User's Guide

JK2520B/JK2520C

Battery Internal Resistance Tester

$4_{3/4}$ bit AC resistance reading，6 bit DC voltage readings
Resistance test range：0.000mΩ~33.000kΩ
Voltage test range：0.00000V~120.000VDC
0.2% resistance accuracy, 0.01% voltage accuracy.
Test speed up to 145 times / sec.
HANDLER interface（Optional 18 gear sorting）
RS-232C inerface

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Security needs

 warning  DANGER：When you find the following abnormal conditions, please terminate the operation immediately and disconnect the power cord. Contact and repair the Jinke instrument sales department immediately. Otherwise, it will cause a fire or potential danger to the operator.。

Abnormal operation of instrument
Abnormal noise, odor, smoke or Flash occurred during operation.
During operation, the instrument produces high temperature or electric shock.
The power cord, power switch or power socket is damaged.
Impurities or liquids flow into the instrument.

security information

 **warning**  danger：To avoid possible electrical shock and personal safety, follow these guidelines.

Disclaimer: Users should read the following safety information carefully before starting to use the instrument. The company will not be liable for any personal and property losses caused by non-compliance with the following provisions.

Instrument grounding: to prevent the danger of electric shock, please connect the power ground.

Do not use the instrument in an explosive gas environment: Do not use the instrument in an inflammable and explosive gas, steam or dust environment. The use of any electronic device in such an environment is an adventure for personal safety.

Do not turn on the case: non professional maintenance personnel can not open the instrument shell to try to repair the instrument. The instrument still has no clean charge released for a period of time after shutdown, which may cause electric shock hazard to the human body.

Do not use damaged instruments: if the instrument has been damaged, the danger will be unpredictable. Please disconnect the power cord, do not use it again, and do not attempt to repair it yourself.

Do not use abnormal instruments: if the instrument is not working properly, its danger is unpredictable, please disconnect the power cord, can not be used again, do not try to repair themselves.

Do not use the instrument in a manner specified in this specification: beyond the scope, the protection provided by the instrument will fail.

Limited warranty and scope of liability

Changzhou JinAiLian Electronic Technology Co.,Ltd (hereinafter referred to as JinAiLian) to ensure that you buy each JK2520B/JK2520C in quality and measurement are fully qualified.This warranty does not include fuses and damage caused by negligence, misuse, pollution, accident or abnormal use. This warranty applies only to the original purchaser and is not transferable.

From the date of shipment,JinAiLian offers 90 Day Warranty and two year free warranty, which also includes VFD or LCD. During the 90 day warranty period, the replacement clause is terminated due to damage caused by improper user operation.During the repair period, the equipment was damaged due to improper operation of users, and the maintenance cost was borne by the users.Two years later, until the instrument is life-long, JinAiLian will provide maintenance by charging. For VFD or LCD replacement, the cost is charged at the current cost price.

If product damage is found, please contact JinAiLian to get information that you agree to return or replace.After that, please send the product back to the seller. Please be sure to explain the cause of the product damage, and prepay the postage and the premium to the destination.During the warranty period, the JinAiLian will be responsible for the transportation cost of the mail for repair or replacement of the product.Repair of non warranty products，Jin Ai Lian will evaluate the cost of repairs for non-warranty products. Maintenance will be performed only with your consent. All costs incurred by the maintenance will be borne by the user, including shipping costs for return mail.

This guarantee is the only guarantee for JinAiLian and the only compensation for youThere are no express or implied warranties (including warranties of suitability for a particular purpose) and all other warranties are explicitly denied.Jin Ai Lian or any other agent has not given any oral or written expression to establish or in any way extend the scope of this warranty.Jin Ai Lian will not be liable for any particular, indirect, incidental or

consequential damage or loss (including loss of information) caused by any reason outside the scope of the specification.If one of these clauses contravenes local laws or because certain jurisdictions do not permit the exclusion or restriction of implied warranties, the local laws and regulations prevail, then this clause may not apply to you. However, the ruling of this clause does not affect the validity and enforceability of other provisions.

Catalog

List of illustrations

Table list

1. installation and setup wizard

Thank you for buying our products. Please read this chapter carefully before using. In this chapter, you will learn about the following:

Main function packing list

Power requirements

Operation environment

Cleaning

1.1 packing list

Before using the instrument formally, please first:

1. check whether the appearance of the product is damaged or scratched.
2. check the instrument packing list to check if the attachment is missing.

If there is any damage or insufficient accessories, please contact JinAiLian sales department or distributor immediately.

1.2 power requirements

JK2520B can only be used in the following power supply conditions:

Voltage: 85VAC~250VAC

Frequency: 50Hz~400Hz

Warning: to prevent the danger of electric shock, please connect the power ground. If the user changes the power cord, ensure the reliable connection of the power cord.

1.3 operation environment

JK2520B must be used under the following environmental conditions:

The temperature：0℃～55℃，

Humidity： 23℃,< 70%RH

1.4 Cleaning

To prevent electric shock, remove the power cord before cleaning.

Please use a clean cloth with a little water to clean the shell and panel.

Do not clean inside the instrument.

can’t use solvents (alcohol or gasoline) to clean the instruments.

2. Overview

In this chapter, you will learn about the following:

Introduction

major function

2.1 introduction

Thank you for purchasing JK2520B /JK2520C AC resistance tester.

JK2520B/JK2520C is a fully automatic real-time detection of miniature desktop instruments controlled by high-performance 32 bit ARM microprocessor.The instrument can test the resistance of 0.001mΩ~33kΩ ，the DC voltage of 0.00001V~120.000V，the maximum resistance of 33000 display digits， and the maximum voltage of 600 000 display digits.JK2520B/JK2520C has the characteristics of high precision, high resolution and ultra-high speed measurement. It provides 0.2% resistance accuracy and 0.01% voltage accuracy. The maximum measurement speed can reach 145 times per second.

The instrument is used for professional sorting function, standard Handler (PLC) interface, output resistance HIGH / IN / LOW signal and voltage HIGH / IN / LOW signal separately. It can completely cope with high-speed automatic sorting system to complete automatic pipeline test, and the enhanced IO signal can directly drive power relay and signal relay.

The instrument has built-in RS-232C interface, optional USB232 interface and RS485 interface, universal data acquisition software, database function and Excel export function. It can be effectively used in remote control and data acquisition and analysis.

The instrument uses Jinko instruments to enhance the computer remote control instruction set, compatible with SCPI (Standard Command for Programmable Instrument Standard Command Set), and efficiently completes remote control and data acquisition functions.

The newly designed AC resistance testing principle can be used for almost all battery internal resistance testing, including lithium battery, lead-acid battery, button battery and other battery pipeline inspection. JK2520B do not support UPS online measurement, JK2520C support UPS online measurement.

Model	Accuracy	Measuring range	Test speed	Interface
JK2520C	Resistance：1% Voltage：0.2%	Resistance：1μΩ~33.00kΩ Voltage： 0.0001~120.000V	145times/sec 30 times/sec, 10 times/sec	RS232 Handler
JK2520B	Resistance ：1% Voltage ：0.3%	Resistance： 0.01 mΩ~30.00 Ω Voltage：0.001~59.99V	10 times/sec	RS232

Complete technical specifications refer to the tenth chapter.

2.2 main functions

2.2.1 test frequency

1kHz， frequency stability：20ppm

2.2.2 Range

JK2520C:6 range test，30mΩ~30kΩ。

JK2520B: 4 range test，30mΩ~30Ω。

Range automatic, manual and nominal.

Range nominal(Jinko new noun definition)： the instrument automatically selects the best range based on the nominal value.

2.2.3 Test speed

The instrument is divided into four speeds: slow speed, medium speed, high speed and high speed.

All channels are opened and manual range mode:

Slow: 1 times / sec.

