

UNI-T®

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Programming Manual

UTL8200+ Series DC Electronic Load

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SCPI Introduction

SCPI (Standard Commands for Programmable Instruments) is a standardized instrument programming language that builds on existing standards IEEE 488.1 and IEEE 488.2 and follows the floating point rules of IEEE 754 standard, ISO 646 message exchange 7-bit encoding notation (equivalent to ASCII programming) and many other standards.

This section introduces the format, symbols, parameters, and abbreviations of the SCPI command.

Command String Parse

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

For example

Valid command string:

AAA:BBB CCC;DDD EEE;:FFF

The instrument command parser is responsible for all command parsing and execution, and you must understand its parsing rules before writing a program.

Command Parse Rule

IE command parser only parses and responds to ASCII data.

SCPI command string must be end with end mark NL(' \n' ASCII 0x0A). The command parser starts to executing when receive the end mark or an input buffer overflow.

If the command handshake is open, the command parser sends the character back to the host immediately after each character is received, and the host can continue to send the next character only after receiving this return character.

The command parser will terminate the parsing immediately after parsing an error, and the current command will be invalidated.

After the command parser parses the query command, it terminates this command string parsing and the subsequent strings are ignored.

The command parser is case-insensitive for parsing command strings.

The command parser supports abbreviated form of command and the detailed see the following section.

Symbol Stipulation and Definition

This chapter uses some symbols that are not part of the command tree, but only for a better understanding of the command string.

- <> The text in angle brackets indicates the parameter of the command.
- [] The text in square brackets indicates the optional command.
- { } When the curly brackets contain several parameter items, it means that only one item can be selected from them.
- () The abbreviated form of the parameter is enclosed in parentheses.

Capital letter Abbreviated form of the command.

Command Tree Structure

SCPI commands have a tree-like structure with three level (note: the command parser of this instrument can parse any level), where the highest level is called the subsystem command. SCPI uses a colon (:) to separate high level commands from low level commands.

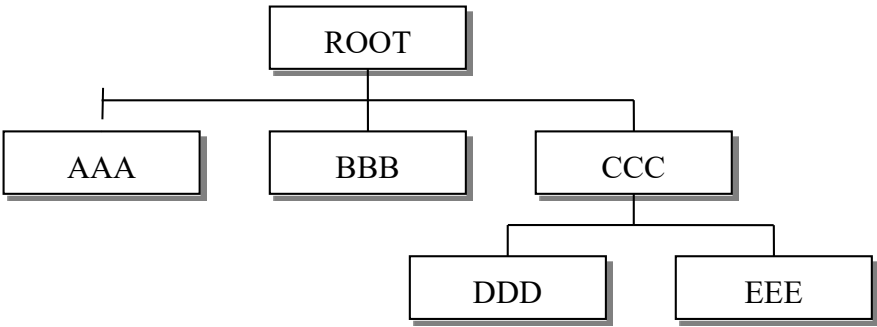


Figure 1-1 Command Tree Structure

For Example

ROOT:CCC:DDD ppp

ROOT	Subsystem command
CCC	Second level
DDD	Third level
ppp	Parameter

Command and Parameter

A command tree is consist of command and [parameter], use a blank to separate (ASCII: 20H).

For example AAA:BBB 1.234
Command [parameter]

Command

Command words can be in long command format or in abbreviated form. Long format facilitates engineers to better understand the meaning of the command string; abbreviated form is suitable for writing.

Parameter

Single character command, no parameter

For Example AAA:BBB

Parameter can be string format and its abbreviated form is also follow the last section “command abbreviated rule” For example AAA:BBB 1.23

Parameter can be numerical value format

<integer> integer 123, +123, -123

<float> floating point number

- 1. <fixfloat>: fixed floating point number: 1.23, -1.23
- 2. <Sciloat>: floating point number represented by scientific notation: 1.23E+4, +1.23e-4
- 3. <mpfloat>: floating point number represented by multiplying power: 1.23k, 1.23M, 1.23G, 1.23u represented by 0-1 multiplying power abbreviation

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

Note: The multiplying power is case-insensitive, and the writing is differently from the standard name.

