Operation Manual

TH2554 Data Acquisition/Multimeter System

V1.0.1@202406

DISCLAIMER: The Company may make improvements and enhancements to the performance, functions, software, structure, appearance, accessories, packaging, and manuals of this product without notice! If this causes doubt, please contact our company.

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Chapter 1 Instrument Overview

Thank you for purchasing and using our products. Before using the product, please review the items in the last chapter of the manual, "Package and Warranty". If there is any discrepancy, please contact us as soon as possible to protect your rights.

1.1 Introductory

TH2554 is a high-precision, high-stability, multi-channel data collector. Five module slots are built into the rear of the instrument, allowing any combination of data acquisition or switching modules. The instrument has both data logging and data acquisition capabilities, making it a versatile solution for your current and future test needs.

Measurement range:

DC voltage: 0.1μV to 300V

AC voltage: 0.1μV to 300V

DC current: 10pA to 3A

AC current: 1nA to 3A

Two-wire and four-wire resistance measurement: 0.01mΩ to 120MΩ

Frequency: 2Hz to 1MHz

Programming Language and Control Interfaces: The machine provides the SCPI programming control language and three control interfaces for your use: USB Device, RS-232C, LAN, IEEE-488/GPIB (optional), and Handler (optional).

Complete calibration: The unit can be calibrated from the front panel or remote-control interface.

Convenient data logging function:

6½ digit DMM, any slot can be plugged and unplugged, supports DCV, DCI, ACV, ACI, 2WR, 4WR, period, frequency, temperature (thermocouple, thermistor and RTD).

Interval scan function. Can store up to 100,000 readings with time stamps

Supports up to 160 switching channels on a single unit at a very low cost per channel.

Independent channel configuration. Can configure independent functions, Mx+B calibration and alarm limits for each channel

Intuitive user interface. Use the rotary knob to quickly select channels from the front panel, navigate menus and enter data

Portable and durable case with non-slip feet

1.2 General Conditions

1.2.1 Power Supply

Supply voltage: 90V to 264V

Power frequency: 50Hz/60Hz (1 ±5%)

Power consumption: <250VA

1.2.2 Environmental Temperature and Humidity

Normal operating temperature: 0℃~ 40℃, humidity ≤ 90%RH

1.2.3 Volume and Weight

Dimension of whole machine(W*H*D):

Weight:

1.2.4 Notes

Do not use the instrument in a dusty, vibrating, direct sunlight, or corrosive gas environment.

If the instrument is not to be used for an extended period of time, please store it in its original or similar packaging in a well-ventilated room. The air should not contain harmful impurities that may corrode the instrument, and direct sunlight should be avoided.

This instrument should be used in an environment with as little noise as possible. If this is unavoidable, please install a mains filter.

Please ensure that the instrument is well ventilated, with forced ventilation, with air intake at the side of the instrument and exhaust at the rear, to prevent the internal temperature from rising and affecting accuracy.

Please do not turn the instrument on and off frequently, as this may cause loss of stored data.

1.3 Safety Requirement

The meter is a Class I safety instrument.

It meets the safety requirements of Directive 2006/95/EC

EN 61010-1:2010+A1:2019 Safety requirements for electrical equipment for measurement, control and laboratory use.

Insulation Resistance:

Under reference operating conditions, the insulation resistance between the power terminal and the case shall be not less than 50MΩ.

Under hot and humid conditions during transportation, the insulation resistance between the power terminal and the case shall be not less than 2MΩ.

Dielectric Strength:

Under reference operating conditions, the power terminal and housing shall withstand an AC voltage of 1.5kV at a frequency of 50Hz for 1 minute. There shall be no breakdown or arcing.

Leakage Current:

The leakage current shall not exceed 3.5mA (AC RMS).

1.4 Electromagnetic Compatibility

Electromagnetic Compatibility Requirements

Compliance with Electromagnetic Compatibility Directive 2004/108/EC

EN 61326-1:2021 Electromagnetic compatibility requirements for electrical equipment for measurement, control and laboratory use

CISPR 11:2015+A1:2016+A2:2019 Radioactive and conducted radiation levels, group 1, category A

EN 61000-4-2:2009 Electrostatic discharge immunity

EN 61000-4-3:2020 Radiated, radio frequency, electromagnetic field immunity

EN 61000-4-4:2012 Electrical fast transient/burst immunity

EN 61000-4-5:2014+A1:2017 Power line surge immunity

EN 61000-4-6:2014 Conducted RF immunity

EN 61000-4-11:2020 Voltage dips and interruptions immunity

EN 61000-3-2:2019+A1:2021 Harmonic emissions for AC power lines l

EN 61000-3-3:2013+A1:2019+A2:2021 Voltage variations, dips and flicker

Chapter 2 Panel Overview

The contents of this chapter are general descriptions only. For specific operations and detailed explanations, refer to the corresponding functional contents in Chapter 3.

2.1 Front Panel Description

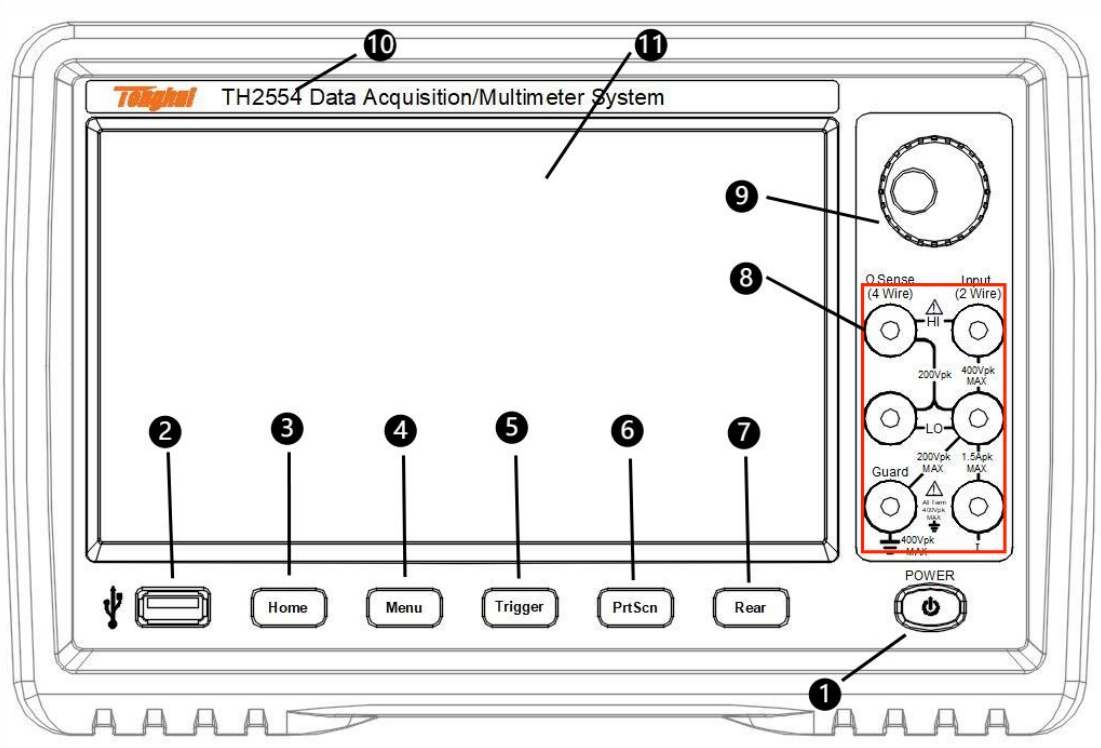


Figure 2-1 Front Panel Diagram

Power switch: Turns the unit on or off. To turn it on, press and hold the power switch. To turn it off, press and hold the power switch again. The LED is green when the instrument is on and red when it is off.

USB port: To connect a USB memory stick. Disconnect the USB memory stick, wait for 10 seconds, then reconnect it or connect a new memory stick.

Home key: Returns the display to the HOME screen.

Menu key: Opens the Main Menu. Pressing icons in the main menu opens the Channels, Measurements, Views, Triggers, Scripts, and System screens.

Trigger key: Accesses trigger-related settings and operations. The function of the trigger button depends on the state of the instrument.

PrtScn (Screenshot) key: If a USB flash drive is connected to the instrument, pressing this button will save the current screen contents to the USB flash drive in *.bmp format.

Rear (Toggle) key: Toggles the display between showing the settings for the front or rear bay module.

Measurement terminals: High Force, Low Force, High Sense, Low Sense, Guard, and Chassis Ground.

***CAUTION:** Do not connect the Guard terminal to any output, including the common circuit, chassis ground, or other protective terminal, as this will damage the instrument. Do not apply a load to the chassis ground terminal. Doing so will damage the unit.

Knob: The scroll wheel provides quick access to the channel control section (see 3.2.2 for details).

Nameplate: Identifies the unit model.

Touchscreen: Provides access to the sliding screen and menu options.

2.2 Rear Panel Description

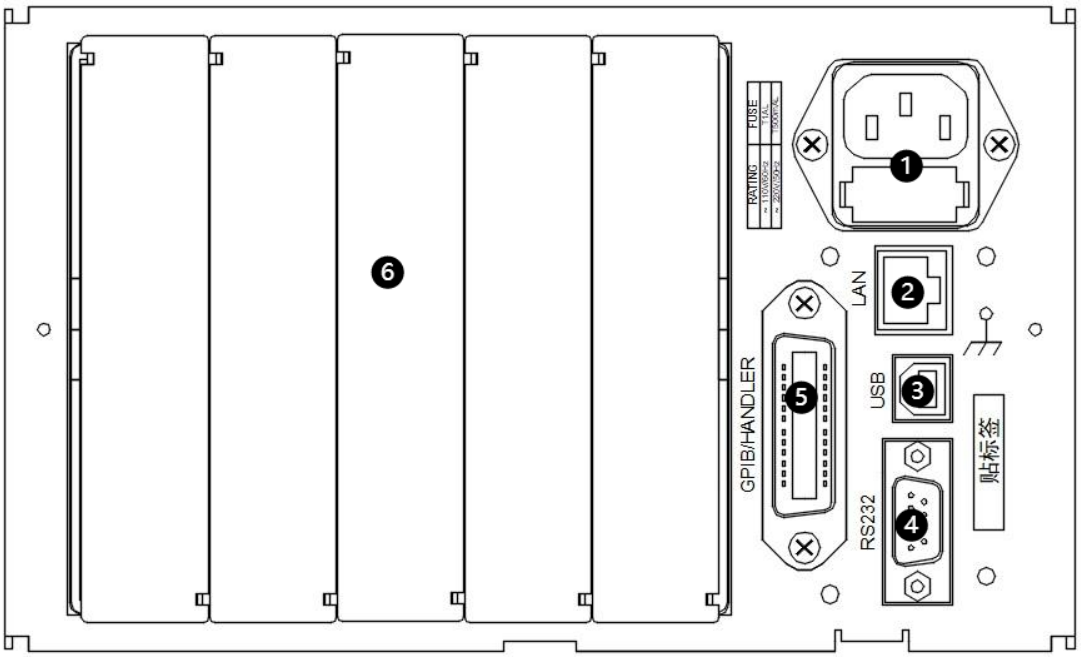


Figure 2-2 Rear Panel Diagram

Power socket and fuse: The unit is connected to AC power through the power socket. The power supply is ~110V/60Hz and the fuse is T1AL; or the power supply is ~220V/50Hz and the fuse is T500mAL.

Fuse replacement steps:

Turn off the main power switch and unplug the power cord.

Use a screwdriver to remove the fuse cover, then remove the fuse cap and fuse.

Replace the fuse with one of the appropriate specifications, replace the fuse cap, and replace the fuse cover.

***Note:** To avoid the risk of electric shock or fire, please use the specified fuse.

LAN interface connector: Connects to a 10/100Base-T interface. The left LED indicates activity, and the right LED indicates link integrity.

USB port: Connects to a USB memory stick.

RS232 port: Provides a universal communication interface between the unit and external devices.

All parameter settings, commands, etc. can be set up and retrieved from the computer for remote control without the instrument panel.

Handler connector: DSUB 25-pin female connector for general purpose I/O. It can be used for functions such as data input/output and trigger input/output terminals.

Five slots are provided, and any five modules can be inserted. When a module is inserted into a slot, the position number of the corresponding inserted slot is displayed on the front panel setting page.

2.3 Plug-in Module Overview

TH2554-DMM:

The DMM module is used to measure the signal under the test. It has a reading resolution of 6½ digits. Measurement functions include DC voltage, AC voltage, DC current, AC current, 2-wire resistance, 4-wire resistance, frequency, period, temperature, and any sensor.

※Note: After connecting the DMM module, make sure that the signal under test connected to the analog bus does not exceed 300 Vdc or 300 Vrms.

TH2554-01

20-channel multiplexer. All 20 channels can switch between HI and LO inputs, providing fully isolated signals to the DMM module. The TH2554-01 is divided into two rows (referred to as A and B) of 10 two-wire channels each. When performing 4-wire resistance measurements, the channels in rows A and B are automatically paired. All channels added to the scan list are break-before-made. If no channel has been added to the scan list, multiple channels can be closed. Voltage is tested up to 60V, current is not tested.

TH2554-02

40-channel single-ended multiplexer. The module is divided into two groups of 20 channels each. All 40 channels switch HI only and provide a common LO for the module. The module has a built-in thermocouple reference connection that minimizes errors due to thermal gradients when measuring thermocouples. Voltage testing is up to 300V, and current testing is up to 1A. The test port has a common connection and can be 1 to many. Scanning speed is up to 90 channels/second.

2.4 Power-on Inspection

Plug in the three-prong power cord. Note: The supply voltage, frequency and other conditions should be in accordance with the above regulations. The phase wire L, neutral wire N and ground wire E of the power input should be the same as the phase wire, neutral wire and ground wire of the power plug of this unit.

Press the power switch on the front panel. The instrument will start up. After the unit has powered up, it will detect the module. Depending on the number of modules you have inserted, this process may take a few seconds to ten seconds. The instrument will not allow the user to operate during the detection process.

If the instrument does not start normally, please check as follows:

Check that the power cord is properly connected.

Check that the power switch on the front panel is turned on.

Unplug the power cord and check that the power input fuse is intact. If it has blown, replace the fuse as necessary.

After completing the above checks, restart the instrument; if the fault persists, please contact us.

Chapter 3 Specification Features

Technical Description

Technical indicator assumptions

One year calibration cycle.

Calibration temperature T_{CAL} = 23℃.

Calibrate after 60 minutes of preheat.

Accuracy specification: ±(% reading + % range) [1].

