



OEL85 Series Programming Manual

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1. SCPI Introduction

This chapter mainly covers the following topics:

- Syntax — Understanding the main structure of commands
- Syntax Rules — Understanding the rules for writing commands
- Command Abbreviations — Understanding the specifications for command abbreviations

Syntax

SCPI commands present a hierarchical tree structure and contain multiple sub-systems, each of which is made up of a root keyword and one or more sub-keywords. The command string usually starts with ":", the keywords are separated by ":" and are followed by the parameter settings available, "?" is added at the end of the command string to indicate query and the command and parameter are separated by "space".

For example:

:TRIGger:SINGle:EDGE:SOURce <source>

:TRIGger:SINGle:EDGE:SOURce?

TRIGger is the root keyword of the command. **SINGle**, **EDGE** and **SOURce** are the second level, third level and fourth level keywords. The command string starts with ":" which separates the multiple-level keywords. **<source>** represents parameters available for setting, "?" represents query and the command: **TRIGger:SINGle:EDGE:SOURce** and the parameter **<source>** are separated by "space".

Syntax Rules

SCPI language itself defines a group of sub-system keywords, and at the same time allows users to add or reduce keywords. Those keywords can be some meaningful English words and are easy to remember, which are called mnemonics. Mnemonic has long and short types. The short are the abbreviation of the long. Keywords, data, and statements are separated by special characters.

➤ Rule to format mnemonics:

1. If the letter number of an English word is less than or equal to 4, then the word itself can be the mnemonic.(such as "Free" can be "FREE");
2. If the letter number of an English word exceeds 4, then the first four letters will be the mnemonic.(such as "Frequency" can be "FREQ");

3. If the forth letter is vowel, then mnemonic uses the former three letters. Vowels consists of a, e, i, o, and u.(such as "Power" can be "POW");
4. If it is not a word but a sentence, then use the first letters of the former words and the whole of the last word. (such as "Input Voltage" can be "IVOLtage")

➤ **Usage of symbols**

1. Space

The space is used to separate command and parameter.

2. Colon :

If the colon is in front of the first character, it means the following is Root Command. When the colon is set between two keywords, then it means moving from the current level to the next level.

3. asterisk*

The commands start with asterisk are named Common Command, which is used to execute IEEE488.2 common commands.

4. Braces {}

The parameters enclosed in the braces are optional and are usually separated by the vertical bar "|". When using this command, one of the parameters must be selected.

5. Vertical Bar |

The vertical bar is used to separate multiple parameters and one of the parameters must be selected when using the command.

6. Triangle Brackets < >

The parameter enclosed in the triangle brackets must be replaced by an effective value.

7. Square Brackets []

The content (command keyword) enclosed in the square brackets can be omitted.

➤ **Parameter Type**

1. **Discrete**

The parameter should be one of the values listed.

For example:

:TRIGger:SINGle:EDGE:SOURce <source>

:TRIGger:SINGle:EDGE:SOURce?

Of which:

<source> can be set to: CH1|CH2|EXT|EXT/5|ACLine

The query returns an abbreviated form: CH1、CH2、EXT、EXT/5 or ACLine.

2. **Real**

Parameters can be any real number in the range of valid values, This command accepts decimal numbers(NR2 format) and scientific notation (NR3 format) parameter input. For example:

:CH<n>:OFFSet <offset>

:CH<n>:OFFSet?

Of which:

<n> can be set to: 1 or 2 denote channel1 or channel2.

<offset> can be set to: between -2000 and 2000 .

The query returns the number between -2000 and 2000.

3. **Bool**

The parameter could be "OFF"、"0"、"ON"、"1".For example:

:CH1:DISPlay <bool>

:CH1:DISPlay?

Of which:

<bool> can be set to: {OFF|0}|{ON|1}

The query returns "OFF" or "ON".

4. **ASCII String**

The parameter could be ASCII characters combination.For example:

:TRIGger:SINGle:EDGE:LEVel <level>

:TRIGger:SINGle:EDGE:LEVel?

Of which:

<level> can be set to: 25mV.

Command Abbreviation

Each SCPI command can be written mixed with uppercase and lowercase according to the syntax rules, and the capital letter part is just the abbreviation of the command. If abbreviation is used, all the capital letters in the command must be written completely. For parameters with units, please refer to the detail parameter specifications in the sub-system.