Separator

The instrument command parser can only receive allowable separator. Other separator will cause error “Invalid separator”.

The allowable separator is as follows.

; Semicolon is for separating two commands.

For Example AAA:BBB 100.0 ; CCC:DDD

: Colon is for separating command tree or restart the command tree.

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

? Question mark is for querying.

For ExampleAAA ?

□ Blank is for separating the parameter.

For Example AAA:BBB□1.234

Error Code

Error Code	Description
*E00	No error
*E01	Bad command
*E02	Parameter error
*E03	Missing parameter
*E04	buffer overrun
*E05	Syntax error
*E06	Invalid separator
*E07	Invalid multiplier
*E08	Numeric data error
*E09	Value too long
*E10	Invalid command
*E11	Unknow error

Command Reference

All commands is explained by the subsystem command order.

SOURce	Setup subsystem
SYSTem	System subsystem
MEASure	Measurement subsystem
CHANnel	Channel subsystem

Common Command

*IDN?	Instrument query subsystem
*RST	Reset the instrument state

SYSTem Subsystem

SYSTem	:ERRor[:NEXT]?	
	:ERRor:COUNT?	
	:VERSion?	
	:BEEPer[:STATe]	
	:BEEPer[:STATe]?	

Figure 1-2 SYSTem Subsystem Tree

* The parameter is set by SYSTem subsystem will not saved in the instrument.
It should be reset when reboot the instrument.

SYSTem:ERRor[:NEXT]?

SYSTem:ERRor[:NEXT]? Query the error message

Query Syntax	SYSTem:ERRor[:NEXT]? // Query the error message
Query Response	Error message

SYSTem:ERRor:COUNT?

SYSTem:ERRor:COUNT? Query the count of error message.

Query Syntax	SYSTem:ERRor:COUNT? // Query the count of error message
Query Response	The count of error message

SYSTem:VERSIon?

SYSTem:VERSIon? Query the version of SCPI system

Query Syntax	SYSTem:VERSIon? // Query the version of SCPI system
Query Response	SCPI system version

SYSTem:BEEPer:STATe

SYSTem:BEEPer:STATe Enable or disable the beeper

Command Syntax	SYSTem:BEEPer:STATe<bool>
Parameter	0 1 OFF ON
For Example	SYST:BEEP:STAT ON // Enable the beeper
Query Syntax	SYSTem:BEEPer:STATe? // Query the state of beeper
Return Parameter	0 1

[SOURce:]INPut

[SOURce:]INPut Turn on or turn off the input

Command Syntax	[SOURce;]INPut[:STATe]<bool>
Parameter	0 1 OFF ON
For Example	INP 1 // Turn on the input
Query Syntax	INPut[:STATe]? // Query the state of the input
Return Parameter	0 1

[SOURce:]INPut:SHORt

[SOURce:]INPut:SHORt Turn on or turn off the short circuit

Command Syntax	[SOURce;]INPut[:STATe]<bool>
Parameter	0 1 OFF ON
For Example	INP:SHOR 1 // Turn on the short circuit
Query Syntax	INPut:SHORt? // Query the state of the short circuit
Return Parameter	0 1