3.1 DC Voltage Specifications

Range	Resolution [4]	24 hours [3] T_{CAL} ± 1°C	90 days T_{CAL} ± 5°C	1 year T_{CAL} ± 5°C	Temperature Coefficient/°C [2]
100.0000mV [5]	0.1μV	0.0030 + 0.0030	0.0040 + 0.0035	0.0050 + 0.0035	0.0005 + 0.0005
1.000000V	1μV	0.0020 + 0.0006	0.0030 + 0.0007	0.0040 + 0.0007	0.0005 + 0.0001
10.00000V	10μV	0.0015 + 0.0004	0.0020 + 0.0005	0.0035 + 0.0005	0.0005 + 0.0001
100.0000V	100μV	0.0020 + 0.0006	0.0035 + 0.0006	0.0045 + 0.0006	0.0005 + 0.0001
300.000V [6]	1mV	0.0020 + 0.0006	0.0035 + 0.0010	0.0045 + 0.0010	0.0005 + 0.0001

3.2 DC Current Specifications

Range	Internal Resistance Voltage Drop	Minimum Resolution	24 hours T_{CAL} ± 1°C	90 days T_{CAL} ± 5°C	1 year T_{CAL} ± 5°C	Temperature Coefficient/°C
100uA	< 0.011V	0.1nA	0.010 + 0.006	0.040 + 0.006	0.050 + 0.006	0.0020 + 0.0005
1mA	< 0.011V	1nA	0.007 + 0.006	0.030 + 0.006	0.050 + 0.006	0.0020 + 0.0005
10mA	< 0.05V	10nA	0.007 + 0.006	0.030 + 0.006	0.050 + 0.006	0.0020 + 0.0005
100mA	< 0.5V	100nA	0.010 + 0.004	0.030 + 0.005	0.050 + 0.005	0.0020 + 0.0005
1A	< 0.7V	1μA	0.050 + 0.006	0.080 + 0.010	0.100 + 0.010	0.0050 + 0.0010
3A	< 2.0V	1μA	0.180 + 0.020	0.200 + 0.020	0.200 + 0.020	0.0050 + 0.0020

3.3 DC Resistance Specifications [7] [8]

Range	Test Current	Resolution	24 hours T_{CAL} ± 1°C	90 days T_{CAL} ± 5°C	1 year T_{CAL} ± 5°C	Temperature Coefficient/°C
10.00000Ω	10mA	10uΩ	0.0050 + 0.0040	0.0100 + 0.0060	0.0120 + 0.0080	0.0008 + 0.0005
100.0000 Ω	10mA	0.1mΩ	0.0030 + 0.0020	0.0080 + 0.0030	0.0100 + 0.0040	0.0006 + 0.0005
1.000000kΩ	1mA	1mΩ	0.0020 + 0.0005	0.0080 + 0.0010	0.0100 + 0.0010	0.0006 + 0.0001
10.00000kΩ	100μA	10mΩ	0.0020 + 0.0005	0.0080 + 0.0010	0.0100 + 0.0010	0.0006 + 0.0001
100.0000kΩ	10μA	100mΩ	0.0020 + 0.0005	0.0080 + 0.0010	0.0100 + 0.0010	0.0006 + 0.0001
1.000000MΩ	5μA	1Ω	0.0020 + 0.0010	0.0080 + 0.0010	0.0100 + 0.0010	0.0010+ 0.0002
10.00000MΩ	500nA	10Ω	0.0150 + 0.0010	0.0200 + 0.0010	0.0400 + 0.0010	0.0030+ 0.0004
100.0000MΩ	500nA //10M	100Ω	0. 3000 + 0.0100	0.8000 + 0.0100	0.8000 + 0.0100	0.1500 + 0.0002

3.4 Continuity (Conductivity) Test Specifications

Function	Range	Test Current	24 hours TCAL ±1℃	90 days TCAL ±5℃	1 year TCAL ±5℃	Temperature Coefficient/℃
Contiguity	1kΩ	1mA	0.002 + 0.030	0.008 + 0.030	0.010 + 0.030	0.0010 + 0.0020

3.5 Diode Test Specifications

Function	Range	Test Current	24 hours T_{CAL} ± 1°C	90 days T_{CAL} ± 5°C	1 year T_{CAL} ± 5°C	Temperature Coefficient/°C
Diode [12]	5V	1mA	0.002 + 0.030	0.008 + 0.030	0.010 + 0.030	0.0010 + 0.0020

3.6 Temperature Test Specifications

Temperature	
TH1953/TH1963/A	
PT100 (DIN/ IEC 751)	Probe Accuracy + 0.05°C
5 kΩ thermistor	Probe Accuracy + 0.10°C

3.7 Capacitance Test Count Indicator

Range	24 hours TCAL ± 1°C	90 days TCAL ± 5°C	1 year TCAL ± 5°C	Temperature Coefficient/°C
1.0000nF	0.5 + 0.10	0.5 + 0.40	1.0 + 0.50	0.02 + 0.001
10.000nF	0.2 +0.05	0.5 + 0.10	0.5 + 0.10	0.02 + 0.001
100.00nF	0.2 + 0.05	0.5 + 0.10	0.5 + 0.10	0.02 + 0.001
1.0000µF	0.2 + 0.05	0.5 + 0.05	0.5 + 0.10	0.02 + 0.001
10.000µF	0.2 + 0.05	0.5 + 0.05	0.5 + 0.10	0.02 + 0.001
100.00µF	0.2 + 0.05	0.5 + 0.05	0.5 + 0.10	0.02 + 0.001
1.0000mF	0.2 + 0.05	0.5 + 0.05	0.5 + 0.10	0.02 + 0.001
10.000mF	0.5 + 0.20	0.5 + 0.30	1.0 + 0.50	0.02 + 0.001

3.8 AC Voltage Test Specifications [6] [9] [10]

Frequency/Range	24 hours TCAL ± 1°C	90 days TCAL ± 5°C	1 year TCAL ± 5°C	Temperature Coefficient/°C
3 Hz - 5 Hz	1.00 + 0.02	1.00 + 0.02	1.00 + 0.03	1.00 + 0.03
5 Hz - 10 Hz	0.35 + 0.02	0.35 + 0.03	0.35 + 0.03	0.35 + 0.03
10Hz - 20kHz	0.04 + 0.02	0.05 + 0.03	0.06 + 0.03	0.05 + 0.03
20kHz - 50kHz	0.10 + 0.04	0.11 + 0.05	0.12 + 0.05	0.11 + 0.05
50kHz - 100kHz	0.55 + 0.08	0.60 + 0.08	0.60 + 0.08	0.60 + 0.08
100kHz - 300kHz	4.00 + 0.50	4.00 + 0.50	4.00 + 0.50	0.200 + 0.020

3.9 AC Current Specifications [6] [10] [11]

Frequency/Range		24 hours TCAL ±1℃	90 days TCAL ±5℃	1 year TCAL ±5℃	Temperature Coefficient/℃
Range	Pressure Drop				
10µA, 100µA, 1mA, 10mA and	< 0.011V, < 0.11V, < 0.05V,				

100mA	< 0.5V				
3Hz - 5kHz		0.10 + 0.04	0.10 + 0.04	0.10 + 0.04	0.015 + 0.006
5kHz - 10kHz		0.10 + 0.04	0.10 + 0.04	0.10 + 0.04	0.030 + 0.006
1A range	<0.7V				
3Hz - 5kHz		0.10 + 0.04	0.10 + 0.04	0.10 + 0.04	0.015 + 0.006
5kHz - 10kHz		0.10 + 0.04	0.10 + 0.04	0.10 + 0.04	0.030 + 0.006
3A range	<2.0V				
3Hz - 5kHz		0.23 + 0.04	0.23 + 0.04	0.23 + 0.04	0.015 + 0.006
5kHz - 10kHz		0.23 + 0.04	0.23 + 0.04	0.23 + 0.04	0.030 + 0.006

[1]. For DC: Specifications valid after 60 minutes warm up, integration time set to 10 or 100 NPLC, auto-zero enabled. For AC: Specifications valid after 60 minute warm up, slow AC filtering, sine wave.

[2]. Outside TCAL ±5 ℃ range, each 1 ℃ change in temperature increases the factor by 1.

[3]. With respect to calibration standards.

[4]. The smallest change in data that can be displayed.

[5]. Full scale accuracy. For better accuracy, a NULL (zero) operation is required.

[6]. 1000 V DC, 750 V AC, 3 A AC and 3 A DC can only be tested at 5% of overrange.

[7]. When measuring resistance, it is best to use a shielded cable for resistance values greater than 100kΩ. This is because cutting the magnetic field generates induced current, and the test current for large resistances is relatively small, resulting in a low signal-to-noise ratio and thus unstable measurements.

[8]. The specifications apply to 4-wire or 2-wire (operational offset clearing) resistance measurements. If clearing does not begin, 2-wire resistance measurements will have an additional error of 0.2Ω.

[9]. Specifications valid for sine wave inputs > 0.3% of range and > 1 mVrms. 750-ACV range limited to 8 x Volt-Hz.

[10]. Low frequency performance: Three filter settings are provided: 3 Hz, 20 Hz, 200 Hz. No additional error is introduced beyond the frequency of the filter setting.

[11]. Specifications valid for sine wave input >1% of range and >10μA AC. 10A range available on front connector only.

[12]. Specifications apply to voltage measured at input. 1mA test current is typical. Variations in the current source will change the voltage drop across the diode junction.

Chapter 4 Basic Measurement Operations

This section provides the main operating menus of the TH2554 and is intended to help the user quickly understand how to operate the TH2554. Click the drop-down box icon on the touchscreen as shown in the figure below to select the appropriate user menu.

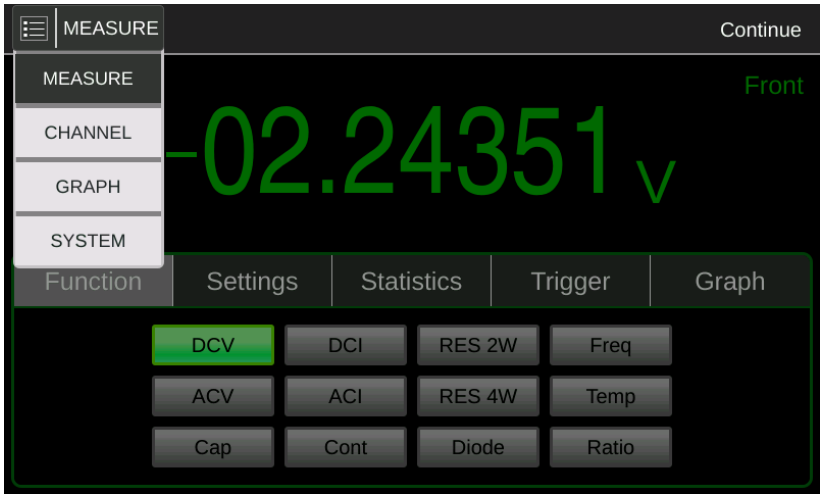


Figure 3-1 General Menu Options

4.1 Measurement Menu

The Home button takes you directly to the measurement screen.

4.1.1 Function

Touch the screen to select the function you want to measure. The selected function is highlighted in green (Continue) or with a border (manual trigger or bus trigger). Tap the function to pause the measurement, tap again to resume.

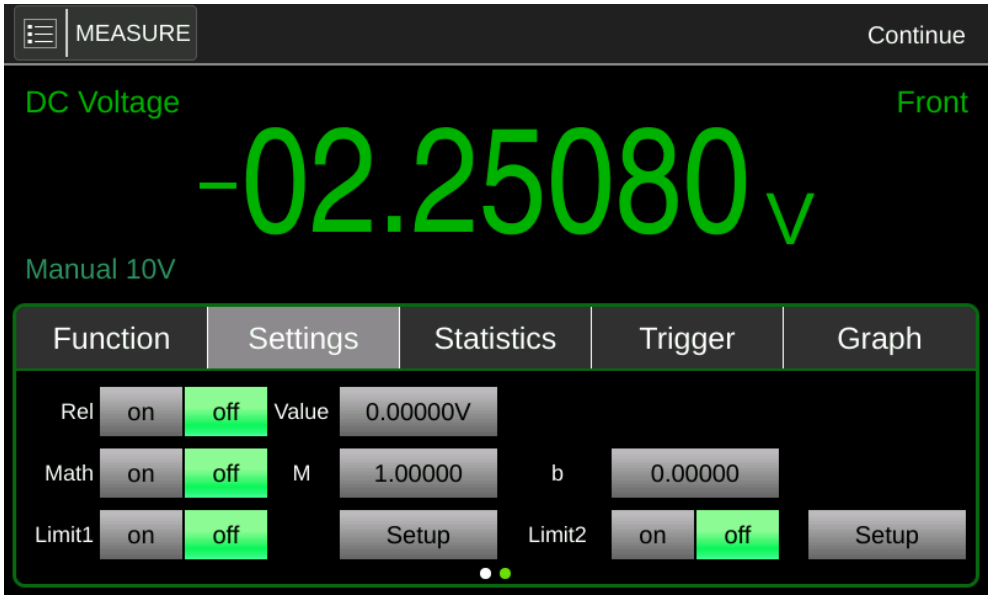
Tapping the measurement result zooms in on the result graph and shrinks the function frame.

Functions that can be measured: DC/AC voltage, DC/AC current, 2-wire/4-wire resistance, frequency, temperature, capacitance, continuity, diode.

4.1.2 Settings

Configure the selected feature accordingly.

4.1.2.1 Public Settings



Rel: A zero calculation is a measured value minus a reference value. When the Zero function is enabled, the instrument uses the current reading as the reference value, and subsequent readings are based on the actual input value minus the reference value.

Displayed Reading = Current Reading - Reference Value

Different reference values can be set for different measurement functions; however, once set, the reference value is the same for all ranges under that function. Using the Zero function does not increase the maximum allowable input signal for that range.

Math: Set gain and offset values. The calibration function allows you to apply the gain and offset to all readings of the specified multiplexer channel during scanning.

This mathematical operation function provides the following calculation of the screen reading (X):

Y=mX+b

Where: X is the general display reading.

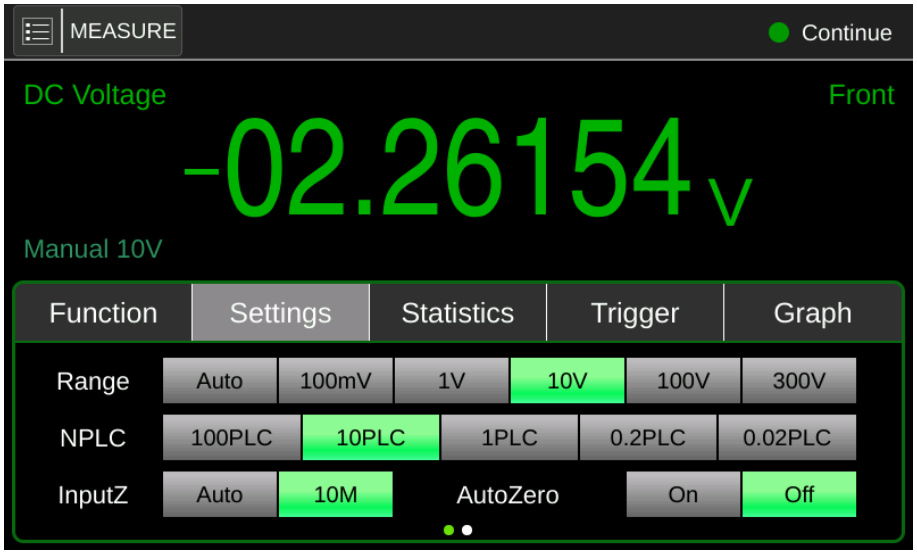
m and b are user-entered parameters.

Y is the result displayed on the screen after the calculation.

Limit: Use the numeric keypad to set the desired upper and lower alarm limits so that an alarm is generated when a measurement exceeds the specified limit or both in the measurement channel, and you can set the alarm buzzer.

If Auto Clear is turned on, the alarm will be turned off and the limits will be cleared when the measurement configuration is changed.

4.1.2.2 DC Voltage Settings



Range: Select the range according to your needs. The range is 100mV, 1V, 10V, 100V, 300V and Auto.

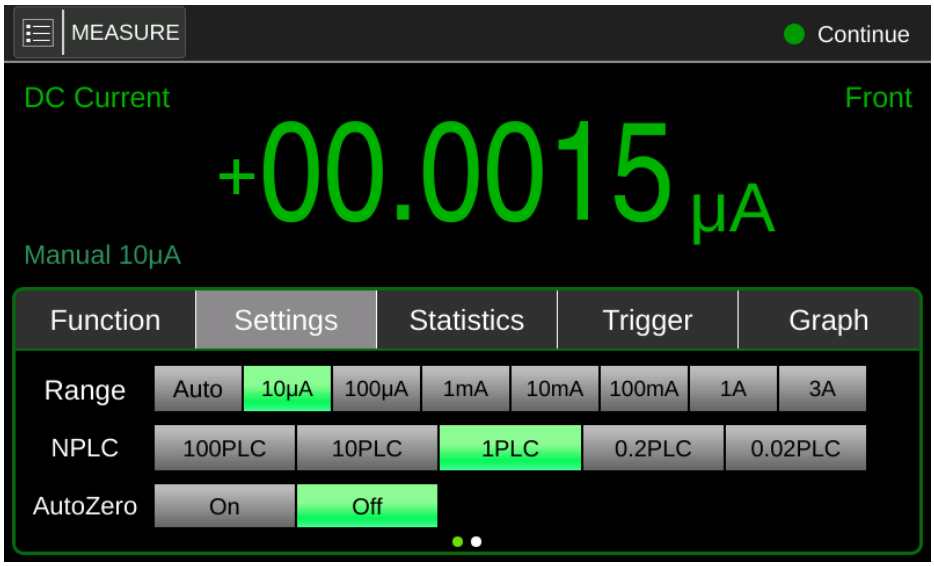
Auto (automatic range): Auto automatically selects the appropriate range for measurement based on the size of the input signal. The automatic range is set to 120% of the current range up and 10% of the current range down.

