ET35 Digital LCR Meter SCPI Protocol

Hangzhou Zhongchuang Electron Co., Ltd

Catalog

1 SCPI Command Syntax

1.1 Grammatical Conventions

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

- [SOURce[1|2]:]VOLTage:UNIT {VPP|VRMS|DBM}
  [SOURce[1|2]:]FREQuency:CENTer {<frequency>|MINimum|MAXimum|DEFault}

According to command syntax, most commands (and some parameters) are expressed in a mixture of uppercase and lowercase letters.For shorter program lines, you can send commands in an abbreviated format.To achieve better program readability, u can send long-format commands.For example, in the syntax statement above, both VOLT and VOLTAGE are acceptable formats.You can use uppercase or lowercase letters.Therefore, VOLTAGE, volt, and volt are all acceptable .However, Other formats, such as VOL and VOLTAG, are invalid and will make errors.

The curly braces ({}) contain the parameter options for the given command string.Braces are not sent with the command string.

A vertical bar (|) separates multiple parameter selections for a given command string.For example, in the above command, {VPP|VRMS|DBM} indicates that you can specify a parameter in "VPP," "VRMS," or "DBM."Bars are not sent with the command string.

The Angle brackets (< >) in the second example indicate that a value must be specified for the parameter within the brackets.For example, in the syntax statement above, the parameter in Angle brackets is < frequency >.Angle brackets are not sent with the command string.You must specify a value for the parameter (for example, "FREQ:CENT 1000") unless you select any other option that shown in the syntax (for example, "FREQ:CENT MIN").

Some syntax elements, such as nodes and parameters, are included in square brackets ([]).This means that the element is optional and can be omitted.Angle brackets are not sent with the command string.If no value is specified for the optional parameter, the instrument will select the default value.In the example above, "SOURce[1|2]" means that you can refer to SOURce channel 1 through "SOURce" or "SOURce1", or "SOUR1" or "SOUR".In addition, since the entire SOURce node is optional (in square brackets), you can also refer to channel 1 by omitting the SOURce node entirely. Because channel 1 is the default channel of the SOURce node.On the

other hand, to refer to channel 2, you can only use "SOURce2" or "SOUR2" on 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 parameters from command keywords. If one command requires more parameters, the parameters must be separated by commas, as shown below:

APPL:SIN 455E3,1.15,0.0

In this example, the APPLy command specifies a sine wave with a frequency of 455 KHz, an amplitude of 1.15 V, and a DC offset of 0.0 V.

The semicolon (;) is used to separate multiple commands in the same subsystem and minimize typing. For example, sending the following command string:

TRIG: SOUR EXT. COUNT 10

Its same as sending the following two commands:

TRIG: SOUR EXT

TRIG: COUNT 10

2 ET35 Command Set

The section titled "description" describes the use of a command or the operations it performs.

The section "parameter" describes the parameters necessary to send a command.When the parameter is a value or string type within <>, the definition of the parameter, allowable value range, default (factory setting) value, and so on are given. When the parameter is a selection type within {}, the description of each selection is given.

The section titled "command syntax" indicates that the command does not need any response, and the instrument only needs to perform the corresponding action according to the command.The section "query syntax" as part of title indicates that the command needs to be answered and the instrument needs to return data to the computer. For the specific answer content, please refer to "query return".Both “command syntax” and “query syntax” are grammars sent from the external controller to ET35.

This communication protocol provides that:

NR1: integer, e.g. 123

NR2: a decimal (fixed-point number), as in 12.3

NR3: floating point number, e.g., 12.3E+5

NRf: NR1, NR2 or NR3

NL: carriage return, integer 10

^END: EOI (END) signal of GPIB bus.(this signal may be omitted for other communication buses)

2.1IEEE488.2 Mandatory Command

***CLS**

Describe This command is used to clear the error/event queue, standard event state register, operation state register, and the query state register.

Command Syntax *CLS

Note: Executing the command also will clear any additional state data structures that executes on the instrument, but it will not affect the corresponding enable register.*CLS forces the device to be in OCIS (idle state of Operation completion command) and OQIS (idle state of Operation completion query), and No Operation Pending flag is set to be true, the OPC bit of the standard event status register is not set to true, and "1" is not placed in the output queue.

***ESE**

Describe This command is used to set the value of the standard event state enable register.Characters?Can query the value of the standard event state enable register.The bit definition of the standard event state enabler register is the same as the standard event state register bit definition below.

Command Syntax *ESE <numeric>

Parameter

	<numeric>
Range	0～255

Query Syntax *ESE?

Query Return <NR1><NL^END>

***ESR?**

Describe This command is used to query the values of the standard event status register.

-

Query Syntax *ESR?

Query Return <NR1><NL^END>

Each of the standard event status registers is defined as follows:

Bit	Description

numbe r	
7	Power On（PON） Bit
6	User Request（URQ）Bit
5	Command Error（CME）Bit
4	Execution Error（EXE）Bit
3	Device Dependent Error（DDE）Bit
2	Query Error（QYE）Bit
1	Request Control（RQC）Bit
0	Operation Complete（OPC）Bit

***IDN?**

Describe This command is used to query information of instrument

Query Syntax *IDN?

Query Return <manufacturer>,<model>,<firmware>,<hardware><NL^END>

Note: <manufacturer> gives the manufacturer (ZC), <model> gives the machine model (ET35), <firmware> gives the software version number, and <hardware> gives the hardware version number.

***OPC**

Describe This command is used to set the OPC bit (bit 0) of the standard event status register to 1 when ET35 completes the measurement of all pending parameters.When the instrument has completed all measurements, what are the characters?The command will tell that if the instrument 's pending operation is complete or not.when it completes, then it will return "1", if not , return "0"

Describe

Command syntax *OPC

Query syntax *OPC?

Query return 1<NL^END>

***RST**

Describe This command is used to reset the instrument.

Command syntax *RST

***SRE**

Describe Sets the value of the state byte enable register, which has the same bit definition as the state byte register.Characters? The value of the service request enable register can be queried.

Command syntax *SRE <numeric>

Parameter

	<numeric>
Range	0～255

Query syntax *SRE?

Query return <NR1><NL^END>

***STB?**

Describe This command is used to back to the value of Status byte register

Query syntax *STB?

Query return <NR1><NL^END>

The status byte register is defined as follows:

Bit No	Describe
7	Operation Status Register Summary Bit
6	MSS Bit： Control summery status bit
5	Standard Event Status Register Summary Bit
4	MAV Bit：information valid bit
3-0	Always is 0

***TST?**

Describe No any operation always return to 0

Query syntax *TST?

Query return {0|1}<NL^END>

***WAI**

Describe No any operation

Command syntax *WAI

2.2IEEE488.2 Operation Command

***TRG**

Describe The command is used to trigger the instrument measurement and write the measurement results to the output buffer. Its same as the command of TRIG+FETCh?