Fast: 10 times / sec.

Medium speed: 30 times / sec.

High speed: 145 times / sec (JK2520C)

2.2.4 trigger mode

Internal, external, manual and remote triggers.

2.2.5 Basic accuracy

JK2520C: resistance：0.2% voltage ：0.2%

JK2520B: resistance：0.5% voltage：0.05%

2.2.6 Maximum reading

resistance：33,000

JK2520C： voltage：120.000

JK2520B： voltage：59.99

2.2.7 Calibration function

Full range short circuit "0": eliminate the influence of lead resistance.

2.2.8 Comparator function (sorting function)

The instrument has sorting function.

RHI/RNG/RLO output.

VHI/VNG/VLO output.

Comparison mode:

Absolute value tolerances + TOL sorting:The absolute deviation between the measured value and the nominal value is compared with the limit of each file.

Percentage tolerance TOL sorting: The percentage deviation between measured and nominal values is compared with the limit of each file.

Sequential comparison sorting: comparison of measured values directly with upper and lower limits

2.2.9 system setup

1. data retention (DH) function
2. Beep setting
3. keyboard lockout function
4. administrators and user accounts can set password for administrators.

2.2.10 Interface

RS-232 Remote control：

The baud rate, which supports the largest 115200bps, is compatible with SCPI protocol and ASCII transmission.

Handler interface

All optical coupling isolation, input and output with built-in pull-up resistors.

Supports internal 5V and external maximum 35V power supply.

Input: trigger signal.

Output: All sorting comparison result signals; Measuring synchronous signal (EOC); High current drive output, direct drive relay.

3. Start

In this chapter, you will learn about the following:

Recognize the front panel, including keystrokes and test terminals.

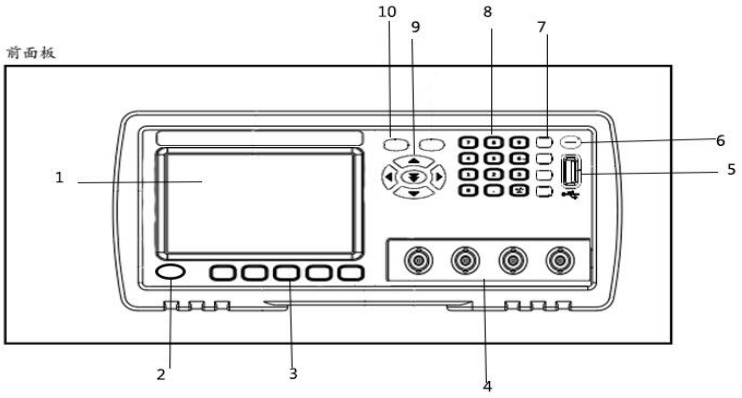
Rear panel - introduction of power and interface information.

Power on startup - including power on self test process, instrument default value and instrument preheating time.

Start testing - including how to connect to the test end.

3.1 Understanding the front panel

3.1. 1 Front panel description

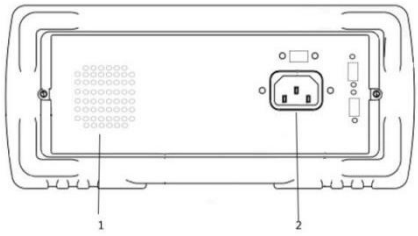


Front panel function description

NO	Function
1	display
2	Power switch
3	System function keys
4	Test end
5	USB disk interface
6	Qualified / unqualified
7	
8	Digital keyboard
9	Cursor key
10	Display key

3.1.2 Understanding the rear panel

Fig. 3-2 rear panel

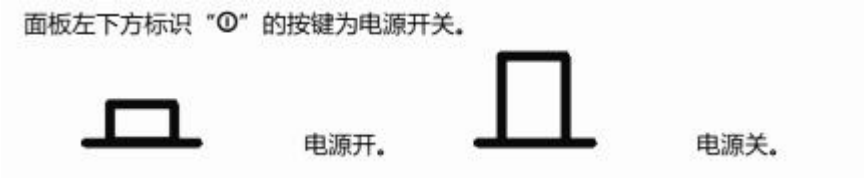


1.blowhole

2.Power socket (without fuse, fuse in instrument).

3.2 power on startup

3.2.1 starting up



3.3 Connection of test end

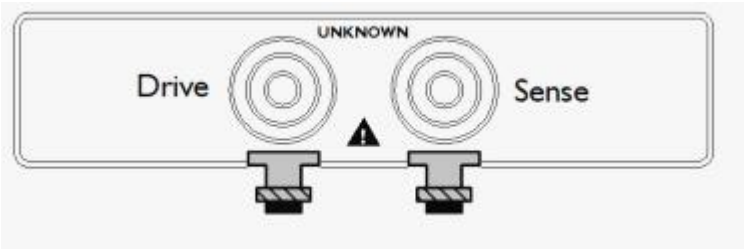
If you use a random "Kelvin" test clip for testing, connect to the instrument test end in the following manner.

High frequency head does not distinguish between Drive and Sense terminals, the instrument will automatically convert.

At the time of measurement:

The test clip of red logo is the high end of the test end.

The black identification test folder is the low end of the test end.



To ensure the accuracy of the instrument, test it with a random "Kelvin" test clip.

⚠Warning: it is strictly forbidden to directly connect the alternating current source and voltage source to the test end.

4. [Meas]　Measuring main page

Measurement homepage includes:

< measurement display> page related settings.

Data recording function

4.1<measurement display> page

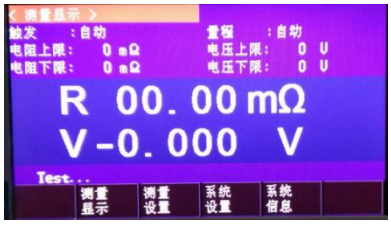
Press the [Meas] key to enter the page of [measurement display].

< measurement display> page is mainly used to display measurement results and sorting results.

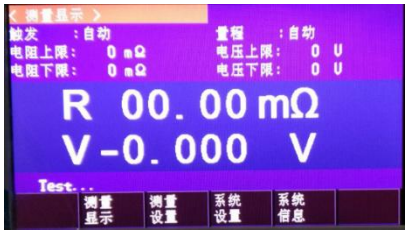
6 common functions can be set up on this page. They include:

Trigger – trigger mode
Range - Test Range
Speed - test speed
Alarm - comparator alarm alarm

Figure 4 -1 < measurement display> page
Slow, medium speed and fast mode



High speed mode



4.1.1 [Trigger] mode

SCPI Command: TRIGger:SOURce {INT,MAN,EXT,BUS}
SCPI Query Command: TRIGger:SOURce?
The instrument has 4 triggering modes:
Internal triggering, manual triggering, external triggering and remote triggering.

Trigger mode	Describe
Internal	Also known as continuous testing, triggering signals from inside the instrument Testing continuously according to inherent cycle.
manual	Every time the [Trig] key is pressed, the instrument performs a measuring cycle.Other times the instrument is in wait state.
external	An ascending edge pulse is received from the Handler interface of the rear panel, and the instrument performs a measuring cycle. The other time is waiting. Please refer to the Handler interface.
remote	After receiving the RS232 trigger command, the instrument executes one measurement cycle and the other time is in a waiting state.

* set trigger mode steps:
The first step is to press the Meas key into the main page.
The second step is to use the cursor key to select the trigger field.
The third step is to use function keys to select trigger mode.

Function key	Function

Internal	Internal triggering
manual	manual triggering
external	external triggering
remote	remote triggering

4.1.2[range]

SCPI Command: FUNCtion:RANGe {<range number>,min,max}

SCPI Command: FUNCtion:RANGe:MODE {AUTO,HOLD,NOMinal}

SCPI Query Command: FUNCtion:RANGe?

