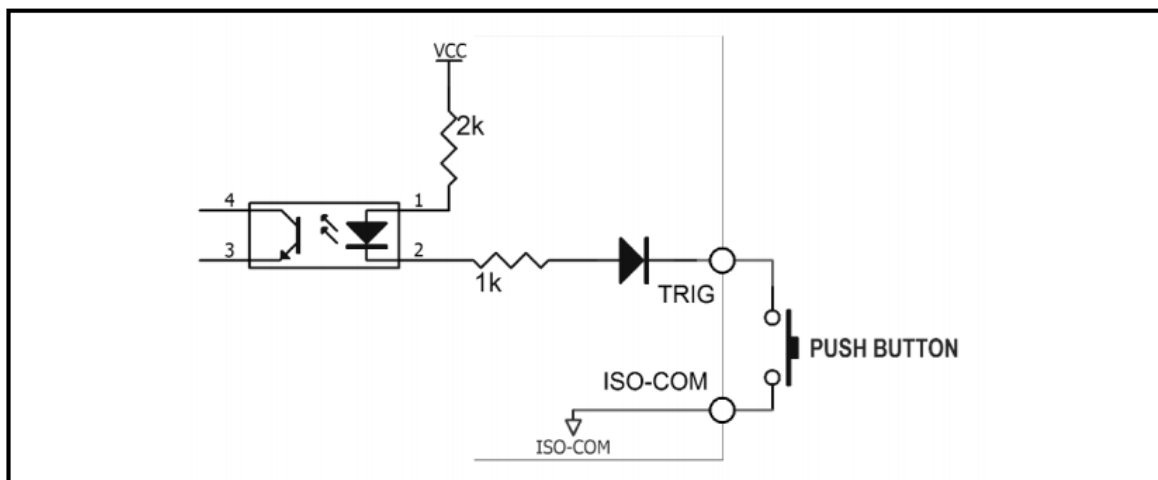


Figure 12-5 Relay Control

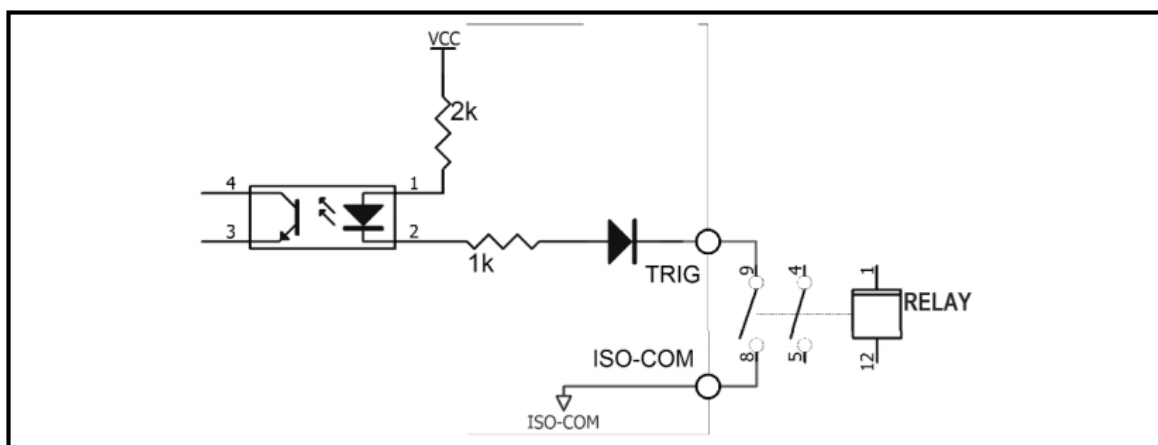