NPLC (integration time): The integration time setting affects the measurement speed and accuracy. The longer the integration time, the higher the accuracy, but the slower the measurement speed. 0.2PLC, 0.02PLC, 1PLC, 10PLC and 100PLC have a suppressing effect on the power supply noise. Selecting 100PLC provides the best noise suppression, but the speed will be slow.

Input impedance: Internal resistance selection, Auto or 10MΩ. Auto mode is suitable for 100mV, 1V and 10V ranges. The internal resistance for 100V and 300V ranges is fixed at 10MΩ.

Auto Zero: Automatic zeroing provides more accurate test results but takes longer. When Auto Zero is enabled, the multimeter's internal offset is measured after each measurement input signal. The offset is then subtracted from the previous reading. This prevents the influence of offset voltages on the digital multimeter's input circuitry from affecting measurement accuracy. With automatic zeroing, the digital multimeter measures the offset once and subtracts it from all subsequent measurements. Each time you change the function, range, or integration time, the digital multimeter makes a new offset measurement.

4.1.2.3 DC Current Settings



Range: Select the range according to your needs. The range is 10μA, 100μA, 1mA, 10mA, 100mA, 1A, 3A and Auto.

Auto (automatic range): Auto automatically selects the appropriate range for measurement based on the magnitude of the input signal. Auto range is set up to 120% of the current range and down to 10% of the current range.

NPLC (integration time): The integration time setting affects the measurement speed and accuracy. The longer the integration time, the higher the accuracy, but the slower the measurement speed. 0.2PLC, 0.02PLC, 1PLC, 10PLC, and 100PLC have a suppressing effect on the power supply noise. Selecting 100PLC provides the best noise suppression, but the speed will be slow.

Auto Zero: Automatic zeroing provides more accurate test results but takes longer. When Auto Zero is enabled, the multimeter's internal offset is measured after each measurement input signal. The offset is then subtracted from the previous reading. This prevents the influence of offset voltages on the digital multimeter's input circuitry from affecting measurement accuracy. With automatic zeroing, the digital multimeter measures the offset once and subtracts it from all subsequent measurements. Each time you change the function, range, or integration time, the digital multimeter makes a new offset measurement.

4.1.2.4 2-wire Resistance Settings

Range: Select the range according to your needs. The range is 10Ω, 100Ω, 1kΩ, 10kΩ, 100kΩ, 1MΩ, 100MΩ, and Auto.

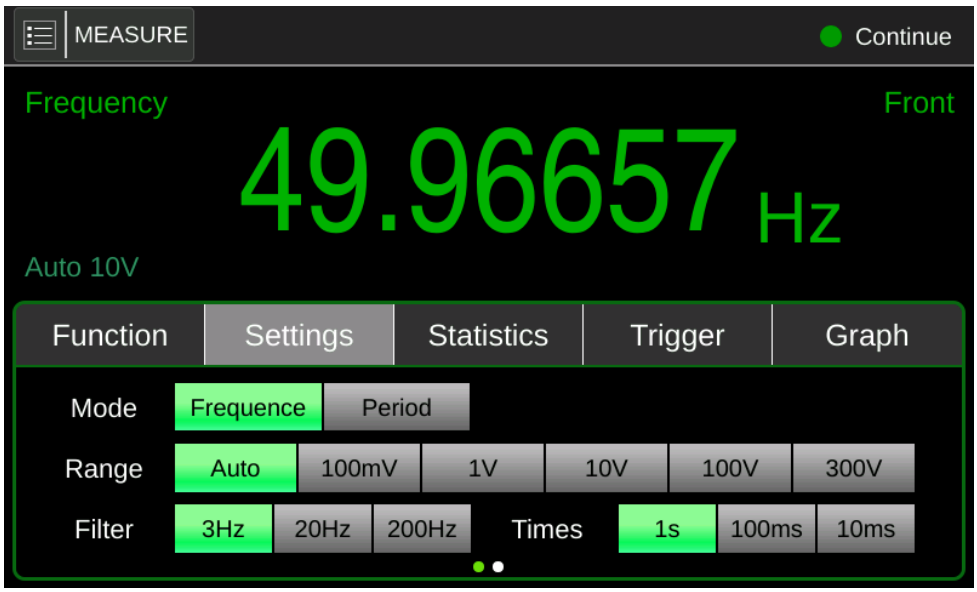
Auto (automatic range): Auto automatically selects the appropriate range for measurement based on the size of the input signal. Auto adjusts up to 120% of the current range and down to 10% of the current range.

NPLC (integration time): The integration time setting affects the measurement speed and accuracy. The longer the integration time, the higher the accuracy, but the slower the measurement speed. 0.2PLC, 0.02PLC, 1PLC, 10PLC and 100PLC have a suppressing effect on the power supply noise. Selecting 100PLC provides the best noise suppression, but the speed will be very slow.

Auto Zero: Automatic zeroing provides more accurate test results but takes longer. When Auto Zero is enabled, the multimeter's internal offset is measured after each measurement input signal. The offset is then subtracted from the previous reading. This prevents the influence of offset voltages on the digital multimeter's input circuitry from affecting measurement accuracy. With automatic zeroing, the digital multimeter measures the offset once and subtracts it from all subsequent measurements. Each time you change the function, range, or integration time, the digital multimeter makes a new offset measurement.

Low Current Mode: When switched on, measurements will be made using 1mA of current, and when switched off, measurements will be made using 10mA of current.

4.1.2.5 Frequency Settings



Mode: Display is in frequency or period.

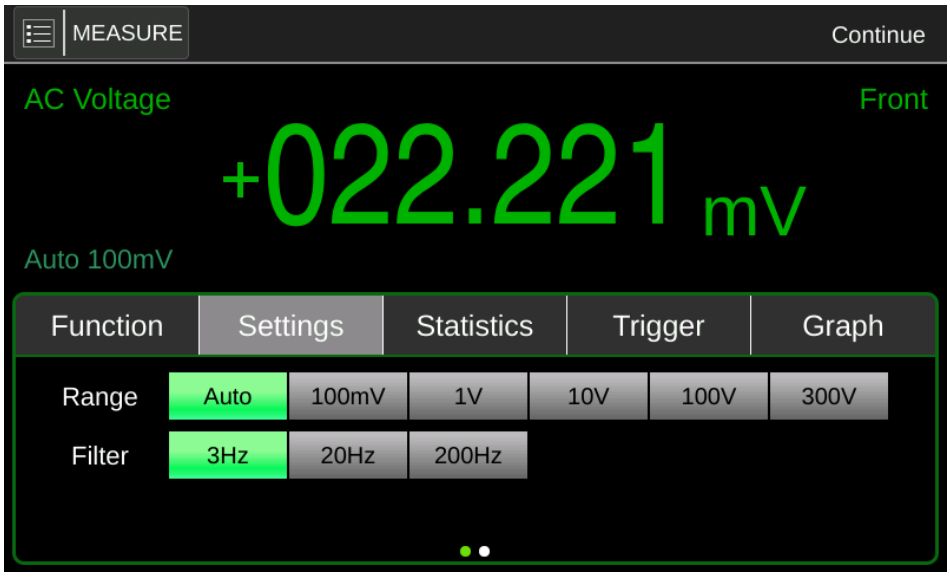
Range: Select the range according to your needs from 100mV, 1V, 10V, 100V, 300V and Auto.

Auto (automatic range): Auto range automatically selects the appropriate range for measurement based on the size of the input signal. The Auto range is set to 120% of the current range up and 10% of the current range down.

Filter: Three filter options are available: 3 Hz, 20 Hz, and 200 Hz. The selected filter should be less than the frequency of the test signal. To obtain stable data more quickly, it is best to select a filter close to the test frequency of the input signal.

Times: The instrument provides three different gate times for frequency measurements.

4.1.2.6 AC Voltage Settings

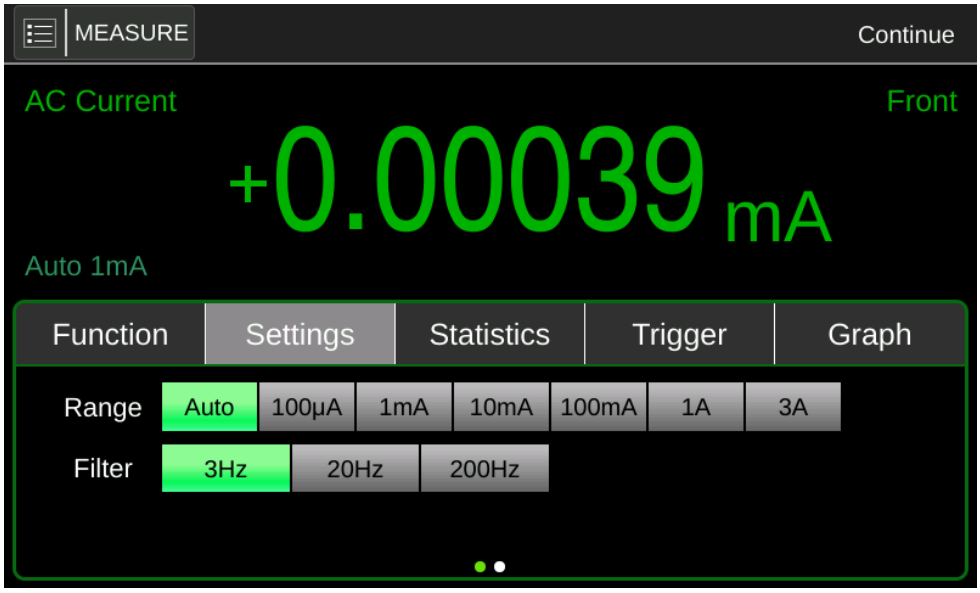


Range: Select the range according to your requirements, from 100mV, 1V, 10V, 100V, 300V to Auto.

Auto (automatic range): Auto automatically selects the appropriate range for measurement based on the size of the input signal. Auto range is set up to 120% of the current range and down to 10% of the current range.

Filter: Three filter options are available: 3 Hz, 20 Hz, and 200 Hz. The selected filter should be less than the frequency of the test signal. To obtain stable data more quickly, it is best to select a filter close to the test frequency of the input signal.

4.1.2.7 AC Current Settings

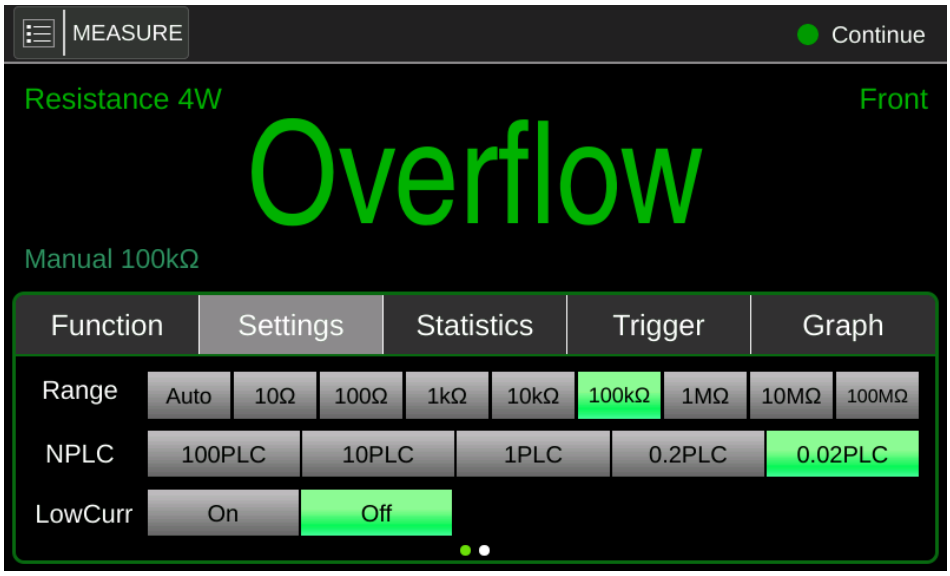


Range: Select the range according to your requirements, from 100mV, 1V, 10V, 100V, 300V to Auto.

Auto (automatic range): Auto automatically selects the appropriate range for measurement based on the size of the input signal. Auto range is set up to 120% of the current range and down to 10% of the current range.

Filter: Three filter options are available: 3 Hz, 20 Hz, and 200 Hz. The selected filter should be less than the frequency of the test signal. To obtain stable data more quickly, it is best to select a filter close to the test frequency of the input signal.

4.1.2.8 4-wire Resistance Settings



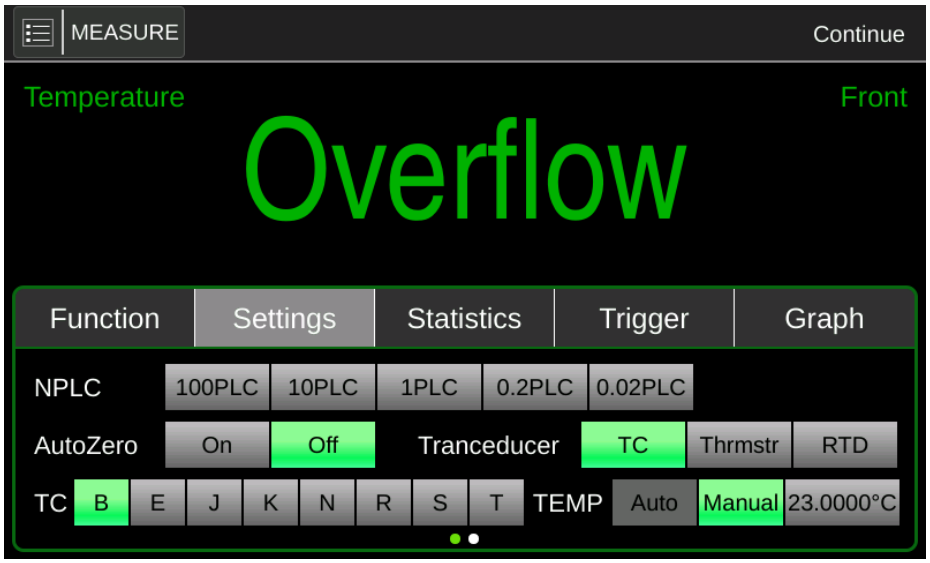
Range: Select the range according to your needs. The range is 10Ω, 100Ω, 1kΩ, 10kΩ, 100kΩ, 1MΩ, 100MΩ, and Auto.

Auto (automatic range): Auto automatically selects the appropriate range for measurement based on the size of the input signal. Auto range is set up to 120% of the current range and down to 10% of the current range.

NPLC (integration time): The integration time setting affects the measurement speed and accuracy. The longer the integration time, the higher the accuracy, but the slower the measurement speed. 0.2PLC, 0.02PLC, 1PLC, 10PLC and 100PLC have a suppressing effect on the power supply noise. Selecting 100PLC provides the best noise suppression, but the speed will be very slow.

Low Current Mode: When switched on, measurements will be made using 1mA of current, and when switched off, measurements will be made using 10mA of current

4.1.2.9 Temperature Settings



NPLC (integration time): The integration time setting affects the measurement speed and accuracy.

The longer the integration time, the higher the accuracy, but the slower the measurement speed. 0.2PLC, 0.02PLC, 1PLC, 10PLC and 100PLC have a suppressive effect on the power supply noise. Selecting 100PLC provides the best noise suppression, but the speed will be very slow.

