ET54 Electronic load SCPI communication protocol

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Catalog

1 SCPI command syntax

1.1 Syntax conventions

Take the following two commands as examples to illustrate the meanings of the symbols in the SCPI command:

Case 1: the LOAD [1] | 2: the TRIGger {MAN | EXT | TRG}

Example 2: TIME: OFFDelay < numeric >

Following the command syntax, most commands (and some arguments) are represented as a mixture of upper and lower case letters. For shorter program lines, you can send commands in abbreviated format. For better program readability, you can send long format commands. For example, in the syntax statement above, TRIGger and TRIG are both acceptable formats.

The brackets ([]) contain the argument categories for the given command string. The brackets are not sent with the command string.

Bar (|) separated by a given command string multiple parameter selection. For example, in the above command, {MAN | EXT | TRG} said can specify "MAN", "EXT", "TRG" one of the parameters. Bar is not be sent with the command string.

The Angle brackets (< >) in the second example indicate that a value must be specified for the argument inside the brackets. For example, in the syntax statement above, the argument inside the Angle brackets is < delay value >. The Angle brackets are not sent with the command string. You must specify a value for the parameter (for example, "1500").

Some syntax elements (such as nodes and parameters) are contained within square brackets ([]). This indicates that the element is optional and can be omitted. The brackets are not sent with the command string. If no value is specified for the optional argument, the instrument will select the default value. In the example above, the "LOAD [1 | 2]," says you can through the "LOAD" or "LOAD1", refers to channel 1. In addition, because the entire LOAD node is optional (in brackets), you can also pass completely omit the LOAD node to refer to channel 1. This is because channel 1 is the default channel for the LOAD node. On the other hand, to refer to channel 2, you can only use "LOAD2" in the program line.

1.2 Command separator

The colon (:) is used to separate the command keyword from the keyword at the next level. Spaces must be inserted to separate the argument from the command key. If a command requires more than one argument, you must separate the adjacent arguments with commas, as follows:

VOLT:ON 1

In this example, the command specifies a load setting channel to start voltage of 1V.

A semicolon (,) is used to separate multiple parameter setting items in the same subsystem. For example, send the following command string:

LIST:PARA 10,0,3, 100,1,3,0.1

Under low current range, set the test mode of step 10 to CC, set the load value to 2A, set the delay time to 100S, compare the upper and lower limits to open, set the upper limit value to 3A, set the lower limit value to 0.1A

2 Command set of ET54

The section titled "Description" describes how the command is used or what the command does.

The section titled "Parameters" introduces the required parameters for sending the command. When the parameter is a numeric or string type in <>, the definition of the parameter, allowable range of values, default (factory setting) values, and so on are given, and when the parameter is a selection type in {}, the description of each option is given.

The section titled "Command Syntax" indicates that the command does not need to be answered, and the instrument only needs to perform the corresponding action according to the command. The part titled "Query syntax" means that the command needs to be answered and the instrument needs to return data to the host computer. For details about the response, please refer to "Query Return". "Command Syntax" and "Query syntax" are both syntax sent from the external controller to the ET54. This communication protocol states:

NR1: integer, such as: 123

NR2: Decimal (fixed-point number), such as: 12.3

NR3: floating-point number, such as: 12.3E+5

NRf: NR1, NR2, or NR3

NL: Carriage return, integer 10

The default baud rate is 9600, which can be modified manually or by command in the communication Settings. After modifying the baud rate, set the baud rate of the serial port software to the corresponding value, close the serial port and then open the serial port. You can set the electronic load address (485 with 000-255).

Send instruction format, no frame header + instruction content + no check +0A (frame tail)

RS485 communication send instruction format is

No frame head + address (M@SXXX) + instruction content + no check +0A (frame tail) (DB-9 pin 1 A, pin 2 B, pin 6 GNG, load address cannot be set the same, other same as the user manual)
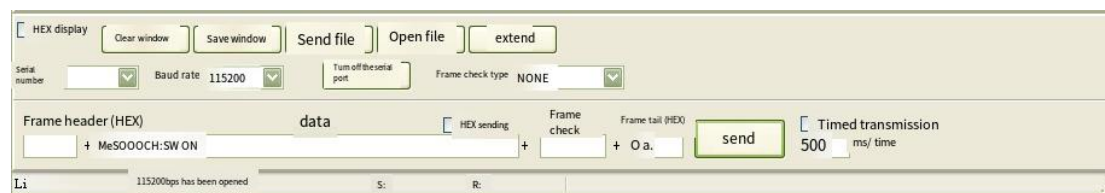
2.1　　IEEE488.2 Mandatory command

*IDN?

The description command is used to query instrument information

Query syntax *IDN?

Query returns <model>,<SN>,<software>,<NL>

Note <model> gives the machine model number as ET54XX,< SN> gives the serial number,<software> gives the software version number, and <hardware> gives the hardware version number.

*TRG

Describe the load Select "software" as the trigger source, generating a trigger signal.

Command syntax *TRG

SELE

Description Settings Selected channel (valid for two-channel type loads).

Command syntax SELE {1} | 2

The query syntax SELE?

Query returns 1 | {2} < NL >

2.2 SCPI command instrument requirements

2.2.1 SYSTem subsystem command set

:VERSion?

Describe the SCPI version number that the query instrument conforms to

Query syntax SYSTem:VERSion?

Query return 2017.7<NL>

:BEEP

Describe making a buzzer beep.

Command syntax SYST:BEEP

:LOCA

Describes putting ET54 in the local action state.(The program control command that sets the instrument to local or remote operation state interacts with the key switching of the instrument)

Command syntax SYST:LOCA

2.3 ET54 command set

2.3.1 [LOAD [1 | 2]] subsystem command set

Command the LOAD subsystem is mainly used for configuration of the current

channel LOAD Settings.You can query the load Settings of the current channel.

:TRIGger

Set the trigger mode of the trigger source. You can query the current trigger mode of the trigger source.

Command syntax LOAD: the TRIGger {MAN | EXT | TRG}

parameter

	Description
MAN	Manual trigger mode
EXT	External trigger mode
TRG	Command trigger mode (software)

Query syntax LOAD:TRIGger?

Query returns {MAN | EXT | TRG} < NL >

:VRANge

Set the range of voltage. You can query the range of voltage.

