General Warranty

Lilliput warrants that the product will be free from defects in materials and workmanship for a period of 3 years (1 year for accessories) from the date of purchase of the product by the original purchaser from the Lilliput Company. This warranty only applies to the original purchaser and is not transferable to the third party. If the product proves defective during the warranty period, Lilliput either will repair the defective product without charge for parts and labor, or will provide a replacement in exchange for the defective product. Parts, modules and replacement products used by Lilliput for warranty work may be new or reconditioned like new performance. All replaced parts, modules and products become the property of Lilliput.

In order to obtain service under this warranty, Customer must notify Lilliput of the defect before the expiration of the warranty period. Customer shall be responsible for packaging and shipping the defective product to the service center designated by Lilliput, and with a copy of customer proof of purchase.

This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate maintenance and care. Lilliput shall not be obligated to furnish service under this warranty a) to repair damage resulting from attempts by personnel other than Lilliput representatives to install, repair or service the product; b) to repair damage resulting from improper use or connection to incompatible equipment; c) to repair any damage or malfunction caused by the use of non-Lilliput supplies; or d) to service a product that has been modified or integrated with other products when the effect of such modification or integration increases the time or difficulty of servicing the product.

Table of Contents

1. Safety Information

Safety Terms and Symbols

Safety Terms

Terms in this Manual. The following terms may appear in this manual:

Warning: Warning indicates the conditions or practices that could result in injury or loss of life.

Caution: Caution indicates the conditions or practices that could result in damage to this product or other property.

Terms on the Product. The following terms may appear on this product:

Danger: It indicates an injury or hazard may immediately happen.

Warning: It indicates an injury or hazard may be accessible potentially.

Caution: It indicates a potential damage to the instrument or other property might occur.

Safety Symbols

Symbols on the Product. The following symbol may appear on the product:

⎓	Direct current (DC)	⚡	Warning, risk of electric shock
~	Alternating current (AC)	⚠	Caution, risk of danger (refer to this manual for specific Warning or Caution information)
⎓~	Both direct and alternating current	CE	Conforms to European Union directives
⏚	Ground terminal	⏚	Chassis Ground
CAT I (1000V)	IEC Measurement Category I. The maximum measurable voltage is 1000 Vpk in the HI -LO terminal.		
CAT II (600V)	IEC Measurement Category II. Inputs may be connected to AC mains power (up to 600 VAC) under Category II overvoltage conditions.		
	This product complies with the WEEE Directive (2002/96/EC) marking equipment. The affixed product label indicates that you must not discard this electrical/electronic product in domestic household waste.		

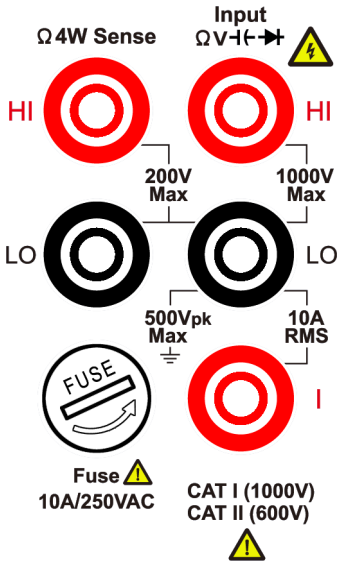
General Safety Requirements

Before any operations, please read the following safety precautions to avoid any possible bodily injury and prevent this product or any other products connected from damage. In order to avoid any contingent danger, this product is only used within the range specified.

- Check AC power input setting according to the standards in your own country (see page 10, *AC Power Input Setting*).
- **Use Proper Power Cord.** Use only the power cord supplied with the product and certified to use in your country.
- **Product Grounded.** This instrument is grounded through the power cord grounding conductor. To avoid electric shock, the grounding conductor must be grounded. The product must be grounded properly before any connection with its input or output terminal.
- **Limit operation to the specified measurement category, voltage, or amperage ratings.**
- **Check all Terminal Ratings.** To avoid instrument damage and the risk of electric shock, check all the Measurement Limits and markers of this product. Refer to the user's manual for the Measurement Limits before connecting to the instrument. Do not exceed any of the Measurement Limits defined in the following section.
- **Do not operate without covers**. Do not operate the instrument with covers or panels removed.
- **Use Proper Fuse.** Use only the specified type and rating fuse for this instrument.
- **Avoid exposed circuit**. Do not touch exposed junctions and components when the instrument is powered.
- **Do not operate if in any doubt.** If you suspect damage occurs to the instrument, have it inspected by qualified service personnel before further operations.
- **Use your instrument in a well-ventilated area.** Inadequate ventilation may cause increasing of temperature or damages to the device. Please keep well ventilated and inspect the intake regularly.
- **Do not operate in wet conditions.** In order to avoid short circuiting to the interior of the device or electric shock, please do not operate in a humid environment.
- **Do not operate in an explosive atmosphere.**
- **Keep product surfaces clean and dry.**
- **Only the qualified technicians can implement the maintenance.**

Measurement Limits

The protection circuitry of the multimeter can prevent damage to the instrument and protect against the danger of electric shock, when the Measurement Limits are not exceeded. To ensure safe operation of the instrument, do not exceed the Measurement Limits shown on the front panel, it is defined as follows:



The user-replaceable 10 A current-protection fuse is on the front panel. To maintain protection, replace fuse only with fuse of the specified type and rating. About the specified type and rating of the fuse, please refer to "7 Current Terminal Fuse" in "Front panel overview" on page 7.