Auto Zero: Automatic zeroing provides more accurate test results but requires more test time. With automatic zeroing enabled, the multimeter's internal offset is measured after each measurement input signal. The offset is then subtracted from the previous reading. This eliminates the influence of offset voltages on the digital multimeter's input circuitry on measurement accuracy. With automatic zeroing, the digital multimeter measures the offset once and subtracts it from all subsequent measurements. Each time you change the function, range, or integration time, the digital multimeter performs a new offset measurement.

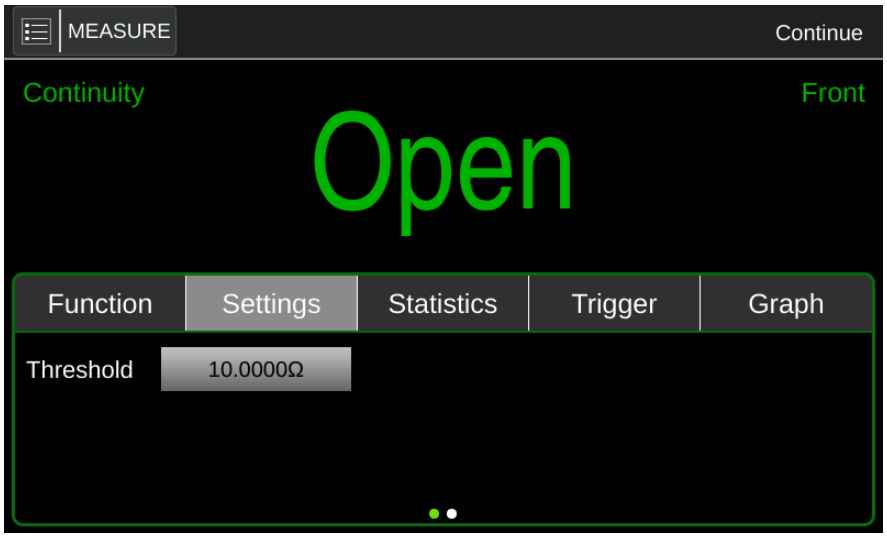
Tranceducer: Select the sensor type. Thermocouple sensor: Type B, E, J, K, N, R, S, T and set the cold junction compensation temperature; Thermistor sensor: R25 and B values; platinum resistance sensor: select the wire system and standard.

4.1.2.10Capacitance Settings

Range: Select the range according to your needs. The range is 1nF, 10nF, 100nF, 1μF, 100μF, 1mF, 10mF and Auto.

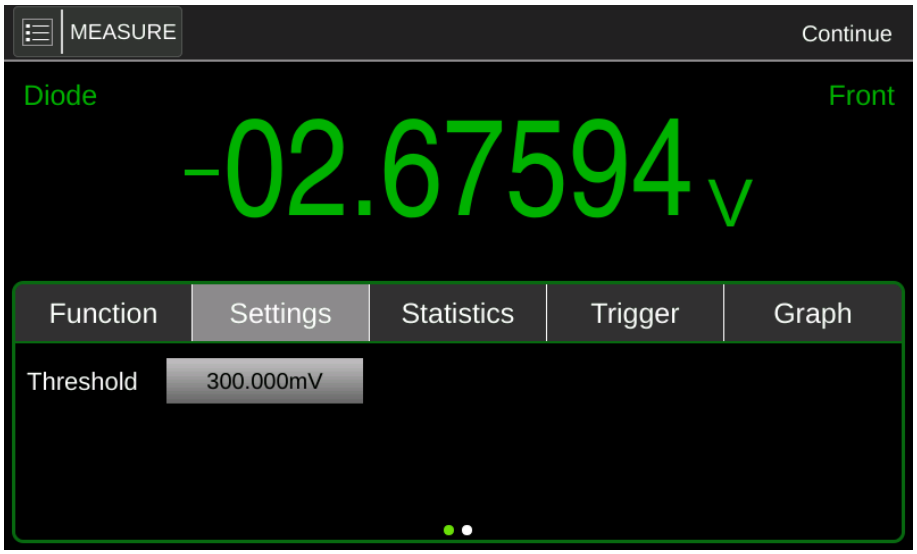
Auto (automatic range): Auto range automatically selects the appropriate range for measurement based on the size of the input signal. Auto range is adjusted up to 110% of the current range and down to 10% of the current range.

4.1.2.11Conductivity Settings



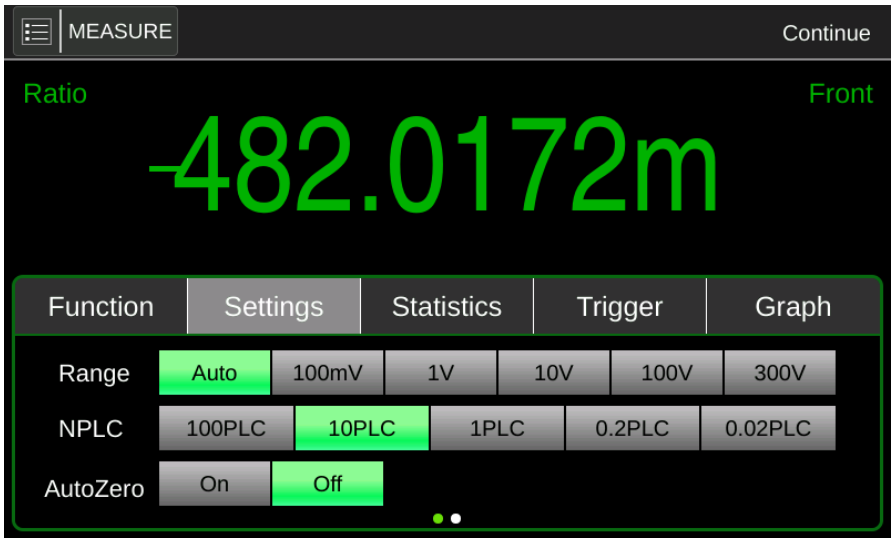
Threshold: If the measured resistance is greater than the threshold, Open is displayed; if it is less than the threshold, the resistance value is displayed.

4.1.2.12Diode Settings



Threshold: If the measured voltage is greater than the threshold, Overload is displayed; if it is less, the voltage value is displayed.

4.1.2.13Ratio Settings



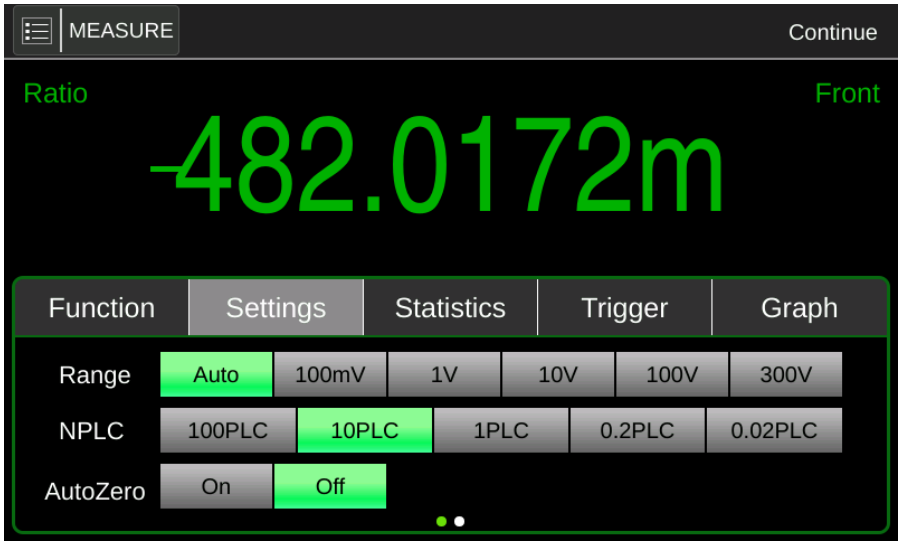
Range: Select the range according to your needs. The range is 100mV, 1V, 10V, 100V, 300V and Auto.

Auto (automatic range): Auto automatically selects the appropriate range for measurement based on the size of the input signal. The automatic range is set to 120% of the current range up and 10% of the current range down.

NPLC (integration time): The integration time setting affects the measurement speed and accuracy. The longer the integration time, the higher the accuracy, but the slower the measurement speed. 0.2PLC, 0.02PLC, 1PLC, 10PLC and 100PLC have a suppressing effect on the power supply noise. Selecting 100PLC provides the best noise suppression, but the speed will be slow.

Auto Zero: Automatic zeroing provides more accurate test results but takes longer. When Auto Zero is enabled, the multimeter's internal offset is measured after each measurement input signal. The offset is then subtracted from the previous reading. This prevents the influence of offset voltages on the digital multimeter's input circuitry from affecting measurement accuracy. With automatic zeroing, the digital multimeter measures the offset once and subtracts it from all subsequent measurements. Each time you change the function, range, or integration time, the digital multimeter makes a new offset measurement.

4.1.3 Statistics



Records the peak-to-peak value, average value, standard deviation, maximum value, minimum value, and number of readings in the current sample buffer.

The sample buffer can store up to 100,000 data points, and if the sample buffer overflows, the oldest data is discarded. You can manually clear the buffer on the touchscreen to clear all cached data.

4.1.4 Trigger

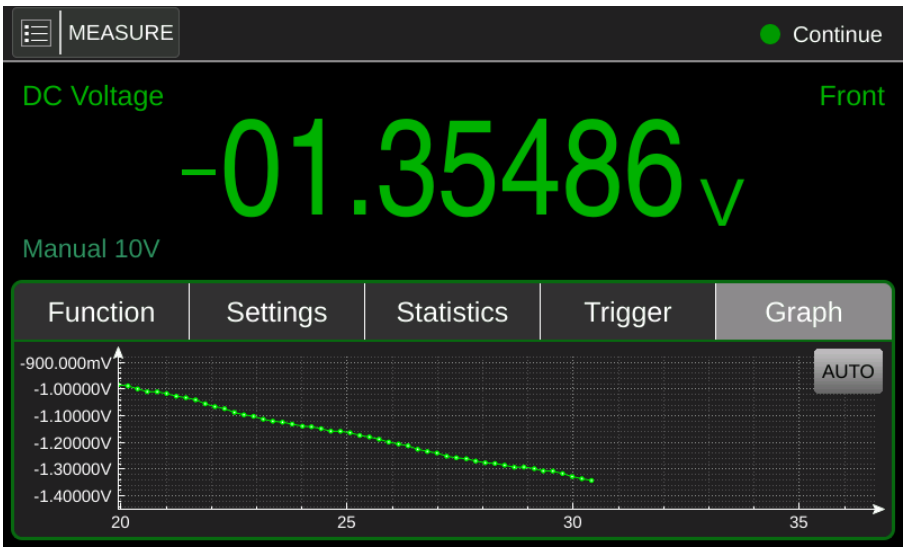
Continue: The instrument continuously measures the sample and displays the results.

Manual: Pressing the "TRIGGER" button on the control panel causes the instrument to measure and display the final result. The instrument is normally in standby mode.

Bus: After receiving the "start" signal from the external HANDLER interface, the instrument measures and displays the final measurement result and then returns to the standby mode.

Count: A trigger measures the value of this number of times.

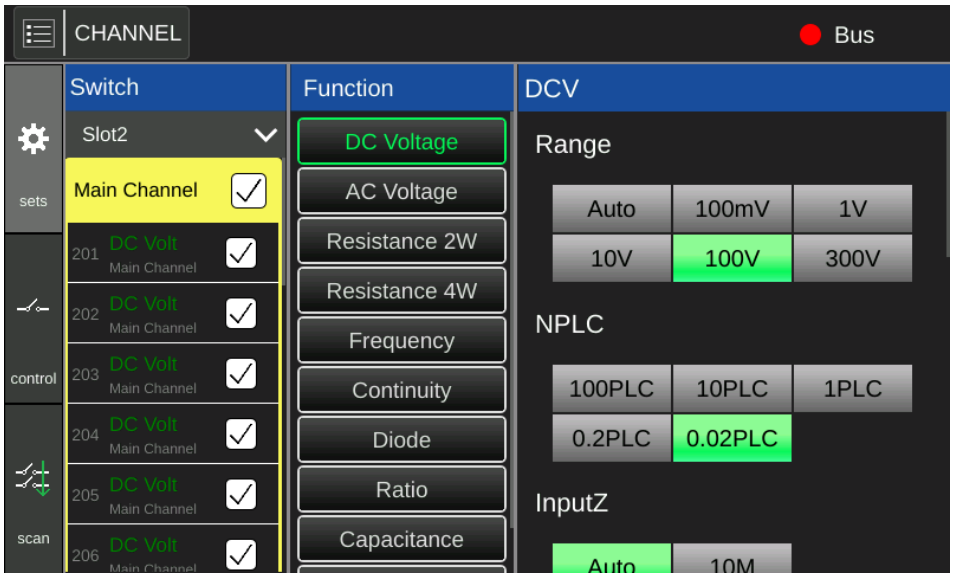
4.1.5 Diagrams



A line graph showing the measurement results of the selected function over time. (Same as the line graph in the graph interface)

4.2 Channel Menu

4.2.1 Channel Settings



This page is used to set and display the specific functions of each channel.

Switch: Used to select the channel to be adjusted. Use the drop-down menu to select the slot where the channel is located.

The basic version of the channel board contains three channels with different functions: **the main channel, the auxiliary channel, and the current channel**. The main channel can be used to select all two-wire and four-wire measurement functions except current. The auxiliary channel can be used to select all 2-wire measurement functions except current, and the current channel can be used to select D.C. current measurement.

The primary channel starts with channel 1 and the basic version of the channel board contains a maximum of 20 channels. The secondary channel starts at channel 21 and contains a maximum of 20 channels. The current channel starts at channel 41 and contains a maximum of 2 channels.

After a 4-wire measurement function is selected for a master channel, the corresponding slave channel is automatically set to sense mode and marked as paired and uncheckable. At this time, the main channel is used as the input end and the corresponding slave channel is used as the sense end for the measurement. After the master channel is switched to another non-four-wire measurement function, the corresponding slave channel is released from sense mode and can be selected to set its measurement function.

Click the Primary, Secondary, or Current Channel tab to expand or collapse the corresponding channel. Click the checkbox to select or deselect all channels for the corresponding function.

Function: This displays the measurement function buttons supported by all channels selected in the channel selection module. Clicking the appropriate button will set the selected channels. If no channels are selected, or if the selected channels support conflicting functions (current channel and main and auxiliary channels selected at the same time), a message is displayed indicating that no function has been selected.

The function specific setting area displays the specific setting parameters for the selected channels and

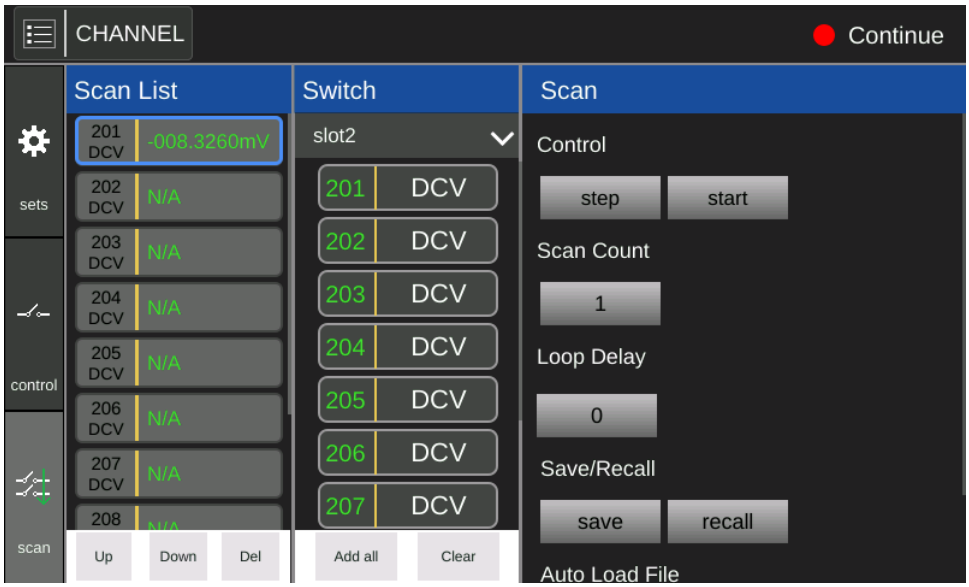
allows you to make settings.