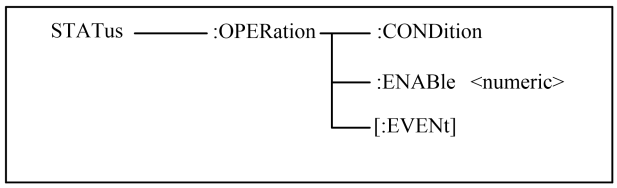
Command syntax *TRG

Note: *TRG is not a query command, but still has query value return function, and need to read this value. Otherwise,an error will occur when you send a subsequent command.

2.3 SCPI Instrument requirement command

2.3.1 STATus Subsystem Command Set

STATus subsystem command is used to query and set the value of operation state related register



:OPERation:CONDition?

Describes query the value of operation status register.

Query syntax STATus:OPERation:CONDition?

Query return <NR1><NL^END>

:OPERation:ENABle

Describe Sets the value of the operation status enable register.

Command syntax STATus:OPERation:ENABle <numeric>

Parameter

	<numeric>
Range	0～65535
Preset value	0

Query syntax STATus:OPERation:ENABle?

Query return <NR1><NL^END>

:OPERation[:EVENt]?

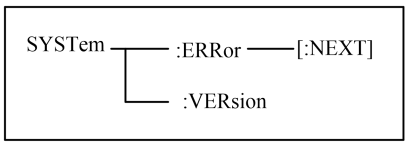
Describe Return to the value of operation state event register

Query syntax STATus:OPERation[:EVENt]?

Query return <NR1><NL^END>

2.3.2 SYSTem Subsystem Command Set

This SYSTem subsystem is mainly used to query the error message and the SCPI version number that matches to the instrument



:ERRor[:NEXT]?

Describe This command is used to query error messages

Query syntax SYSTem:ERRor[:NEXT]?

Query return <error message><NL^END>

Note: error message contains error number and an error message string with double quotation marks

:VERSion?

Describe Query SC[I version number that matches to instrument

Query syntax SYSTem: VERSion?

Query return 1999.0<NL^END>

2.4 ET35 Command set

2.4.1 ABORt subsystem command set

Describe ABORT subsystem command is used to abort the current measurement that made by the instrument

Command syntax ABORt

2.4.2 AMPLitude subsystem command set

AMPLitude subsystem command is used to set the automatic level control (ALC) switch, character?and is able to query the current automatic level control (ALC) switch status.When CURRent[:LEVel] <numeric> is set, the ALC switch is in constant CURRent mode when it is on, and output the set CURRent is directly when it is off.When VOLTage[:LEVel] <numeric> is set, the ALC switch is in constant VOLTage mode when on and outputs the VOLTage set when off.If no voltage current is set, the default output is used.

Command syntax AMPLitude:ALC {ON|OFF|1|0}

Parameter

	Describe
ON or 1	Turn on automatic level control
OFF or 0（Preset value）	Stop automatic level control

Query syntax AMPLitude:ALC?

Query return <NR1><NL^END>

2.4.3 APERture subsystem command set

The APERture subsystem commands are mainly used to set the mode of measuring speed, and the average number of times used in the measurement or the measurement time.When the measurement speed mode is FAST, MEDium, and SLOW, the latter parameter represents the average times; when the measurement speed mode is CUSTom, the latter parameter represents the time of one measurement.Characters?You can query the current measurement speed mode, the average number of times used in the measurement, or the measurement time.

Command syntax APERture {FAST|MEDium|SLOW|CUSTom},<numeric>

Parameter

	Describe
FAST	Set measurement speed mode as FAST
MEDium（Preset value）	Set measurement speed mode as MEDium
SLOW	Set measurement speed mode as SLOW
CUSTom	Set measurement speed mode as CUSTom

When current measurement speed mode is FAST|MEDium|SLOW：

	<numeric>
Range	1～256
Preset value	1
Resolution rate	1

When current measurement speed mode is CUSTom：

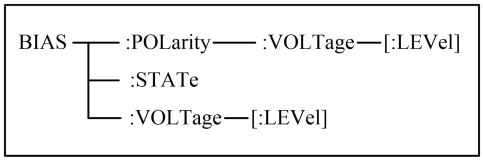
	<numeric>
Range	5.0E-3～2.0E+1
Preset value	1
Unit	s

Query syntax APERture?

Query return {FAST|MEDium|SLOW|CUSTom},{<NR1>|<NR3>}<NL^END>

2.4.4 BIAS subsystem command set

BIAS subsystem command is mainly used to set internal and external BIAS and BIAS voltage of the instrument.The command tree is as follows:



:POLarity:VOLTage[:LEVel]

Describe character? Can query the actual output level of the external bias voltage.

Query syntax BIAS:POLarity:VOLTage[:LEVel]?

Query return <NR3><NL^END>

:STATe

Describe Set the internal and external BIAS, character? Can query the current status of BIAS.

Command syntax BIAS:STATe {0|1|2}

Parameter

	Describe
0（Preset value）	Stop internal and external bias
1	Start internal bias
2	Start external bias

Query syntax BIAS:STATe?

Query return <NR1><NL^END>

:VOLTage[:LEVel]

Set DC bias voltage, character?can query the value of current DC bias voltage

Command syntax BIAS:VOLTage[:LEVel] <numeric>

Parameter

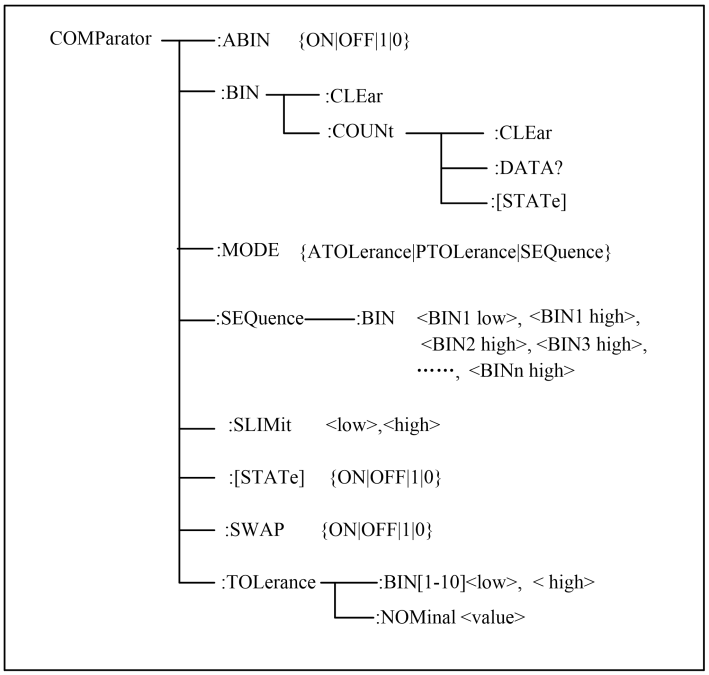
	< numeric >
Range	-2～2
Preset value	0
Unit	V

Query syntax BIAS:VOLTage[:LEVel]?

