Hantek HBT4000 Series Electronic Testing Solution Provider Instruction Manual

Internal resistance tester programming manual
(V 1.0)

Contents

HBT4000 Series Electronic Testing Solution Provider

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Introduction to SCPI command

SCPI (Standard Commands for ProgrammMable Instruments abbreviation), that is, the standard command set of program control instruments (programmable instruments). SCPI is a standardized instrument based on the existing standard IEEE 488.1 and IEEE 488.2, and follows the standardized instruments of the floating-point computing rules of the IEEE 754 standard, ISO 646 information exchange 7-bit encoding symbols (equivalent to ASCII programming). programming language. The SCPI command is a tree-like structure, including multiple subsystems. Each subsystem consists of a root keyword and one or several layers of keywords.

Command format

The command usually starts with the colon ":". The keywords are separated by the colon ":", followed by the optional parameter settings behind the keywords. Add a question mark "?" Behind the command line, indicating that this function is queried. The command keyword and the first parameter are separated by space, for example:
:ACQuire:TYPE <type>
:ACQuire:TYPE?
Acquire is the root keyword of the command, and Type is the second-level keyword. The command line starts with the colon ":", and at the same time use the colon "::" to separate the keywords at all levels. <Type> indicates the settable parameter. The question mark "?" Indicates the query. Command keywords: Acquire: Type and parameters <Type> are separated by spaces. In some commands with parameters, the comma ",", "separate multiple parameters, for example:
[:TRACe[<n>]]:DATA:VALue volatile,<points>,<data>

Symbol Description

The following symbols are not sent with commands.

1. Braces {}

   The content in the brackets is the parameter option. Parameters are usually separated by vertical lines "|".

   When using the command, one of the parameters must be selected.
2. Vertical line |

   The vertical line is used to separate multiple parameter options, and one of the parameters must be selected when using the command.

3. Square bracket [] The content in square brackets is omitted.
4. Triangle bracket <>
   The parameters in the triangular bracket must be replaced with an effective value.

Parameter Type

1. Bool
   The parameter is ON, OFF, 1 or 0. For example:
   :MEASure:ADISplay <bool> :MEASure:ADISplay?
   Among them:
   <bool> can be set to:{{1|ON}|{0|OFF}}. Query back 1 or 0
2. Discrete
   The parameter takes the option listed. For example:
   :ACQuire:TYPE <type> :ACQuire:TYPE? Among them: <type>can be set as:
   NORMal|AVERages|PEAK|HRESolution. Query Return to abbreviations: NORM, AVER, PEAK or HRES.
3. Integer
   Unless there is another instructions, the parameters can be an arbitrary integer (NR1 format) within the effective value range. Note that at this time, please do not set the parameter as a decimal format, otherwise there will be abnormalities. For example:
   :DISPlay:GBRightness <brightness> :DISPlay:GBRightness? Among them: <brightness> can be set to: Our integer between 0 and 100. The query returns an integer between 0 and 100.
4. Real
   The parameters can be arbitrarily numbered within the valid value range. The command accepts the parameter input of the decimal (NR2 format) and the scientific count (NR3 format) format.
   For example:
   :TRIGger:TIMeout:TIMe <NR3> :TRIGger:TIMeout:TIMe?
   Among them: The parameter<NR3> can be set to a real number between 1.6e-08 (ie 16ns) and 1e+01 (ie 10s). The query returns a real number in the scientific counting format.
5. ASCII String
   The combination of the parameter is the combination of ASCII characters, for example:
   :SYSTem:OPTion:INSTall <license> Among them: <license> can be set to:
   PDUY9N9QTS9PQSWPLAETRD3UJHYA

Order abbreviation

All commands are not sensitive to the case, you can use uppercase or lowercase. However, if you want to abbreviate, you must lose all the capital letters in the command format.
For example:
:MEASure:ADISplay? Can be abbreviated as MEAS:ADIS?