4.2.2 Channel Control

This section displays the functions and measurement results of all channel settings. Click the button to turn on the test for that channel.

This section can be quickly navigated using the scroll wheel, which can be rotated to select the specified channel. Press the button to toggle the current channel on and off.

4.2.3 Scanning Function



Switch: The channels for which functions have been configured in the channel settings are displayed here.

Click a channel button to add it to the scan list.

Click Add All to add all channels for which functions have been configured in the current slot to the scan list.

Click Clear to clear the current scan list.

Scan List: This section displays the measurement data and queue order of the current scan list.

Select a measurement channel in the list and use Up and Down to change its scan order.

Select a measurement channel in the list and click Delete to remove the channel from the scan list.

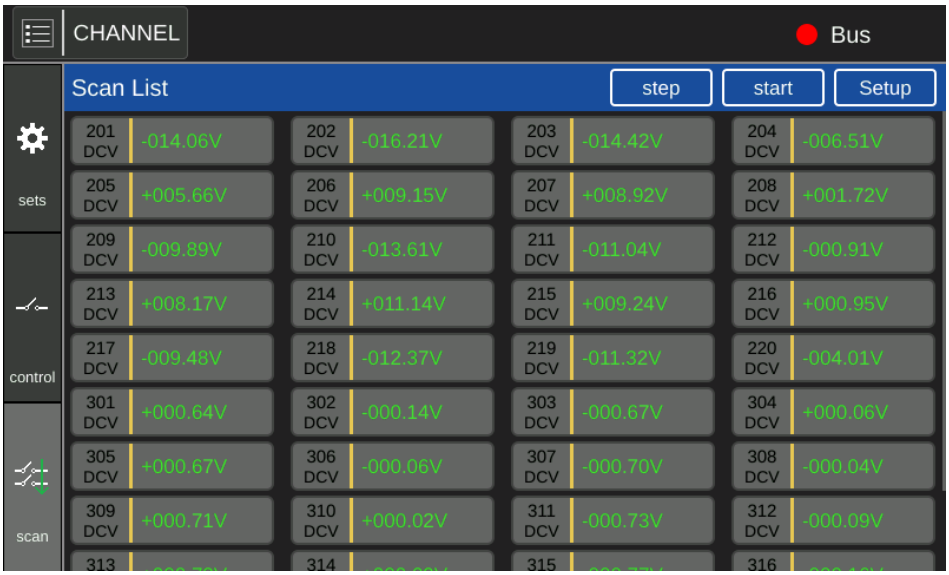
Scan Settings: This section is used to control the scan.

Clicking Step or Start will perform scan measurements according to the current scan list order.

Setting the number of scans can change the number of times the scan queue is cycled.

Save: You can save the functions and queue order of all channels in the current scan queue to a specified file. Operation: Click Save, name the scan file, the file format is .sca, click OK, click Save, and click Close.

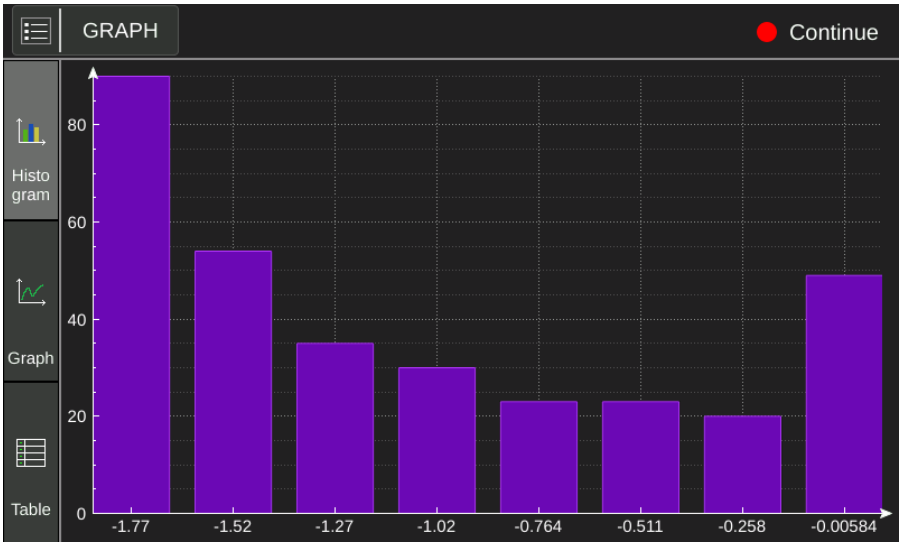
Recall: You can read the queue configuration from the file and replace the current scan queue. Operation: Click Load, select the desired .sca file, click Load, and click Close to display the loaded scan queue in the Scan List.



When scanning is switched on, it will automatically switch to the channel scanning display interface, which is convenient for displaying the scanning data.

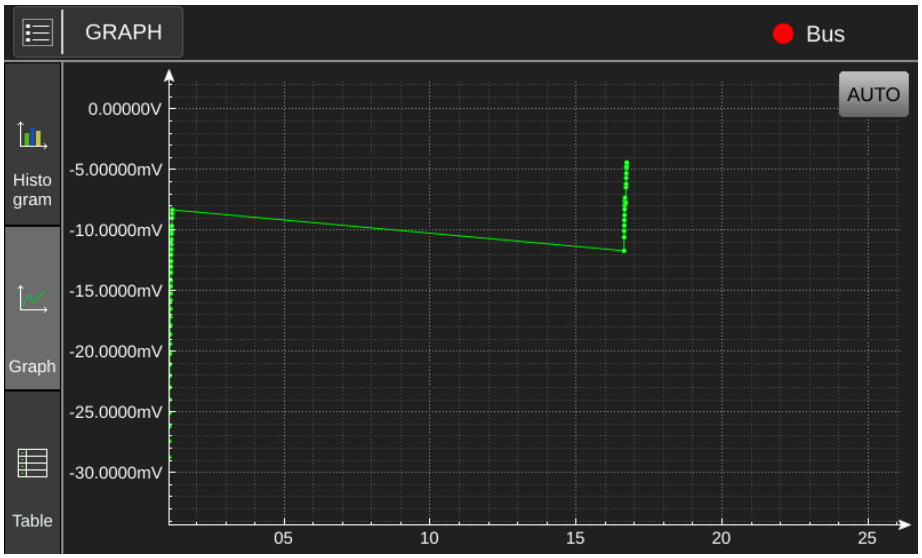
4.3 Graph Menu

Bar Chart



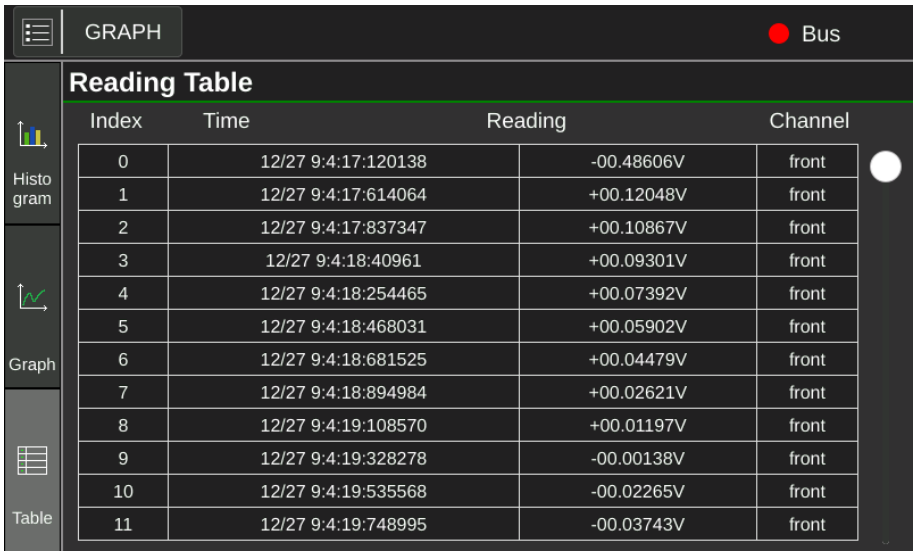
View cached statistics for all measured data values

Line Graph



Displays a line graph showing the numerical changes in cached readings over time.

Table



Index	Time	Reading	Channel
0	12/27 9:4:17:120138	-00.48606V	front
1	12/27 9:4:17:614064	+00.12048V	front
2	12/27 9:4:17:837347	+00.10867V	front
3	12/27 9:4:18:40961	+00.09301V	front
4	12/27 9:4:18:254465	+00.07392V	front
5	12/27 9:4:18:468031	+00.05902V	front
6	12/27 9:4:18:681525	+00.04479V	front
7	12/27 9:4:18:894984	+00.02621V	front
8	12/27 9:4:19:108570	+00.01197V	front
9	12/27 9:4:19:328278	-00.00138V	front
10	12/27 9:4:19:535568	-00.02265V	front
11	12/27 9:4:19:748995	-00.03743V	front

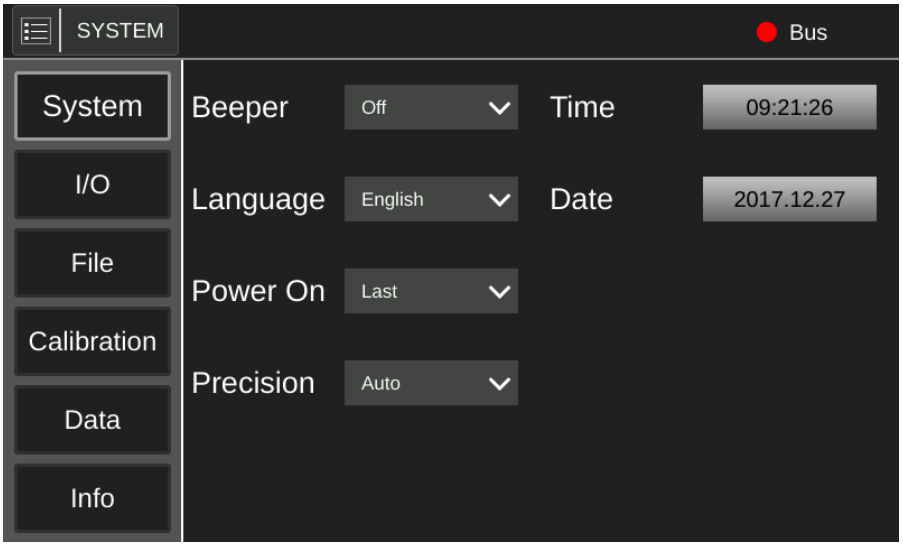
Displays all cached measurements for the selected channel.

Chapter 5 System Settings Operation

This chapter describes the system settings, interface settings, file operations, and calibration settings.

The Menu button on the front panel provides direct access to the system settings.

5.1 System Settings



5.1.1 Beeper

A sound switch is used to control the button.

5.1.2 Language

The operating language mode, Chinese or English, is used to control and display the current instrument operation.

5.1.3 Power-on Settings

Used to control and display the settings for the next time the unit is started, the settings before the last shutdown, or to restore the factory settings.

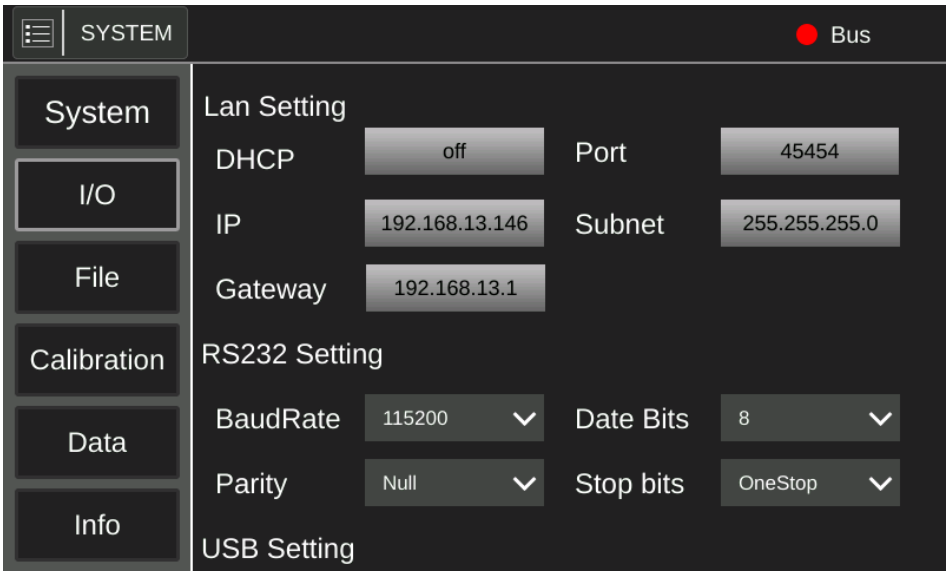
5.1.4 Precision

Used to control the number of decimal places displayed for measuring results on the measuring page of the instrument.

5.1.5 Time and Date

Used to modify the system time and date.

5.2 I/O Settings



5.2.1 Network Settings

Connect the network cable to the rear panel to set up network communication. The <Network Settings> menu allows you to set the DCHP, IP address, subnet mask, gateway, and TCP/IP port number. The parameters on the Network Settings page are automatically saved after setting, and the next time the machine is turned on, the last settings before the last shutdown will be used.

DHCP: The connected network device (router or switch) supports automatic IP assignment.

IP address, subnet mask, gateway, TCP/IP port number: Touch screen, complete the settings after entering them from the keyboard.

5.2.2 RS232C Serial Port Setup

This instrument can use the RS-232C serial port (standard) for data communication and remote control without an operator panel. The instrument provides a variety of program control commands. Using the RS-232C interface, the computer can perform almost all of the functions of the control panel. See Chapter 5 for details on the interface commands.

Baud Rate (bps)	4800 / 9600 / 19200 / 38400 / 115200
Data Bit	5/6/7/8 (default 8)
Stop Bit	OneStop/TwoStop/OneAndHalfStop (default OneStop 1 bit)
Check Bit	Null/Even/Odd/Space/Mark (default Null none)
Terminator	NL (newline character, ASCII code 10)
Contact Details	Software Contact
Connectors	DB9 core

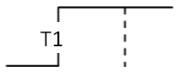
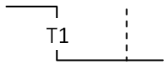
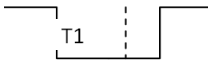
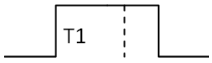
Serial Port Main Parameters

5.2.3 Handler Settings

Step 1: Set the instrument's trigger mode.

Set the trigger mode to Bus Trigger. Only then can the handler be used for triggering.