SCPI Query Command: FUNCtion:RANGe:MODE?

JK2520C has 6 ranges.

The range of variation for each range is as follows:

Table 4 - 1 Range of change

Range number	Range name 10kΩ	Range 3.2kΩ~33kΩ
6	1kΩ	320Ω ~ 3.3kΩ
5	100Ω	32Ω ~ 330Ω
4	10Ω	3.2Ω ~ 33Ω
3	1Ω	320mΩ ~ 3.3Ω
2	100mΩ	32mΩ~ 330mΩ
1	10mΩ	<33mΩ

JK2520B have 4 ranges. The range of variation for each range is as follows:

Table 4 - 2 Range of change

Range number	Range name	Range
4	10Ω	3.2Ω ~ 33Ω
3	1Ω	320mΩ ~ 3.3Ω
2	100mΩ	32mΩ~330mΩ
1	10mΩ	<33mΩ

There are 3 ways of measuring.

Table 4 - 3 test range specification

Range mode	Description	Advantage	Disadvantage

auto	The instrument automatically selects the best test range according to the impedance value, and the range number is automatically set in the range field.	Users do not need any involvement.	The automatic range needs the predicted range, and the test speed will be lower than the manual range.
Manual	The instrument will always be tested with user specified ranges.	The test speed is the fastest.	Users need to participate in range selection.
nominal	The instrument will automatically select the best range according to the nominal value for testing.	The best way of sorting test. The fastest speed。	Only for sorting tests.

Steps to set the range:

The first step is to press the Meas key into the measurement page or press the Setup button to enter the setup page.

he second step uses cursor keys to select [range] fields.

The third step is to use function keys to select ranges automatically, manually or selectively.

Function key	Function
Auto	The instrument will automatically select the range.
Manual	The instrument is locked in the current range.
nominal	The instrument will select the best range according to the nominal value.
Increase +	Increase the range number and change the range to lock.
Decrease -	Decrease the range number and change the range to lock.

Note! When the range is automatic, the instrument makes a range prediction for each measurement cycle, so the test speed will be slightly slower than the locked range. Moreover, when automatic measurement, frequent replacement of the range will cause the response to slow down. Usually, when the instrument is used as sorting and measuring, the automatic measuring range is not suitable.

For sorting users, please select the nominal scale.

4.1.3 Test [speed]

SCPI Command: FUNCtion:RATE {SLOW,MED,FAST,ULTRA}

SCPI Query Command: FUNCtion:RATE?

JK2520C Provide 4 test speeds (slow, medium speed, fast and high speed).

JK2520B Provide three test speeds (slow, medium, fast), the slower the test results are more accurate and stable.

In the manual range mode, the sampling time of the comparator is as follows:

Slow: 1 times / sec (1s).

Medium speed: 10 times / sec (100ms)

Speed: 30 times / sec (33ms).

High speed: 145 times / sec (6.8ms) (JK2520B)

Steps to set test speed are:

The first step is to enter the measurement page according to [Meas] or enter the setup page according to [Setup].

The second step is to use cursor keys to select [speed] fields.

The third step is to use function key selection.

Function key	Function
Slow	
Medium speed	
Fast speed	
High speed	(JK2520B)

4.1.4【Beep】setting

SCPI Command: COMParator:BEEP {OFF,GD,NG}

SCPI Query Command: COMParator:BEEP

The Beep function is only valid after the comparator function is turned on.

Sound setting allows qualified Beep, disqualification Beep or close Beep.

Beep setting

The first step is to enter the < measurement > page.

The second step is to use the cursor keys to select the Beep field.

The third step is to use function key selection.

Function key	Function
Close	Beep closed
Qualified Beep	When the sorting result is qualified (GD), the buzzer calls.
Unqualified Beep	When the sorting result is unqualified (NG), the buzzer calls.

4.2 Status bar

Data retention [H] – During the internal trigger, the measurement results will remain unchanged, and the testing process will be suspended. ..

System -access to system configuration > page

Keyboard lock - lock keyboard..

4.2.1 Icons

Tabel 4 - 5 Icons

Icon	Description

	USB The disk is ready.
H	Data is maintained.

4.2.2 [Browse data] function keys

According to [browse data] funtion key, enter the< browse data > page.

4.3 [Browse data] page

The measurement results on the current screen can be maintained on the Flash disk inside the instrument by the Save Data function key on the Measurement Display page.
In total, the instrument can store 500 sets of data, which can be stored in an external USB disk with one key.
Figure 4 2 < browse data > page

[save to U disk] function key - save all data to external USB disk.The format is CSV format.
[Reset]function key - point the data pointer to the first row and the previous data will be overwritten.
[formatting] function key - emptying all storage data.
[next page] function - used for page browsing.

5. [Setup] set page

In this chapter, you will learn all the settings:
Measurement setting
Temperature compensation settings
Short circuit clearing operation
Comparator settings
At any time, if you press the Setup button, the instrument will enter the main page.

5.1 Measurement setting

All the settings related to measurement are operated in < Settings > page.

< Settings > page, the instrument does not display test results or comparator results, but the instrument test is still in progress.

These settings include the following parameters:

Trigger -trigger mode

Range - Test Range

Speed - test speed

Beep-Beep -alarm

Resistance,voltage Comparison method

Resistance nominal value and voltage nominal value

Upper and lower limit setting

The settings of [trigger], [range], [sound] and [speed] can also be set on the < measurement display > page. For the setting of these parameters, please refer to the [Meas] main page section.

Fig 5 - 1< Settings > page

5.1.1 Comparator settings

SCPI Command: COMP:RMOD {OFF,ABS,PER,SEQ}

SCPI Command: COMP:VMOD {OFF,ABS,PER,SEQ}

The instrument can compare resistance and voltage at the same time or separately.

There are 3 ways to compare: absolute value comparison (delta).

Percentage comparison (delta%)

Sequential comparison (SEQ)

Absolute value = measured value- nominal value

Percentage %=(measured value -nominal value) / nominal value x 100%

Direct-reading SEQ comparisons use direct-reading measurements compared to the upper and lower limits of the file, so that nominal values are not required to participate in the operation.

The steps to set the comparator are:

The first step is to go to < Settings > page.

The second step uses cursor keys to select [resistance comparison] or [voltage] comparison fields.

The third step is to use function key selection.

Function key	Function
Close	The comparator of the current parameter is closed.
Absolute value	Switch comparator to absolute value comparison mode.
Relative value %	Switch comparator to Relative value comparison mode.
Direct reading value SEQ	Switch comparator to Direct reading value comparison mode.

5.1.2[nominal value] input

SCPI Command: COMParator:TOLerence:RNOMinal <float>

SCPI Command: COMParator:TOLerence:VNOMinal <float>

The absolute value and relative value comparison method must input the nominal value.Direct reading nominal values do not participate in the calculation, but in the nominal range, the[nominal]value of resistance will participate in the range selection, so in the[nominal] range, no matter what the comparison method, the correct nominal value of resistance needs to be input.

Input nominal value:

The first step is to go to < Settings > page.

The second step is to use cursor keys to select "resistor nominal" or "voltage nominal" fields.

The third step is to use numeric keys to input data, and units use function keys to select them.

5.1.3 [Lower limit] and [upper limit] setting section

SCPI Command: COMParator:TOLerence:RLMT <lower>,<upper limit>

SCPI Command: COMParator:TOLerence:VLMT <lower>,<upper limit>

Input limit value

The first step is to enter the < comparator > page.

The second step uses the cursor key to select the[lower limit of resistance] or the[lower voltage limit]field.

The third step is to use numeric keypad to input data.

Relative value % does not need to select unit rate. Please input percentage percentage.

Absolute value and direct reading SEQ, please use the function key selection unit.