Query return <NR3><NL^END>

2.4.5 COMParator subsystem command set

The COMParator subsystem commands are used to set the COMParator BIN count function, including the setting of the COMParator switch and limit list.The command tree is as follows:



:ABIN

Describe start or stop the comparator's auxiliary BIN counting function.Can query the current status of the auxiliary BIN counting function.

Command COMParator:ABIN {ON|OFF|1|0}

Parameter

	Describe
ON or 1	Start auxiliary BIN counting function
OFF or 0（preset value）	Stop auxiliary BIN counting function

Query syntax COMParator:ABIN?

Query return <NR1><NL^END>

:BIN:CLEar

Describe clear all the set of BIN limit value

Command syntax COMParator:BIN:CLEar

:BIN:COUNt:CLEar

Describe clear all BIN count （not query）

Command syntax COMParator:BIN:COUNt:CLEar

:BIN:COUNt:DATA?

Describe query comparator BIN counting result

Query syntax COMParator:BIN:COUNt:DATA?

Query return <Bin 1>,<Bin 2>,<Bin 3>,<Bin 4>,<Bin 5>,<Bin 6>,<Bin 7>,<Bin 8>,<Bin 9>,<Bin 10>,<Out of Bin>,<Aux Bin><NL^END>

Note: <Bin 1-10> NR1 data format, is the 1-10 counting result; <Out of Bin> NR1 data format, is the worst counting result; <Aux Bin> NR1 data format, is the counting result for attached file.

:BIN:COUNt[:STATe]

Describe Set BIN count function switch, you can query the status of current set BIN count

switch.

Command syntax COMParator:BIN:COUNt[:STATe] {ON|OFF|1|0}

Parameter

	Describe
ON or 1	Start BIN count function
OFF or 0 （preset value ）	Stop BIN count function

Query syntax COMParator:BIN:COUNt[:STATe]?

Return <NR1><NL^END>

:MODE

Describe Set the limit mode of comparator function, clear the limit of primary and secondary parameters, and query the current set limit mode.

Command syntax COMParator:MODE {ATOLerance|PTOLerance|SEQuence}

Parameter

	Describe
ATOLerance	Set comparator mode.This command clears the limit table data represented by "ABS" and the quadratic limit.
PTOLerance （ Preset value）	Set comparator mode.This command clears the limit table data represented by "％" and the quadratic limit.
SEQuence	Set comparator mode.This command clears the limit table data represented by "SEQ" and the quadratic limit.

Query syntax COMParator:MODE?

Query return {ATOLerance|PTOLerance|SEQuence}<NL^END>

:SEQuence:BIN

Describe Set BIN upper/ lower limit value of comparator function queue mode, and can query current BIN upper/ lower limit value.

Command syntax COMParator:SEQuence:BIN <Bin 1 Low>, <Bin 1 High>,<Bin 2 High>,<Bin 3 High>,…… , <Bin n High>

Parameter

	<Bin 1 Low>
Unit	Depends on :FUNCtion:IMPedance[:TYPE]

	<Bin n High>
Range of “n”	1～10
Unit	Depends on :FUNCtion:IMPedance[:TYPE]

Query syntax COMParator:SEQuence:BIN?

Query return <Bin 1 Low>, <Bin 1 High>,<Bin 2 High>,<Bin 3 High>,…… , <Bin n High><NL^END>

Note: These limits only can be set when the limit mode is queue mode. Of course, the lower limit valur must be lower than the upper limit value. If not use BIN, this command will return, then -9.9E37 and9.9E37 will be as the lower limit and upper limit.

:SLIMit

Describe Set the upper and lower limits of the secondary parameters of the comparator, and query the upper and lower limits of the current secondary parameters of the instrument

Command syntax COMParator:SLIMit <Low>,<High>

Parameter

	<Low>,<High>
Preset value	-9.9E+37、9.9E+37
Unit	Depends on :FUNCtion:IMPedance[:TYPE]

Query syntax COMParator:SLIMit?

Query return <NR3>,<NR3><NL^END>

[:STATe]

Describe Set start or stop the comparator function, and can query the current comparator function status.

Command syntax COMParator[:STATe] {ON|OFF|1|0}

Parameter

	Describe
ON or 1	Start the comparator function
OFF or 0 （ preset value ）	Stop the comparator function

Query syntax COMParator[:STATe]?

Query return <NR1><NL^END>

:SWAP

Describe Set the switch function of main and auxiliary parameters.For example: function parameter: cp-D; select SWAP mode as ON, then the function parameter becomes: D-Cp;At this moment, the parameter limit setting of 1-10 gears becomes the upper and lower limit of setting D, and the worst level will set the Cp limit.That is, when ON is selected, the primary and secondary parameters are compared in reverse, and when OFF is selected, they are compared in the original order.you can query the switching comparison mode status of primary secondary parameters set by current instrument.

Command syntax COMParator:SWAP {ON|OFF|1|0}

Parameter

	Describe
ON or 1	BIN set is used to set secondary parameter
OFF or 0 （ preset value ）	BIN set is used to set primary parameter

Query syntax COMParator:SWAP?

Query return <NR1><NL^END>

:TOLerance:BIN[1-10]

Describe Set the lower and upper limits for each BIN in the comparator's functional tolerance mode.These limits can only be set when the limit mode is set to tolerance mode.If do not set lower and upper limit,will return to -9.9e37 and 9.9E37 respectively.You can query the current lower and upper limits setted for each BIN

Command syntax COMParator:TOLerance:BIN[1-10] <low>,<high>

Parameter

	<low>,<high>
Unit	Depends on:FUNCtion:IMPedance[:TYPE]

Query syntax COMParator:TOLerance:BIN[1-10]?

Query return <low>,<high><NL^END>

:TOLerance:NOMinal

Describe Sets the nominal value of the comparator function tolerance mode.(nominal values can only be set when limit mode is set to tolerance mode.). Can query the nominal value of current tolerance mode

Command syntax COMParator:TOLerance:NOMinal <numeric>

Parameter

	<numeric>
Preset value	0

Query syntax COMParator:TOLerance:NOMinal?

Query return <NR3><NL^END>

2.4.6 CONTrol subsystem command set

The CONTrol subsystem is used to set processor I/F to start and disable, characters?Represents the query startup status of processor I/F.