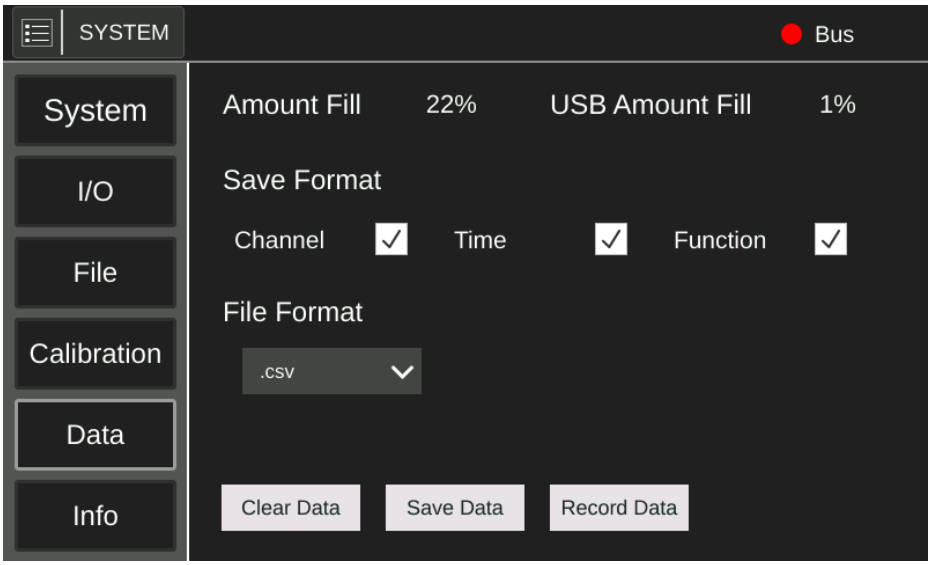
Step 2: Set the external trigger mode

Edge Trigger	Rising edge trigger		T1 trigger time, the high level that is maintained after the rising edge is greater than the trigger time, and only then can it trigger
	Falling edge trigger		T1 trigger time, the high level that is maintained after the falling edge is greater than the trigger time, and only then can it trigger
Pulse Width Trigger	Low pulse width trigger		T1 trigger time, the pulse width must be greater than the width of T1 in order to trigger the test
	High pulse width trigger		T1 trigger time, the pulse width must be greater than the width of T1 in order to trigger the test

The difference between edge triggering and pulse width triggering: Edge triggering requires only the corresponding edge and then a delay longer than the set delay time to trigger the measurement. Pulse width triggering requires a delay after the first edge for a period longer than the set delay time, and then another opposite edge signal to trigger the test.

5.3 Data/File Settings

5.3.1 Data Settings



Amount Fill: Indicates the ratio of the volume of data stored to the volume of the cache.

Save format: the type and arrangement of the stored data.

File format support: .csv, .dat, and .txt.

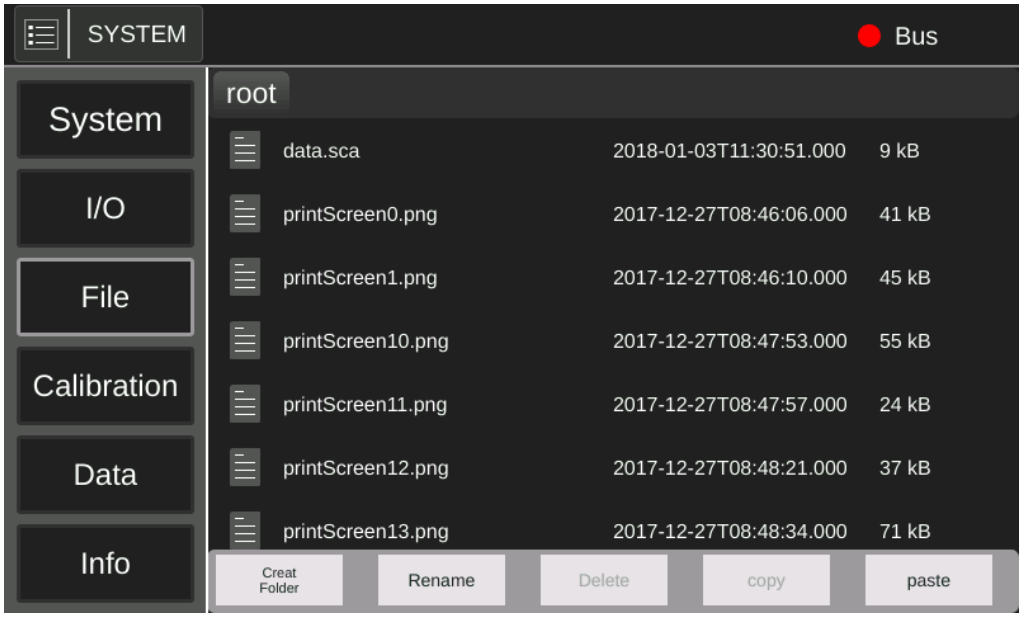
Clear data: the function is the same as the Clear cache function in the statistics area on the measurement page, which can clear all measurement data in the cache.

Save data: save the measurement data cached before the moment the key is pressed. Operation: Touch the screen to save the data, name the file, and then touch the screen to save.

Record data: Save the measurement data cached from the moment the button is pressed until the

recording is stopped. (The record data button changes from start recording to stop recording): Touch the screen to record the data, name the file, touch the screen to save, then touch the screen to close. After recording the required time, touch the screen to stop recording.

5.3.2 File Settings



Screenshot file: Press the PrtScn button on the front panel to save a .png image in the root directory.

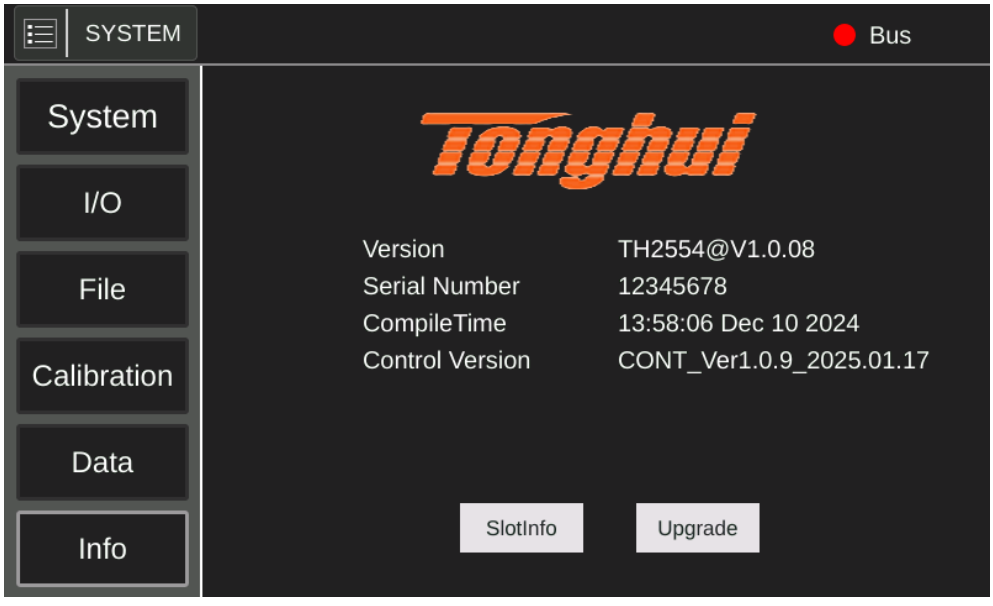
Create a new folder: Touch the button, enter the folder name, and touch OK.

Rename: Select a file, touch Rename, enter the new name, and touch OK.

Delete: Select a file, touch Delete and then touch OK to confirm deletion.

Copy/paste: Select a file and touch the screen to copy it. If the file is not in the same folder, you can touch Copy, and the file will be copied to a new folder/USB folder.

5.4 Version Information



The display shows the instrument version, serial number, compilation time, and control program version.

To upgrade the instrument using the provided upgrade tool, you must copy the specified file to the root directory and then upgrade it on the touchscreen. A window will appear asking if you want to use the file to upgrade, click OK to upgrade. When the upgrade is complete and a prompt appears, restart the instrument to apply the upgraded program.

Chapter 6 Command Reference

6.1 SCPI Language Introduction

SCPI (Standard Commands for Programmable Instruments) is an ASCII-based instrument programming language for test and measurement instruments. SCPI commands are structured in a hierarchical manner, also known as a tree system. Related commands are grouped under a common node or root, which forms a subsystem. The following section of the SENSe subsystem illustrates this.

SENSe.
VOLTage.
DC:RANGe {<range>|MIN|MAX|DEF}
DC:RANGe? [MINimum|MAXimum|DEFault]

SENSe is the root-level keyword for the command, VOLTage is the second-level keyword, and DC is the third-level keyword. Consecutive keywords are separated by colons (:).

6.1.1 Grammatical Convention

The command syntax is formatted as follows:

VOLTage:DC:RANGe {<range>|MIN|MAX|DEF}

Most commands (and some parameters) are a mixture of upper and lower cases. The uppercase letters indicate an abbreviation of the command, which makes the program line shorter. For better readability of the program, you can use the long format command.

For example, consider the keyword VOLTage from the previous paragraph. You can type VOLT or VOLTage with any combination of upper- and lower-case letters. Thus, VolTaGe, volt, and Volt are all acceptable. Other formats (such as VOL and VOLTAG) will generate an error.

Curly braces ({ }) enclose parameter options. The parentheses are not sent with the command string.

A vertical bar (|) separates parameter options. For example, {<range>|MIN|MAX|DEF} in the command above indicates that you can specify a numeric range parameter or "MIN", "MAX", or "DEF". The bar is not sent with the command string.

Angular brackets (< >) indicate that a value must be specified for the parameter inside the brackets. For example, the syntax above indicates that the <range> parameter is enclosed in angle brackets. The angle brackets are not sent with the command string. A value must be specified for this parameter (e.g., "VOLT:DC:RANG 10") unless you select one of the other options shown in the syntax (e.g., "VOLT:DC:RANG MIN").

Optional parameters are enclosed in square brackets ([ ]). The brackets are not sent with command string. If you do not specify a value for an optional parameter, the instrument uses the default value.

6.1.2 Command Separator

A colon (:) separates consecutive keywords. Space must be included to separate the parameter from the command keyword. If a command requires multiple parameters, separate adjacent parameters with a comma:

```
CONF:VOLT:DC 10
```

A semicolon (;) separates two commands in the same subsystem and minimizes typing. For example, the following string:

```
TRIG:SOUR EXT;COUNT 10
```

Equivalent to the following two commands:

```
TRIG:SOUR EXT

TRIG:COUNT 10
```

Use a colon and a semicolon to concatenate commands from different subsystems. For example, in the following example, an error would occur if the colon and semicolon were not used:

```
TRIG:COUN MIN;:SAMP:COUN MIN
```

6.1.3 Using the MIN, MAX and DEF Parameters

For many commands, the parameter can be replaced with "MIN" or "MAX". In some cases, "DEF" can be used instead. For example, see the following example:

VOLTage:DC:RANGe {<range>|MIN|MAX|DEF}

Instead of selecting a specific value for the <RANGE> parameter, you can use the MIN parameter to set the range to the minimum value, the MAX parameter to set the range to the maximum value, or the DEF parameter to set the range to the default value.

6.1.4 Query Parameter Settings

To query the current value of most parameters, you can prefix this command with a question mark (?). For example, the following example sets the trigger count to 10 measurements:

```
TRIG:COUN 10
```

The count value can then be queried by sending:

```
TRIG:COUN?
```

You can also query the minimum or maximum count allowed as follows:

```
TRIG:COUN?

TRIG:COUN?
```

6.1.5 Parameter Type

The SCPI language defines several data formats used for program and response information.

6.1.5.1 Numerical Parameter

Commands that require a numeric parameter accept all common decimal number representations, including optional symbols, decimal points, and scientific notation. Special values for the numeric parameter, such as MIN, MAX, and DEF, are also accepted. In addition, units can be appended to the numeric parameter (e.g., M, k, m, or u). If a command accepts only certain values, the instrument

automatically rounds the entered numeric parameter to an acceptable value. The following command requires a range value for the numeric parameter:

VOLTage:DC:RANGe {<range>|MIN|MAX|DEF}

Because the SCPI parser is not case sensitive, there is some confusion between the letters "M" (or "m"). To avoid confusion, use the 'MA' symbol. Use 'u' for 'µ'.

6.1.5.2 Discrete Parameter

Discrete parameters are used to set a limited number of parameter values (e.g., IMMediate, EXTernal, or BUS). Like command keywords, they can have short and long forms. Both upper and lower case can be used. The short form, which is always uppercase, is always returned in the query response. The following example requests the use of a discrete parameter for the temperature unit:

UNIT:TEMPerature {C|F|K}

6.1.5.3 Boolean Parameter

A Boolean parameter represents a binary state that is either true or false. For a false condition, the device accepts "OFF" or "0". For a true condition, the device accepts "ON" or "1". When queried for the Boolean setting, the device will return "0" or "1". The following examples require the use of Boolean parameters:

DISPlay:STATe {ON|1|OFF|0}

6.1.5.4 ASCII String Parameter

String parameters can actually contain the full ASCII character set. Strings must begin and end with paired quotes; either single or double quotes can be used. The quote delimiters can also be part of the string, provided they are typed twice without any intervening characters. The following command uses one string parameter:

DISPlay:TEXT <quoted *string*>

For example, the following example displays the message "WAITING..." on the front panel of the device (without displaying the quotes).

```
DISP:TEXT "WAITING..."
```

The same message can also be displayed with single quotes, as in the following example.

```
DISP:TEXT 'WAITING...'
```

6.1.5.5 Channel Setup Parameters

Some commands can be used to set the specified channel. The channel name is formed by combining the slot number and the channel number. For example:

```
201 represents channel 1 on board 2

323 represents channel 23 on board 3
```

In the scpi command, the format of the channel setting is (@XXX), where XXX is the set channel number or plug-in board number.

To set multiple specified channels, you can use, separated by commas. For example:

(@101,103) to set channels 101 and 103.

To set a number of consecutive channels, separate them with a colon, for example:

(@101:120) for channels 101 through 120, a total of 20 channels

(@111:220) represents all channels starting from slot 11 in slot 1 and channels 201 to 220 in slot 2

To specify an entire slot, use SLOTX. You can also use ALLSLOTS to specify all channels. For example:

(@SLOT1) represents all channels in slot 1

(@ALLSLOTS) represents all channels

6.2 Public Command

6.2.1 *IDN?

Description:	**Return the device information including the software version**
Syntax:	*IDN?
Parameters:	(none)
Examples:	*IDN? Typical return: DCI,1.00000000E-04,1.00000000E-09

6.2.2 *RST

Description:	**Reset device measurement function and scan function settings**
Syntax:	*RST
Parameters:	(none)
Examples:	*RST

6.2.3 *OPC?

Description:	**Query whether the current instrument status is idle**
Syntax:	*OPC?
Parameters:	(none)
Examples:	*OPC? Typical return: 1 Idle 0 Busy

6.2.4 TERMinal

Description:	**Switch front panel mode or channel board mode**
Syntax:	TERMinal {ON|OFF}
Parameters:	{ON|1|OFF|0} ON|1 Switch to channel board OFF|0 Switch to front panel
Examples:	TERMinal ON

6.2.5 TERMinal?

Description:	Query whether the current mode is front panel mode or channel board mode
Syntax:	TERMinal?
Parameters:	(none)
Examples:	TERMinal? Typical return: 1 Current mode is channel board mode 0 Current mode is front panel mode

6.2.6 SLOT:INFO?

Description:	Query Slot Information
Syntax:	SLOT:INFO?
Parameters:	(none)
Examples:	SLOT:INFO? Typical return: the model and version number of each currently recognisable slot.

6.3 SENSe1 Subsystem

The SENSe1 system is used to configure channel measurement functions. You can add channel setting parameters at the end of the command to configure the specified channel, or the current channel will be set if you do not add them.

6.3.1 [SENSe1:]FUNCtion[:ON]

Description:	Set the measurement function for the current channel or a specified channel
Syntax:	[SENSe1:]FUNCtion[:ON] {<function>}[,(@XXX)] [SENSe1:]FUNCtion[:ON] [(@XXX)]
Parameters:	<function>:{ VOLTage[:DC]|CURRent[:DC]|VOLTage:AC|CURRent:AC|RESistance|FRESistance |FREQuency|CONTinuity|DIODe|VOLTage[:DC]:RATio|CAPacitance|TEMPerature}
Examples:	FUNC VOLT:DC,(@102) Set the 102-channel measurement function to DC voltage

6.3.2 [SENSe1:]VOLTage:{AC|DC[:RATio]}:RANGe

Description:	Select the fixed range for AC and DC voltage measurements
Syntax:	[SENSe1:]VOLTage:{AC|DC[:RATio]}:RANGe {<range>|MIN|MAX}[,(@XXX)] [SENSe1:]VOLTage:{AC|DC[:RATio]}:RANGe? [{MIN|MAX|DEF}][,(@XXX)]
Parameters:	AC:<range>:{100m|1|10|100|750}. Default value: 10 DC: <range>:{100m|1|10|100|1000}. Default value: 1000
Examples:	VOLT:RANG 10 Set the DC voltage range of the current channel to 10 V.