[SOURce:]FUNCTION**[SOURce:]MODE** **2 command equivalences**

[SOURce:]MODE Select the input mode of the load, 2 command equivalences

Command Syntax

`[SOURce:]FUNCTION <function>``[SOURce:]MODE <function>`

Parameter

Operation mode

CURRent

Constant current mode

VOLTage

Constant voltage mode

POWer

Constant power mode

RESistance

Constant resistance mode

DYNamic

Dynamic mode

BATtery

Battery mode

LIST

List mode

For Example

`MODE RES` // Set to constant resistance mode

Query Syntax

`[SOURce:]FUNCTION? [SOURce:]MODE?`

// Query the input mode of the load

Return Parameter

`<CRD>`**[SOURce:]CURRENT:RANGe**

[SOURce:]CURRENT:RANGe Set the range for the current

Command Syntax

`[SOURce:]CURRENT:RANGe<NRF+>`

Parameter

0~MAX |MINimum|MAXimum

Unit

A

Reset Value

MAXimum range

For Example

`CURR:RANGE MIN` // Set the current range to MIN

Query Syntax

`[SOURce:]CURRENT[:LEVel][:IMMediate][:AMPLitude]?`

// Query the size of the current

Return Parameter

`<NR2>`**[SOURce:]VOLTage:RANGe**

[SOURce:]VOLTage:RANGe Set the range for the voltage

Command Syntax

`[SOURce:]VOLTage:RANGe<NRF+>`

Parameter

0~MAX |MINimum|MAXimum

Unit

V

Reset Value	MAXimum range
For Example	SOUR:VOLTage:RANGE MIN // Set the voltage range to MIN
Query Syntax	[SOURce;]VOLTage:RANGE? // Query the size of the voltage
Return Parameter	<NR2>

[SOURce]:CURRent:SLEW

[SOURce]:CURRent:SLEW Set the rising and falling rate for the same current

Command Syntax	[SOURce]:CURRent:SLEW[:BOTH]<NRF+>
Parameter	MIN~MAX MINimum MAXimum
Unit	A/us
Reset Value	1
For Example	CURR:SLEW 3 // Set the rising and falling rate for the current to 3 A/us
Query Syntax	[SOURce]:CURRent:SLEW? // Query the rising and falling rate of the current
Return Parameter	<NR2>

[SOURce]:CURRent:SLEW:RISE

[SOURce]:CURRent:SLEW:RISE Set the rising rate for the current

Command Syntax	[SOURce]:CURRent:SLEW:RISE<NRF+>
Parameter	MIN~MAX MINimum MAXimum
Unit	A/us
Reset Value	1
For Example	CURR:SLEW 3 // Set the rising rate for the current to 3 A/us
Query Syntax	[SOURce]:CURRent:SLEW:RISE? // Query the rising rate of the current
Return Parameter	<NR2>

[SOURce]:CURRent:SLEW:FALL

[SOURce]:CURRent:SLEW:FALL Set the falling rate for the current

Command Syntax	[SOURce]:CURRent:SLEW:FALL <NRF+>
Parameter	MIN~MAX MINimum MAXimum
Unit	A/us
Reset Value	1
For Example	CURR:SLEW 3 // Set the falling rate for the current to 3 A/us
Query Syntax	[SOURce]:CURRent:SLEW:FALL? // Query the falling rate of the current
Return Parameter	<NR2>

[SOURce]:VOLTage:SLEW

[SOURce]:VOLTage:SLEW Set the rising and falling rate for the voltage

Command Syntax	[SOURce]:VOLTage:SLEW[:BOTH] <NRF+>
Parameter	MIN~MAX MINimum MAXimum
Unit	A/ms
For Example	VOLT:SLEW 0.3 // Set the rising and falling rate for the voltage to 0.3 A/ms
Query Syntax	[SOURce]:VOLTage:SLEW? // Query the rising and falling rate of the voltage
Return Parameter	<NR2>

[SOURce]:CURRent:PROTectiOn

[SOURce]:CURRent:PROTectiOn Set the protective value for the current

Command Syntax	[SOURce]:CURRent:PROTectiOn[:LEVel] <NRF+>
Parameter	0~MAX MINimum MAXimum
Unit	A
Reset Value	MAXimum
For Example	CURR:PROT 3 // Set the protective value for the current to 3A
Query Syntax	[SOURce]:CURRent:PROTectiOn[:LEVel]? // Query the protective value of the current
Return Parameter	<NR2>

[SOURce]:POWer:PROTectiOn

[SOURce]:POWer:PROTectiOn Set the protective value for the power

Command Syntax	[SOURce]:POWer:PROTectiOn[:LEVel] <NRF+>
Parameter	0~MAX MINimum MAXimum
Unit	W
Reset Value	MAXimum range
For Example	CURR:PROT 100 // Set the protective value for the power to 100 W
Query Syntax	[SOURce]:POWer:PROTectiOn[:LEVel]? // Query the protective value of the power
Return Parameter	<NR2>

[SOURce]:VOLTage[:LEVel]:ON

[SOURce]:VOLTage[:LEVel]:ON Set voltage value of the start load (Von)