Main Input Terminals (HI Input and LO Input) Measurement Limits

The HI and LO input terminals are used for voltage, resistance, continuity, frequency (period), capacitance, diode, and temperature test measurements. Two Measurement Limits are defined for these terminals:

- **HI Input to LO Input Measurement Limit**

  The Measurement Limit from HI Input to LO Input is 1000 VDC or 750 VAC, which is also the maximum voltage measurement. This limit can also be expressed as 1000 Vpk maximum.

- **LO Input to Ground Measurement Limit**

  The LO input terminal can safely "float" a maximum of 500 Vpk relative to ground, where ground is defined as the Protective Earth Conductor in the AC mains power cord connected to the instrument.

As implied by the above limits, the Measurement Limit for the HI input terminal is a maximum of 1500 Vpk relative to ground when LO Input is at its maximum of 500 Vpk relative to ground.

Current Input Terminal (I) Measurement Limits

The Measurement Limit from the current input terminal (I) to the LO Input terminal is 10 A (DC or AC). Note that the current input terminals will always be at approximately the

same voltage as the LO Input terminal, unless a current protection fuse is open.

Sense Terminals (HI Sense and LO Sense) Measurement Limits

The HI and LO sense terminals are used for four-wire resistance measurements.
The Measurement Limit from HI Sense to LO Input is 200 Vpk.
The Measurement Limit from HI Sense to LO Sense is 200 Vpk.
The Measurement Limit from LO Sense to LO Input is 2 Vpk.

Note: The 200 Vpk limit on the sense terminals is the Measurement Limit. Operational voltages in resistance measurements are much lower – up to ± 12 V in normal operation.

Measurement Category

The safety rating of the multimeter:

1000 V, CAT I
IEC Measurement Category I. The maximum measurable voltage is 1000 Vpk in the HI -LO terminal.

600 V, CAT II
IEC Measurement Category II. Inputs may be connected to AC mains power (up to 600 VAC) under Category II overvoltage conditions.

Measurement category definition

Measurement CAT I applies to measurements performed on circuits not directly connected to the AC mains. Examples are measurements on circuits not derived from the AC mains and specially protected (internal) mains- derived circuits.

Measurement CAT II applies to protect against transients from energy-consuming equipment supplied from the fixed installation, such as TVs, PCs, portable tools, and other household circuits.

Measurement CAT III applies to protect against transients in equipment in fixed equipment installations, such as distribution panels, feeders and short branch circuits, and lighting systems in large buildings.

Measurement CAT IV applies to measurements performed at the source of the low-voltage installation. Examples are electricity meters and measurements on primary over current protection devices and ripple control units.

2. Quick Start

General Inspection

After you get a new multimeter, it is recommended that you should make a check on the instrument according to the following steps:

1. **Check whether there is any damage caused by transportation.**

   If it is found that the packaging carton or the foamed plastic protection cushion has suffered serious damage, do not throw it away first till the complete device and its accessories succeed in the electrical and mechanical property tests.