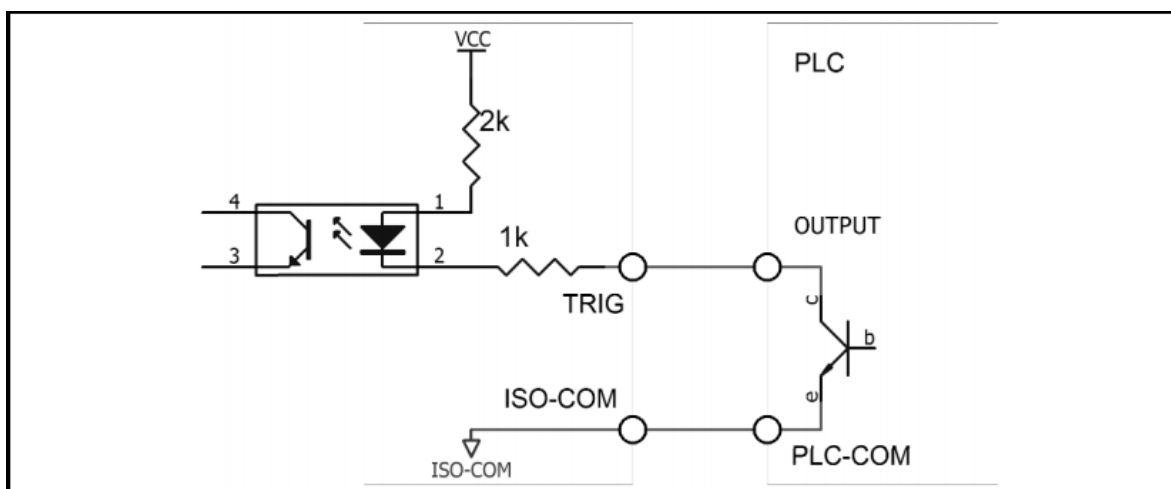
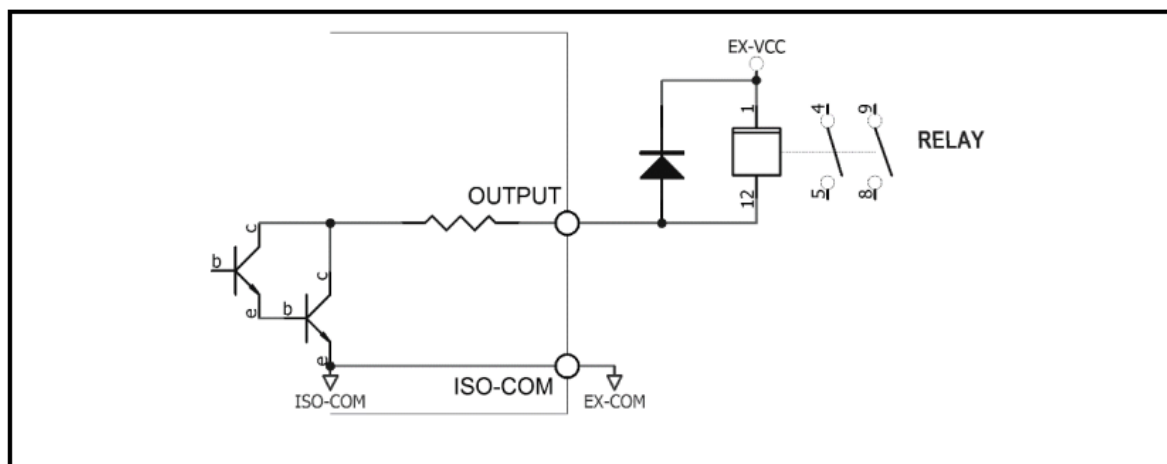


Figure 12-6 PLC Control (Negative Common Terminal)