Command syntax CONTrol:HANDler:STATe {ON|OFF|1|0}

Parameter

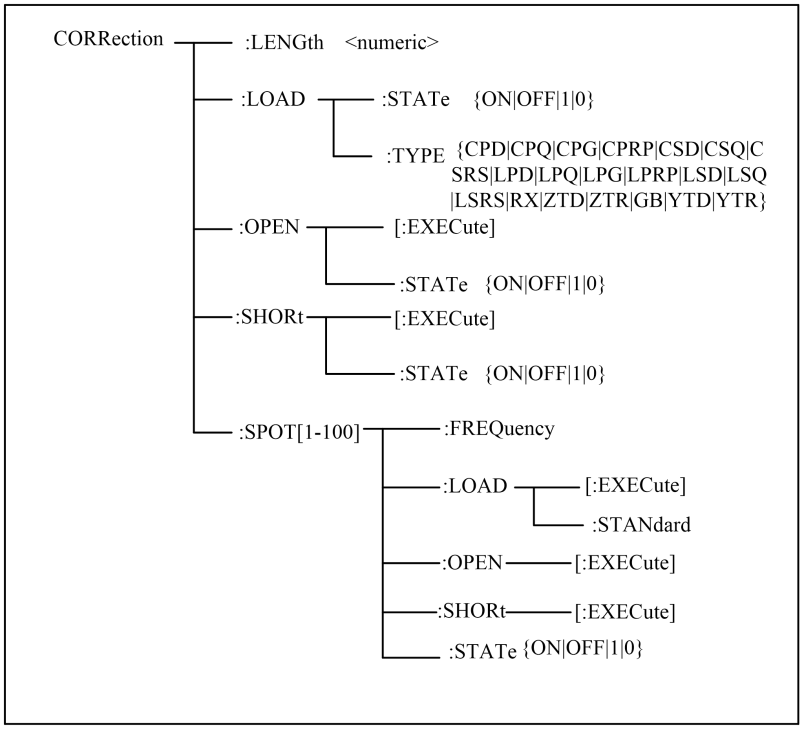
	Describe
ON or 1	Start processor I/F
OFF or 0 （ preset value ）	Disable processor I/F

Query syntax CONTrol:HANDler:STATe?

Query return <NR1><NL^END>

2.4.7 CORRection subsystem command set

The CORRection subsystem command set is used to set the user CORRection function, the setting of open circuit, short circuit and load CORRection.See next page for the command tree:



:LENGth

Describe Set instrument’s correction cable length, character?You can query the current set cable length.

Command syntax CORRection:LENGth <numeric>

Parameter

	<numeric>
Range	0|1|2|4
Preset value	0
Unit	m

Query syntax CORRection:LENGth?

Query return <NR1><NL^END>

:LOAD:STATe

Describe is used to set instrument’s load correction function, charator? Can query current load correction function status

Command syntax CORRection:LOAD:STATe {ON|OFF|1|0}

Parameter

	Describe
ON or 1	start load correction
OFF or 0 （ Preset value ）	disable load correction

Query syntax CORRection:LOAD:STATe?

Query return <NR1><NL^END>

:LOAD:TYPE

Describe is used to set the combination parameter function that being test of instrument's load correction , charator? can query current combined parameter type

Command syntax CORRection:LOAD:TYPE

{CPD|CPQ|CPG|CPRP|CSD|CSQ|CSRS|LPD|LPQ|LPG|LPRP|LSD|LSQ|LSRS|RX|ZTD| ZTR|GB|YTD|YTR}

Parameter

	Describe
CPD（Preset value ）	Load correction reference type Settings as “Cp-D”
CPQ	Load correction reference type Settings as “Cp-Q”
CPG	Load correction reference type Settings as “Cp-G”
CPRP	Load correction reference type Settings as “Cp-Rp”
CSD	Load correction reference type Settings as “Cs-D”
CSQ	Load correction reference type Settings as “Cs-Q”
CSRS	Load correction reference type Settings as “Cs-Rs”
LPD	Load correction reference type Settings as “Lp-D”
LPQ	Load correction reference type Settings as “Lp-Q”
LPG	Load correction reference type Settings as “Lp-G”
LPRP	Load correction reference type Settings as “Lp-Rp”
LSD	Load correction reference type Settings as “Ls-D”
LSQ	Load correction reference type Settings as “Ls-Q”
LSRS	Load correction reference type Settings as “Ls-Rs”
RX	Load correction reference type Settings as “R-X”
ZTD	Load correction reference type Settings as “Z-thd”
ZTR	Load correction reference type Settings as “Z-thr”
GB	Load correction reference type Settings as “G-B”
YTD	Load correction reference type Settings as “Y-thd”
YTR	Load correction reference type Settings as “Y-thr”

Query syntax CORRection:LOAD:TYPE?

Query return

{CPD|CPQ|CPG|CPRP|CSD|CSQ|CSRS|LPD|LPQ|LPG|LPRP|LSD|LSQ|LSRS|RX|ZTD| ZTR|GB|YTD|YTR}<NL^END>

:OPEN[:EXECute]

Describe Open circuit correction for all frequency points

Command syntax CORRection:OPEN[:EXECute]

:OPEN:STATe

Describe set the instrument’s open circuit correction function, character? Can query current open circuit correction function status.

Command syntax CORRection:OPEN:STATe {ON|OFF|1|0}

Parameter

	Describe
ON or 1	Start open circuit correction
OFF or 0 （ preset value）	Stop open circuit correction

Query syntax :CORRection:OPEN:STATe?

Query return <NR1><NL^END>

:SHORt[:EXECute]

Describe do short circuit correction for all frequency points

Command syntax CORRection:SHORt[:EXECute]

:SHORt:STATe

Describe Set short circuit correction function of instrument, character? Can query current short circuit correction function status of instrument.

Command syntax CORRection:SHORt:STATe {ON|OFF|1|0}

Parameter

	Describe
ON or 1	Start short circuit correction
OFF or 0 （ preset value ）	Disable short circuit correction

Query syntax CORRection:SHORt:STATe?

Query return <NR1><NL^END>

:SPOT[1-100]:FREQuency

Describe is used to set the frequency of specified measuring point. Character ?can query the frequency of current specified frequency point

Command syntax CORRection:SPOT[1-100]:FREQuency <numeric>

Parameter

	<numeric>
Range	10～1000000*1
Preset value	10
Unit	Hz

Query syntax CORRection:SPOT[1-100]:FREQuency?

Query return <NR3><NL^END>

*1 Frequency range is different with with different models, for the details please refer to the brochure.

:SPOT[1-100]:LOAD[:EXECute]

Describe carry out load correction in specify measuring points

Command syntax CORRection:SPOT[1-100]:LOAD[:EXECute]

:SPOT[1-100]:LOAD:STANdard

Describe The standard reference value of LOAD CORRection is set at the specified measurement point. Can query the reference value's measurement function of current specified frequency point load correction, and can select by CORRection:LOAD:TYPE

Command syntax CORRection:SPOT[1-100]:LOAD:STANdard <reference value for primary>, <reference value for secondery>

Parameter

	<reference value for primary>, <reference value for secondery>
Preset value	0
Unit	Depends on :CORRection:LOAD:TYPE

Query syntax CORRection:SPOT[1-100]:LOAD:STANdard?