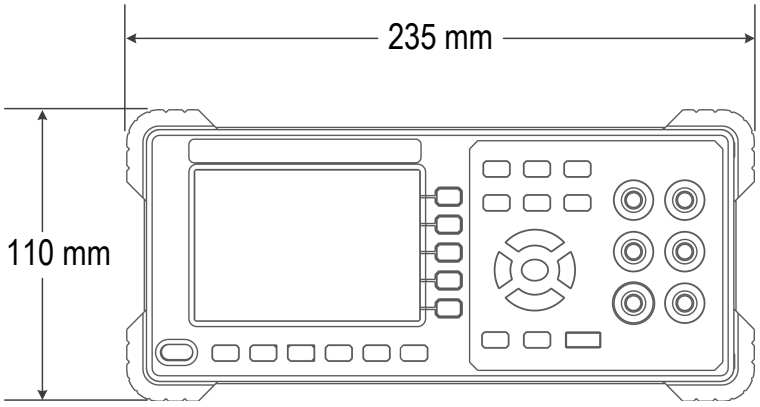
2. **Check the Accessories**

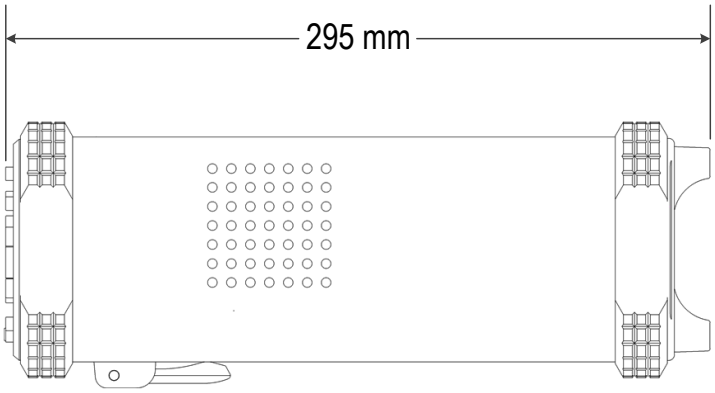
   The supplied accessories have been already described in the *Appendix A: Enclosure* of this Manual. You can check whether there is any loss of accessories with reference to this description. If it is found that there is any accessory lost or damaged, please get in touch with the distributor of Lilliput responsible for this service or the Lilliput's local offices.

3. **Check the Complete Instrument**

   If it is found that there is damage to the appearance of the instrument, or the instrument can not work normally, or fails in the performance test, please get in touch with the Lilliput's distributor responsible for this business or the Lilliput's local offices. If there is damage to the instrument caused by the transportation, please keep the package. With the transportation department or the Lilliput's distributor responsible for this business informed about it, a repairing or replacement of the instrument will be arranged by the Lilliput.

Dimensions





Foot Stool Adjustment

Unfold the foot stool on the bottom of the multimeter.

Front Panel Overview

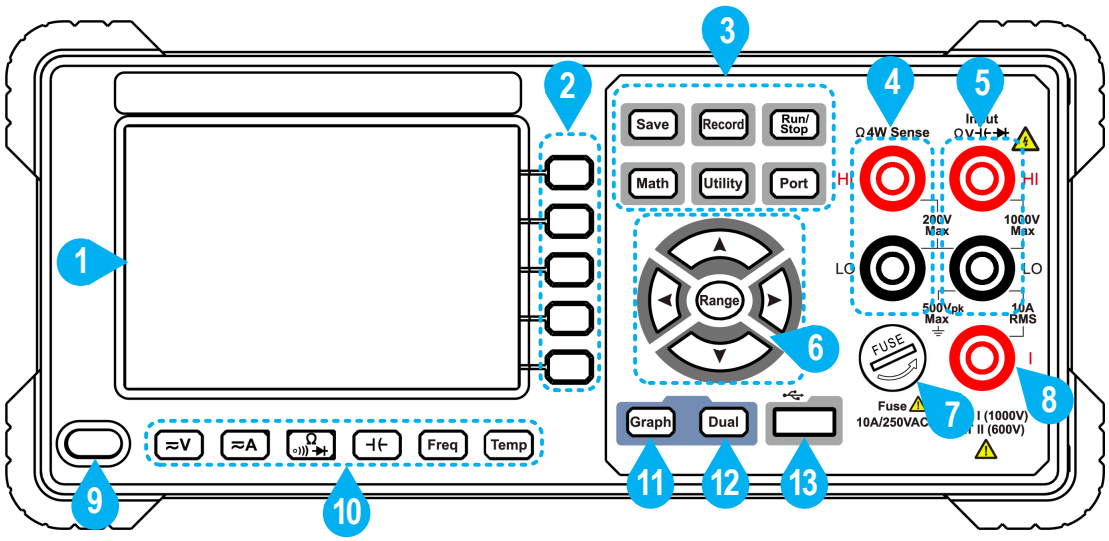


Figure 2-1 Front panel overview

Item	Name	Description
1	**LCD**	Display the user interface
2	**Menu selection Keys**	Activate the corresponding menu
3	**Operation Keys**	
	Save	Collect data in manual logging. The instrument saves current reading in volatile memory each time the **Save** key is pressed. See page 12, *Manual Logging*.
	Record	Enter menus of manual logging and auto logging. See page 12, *Data Logging Function*.
	Run/Stop	Start or stop auto trigger.