Command syntax LOAD: VRANge {HIGH | LOW}

parameter

	Description
HIGH	High range
LOW	Low range

Query syntax LOAD:VRANge?

Query returns {HIGH | LOW} < NL >

:CRANge

Set the range of the current. You can query the range of the current.

Command syntax LOAD: CRANge {HIGH | LOW}

parameter

	Description
HIGH	High range
LOW	Low range

Query syntax LOAD:CRANge?

Query returns {HIGH | LOW} < NL >

:ABNO

Query if the current load is abnormal.

Description

	Description
NONE	There is no
OV	Overvoltage protection
OC	Overcurrent protection
OP	Overpower protection
OT	Overtemperature protection
LRV	Polarity reverse connection protection
UN	The actual value does not reach the set value
FAIL	Communication failure

Query syntax LOAD:ABNO?

Query returns {NONE | OV | OC | OP | | OT LRV | UN | FAIL} < NL >

2.3.2 [QUAL | 2 [1]] subsystem command set

QUAL subsystem is mainly used to set the current command channel (CC, CV, CP, CR) model of qualification testing.You can query the qualifying test Settings for the current channel.

:TEST

To enable or disable qualifying tests, you can query whether the current qualifying test is open.

Command syntax QUAL: TEST {ON | OFF}

parameter

	Description
ON	Pass test open
OFF	Qualifying test off

Query syntax QUAL:TEST?

Query returns {ON | OFF} < NL >

:OUT

Query whether the result of the qualifying test passes.

	Description
NONE	There is no
PASS	Pass the qualifying test
FAIL	Fail the passing test

Query syntax QUAL:OUT?

Query returns {NONE | PASS | FAIL} < NL >

:VHIGh

Set the qualified test upper voltage value, you can query the current upper voltage value.

Command syntax QUAL:VHIGh <numeric>

Arguments

< numeric >				
Model number	5410, 5420		5411	
Range	high	low	high	low
Range	0.10 to 150.00	0.100 to 20	0.10 to 500.00	0.100 to 20
Preset value	0.10	0.100	0.10	0.100
Units	V			

Query syntax QUAL:VHIGh?

Query returns <NR3><NL>

Example: In the case of low voltage range, set the upper voltage to 20V

    QUAL:VHIGh 20 (note the space in the middle);

Query: QUAL:VHIGh?

    Return: 20.000

:VLOW

Set the qualified test lower limit voltage value, you can query the current lower limit voltage value.

Command syntax QUAL:VLOW <numeric>

Arguments

< numeric >				
Model number	5410, 5420		5411	
Range	high	low	high	low
Range	0.10 to 150.00	0.100 to 20	0.10 to 500.00	0.100 to 20
Preset value	0.10	0.100	0.10	0.100
Units	V			

Query syntax QUAL:VLOW?

Query returns <NR3><NL>

Example: In the case of low voltage range, set the lower limit voltage to 10V

    QUAL:VLOW 10 (note the space in the middle);

Query: QUAL:VLOW?

    Return: 10.000

:CHIGh

Set the qualifying test upper current value, which can be queried for the current upper current value.

Command syntax QUAL:CHIGh <numeric>

Arguments

< numeric >						
Model number	5410		5411		5420	
Range	high	low	high	low	high	low
Range	0.00 to 40.00	0.000 ~ 3.000	0.00 to 15.00	0.000 ~ 3.000	0.00 to 20.00	0.000 ~ 3.000
Preset value	40.00	3.000	15.00	3.000	20.00	3.000
Units	A					

Query syntax QUAL:CHIGh?

Query returns <NR3><NL>

Example: In the case of low current range, set the upper current to 3A

    QUAL:CHIGh 3 (note the space in the middle);

Query: QUAL:CHIGh?

    Return: 3.000

:CLOW

Set the qualifying test lower limit current value to query the current lower limit current value.

Command syntax QUAL:CLOW <numeric>

Arguments

< numeric >

Model number	5410		5411		5420	
Range	high	low	high	low	high	low
Range	0.00 to 40.00	0.000 ~ 3.000	0.00 to 15.00	0.000 ~ 3.000	0.00 to 20.00	0.000 ~ 3.000
Preset value	40.00	3.000	15.00	3.000	20.00	3.000
Units	A					

Query syntax QUAL:CLOW?

Query returns <NR3><NL>

Example: In the case of low current range, set the lower limit current to 1A

    QUAL:CLOW 1 (note the space in the middle);

Query: QUAL:CLOW?

    Return: 1.000

:PHIGh

Set the qualified test upper limit power value to query the current upper limit power value.

Command syntax QUAL:PHIGh <numeric>

Arguments

< numeric >		
Model number	5410, 5411	5420
Range	0.00 to 400.00	0.00 ~ 200.00
Preset value	400.00	200.00
Units	W	

Query syntax QUAL:PHIGh?

Query returns <NR3><NL>

Example: Set the upper power value to 200W

    QUAL:PHIGh 200 (note the space in the middle);

Query: QUAL:PHIGh?

    Return: 200.00

:PLOW

Set the qualifying test lower limit power value to query the current lower limit power value.

Command syntax QUAL:PLOW <numeric>

Parameters

< numeric >		
Model number	5410, 5411	5420
Range	0.00 to 400.00	0.00 ~ 200.00
Preset value	400.00	200.00
Units	W	

Query syntax QUAL:PLOW?

Query returns <NR3><NL>

Example: Set the lower limit power value to 100W

    QUAL:PLOW 100 (note the space in the middle);

Query: QUAL:PLOW?

Return: 100.00

2.3.3 SYSSet subsystem command set

The SYSSet subsystem commands are used to set system Settings and query the current instrument system Settings.

:STARt

Set the boot Settings, which can be queried.

Command syntax SYSSet: STARt {DEFAULT | LAST}

	describe
DEFAULT	Default
LAST (default)	Last value

Query syntax SYSSet:STARt?

Query returns {DEFAULT | LAST} < NL >

:LANGuage

Set display language Settings, you can query language Settings.

Command syntax SYSSet: LANGuage {CHINESE | ENGLISH}

	describe
CHINESE	Chinese
ENGLISH	English

Query syntax SYSSet:LANGuage?

Query returns {CHINESE | ENGLISH} < NL >

2.3.4 COMM subsystem command set

The COMM subsystem command set is used to set up the remote communication.

