

OPERATION MANUAL

TH2512B DC Low-Ohm Meter

TONGHUI (CHANGZHOU) Electronic Co., Ltd.

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Contents

Notice.....	3
Warranty.....	3
Safety Precautions.....	3
Chapter 1. Introduction.....	4
1.1 Unpacking and Inspection.....	4
1.2 Product Overview.....	4
1.3 Controls and Indicators.....	4
1.3.1 Controls and Indicators on Front Panel.....	4
1.3.2 Controls and Connectors on Rear Panel.....	5
1.4 Installation.....	6
1.4.1 Power Requirements.....	6
1.4.2 Safety Inspection.....	6
1.5 Specifications.....	6
1.5.1 Resistance Range:.....	6
1.5.2 Measurement Rate.....	6
1.5.3 Trigger.....	6
1.5.4 Range.....	7
1.5.5 Zeroing.....	7
1.5.6 Comparator.....	7
1.5.7 Display.....	7
1.5.8 Beep Alarm.....	7
1.5.9 Unknown Connector.....	7
1.5.10 Dimensions.....	7
1.5.11 Weight.....	7
1.5.12 Environment & Humidity.....	8
1.5.13 Power.....	8
Chapter 2. Operation.....	9
2.1 Startup.....	9
2.2 Display.....	9
2.3 SPEED.....	9
2.4 Comparator Function.....	10
2.5 ZERO.....	10
2.6 RANGE.....	11
2.7 Beeper.....	11

Notice

The material in this manual is for informational purposes only and is subject to change, without notice. Tonghui assumes no responsibility for any error or consequential damage that may result from the misinterpretation of any procedure in this publication.

Warranty

This product is warranted against defects in material and workmanship for a period of one and a half years from the date of shipment. During the warranty period, Tonghui Company will, at its option, either repair or replace products which prove to be defective. For warranty service or repair, this product must be returned to a service facility designated by Tonghui.

The foregoing warranty shall not apply to defects resulting from improper or inadequate maintenance by Buyer, Buyer-supplied software or interfacing, unauthorized modifications for the product, or improper site preparation or maintenance.

No other warranty is expressed or implied. Tonghui specifically disclaims the implied warranties of merchantability and fitness for a particular purpose.

Tonghui shall not be liable for any direct, indirect, special or consequential damages, whether based on contract, tort, or any other legal theory.

Safety Precautions

CAUTION

TH2512B DC low-ohm meter is a low-voltage instrument and provides no more than 1A DC output to the device under test (DUT). Some devices tested (especially capacitors) can store charge and may cause a hazard if not discharged properly. Follow these safety instructions.

1. Operate the TH2512B unit with its chassis connected to earth ground. The instrument is shipped with a three-prong power cord to provide this connection to ground. This power cord should only be plugged in to a receptacle that provides earth ground.
2. Plug the Kelvin low-ohm clip leads into the unknown terminal.
3. Before touching the test lead wires or output terminals, make sure any capacitive device has been fully discharged.
4. In the case of an emergency, turn OFF the POWER switch and disconnect the AC power cord from the wall. Do not touch the TH2512B instrument.

Chapter 1. Introduction

1.1 Unpacking and Inspection

Inspect the shipping carton before opening. If it's damaged, contact the carrier agent immediately. Inspect the instrument for any damage. If the instrument appears damaged or fails to meet specifications, contact Tonghui Company (referring to the manual's front cover to get the contact way) or its local representative. Retain the original shipping carton and packing material for future use such as returning the instrument for recalibration or service.

1.2 Product Overview

TH2512B is a precise low-ohm meter for production or laboratory testing of individual component, materials, printed circuit boards and other resistive items. TH2512B provides seven measurement ranges from 20 mΩ to 20 kΩ over five current ranges from 100 μ A to 1A. The basic measurement accuracy is 0.1%. SLOW or FAST measurement rate is available. The measurement rate in FAST mode can be up to 10 meas/sec. Automatic or Hold Range mode can also be selected. The error induced by the serial resistance of the test leads can be zeroed with the short correction function. TH2512B is equipped with a built-in comparator. Standard Value, High limit and low limit can be set and displayed within the SETUP menu. When sorting function is turned on, the measurement result can be displayed as a direct value or as a percent difference of the standard reference value. Comparison results will be indicated on the front panel. Four-terminal Kelvin connection to the device under test is obtained through the unknown terminal on the front panel.