	Math	Perform math operations (statistic, limits, dB/dBm, REL) on the measurement results.
	Utility	Set the auxiliary system function, including language, backlight, clock, trigger, set to default, system information, LCD test, key test.
	Port	Set Serial, SCPI, Output connector, Net Type.
4	**HI and LO Sense Terminals**	Signal input terminals, used for four-wire resistance measurements.
5	**HI and LO Input Terminals**	Signal input terminals, used for voltage, resistance, continuity, frequency (period), capacitance, diode, and temperature test measurements.
6	**Range/Direction Keys**	When the Range softkey is shown on the right menu, you can push the Range key to switch between auto and manual range. Push ▲▼ to enable manual range, and increase or decrease the measurement range. When setting a parameter, push ◄► to move the cursor, push ▲▼ to increase or decrease the value.
7	**Current Terminal Fuse**	The rating is 10A, 250 VAC. To replace the fuse: Turn off the multimeter and remove the power cord. Use a flat-blade screw driver to turn the fuse holder counter-clockwise, and pull out the fuse holder. Put the new specified fuse into the fuse holder, and insert the assembly back into the instrument, turning the fuse holder clockwise to lock it in place.
8	**AC/DC Current Input Terminals**	Signal input terminals, used for AC/DC current measurements.
9	**Power button**	Turn on/off the multimeter.
10	**Measurement Function Keys**	≂V DC or AC voltage measurements ≂A DC or AC current measurements Ω Resistance, continuity, and diode measurements ⊣⊢ Capacitance measurements Freq Frequency/Period measurements Temp Temperature measurements

11	**Graph**	Choose what is displayed: number, bar meter, trend chart, or histogram.
12	**Dual**	Push this key to display the function list on the right menu, select a function, if the function is supported, the reading will be displayed in the Vice Display.
13	**USB Port**	Connect with an external USB device, such as connect a USB device to the instrument.