Query return <NR3>,<NR3><NL^END>

:SPOT[1-100]:OPEN[:EXECute]

Describe do the open circuit correction for specify measuring point

Command syntax CORRection:SPOT[1-100]:OPEN[:EXECute]

:SPOT[1-100]:SHORt[:EXECute]

Describe do the short circuit correction for specify measuring point

Command syntax CORRection:SPOT[1-100]:SHORt[:EXECute]

:SPOT[1-100]:STATe

Describe Set specify measuringpoint, charator?Can query the specify measuring point

Command syntax CORRection:SPOT[1-100]:STATe {ON|OFF|1|0}

Parameter

	describe
ON or 1	start specify measuring point
OFF or 0 （ preset value）	stop specify measuring point

Query syntax CORRection:SPOT[1-100]:STATe?

Query return <NR1><NL^END>

2.4.8 CURRent subsystem command set

Describe set level current of measured signal, character? Can query the current measured level current

Command syntax CURRent[:LEVel] <numeric>

Parameter

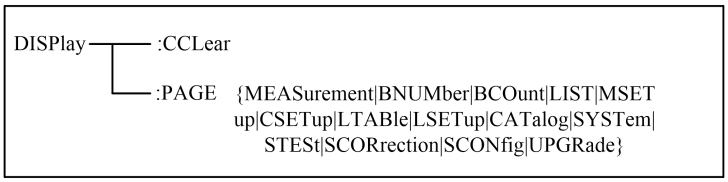
	<numeric>
Range	1.0E-4～2.0E-2
Unit	A

Query Syntax CURRent[:LEVel]?

Query return <NR3><NL^END>

2.4.9 DISPlay subsystem command set

The DISPlay subsystem command set is mainly used to set and clear the DISPlay interface of the instrument. The command tree is as follows:



:CCLear

Describe clear an error or warning message in display screen

Command syntax DISPlay:CCLear

:PAGE

Describe set the page to be displayed, character? Can query the current page

Command syntax DISPlay:PAGE{MEASurement|BNUMber|BCOunt|LIST|MSETup|CSETup|LTABle|LSETup|SAVE|SYSTem|STESt|SCORrection|SCONfig|UPGRade}

Parameter

	Describe
MEASurement（Preset value）	Set display page as < MEAS DISPLAY>
BNUMber	Set display page as<BIN No. DISPLAY>

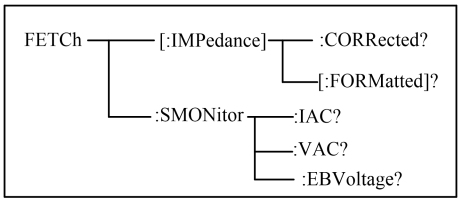
BCOunt	Set display page as<BIN COUNT DISPLAY>
LIST	Set display page as<LIST SWEEP DISPLAY>
MSETup	Set display page as<MEAS SETUP>
CSETup	Set display page as<CORRECTION>
LTABle	Set display page as<LIMIT TABLE SETUP>
LSETup	Set display page as<LIST SWEEP SETUP>
SAVE	Set display page as<SAVE/RECALL>
SYSTem	Set display page as<SYSTEM INFO>
STESt	Set display page as<SELF TEST>
SCORrection	Set display page as<SELF CORRECTION>
SCONfig	Set display page as<SYSTEM CONFIG>
UPGRade	Set display page as<PROGRAMME UPGRADE>

Query syntax DISPlay:PAGE?

Query return {MEASurement|BNUMber|BCOunt|LIST|MSETup|CSETup|LTABle|LSETup |SAVE|SYSTem|STESt|SCORrection|SCONfig|UPGRade}<NL^END>

2.4.10 FETCh？subsystem command set

FETCh？Subsystem commands are mainly used to make ET35 output a measurement result. The command tree is as follows:



[:IMPedance]:CORRected?

Describe query the complex measuring result after correction （R-X format）

Query syntax FETCh[:IMPedance]:CORRected?

Query return <NR3>,<NR3><NL^END>

[:IMPedance][:FORMatted]?

Describe return to measuring result through the selected measuring function

Query syntax FETCh[:IMPedance][:FORMatted]?

Note: the definition of returned result through query return is different as well according to different display interface, and the returned data format is related with FORMat[:DATA] {ASCii|REAL[,64]}

:SMONitor:IAC?

Describe Query the latest measuring data of AC current monitor

Query syntax FETCh:SMONitor:IAC?

Query return <NR3><NL^END>

:SMONitor:VAC?

Describe Query the latest measuring data of AC voltage monitor

Query syntax FETCh:SMONitor:VAC?

Query return <NR3><NL^END>

:SMONitor:EBVoltage?

Describe Query the latest measuring data of external BIAS voltage monitor

Query syntax FETCh:SMONitor:EBVoltage?

Query return <NR3><NL^END>

2.4.11 FREQuency subsystem command set

FREQuency subsystem command set is mainly used to set instrument's measurement frequency, cahractor? Can query current measurement frequency

Command syntax FREQuency[:CW] <numeric>

Parameter

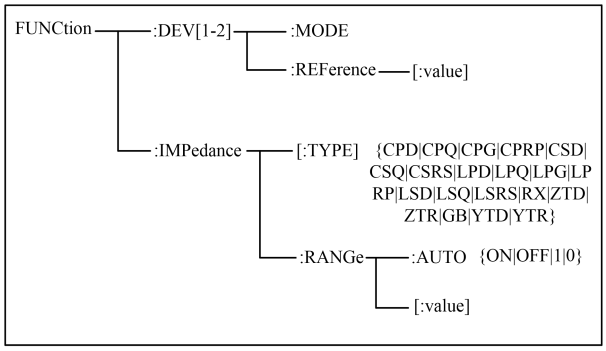
	<numeric>
Range	10～1000000
Preset value	1000
Unit	Hz
Resolution rate	Depends on frequency setting

Query syntax FREQuency[:CW]?

Query return <NR3><NL^END>

2.4.12 FUNCtion subsystem command set

The FUNCtion subsystem commands are mainly used to set "FUNCtion", range, current and voltage monitoring switch, and deviation display mode and nominal setting .The command tree is as follows:



:DEV[1-2]:MODE

Describe Set deviation measurement mode, character? Can query current deviation measurement mode status.

Command syntax FUNCtion:DEV[1-2]:MODE {ABSolute|PERCent|OFF}

Parameter

	Describe
ABSolute	set deviation measurement mode as "ABS"
PERCent	set deviation measurement mode as "%"
OFF（preset value ）	stop deviation measurement mode

Query syntax FUNCtion:DEV[1-2]:MODE?

Query return {ABS|PERC|OFF}<NL^END>

:DEV[1-2]:REFerence[:VALue]

Describe is used to set reference value of deviation measurement, character? Can query current deviation value.