Measuring command

:SAMPle:RATE
This command is used to set the sampling rate.
Command grammar
SAMPle:RATE < SLOW|HORO|FAST>

Exemplary example
SAMPle:RATE SLOW
Query command
SAMPle:RATE?
Return parameter
SLOW|HORO|FAST

:CALCulate:AVERage

This command is used to set the average number of times.
Command grammar
:CALCulate:AVERage <1|2|4|8>
Exemplary example
:CALCulate:AVERage 2
Query command
:CALCulate:AVERage?
Return parameter
1|2|4|8

:TRIGger:SOURce

This command is used to set the trigger mode.
Command grammar
:TRIGger:SOURce<INT|EXT|MAN>
Exemplary example
:TRIGger:SOURce MAN
Query command
:TRIGger:SOURce?
Return parameter
INT|EXT|MAN
:TRIGger:DELay
This command is used to set the trigger delay time(ms).
Command grammar
:TRIGger:DELay<1 – 9999>
Exemplary example
:TRIGger:DELay MAN
Query command
:TRIGger:DELay?
Return parameter
1 – 9999

:ABSolute

This command is used to set the absolute value function.
Command grammar
:ABSolute <ON|OFF>
Exemplary example
:ABSolute OFF
Query command
:ABSolute?
Return parameter
ON|OFF

:FETCh?

This command is used to read the latest measurement value.
Query command
:FETCh?

Return parameter

<Resistance measurement value>, <Voltage measurement value> (ΩV function)
<Resistance measurement value> (Ω function)
<Voltage measurement value> (V function)

Exemplary example

Example: Query :FETC?
Response 288.02E-3 , 1.3921E+0 (ΩV function)
The resistance measurement value is 288.02mΩ, and the voltage measurement value is1.3921V.

Range command

:FUNCtion
This command is used to set the measurement type.
Command grammar
FUNCtion< RV|VOLTage|RESistance>
Exemplary example
FUNCtion FUNCtion
Query command
FUNCtion?
Return parameter
RV|VOLTage|RESistance
:VOLTage:RANGe
This command is used to set the measurement voltage range.
Command grammar
VOLTage:RANGe < 6V|60V|300V|AUTO>
Exemplary example
VOLTage:RANGe 6V
Query command
VOLTage:RANGe?
Return parameter
6V|60V|300V|AUTO
:RESistance:RANGe
This command is used to set the measurement resistance schedule.
Command grammar
RESistance:RANGe <3mR|30mR|300mR|3R|30R|300R|3000R|AUTO>
Exemplary example
RESistance:RANGe 30mR
Query command
RESistance:RANGe?
Return parameter
3mR|30mR|300mR|3R|30R|300R|3000R|AUTO

Statistical command

:CALCulate:STATistics:STATe
This command is used to set the statistical function to open and close.
Command grammar
:CALCulate:STATistics:STATe <ON|OFF|1|0>
Exemplary example
:CALCulate:STATistics:STATe OFF
Query command
:CALCulate:STATistics:STATe?
Return parameter
ON|OFF
:CALCulate:STATistics:CLEAr
This command is used to clear the statistical operation results
:CALCulate:STATistics:RESistance:NUMBer?
This command is used to query the data of the resistance.
Command grammar
Query :CALCulate:STATistics:RESistance:NUMBer?
Response <Total data number(NR1)>, <Effective data number(NR1)>
<Total data number (NR1)> = 0 – 1000
<Effective data number (NR1)> = 0-1000
Example
Query :CALC:STAT:RES:NUMB?
Response 22 , 20
:CALCulate:STATistics:VOLTage:NUMBer?

This command is used to query the voltage measurement data.
Command grammar
Query :CALCulate:STATistics:VOLTage:NUMBer?
Response <Total data number(NR1)>, <Effective data number(NR1)>
<Total data number(NR1)> = 0 – 1000
<Effective data number(NR1)>= 0 – 1000
Example
Query :CALC:STAT:VOLT:NUMB?
Response 22 , 20

:CALCulate:STATistics:RESistance:MEAN?