Rear Panel Overview

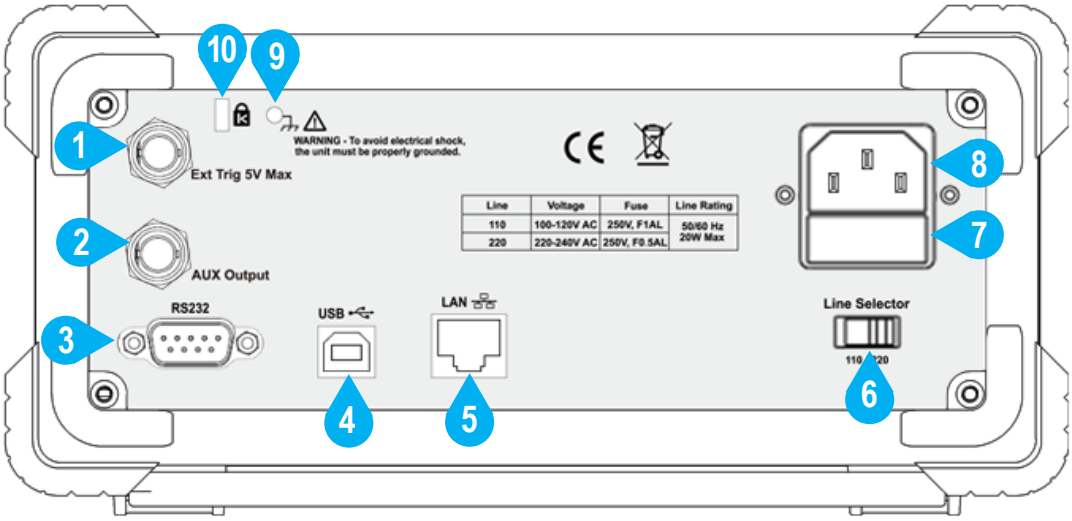


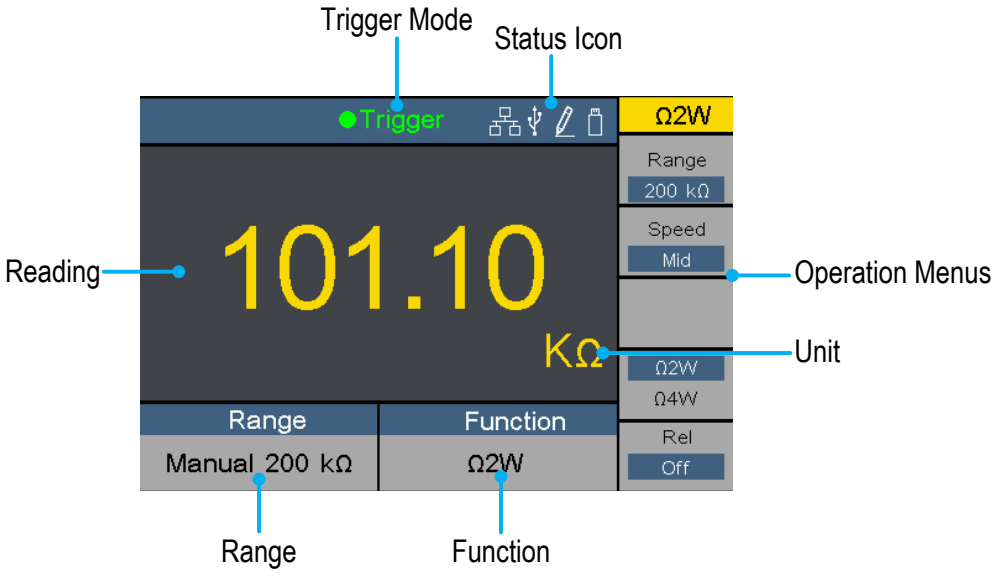
Figure 2-2 Rear panel overview

Item	Name	Description
1	**External Trigger Input**	Trigger the multimeter by connecting a trigger pulse. The external trigger source must be selected. (Utility → Trigger → Source (External))
2	**Auxiliary Output Connector**	Defaults to Voltmeter Measurement Complete Output, outputs a pulse whenever the multimeter finishes taking a measurement to allow you to signal other devices. This connector can also be configured to output a pulse when limits are violated in Math limits function (Port → Output → Output (P/F)).
3	**RS232**	Connect the PC through this interface.
4	**USB (type B) Connector**	This can be used to connect a USB type B controller. Connect with an external device, such as connected to a PC and controlled via PC software.
5	**Local Area Network (LAN) Connector**	The multimeter can be connected to the network for remote control via this connector.

6	**AC Mains Line Voltage Selector**	Select a proper voltage scale according to the AC supply used. Switch between 110 V and 220 V.
7	**Line Fuse**	Use the specified fuse according to the voltage scale. To replace the fuse, see page 16, *Appendix C: Line Fuse Replacement*.
8	**AC Mains Input**	AC mains input connector.
9	**Chassis Ground Screw**	To ground the chassis.
10	**Instrument Cable Lock**	You can lock the instrument to a fixed location using the security lock (please buy it yourself) to secure the instrument.

Voltage	Fuse
100 - 120 V AC	250 V, F1AL
220 - 240 V AC	250 V, F0.5AL

User Interface



Trigger Mode

Display	Description
Trigger	Auto trigger
Ext	External trigger

Status Icon

Icon	Description
	LAN is connected
	Connect as a slave device with PC
	Recording data
	USB memory device is detected

Figure 2-3 User interface (Single display)

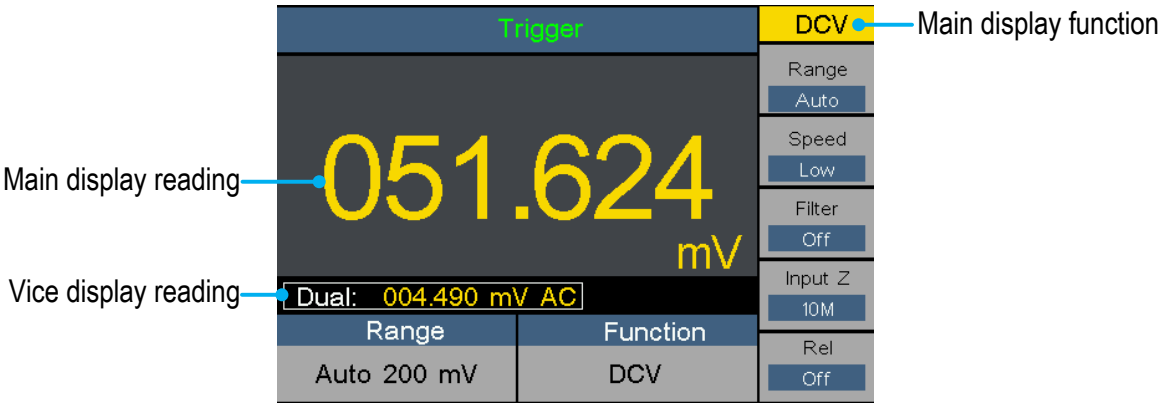


Figure 2-4 User interface (Dual display)

AC Power Input Setting

Adopt 100 - 120 VAC or 220 - 240 VAC power source. Users should regulate the voltage scale of the **AC Mains Line Voltage Selector** according to the standards in their own country (see *Figure 2-2 Rear panel overview*) at the rear panel, and use an appropriate fuse.

Voltage	Fuse
100 - 120 V AC	250 V, F1AL
220 - 240 V AC	250 V, F0.5AL

To change the voltage scale of the instrument, do the following steps:

(1) Turn off the power button at the front panel, and remove the power cord.

(2) Check if the fuse installed before leaving factory (250 V, F0.5AL) can match with the selected voltage scale; if not, change the fuse. (See page 16, *Appendix C: Line Fuse Replacement.*)

(3) Regulate the **AC Mains Line Voltage Selector** to the desired voltage scale.

Power On

(1) Connect the instrument to the AC supply using the supplied power cord.

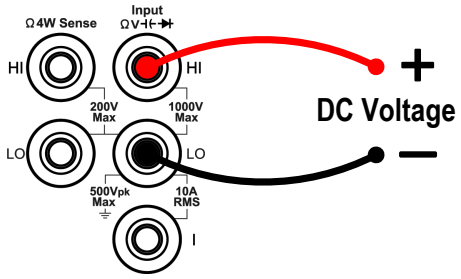
> **Warning:**
> To avoid electric shock, the instrument must be grounded properly.