Output Circuit Connection

Figure 12-6 Relay Drive



Warning: EX-VCC must not exceed 30 V

Figure 12-7 Driving an LED or Optocoupler

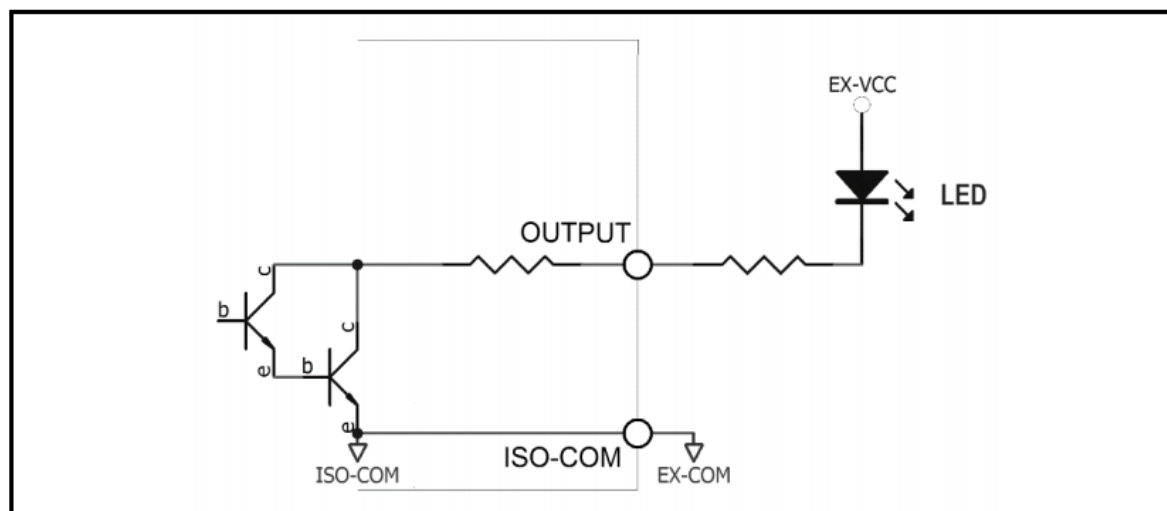