1.3 Controls and Indicators

1.3.1 Controls and Indicators on Front Panel

Figure 1-1 illustrates the controls and indicators on the front panel of TH2512B. Table 1-1 describes them with names and functions.

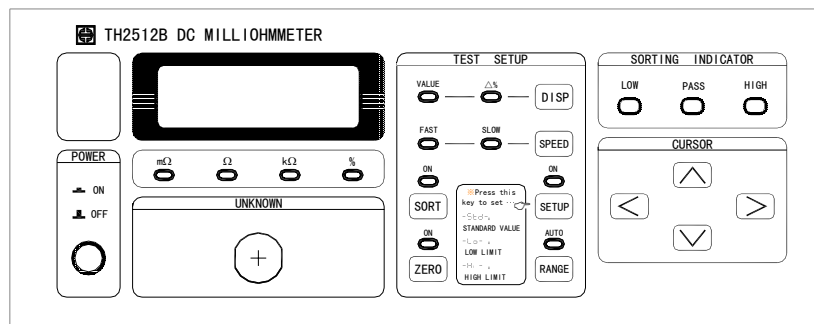


Figure 1-1: Front Panel Overview

Table 1-1: Front Panel Description

NO.	Name	Function
1	Measurement display	Display the measurement result. Display the limit setup information.
2	Unit indicators	Display the current unit.
3	SORT key	Turn on/off the comparison function.
4	DISP key	Select the direct or percent display mode.
5	SPEED key	Set the measurement rate: FAST or SLOW.
6	SORTING INDICATOR	Indicate the comparison results.
7	CURSOR keys	Select a digit to modify. Increase/decrease a digit by 1. Select a measurement range.
8	RANGE key	Set ranging mode: AUTO/HOLD.
9	SETUP key	Comparison parameters setup.
10	ZERO key	Eliminate the lead resistor error.
12	UNKNOWN terminal	Current Drive Terminal, Low (-) Voltage Sense Terminal, Low (-) Voltage Sense Terminal, High (+) Current Drive Terminal, High (+) Shielding Terminal.
13	POWER	POWER ON/OFF switch.

1.3.2 Controls and Connectors on Rear Panel

Figure 1-2 illustrates the controls and connectors on the rear panel of TH2512B DC low-ohm meter. Table 1-2 identifies them with descriptions and functions.

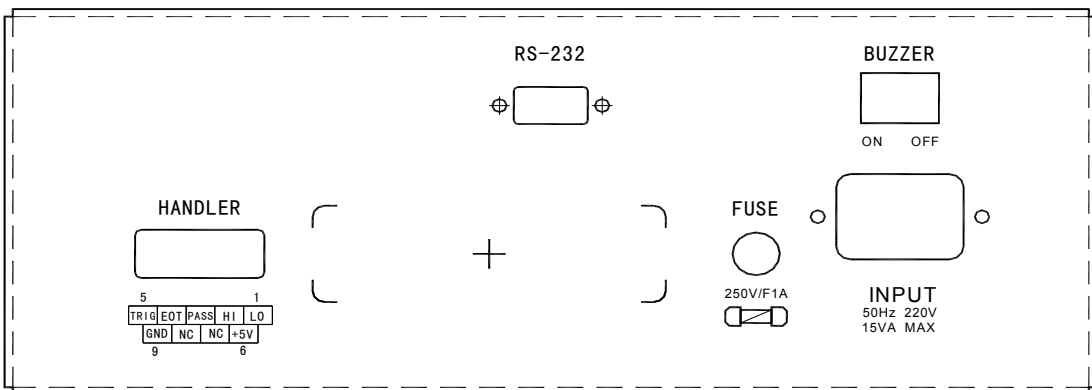


Figure 1-2: Rear Panel Overview

Table 1-2: Rear Panel Description

NO.	Name	Function
1	Buzzer switch	Turn ON/OFF the buzzer
2	AC line input	Connect to AC power source
3	FUSE	Line voltage protection
4	Nameplate	Nameplate for production information.

1.4 Installation

1.4.1 Power Requirements

TH2512B can be operated at the power source from 190V to 250V AC. Power connection is via the rear panel through a standard receptacle. Remember to always use an outlet that has a properly-connected protection ground.