(2) Press down the **power button** at the front panel, the screen shows the boot screen.

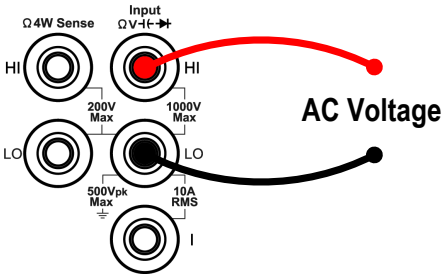
Measurement Connections

After selecting the desired measurement function, please connect the signal (device) under test to the multimeter according to the method below. To avoid instrument damage, do not discretionarily switch the measurement function when measuring.

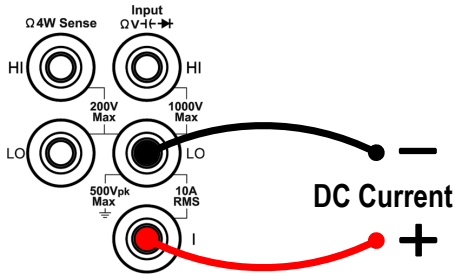
DC Voltage Measurement



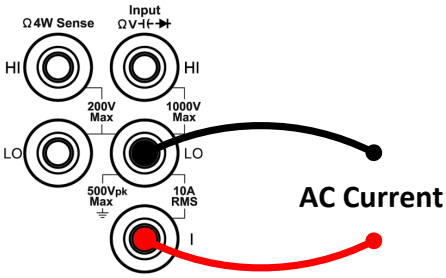
AC Voltage Measurement



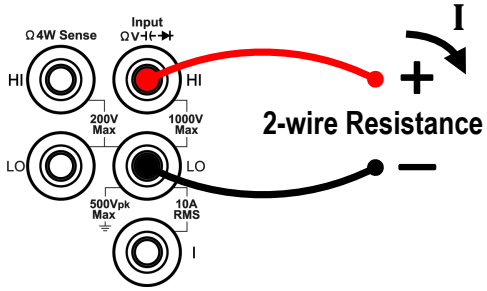
DC Current Measurement



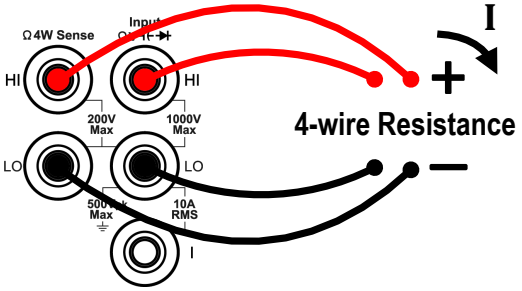
AC Current Measurement



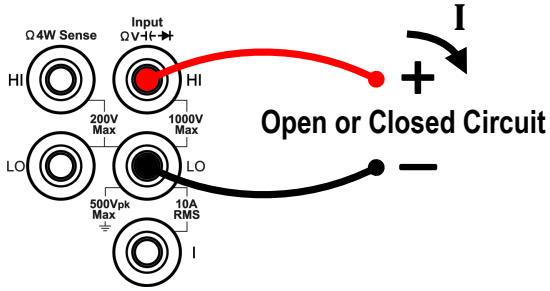
2-wire Resistance Measurement



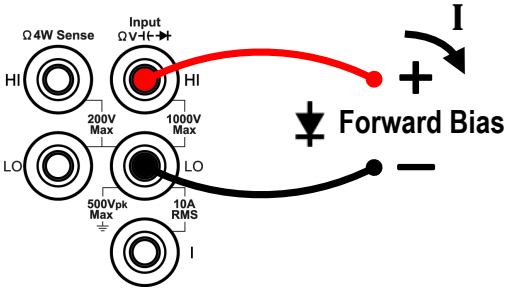
4-wire Resistance Measurement



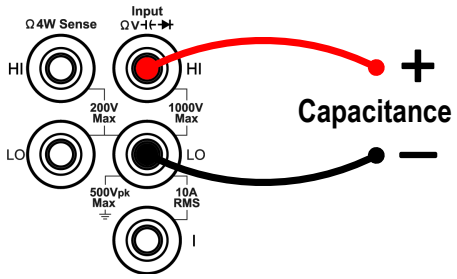
Continuity Test



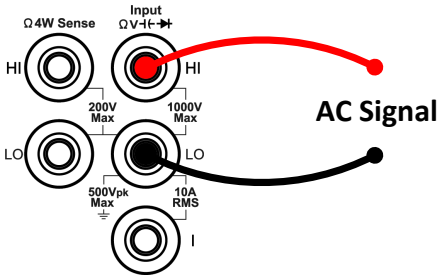
Diode Measurement



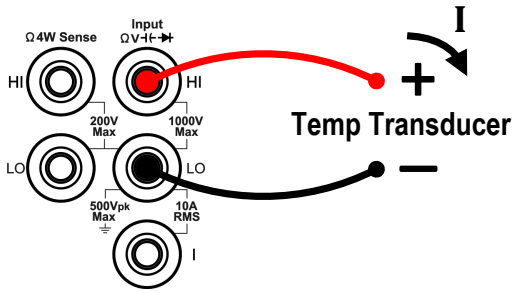
Capacitance Measurement



Frequency/Period Measurement



Temperature Measurement



Data Logging Function

Data logging function includes manual logging and auto logging. You can use any or both functions to log the data.

Manual logging: Press the front panel Save key to save current reading to volatile memory. The maximum number of readings is 1000. Once you have finished collecting data, you can view it in table, and save it to internal or external memory.

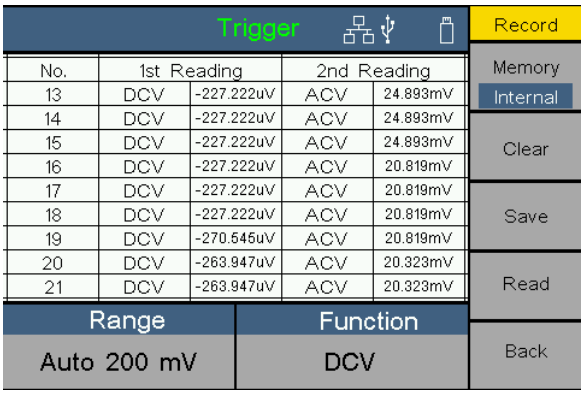
Auto logging: After setting memory, number of readings, sample interval, press the Start softkey to start logging. You can view the data logging measurements in table or graph.

Manual Logging

1. **Collect data**: The instrument saves current reading in volatile memory each time the front panel Save key is pressed.