The fourth step is to use the cursor key to select the upper limit of resistance and the lower limit of resistance.

The fifth step is to use numeric keypad to input data.

The sixth step is to repeat 2~5 to complete data input from other files.

Note! The instrument shares the same storage space for three comparison methods,so it is necessary to reset the comparator data after switching the comparisons.

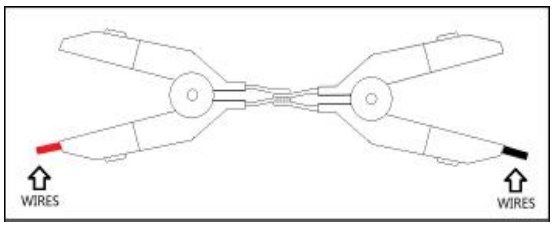
5.2 Short circuiting zero

Communication instruction：CORRect:SHORt

In order to achieve high-precision measurement, zero calibration is necessary. Short circuit clearing can effectively offset the stray resistance of the test line.

Before you clear it, please first clip the test clip according to the following methods.

Fig 5 - 2 Correct short circuit method



Short circuit clearing method

The first step is to press [Setup] to enter the setup page.

Second step short test clip

The third step is to use function keys to select [short circuit]

The fourth step is to press[confirm]the instrument to start clearing.

The fifth step is to return to the setup page after finishing zero.

6. system configuration

In this chapter, you will see the system configuration of the instrument:

System configuration page

System information page

Any time you press the [Meas[or [Setup] key, the System key appears at the bottom of the main page.

6.1 System configuration page

Under the [Meas] or [Setup]main page, press the [system]key to enter the< system configuration > page.

The system configuration page includes the following settings:

LANGUAGE

Date / time settings

Account settings

Beep setting

Set baud rate

Communication [instruction handshake] switch

Communication [result delivery] mode

All settings of the system configuration page will be automatically saved in the system and automatically loaded on the next boot.

Figure 6 < 1 < system configuration > page

6.1.1 Change system language【LANGUAGE】

Communication instruction：SYSTem:LANGuage {ENGLISH,CHINESE,EN,CN}

The instrument supports two languages, Chinese and English.

Change the language steps

The first step is to enter the < system configuration > page.

The second step is to use cursor keys to select [LANGUAGE].

The third step is to use the function key selection language:

Function key	Function
中文[CHN]	
ENGLISH	English

6.1.2 Modification date and time

The instrument uses 24 hours of clock.

Change date:

The first step is to enter the system setup interface.

The second step is to use cursor keys to select [date] fields.

The third step is to use the function key to set the date:

Function key	Function
Year +	+1 year
Year -	-1 year
Month +	+1 momth
Day +	+1 day
Day -	-1 day

Change the clock

The first step is to enter the system setup interface.

The second step is to use the cursor keys to select the clock field.

The third step is to use the function key to set the clock:

Function key	Function
Hour +	+1 Hour
Hour -	-1 Hour

Minute+	+1 Minute
Minute-	-1Minute
Second +	+1 second
Second -	-1 second

6.1.3 Account Settings

There are two user modes to choose from.

Administrators Except for the System Services page, other functions are open to administrators, and the parameters set by administrators are stored in system memory after a delay of 5 seconds for loading after the next boot.

user In addition to the [System Services] and [Files] pages, other functions can be operated by the user, and the data modified by the user is restored to the value set by the administrator after the next boot.

Change account:

The first step is to enter the system configuration page.

The second step uses cursor keys to select [account] fields.

The third step uses functional keys to change:

Function key	Function
Administrators	All functions except the system service page are open. If you forget your password, please call our sales department.
user	In addition to the operation of the system service page and the file page, the data set is not allowed to be saved.

Administrator password settings:

The first step is to enter the system configuration page.

The second step uses cursor keys to select [account] fields.

The third step is to use function keys to select:

Function key	Function
Change the password	Enter a numeric password of up to 9 bits, which contains only numbers and symbols.
Delete the password	Administrators will not be password protected.

6.1.4 【BEEP】setting

Communication instruction:COMParator:BEEP {OFF,GD,NG}

BEEP setting allows qualified voice, disqualification or closing.

The BEEP function is valid only after the comparator is turned on.

Set the beep

The first step is to enter the < system configuration > page.

The second step is to use the cursor keys to select the[beep]field.

The third step is to use function key selection.

Function key	Function
Closed	Beep closed
Qualified beep	When the sorting result is qualified (GD), the buzzer calls.
Unqualified beep	When the sorting result is unqualified (NG), the buzzer calls.

6.1.5 [baud rate] settings

The instrument has built-in RS-232 interface. After sensing the signal transformation of RS-232 interface, the instrument immediately communicates with the host computer according to the set baud rate.

At the same time, the keyboard is locked.

In order to communicate correctly, please make sure that the baud rate is set correctly. The difference between the upper computer and the instrument will not communicate correctly.

The instrument RS-232 is programmed in SCPI language.

The RS-232 configuration is as follows:

Data bits: 8 bits

Stop bit: 1 bits.

Parity check: None

Baud rate: configurable

Set baud rate:

The first step is to enter the < system configuration > page.

The second step uses the cursor key to select the baud rate field.

The third step is to use function key selection.

Function key	Function
1200	If you use a communication converter with optocoupler isolation, please use this baud rate.
9600	
38400	
57600	
115200	It is recommended that you use this high speed baud rate for communication with the host computer.

6.1.6 Communication [instruction handshake] switch

Instrument supports RS232 instruction handshake.

When the instruction handshake is opened, all instructions sent by the host to the instrument will be returned to the host as they are, and then the data will be returned.

After the command handshake is closed, the instructions of the host Send out to the instrument will be processed immediately.

The steps to set the instruction handshake are:

The first step is to enter the < system configuration > page.

The second step is to use the cursor keys to select the[instruction handshake] field.

The third step is to use function keys.

Function key	Function
Close	Do not use Command handshake.If there is no special requirement, please set the command handshake closed
Open	

6.1.7 communication【Result Send out 】mode

Communication instruction:SYSTem:SENDmode {FETCH,AUTO}

The instrument supports the function of sending data automatically to the host computer. After each test is completed, the data will be sent to the host automatically without the need for the host to send FETCH? Instructions.

The test results and comparator results are sent to the host after each test is completed. The format is as follows:

+3.549568e－01,+3.827993e+00,RV GD

+3.549911e－01,+3.827931e+00,RV GD

+1.000000e+20,+1.000000e+20,RV NG

.....

The format is: resistance value, voltage value, comparison result.

Among them :+1.000000e+20　　Representing data opening or overflow

Set the steps of [result sending]:

The first step is to enter the < system configuration > page.

The second step is to use the cursor key to select [result delivery] fields.

The third step is to use function key selection.

Function key	Function
FETCH	Using instruction FETCH? Get all measurements
Auto	After each test is completed, it is automatically sent to the host.

6.2 < system information > page

Press [Meas] or [Setup] to go to the main page, press the [System] button in the bottom taskbar,enter into < System Configuration > page, and press the function key to select [System Information].

The system information page has no user configurable options.