1.4.2 Safety Inspection

Before operating the instrument, inspect the fuse holder on the rear panel to ensure that the properly-rated fuse is in place; otherwise, damage to the unit is possible.

Make sure the instrument is only used with the approved international cord set to ensure that the instrument is provided with connection to protective earth ground.

The surrounding environment should be free from excessive dust to prevent contamination of electronic circuits. The surrounding environment should also be free from excessive vibration. Do not expose the instrument to direct sunlight, extreme temperature or humidity variations, or corrosive chemicals.

1.5 Specifications

1.5.1 Resistance Range:

Range F.S	Resolution	Accuracy	Test I (typical)	Test Voltage
20 m Ω	1 $\mu\Omega$	$\pm 0.1\%$ of rdc+ 3ct	1A	<1.0V DC
200 m Ω	10 $\mu\Omega$	$\pm 0.1\%$ of rdc + 2ct	100mA	
2 Ω	100 $\mu\Omega$	$\pm 0.1\%$ of rdc + 2ct	100mA	
20 Ω	1 m Ω	$\pm 0.1\%$ of rdc + 2ct	10mA	<4.0V DC
200 Ω	10 m Ω	$\pm 0.1\%$ of rdc + 2ct	1mA	
2 k Ω	100 m Ω	$\pm 0.1\%$ of rdc + 2ct	100 μ A	
20 k Ω	1 Ω	$\pm 0.1\%$ of rdc + 2ct	100 μ A	

1.5.2 Measurement Rate

Fast: 10meas/sec
Slow: 2.5meas/sec

1.5.3 Trigger

Manual, Internal or External

1.5.4 Range

Automatic or Manual

1.5.5 Zeroing

Short circuit compensation

1.5.6 Comparator

Three indicators: LOW/PASS/HIGH

Comparator parameters setup: Nominal, Hi and Lo Limits

1.5.7 Display

4 1/2 digits LED display.

1.5.8 Beep Alarm

Beep alarm for PASS can be turned on/off through BUZZER switch on rear panel.

1.5.9 Unknown Connector

Current Drive Low Terminal: D-
Voltage Sense Low Terminal: S-
Voltage Sense High Terminal: D+
Current Drive High Terminal: S+
Shielding Terminal.

1.5.10 Dimensions

W x H x D: 270 mm x 110 mm x 330 mm

1.5.11 Weight

About 4 kg net

1.5.12 Environment & Humidity

Specifications: 10°C to 30°C, <75% RH

Operating: 0°C to 40°C, <85% RH

Storage: -40°C to 75°C, <90% RH

1.5.13 Power

198-242VAC

50Hz/60Hz

Consumption <30VA

Chapter 2. Operation

2.1 Startup

Connect the instrument power cord to the source of proper voltage.

The instrument is to be used only with three-wire grounded outlets.

Power is applied to TH2512B by pressing the red power switch on the front panel to the ON position. TH2512B unit should be warmed up for a period of at least 10 minutes prior to measurements being made.

2.2 Display

TH2512B provides two display modes: "VALUE" and "%".

VALUE: The direct measurement value of the device under test is displayed

%; The difference of the measured value and a previously stored reference value is displayed as a percentage of the reference value.

Perform the following steps to set the display mode.

1. The default display mode is "VALUE", when TH2512 is turned on.
2. "%" mode can only be used when comparison function is turned on.
3. Press **SORT** key to turn on the comparison function and the corresponding led turns on.
4. Press **DISP** key to select the display mode between "VALUE" and "%".
5. If you press **SORT** key to turn off the comparison function. The display mode will be set to "VALUE" mode automatically, despite of the original display mode you select.

2.3 SPEED

TH2512B can be programmed for SLOW (2.5meas/sec), or FAST (10meas/sec). The basic accuracy (0.1%) is specified for the slow measurement speed. The instrument's default setting is SLOW.

Perform the following steps to set the measurement speed.

1. Press **SPEED** key to toggle the measurement speed between FAST and SLOW.
2. FAST or SLOW led flashes after each measurement is finished.

2.4 Comparator Function

With its built-in comparator, TH2512B can sort components under test into PASS, HIGH, or LOW bin and indicate the comparison results on the front panel.