Command syntax FUNCtion:DEV[1-2]:REFerence[:VALue] <numeric>

Parameter

	<numeric>
Preset value	0
Unit	Depends on :FUNCtion:IMPedance[:TYPE]。

Query syntax FUNCtion:DEV[1-2]:REFerence[:VALue]?

Query return <NR3><NL^END>

:IMPedance:RANGe:AUTO

Describe Enable automatic conversion range function for impedance measurement, character?can query the status of current range

Command syntax FUNCtion:IMPedance:RANGe:AUTO {ON|OFF|1|0}

Parameter

	Describe
ON or 1 （ Preset value ）	Start automatic conversion range
OFF or 0	Close automatic conversion range

Query syntax FUNCtion:IMPedance:RANGe:AUTO?

Query return <NR1><NL^END>

:IMPedance:RANGe[:VALue]

Describe is used to set range of instrument, character? Can query current range parameter. This command will close current automatic conversion range function

Command syntax FUNCtion:IMPedance:RANGe[:VALue] <numeric>

Parameter

	<numeric>
Range	30|100|300|1000|3000|10000|30000|100000|3000000|1000000
Preset value	100
Unit	Ω

Query syntax FUNCtion:IMPedance:RANGe[:VALue]?

Query return <Numeric><NL^END>

:IMPedance[:TYPE]

Describe set the measuring function parameter, character? Can query current measuring function parameter

Command syntax FUNCtion:IMPedance[:TYPE]<function>

Parameter

	<function>
CPD（Preset value）	Set impedance parameter type“Cp-D”
CPQ	Set type of impedance parameter as“Cp-Q”
CPG	Set type of impedance parameter as“Cp-G”
CPRP	Set type of impedance parameter as“Cp-Rp”
CSD	Set type of impedance parameter as“Cs-D”
CSQ	Set type of impedance parameter as“Cs-Q”
CSRS	Set type of impedance parameter as“Cs-Rs”
LPD	Set type of impedance parameter as“Lp-D”

LPQ	Set type of impedance parameter as“Lp-Q”
LPG	Set type of impedance parameter as“Lp-G”
LPRP	Set type of impedance parameter as“Lp-Rp”
LSD	Set type of impedance parameter as“Ls-D”
LSQ	Set type of impedance parameter as“Ls-Q”
LSRS	Set type of impedance parameter as“Ls-Rs”
RX	Set type of impedance parameter as“R-X”
ZTD	Set type of impedance parameter as“Z-thd”
ZTR	Set type of impedance parameter as“Z-thr”
GB	Set type of impedance parameter as“G-B”
YTD	Set type of impedance parameter as“Y-thd”
YTR	Set type of impedance parameter as“Y-thr”

Query syntax FUNCtion:IMPedance[:TYPE]?

Query return <function><NL^END>

2.4.13 HCOPy subsystem command set

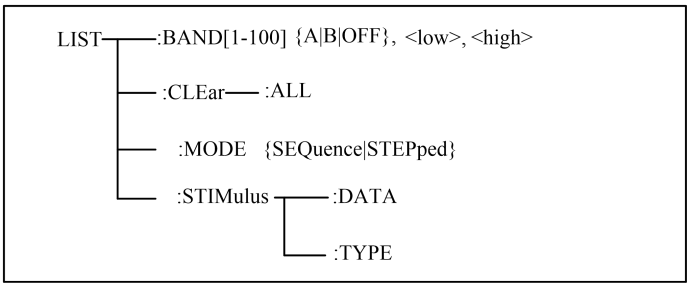
Subsystem command is mainly used in screen shot, it will output display image to the controller.

Query syntax HCOPy:SDUMp:DATA？

Note: if the command is done successfully, then store the screen shot into U disk; If not, then return the error message.

2.4.14 LIST subsystem command set

The LIST subsystem commands are mainly used to set the LIST scan and measurement function, scan point setting, scan mode setting, and scan comparison limit setting. The command tree is as follows:



:BAND[1-100]

Describe set the limit value of list scan measurement limit function. Can query the current limit data set.

Command syntax LIST:BAND[1-100] {A|B|OFF},<low>,<high>

Parameter

	Describe
A	Set limit test target as A（primary parameter ）
B	Set limit test target asB（secondary parameter ）
OFF（preset value ）	Close limit test target

	<low>,<high>
Preset value	In shut down status，for <low>、<high>，query respectively return to -9.9E37、+9.9E37。

Uint	Depends on :FUNCtion:IMPedance[:TYPE]

Note: When parameter is as A OR b, it needed to input both of upper limit and lower limit. If less any of these two, then it will return error no -109. In shut down status, can select <low>，<high>

Query syntax LIST:BAND[1-100]?

Query return {A|B|OFF},<low>,<high><NL^END>

:CLEar:ALL

Describe clear list scanning set

Command syntax LIST:CLEar:ALL

:MODE

Describe Select scanning mode of list scanning test function. If its in **sequential scanning,** a trigger can make all scan point measurements.If it is a step scan.A trigger makes a single point-by-point measurement.

Command syntax LIST:MODE {SEQuence|STEPped}

Parameter

	Describe
SEQuence （ Preset value ）	set list scanning mode as sequential mode
STEPped	set list scanning mode as step mode

Query syntax LIST:MODE?

Query return {SEQuence|STEPped}<NL^END>

:STIMulus:DATA

Describe This command indicates that users can scan by setting reference value of scanning point. The type of reference value depends on LIST:STIMulus:TYPE. For example, users can scan with 1kHz at first point, scan with 2kHz at second point, scan with 3kHz at third point. Its necessary to set the frequency that corresponding to parameter. Any blank point set value should be 9.9E37.

Command syntax LIST:STIMulus:DATA <Point 1>,<Point 2>,……,< Point n>

Parameter

	<Point n>
Range of n	1～100
Unit	Depends on :LIST:STIMulus:TYPE

Query syntax LIST:STIMulus:DATA?

Query return <NR3>,< NR3>,……,< NR3><NL^END>

:STIMulus:TYPE

Describe The scan condition is determined by setting corresponding scan condition parameters.

Command syntax LIST:STIMulus:TYPE {FREQuency|VOLTage|CURRent|BVOLtage}

Parameter

	scan condition parameter
FREQuency （ Preset value ）	Set frequency as scan condition
VOLTage	Set voltage as scan condition

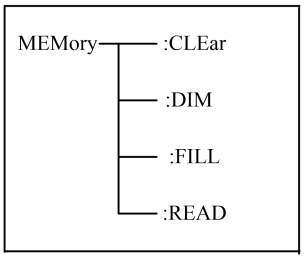
CURRent	Set current as scan condition
BVOLtage	Set bias voltage as scan condition

Query syntax LIST:STIMulus:TYPE?