Fig　6－2 < system information > page

7.Processor (Handler) interface<JK2520B>

You will learn the following:

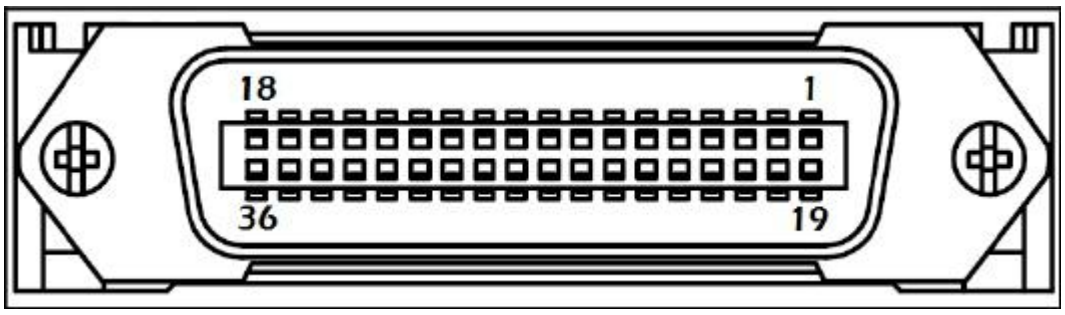
Wiring terminal

How to connect and interface schematics

The instrument provides users with a fully functional processor interface, which includes 10 grades of qualified sorted output, HI / IN / LO, EOC (test completion signal), TRIG (external trigger start) input and other signals. Through this interface, the instrument can conveniently control the components of the user system to complete the automatic control function.

7.1 connecting terminal and signal

Fig 7‐1 connecting terminal



Output (all signals are low effective)

Table 7‐1 Output pin definition

Pin	Name	Explain
1	/R-OK	0：R-OK
2	/V-OK	0 : V-OK
3	/RV-OK	0: RV-OK
5	/RV-NG	Total unqualified output 0：NG
7	/EOC	0：Measurement，1：Measurement completion
19	/OPEN	0：open circuit
20	/V-HI	0：V-HI
21	/V-NG	0：V-NG

22	/V-LO	0：V-LO
23	/R-HI	0：R-HI
24	/R-NG	0：R-NG
25	/R-LO	0：R-LO

Input end

Tabel 7‐2 Input pin definition

Pin	**Name**	**Explain**
18	Trigger input	Trigger input, built-in 0.25W, 2K, current limiting resistor. The rising edge is effective.

Power terminal

Table 7‐3 Power end pin definition

Pin	Name	Explain
27-30	GND	Power Supply GND
33-34	External VCC	External power input terminal
35-36	Internal VCC	Internal VCC power supply positive end(5V ,1A)

1,3	External triggering
6,7	PASS
8，9	FAIL

7.2 Connection mode

Use external power supply (recommended)

Please connect the external power to the following pin simultaneously.

VCC：33-34 foot

GND：27-30 foot

Internal power supply 35-36：floating.

Use internal power supply

Note! In the case of unknown or uncertain power, internal power supply should not be used, otherwise the instrument will not work properly.

In known low-power applications, you can work with an internal power supply,But it may make the instrument's anti-interference ability worse.

Internal power: 5V Max 1A.

Use internal power supply and connect to the following pins. :

VCC (5V) :34 and 35 short circuit

Electrical parameters
Power requirements: +3.3V~24VDC
Output signal: collector output with built-in pull resistance. Optocoupler isolation. Low level effective.
Maximum voltage: supply voltage.
Input signal: optocoupler isolation. Low level effective.
Maximum current: 50mA

Note: to avoid damaging the interface, the power supply voltage should not exceed the power requirements.
To avoid damage to the interface, please connect after the instrument is closed.
If the output signal user is used to control the relay, the output terminal driven by Darlington can drive the low-power relay and the signal relay.
Reverse diode has been integrated inside the instrument.

Fig 7 - 2 Input schematic diagram (Trig)

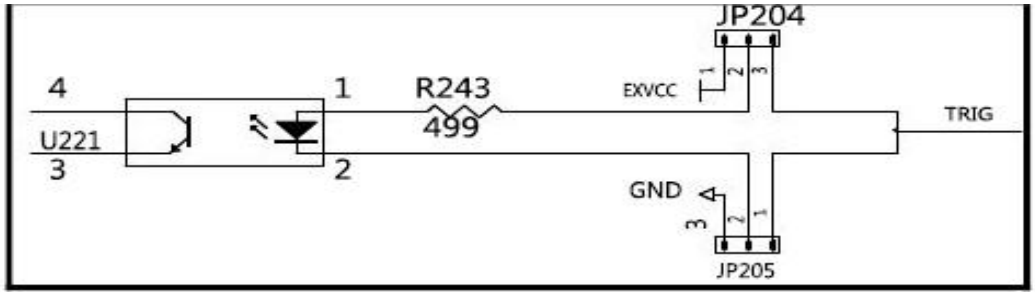
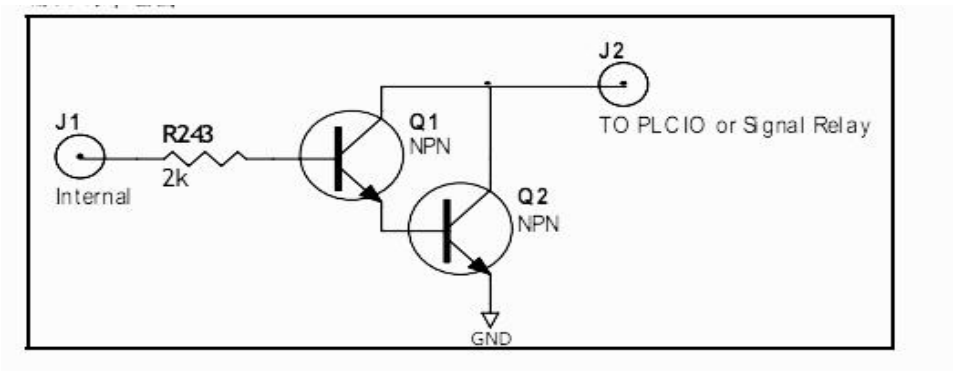


Figure: JP204 and JP205 factory configuration is 1-2 short. The trigger signal is triggered by rising edge.
If the trigger signal is triggered by a falling edge, set both JP204 and JP205 to 2-3 short connections, and the external VCC can float.

Fig 7 - 3 Output principle diagram



8.remote communication

You will learn the following:
Introduction of RS-232 interface
RS-232 connection.
Select baud rate.
Software protocol.
The instrument uses RS-232 interface (standard configuration) to communicate with the computer to complete all the functions of the instrument. Through the standard SCPI command, users can easily compile various collection systems suitable for themselves.

8.1 RS-232C

RS-232 is a widely used serial communication standard, also known as asynchronous serial communication standard, used to achieve data communication between computers and computers, computers and peripherals.RS is abbreviation of “Recommended Standard” (recommended standard) , 232 is the standard number, which was officially published by the American Electronics Industry Association (EIA) in 1969. It provides for one data line at a time.
Most serial port configurations are usually not strictly based on the RS-232 standard: 25-core connectors are used at each port (computers today basically use 9-core connectors). The most commonly used RS-232 signals are shown in the table:

Table- 8 commonly used RS - 232 signals

signal	Symbol	Pin number of 25 core connector	Pin number of 9 core connector
Request to send	RTS	4	7
Scavenging sending	CTS	5	8
Data setup preparation	DSR	6	6
Data carrier detection	DCD	8	1
Data terminal preparation	DTR	20	4
send data	TXD	2	3

receive data	RXD	3	2
Grounding	GND	7	5
Request to send	RTS	4	7

Besides, RS232 also has the smallest subset, which is the way of connecting the instrument.

Table- 8-2 The smallest subset of the RS - 232 standard

signal	Symbol	Pin number of 9 core connector
send data	TXD	2
receive data	RXD	3
Grounding	GND	5

8.1.1 RS232C connection

The RS-232 serial interface can be interconnected with the controller's serial interface through direct DB-9 cable.(For example: personal computer or IPC)

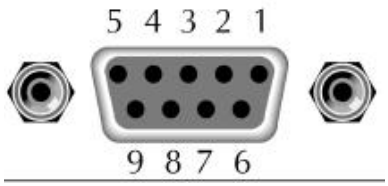
Note: the instrument can not use null modem cable.