Example1:

:ACQuire:MODE SAMPlE

Abbreviation Below:

:ACQ:MODE SAMP

Example2:

:CH1:SCALe 1V

Abbreviation Below:

:CH1:SCAL 1V

2. IEEE488.2 Common Command

This chapter mainly introduces the following commands:

- [*IDN?](#)
- [*RST](#)

*IDN?

Format	*IDN?	
Function Description	The query returns the ID character string of the instrument.	
Parameter	None.	
Instruction	None.	
Return format	<Factory>,<model>,<serial number>,XX.X.X.X.X <model>: type of instrument. <serial number>: serial number of instrument. XX.X.X.X.X: software version of instrument.	
Example	Sent	*IDN?
	Return	Factory,model,2322011,V1.0.2.0.1

*RST

Format	*RST	
Function Description	Restore the instrument to its default value.	
Parameter	None.	
Instruction	None.	
Return format	None.	
Example	Sent	*RST
	Return	None

3. System Command

This chapter mainly introduces the following commands:

- [SYSTem:LOCaI](#)
- [SYSTem:REMOte](#)
- [SYSTem:SENSe\[:STATe\] <bool>](#)

SYSTem:LOCaI

Format	SYSTem:LOCaI	
Function Description	Power off to remote control mode via communication interface (USB,RS485,LAN). At this point, the panel key resumes the operation.	
Parameter	None.	
Instruction	None.	
Return format	None.	
Example	Sent	SYST:LOC?
	Return	None

SYSTem:REMOte

Format	SYSTem:REMOte	
Function Description	Set the power supply to remote control mode through the communication interface (USB,RS485,LAN). At this time, the panel key is locked and cannot be operated. All control commands need to be operated after this command.	
Parameter	None.	
Instruction	None.	
Return format	None.	
Example	Sent	SYST:REM?
	Return	None

SYSTem:SENSe[:STATe] <bool>

Format	SYSTem:SENSe[:STATe] <bool> SYSTem:SENSe[:STATe]?
---------------	--

Function Description	Enable and disable the remote compensation function.	
Parameter	0 1 OFF ON	
Instruction	0 OFF: disable the remote compensation function; 1 ON: enable the remote compensation function.	
Return format	0 1	
Example	Sent	SYST:SENS ON //Set the remote compensation function to enable mode.
	Query	SYSTem:SENSe[:STATe]? //Query the remote compensation function status.
	Return	1

4. Source Command

This chapter mainly introduces the following commands:

- [\[SOURce:\]FUNctIon <function>](#)
- [Input Command](#)
 - ◆ [\[SOURce:\]INPut <bool>](#)
 - ◆ [\[SOURce:\]INPut:SHORT <bool>](#)
- [Voltage Command](#)
 - ◆ [\[SOURce:\]VOLTage:RANGe <NRf+>](#)
 - ◆ [\[SOURce:\]VOLTage:SLEW\[:BOTH\] <NRf+>](#)
 - ◆ [\[SOURce:\]VOLTage:SLEW:RISE <NRf+>](#)
 - ◆ [\[SOURce:\]VOLTage:SLEW:FALL <NRf+>](#)
 - ◆ [\[SOURce:\]VOLTage:PROTection\[:LEVel\] <NRf+>](#)
 - ◆ [\[SOURce:\]VOLTage\[:LEVel\]ON <NRf+>](#)
 - ◆ [\[SOURce:\]VOLTage\[:LEVel\]\[:IMMediate\]\[:AMPLitude\] <NRf+>](#)
- [Current Command](#)
 - ◆ [\[SOURce:\]CURRent:RANGe <NRf+>](#)
 - ◆ [\[SOURce:\]CURRent:SLEW\[:BOTH\] <NRf+>](#)
 - ◆ [\[SOURce:\]CURRent:SLEW:RISE <NRf+>](#)
 - ◆ [\[SOURce:\]CURRent:SLEW:FALL <NRf+>](#)
 - ◆ [\[SOURce:\]CURRent:PROTection\[:LEVel\] <NRf+>](#)
 - ◆ [\[SOURce:\]CURRent\[:LEVel\]\[:IMMediate\]\[:AMPLitude\] <NRf+>](#)
 - ◆ [\[SOURce:\]CURRent:LIMit\[:LEVel\]\[:IMMediate\]\[:AMPLitude\] <NRf+>](#)
- [Resistance Command](#)
 - ◆ [\[SOURce:\]RESistance\[:LEVel\]\[:IMMediate\]\[:AMPLitude\] <NRf+>](#)
 - ◆ [\[SOURce:\]RESistance:SLEW:RISE <NRf+>](#)
 - ◆ [\[SOURce:\]RESistance:SLEW:FALL <NRf+>](#)
- [Power Command](#)
 - ◆ [\[SOURce:\]POWER:PROTection\[:LEVel\] <NRf+>](#)