:BAUDrate

Set the baudrate.

Command syntax COMM:BAUDrate <numeric>

	< numeric >
Baud rate	0 to 3 corresponds (4800 | 7200 | | 14400 | 9600)
The preset value	0

Query syntax COMM:BAUDrate?

Query returns {4800 | 7200 | 9600 | 14400} < NL >

2.3.5 [VOLT | 2 [1]] subsystem command set

The VOLT subsystem command set is used to set the voltage value.

Parameters

< numeric >				
Model number	5410, 5420		5411	
Range	high	low	high	low
Range	0.10 to	0.100 to	0.10 to	0.100 to

	150.00	20.000	500.00	20.000
Preset value	0.10	0.100	0.10	0.100
Units	V			

:ON

Set the starting voltage value, you can query the current starting voltage value.

Command syntax VOLT:ON <numeric>

Query syntax VOLT:ON?

Query returns <NR3><NL>

Example: Set the starting voltage to 1V in the case of low voltage range

VOLT:ON 1.0 (note the space in the middle);

Query: VOLT:ON?

Return: 1.000

:OFF

Set off voltage value, you can query the current off voltage value.

Command syntax VOLT:OFF <numeric>

Query syntax VOLT:OFF?

Query returns <NR3><NL>

Example: In the case of low voltage range, set the turn-off voltage to 1V

VOLT:OFF 1.0 (note the space in the middle);

Query: VOLT:OFF?

Return: 1.000

:VMAX

Set the overvoltage protection voltage value, you can query the current overvoltage protection voltage value.

Command Syntax VOLT:VMAX <numeric>

Parameters

< numeric >				
Model number	5410, 5420		5411	
Range	high	low	high	low
Range	0.10 to 155.00	0.100 to 21.000	0.10 to 520.00	0.100 to 21.000
Preset value	155.00	21.000	520.00	21.000
Units	V			

Query syntax VOLT:VMAX?

Query returns <NR3><NL>

Example: Set the overvoltage protection voltage to 21V in the case of low voltage range

VOLT:VMAX 21 (note the space in the middle);

Query VOLT:VMAX?

Return: 21.000

:CV

Set CV mode voltage value, you can query CV mode voltage value.

Command Syntax VOLT:CV <numeric>

Query syntax VOLT:CV?

Query returns <NR3><NL>

Example: Set CV to 15V in the case of low voltage range

    VOLT:CV 15 (note the space in the middle);

Query: VOLT:CV?

    Return: 15.000

:CCCV

Set the CC+CV mode voltage, you can query the CC+CV mode voltage value.

Command Syntax VOLT:CCCV <numeric>

Query syntax VOLT:CCCV?

Query returns <NR3><NL>

Example: Set the CCCV to 15V in the case of low voltage range

    VOLT:CCCV 15 (note the space in the middle);

Query: VOLT:CCCV?

    Return: 15.000

:CRCV

Set the CR+CV mode voltage value, you can query the CR+CV mode voltage value.

Command Syntax VOLT:CRCV <numeric>

Query syntax VOLT:CRCV?

Query returns <NR3><NL>

Example: Set the CRCV to 15V in the case of low voltage range

    VOLT:CRCV 15 (note the space in the middle);

Query: VOLT:CRCV?

    Return: 15.000

:TA

Set the dynamic test mode A voltage value, you can query the dynamic test mode A voltage value.

Command syntax VOLT:TA<numeric>

Query syntax VOLT:TA?

Query returns <NR3><NL>

Example: Set the dynamic test A value to 15V with the current low range

    VOLT:TA 15 (note the space in the middle);

Query: VOLT:TA?

    Return: 15.000

:TB

Set the dynamic test mode B voltage value to query the dynamic test mode B voltage value.

Command Syntax VOLT:TB<numeric>

Query syntax VOLT:TB?

Query returns <NR3><NL>

Example: Set the dynamic test mode B value to 10V with the current low range

　　VOLT:TB 10 (note the space in the middle);

Query: VOLT:TB?

　　Return: 10.000

:LED

Set the LED test mode Vo voltage value, you can query the LED test mode Vo voltage value.

Command syntax VOLT:LED<numeric>

Query syntax VOLT:LED?

Query returns <NR3><NL>

Example: Set the LED test mode Vo value to 12V with the current down range

　　VOLT:LED 12 (note the space in the middle);

Query: VOLT:LED?

　　Return: 12.000

:BCR

Set the battery test mode constant resistance cut-off voltage value, you can query the battery test mode constant resistance cut-off voltage value.

Command syntax VOLTage:BCR<numeric>

Arguments

Range	high	low
Range	0.10 to 150.00	0.100 to 20.000
Preset value	0.10	0.100
Units	V	

Query syntax VOLT:BCR?

Query returns <NR3><NL>

Example: Set the battery test mode constant resistance cutoff voltage value to 12V with the current down range

　　VOLT:BCR 12 (note the space in the middle);

Query: VOLT:BCR?

　　Return: 12.000

:BCC1

Set battery test mode constant current cutoff voltage value 1, you can query battery test mode constant current cutoff voltage value 1.

Command syntax VOLT:BCC1<numeric>

Parameters

Range	high	low
Range	0.10 to 150.00	0.100 to 20.000
Preset value	0.10	0.100
Units	V	

Query Syntax VOLT:BCC1?

Query returns <NR3><NL>

Example: Set the battery test mode constant current cutoff voltage value 1 to 18V in the case of low voltage range

VOLT:BCC1 18 (note the space in the middle);

Query: VOLT:BCC1?

    Return: 18.000

:BCC2

Set battery test mode constant current cutoff voltage value 2, you can query battery test mode constant current cutoff voltage value 2.

Command syntax VOLT:BCC2<numeric>

Parameters

Range	high	low
Range	0.10 to 150.00	0.100 to 20.000
Preset value	0.10	0.100
Units	V	

Query Syntax VOLT:BCC2?

Query returns <NR3><NL>

Example: Set the battery test mode constant current cutoff voltage value of 2 to 12V in the case of low voltage range

    VOLT:BCC2 12 (note the space in the middle);

Query: VOLT:BCC2?

    Return: 12.000

:BCC3

Set battery test mode constant current cutoff voltage value 3, you can query battery test mode constant current cutoff voltage value 3.