6.3.3 [SENSe1:]VOLTage:{AC|DC[:RATio]}:RANGe:AUTO

Description:	**Set the auto ranges for AC and DC voltage measurements**
Syntax:	[SENSe1:]VOLTage:{AC|DC[:RATio]}:RANGe:AUTO {ON|OFF}[,(@XXX)] [SENSe1:]VOLTage:{AC|DC[:RATio]}:RANGe:AUTO? [(@XXX)]
Parameters:	{ON|1|OFF|0}
Examples:	VOLT:AC:RANG:AUTO ON Set the AC voltage range of the current channel to ON.

6.3.4 [SENSe1:]VOLTage:[DC:][RATio:]NPLC

Description:	**Set the measurement speed for DC voltage measurement**
Syntax:	[SENSe1:]VOLTage:[DC:][RATio:]NPLC {<plc>|MIN|MAX}[,(@XXX)] [SENSe1:]VOLTage:[DC:][RATio:]NPLC? [(@XXX)]
Parameters:	<plc>:{0.02|0.2|1|10|100}
Examples:	VOLT:NPLC 10 Set the DC voltage measurement speed of the current channel to 10 plc.

6.3.5 [SENSe1:]VOLTage:[DC:]INPutimpedance

Description:	**Set the input impedance for DC voltage measurement**
Syntax:	[SENSe1:]VOLTage:[DC]:NPLC {<plc>|MIN|MAX}[,(@XXX)] [SENSe1:]VOLTage:[DC]:NPLC? [(@XXX)]
Parameters:	<plc>:{0.02|0.2|1|10|100}
Examples:	VOLT:NPLC 10 Set the DC voltage measurement speed of the current channel to 10 plc.

6.3.6 [SENSe1:]VOLTage:[DC:][RATio:]AZERo[:STATe]

Description:	**Set Auto Zero for DC voltage measurement**
Syntax:	[SENSe1:]VOLTage:[DC:][RATio:]AZERo[:STATe] {ON|OFF}[,(@XXX)] [SENSe1:]VOLTage:[DC:][RATio:]AZERo[:STATe] [(@XXX)]
Parameters:	{ON|1|OFF|0}
Examples:	VOLT:AZER:STAT ON Set automatic zeroing of the DC voltage of the current channel to ON.

6.3.7 [SENSe1:]VOLTage:AC:BANDwidth

Description:	**Set the AC filter cutoff frequency for AC voltage measurement.** **The instrument uses three different AC filters that allow you to optimize low-frequency accuracy or reduce the AC settling time after changing the input signal amplitude. Based on the cutoff frequency specified by this command, the instrument selects a slow (3 Hz), medium (20 Hz), or fast (200 Hz) filter. Specify the lowest frequency you want to capture. Lower frequencies result in longer stabilization times.**
Syntax:	[SENSe1:]VOLTage:AC:BANDwidth {<filter>|MIN|MAX}[,(@XXX)]

	[SENSe1:]VOLTage:AC:BANDwidth [(@XXX)]
Parameters:	<filter>:{3|20|200}. Default value: 20
Examples:	VOLT:AC:BAND 200 Set the AC voltage filter of the current channel to 200Hz.

[SENSe1:]CURRent:{AC|DC}:RANGe

Description:	**Select the fixed range for AC and DC current measurements**
Syntax:	[SENSe1:]CURRent:{AC|DC}:RANGe {<range>|MIN|MAX}[,(@XXX)] [SENSe1:]CURRent:{AC|DC}:RANGe? [{MIN|MAX|DEF}][,(@XXX)]
Parameters:	DC:<range>:{10u|100u|1m|10m|100m|1|3}. Default value: 1m AC: <range>:{100u|1m|10m|100m|1|3}. Default value: 100u
Examples:	CURR:RANG 10m Set DC current range of the current channel to 10mA.

6.3.8 [SENSe1:]CURRent:{AC|DC}:RANGe:AUTO

Description:	**Set auto-ranging for AC and DC current measurements**
Syntax:	[SENSe1:]CURRent:{AC|DC}:RANGe:AUTO {ON|OFF}[,(@XXX)] [SENSe1:]CURRent:{AC|DC}:RANGe:AUTO? [(@XXX)]
Parameters:	{ON|1|OFF|0}
Examples:	CURR:AC:RANG:AUTO ON Set AC current auto-ranging of the current channel to ON.

6.3.8.1 [SENSe1:]CURRent:[DC:]NPLC

Description:	**Set the measurement speed for DC current measurement**
Syntax:	[SENSe1:]CURRent:[DC:]NPLC {<plc>|MIN|MAX}[,(@XXX)] [SENSe1:]CURRent:[DC:]NPLC? [(@XXX)]
Parameters:	<plc>:{0.02|0.2|1|10|100}
Examples:	CURR:NPLC 10 Set DC current measurement speed of the current channel to 10 plc

6.3.9 [SENSe1:]CURRent:[DC:]AZERo[:STATe]

Description:	**Set Auto Zero for DC current measurement**
Syntax:	[SENSe1:]CURRent:[DC:] AZERo[:STATe] {ON|OFF}[,(@XXX)] [SENSe1:]CURRent [:DC]:AZERo[:STATe] [(@XXX)]
Parameters:	{ON|1|OFF|0}
Examples:	CURR:AZER:STAT ON Set DC current auto zero of the current channel to ON.

6.3.10 [SENSe1:]CURRent:AC:BANDwidth

Description:	**Set the AC filter cutoff frequency for AC current measurement.** **The instrument uses three different AC filters that allow you to optimize low-frequency accuracy or reduce the AC settling time after changing the input signal amplitude.**

	Based on the cutoff frequency specified by this command, the instrument selects a slow (3 Hz), medium (20 Hz), or fast (200 Hz) filter. Specify the lowest frequency you want to capture. Lower frequencies result in longer stabilization times.
Syntax:	[SENSe1:]CURRent:AC:BANDwidth {<filter>|MIN|MAX}[,(@XXX)] [SENSe1:]CURRent:AC:BANDwidth [(@XXX)]
Parameters:	<filter>:{3|20|200}. Default value: 20
Examples:	CURR:AC:BAND 200 Set AC current filter of the current channel to 200Hz.

6.3.11 [SENSe1:]{RESistance|FRESistance}:{AC|DC}:RANGe

Description:	**Select the fixed range for 2-wire and 4-wire resistance measurements**
Syntax:	[SENSe1:]{RESistance|FRESistance}:RANGe {<range>|MIN|MAX}[,(@XXX)] [SENSe1:]{RESistance|FRESistance}:RANGe? [{MIN|MAX|DEF}][,(@XXX)]
Parameters:	<range>:{10|100|1k|10k|100k|1M|10M|100M}
Examples:	RES:RANG 10M Set 2-wire resistance range of the current channel to 10MΩ.

6.3.12 [SENSe1:]{RESistance|FRESistance}:RANGe:AUTO

Description:	**Set auto range for 2-wire and 4-wire resistance measurements**
Syntax:	[SENSe1:]{RESistance|FRESistance}:RANGe:AUTO {ON|OFF}[,(@XXX)] [SENSe1:]{RESistance|FRESistance}:RANGe:AUTO? [(@XXX)]
Parameters:	{ON|1|OFF|0}
Examples:	RES:RANG:AUTO ON Set 2-wire resistance auto-range of the current channel to ON.

6.3.13 [SENSe1:]{RESistance|FRESistance}:NPLC

Description:	**Set the measurement speed for 2-wire and 4-wire resistance measurements**
Syntax:	[SENSe1:]{RESistance|FRESistance}:NPLC {<plc>|MIN|MAX}[,(@XXX)] [SENSe1:]{RESistance|FRESistance}:NPLC? [(@XXX)]
Parameters:	<plc>:{0.02|0.2|1|10|100}
Examples:	RES:NPLC 10 Set 2-wire resistance measurement speed of the current channel to 10plc

6.3.14 [SENSe1:]{RESistance|FRESistance}:LOWCurr

Description:	**Set low current mode for 2-wire and 4-wire resistance measurements**
Syntax:	[SENSe1:]{RESistance|FRESistance}:LOWCurr {ON|OFF}[,(@XXX)] [SENSe1:]{RESistance|FRESistance}:LOWCurr? [(@XXX)]
Parameters:	{ON|1|OFF|0}
Examples:	RES:LOWC ON Set the current channel 2-wire resistance to turn on the low current mode

6.3.15 [SENSe1:]RESistance:AZERo[:STATe]

Description:	**Set Auto Zero for 2-wire resistance measurement**
Syntax:	[SENSe1:]RESistance:AZERo[:STATe] {ON|OFF}[,(@XXX)] [SENSe1:]RESistance:AZERo[:STATe] [(@XXX)]
Parameters:	{ON|1|OFF|0}
Examples:	RES:AZER:STAT ON Set 2-wire resistor auto zero of the current channel to ON

6.3.16 [SENSe1:]FREQuency:RANGe

Description:	**Select the fixed range for frequency measurements**
Syntax:	[SENSe1:]FREQuency:RANGe {<range>|MIN|MAX}[,(@XXX)] [SENSe1:]FREQuency:RANGe? [{MIN|MAX|DEF}][,(@XXX)]
Parameters:	<range>:{100m|1|10|100|750}
Examples:	FREQ:RANG 10 Set frequency range of the current channel to 10V

6.3.17 [SENSe1:]FREQuency:RANGe:AUTO

Description:	**Set auto range for frequency measurement**
Syntax:	[SENSe1:]FREQuency:RANGe:AUTO {ON|OFF}[,(@XXX)] [SENSe1:]FREQuency:RANGe:AUTO? [(@XXX)]
Parameters:	{ON|1|OFF|0}
Examples:	FREQ:RANG:AUTO ON Set frequency auto range of the current channel to ON

6.3.18 [SENSe1:]FREQuency:BANDwidth

Description:	**Set AC filter cutoff frequency for frequency measurement.** **The instrument uses three different AC filters that allow you to optimize low-frequency accuracy or reduce the AC settling time after changing the input signal amplitude. Based on the cutoff frequency specified by this command, the instrument selects a slow (3 Hz), medium (20 Hz), or fast (200 Hz) filter. Specify the lowest frequency you want to capture. Lower frequencies result in longer stabilization times.**
Syntax:	[SENSe1:]FREQuency:BANDwidth {<filter>|MIN|MAX}[,(@XXX)] [SENSe1:]FREQuency:BANDwidth [(@XXX)]
Parameters:	<filter>:{3|20|200}. Default value: 20
Examples:	FREQ:AC:BAND 200 Set frequency filter if the current channel to 200Hz

6.3.19 [SENSe1:]FREQuency:MODE

Description:	**Set the display mode for frequency measurement**
Syntax:	[SENSe1:]FREQuency:MODE {<mode>}[,(@XXX)]

	[SENSe1:]FREQuency:MODE [(@XXX)]
Parameters:	<mode> period Display period value frequency Display frequency value
Examples:	FREQ:MODE frequency Set the current channel frequency display mode to frequency display mode

6.3.20 [SENSe1:]CAP:RANGe

Description:	**Select fixed range for capacitance measurement**
Syntax:	[SENSe1:]CAP:RANGe {<range>|MIN|MAX}[,(@XXX)] [SENSe1:]CAP:RANGe? [{MIN|MAX|DEF}][,(@XXX)]
Parameters:	<range>:{1n|10n|100n|1u|10u|100u|1m|10m}
Examples:	CAP:RANG 10 Set capacitance range of the current channel to 10V

6.3.21 [SENSe1:]CAP:RANGe:AUTO

Description:	**Set auto range for capacitance measurement**
Syntax:	[SENSe1:]CAP:RANGe:AUTO {ON|OFF}[,(@XXX)] [SENSe1:]CAP:RANGe:AUTO? [(@XXX)]
Parameters:	{ON|1|OFF|0}
Examples:	CAP:RANG:AUTO ON Set capacitance auto-range of the current channel to ON

6.3.22 [SENSe1:]{DIODe|CONTinuity}:THReshold

Description:	**Set thresholds for conduction and diode measurements**
Syntax:	[SENSe1:]{DIODe|CONTinuity}:THReshold {<threshold>}[,(@XXX)] [SENSe1:]{DIODe|CONTinuity}:THReshold? [(@XXX)]
Parameters:	<threshold> Threshold
Examples:	CONT:THR 10 Set conduction threshold of the current channel to 10Ω

6.3.23 [SENSe1:]TEMP:NPLC

Description:	**Set measuring speed for temperature measurement**
Syntax:	[SENSe1:]TEMP:NPLC {<plc>|MIN|MAX}[,(@XXX)] [SENSe1:]TEMP:NPLC? [(@XXX)]
Parameters:	<plc>:{0.02|0.2|1|10|100}
Examples:	RES:NPLC 10 Set temperature measurement speed of the current channel to 10 plc.

6.3.24 [SENSe1:]TEMP:AZERo[:STATe]

Description:	**Set auto zero for temperature measurement**
Syntax:	[SENSe1:]TEMP:AZERo[:STATe] {ON|OFF}[,(@XXX)]

	[SENSe1:]TEMP:AZERo[:STATe] [(@XXX)]
Parameters:	{ON|1|OFF|0}
Examples:	TEMP:AZER:STAT ON Set temperature auto zero of the current channel to ON.

6.3.25 [SENSe1:]TEMP:TRANsducer

Description:	**Select the sensor type for temperature measurement**
Syntax:	[SENSe1:]TEMP:TRANsducer {<transducer>}[,(@XXX)] [SENSe1:]TEMP:TRANsducer? [(@XXX)]
Parameters:	<transducer>: {TCouple|THERmistor|RTD|TRTD|FRTD} TCouple Thermocouple THERmistor Thermistor RTD Platinum resistance - 2-wire TRTD Platinum resistance - 3-wire FRTD Platinum resistance - 4 wire
Examples:	TEMP:TRAN RTD Set the current channel temperature sensor to 2-wire platinum resistance

6.3.26 [SENSe1:]TEMP:TCouple

Description:	**Select thermocouple type for temperature measurement**
Syntax:	[SENSe1:]TEMP:TCouple {<tc>}[,(@XXX)] [SENSe1:]TEMP:TCouple? [(@XXX)]
Parameters:	<tc>: { B|E|J|K|N|R|S|T }
Examples:	TEMP:TC B Set temperature thermocouple of the current channel to type B

6.3.27 [SENSe1:]TEMP:TCouple:RJUNction:SIMulated

Description:	**Set thermocouple cold end compensation for temperature measurement**
Syntax:	[SENSe1:]TEMP:TCouple:RJUNction:SIMulated {< simulated >}[,(@XXX)] [SENSe1:]TEMP:TCouple:RJUNction:SIMulated? [(@XXX)]
Parameters:	< simulated >
Examples:	TEMP:TC:RJUN:SIM 23 Set temperature thermocouple cold end compensation of the current channel to 23°C

6.3.28 [SENSe1:]TEMP:TCouple:RJUNction:AUTO

Description:	**Setting the cold end compensation temperature auto mode for temperature measurement**
Syntax:	[SENSe1:]TEMP:TCouple:RJUNction:AUTO {ON|OFF}[,(@XXX)] [SENSe1:]TEMP:TCouple:RJUNction: AUTO? [(@XXX)]
Parameters:	{ON|1|OFF|0}

Examples:	TEMP:TC:RJUN:AUTO ON Set the current channel cold end compensation temperature to turn on automatically

6.3.29 [SENSe1:]TEMP:THERmistor:R25

Description:	**Set thermistor R25 for temperature measurement**
Syntax:	[SENSe1:]TEMP:THERmistor:R25 {<r25>}[,(@XXX)] [SENSe1:]TEMP:THERmistor:R25? [(@XXX)]
Parameters:	<r25>
Examples:	TEMP:THER:R25 10k Set temperature thermistor R25 of the current channel to 10k