- ◆ [\[SOURce:\]POWer\[:LEVel\]\[:IMMediate\]\[:AMPLitude\] <NRf+>](#)
- ◆ [\[SOURce:\]POWer:SLEW:RISE <NRf+>](#)
- ◆ [\[SOURce:\]POWer:SLEW:FALL <NRf+>](#)
- [Dynamic Command](#)
 - ◆ [\[SOURce:\]DYNamic:HIGH\[:LEVel\] <NRf+>](#)
 - ◆ [\[SOURce:\]DYNamic:HIGH:DEWLI <NRf+>](#)
 - ◆ [\[SOURce:\]DYNamic:LOW\[:LEVel\] <NRf+>](#)
 - ◆ [\[SOURce:\]DYNamic:LOW:DEWLI <NRf+>](#)
 - ◆ [\[SOURce:\]DYNamic:SLEW <NRf+>](#)
 - ◆ [\[SOURce:\]DYNamic:SLEW:RISE <NRf+>](#)
 - ◆ [\[SOURce:\]DYNamic:SLEW:FALL <NRf+>](#)
 - ◆ [\[SOURce:\]DYNamic:MODE <mode>](#)
- [Battery Test Mode Command](#)
 - ◆ [\[:SOURce\]:BATtery\[:LEVel\]\[:IMMediate\] <NRf+>](#)
 - ◆ [\[:SOURce\]:BATtery:VSTop <NRf+>](#)
 - ◆ [\[:SOURce\]:BATtery:CSTop <NRf+>](#)
 - ◆ [\[:SOURce\]:BATtery:TIMestop](#)
 - ◆ [\[:SOURce\]:BATtery:VENabstop](#)
 - ◆ [\[:SOURce\]:BATtery:CENabstop](#)
 - ◆ [\[:SOURce\]:BATtery:TENabstop](#)
 - ◆ [\[:SOURce\]:BATtery:CAPAcity\[:REAL\]?](#)
 - ◆ [\[:SOURce\]:BATtery:ENERGY\[:REAL\]?](#)
 - ◆ [\[:SOURce\]:BATtery:TIME\[:ELAPsed\]?](#)
 - ◆ [\[:SOURce\]:BATtery:STATe?](#)
 - ◆ [\[:SOURce\]:BATtery:ALL?](#)
- [OCP Test Mode Command](#)
 - ◆ [\[:SOURce\]:OCP:VON <NRf+>](#)
 - ◆ [\[:SOURce\]:OCP:ISet <NRf+>](#)
 - ◆ [\[:SOURce\]:OCP:IStep <NRf+>](#)
 - ◆ [\[:SOURce\]:OCP:IDELaystep](#)

- ◆ [\[:SOURce\]:OCP:VOCP <NRf+>](#)
- ◆ [\[:SOURce\]:OCP:IMAX <NRf+>](#)
- [OPP Test Mode Command](#)
 - ◆ [\[:SOURce\]:OPP:VON <NRf+>](#)
 - ◆ [\[:SOURce\]:OPP:PSET <NRf+>](#)
 - ◆ [\[:SOURce\]:OPP:PSTep <NRf+>](#)
 - ◆ [\[:SOURce\]:OPP:IDELaystep](#)
 - ◆ [\[:SOURce\]:OPP:VOPP <NRf+>](#)
 - ◆ [\[:SOURce\]:OPP:PMAX <NRf+>](#)
 - ◆ [\[:SOURce\]:OPP:PMIN <NRf+>](#)

[SOURce:]FUNCTION <function>

Format	[SOURce:]FUNCTION <function> [SOURce:]FUNCTION? [SOURce:]MODE <mode> [SOURce:]MODE?	
Function Description	These two commands are equivalent and are used to select the input mode of the load.	
Parameter	CURRent VOLTage POWer RESistance DYNamic BATtery OCP OVP	
Instruction	CURRent: constant current mode. VOLTage: constant voltage mode. POWer: constant power mode. RESistance: constant resistance mode. DYNamic: dynamic mode. BATtery: battery test mode. OCP: OCP test mode. OPP: OPP test mode.	
Return format	current voltage power resistance dynamic ocp ovp	
Example	Sent	MODE RES //Set load input mode to resistance.
	Query	MODE? //Query load input mode.
	Return	resistance