This command is used to query the average value of resistance measurement data.
Command grammar
Query :CALCulate:STATistics:RESistance:MEAN?
Response <Average(NR3)>
Example
Query :CALC:STAT:RES:MEAN?
Response 30.370E+0

:CALCulate:STATistics:VOLTage:MEAN?

This command is used to query the average value of the voltage measurement data.
Command grammar
Query :CALCulate:STATistics:VOLTage:MEAN?
Response <Average(NR3)>
Example
Query :CALC:STAT:VOLT:MEAN?
Response 0.000124E+0

:CALCulate:STATistics:RESistance:MAXimum?

This command is used to query the maximum value in the measurement of resistance measurement data.
Command grammar
Query :CALCulate:STATistics:RESistance:MAXimum?
Response <Maximum value (NR3)>, <Data number of the maximum value (NR1)
Example
Query :CALC:STAT:RES:MAX?
Response 3.5044E+0 , 142

:CALCulate:STATistics:VOLTage:MAXimum?

This command is used to query the maximum value in the voltage measurement data.
Command grammar
Query :CALCulate:STATistics:VOLTage:MAXimum?
Response <maximum value (NR3)>, <data number of the maximum value (NR1)
Example
Query :CALC:STAT:VOLT:MAX?
Response 30.384E+0 , 26

:CALCulate:STATistics:RESistance:MINimum?

This command is used to query the minimum value in the resistance measurement data.
Command grammar
Query :CALCulate:STATistics:RESistance:MINimum?
Response < Minimum value (NR3)> , < Minimum data number (NR1)
Example
Query :CALC:STAT:RES:MIN?
Response 3.5044E+0 , 142

:CALCulate:STATistics:VOLTage:MINimum?

This command is used to query the minimum value in the voltage measurement data.
Command grammar
Query :CALCulate:STATistics:VOLTage: MINimum?
Response < Minimum value (NR3)> , < Minimum data number (NR1)
Example
Query :CALC:STAT:VOLT: MIN?
Response 30.384E+0 , 26

:CALCulate:STATistics:RESistance:LIMit?

This command is used to query the results of the resistance comparator under

the statistical interface.
Command grammar
Query :CALCulate:STATistics:RESistance:LIMit?
Response <Hi number>,<In number>,<Lo number>,< test exception number>
Example
Query :CALC:STAT:RES:LIMit?
Response 6 , 160 , 0 , 2

:CALCulate:STATistics:VOLTage:LIMit?

This command is used to query the result of the voltage comparator under the statistical interface.
Command grammar
Query :CALCulate:STATistics:VOLTage:LIMit?
Response <Hi number>,<In number>,<Lo number>,< test exception
number>
Example
Query :CALC:STAT:VOLT:LIMit?
Response 2 , 110 , 0 , 2

:CALCulate:STATistics:RESistance:DEViation?

This command is used to query the standard deviation under the statistical interface.
Command grammar
Query :CALCulate:STATistics:RESistance:DEViation??
Response <σn(NR3)>,<σn-1(NR3)>
Example
Query :CALC:STAT:RES:DEV?
Response 0.0195E-3 , 0.0196E-3

:CALCulate:STATistics:VOLTage:DEViation?

This command is used to query the standard deviation under the statistical interface.
Command grammar
Query :CALCulate:STATistics:VOLTage:DEViation?
Response <σn(NR3)>,<σn-1(NR3)>
Example
Query :CALC:STAT:VOLT:DEV?
Response 0.000000E+0 , 0.000000E+0

:CALCulate:STATistics:RESistance:CP?

This command is used to query the statistical resistance process capability
index.
Command grammar
Query :CALCulate:STATistics:RESistance:CP?
Response <Cp(NR2)>,<CpK(NR2)>
Example
Query :CALC:STAT:RES:CP?
Response 99.99 , 99.99

:CALCulate:STATistics:VOLTage:CP?