Command Syntax	[SOURce]:VOLTage[:LEVel]:ON <NRF+>
Parameter	0~MAX MINimum MAXimum
Unit	V
Reset Value	1
For Example	VOLT:ON 3 // Set voltage value of the start load to 3V
Query Syntax	[SOURce]:VOLTage[:LEVel]:ON? // Query voltage value of the start load
Return Parameter	<NR2>

[SOURce]:VOLTage[:LEVel]:OFF

[SOURce]:VOLTage[:LEVel]:OFF Set voltage value of the start unload (Voff)

Command Syntax	[SOURce]:VOLTage[:LEVel]:OFF <NRF+>
Parameter	0~MAX MINimum MAXimum
Unit	V
Reset Value	0.5
For Example	VOLT:ON 2 // Set voltage value of the start unload to 2V
Query Syntax	[SOURce]:VOLTage[:LEVel]:OFF? // Query voltage value of the start unload
Return Parameter	<NR2>

[SOURce]:CURRent

[SOURce]:CURRent Set the current in CC mode

Command Syntax	[SOURce]:CURRent[:LEVel][:IMMediate][:AMPLitude] <NRF+>
Parameter	0~MAX MINimum MAXimum
Unit	A
Reset Value	MINimum
For Example	CURR 5 // Set the current to 5A in CC mode
Query Syntax	[SOURce]:CURRent[:LEVel][:IMMediate][:AMPLitude]? // Query the current in CC mode
Return Parameter	<NR2>

[SOURce]:VOLTage

[SOURce]:VOLTage Set the voltage in CV mode

Command Syntax	[SOURce]:VOLTage[:LEVel][:IMMediate][:AMPLitude]<NRF+>
Parameter	0~MAX MINimum MAXimum
Unit	V
Reset Value	MAXimum
For Example	VOLT 5 // Set the voltage to 5V in CV mode
Query Syntax	[SOURce]:VOLTage[:LEVel][:IMMediate][:AMPLitude]? // Query the voltage in CV mode
Return Parameter	<NR2>

[SOURce]:RESistance

[SOURce]:RESistance Set the resistance in CR mode

Command Syntax	[SOURce]:RESistance[:LEVel][:IMMediate][:AMPLitude]<NRF+>
Parameter	0~MAX MINimum MAXimum
Unit	ohm
Reset Value	MAXimum
For Example	RES 5 // Set the resistance to 5ohm in CR mode
Query Syntax	[SOURce]:RESistance[:LEVel][:IMMediate][:AMPLitude]? // Query the resistance in CR mode
Return Parameter	<NR2>

[SOURce]:POWer

[SOURce]:RESistance Set the power in CP mode

Command Syntax	[SOURce]:POWer[:LEVel][:IMMediate][:AMPLitude]<NRF+>
Parameter	0~MAX MINimum MAXimum
Unit	W
Reset Value	MINimum
For Example	POW 10 // Set the power to 10W in CP mode
Query Syntax	[SOURce]:POWer[:LEVel][:IMMediate][:AMPLitude]? // Query the power in CP mode
Return Parameter	<NR2>

[SOURce]:DYNamic:LOW

[SOURce]:DYNamic:IA 2 command equivalences

[SOURce]:DYNamic:LOW Set the load current (IA) in dynamic mode

Command Syntax	[SOURce]:DYNamic:LOW[:LEVel]<NRF+>
Command Syntax	[SOURce]:DYNamic:IA[:LEVel<NRF+>
Parameter	0~MAX MINimum MAXimum
Unit	A
Reset Value	0
For Example	DYN:LOW 10 or DYN:IA 10 // Set the load current (IA) to 10A in dynamic mode
Query Syntax	[SOURce]:DYNamic:LOW[:LEVel]? // Query the low level of load current (IA) in dynamic mode
Query Syntax	[SOURce]:DYNamic:IA[:LEVel? // Query the low level of load current (IA) in dynamic mode
Return Parameter	<NR2>

[SOURce]:DYNamic:LOW:DWELI

[SOURce]:DYNamic:TA 2 command equivalences

[SOURce]:DYNamic:LOW:DWELI Set the duration (TA) for the load current in dynamic mode