4.1 Input Command

[SOURce:]INPut <bool>

Format	[SOURce:]INPut <bool> [SOURce:]INPut?	
Function Description	Set or query the input status.	
Parameter	0 1 OFF ON	
Instruction	0 OFF: disable the input; 1 ON: enable the input.	
Return format	0 1	
Example	Sent	INP 1 //Set the input to enable mode.
	Query	INP? //Query the input status.
	Return	1

[SOURce:]INPut:SHORT <bool>

Format	[SOURce:]INPut:SHORT <bool> [SOURce:]INPut:SHORT?	
Function Description	Set or query the short status.	
Parameter	0 1 OFF ON	
Instruction	0 OFF: disable the short; 1 ON: enable the short.	
Return format	0 1	
Example	Sent	INP:SHOR 1 //Set the short to enable mode.

	Query	INP:SHOR? //Query the short state.
	Return	1

4.2 Voltage Command

[SOURce:]VOLTage:RANGe <NRf+>

Format	[SOURce:]VOLTage:RANGe <NRf+> [SOURce:]VOLTage:RANGe?	
Function Description	Set or query the voltage range of the load module.	
Parameter	MIN ~MAX	
Instruction	When the set parameter falls within the small range, the small voltage range is selected; otherwise, the large voltage range is selected. The default unit is V.	
Return format	<NR2>	
Example	Sent	VOLT:RANGE MIN //Set the voltage range to minimum.
	Query	[SOURce:]VOLTage:RANGe? //Query the voltage range.
	Return	0.0

[SOURce:]VOLTage:SLEW[:BOTH] <NRf+>

Format	[SOURce:]VOLTage:SLEW[:BOTH] <NRf+> [SOURce:]VOLTage:SLEW[:BOTH]?	
Function Description	Set or query the voltage rise and fall slope.	
Parameter	FAST/NORM/SLOW	
Instruction	None.	
Return format	FAST/NORM/SLOW	
Example	Sent	VOLT:SLEW FAST //Set the rise and fall slope to fast.

	Query	[SOURce:]VOLTage:SLEW[:BOTH]? //Query the rise and fall slope.
	Return	FAST

[SOURce:]VOLTage:SLEW:RISE <NRf+>

Format	[SOURce:]VOLTage:SLEW:RISE <NRf+> [SOURce:]VOLTage:SLEW:RISE?	
Function Description	Set or query the voltage rise slope.	
Parameter	FAST/NORM/SLOW	
Instruction	None.	
Return format	FAST/NORM/SLOW	
Example	Sent	VOLT:SLEW RISE FAST //Set the rise slope to fast.
	Query	[SOURce:]VOLTage:SLEW:RISE? //Query the rise slope.
	Return	FAST

[SOURce:]VOLTage:SLEW:FALL <NRf+>

Format	[SOURce:]VOLTage:SLEW:FALL <NRf+> [SOURce:]VOLTage:SLEW:FALL?	
Function Description	Set or query the voltage fall slope.	
Parameter	FAST/NORM/SLOW	
Instruction	None.	
Return format	FAST/NORM/SLOW	
Example	Sent	VOLT:SLEW FALL FAST //Set the fall slope to FAST.

	Query	[SOURce:]VOLTage:SLEW:FALL? //Query the fall slope.
	Return	FAST

[SOURce:]VOLTage:PROTection[:LEVel] <NRf+>

Format	[SOURce:]VOLTage:PROTection[:LEVel] <NRf+> [SOURce:]VOLTage:PROTection[:LEVel]?	
Function Description	Set or query the voltage protection value. If the input voltage exceeds the set voltage protection value, the input will be turned off.	
Parameter	MIN ~ MAX MINimum MAXimum	
Instruction	The default unit is V.	
Return format	<NR2>	
Example	Sent	VOLT:PROT 3 //Set the voltage protection to 3 V.
	Query	[SOURce:]VOLTage:PROTection[:LEVel]? //Query the voltage protection value.
	Return	3.0

[SOURce:]VOLTage:[LEVel:]ON <NRf+>

Format	[SOURce:]VOLTage:[LEVel:]ON <NRf+> [SOURce:]VOLTage:[LEVel:]ON?	
Function Description	Set or query the load's start carrying voltage value.	
Parameter	None.	
Instruction	The default unit is V.	
Return format	<NR2>	
Example	Sent	VOLT:ON 3

		//Set the load's start carrying voltage value to 3 V.
	Query	[SOURce:]VOLTage[:LEVel:]ON? //Query the load's start carrying voltage value.
	Return	3.0