Query return {FREQuency|VOLTage|CURRent|BVOLtage}<NL^END>

2.4.15 MEMory subsystem command set

MEMory subsystem command is mainly used to clear and start the data buffer storage, and can set the capacity of data buffer storage.



:CLEar

Describe clear the data buffer storage, and stop recording

Command syntax MEMory:CLEar

:DIM

Describe Clear data buffer storage

Command syntax MEMory:DIM

:FILL

Describe Start the data buffer storage to store the measurement data.After this command is executed, all measurements data will be stored in the data buffer storage.If the memorizer has been started, the command will not do any operation.

Command syntax MEMory:FILL

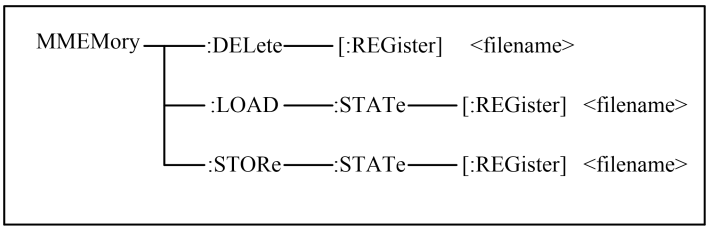
:READ

Describe Place data from the data buffer to a usb flash drive.Output format of this command is same as FETC:IMP?.In the default state, "-9.90000e +37, +9.90000E+37, -1, 0" returns through the number of times specified by :MEMory:DIM.When the data buffer is not populated to the specified size (specified by the :MEMory:DIM command), "-9.90000e +37, +9.90000E+37, -1, 0" is left for the remaining data units.

Query syntax MEMory:READ?

2.4.16 MMEMorysubsystem command set

MMEMory subsystem comamnd is used to delete, save and load files,the command tree is as followed:



:DELete[:REGister]

Describe This command is used to delete files from memory

Command syntax MMEMory:DELete[:REGister] <filename>

Note: <filename> means that the filename is without.cfg, and File names are not case sensitive

:LOAD:STATe[:REGister]

Describe This command is used to the save files.

Command syntax MMEMory:LOAD:STATe[:REGister] <filename>

Note: <filename> means that the filename is without.cfg, and File names are not case sensitive

:STORe:STATe[:REGister]

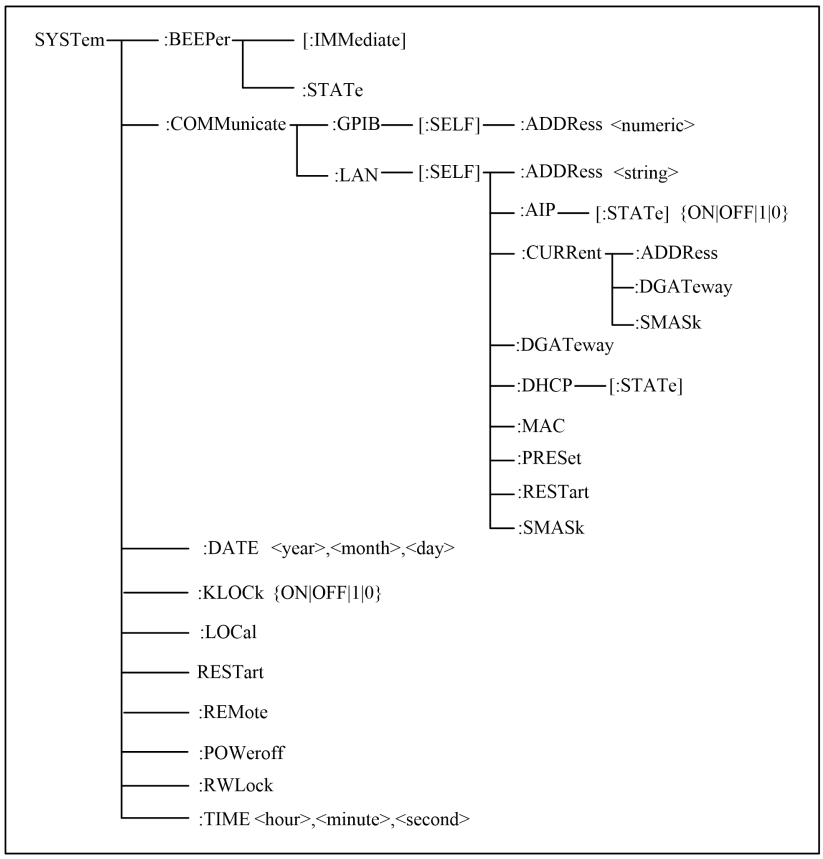
Describe This command is used to store data of current instrument into a file.

Command syntax MMEMory:STORe:STATe[:REGister] <filename>

Note: <filename> means that the filename is without.cfg, and File names are not case sensitive

2.4.17 SYSTem subsystem command set

SYSTem subsystem command is mainly used



:BEEPer[:IMMediate]

Describe make a beeper. Even if the sound has been forbidden by :SYSTem:BEEPer:STATe , it still can make a beeper.

Command syntax SYSTem:BEEPer[:IMMediate]

:BEEPer:STATe

Describe set the beeper sound in turn on / off status

Command syntax SYSTem:BEEPer:STATe {ON|OFF|1|0}

Parameter

	Describe
ON or 1	Turn on beeper
OFF or 0 （ preset value ）	Turn off beeper

Query syntax SYSTem:BEEPer:STATe?

Query return <NR1><NL^END>

:COMMunicate:GPIB[:SELF]:ADDRess

Describe set GPIB stress

Command syntax SYSTem:COMMunicate:GPIB[:SELF]:ADDRess <numeric>

Parameter

	<Numeric>
Range	0～30
Preset value	17
Resolution rate	1

Query syntax SYSTem:COMMunicate:GPIB[:SELF]:ADDRess?

Query return <NR1><NL^END>

:COMMunicate:LAN[:SELF]:ADDRess

Describe Set static IP address

Command syntax SYSTem:COMMunicate:LAN[:SELF]:ADDRess <String>

Parameter

	<String>
Preset value	"192.168.0.123"

Query syntax SYSTem:COMMunicate:LAN[:SELF]:ADDRess?

Query return <String><NL^END>

:COMMunicate:LAN[:SELF]:AIP[:STATe]

Describe Turn on automatic IP address setting

Command syntax SYSTem:COMMunicate:LAN[:SELF]:AIP[:STATe] {ON|OFF|1|0}

Parameter

	Describe
ON or 1 （ preset value ）	Turn on automatic IP address setting
OFF or 0	Turn off automatic IP address setting

Query syntax SYSTem:COMMunicate:LAN[:SELF]:AIP[:STATe]?

Query return <NR1><NL^END>

:COMMunicate:LAN[:SELF]:CURRent:ADDRess?

Describe Query current IP address

Query syntax SYSTem:COMMunicate:LAN[:SELF]:CURRent:ADDRess?

Query return <String><NL^END>

:COMMunicate:LAN[:SELF]:CURRent:DGATeway?