You can directly manufacture or purchase 9 core straight through cables to Jinke instrument format.

The user's self-made 3 wire cable should pay attention to:

Using the DB9 port that comes with the PC, you may want to shortcut the 4-6, 7-8 connection of the DB-9 connector (pin) on the computer side

Fig 8 - 1 RS 232 interface on the rear panel



Suggestion: to avoid electrical shock, please turn off the instrument power when inserting connectors.

Default communication settings for the instrument:

Transmission mode: full duplex asynchronous communication with start bits and stop bits.

Data bits: 8 bits

Stop bits: 1 bits.

Check bits: None

8.2 Handshake protocol

Because the instrument uses the smallest subset of RS-232 standard and does not use the hardware handshake signal, in order to reduce the possibility of data loss or data error

in communication, the instrument can enable software handshake. The high-level language software engineer should compile the computer communication software strictly according to the following handshake protocol:

The instrument command parser accepts only ASCII format, and command response also returns ASCII code.

The command string sent by the host must end with NL ('\n'), and the instrument command parser does not start executing the command string until it receives the terminator.

Instrument can set instructions to shake hands: the instrument receives a character, immediately after the character back to the host, the host only receives the return character can continue to send the next character.

Tip: If the host can't accept the data returned by the instrument, you can try to solve it by using the following methods:

1． The software handshake is closed, please refer to the instrument < System Settings > page to turn it on.

2． Serial port connection failure. Please check cable connection.

3． The communication format of the high-level language program is wrong. Please try to check the serial port number.is the communication format correct And whether the baud rate is the same as that of the instrument.

4．If the instrument is parsing the last command, the host will not be able to receive the response of the instrument. Please try again later.

<The problem is still not resolved. Please consult the technical engineer of Jinke instrument immediately>

8.3 SCPI language

SCPI-Standard Commands for Programmable Instruments(Standard commands for programmable instruments)It is a general command set used by Jinke instrument for testing instruments. SCPI is also known as TMSL-Test and Measurement System Language(Measurement System Language). Developed by Agilent Technologies based on IEEE488.2, it has been widely used by test equipment manufacturers.

The built-in command parser is responsible for various user command format parsing. Since the command parser is based on the SCPI protocol, but not entirely consistent with the SCPI, please read the "SCPI Command Reference" chapter carefully before you start work.

8. SCPI Command Reference

This chapter includes the following aspects:

Command parser - understand some rules of command parser.
Command grammar——Writing rules of command line
Query syntax——Writing rules for query commands
Query response——Query response format
Command Reference

This section provides all the SCPI commands used by the instrument, through which all the functions of the instrument can be fully controlled.

9.1 Command string parsing

The host can send a string of commands to the instrument, and the instrument command parser starts parsing after capturing the terminator (\n) or an input buffer overflow.

Legal command string:For example:AAA:BBB CCC;DDD EEE;:FFF
Instrument command parser is responsible for all command parsing and execution, you must first understand its parsing rules before writing a program.

9.1.1 Command resolution rule

1．The command parser only parses and responds to ASCII code data.

2．The SCPI command string must end with NL ('n'ASCII 0x0A), and the command parser does not start executing the command string until it receives the terminator or a buffer overflow.

3． If the instruction handshake is turned on, the command parser sends the character back to the host immediately after each character is received, and the host can only continue sending the next character after receiving the return character.

4． The command parser immediately resolves the parsing after parsing the error, and the current instruction is invalid.

5． After the command parser parses the query command, it terminates the command string parsing and then the string is ignored.

6． The command parser is not case sensitive to the parsing of the command string.

7． The command parser supports the abbreviation of the command, and the abbreviation specification can be seen in the later chapters.

9.1.2 Symbolic conventions and definitions

This chapter uses symbols that are not part of the command tree, just to better understand the command string.

<> The text in the brackets represents the parameters of the command.

[ ] The words in square brackets indicate optional commands.

{} When braces contain several parameter items, it means that only one item can be selected from it.

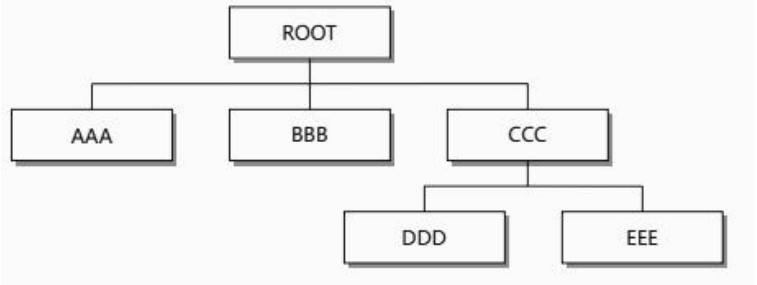
( ) The abbreviations of parameters are in parentheses

majuscule The abbreviation of command.

9.1.3 Command tree structure

SCPI commands are tree-structured and can be parsed down three levels (note: the instrument's command parser can parse down any level), where the highest level is called subsystem commands.The subordinate command is valid only if the subsystem command is selected, and the SCPI uses a colon (:) to separate the high-level command from the low-level command.

Fig 9 - 1 Command tree structure



For example:

ROOT:CCC:DDD ppp

ROOT

CCC

DDD Third level

ppp Parameters

9.2 Commands and parameters

A command tree is composed of commands and parameters, separated by 1 spaces (ASCII: 20H).

For example: AAA:BBB 1.234

commands [parameters]

9.2.1 commands

Command words can be long command format or abbreviated form, using long format for engineers to better understand the meaning of the command string; abbreviated form for writing。

9.2.2 Parameters

Single command word command, no parameter

For example:AAA:BBB

The parameter can be a string form, and its abbreviation rule still obeys the command abbreviation rule of the preceding section.

For example:AAA:BBB 1.23

Parameter can be numerical form.

<*integer*> integer 123，+123， -123

<float> Floating-point number

1. <fixfloat>：Fixed point floating point number ：1.23，-1.23
2. <Sciloat>：Scientific counting method Floating-point number：1.23E+4，+1.23e-4
3. <mpfloat>: Multiplying floating-point numbers：1.23k，1.23M，1.23G，1.23u

Table 9－1 multiplying power Abbreviation

numerical value	multiplying power
1E18 (EXA)	EX
1E15 (PETA)	PE
1E12 (TERA)	T
1E9 (GIGA)	G
1E6 (MEGA)	MA
1E3 (KILO)	K
1E-3 (MILLI)	M
1E-6 (MICRO)	U
1E-9 (NANO)	N
1E-12 (PICO)	P
1E-15 (PEMTO)	F
1E-18 (ATTO)	A

Hint: the rate is not case sensitive, and its writing is different from the standard name.

9.2.3 Delimiter

The instrument command parser accepts only the allowable separator.In addition, the separator command parser will generate the "Invalid separator" illegal delimiter error.These separators include:

;semicolon，Used to separate two commands.

For example:AAA:BBB 100.0;CCC:DDD

：colon，It is used to separate the command tree or restart the command tree.

For example:AAA:BBB:CCC 123.4;:DDD:EEE 567.8

？Question mark,，Used for query.

For example:AAA?

□Space , used to separate parameters.

For example:AAA:BBB□1.234

9.3 Command Reference

All commands are interpreted in the order of subsystem commands, and all subsystems are listed below.

DISPlay display subsystem

FUNCtion funtion subsystem
CORRection correction subsystem
COMParator comparator subsystem
SYSTem system subsystem
TRIGger trigger subsystem
FETCh? Get the result subsystem
ERRor error message subsystem

Public command :

IDN? Instrument information inquiry subsystem
TRG Trigger and get data
SAV Save all settings parameters to internal disk.