[SOURce:]VOLTage[:LEVel][:IMMediate][:AMPLitude] <NRf+>

Format	[SOURce:]VOLTage[:LEVel][:IMMediate][:AMPLitude] <NRf+> [SOURce:]VOLTage[:LEVel][:IMMediate][:AMPLitude]?	
Function Description	Set or query the set voltage in CV mode.	
Parameter	MIN~MAX	
Instruction	The default unit is V.	
Return format	<NR2>	
Example	Sent	VOLT 5 //Set the voltage in CV mode to 5V.
	Query	[SOURce:]VOLTage[:LEVel][:IMMediate][:AMPLitude]? //Query the voltage in CV mode.
	Return	5.0

4.3 Current Command

[SOURce:]CURRent:RANGe <NRf+>

Format	[SOURce:]CURRent:RANGe <NRf+> [SOURce:]CURRent:RANGe?	
Function Description	Set or query the current range of the load module.	
Parameter	MIN ~MAX	
Instruction	When the set parameter falls within the small range, the small current range is selected; otherwise, the large current range is selected. The default unit is A.	
Return format	<NR2>	
Example	Sent	CURR:RANGE MIN //Set the current range to minimum.
	Query	[SOURce:]CURRent:RANGe? //Query the current range.
	Return	0.0

[SOURce:]CURRent:SLEW[:BOTH] <NRf+>

Format	[SOURce:]CURRent:SLEW[:BOTH] <NRf+> [SOURce:]CURRent:SLEW[:BOTH]?	
Function Description	Set or query the current rise and fall slope.	
Parameter	Min ~ Max	
Instruction	The default unit is A/uS.	
Return format	<NR2>	
Example	Sent	CURR:SLEW 3 //Set the rise and fall slope to 3 A/μs.

	Query	[SOURce:]CURRent:SLEW[:BOTH]? //Query the rise and fall slope.
	Return	3.0

[SOURce:]CURRent:SLEW:RISE <NRf+>

Format	[SOURce:]CURRent:SLEW:RISE <NRf+> [SOURce:]CURRent:SLEW:RISE?	
Function Description	Set or query the current rise slope.	
Parameter	MIN ~MAX	
Instruction	The default unit is A/uS.	
Return format	<NR2>	
Example	Sent	CURR:SLEW RISE 3 //Set the rise slope to 3 A/uS.
	Query	[SOURce:]CURRent:SLEW:RISE? //Query the rise slope.
	Return	3.0

[SOURce:]CURRent:SLEW:FALL <NRf+>

Format	[SOURce:]CURRent:SLEW:FALL <NRf+> [SOURce:]CURRent:SLEW:FALL?	
Function Description	Set or query the current fall slope.	
Parameter	FAST/NORM/SLOW	
Instruction	The default unit is A/uS.	
Return format	MIN ~ MAX	
Example	Sent	CURR:SLEW FALL 3 //Set the fall slope to 3 A/uS.

	Query	[SOURce:]CURRent:SLEW:FALL? //Query the fall slope.
	Return	3.0

[SOURce:]CURRent:PROTection[:LEVel] <NRf+>

Format	[SOURce:]CURRent:PROTection[:LEVel] <NRf+> [SOURce:]CURRent:PROTection[:LEVel]?	
Function Description	Set or query the current protection value. If the input current exceeds the software current protection value within the time specified by CURR:PROT:DEL, the input will be turned off.	
Parameter	MIN ~ MAX MINimum MAXimum	
Instruction	The default unit is A. Use CURR:PROT:DEL to prevent current protection due to momentary overcurrent.	
Return format	<NR2>	
Example	Sent	CURR:PROT 3 //Set the current protection to 3 A.
	Query	[SOURce:]CURRent:PROTection[:LEVel]? //Query the current protection value.
	Return	3.0

[SOURce:]CURRent[:LEVel][:IMMediate][:AMPLitude] <NRf+>

Format	[SOURce:]CURRent[:LEVel][:IMMediate][:AMPLitude] <NRf+> [SOURce:]CURRent[:LEVel][:IMMediate][:AMPLitude]?
Function Description	Set or query the set current in CC mode.