This command is used to query the statistical voltage process capability index.
Command grammar
Query :CALCulate:STATistics:VOLTage:CP?
Response <Cp(NR2)>,<CpK(NR2)>
Example
Query :CALC:STAT:VOLT:CP?
Response 99.99 , 0.00

Comparison command

:CALCulate:LIMit:STATe

This command is used to set the comparator to open and close.
Command grammar
:CALCulate:LIMit:STATe<ON|OFF|1|0>
Exemplary example
:CALCulate:LIMit:STATe ON

Query command
:CALCulate:LIMit:STATe?
Return parameter
ON|OFF

:CALCulate:LIMit:BEEPer

This command is used to set the comparator decision buzzer
Command grammar
:CALCulate:LIMit:BEEPer <OFF|HL|IN|BT1|BT2>
Exemplary example
:CALCulate:LIMit:BEEPer OFF
Query command
:CALCulate:LIMit:BEEPer?
Return parameter
OFF|HL|IN|BT1|BT2

:CALCulate:LIMit:COMParator

This command is used to set the comparator comparison mode.
Command grammar
:CALCulate:LIMit:COMParator <AUTO| MANUAL>
Exemplary example
:CALCulate:LIMit:COMParator AUTO
Query command
:CALCulate:LIMit:COMParator?
Return parameter
AUTO| MANUAL

:CALCulate:LIMit:RESistance:MODE

This command is used to set the resistor mode.
Command grammar
:CALCulate:LIMit:RESistance:MODE <HL|REF>
Exemplary example
:CALCulate:LIMit:RESistance:MODE HL
Query command
:CALCulate:LIMit:RESistance:MODE?
Return parameter
HL| REF

:CALCulate:LIMit:RESistance:PERCent

This command is used to set the setting of the resistance range.
Command grammar
:CALCulate:LIMit:RESistance:PERCent <0 – 99.99>
Exemplary example
:CALCulate:LIMit:RESistance:PERCent 0.5
Query command
:CALCulate:LIMit:RESistance:PERCent?
Return parameter
0.5

:CALCulate:LIMit:VOLTage:PERCent

This command is set to set the voltage range.
Command grammar
:CALCulate:LIMit:VOLTage:PERCent <0 – 99.99>
Exemplary example
:CALCulate:LIMit:VOLTage:PERCent 1.523
Query command
:CALCulate:LIMit:VOLTage:PERCent?
Return parameter
1.523

Auxiliary command

:SYSTem:BEEPer:STATe

This command is used to set the system key sound.
Command grammar
:SYSTem:BEEPer:STATe<ON|OFF|1|0>
Exemplary example
:SYSTem:BEEPer:STATe ON
Query command
:SYSTem:BEEPer:STATe?
Return parameter
ON|OFF

:SYSTem:KLOCk

This command is used to set the key lock.
Command grammar
:SYSTem:KLOCk <ON|OFF|1|0>
Exemplary example
:SYSTem:KLOCk OFF
Query command
:SYSTem:KLOCk?
Return parameter
ON|OFF

:SYSTem:BRIGHTness

This command is used to set the screen brightness.
Command grammar
:SYSTem:BRIGHTness <10 – 100>
Exemplary example
:SYSTem:BRIGHTness 50
Query command
:SYSTem:BRIGHTness?
Return parameter
10 – 100

:SYSTem:LOCal

This command is used to set the machine from the remote state (the upper right corner is Remote) to the local state (the Local can be pressed in the upper right corner
:ADJust?
This command is used to set the automatic zero-zero and return the zero-zero result.
Query command
:ADJust?
Return parameter
<0 ,1>
Note: 0 Represents success 1 represents failure
It takes a certain amount of time to adjust the zero process. After the input command is entered for about eight seconds, the zero-adjustment result is returned

:ADJust:CLEAr

This command is used to remove zero-adjusting data.

Documents / Resources

	Hantek HBT4000 Series Electronic Testing Solution Provider [pdf] Instruction Manual HBT4000 Series Electronic Testing Solution Provider, HBT4000 Series, Electronic Testing Solution Provider, Testing Solution Provider, Solution Provider, Provider

References

- Hantek Electronic & Your testing solution provider
- Hantek Electronic & Your testing solution provider
- User Manual