Command Syntax	[SOURce]:DYNamic:LOW:DWELI<NRF+>
Command Syntax	[SOURce]:DYNamic:TA:DWELI<NRF+>
Parameter	0.00001~50 MINimum MAXimum
Unit	S
Reset Value	0.00001
For Example	DYN:LOW:DWELL 10 or DYN:TA:DWELL 10 // Set the duration (TA) to 0.01S for the load current in dynamic mode
Query Syntax	[SOURce]:DYNamic:LOW:DWELI? // Query the duration (TA) of the load current in dynamic mode
Query Syntax	[SOURce]:DYNamic:TA:DWELI? // Query the duration (TA) of the load current in dynamic mode
Return Parameter	<NR2>

[SOURce]:DYNamic:HIGH

[SOURce]:DYNamic:IB 2 command equivalences

[SOURce]:DYNamic:HIGH Set the load current (IB) in dynamic mode

Command Syntax	[SOURce]:DYNamic:HIGH[:LEVel]<NRF+>
Command Syntax	[SOURce]:DYNamic:IB[:LEVel]<NRF+>
Parameter	0~MAX MINimum MAXimum
Unit	A
Reset Value	0
For Example	DYN:LOW 1 or DYN:IB 1 // Set the load current (IB) to 1A in dynamic mode
Query Syntax	[SOURce]:DYNamic:HIGH[:LEVel]? // Query the high level of the load current (IB) in dynamic mode
Query Syntax	[SOURce]:DYNamic:IB[:LEVel]? // Query the high level of the load current (IB) in dynamic mode
Return Parameter	<NR2>

[SOURce]:DYNamic: HIGH:DWELI

[SOURce]:DYNamic:TB 2 command equivalences

[SOURce]:DYNamic: HIGH:DWELI Set the duration for the load current (IB) in dynamic mode

Command Syntax	[SOURce]:DYNamic: HIGH:DWELI<NRF+>
Command Syntax	[SOURce]:DYNamic:IB:DWELI<NRF+>
Parameter	0.00001~50 MINimum MAXimum
Unit	S
Reset Value	0.00002
For Example	DYN: HIGH:DWELL 10 or DYN:TB:DWELL 10 // Set the duration of the load current (IB) to 10S in dynamic mode
Query Syntax	[SOURce]:DYNamic: HIGH:DWELI? // Query the duration of the load current (IB) in dynamic mode
Query Syntax	[SOURce]:DYNamic:TB:DWELI? // Query the duration of the load current (IB) in dynamic mode
Return Parameter	<NR2>

[SOURce]:DYNamic:SLEW

[SOURce]:DYNamic:SLEW Set the current slop for the dynamic mode

Command Syntax	[SOURce]:DYNamic:SLEW<NRF+>
Parameter	MIN~MAX MINimum MAXimum
Unit	A/us

Reset Value	MAX
For Example	DYN:SLEW 3 // Set the current slop to 3 A/us for the dynamic mode
Query Syntax	[SOURce]:DYNamic:SLEW? // Query the current slop of the dynamic mode
Return Parameter	<NR2>

[SOURce]:DYNamic:SLEW:RISE

[SOURce]:DYNamic:SLEW:RISE Set the rising rate for the current in dynamic mode

Command Syntax	[SOURce]:DYNamic:SLEW:RISE <NRF+>
Parameter	MIN~MAX MINimum MAXimum
Unit	A/us
Reset Value	MAX
For Example	DYN:SLEW 3 // Set the rising rate of the current to 3 A/us in dynamic mode
Query Syntax	[SOURce]:DYNamic:SLEW:RISE? // Query the rising rate of the current in dynamic mode
Return Parameter	<NR2>

[SOURce]:DYNamic:SLEW:FALL

[SOURce]:DYNamic:SLEW:FALL Set the falling rate for the current in dynamic mode

Command Syntax	[SOURce]:DYNamic:SLEW:FALL <NRF+>
Parameter	MIN~MAX MINimum MAXimum
Unit	A/us
Reset Value	MAX
For Example	DYN:SLEW:FALL 3 // Set the falling rate of the current to 3 A/us in dynamic mode
Query Syntax	[SOURce]:DYNamic:SLEW:FALL? // Query the falling rate of the current in dynamic mode
Return Parameter	<NR2>