Parameter	MIN~MAX	
Instruction	The default unit is A.	
Return format	<NR2>	
Example	Sent	CURR 5 //Set the current in CC mode to 5A.
	Query	[SOURce:]CURRent[:LEVel][:IMMediate][:AMPLitude]? //Query the current in CC mode.
	Return	5.0

[SOURce:]CURRent:LIMit[:LEVel][:IMMediate][:AMPLitude] <NRf+>

Format	[SOURce:]CURRent:LIMit[:LEVel][:IMMediate][:AMPLitude] <NRf+> [SOURce:]CURRent:LIMit[:LEVel][:IMMediate][:AMPLitude]?	
Function Description	Set or query the set current limit value.	
Parameter	MIN~MAX	
Instruction	The default unit is A.	
Return format	<NR2>	
Example	Sent	CURR:LIM 5 //Set the current limit value to 5A.
	Query	[SOURce:]CURRent:LIMit[:LEVel][:IMMediate][:AMPLitude]? //Query the current limit value.
	Return	5.0

4.4 Resistance Command

[SOURce:]RESistance[:LEVel][:IMMediate][:AMPLitude]

<NRf+>

Format	[SOURce:]RESistance[:LEVel][:IMMediate][:AMPLitude] <NRf+> [SOURce:]RESistance[:LEVel][:IMMediate][:AMPLitude] ?	
Function Description	Set or query the set resistance in CR mode.	
Parameter	MIN~MAX	
Instruction	The default unit is ohm.	
Return format	<NR2>	
Example	Sent	RES 10 //Set the resistance in CR mode to 10ohm.
	Query	[SOURce:]RESistance[:LEVel][:IMMediate] [:AMPLitude]? //Query the resistance in CR mode.
	Return	10.0

[SOURce:]RESistance:SLEW:RISE <NRf+>

Format	[SOURce:]RESistance:SLEW:RISE <NRf+> [SOURce:]RESistance:SLEW:RISE?
Function Description	Set or query the current rise slope in resistance mode.
Parameter	FAST/NORM/SLOW
Instruction	None.

Return format	FAST/NORM/SLOW	
Example	Sent	RES:SLEW:RISE FAST //Set the current rise slope to fast.
	Query	[SOURce:]RESistance:SLEW:RISE? //Query the current rise slope.
	Return	FAST

[SOURce:]RESistance:SLEW:FALL <NRf+>

Format	[SOURce:]RESistance:SLEW:FALL <NRf+> [SOURce:]RESistance:SLEW:FALL?	
Function Description	Set or query the current fall slope in resistance mode.	
Parameter	FAST/NORM/SLOW	
Instruction	None.	
Return format	FAST/NORM/SLOW	
Example	Sent	RES:SLEW:FALL SLOW //Set the current fall slope to slow.
	Query	[SOURce:]RESistance:SLEW:FALL? //Query the current fall slope.
	Return	SLOW

4.5 Power Command

[SOURce:]POWer:PROTection[:LEVel] <NRf+>

Format	[SOURce:]POWer:PROTection[:LEVel] <NRf+> [SOURce:]POWer:PROTection[:LEVel]?	
Function Description	Set or query the power protection value. If the power exceeds the power protection value within the time specified by POW:PROT:DEL, the input will be turned off.	
Parameter	MIN ~ MAX MINimum MAXimum	
Instruction	The default unit is W. Use the POW:PROT:DEL command to prevent momentary power protection, which is caused by changes in the edit that stop the over-power protection.	
Return format	<NR2>	
Example	Sent	POW:PROT 100 //Set the power protection to 100 W.
	Query	[SOURce:]POWer:PROTection[:LEVel]? //Query the power protection value.
	Return	100.0

[SOURce:]POWer[:LEVel][:IMMediate][:AMPLitude]

<NRf+>

Format	[SOURce:]POWer[:LEVel][:IMMediate][:AMPLitude] <NRf+> [SOURce:]POWer[:LEVel][:IMMediate][:AMPLitude]?
Function Description	Set or query the set power in CP mode.

Parameter	MIN~MAX	
Instruction	The default unit is W.	
Return format	<NR2>	
Example	Sent	POW 10 //Set the power in CP mode to 10W.
	Query	[SOURce:]POWer[:LEVel][:IMMediate][:AMPLitude]? //Query the power in CP mode.
	Return	10.0

[SOURce:]POWer:SLEW:RISE <NRf+>

Format	[SOURce:]POWer:SLEW:RISE <NRf+> [SOURce:]POWer:SLEW:RISE?	
Function Description	Set or query the current rise slope in power mode.	
Parameter	FAST/NORM/SLOW	
Instruction	None.	
Return format	FAST/NORM/SLOW	
Example	Sent	POW:SLEW:RISE NORM //Set the current rise slope to normal.
	Query	[SOURce:]POWer:SLEW:RISE? //Query the current rise slope.
	Return	NORM

[SOURce:]POWer:SLEW:FALL <NRf+>

Format	[SOURce:]POWer:SLEW:FALL <NRf+> [SOURce:]POWer:SLEW:FALL?	
Function	Set or query the current fall slope in power mode.	