Command syntax VOLT:BCC3<numeric>

Parameters

Range	high	low
Range	0.10 to 150.00	0.100 to 20.000
Preset value	0.10	0.100
Units	V	

Query Syntax VOLT:BCC3?

Query returns <NR3><NL>

Example: Set the battery test mode constant current cutoff voltage value 3 to 10V in the case of low voltage range

    VOLT:BCC3 10 (note the space in the middle);

Query: VOLT:BCC3?

    Return: 10.000

:STARt

Set the scanning test starting voltage value, you can query the scanning test starting voltage value.

Command syntax VOLT:STARt<numeric>

Query syntax VOLT:STARt?

Query returns <NR3><NL>

Example: In the case of low voltage range, set the scanning test starting voltage value to 1V

    VOLT:STARt 1 (note the space in the middle);

Query: VOLT:STARt?

　　Return: 1.000

:END

Set the voltage value of the end point of scanning test. You can query the voltage value of the end point of scanning test.

Command syntax VOLT:END<numeric>

Query syntax VOLT:END?

Query returns <NR3><NL>

Example: In the case of low voltage range, set the scanning test terminal voltage value to 18V

　　VOLT:END 18 (note the space in the middle);

Query: VOLT:END?

　　Return: 18.000

:STEP

Set the scanning test stepping voltage value, you can query the scanning test stepping voltage value.

Command syntax VOLT:STEP<numeric>

Query syntax VOLT:STEP?

Query returns <NR3><NL>

Example: Set the scanning test step voltage value to 1V with the current down range

　　VOLT:STEP 1 (note the space in the middle);

Query: VOLT:STEP?

　　Return: 1.000

:VTH

Set the scan test voltage turn threshold, you can query the scan test voltage turn threshold.

Command syntax VOLT:VTH<numeric>

Query syntax VOLT:VTH?

Query returns <NR3><NL>

Example: In the case of low voltage range, set the voltage turn threshold of the scan test to 10V

　　VOLT:VTH 10 (note the space in the middle);

Query: VOLT:VTH?

　　Return: 10.000

:VMIN

Set the scan test minimum voltage threshold, can query the scan test minimum voltage threshold.

Command Syntax VOLT:VMIN<numeric>

Query syntax VOLT:VMIN?

Query returns <NR3><NL>

Example: Set the scan test minimum voltage to 10V in the case of low voltage range

　　VOLT:VMIN 10 (note the space in the middle);

Query: VOLT:VMIN?

    Return: 10.000

:LOW

Set the lower limit of scan test voltage, you can query the lower limit of scan test voltage.

Command syntax VOLT:LOW<numeric>

Query syntax VOLT:LOW?

Query returns <NR3><NL>

Example: Set the lower limit of the scan test scan test voltage to 1V in the case of low voltage range

    VOLT:LOW 1 (note the space in the middle);

Query: VOLT:LOW?

    Return: 1.000

:HIGH

Set the scan test voltage upper limit, you can query the scan test voltage upper limit.

Command syntax VOLT:HIGH<numeric>

Query syntax VOLT:HIGH?

Query returns <NR3><NL>

Example: Set the upper limit of the scan test scan test voltage to 18V in the case of low voltage range

    VOLT:HIGH 18 (note the space in the middle);

Query: VOLT:HIGH?

    Return: 18.000

2.3.6 [CURR | 2 [1]] subsystem command set

CURR subsystem command set is used to set the current value.

Parameters

< numeric >						
Model number	5410		5411		5420	
Range	high	low	high	low	high	low
Range	0.00 to 40.00	0.000 ~ 3.000	0.00 to 15.00	0.000 ~ 3.000	0.00 to 20.00	0.000 ~ 3.000
Preset value	40.00	3.000	15.00	3.000	20.00	3.000
Units	A					

:IMAX

Set the overcurrent protection current value to query the current overcurrent

protection current value.

Command syntax CURR:IMAX <numeric>

Parameters

< numeric >						
Model number	5410		5411		5420	
Range	high	low	high	low	high	low
Range	0.00 to 45.00	0.000 ~ 3.300	0.00 ~ 16.00	0.000 ~ 3.300	0.00 ~ 22.00	0.000 ~ 3.300
Preset value	45.00	3.300	16.00	3.300	22.00	3.300
Units	A					

Query syntax CURR:IMAX?

Query returns <NR3><NL>

Example: In the case of low current range, set the overcurrent protection current to 3A

   CURR:IMAX 3 (note the space in the middle);

Query: CURR:IMAX?

   Return: 3.000

:CC

Set CC mode current value, you can query CC mode current value.

Command syntax CURR:CC <numeric>

Query syntax CURR:CC?

Query returns <NR3><NL>

Example: In the case of low range current, set the CC mode current value to 3A

   CURR:CC 15 (note the space in the middle);

Query: CURR:CC?

   Return: 3.000

:CCCV

Set the CC+CV mode current value, you can query the CC+CV mode current value.

Command syntax CURR:CCCV <numeric>

Query syntax CURR:CCCV?

Query returns <NR3><NL>

Example: In the case of low current range, set the CCCV mode current value to 3A

   CURR:CCCV 15 (note the space in the middle);

Query: CURR:CCCV?

   Return: 3.000

:TA

Set the dynamic test mode A value current value, you can query the dynamic test mode A current value.

Command syntax CURR:TA<numeric>

Query syntax CURR:TA?

Query returns <NR3><NL>

Example: In the case of current range, set the dynamic test A value to 3A

    CURR:TA 3 (note the space in the middle);
Query: CURR:TA?
    Return: 3.000
:TB
Set dynamic test mode B value current value, you can query the dynamic test mode B current value.
Command syntax CURR:TB<numeric>

Query syntax CURR:TB?
Query returns <NR3><NL>
Example: Set dynamic test mode B value to 1A in case of low current range
    CURR:TB 1 (note the space in the middle);
Query: CURR:TB?
    Return: 1.000
:LED
Set LED test mode Io current value, you can query LED test mode Io current value.
Command syntax CURR:LED<numeric>
Query syntax CURR:LED?
Query returns <NR3><NL>
Example: Set the LED test mode Io value to 3A when the current is low range
    CURR:LED 3 (note the space in the middle);
Query: CURR:LED?
    Return: 3.000
:BCC
Set the battery test mode constant discharge value (cutoff condition non-voltage), you can query the battery test mode constant discharge value.
Command syntax CURR:BCC<numeric>
Query syntax CURR:BCC?
Query returns <NR3><NL>
Example: In the case of low current range, set the battery test mode constant discharge value to 3A
    CURR:BCC 3 (note the space in the middle);
Query: CURR:BCC?
    Return: 3.000

:BCC1
Set battery test mode constant discharge value 1, you can query battery test mode constant discharge value 1.
Command syntax CURR:BCC1<numeric>
Query syntax CURR:BCC1?
Query returns <NR3><NL>
Example: In the case of low current range, set the battery test mode constant discharge value 1 to 3A
    CURR:BCC1 3 (note the space in the middle);

Query: CURR:BCC1?