Figure 12-8 Negative Logic Output

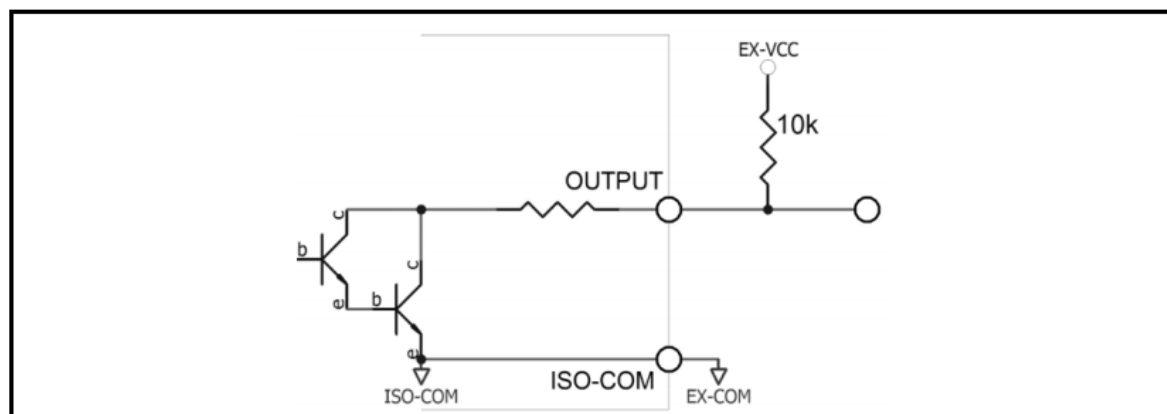


Figure 12-10 Two-Port OR Logic Circuit

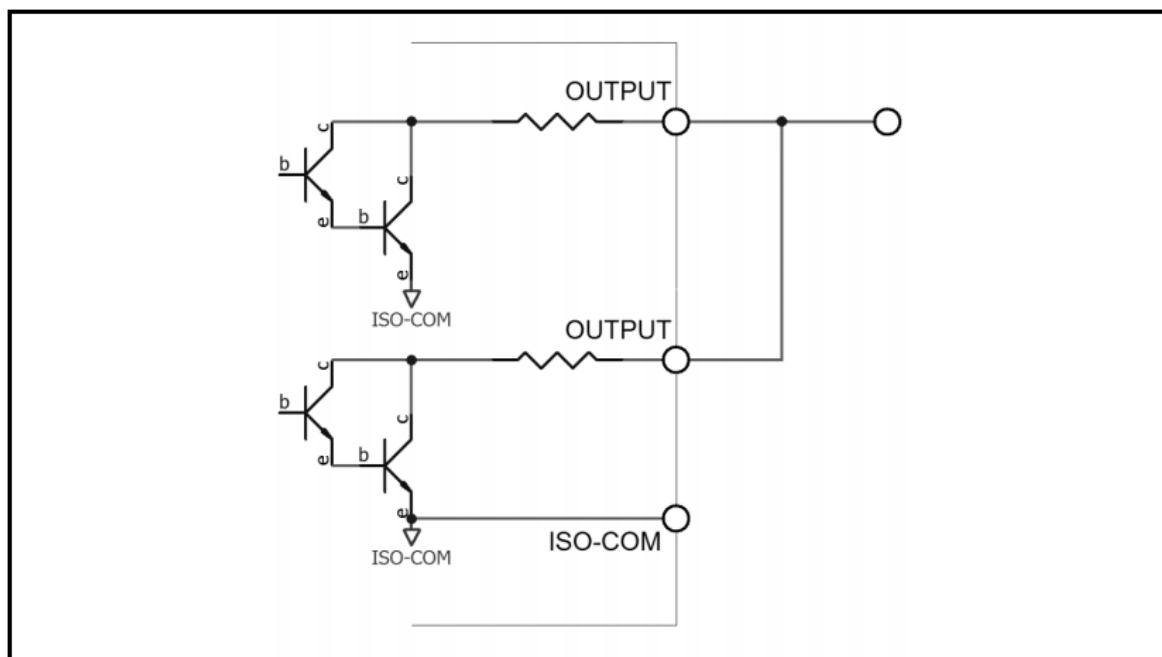
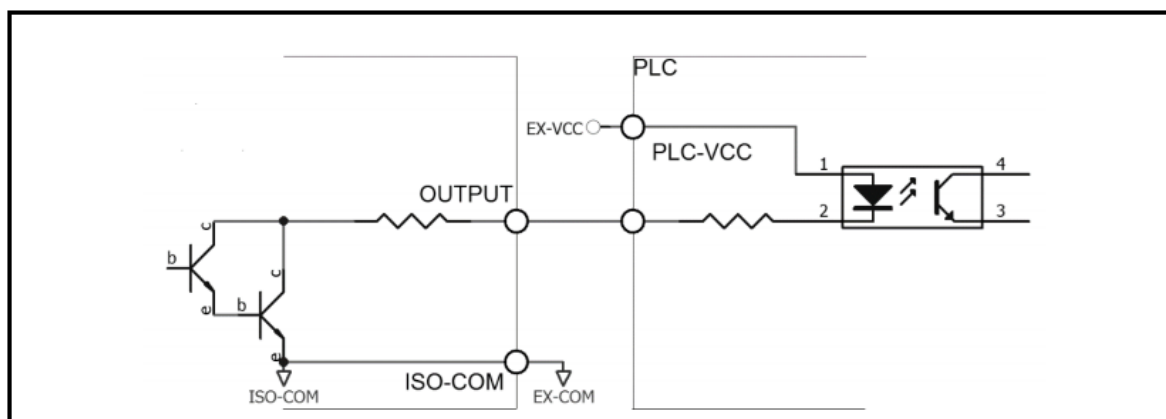