[SOURce]:DYNamic:MODE

[SOURce]:DYNamic:MODE Set the operation mode for the dynamic mode

Command Syntax	[SOURce]:DYNamic:MODE <mode>
Parameter	CONTInuous PULSe TOGGLE
Reset Value	CONTInuous

For Example	DYN:MODE PULS // Set the operation mode to pulse mode in dynamic mode
Query Syntax	[SOURce]:DYNamic:MODE? // Query the operation mode of the dynamic mode
Return Parameter	<CRD>

[SOURce]:DYNamic:REPeat

[SOURce]:DYNamic:REPeat Set the repeat times for the dynamic mode

Command Syntax	[SOURce]:DYNamic:REPeat
Parameter	0~99999 MINimum MAXimum LOOP
For Example	DYNamic:REPEAT 10 // Set the repeat times to 10 for the dynamic mode
Query Syntax	[SOURce]:DYNamic:REPeat? // Query the repeat times of the dynamic mode
Return Parameter	<NR2>

[SOURce]:BATtery:MODE

[SOURce]:BATtery:MODE Set the operation mode in battery mode

Command Syntax	[SOURce]:BATtery:MODE <mode>
Parameter	CURRent RESistance POWer
Reset Value	CURRent
For Example	BATery:MODE CURRent // Set the operation mode to CC mode in battery mode
Query Syntax	[SOURce]:BATtery:MODE? // Query the operation mode in battery mode
Return Parameter	<CRD>

[SOURce]:BATtery:CURRent

[SOURce]:BATtery:CURRent Set the load size of CC mode in battery mode

Command Syntax	[SOURce]:BATtery:CURRent
Parameter	0.01~20 MINimum MAXimum
Unit	A
Reset Value	1
For Example	BATery:CURRent 3 // Set the load size of CC mode to 3A in battery mode

Query Syntax	[SOURce]:BATtery:CURRent? // Query the load size of CC mode in battery mode
Return Parameter	<NR2>

[SOURce]:BATtery:POWer

[SOURce]:BATtery:POWer Set the load size of CP mode in battery mode

Command Syntax	[SOURce]:BATtery:POWer
Parameter	0.1~400 MINimum MAXimum
Unit	W
Reset Value	1
For Example	BATtery: POWer 3 // Set the load size of CP mode to 3W in battery mode
Query Syntax	[SOURce]:BATtery:POWer? // Query the load size of CP mode in battery mode
Return Parameter	<NR2>

[SOURce]:BATtery:RESistance

[SOURce]:BATtery:RESistance Set the load size of CR mode in battery mode

Command Syntax	[SOURce]:BATtery:RESistance
Parameter	0.05~7500 MINimum MAXimum
Unit	Ohm
Reset Value	1
For Example	BATtery:RESistance 3 // Set the load size of CR mode to 3ohm in battery mode
Query Syntax	[SOURce]:BATtery:RESistance? // Query the load size of CR mode in battery mode
Return Parameter	<NR2>

[SOURce]:BATtery[:VOLTage]:Unloade

[SOURce]:BATtery[:VOLTage]:Unloade Set the cut-off size of voltage in battery mode

Command Syntax	[SOURce]:BATtery[:VOLTage]:Unloade
Parameter	0.01~150 MINimum MAXimum
Unit	V
Reset Value	1
For Example	BATtery:Unloade 3 // Set the cut-off size of voltage to 3V in battery mode

Query Syntax	[SOURce]:BATtery[:VOLTage]:Unloade? // Query the cut-off size of voltage in battery mode
Return Parameter	<NR2>

[SOURce]:BATtery:CAPacity?

[SOURce]:BATtery:CAPacity? Query the battery capacity

Command Syntax	[SOURce]:BATtery:CAPacity?
Parameter	
Unit	Ah/Wh // The unit is Ah in CC/CR mode. The unit is Wh in CP mode
Reset Value	0
For Example	
Query Syntax	[SOURce]:BATtery:CAPacity? // Query the battery capacity
Return Parameter	<NR2>

MEASure:VOLTage?