  Return: 3.000

:BCC2

Set battery test mode constant discharge value 2, you can query battery test mode constant discharge value 2.

Command syntax CURR:BCC2<numeric>

Query syntax CURR:BCC2?

Query returns <NR3><NL>

Example: In the case of low current range, set the battery test mode constant discharge value 2 to 2A

  CURR:BCC2 2 (note the space in the middle);

Query: CURR:BCC2?

  Return: 2.000

:BCC3

Set battery test mode constant discharge value 3, you can query battery test mode constant discharge value 3.

Command syntax CURR:BCC3<numeric>

Query syntax CURR:BCC3?

Query returns <NR3><NL>

Example: In the case of low current range, set the battery test mode constant discharge value 3 to 1A

  CURR:BCC3 1 (note the space in the middle);

Query: CURR:BCC3?

  Return: 1.000

:STARt

Set the scanning test starting current value, you can query the scanning test starting current value.

Command syntax CURR:STARt<numeric>

Query syntax CURR:STARt?

Query returns <NR3><NL>

Example: In the case of low range current, set the scanning test starting point current value to 1A

  CURR:STARt 1 (note the space in the middle);

Query: CURR:STARt?

  Return: 1.000

:END

Set the current value at the end of the scanning test. You can query the current value at the end of the scanning test.

Command syntax CURR:END<numeric>

Query syntax CURR:END?

Query returns <NR3><NL>

Example: In the case of low current range, set the scanning test endpoint current

value to 3A

    CURR:END 3 (note the space in the middle);

Query: CURR:END?

    Return: 3.000

:STEP

Set the scanning test stepping current value, you can query the scanning test stepping current value.

Command syntax CURR:STEP<numeric>

Query syntax CURR:STEP?

Query returns <NR3><NL>

Example: In the case of low range current, set the scan test step current value to 1A

    CURR:STEP 1 (note the space in the middle);

Query: CURR:STEP?

    Return: 1.000

:LOW

Set the scanning test current limit, you can query the scanning test current limit.

Command syntax CURR:LOW<numeric>

Query syntax CURR:LOW?

Query returns <NR3><NL>

Example: In the case of low current range, set the lower limit of scan test scan test current to 0.5A

    CURR:LOW 0.5 (note the space in the middle);

Query: CURR:LOW?

    Return: 0.500

:HIGH

Set the upper limit of scan test current. You can query the upper limit of scan test current.

Command syntax CURR:HIGH<numeric>

Query syntax CURR:HIGH?

Query returns <NR3><NL>

Example: In the case of low current range, set the upper limit of scan test scan test current to 3A

    CURR:HIGH 3 (note the space in the middle);

Query: CURR:HIGH?

    Return: 3.000

:LOADC1

Set the first current setting value of the load effect test, you can query the first current setting value of the load effect test.

Command syntax CURR:LOADC1<numeric>

Query syntax CURR:LOADC1?

Query returns <NR3><NL>

Example: In the case of low current range, set the first current setting value of load effect test to 0.1A

　　CURR:LOADC1 0.1 (note the space in the middle);

Query: CURR:LOADC1?

　　Return: 0.100

:LOADC2

Set the second current setting value of the load effect test, you can query the second current setting value of the load effect test.

Command syntax CURR:LOADC2<numeric>

Query syntax CURR:LOADC2?

Query returns <NR3><NL>

Example: In the case of low current range, set the load effect test 2 current setting value to 0.5A

　　CURR:LOADC2 0.5 (note the space in the middle);

Query: CURR:LOADC2?

　　Return: 0.500

:LOADC3

Set the third current setting value of the load effect test, you can query the third current setting value of the load effect test.

Command syntax CURR:LOADC3<numeric>

Query syntax CURR:LOADC3?

Query returns <NR3><NL>

Example: In the case of low current range, set the load effect test 3rd current setting value to 1A

　　CURR:LOADC3 1 (note the space in the middle);

Query: CURR:LOADC3?

　　Return: 1.000

:COMPC1

Set the remote compensation first current setting value, you can query the remote compensation first current setting value.

Command syntax CURR:COMPC1<numeric>

Query syntax CURR:COMPC1?

Query returns <NR3><NL>

Example: In the case of low current range, set the remote compensation 1st current setting value to 0.1A

　　CURR:COMPC1 0.1 (note the space in the middle);

Query: CURR:COMPC1?

　　Return: 0.100

:COMPC2

Set the remote compensation second current setting value, you can query the remote compensation second current setting value.

Command syntax CURR:COMPC2<numeric>

Query syntax CURR:COMPC2?

Query returns <NR3><NL>

Example: In the case of low current range, set the remote compensation 1st current setting value to 1A

　　CURR:COMPC2 1 (note the space in the middle);

Query: CURR:COMPC2?

　　Return: 1.000

2.3.7 [POWE | 2 [1]] subsystem command set

　　POWE subsystem command set is used to set the power value.

Parameters

⟨ numeric ⟩		
Model number	5410, 5411	5420
Range	0.00 to 400.00	0.00 ~ 200.00
Preset value	400.00	200.00
Units	W	

:PMAX

Set the overpower protection value, you can query the current overpower protection value.

Command syntax POWE:PMAX ⟨numeric⟩

Arguments

⟨ numeric ⟩		
Model number	5410, 5411	5420
Range	0.00 ~ 420.00	0.00 ~ 220.00
Preset value	420.00	220.00
Units	W	

Query syntax POWE:PMAX?

Query returns ⟨NR3⟩⟨NL⟩

Example: Set the overpower protection value to 200W

　　POWE:PMAX 200 (note the space in the middle);

Query: POWE:PMAX?