Figure 12-11 Output to PLC Negative Common Terminal



12.3 Timing Diagram

Figure 12-9 Handler Control Timing Diagram

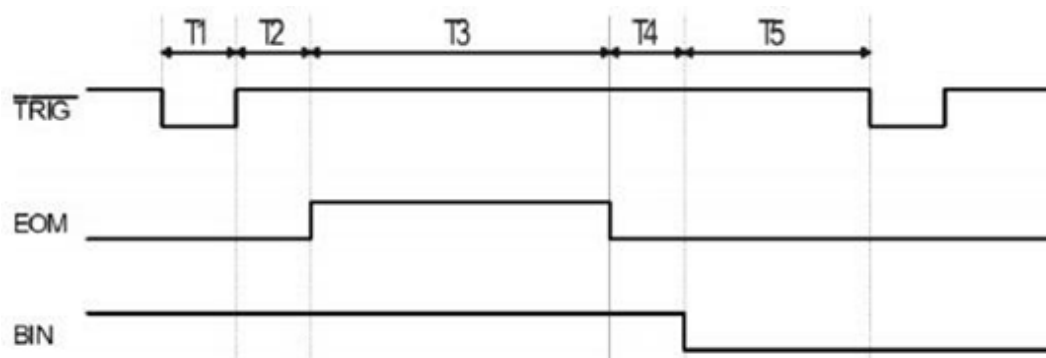


Table 12-4 Timing Parameters

Description			Minimum
T1	Trigger pulse width		1 ms
T2	Measurement cycle	Trigger delay	< 10 μ s
T3		Measurement time	Depends on settings
T4		BIN output delay	200 μ s
T5	Wait time after trigger		0 s

13 Remote Communication

The instrument features built-in RS-232C, RS-485, USB, and LAN interfaces, and supports two command sets (SCPI and Modbus-RTU), enabling efficient remote control and data acquisition.

13.1 RS-232C Interface

13.1.1 Introduction

RS-232 is a widely used serial communication standard, also known as an asynchronous serial communication standard. It is used for data communication between computers and between computers and peripherals.

RS stands for "Recommended Standard", and "232" is the standard number. The standard was officially released by the Electronic Industries Association (EIA) in 1969.

In practice, many serial ports are not strictly implemented according to RS-232, and 25-pin connectors were historically used (most modern computers use 9-pin connectors). Common RS-232 signals are listed below.

Table 13-1 Common RS-232 Signals

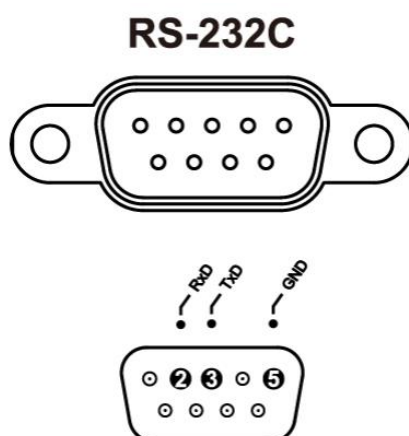
Signal	Symbol	25-pin	9-pin
Request to send	RTS	4	7
Clear to send	CTS	5	8
Data set ready	DSR	6	6
Data carrier detect	DCD	8	1
Data terminal ready	DTR	20	4
Transmit data	TXD	2	3
Receive data	RXD	3	2
Ground	GND	7	5
Request to send	RTS	4	7

Table 13-2 Minimum Subset of RS-232

Signal	Symbol	9-pin
Transmit data	TXD	2
Receive data	RXD	3
Ground	GND	5

13.1.2 RS-232 Connection Settings

Figure 13-1 RS-232 Connector on the Rear Panel



To prevent electrical shock, turn off the instrument power before plugging or unplugging the connector.

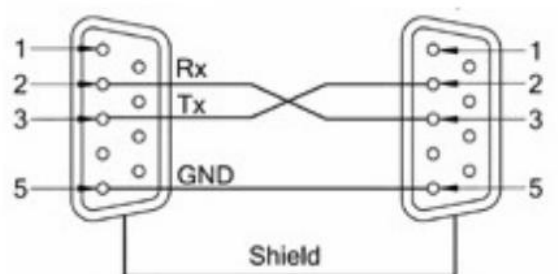
Default communication settings:

- Transmission: full-duplex asynchronous communication with start and stop bits
- Interface selection: Select RS232 under **Communication Mode** on the <System Config> page

- Baud rate: Set under **Baud Rate** on the <System Config> page
- Data bits: 8
- Stop bits: 1
- Parity: None

13.1.3 RS-232 Connection Method

Figure 13-2 RS-232 Cable Requirements



The RS-232 serial interface can be connected to a controller (e.g., a PC or industrial computer) using a DB-9 cable with pins 2 and 3 crossed.