   Note: The measurement function can be switched during manual logging. When the dual display is enabled, both readings can be logged.

2. **View the manual log in volatile memory**: Press the front panel Record key, press the Manual Log softkey to display the data table. Press ▲▼ keys to turn the page. (When the data table is shown, you can still add records by pressing the Save key.)



3. **Save the manual log in volatile memory**: Press the Memory softkey to select internal or external memory. Press the Save softkey to save the manual log in volatile memory into the specified memory as a CSV file. (The existing file of manual log in the internal or external memory will be overwritten. If you want to keep the existing file, back up it to other location in advance.)

4. **Read the manual log in the specified memory**: Press the Read softkey to read the manual log in the internal or external memory.

5. **Clear the manual log**: Press the Clear softkey to clear current manual log.

Auto Logging

1. **Configure the auto logging parameters**: Press the front panel Record key, press the Settings softkey.

   Press the Memory softkey to select internal or external memory

   Press the Points softkey to specify the total number of readings to log. The range is 1 to 1 M for internal memory, 1 to 100 M for external memory.

   Press the Interval softkey to specify the time interval between readings. The range is 5 ms to 1000 s.

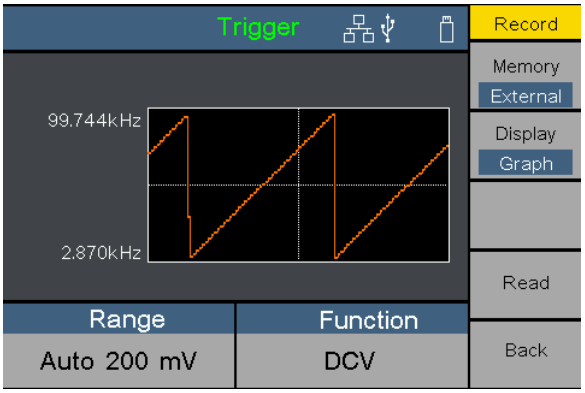
2. **Log data**: Press the Start softkey to start auto logging. Press the Stop softkey to stop logging, the data will be saved in the specified memory as a CSV file. (The existing file of auto log in the internal or external memory will be overwritten. If you want to keep the existing file, back up it to other location in advance.)