　　Return: 200.00

:CP

Set CP mode power value, you can query CP mode power value.

Command syntax POWE:CP ⟨numeric⟩

Query syntax POWE:CP?

Query returns ⟨NR3⟩⟨NL⟩

Example: Set the power value to 50W

　　POWE:CP 50 (note the space in the middle);

Query: POWE:CP?

　　Return: 50.00

:STARt

Set the scanning test starting point power value, you can query the scanning

test starting point power value.

Command syntax POWE:STARt<numeric>

Query syntax POWE:STARt?

Query returns <NR3><NL>

Example: Set the power value to 50W

    POWE:STARt 50 (note the space in the middle);

Query: POWE:STARt?

    Return: 50.00

:END

Set the scanning test end power value, you can query the scanning test end power value.

Command syntax POWE:END<numeric>

Query syntax POWE:END?

Query returns <NR3><NL>

Example: Set the power value to 200W

    POWE:END 200 (note the space in the middle);

Query: POWE:END?

    Return: 200.00

:STEP

Set the scanning test stepping power value, you can query the scanning test stepping power value.

Command syntax POWE:STEP<numeric>

Query syntax POWE:STEP?

Query returns <NR3><NL>

Example: Set the power value to 5W

    POWE:STEP5 (note the space in the middle);

Query: POWE:STEP?

    Return: 5.00

:LOW

Set the lower limit of scan test power, you can query the lower limit of scan test power.

Command syntax POWE:LOW<numeric>

Query syntax POWE:LOW?

Query returns <NR3><NL>

Example: Set the power value to 50W

    POWE:LOW 50 (note the space in the middle);

Query: POWE:LOW?

    Return: 50.00

:HIGH

Set the scan test power upper limit, you can query the scan test power upper limit.

Command syntax POWE:HIGH<numeric>

Query syntax POWE:HIGH?

Query returns <NR3><NL>

Example: Set the power value to 200W

    POWE:HIGH 200 (note the space in the middle);

Query: POWE:HIGH?

    Return: 200.00

2.3.8 [rsei | 2 [1]] subsystem command set

    The rsei subsystem command set is used to set the resistance value.

:CR

Set CR mode resistance value, you can query CR mode resistance value.

Command syntax RESI:CR <numeric>

Arguments

< numeric >	
Range	0.01 to 5000.00
Preset value	100
Units	Ω

Query syntax RESI:CR?

Query returns <NR3><NL>

Example: Set the resistance value to 500Ω

    RESI:CR 500 (note the space in the middle);

Query: RESI:CR?

    Return: 500.00

:CRCV

Set the CR+CV mode resistance value, you can query the CR+CV mode resistance value.

Command syntax RESI:CRCV <numeric>

Arguments

< numeric >	
Range	0.01 to 5000.00
Preset value	100
Units	Ω

Query syntax RESI:CRCV?

Query returns <NR3><NL>

Example: Set the resistance value to 500Ω

    RESI:CRCV 500 (note the space in the middle);

Query: RESI:CRCV?

    Return: 500.00

:BCR

Set battery test mode constant resistance discharge resistance value, you can query battery test mode constant resistance discharge resistance value.

Command syntax RESI:BCR<numeric>

Arguments

< numeric >

Range	0.03 to 4500.00
Preset value	500
Units	Ω

Query syntax RESI:BCR?

Query returns <NR3><NL>

Example: Set the resistance value to 500Ω

    RESI:BCR 500 (note the space in the middle);

Query: RESI:BCR?

    Return: 500.00

2.3.9 [TIME] [1 | 2] subsystem command set

    Command set is used to set delay shut off TIME subsystem, dynamic test and scanning the TIME value of the test.

:OFFDelay

Set the delay off time, you can query the current delay off time value.

Command syntax TIME:OFFDelay <numeric>

Arguments

	< numeric >
Range	0 to 60,000
Preset value	0
Units	S

Query syntax TIME:OFFDelay?

Query returns <NR1><NL>

Example: Set the delay turn-off time to 1500S

    TIME:OFFDelay 1500 (note the space in the middle);

Query: TIME:OFFDelay?

    Return: 1500

:WA

Set the dynamic test pulse width A value.

Command syntax TIME:WA <numeric>

Arguments

	< numeric >
Range	50 to 60,000
Preset value	1000
Units	mS

Query syntax TIME:WA?

Query returns <NR1><NL>

Example: Set the delay off time to 1000ms

    TIME:WIDThA 1000 (note the space in the middle);

Query: TIME:WIDThA?

    Return: 1000

:WB

Set the dynamic test pulse width B value.

Command syntax TIME:WB <numeric>

Arguments

	< numeric >
Range	50 to 60,000
Preset value	1000
Units	mS

Query syntax TIME:WB?

Query returns <NR1><NL>

Example: Set the delay off time to 1000mS

    TIME:WB 1000(note the space in the middle);

Query: TIME:WB?

    Return: 1000

:STEP

Set the scan test step delay value.

Command syntax TIME:STEP<numeric>

Arguments

	< numeric >
Range	1 to 999
Preset value	1
Units	S

Query syntax TIME:STEP?

Query returns <NR1><NL>

Example: Set the delay off time to 15S

    TIME:STEP 15 (note the space in the middle);

Query: TIME:STEP?

    Return: 15

:BTT

Set the scan test step delay value.

Command syntax TIME:BTT<numeric>

Arguments

	< numeric >
Range	1 to 60,000
Preset value	60
Units	S

Query syntax TIME:BTT?

Query returns <NR1><NL>

Example: Set the delay off time to 15S

    TIME:BTT 15 (note the space in the middle);

Query: TIME:BTT?

    Return: 15

:ONESTEP

Set the load effect test single step time.

Command syntax TIME:ONESTEP<numeric>

Arguments

	〈 numeric 〉
Range	1 to 60,000
Preset value	5
Units	S

Query syntax TIME:ONESTEP?

Query returns <NR1><NL>

Example: Set the load effect test single step time to 15S

　　TIME:ONESTEP 15 (note the space in the middle);

Query: TIME:ONESTEP?

　　Return: 15

2.3.10 | 2 [1]] [LED subsystem command set

　　LED subsystem command set is used to set the LED COEFF coefficient values.
:COEFf

Set LED test mode coefficient value, you can query LED test mode coefficient value.