MEASure:VOLTage? Read the average value of voltage

Command Syntax	MEASure[:SCALar]:VOLTage[:DC]?
For Example	MEAS:VOLT? // Query the average value of voltage
Query Syntax	MEASure[:SCALar]:VOLTage[:DC]? // Query the average value of voltage
Return Parameter	<NR2>

MEASure:CURREnt?

MEASure:CURREnt? Read the average value of current

Command Syntax	MEASure[:SCALar]:CURREnt[:DC]?
For Example	MEAS:CURREnt? // Query the average value of current
Query Syntax	MEASure[:SCALar]:CURREnt[:DC]? // Query the average value of current
Return Parameter	<NR2>

MEASure:POWer?

MEASure:POWer? Read the average value of power

Command Syntax	MEASure[:SCALar]:POWer[:DC]?
For Example	MEAS:POWer? // Query the average value of power

Query Syntax	MEASure[:SCALar]:POWer[:DC]? // Query the average value of power
Return Parameter	<NR2>

MEASure:RESistance?

MEASure:RESistance?	Read the equivalent resistance
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Command Syntax	MEASure[:SCALar]:RESistance[:DC]?
For Example	MEAS:RESistance? // Query the equivalent resistance
Query Syntax	MEASure[:SCALar]:RESistance[:DC]? // Query the equivalent resistance
Return Parameter	<NR2>

MEASure:REAL?

MEASure:REAL?	Query the real-time measured data set
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Command Syntax	MEASure[:SCALar]:REAL[:TIME[:DC]]?
For Example	MEAS:REAL? // Query the real-time measured data set
Query Syntax	MEASure[:SCALar]:REAL[:TIME[:DC]]? // Query the real-time measured data set
Return Parameter	Voltage, current, power, resistance <NR2>

[SOURce]:LIST:GROUP

[SOURce]:LIST:GROUP	Set the group number for the list mode
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Command Syntax	[SOURce]:LIST:GROUP
Parameter	0~60 MINimum MAXimum
For Example	LIST:GROUP 3 // Set the group number to 3 for the list mode
Query Syntax	[SOURce]:LIST:GROUP? // Query the group number of the list mode
Return Parameter	<NR2>

[SOURce]:LIST:MODE

[SOURce]:LIST:MODE	Set the operation mode in list mode
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Command Syntax	[SOURce]:LIST:MODE
Parameter	CONTInuous TRIGger TRIGger EX CONTInuousEX
For Example	LIST:MODE CONTInuous // Set the operation mode to continuous in list mode

Query Syntax	[SOURce]:LIST:MODE? // Query the operation mode in list mode
Return Parameter	<CDR>

[SOURce]:LIST:STEP

[SOURce]:LIST:STEP Set the step for the list mode

Command Syntax	[SOURce]:LIST:STEP
Parameter	0~16 MINimum MAXimum
For Example	LIST:STEP 3 // Set the step to 3 for list mode
Query Syntax	[SOURce]:LIST:STEP? // Query the step of list mode
Return Parameter	<NR2>

[SOURce]:LIST:REPEAT

[SOURce]:LIST:REPEAT Set the repeat times for list mode

Command Syntax	[SOURce]:LIST:REPEAT
Parameter	0~99999 MINimum MAXimum
For Example	LIST:REPEAT 10 // Set the repeat times to 10 for list mode
Query Syntax	[SOURce]:LIST:REPEAT? // Query the repeat times of list mode
Return Parameter	<NR2>

[SOURce]:LIST:PAPAMeter:ITEM

[SOURce]:LIST:PAPAMeter:ITEM Set each parameter in list

Command Syntax	[SOURce]:LIST:PAPAMeter:ITEM
Parameter	1~16,0~40,200~99999 , MINimum MAXimum OFF OF CURRent VOLTage RESistance POWer OPEN SHORT
For Example	LIST:PAPAMeter:ITEM 0,CURR,2.0,1000,OFF,1.0, 2.0 // Set the serial number to 1, mode to CC, constant value to 2.0, timing to1000ms, check is off, the lower limit is 1.0, the upper limit is 2.0 for the list mode
Query Syntax	[SOURce]:LIST:PAPAMeter:ITEM? // Query each parameter of list in list mode
Return Parameter	<>

[SOURce]: LIST:TEST:RESUIts?