Description		
Parameter	FAST/NORM/SLOW	
Instruction	None.	
Return format	FAST/NORM/SLOW	
Example	Sent	POW:SLEW:FALL FAST //Set the current fall slope to fast.
	Query	[SOURce:]POWer:SLEW:FALL? //Query the current fall slope.
	Return	FAST

4.6 Dynamic Command

[SOURce:]DYNamic:HIGH[:LEVel] <NRf+>

Format	[SOURce:]DYNamic:HIGH[:LEVel] <NRf+> [SOURce:]DYNamic:HIGH[:LEVel]?	
Function Description	Set or query the high-precision load current in dynamic mode.	
Parameter	MIN~MAX	
Instruction	The default unit is A.	
Return format	<NR2>	
Example	Sent	DYN:HIGH 10 //Set the high-precision load current to 10A.
	Query	[SOURce:]DYNamic:HIGH[:LEVel]? //Query the high-precision load current.
	Return	10.0

[SOURce:]DYNamic:HIGH:DWELI <NRf+>

Format	[SOURce:]DYNamic:HIGH:DWELI <NRf+> [SOURce:]DYNamic:HIGH:DWELI?	
Function Description	Set or query the high-precision load current duration in dynamic mode.	
Parameter	MIN~MAX	
Instruction	The default unit is S.	
Return format	<NR2>	
Example	Sent	DYN:HIGH:DWELI 0.01 //Set the high-precision load current duration to 0.01S.
	Query	[SOURce:]DYNamic:HIGH:DWELI?

		//Query the high-precision load current duration.
	Return	0.01

[SOURce:]DYNamic:LOW[:LEVel] <NRf+>

Format	[SOURce:]DYNamic:LOW[:LEVel] <NRf+> [SOURce:]DYNamic:LOW[:LEVel]?	
Function Description	Set or query the low-precision load current in dynamic mode.	
Parameter	MIN~MAX	
Instruction	The default unit is A.	
Return format	<NR2>	
Example	Sent	DYN:LOW 1 //Set the low-precision load current to 1A.
	Query	[SOURce:]DYNamic:LOW[:LEVel]? //Query the low-precision load current.
	Return	1.0

[SOURce:]DYNamic:LOW:DWELI <NRf+>

Format	[SOURce:]DYNamic:LOW:DWELI <NRf+> [SOURce:]DYNamic:LOW:DWELI?	
Function Description	Set or query the low-precision load current duration in dynamic mode.	
Parameter	MIN~MAX	
Instruction	The default unit is S.	
Return format	<NR2>	
Example	Sent	DYN:LOW:DWELI 1 //Set the low-precision load current duration

		to 1S.
	Query	[SOURce:]DYNamic:LOW:DWELI? //Query the low-precision load current duration.
	Return	1.0

[SOURce:]DYNamic:SLEW <NRf+>

Format	[SOURce:]DYNamic:SLEW <NRf+> [SOURce:]DYNamic:SLEW?	
Function Description	Set or query the current slope in dynamic mode.	
Parameter	MIN~MAX	
Instruction	The default unit is A/uS.	
Return format	<NR2>	
Example	Sent	DYN:SLEW 3 //Set the current slope to 3 A/uS.
	Query	[SOURce:]DYNamic:SLEW? //Query the current slope.
	Return	3.0

[SOURce:]DYNamic:SLEW:RISE <NRf+>

Format	[SOURce:]DYNamic:SLEW:RISE <NRf+> [SOURce:]DYNamic:SLEW:RISE?	
Function Description	Set or query the current rise slope in dynamic mode.	
Parameter	MIN~MAX	
Instruction	The default unit is A/uS.	
Return format	<NR2>	

Example	Sent	DYN:SLEW:RISE 3 //Set the current rise slope to 3 A/uS.
	Query	[SOURce:]DYNamic:SLEW:RISE? //Query the current rise slope.
	Return	3.0

[SOURce:]DYNamic:SLEW:FALL <NRf+>

Format	[SOURce:]DYNamic:SLEW:FALL <NRf+> [SOURce:]DYNamic:SLEW:FALL?	
Function Description	Set or query the current fall slope in dynamic mode.	
Parameter	MIN~MAX	
Instruction	The default unit is A/uS.	
Return format	<NR2>	
Example	Sent	DYN:SLEW:FALL 3 //Set the current fall slope to 3 A/uS.
	Query	[SOURce:]DYNamic:SLEW:FALL? //Query the current fall slope.
	Return	3.0