Command Syntax LED:COEFf <numeric>

Parameters

〈 numeric 〉	
Range	0.01 to 1.00
Preset value	1.00

Query syntax LED:COEFf?

Query returns <NR3><NL>

Example: Set the coefficient value to 0.5

　　LED:COEFf 0.5 (note the space in the middle);

Query: LED:COEFf?

　　Return: 0.50

2.3.11 [TRAN | 2 [1]] subsystem command set

　　TRAN subsystem command set is used to set the dynamic test of dynamic load and dynamic model.
:STATe

Set the dynamic state of the dynamic test. You can query the dynamic state of the dynamic test.

Command syntax TRAN: STATe {CC | CV}

	describe
CC(preset value)	Dynamic load state is CC
CV	The dynamic carrier state is CV

Query syntax TRAN:STATe?

Query returns {CC | CV} 〈 NL 〉
:MODE

Set the dynamic mode of the dynamic test. You can query the dynamic mode of the

dynamic test.

Command syntax TRAN: MODE {COUT | TRIG | PULS}

	describe
COUT(preset value)	Dynamic mode is continuous
TRIG	Dynamic mode for Trigger
PULS	Dynamic mode is pulse

Query syntax TRAN:MODE?

Query returns {COUT | TRIG | PULS} < NL >

2.3.12 [BATT | 2 [1]] subsystem command set

BATT subsystem command set is used to set the battery test firing pattern.
:MODE

Set the discharge mode for the battery test.

Command syntax BATT: MODE} {CC | CR

	describe
CC(preset value)	Discharge mode is CC
CR	Discharge mode CR

Query syntax BATT:MODE?

Query returns {CC | CR} < NL >

:CAPA

Description Query battery discharge capacity.

Query syntax BATT:CAPA?

Query returns <NR3><NL>

:ENER

Description Query battery discharge energy.

Query syntax BATT:ENER?

Query returns <NR3><NL>
:BCUT

Set cut-off conditions for battery testing.

Command syntax BATT: BCUT | E} {T | V | C

	describe
V(preset value)	The cut-off condition is voltage
T	Cut-off condition is time
C	Cut-off condition is capacity
E	The cut-off condition is energy

Query syntax BATT:BCUT?

Query returns {T | V | | E C} < NL >
:BAEN

Set cutoff enable for battery testing.

Command syntax BATT: BAEN | 2 | 3} {1

	describe
3(preset value)	Enable 3 stage discharge
2	Enable 2 stage discharge
1	Enable 1 stage discharge

Query syntax BATT:BAEN?

Query returns 1 | 2 | 3} {< NL >

:BTC

Set battery test mode cutoff energy.

Command syntax BATT:BTC <numeric>

Arguments

〈 numeric 〉	
Range	0 to 9999
Preset value	0

Query syntax BATT:BTC?

Query returns <NR3><NL>

Example: Set the coefficient value to 1

    BATT:BTC 1 (note the space in the middle);

Query: BATT:BTC?

    Return: 1.00

:BTE

Set battery test mode cutoff energy.

Command syntax BATT:BTE <numeric>

Arguments

〈 numeric 〉	
Range	0 to 9999
Preset value	0

Query syntax BATT:BTE?

Query returns <NR3><NL>

Example: Set the coefficient value to 1

    BATT:BTE 1 (note the space in the middle);

Query: BATT:BTE?

    Return: 1.00

2.3.13 [SCAN | 2 [1]] subsystem command set

    SCAN subsystem command set is used to set the scanning test scanning type, threshold value type and comparison.

:TYPE

Set the scan type of the scan test to query the scan type of the scan test.

Command syntax SCAN: TYPE {CC | CV | CP}

	describe
CC(preset value)	Scan type is CC
CV	The scan type is CV

CP	The scan type is CP

Query syntax SCAN:TYPE?

Query returns {CC | CV | CP} < NL >

:THTYpe

Set the threshold type of the scan test. The threshold type of the scan test can be queried.

Command syntax SCAN: THTYpe {VTH | DROP | VMIN}

	describe
VTH(preset value)	The threshold type is voltage transition
DROP	The threshold type is drop
VMIN	The threshold type is minimum voltage

Query syntax SCAN:THTYpe?

Query returns {VTH | DROP | VMIN} < NL >

:COMPare

Set the comparison type of the scan test to query the comparison type of the scan test.

Command syntax SCAN: COMPare {INCURR | INVOLT | INPOW}

	describe
INCURR(preset)	The comparison type is by current
INVOLT	Compare type by voltage
INPOW	Compare type by power

Query syntax SCAN:COMPare?

Query returns {INCURR | INVOLT | INPOW} < NL >

2.3.14 [LIST | 2 [1]] subsystem command set

LIST command set is used to set the LIST subsystem test test steps, loop switch and step mode.

:LOOP

To turn loop on or off, you can query whether loop is open for the current test.

Command syntax LIST: LOOP {ON | OFF}

parameter

	Description
ON	Loop open
OFF	Loop off

Query syntax LIST:LOOP?

Query returns {ON | OFF} < NL >

:MODE

Set the list test step mode to query the step mode of the current test.

Command syntax LIST: MODE {AUTO | TRIGGER}

parameter

	Description
AUTO	Step mode is continuous
TRIGGER	Step mode for trigger

Query syntax LIST:MODE?

Query returns {AUTO | TRIGGER} ＜ NL ＞

:NUM

Set list test steps to query the current number of test steps.

Command syntax LIST:NUM ＜numeric＞

Parameters

＜ numeric ＞	
Range	1 to 10
Preset values	5

Query syntax LIST:NUM?

Query returns ＜NR1＞＜NL＞

Example: Set the test step number to 10

   LIST:NUM 10 (note the space in the middle);

Query: LIST:NUM?

   Return: 10

:PARAmeter

Set parameters for the specified number of steps.

Command syntax LIST:PARA ＜secnum＞,＜type＞,＜value＞,＜ delay＞,＜compar＞,＜max＞,＜min＞

Set number of steps ＜ secnum＞	
Range	1 to 10
Preset values	1

Set the test mode for the corresponding number of steps.

type	Description
0	Test mode is CC
1	Test mode is CV
2	Test mode CP
3	Test mode CR
4	Test mode is open circuit
5	Test mode is short circuit

Set the upper and lower limits for the number of steps opened or closed

COMPare	Description
0	Compare off
1	Compare currents
2	Compare voltage
3	Compare power
4	Compare resistors

Set the corresponding step delay value.