6.3.30 [SENSe1:]TEMP:THERmistor:B

Description:	**Set thermistor B for temperature measurement**
Syntax:	[SENSe1:]TEMP:THERmistor:B {<b>}[,(@XXX)] [SENSe1:]TEMP:THERmistor:B? [(@XXX)]
Parameters:	<b>
Examples:	TEMP:THER:B 3.435k Set temperature thermistor B of the current channel to 3.435k

6.3.31 [SENSe1:]TEMP:RTD:STANdard

Description:	**Select platinum resistance standard for temperature measurement**
Syntax:	[SENSe1:]TEMP:RTD:STANdard {<standard>}[,(@XXX)] [SENSe1:]TEMP:RTD:STANdard? [(@XXX)]
Parameters:	< standard >: { PT100|PT385 }
Examples:	TEMP:RTD:STAN PT100 Set temperature thermocouple of the current channel to type B

6.4 TRIGger Subsystem

6.4.1 ABORt

Description:	**Terminate the measurement in progress and return the instrument to the triggered idle state**
Syntax:	ABORt
Parameters:	(none)
Examples:	Terminate the measurement in progress: ABORt

6.4.2 *TRG

Description:	**Trigger a measurement. If the scan queue is not empty, a scan test is triggered.**

Syntax:	*TRG [(@XXX)]
Parameters:	(none)
Examples:	*TRG (@201)

6.4.3 FETCh?

Description:	**Wait for the measurement to complete and send all the results to the user.** **The FETCh? query does not erase measurements from the readout memory. You can send the query multiple times to retrieve the same data.**
Syntax:	FETCh？ [n]
Parameters:	(none)
Examples:	Combine *TRG with FETCh? FUNC VOLT:DC *TRG FETC? Typical response: -4.98748741E-01

6.4.4 READ?

Description:	**Start a new set of measurements, wait for all measurements to be completed and transmit all available measurements. Sending READ? is similar to sending *TRG;:FETCh?. Trigger a scan test if the scan queue is non-empty.**
Syntax:	READ? [(@XXX)]
Parameters:	(none)
Examples:	Remove the measurement from the reading memory: READ? Typical response: -4.98748741E-01

6.4.5 TRIGger:SOURce

Description:	**Set the trigger source.**
Syntax:	TRIGger:SOURce <source> TRIGger:SOURce?
Parameters:	<source>:{ CONTinue|MANual|BUS }
Examples:	TRIG:SOUR BUS Set the trigger mode to bus trigger

6.4.6 TRIGger:COUNt

Description:	**Set the number of triggers. You can specify the number of triggers for different channels**
Syntax:	TRIGger:COUNt <count>,[,(@XXX)] TRIGger:COUNt? [(@XXX)]
Parameters:	<count>
Examples:	TRIG:COUN 10 Set the number of triggers to 10

6.4.7 TRIGger: DELay

Description:	**Set the trigger delay**
Syntax:	TRIGger:DELay <s>,[,(@XXX)] TRIGger:DELay? [(@XXX)]
Parameters:	<count>
Examples:	TRIG:DEL 1 Sets the trigger delay to 1 second

6.5 ROUTe Subsystem

6.5.1 ROUTe:SCAN[:CREAte]

Description:	**Create a scan list**
Syntax:	ROUTe:SCAN[:CREAte] (@XXX)
Parameters:	
Examples:	ROUT:SCAN (@101:110) Create a scan list of channels 101 through 110

6.5.2 ROUTe:SCAN:ADD

Description:	**Add channels to the current scan list**
Syntax:	ROUTe:SCAN:ADD (@XXX)
Parameters:	
Examples:	ROUT:SCAN:ADD (@120) Add 120 channels to the current scan list

6.5.3 ROUTe:SCAN:COUNt

Description:	**Set the number of scanning cycles**
Syntax:	ROUTe:SCAN:COUNt {<count>} ROUTe:SCAN:COUNt?
Parameters:	<count>
Examples:	ROUT:SCAN:COUN 2 Set the scanning cycle 2 times

6.5.4 ROUTe:SCAN:CLEAr

Description:	**Clear the scan list**
Syntax:	ROUTe:SCAN:CLEAr
Parameters:	(none)
Examples:	ROUT:SCAN:CLEA Clear the scan list

6.5.5 ROUTe:SCAN:LOOP:DELAy

Description:	**Setting the loop delay**
Syntax:	ROUTe:SCAN:LOOP:DELay {s}
Parameters:	s Delay time
Examples:	ROUT:SCAN:LOOP:DEL 0.1 Set loop delay 100ms

6.6 CALCulate Subsystem

Configure the math operation for the specified measurement function (<function>) of the specified channel.

<function>:

VOLTage[:DC]|CURRent[:DC]|VOLTage:AC|CURRent:AC|CONTinuity|DIODe|RESistance|FRESistance|FREQuency|TEMPerature| CAPacitance|VOLTage[:DC]:RATio

6.6.1 CALCulate:{<function>}:{LIMit1|LIMit2}:STATe

Description:	**Set switch status of the limit value function**
Syntax:	CALCulate:{<function>}:{LIMit1|LIMit2}:STATe {ON|OFF}[,(@XXX)] CALCulate:{<function>}:{LIMit1|LIMit2}:STATe? (@XXX)
Parameters:	
Examples:	CALC:VOLT:DC:LIM1:STAT ON Turn on the DC voltage limit 1 function of the current channel

6.6.2 CALCulate:{<function>}:{LIMit1|LIMit2}:FAIL?

Description:	**Query if the limit is exceeded**
Syntax:	CALCulate:{<function>}:{LIMit1|LIMit2}:FAIL? (@XXX)
Parameters:	Return: NONE|LOW|HIGH|BOTH
Examples:	CALC:VOLT:DC:LIM1:FAIL? Query whether DC voltage of the current channel exceeds the limit.

6.6.3 CALCulate:{<function>}:{LIMit1|LIMit2}:BEEP

Description:	**Set the limit buzzer function**
Syntax:	CALCulate:{<function>}:{LIMit1|LIMit2}:BEEP {ON|OFF}[,(@XXX)] CALCulate:{<function>}:{LIMit1|LIMit2}:BEEP? (@XXX)
Parameters:	
Examples:	CALC:VOLT:DC:LIM1:BEEP ON Turn on the current channel DC voltage over-limit is the buzzer alarm function

6.6.4 CALCulate:{<function>}:{LIMit1|LIMit2}:CLEAr:AUTO

Description:	**Set the buzzer auto-clear function**

Syntax:	CALCulate:{<function>}:{LIMit1|LIMit2}:CLEAr:ATUO {ON|OFF}[,(@XXX)] CALCulate:{<function>}:{LIMit1|LIMit2}:CLEAr:ATUO? (@XXX)
Parameters:	
Examples:	CALC:VOLT:DC:LIM1:CLEAr:ATUO ON Turn on the DC voltage auto-clear over-limit alarm function of the current channel

6.6.5 CALCulate:{<function>}:{LIMit1|LIMit2}:{LOWer|UPPer}:DATA

Description:	**Set the upper or lower limit**
Syntax:	CALCulate:{<function>}:{LIMit1|LIMit2}:{LOWer|UPPer}:DATA {data}[,(@XXX)] CALCulate:{<function>}:{LIMit1|LIMit2}:{LOWer|UPPer}:DATA? (@XXX)
Parameters:	
Examples:	CALC:VOLT:DC:LIM1:LOW:DATA 10 Set DC voltage lower limit of the current channel to 10V

6.6.6 CALCulate:{<function>}:MATH:STATe

Description:	**Set the switch state of the math operation function**
Syntax:	CALCulate:{<function>}:MATH:STATe {ON|OFF}[,(@XXX)] CALCulate:{<function>}:MATH:STATe? (@XXX)
Parameters:	
Examples:	CALC:VOLT:DC:MATH:STAT ON Turn on the DC voltage math operation function of the current channel

6.6.7 CALCulate:{<function>}:MATH:MBFactor

Description:	**Set the math operation function b value, the operation formula is v= mx+b, x is the measured value, v is the output value**
Syntax:	CALCulate:{<function>}:MATH:MBFactor {b}[,(@XXX)] CALCulate:{<function>}:MATH:MBFactor? (@XXX)
Parameters:	
Examples:	CALC:VOLT:DC:MATH:MB 20 Set DC voltage b value of the current channel to 20

6.6.8 CALCulate:{<function>}:MATH:MMFactor

Description:	**Set the math operation function m value, the operation formula is v= mx+b, x is the measured value, v is the output value**
Syntax:	CALCulate:{<function>}:MATH:MMFactor {m}[,(@XXX)] CALCulate:{<function>}:MATH:MMFactor? (@XXX)
Parameters:	
Examples:	CALC:VOLT:DC:MATH:MM 2 Set DC voltage m value of the current channel to 2

6.6.9 CALCulate:{<function>}:RELative

Description:	**Set the relative value**
Syntax:	CALCulate:{<function>}:RELative {rel}[,(@XXX)] CALCulate:{<function>}:RELative? (@XXX)
Parameters:	
Examples:	CALC:VOLT:DC:REL 2.1 Set DC voltage relative value of the current channel to 2.1

6.6.10 CALCulate:{<function>}:RELative:STATe

Description:	**Set the relative switch state**
Syntax:	CALCulate:{<function>}:RELative:STATe {ON|OFF}[,(@XXX)] CALCulate:{<function>}:RELative:STATE? (@XXX)
Parameters:	
Examples:	CALC:VOLT:DC:REL:STAT ON Turn on the DC voltage relative function of the current channel

6.7 SYSTem Subsystem

6.7.1 SYSTem:LANGuage

Description:	**Set the system language**
Syntax:	SYSTem:LANGuage {language} SYSTem:LANGuage?
Parameters:	{Chinese English
Examples:	SYST:LANGuage Chinese Set the system language to Chinese

6.7.2 SYSTem:BEEP

Description:	**Set the buzzer status**
Syntax:	SYSTem:BEEP {ON|OFF} SYSTem:BEEP?
Parameters:	
Examples:	SYST:BEEP ON Turn on the buzzer.

6.7.3 SYSTem:POW

Description:	**Set the power-on initialization state**
Syntax:	SYSTem:POW {pow} SYSTem:POW?

Parameters:	{pow} LAST Initialize to the state at last shutdown FACTory Initialize to factory mode
Examples:	SYST:POW LAST Initialize power-up to last

6.7.4 SYSTem:PRECision

Description:	**Set the display accuracy**
Syntax:	SYSTem:PRECision {prec} SYSTem:PRECision?
Parameters:	{ prec }AUTO|3|4|5|6
Examples:	SYST:PREC 5 Display accuracy of 5 digits

6.7.5 SYSTem:DATE

Description:	**Set the date**
Syntax:	SYSTem:DATE {date} SYSTem:DATE?
Parameters:	{ data } yyyyy,mm,dd
Examples:	SYST:DATE 2023,12,29 Set the date to December 29, 2023

6.7.6 SYSTem:TIME

Description:	**Set the time**
Syntax:	SYSTem:TIME {time} SYSTem:TIME?
Parameters:	{ time } hh,mm,ss
Examples:	SYST:TIME 14,34,24 Set the time to 14:34:24

6.7.7 SYSTem:Communication:LAN:DHCP

Description:	**Set the DHCP switch**
Syntax:	SYSTem:Communication:LAN:DHCP {ON|OFF} SYSTem:Communication:LAN:DHCP?
Parameters:	
Examples:	SYST:COMM:LAN:DHCP ON Turn on the DHCP function

6.7.8 SYSTem:COMMunication:LAN:MACaddress?

Description:	**Query mac address**
Syntax:	SYSTem:COMMunication:LAN:MACaddress?

Parameters:	
Examples:	SYST:COMM:LAN: MAC?

6.7.9 SYSTem:Communication:LAN:PORT

Description:	**Set the port number**
Syntax:	SYSTem:COMMunication:LAN:PORT {port} SYSTem:Communication:LAN:PORT?
Parameters:	
Examples:	SYST:COMM:LAN:PORT 45454 Set the port number to 45454

6.7.10 SYSTem:Communication:LAN:IP

Description:	**Set the IP address**
Syntax:	SYSTem:Communication:LAN:IP {IP} SYSTem:Communication:LAN:IP?
Parameters:	
Examples:	SYST:COMM:LAN:IP 192.168.1.100 Set the IP address to 192.168.1.100

6.7.11 SYSTem:Communication:LAN:SUBnet

Description:	**Set the subnet mask address**
Syntax:	SYSTem:Communication:LAN:SUBnet { subnet } SYSTem:Communication:LAN:subnet?
Parameters:	
Examples:	SYST:COMM:LAN:SUB 255.255.255.0 Set the SUBNET address to 255.255.255.0

6.7.12 SYSTem:Communication:LAN:GATEway

Description:	**Set the gateway address**
Syntax:	SYSTem:COMMunication:LAN:gateway { gateway } SYSTem:Communication:LAN:gateway?
Parameters:	
Examples:	SYST:COMM:LAN:GATE 192.168.1.1 Set the GATEWAY address to 192.168.1.1

6.7.13 SYSTem:Communication:RS232:BAUDrate

Description:	**Set the serial port baud rate**
Syntax:	SYSTem:Communication:RS232:BAUDrate { baud } SYSTem:Communication:RS232:BAUDrate?

Parameters:	{ baud } 4800|9600|19200|38400|57600|115200
Examples:	SYSTem:Communication:RS232:BAUD 115200 Set the serial port baud rate to 115200

6.7.14 SYSTem:Communication:RS232:DATAbits

Description:	**Set the serial port data bits**
Syntax:	SYSTem:Communication:RS232:DATAbits { data } SYSTem:Communication:RS232:DATAbits?
Parameters:	{ data } 5|6|7|8
Examples:	SYSTem:Communication:RS232:DATA 8 Set the serial port data bits to 8

6.7.15 SYSTem:Communication:RS232:PARity

Description:	**Set the serial port parity bit**
Syntax:	SYSTem:COMMunication:RS232:PARity { parity } SYSTem:Communication:RS232:PARity?
Parameters:	{ parity } NULL|EVEN|ODD|SPACE|MARK
Examples:	SYSTem:Communication:RS232:PAR NULL Set serial port parity bit to NULL

6.7.16 SYSTem:Communication:RS232:STOPbits

Description:	**Set the serial port stop bits**
Syntax:	SYSTem:COMMunication:RS232:STOPbits { stop } SYSTem:COMMunication:RS232:STOPbits?
Parameters:	{ stop } OneStop|TwoStop|OneAndHalfStop
Examples:	SYSTem:Communication:RS232:STOP OneStop Set the serial port stop bit to OneStop

Chapter 7 Appendice

7.1 Package

Instruments should be shipped with the following items:

serial number	name (of a thing)	quantities
1	TH2554 Data Collector	1 unit
2	Three-wire power cord✓	1 root
3	1A Fuse✓	2 pieces
4	instruction manual	1 copy
5	Test Report	1 copy
6	warranty	1 sheet

After the user receives the instrument, please check the above contents when unpacking and inspecting. If any item is missing, please contact our company or the sales department immediately.

7.2 Warranty

Warranty period: The warranty period is one year from the date of shipment from the company for users who purchased the instrument from the company, and from the date of shipment from the business department for users who purchased the instrument from the business department. The warranty card for the instrument should be presented for warranty service. During the warranty period, if the instrument is damaged due to improper operation by the user, the user will bear the repair costs. The company is responsible for repairing the instrument for the lifetime of the instrument.

The repair of this instrument requires professional technical personnel; please do not replace the internal components of the instrument without authorization during the repair. After the instrument is repaired, it needs to be re-measured and calibrated to avoid affecting the test accuracy. Damage to the instrument caused by the user's blind repair or replacement of instrument parts is not covered by the warranty, and the user shall bear the repair costs.

The instrument should be protected from sunlight and moisture, and it should be used correctly in the environment described in 1.2.

If the instrument is not used for a long time, it should be packaged and sealed in the original box.