   Note:

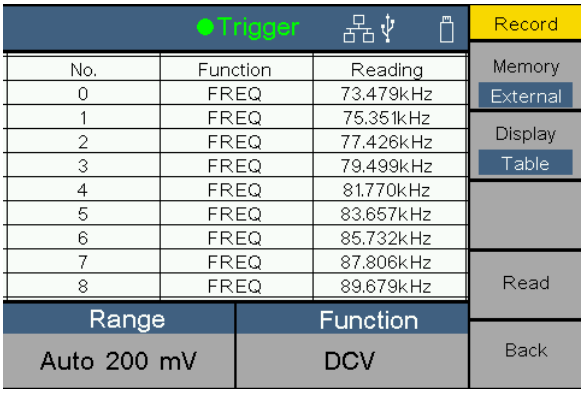
   - When the auto logging mode is running, press another measurement function key, the instrument will display a message "The auto logging mode is running, switching the function will stop auto logging, press the key again to confirm to switch."
     If you want to continue auto logging, just wait until the message disappears.
     If you want to stop auto logging and switch to the function, press the function key again when the message is still displayed. The data logged before switching the function will be saved.
   - When the dual display is enabled, only the reading of main display function can be logged.

3. **Read and view the auto log**: Press the front panel Record key, press the View Log softkey.

Press the Memory softkey to select internal or external memory.
Press the Display softkey to select **Table** or **Graph** to display the readings.
Press the Read softkey to read and view the auto log file in the specified memory. (If the data is viewed in table, press keys to turn the page.)



Auto logging data displayed in graph



Auto logging data displayed in table

Troubleshooting

1. **The instrument is powered on but no Display.**
   1) Check if the power is connected properly.
   2) Check if the AC Mains Line Voltage Selector is in the proper voltage scale.
   3) Check if the line fuse which is below the AC Mains Input is used appropriately and in good condition (see page 16, *Appendix C: Line Fuse Replacement*).
   4) Restart the instrument after the steps above.
   5) If the problem still exists, please contact **LILLIPUT** for our service.
2. **The reading does not change when a current signal is input.**
   1) Check whether the test lead is correctly inserted into the current input terminals (I terminal and LO Input terminal).
   2) Check whether the current terminal fuse at the front panel is burned out.
      Please refer to "7 Current Terminal Fuse" in "Front panel overview" on page 7.
   3) Check whether the DCI or ACI measurement function is enabled.

4) Check whether the DCI measurement function is used to measure AC current.

If you encounter other problems, try to reset the settings or restart the instrument. If it still can not work properly, please contact **LILLIPUT** for our service, and provide your device information. (Utility → Next → System Info)

3. Appendix

Appendix A: Enclosure

(The accessories subject to final delivery.)

Standard Accessories:

Power Cord

Test lead

Alligator clip

USB Cable

Spare Fuses
10A, 250 VAC

Quick Guide

CD Rom

Appendix B: General Care and Cleaning

General Care

Do not store or leave the instrument where the liquid crystal display will be exposed to direct sunlight for long periods of time.

Cleaning

To clean the instrument exterior, perform the following steps:

1. To prevent electrical shock, disconnect the instrument from AC mains power and disconnect all test leads before cleaning.
2. Clean the outside of the instrument using a wet soft cloth not dripping water. Do not make any scuffing when cleaning the LCD screen. To avoid damage to the instrument, do not use any corrosive chemical cleaning agent.

Caution: To avoid any damage to the instrument, do not exposed it to any sprays,

liquids, or solvents.

Warning: Before power on again for operation, it is required to confirm that the instrument has already been dried completely, avoiding any electrical short circuit or bodily injury resulting form the moisture.

Appendix C: Line Fuse Replacement

The line fuse is in the plastic fuse box below the power line input on the rear panel.

Warning: Disconnect the line cord at the rear panel and remove all test leads connected to the instrument before replacing the line fuse. Failure to do so could expose the operator to hazardous voltages that could result in personal injury or death.

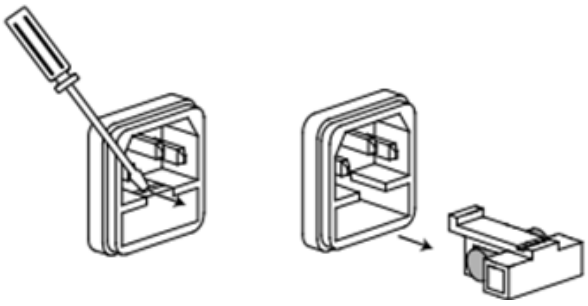
Use only the correct fuse type. Failure to do so could result in personal injury or instrument damage.

Voltage	Fuse
100 - 120 V AC	250 V, F1AL
220 - 240 V AC	250 V, F0.5AL

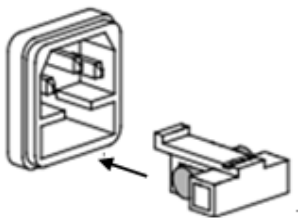
To perform the line fuse replacement, follow these steps:

1. Turn off the multimeter, remove all measurement leads and other cables from the instrument, including the power cord.

2. Use a flat-blade screwdriver to remove the fuse box.



3. Replace the fuse with a new one, which should match with the voltage; install it into the fuse box, and push the fuse box back on to the rear panel.



2016.07 V1.0.0