DELAy	＜ numeric ＞

Range	1 to 60,000
Preset value	5
Units	S

VALUe, MAX, MIN

   Set the load size value, upper limit, and lower limit for the specified edit steps. You can query whether the current specified edit steps are the load value, upper limit, and lower limit.

   According to the test mode of the specified edit steps to determine the range of setting values, CV and OPEN belong to the range of voltage values, CC and SHORT belong to the range of current values, CR is the range of resistance values,CP is the range of power values.

   See 2.3.5VOLTage subsystem command voltage range for voltage values.

   For CURRent values, see 2.3.6CURRent subsystem Command Current Value Range.

   See 2.3.7POWEr subsystem Command Power Value Range for power values.

   See 2.3.8RESIstancee Subsystem Command Resistance Range for resistance values.
Example: under low current range, set the test mode of step 5 to CC, set the load value to 3A, set the delay time to 100S, open the comparison between upper and lower limits, set the upper limit value to 3A, set the lower limit value to 0.1A

   LIST:PARA 5,0,3,100,1,3,0.1

Query the list Settings parameters to get groups of Settings starting from the number of steps.
Query syntax LIST:PARA?<start>,<num>

<start>,<num>	
Range	1 to 10
Preset values	1

Example: Get the setting parameters for the 2 groups from step 3.
Query :LIST:PARA? 1, 2,
Return
3,0,3, 100,1,3 0.1
4,0,3,100,0,3,0.1
:OUT
Query the parameter of the number of steps specified in the list result after the list test is completed.
Query syntax LIST:OUT?<start>,<end>
Return the corresponding 〈 secnum 〉, 〈 type 〉, 〈 value 〉, 〈 pass_fail 〉, 〈 Max 〉, 〈 min 〉

pass_fail	Description
0	Current step comparison not turned on
1	PASS
2	FAIL

Example: Get the list result parameters for steps 1 through 2.
Query :LIST:OUT? 1, 2,
Return
1,0,3.000, 1,0,3.000,1.000
2,0,3.000, 2,0,3.000,0.000

2.3.15 [CH [1 | 2]] subsystem command set

CH subsystem command set is mainly used for setting mode as well as open or close channels.

:MODE

Describe setting channel mode

Command syntax CH: MODE {CC | CV CP | | CR | CCCV | CRCV | TRAN | | LIST SCAN | SHOR | BATT | LED}

The query syntax CH: MODE?

Query returns {CC | CV CP | | CR | CCCV | CRCV | TRAN | | LIST SCAN | SHOR | BATT | LED} < NL >

:SW

Description model opening, closing (ON | OFF)

Command syntax CH: SW {ON | OFF}

parameter

	Description
ON	Turn off the current mode (channel) and after the mode switch is the mode (channel) off state
OFF	Open current mode (channel)

Query syntax CH:SW?

Query returns {ON | OFF} < NL >

2.3.16 FILE subsystem command set

The FILE subsystem command set is used for some operations related to files.

:CHECk

Description Check if a file exists for the number.

Query syntax FILE:CHECk <numeric>?

Parameters

	< numeric >
Channel one list tests the data save range	1 to 100
Channel one list test results save range	101 to 200
Channel two list test data save range	201 to 300
Channel two list test results	301 to 400

save range	

	Description
NO	No files
YES	Existing file

Query returns {NO | YES} < NL >

:RECAll

Describe the call file.

Command syntax FILE:RECAll<numeric>

	< numeric >
Channel one list tests the data save range	1 to 100
Channel one list test results save range	101 to 200
Channel two list test data save range	201 to 300
Channel two list test results save range	301 to 400

:DELEte

Describe deleting the file.

Command syntax FILE:DELEte<numeric>

	< numeric >
Channel one list tests the data save range	1 to 20
Channel one list test results save range	101 to 120
Channel two lists test data retention ranges	201 to 220
Channel two lists test results save range	301 to 320

:STORe

Describe save file.

Command syntax FILE:STORe<numeric>

	< numeric >
Channel one list tests the data save range	1 to 20
Channel one list test results save range	101 to 120
Channel two lists test data retention ranges	201 to 220

| Channel two lists test results save range | 301 to 320 |

Store the file to file address n, save the name FLTX(X is the file serial number).

2.3.17 [MEAS | 2 [1]] command

Describe the query the current value measurement.

Query syntax MEAS:CURRent?

Query returns <NR3><NL>

Description The voltage value measured by the query.

Query syntax MEAS:VOLTage?

Query returns <NR3><NL>

Describe the power value measured by the query.

Query syntax MEAS:POWer?

Query returns <NR3><NL>

Describe the resistance value measured by the query.

Query syntax MEAS:RESIstance?

Query returns <NR3><NL>

Describe the input value of the query measurement (current value, voltage value, power value, resistance value).

Query syntax MEAS:ALL?

Query returns <NR3>, <NR3>, <NR3>, <NR3><NL>

2.3.18 SELF subsystem command set

:FAN

Description Query whether the fan works properly.

	Description
FAIL	Fan failure
PASS	Fan normal

Query syntax SELF:FAN?

Query returns < FAIL | PASS > < NL >

2.3.19 [LOAD [1 | 2]] LOAD set command set

:SENSE

Set the remote compensation on and off.

Command syntax LOAD: SENSE {ON | OFF}

parameter

	Description
ON	Remote compensation on
OFF	Remote compensation off

Query syntax LOAD:SENSE?

Query returns {ON | OFF} < NL >

:DTV

Query the power supply voltage attenuation in the load effect test.

Query syntax LOAD:DTV?

Query returns <NR3><NL>
:RES
Query the internal resistance value of the power supply in the load effect test.

Query syntax LOAD:RS?

Query returns <NR3><NL>
:REGUL
Query the load adjustment rate in the load effect test.

Query syntax LOAD:RATE?

Query returns <NR3><NL>

:ABNO

Query channel exceptions.

Parameters

	Description
NONE	No abnormal condition
OV	Overpressure
OC	Overcurrent
OP	overpower
LRV	Polarity reverse connection
OT	Overheat

Query syntax LOAD:ABNO?

Query returns {NONE | OV | OC | OP | LRV | OT} < NL >