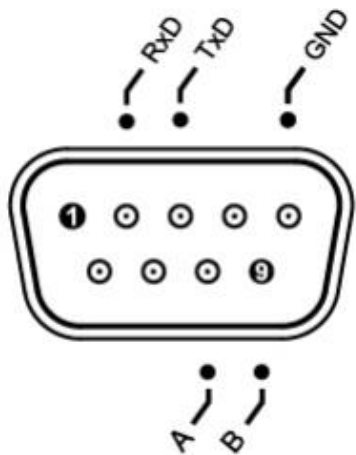
13.2 RS485 Interface

RS-485 is a communication interface that supports multi-drop networking, allowing one master to be connected to multiple slave devices.

The instrument is equipped with an RS-485 interface as standard and also supports the Modbus RTU protocol.

The RS-485 and RS-232 interfaces share the same DB-9 connector.

Figure 13-3 Connector on the Rear Panel



- The instrument address can be set from 1 to 32 on the <System Config> page. Each slave device on the same bus must use a unique address.
- For multi-device RS-485 wiring, a daisy-chain topology is recommended. Use twisted-pair shielded cable for signal wiring.

13.3 USB Interface

Many newer computers and laptops no longer include an RS-232 port, so USB communication may be used instead.

USB connection steps

Step 1	Connect the USB cable between the computer and the instrument. 
Step 2	On the System Config page, select USB under Communication Mode .

13.4 LAN Interface

- The instrument features a built-in 10/100 **Mbps Ethernet** interface and communicates with the host

using the **TCP-Client** protocol.

- Users can establish communication by connecting the instrument to a computer or router using an Ethernet cable.
- Both **SCPI** and **Modbus** commands can be used over the LAN interface.

Figure 13-4 LAN Connector on the Rear Panel



LAN connector LED

Green LED: ON-connected Blinking-communicating

Orange LED: OFF-10M BASE-T ON-100M BASE-TX

13.4.1 Select LAN Communication Mode



Move the cursor to the **Communication Mode** field and select LAN using the function keys at the bottom of the screen.

13.4.2 Set IP Address



- Move the cursor to the **IP Address** field and select input using the function keys.
- An input dialog will appear. Enter the IP address using the numeric keypad, or the knob and **LEFT/RIGHT** arrow keys.
- Press **Enter** to confirm. Press **Esc** to cancel.

13.4.3 Port Number

For LAN communication, the default port is 502. No configuration is required.

13.4.4 Communication Test with Network Debug Assistant

To test communication using the SCPI protocol, configure the host as follows:

1. Protocol type: TCP-Client
2. Remote host address: the host PC IP address (e.g., 192.168.111.136)
3. Remote host port: 502 (fixed)
4. Send/Receive format: ASCII

13.5 Communication Protocols

The instrument supports two communication protocols: SCPI and Modbus (RTU).

- **SCPI:** SCPI commands are transmitted as ASCII strings via the physical transport layer to the instrument. A command consists of keywords, and may include parameters. Commands are specified in the format such as: CONFIGure. In operation, you may send either the full command name or an abbreviated form that includes only the capital letters. Query responses from the instrument are also returned in ASCII. In

practical use (e.g., for PLC applications), users can convert commands to HEX bytes and transmit them byte-by-byte.

- **Modbus (RTU):** Modbus is a common industrial fieldbus protocol and a universal language used on electronic controllers. It is widely used as a communication standard for PLCs, HMIs, and other industrial control equipment.

14. Appendix

14.1 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:

- Please use a soft cloth to wipe the dust outside the instrument.
- When cleaning the LCD screen, please pay attention and protect the transparent LCD screen.
- 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.
- 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.

Warning: Please confirm that the instrument is completely dry before use, to avoid electrical shorts or even personal injury caused by moisture.

14.2 Limited Warranty and Liability

UNI-T guarantees that the Instrument product is free from any defect in material and workmanship within three years from the purchase date. This warranty does not apply to damages caused by accident, negligence, misuse, modification, contamination, or improper handling. If you need a warranty service within the warranty period, please contact your seller directly. UNI-T will not be responsible for any special, indirect, incidental, or subsequent damage or loss caused by using this device. For the probes and accessories, the warranty period is one year. Visit instrument.uni-trend.com for full warranty information.



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