9.4 DISPlay display subsystem

DISPlay subsystemIt can be used to toggle different display pages or to display a string of text on the page prompt bar.
DISPlay subsystem tree

DISPlay	**:PAGE**	**{MEASurement, SETUp,SYSTem,SYSTEMINFO(SINF)}**
	:LINE	**<string>**

9.4.1

9.4.1 DISPlay:PAGE

DISP:PAGE To switch to the specified page.
Command grammar：DISPlay:PAGE < page name >
Parameters：< page name > Including：

MEASurement Measurement display page
SETUp settings page
SYSTem System configuration page
SYSTEMINFO(SINF) System information page

For example: Send out > disp:page setup<NL> //Switch to setup page
Query syntax：DISP:PAGE?
Query response：< page name > abbreviation
meas
setu
syst
Sinf

For example: Send out > disp:page?<NL>
Return > meas<NL>

9.4.2 DISP:LINE

DISP:LINE Used to display a string of text at the bottom of the prompt bar. The text can display up to 30

characters.

Command grammar：DISPlay:LINE <string>

Parameters：<string> Up to 30 characters.

For example:send out > DISP:LINE “This is a Comment.” <NL>

9.5 FUNCtion subsystem

Fig 9‐3 FUNCtion subsystem tree

FUNCtion	**:RANGe**	**{range number，max，min}**	
		:MODE	**{AUTO,HOLD,NOMinal}**
	:RATE	**{SLOW,MED,FAST, ULTRA}**	

9.5.1 FUNCtion:RANGe

FUNC:RANG Used to set the range mode and range number.

Command grammar：FUNCtion:RANGe {<range number>,min,max}

Parameters：among them，<range number> 1~6(JK2520C) 1~4(JK2520B)

min range =1

max range =6(JK2520C) 4（JK2520B）

For example: Send out > FUNC:RANG 3<NL> //Switch to 3 range.（300mΩ）

Query syntax：FUNC:RANG?

Query response：range number

For example: Send out > FUNC:RANGE? <NL>

Return > 5<NL>

9.5.2 FUNCtion:RANGe:MODE

FUNC:RANG:MODE Used to switch the range.

Command grammar：FUNCtion:RANGe:MODE {AUTO,HOLD,NOMinal}

For example: Send out > FUNC:RANG:MODE NOM<NL> //Switch to nominal range mode

Query syntax：FUNC:RANG:MODE?

Query response：{AUTO,HOLD,NOM}

9.5.3 FUNCtion:RATE

FUNC:RATE Used to set test speed.

Command grammar：FUNCtion:RATE

{SLOW,MED,FAST,ULTRa,ULTraNodisp(ULTN)<JK2520B>}

For example: Send out > FUNC:RATE FAST<NL> //Set to high speed test

Query syntax：FUNC:RATE?

Query response：{SLOW,MED,FAST,ULTR，ULTN}

{SLOW,MED,FAST}

9.6 COMParator subsystem

The comparator parameters set by the COMParator subsystem.It will be stored in the system and easy to boot.

COMP The subsystem is used to set comparator parameters.

Fig 9‐4 COMParator subsystem tree

COMParator	**:BEEP**	**{OFF,GD,NG}**	
	:RMODe	**{OFF,SEQ,PER,ABS}**	
	:VMODe	**{OFF,SEQ,PER,ABS}**	
	:TOLerance	**RNOMinal**	**<float>**
		VNOMinal	**<float>**
		RLIMIT(RLMT)	**<LOWER,UPPER>**
		VLIMIT(VLMT)	**<LOWER,UPPER>**

9.6.1 COMParator:RMODe

COMParator:RMODe ,used to set the resistance comparator mode
Command grammar：COMParator:RMODEe {OFF,ABS,PER,SEQ}
parameter：{OFF,ABS,PER,SEQ}
Among them：
ABS Absolute value sorting mode
PER Percentage sorting mode
SEQ Sequential sorting mode
For example: Send out > COMP:RMOD SEQ<NL> //Open comparator.And set to sequential comparison mode.
Query syntax：COMP：RMOD?
Query response：{OFF,ABS,PER,SEQ}

9.6.2 COMParator:VMODe

COMParator:VMODe used to set the voltage comparator mode
Command grammar：COMParator:VMODEe {OFF,ABS,PER,SEQ}
parameter：{OFF,ABS,PER,SEQ}
Among them:
ABS Absolute value sorting mode
PER Percentage sorting mode
SEQ Sequential sorting mode
For example: Send out > COMP:VMOD SEQ<NL> //Open comparator.And set to sequential comparison mode.
Query syntax：COMP：VMOD?
Query response：{OFF,ABS,PER,SEQ}

9.6.3 COMParator:BEEP

COMP:BEEP be used for Enable voice.
Command grammar：COMParator:BEEP {OFF,GD,NG}
For example: Send out > COMP:BEEP GD<NL> //Qualified Beep
Query syntax：COMP:BEEP?
Query response：{OFF,GD,NG}

9.6.4 COMParator:TOLerance:RNOMinal

COMP:TOL:RNOM Used to set the resistance nominal value

Command grammar：COMParator:TOLerance:RNOM <float>
For example: Send out > COMP:TOL:NOM 1m //The nominal value is set to 1mΩ
Send out > COMP:TOL:NOM 1E-3 //The nominal value is set to 1mΩ
Send out > COMP:TOL:NOM 1000 //The nominal value is set to 1mΩ

Query syntax：COMP:TOL:RNOM?
Query response：<scifloat>
For example: Send out > COMP:TOL:NOM? <NL>
Return > 1.0000E-03<NL> //The nominal value is set to 1mΩ

9.6.5 COMParator:TOLerance:VNOMinal

COMP:TOL:VNOM Used to set the voltage nominal value
Command grammar：COMParator:TOLerance:VNOM <float>
For example: Send out > COMP:TOL:VNOM 1.23 //The nominal value is set to 1.23V
Send out > COMP:TOL:VNOM 50 //The nominal value is set to 50V
Query syntax：COMP:TOL:VNOM?
Query response：<scifloat>
For example: Send out > COMP:TOL:VNOM? <NL>
Return > 1.0000E+00<NL> // nominal value is 1V

9.6.6 COMParator:TOLerance:RLMT

COMP:TOLerance:RLMT Used to set the nominal value

Command grammar：COMParator:TOLerance:RLMT <float lower limit>,<float Upper limit>
For example: Send out > COMP:TOL:RLMT -10,+10 //If the percentage is selected, the lower limit is -10% and the upper limit is 10%.
Query syntax：COMP:TOL:RLMT?
Query response：<scifloat>,<scifloat>
For example: Send out > COMP:Beep? 1<NL>
Return > -10.000E+00,+10.000E+00<NL> //-10,+10

9.6.7 COMParator:TOLerance:VLMT

COMP:TOLerance:VLMT Used to set the nominal value
Command grammar :COMParator:TOLerance:VLMT <float lower limit>,<float Upper limit>
For example: Send out > COMP:TOL:VLMT -10,+10 //If the percentage is selected, the lower limit is -10% and the upper limit is 10%.
Query syntax：COMP:TOL:VLMT?
Query response：<scifloat>,<scifloat>
For example: Send out > COMP:TOL:VLMT?<NL>
Return > -10.000E+00,+10.000E+00<NL> //-10,+10

9.7 TRIGger subsystem

Fig 9‑5 TRIGger subsystem tree

TRIGger	**[:IMMediate]**	
	:SOURce	**{INT,MAN,EXT,BUS}**
TRG		

TRIGger is used to set trigger source and generate one trigger.