Perform the following steps to set the comparator to on/off.

1. The instrument's default setting is comparator OFF and SORT LED indicator is off.
2. Press **SORT** key to turn on the comparison function, and SORT led is on; Range mode is automatically changed to HOLD, and current measurement range is held.
3. When comparator is ON, the display mode can be selected between "VALUE" and "%". The comparison results are indicated by the LEDs on the front panel.
4. Press **SORT** key again to turn off the comparison function. The range mode is automatically changed to AUTO. The display mode will be set to "VALUE" mode, if the previous display mode is "%".

Perform the following steps to input the comparator parameters.

1. Press **SETUP** key, "-Std-" will be displayed for 1 second, and then the previously stored standard value will be displayed. The SETUP led flashes.
2. The first digit of the current standard value flashes. Use **←** or **→** keys to select a digit to be modified.
3. Use **↑** or **↓** keys to increase or decrease the flashing digit by 1.
4. Press **SETUP** key again, "-Lo-" will be displayed for 1 second, and then the previously stored low limit value will be displayed.
5. The first digit of the current low limit flashes. Use **←** or **→** keys to select a digit to be modified.
6. Use **↑** or **↓** keys to increase or decrease the flashing digit by 1.
7. Press **SETUP** key again, "-Hi-" will be displayed for 1 second, and then the previously stored high limit value will be displayed.
8. The first digit of the high limit value flashes. Use **←** or **→** keys to select a digit to be modified.
9. Use **↑** or **↓** keys to increase or decrease the flashing digit by 1.
10. Press **SETUP** key again, TH2512B will return back to the measurement state and the SETUP led turns off.

2.5 ZERO

Short circuit compensation can be performed on the test leads/fixture by selecting the ZERO function to ON.

Perform the following steps to ZERO the short circuit offset.

1. The default setting is ZERO off.
2. Short the test clips as shown in Figure 2-1, making sure that "S+" and "S-" are connected directly and "D+" and "D-" are also connected directly.

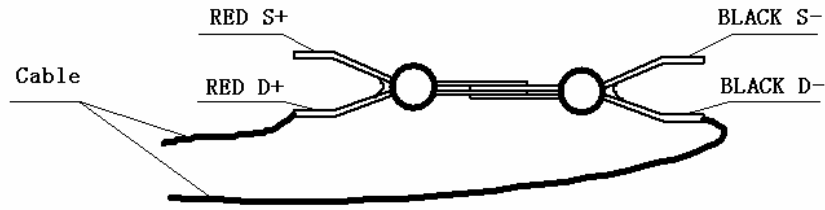


Figure 2-1 Short the test clips

3. The instrument measures and displays the current short circuit resistance.
4. Press **ZERO** key to turn on the ZERO function, and ZERO led turns on.
5. When ZERO function is ON, the short circuit resistance will be eliminated from the measurement value in the following measurements.
6. Press **ZERO** key again to turn off the ZERO function. ZERO led turns off and the short circuit resistance will not be eliminated from the measurement value in the following measurements.

2.6 RANGE

TH2512B's measurement range can be set to AUTO or HOLD.

The measurement ranges are 20mΩ, 200mΩ, 2Ω, 20Ω, 200Ω, 2kΩ and 20kΩ. And the default setting is AUTO Range.

Perform the following steps to set the range mode.

1. The default setting is AUTO Range, and the AUTO led is ON.
2. Press **RANGE** key to set the range to HOLD mode. The AUTO led is off and the current range is held.
3. Press **←** or **→** key to select a measurement range manually. The decimal point and unit will be shifted with the range selected as shown in Table 2-1.

Table: 2-1: Measurement Range, Point and Unit

Full-Scale Range	20mΩ	200mΩ	2Ω	20Ω	200Ω	2kΩ	20kΩ
Resolution	1 μ Ω	10 μ Ω	100 μ Ω	1mΩ	10mΩ	100mΩ	1Ω
Unit	mΩ	mΩ	Ω	Ω	Ω	kΩ	kΩ
Point Position	xx.xxx	xxx.xx	x.xxxx	xx.xxx	xxx.xx	x.xxxx	xx.xxx

2.7 Beeper

The beeper alarms when the device under test is sorted into PASS Bin. The beeper can be turned on or off on the rear panel.