[SOURce]:LIST:TEST:RESUIts? Return the test result of list mode

Command Syntax	[SOURce]: LIST:TEST:RESUIts?
Parameter	1~16 or no parameter (return all test result)
For Example	LIST:TEST:RESUIts? 1 or LIST:TEST:RESUIts?
Query Syntax	[SOURce]: LIST:TEST:RESUIts? // Query each parameter of the list in the list mode
Return Result	0,CURR,1.00,OFF,0.00,0.00,PASS;1,CURR,3.00,OFF,0.00,0.00,PASS;2, CURR,4.00,OFF,0.00,0.00,PASS;3,VOLT,5.00,OFF,0.00,0.00,PASS;

[SOURce]: LIST:TEST[:STATe]?

[SOURce]:LIST:TEST[:STATe]? Return the test state of list mode

Command Syntax	[SOURce]: LIST:TEST[:STATe]?
Parameter	1~16 or no parameter
For Example	LIST:TEST? 1 or LIST:TEST?
Query Syntax	[SOURce]: LIST:TEST? // Query the test state of list mode
Return Result	PASS

CHANnel:LOAD? Channel Control Subsystem(only for dual-channel)

Command Syntax	CHANnel LOAD
Parameter	1~2 or CH1~CH2 ALL (channel)
For Example	CHANnel 1 or CHANnel CH2
Query Syntax	CHANnel:LOAD? Or CHANnel? // Query the channel that receive the insturction
Return Result	2

CHANnel[:LOAD] Set the channel to receive the insturction

CHANnel:SHORtcut[:COMManD]

CHANnel:SHORtcut[:COMManD] Set the shortcut for channel address mode

Command Syntax	CHANnel:SHORtcut[:COMManD]
Parameter	0~1 or ON/OFF(power on is off by default)
For Example	CHANnel:SHORtcut:COMManD ON // Turn on the shortcut of channel address mode MODE CH2,RES // Set CH2 to CR mode RES CH2,500 // Set the resistance of CH2 to 500Ω INP 2,1 // CH2 load CHANnel:SHORtcut:COMManD OFF // Turn off the shortcut of channel address mode CHANnel 1 MODE CURR // Set CH1 to CC mode CURR 2.5 // Set the resistance of CH1 to 2.5A INP 1 // CH1 load
Query Syntax	CHANnel:LOAD? Or CHANnel? // Query the shortcut of channel address mode
Return Result	1

ADDR Device Address Subsystem

ADDR<addr>::[cmd] Set the device address for receiving the instruction

*RST Subsystem

System soft rest (restore to the original state)

Command Syntax	*RST
For Example	Send >*RST <NL> No return >

*IDN? Subsystem

*IDN? subsystem Return the version number of the instrument

Command Syntax	*IDN?
Query Response	< Manufacturer>,<MODEL>,<SN>,<Revision>, For Example
	Send > *IDN? <NL> No return > UNI-TREND,UTL8211+,CDLB123060048,V1.68<NL>

ERRor Subsystem

ERRor subsystem Query the last erro message

Command Syntax	ADDR <addr>:: [cmd]
Parameter	Addr: 1~255 device address number cmd: SCPI control command
For Example	ADDR 1:: MEASure:REAL? // Request the real-time measured data set of NO.1 load device or ADDR 200:: MEASure:REAL? // Request the real-time measured data set of NO.200 load device
Remarks	This command is effective in the control application scenario of multiple load devices in RS485 networking. Device address is used to specific the device number. The address instruction system can be ignored if it is a single device.
Query Syntax	ERRor?
Query Response	Error string
For Example	Send > ERR?<NL> Return > no error.<NL>

Error Code	Description
*E00	No error
*E01	Bad command
*E02	Parameter error
*E03	Missing parameter
*E04	buffer overrun
*E05	Syntax error
*E06	Invalid separator
*E07	Invalid multiplier
*E08	Numeric data error
*E09	Value too long
*E10	Invalid command
*E11	Unknow error