9.7.1 TRIGger[:IMMediate]

TRIG[:IMM] When the trigger source is set to BUS, a trigger is generated, but the data that triggers the test is not returned.If you want to return data
You need to use the TRG directive.
Command grammar：TRIGger[IMMediate]
For example: Send out > TRIG<NL> //the instrument will stop after being tested each time

9.7.2 TRIGger:SOURce

TRIG:SOUR Used to set trigger source.
Command grammar：TRIGger:SOURce {INT,MAN,EXT,BUS}
For example: Send out > TRIG:SOUR BUS<NL> //Set to bus trigger mode.
Query syntax：TRIG:SOUR?
Query response：<INT,MAN,EXT,BUS>

9.7.3 TRG

TRG When the trigger source is set to BUS, a trigger is generated and the data that triggers the test is returned.
Command grammar：TRG
For example: Send out > TRG<NL> //The instrument is tested once and returns the test data.
Return > +9.9651e+01,in,+0.0000e+00,ng <NL> /resistance value，Resistance file，voltage value，voltage file

9.8 FETCh? subsystem

FETCh? Used to obtain test data. Before using this directive, You need to set the [result Send out] field to 【FETCH】under the < system configuration > page

FETCh ? The instruction will return the test data.

Fig 9 - 6 FETCh? subsystem tree

FETCh?	

Query syntax：FETCh?
Query response：<scifloat>,{Beep 00,Beep 09}
Beep 00 represents unqualified.
For example: Send out > FETC? <NL>
Return > +9.9651e+01,in,+0.0000e+00,ng <NL> // resistance value，Resistance file，voltage value，voltage file

9.9 CORRection subsystem

The CORRection subsystem is used for short circuit zero calibration.

Fig 9‐7 SYSTem subsystem tree

CORRect		
	:SHORt	

9.9.1 CORRection:SHORt

Query syntax：CORRection:SHORt

For example: Send out >CORRection:SHOR<NL>

Return >Short Clear Zero Start. <NL>

Return >PASS<NL>

Note:

Before the Send out command, make sure that the test end is short circuited.

9.10 SYSTem subsystem

SYSTem The subsystem is used to set parameters related to the system.

SYSTem The data set by the subsystem will not be stored inside the instrument.

Fig 9‐8 SYSTem Subsystem tree

SYSTem	**:LANGuage**	**{ENGLISH,CHINESE,EN,CN}**
	:SENDmode	**{FETCH,AUTO}**

9.10.1 SYSTem:LANGuage

Instrument language settings.

Command grammar： SYSTem:LANGuage {ENGLISH,CHINESE,EN,CN}

For example: Send out > SYST:LANG EN<NL> // Set to English display

Query syntax：SYST:LANG?

Query response：{ENGLISH,CHINESE}

9.10.2 SYSTem:SENDmode

SYST:SEND is used to set data Send out: automatic or FETCH instructions.

Command grammar：SYSTem:SENDmode {FETCH,AUTO}

For example: Send out > SYST:SEND AUTO // Set to automatic Send out

Query syntax：SYST:SEND?

Query response：{FETCH,AUTO}

9.11 IDN? subsystem

Fig 9‐9IDN? Subsystem tree

IND?	

IDN?subsystem It is used to return the version number of the instrument.
Query syntax：IDN?
Query response：<MODEL>,<Revision>,<SN>,< Manufacturer>
For example: Send out > IDN? <NL>
Return > JK2520C/2520B,REV C1.0,0000000,Applent Instruments<NL>

9.12 ERRor subsystem

The error subsystem is used to get the latest error message.
Query syntax：Error?
Query response：Error string
For example: Send out > ERR?<NL>
Return > no error.<NL>

9.13 SAV subsystem

The SAV subsystem is used to save all the modified settings to the internal disk of the instrument.
Query syntax：SAV
Query response：OK
For example: Send out > SAV<NL>
Return > OK<NL>

9.Specifications

You will learn the following:
Technical indicators.
General specification.
Outline size.

10.1 Technical indicators

The following data are measured under the following conditions:
Temperature conditions：23℃±5℃
Humidity condition： 65% R.H.
Zero adjustment: short circuit zero before testing
Warm-up time: >60 minutes.
Calibration time: 12 months.
Test current accuracy: 1%
Test current frequency accuracy: 1kHz(1±20Hz), 5ppm

JK2520C AC resistance indicator:

RANGE		Max Reading	Resolution	ULTRA	FAST	MED	SLOW	Test Current
1	30mΩ	33.000mΩ	1μΩ	1.5% ± 20	1.25% ± 10	1% ± 10	1% ± 5	150mA
2	300mΩ	330.00mΩ	10μΩ	1.5% ± 20	1.25% ± 10	1% ± 10	1% ± 5	15mA
3	3Ω	3.3000Ω	100μΩ	1.5% ± 20	1.25% ± 10	1% ± 10	1% ± 5	1.5mA
4	30Ω	33.000Ω	1mΩ	1.5% ± 20	1.25% ± 10	1% ± 10	1% ± 5	150μA
5	300Ω	330.00Ω	10mΩ	1.5% ± 20	1.25% ± 10	1% ± 10	1% ± 5	15μA
6	3kΩ	3.3000kΩ	100mΩ	1.5% ± 20	1.25% ± 10	1% ± 10	1% ± 5	15μA
7	30kΩ	33.000kΩ	1Ω	1.8% ± 50	1.25% ± 20	1% ± 20	1% ± 10	1.5μA

JK2520C DC voltage indicator:

RANGE		Max Reading	Resolution	ULTRA	FAST	MED	SLOW
0	6V	12.000V	100μV	0.5%±100	0.3%±50	0.2%±10	0.2%±5
1	60V	120.000V	1mV	0.5%±100	0.3%±50	0.2%±10	0.2%±5

JK2520B AC resistance indicator:

RANGE		Max Reading	Resolution	FAST	SLOW	Test Current
1	10mΩ	30.00mΩ	10μΩ	1.5% ± 10	1% ± 5	150mA
2	100mΩ	300.00mΩ	100μΩ	1.5% ± 10	1% ± 5	15mA
3	1Ω	3.00Ω	1mΩ	1.5% ± 10	1% ± 5	1.5mA
4	10Ω	30.00Ω	10mΩ	1.5% ± 10	1% ± 5	150μA

JK2520B DC voltage indicator：

RANGE		Max Reading	Resolution	FAST	SLOW
0	3V	6.00V	1mV	0.5%±50	0.3%±5
1	30V	60.00V	10mV	0.5%±50	0.3%±5

10.2 General specification

Screen: TFT-LCD true color display, screen size 4.3 inches.

Test speed:0.--- manual range:

Slow: 1 times / sec.

Medium speed: 10 times / sec

Fast: 20 times / sec.

High speed: 145 times / sec (JK2520B)
Maximum reading：JK2520C: resistance：33,000 , voltage ：600,000
JK2520B: resistance：33,000, voltage ：60,000
Range mode : automatic, manual and nominal.
Calibration: short circuit full scale zero clearing
Test end: four terminal test method
Comparators: ABS, PER and SEQ
Handler: Total 8: 3 resistance HI/IN/LO, 3 voltage HI/IN/LO, 1 open circuit, 1 total unqualified
(optional 18 file sorting)
News ring: pass, qualified and unqualified.
Triggering: internal, external, manual and remote triggering.
Interface: processor (Handler) interface, RS232 interface
Optional interface: RS485 and USB-232 interface
Programming language: SCPI
UPS Online measurement: JK2520B do not support UPS online measurement, JK2520C support UPS online measurement.
Auxiliary function: keyboard lock

10.3 Environmental requirements

Environment: indicators: temperature 18℃~28℃ humidity 65% RH
Operation: temperature 10℃~40℃ humidity 10~80% RH
Storage: temperature 0℃~50℃ humidity 10~90% RH

Power supply ：110VAC/220VAC（1±10%）
Fuse ：250V 1A Slow melting
Power ：max 20VA
Weight ： 3.5 kg

10.4 shape size