Describe Query the current gateway address

Query syntax SYSTem:COMMunicate:LAN[:SELF]:CURRent:DGATeway?

Query return <String><NL^END>

:COMMunicate:LAN[:SELF]:CURRent:SMASk?

Describe Query the current subnet mask.

Query syntax SYSTem:COMMunicate:LAN[:SELF]:CURRent:SMASk?

:COMMunicate:LAN[:SELF]:DGATeway

Describe Set static gateway address, character?Can be used to query the static gateway address.

Query syntax SYSTem:COMMunicate:LAN[:SELF]:DGATeway <String>

Parameter

	<String>
Preset value	"0.0.0.0"

Query syntax SYSTem:COMMunicate:LAN[:SELF]:DGATeway?

Query return <String><NL^END>

:COMMunicate:LAN[:SELF]:DHCP[:STATe]

Describe set Turn on and turn off that getting IP address from the DHCP severs, character? Can query the IP address status from DHCP severs.

Command syntax SYSTem:COMMunicate:LAN[:SELF]:DHCP[:STATe] {ON|OFF|1|0}

Parameter

	Describe
ON or 1（preset value）	Turn on DHCP function
OFF or 0	Turn off DHCP function

Query syntax SYSTem:COMMunicate:LAN[:SELF]:DHCP[:STATe]?

Query return <NR1><NL^END>

:COMMunicate:LAN[:SELF]:MAC?

Describe return to MAC address

Query syntax SYSTem:COMMunicate:LAN[:SELF]:MAC?

:COMMunicate:LAN[:SELF]:PRESet

Describe Restart the Internet

Command syntax SYSTem:COMMunicate:LAN[:SELF]:PRESet

:COMMunicate:LAN[:SELF]:RESTart

Describe Restart the Internet

Command syntax SYSTem:COMMunicate:LAN[:SELF]:RESTart

:COMMunicate:LAN[:SELF]:SMASk

Describe Set static subnet mask, character?Can be used to query the current static subnet mask.

Command syntax SYSTem:COMMunicate:LAN[:SELF]:SMASk <String>

Parameter

	<String>
Preset value	"255.255.255.0"

Query syntax SYSTem:COMMunicate:LAN[:SELF]:SMASk?

Query return <String>,<NL^END>

:DATE

Describe set the internal data of clock, character? Can query internal data

Command syntax SYSTem:DATE <year>,<month>,<day>

Parameter

	<year>
Range	2000～2098
Unit	Year
Resolution rate	1

	<month>
Range	1～12
Unit	Month
Resolution rate	1

	<day>
Range	1～31
Unit	Day
Resolution rate	1

Query syntax SYSTem:DATE?

Query return <year>,<month>,<day><NL^END>

:KLOCk

Describe Start front panel key lock function.If the key lock pin on the processor interface is set to lock, the command will not be answered.

Command syntax SYSTem:KLOCk {ON|OFF|1|0}

Parameter

	Describe
ON or 1	turn on key lock of front panel
OFF or 0 （ preset value ）	turn off key lock of front panel

Query syntax SYSTem:KLOCk?

Query return <NR1><NL^END>, if the key lock pin on the processor interface is set to "lock", then it will return to the actual state of the instrument.

:LOCal

Describe Set ET35 into local operation status. (program-controlled command sets the instrument to LOCAL or remote operation state and the switch of the LOCAL key of the instrument affect each other)

Command syntax SYSTem:LOCal

:PRESet

Describe reset instrument setting and correct data

Command syntax SYSTem:PRESet

:RESTart

Describe reset instrument setting and correct data

Command syntax SYSTem:RESTart

:REMote

Describe Set ET35 as remote operation state

Command syntax SYSTem:REMote

:RWLock

Describe This command is used to sent ET35 as remote operation status, but the difference with the above one is that, this command is not able to switch to local operation state by LOCAL key, which can only be restored by the SYSTem: LOCAL command.

Command syntax SYSTem:RWLock

:TIME

Describe set time of internal clock

Command syntax SYSTem:TIME <hour>,<minute>,<second>

Parameter

	<hour>
Range	0～23
Unit	Hour
Resolution rate	1

	<minute>
Range	0～59
Unit	minute
Resolution rate	1

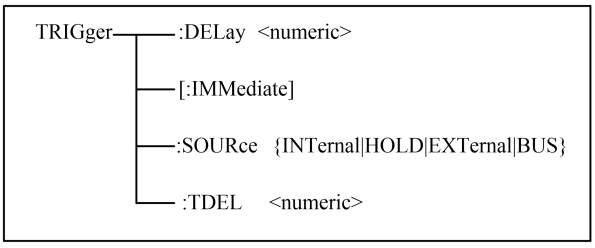
	<second>
Range	0～59
Unit	Second
Resolution rate	1

Query syntax SYSTem:TIME?

Query return <hour>,<minute>,<second><NL^END>

2.4.18 TRIGger subsystem command set

The TRIGger subsystem commands are used to set the TRIGger source of the instrument, the delay after triggering, and the TRIGger instrument measurement.The command tree is as follows:



:DELay list scan）

Describe Set the step delay time.With strings?Represents query step delay time.Step delay time is mainly used in trigger delay in list scan order mode

Command syntax TRIGger:DELay <numeric>

Parameter

	<numeric>
Range	0～20
1 preset value	0
Unit	s

Query syntax TRIGger:DELay?

Query return <NR3><NL^END>

[:IMMediate]

Describe is used to trigger the instrument for one time

Command syntax TRIGger[:IMMediate]

:SOURce

Describe is used to set the trigger source mode, character? Can query current trigger source mode

Command syntax TRIGger:SOURce {INTernal|HOLD|EXTernal|BUS}

Parameter

	Describe
INTernal （ preset value ）	Set trigger source as “internal”
HOLD	Set trigger source as “manual”
EXTernal	Set trigger source as “external”
BUS	Set trigger source as“GPIB/LAN/USB/RS232”

Query syntax TRIGger:SOURce?

Query return {INTernal|HOLD|EXTernal|BUS}<NL^END>

:TDEL

Describe is used to sent the trigger delay time, character? Can query the current trigger delay time

Command syntax TRIGger:TDEL <numeric>

Parameter

	<numeric>
Range	0～10
Preset value	0
Unit	s

Query syntax TRIGger:TDEL?

Query return <NR3><NL^END>

2.4.19 VOLTage subsystem command set

VOLTage subsystem command set is mainly used in setting the measuring level voltage of instrument. If use :CURRent[:LEVel] setting signal, then query the command, it will return error message -230. Character? Can query current measuring level voltage.

Command syntax VOLTage[:LEVel] <numeric>

Parameter

	<numeric>
Range	1.0E-2～2.0E0
Preset value	1V
Unit	V

Query syntax VOLTage[:LEVel]?

Query return <NR3><NL^END>