[SOURce:]DYNamic:MODE <mode>

Format	[SOURce:]DYNamic:MODE <mode> [SOURce:]DYNamic:MODE?	
Function Description	Set or query the mode in dynamic mode.	
Parameter	CONTInuous PULSe	
Instruction	None.	
Return format	CONTInuous PULSe	

Example	Sent	DYN:MODE PULS //Set the mode to pulse.
	Query	[SOURce:]DYNamic:MODE? //Query the mode.
	Return	PULS

4.7 Battery Test Mode Command

[[:SOURce:]BATtery[:LEVel][:IMMediate] <NRf+>

Format	[:SOURce:]BATtery[:LEVel][:IMMediate] <NRf+> [:SOURce:]BATtery[:LEVel][:IMMediate]?	
Function Description	Set or query setting current in battery test mode.	
Parameter	MIN~MAX	
Instruction	Default unit is A.	
Return format	<NR2>	
Example	Sent	BAT 5 //Set setting current in battery test mode to 5A.
	Query	BAT? //Query setting current in battery test mode.
	Return	5.0

[:SOURce:]BATtery:VSTop <NRf+>

Format	[:SOURce:]BATtery:VSTop <NRf+> [:SOURce:]BATtery:VSTop?	
Function Description	Set or query the cutoff voltage setting in battery test mode.	
Parameter	MIN~MAX	
Instruction	Default unit is V.	
Return format	<NR2>	
Example	Sent	BAT:VST 5 //Set the cutoff voltage setting in battery test mode to 5V.

	Query	BAT:VST? //Query the cutoff voltage setting in battery test mode.
	Return	5.0

[:SOURce]:BATtery:CSTop <NRf+>

Format	[:SOURce]:BATtery:CSTop <NRf+> [:SOURce]:BATtery:CSTop?	
Function Description	Set or query the setting battery capacity in battery test mode.	
Parameter	MIN~MAX	
Instruction	Default unit is Ah.	
Return format	<NR2>	
Example	Sent	BAT:CST 5 //Set the setting battery capacity in battery test mode to 5Ah.
	Query	BAT:CST? //Query the setting battery capacity in battery test mode.
	Return	5.0

[:SOURce]:BATtery:TIMestop

Format	[:SOURce]:BATtery:TIMestop [:SOURce]:BATtery:TIMestop?	
Function Description	Set or query the setting battery charge time in battery test mode.	
Parameter	MIN~MAX	
Instruction	Default unit is S.	

Return format	<NR2>	
Example	Sent	BAT:TIM 50 /Set the setting battery charge time in battery test mode to 50S.
	Query	BAT:TIM? //Query the setting battery charge time in battery test mode.
	Return	50.0

:[:SOURce]:BATtery:VENabstop

Format	[:SOURce]:BATtery:VENabstop [:SOURce]:BATtery:VENabstop?	
Function Description	Set or query the enable/disable state of the cutoff voltage in battery test mode.	
Parameter	0 1 OFF ON	
Instruction	ON: enable state of the cutoff voltage	
Return format	OFF ON	
Example	Sent	BAT:VEN ON //Enable state of the cutoff voltage
	Query	BAT:VEN? //Query state of the cutoff voltage
	Return	ON

:[:SOURce]:BATtery:CENabstop

Format	[:SOURce]:BATtery:CENabstop [:SOURce]:BATtery:CENabstop?	
Function Description	Set or query the enable/disable state for the battery capacity test conditions in battery test mode.	

Parameter	0 1 OFF ON	
Instruction	ON: Enable the battery capacity test condition	
Return format	OFF ON	
Example	Sent	BAT:CEN ON //Enable the battery capacity test condition
	Query	BAT:CEN? //Query the battery capacity test condition
	Return	ON

:[:SOURce]:BATtery:TENabstop

Format	[:SOURce]:BATtery:TENabstop [:SOURce]:BATtery:TENabstop?	
Function Description	Set or query the enable/disable state for the battery charge time test conditions in battery test mode.	
Parameter	0 1 OFF ON	
Instruction	ON: Enable the battery charge time test condition	
Return format	OFF ON	
Example	Sent	BAT:TEN ON //Enable the battery charge time test condition
	Query	BAT:TEN? //Query the battery charge time test condition
	Return	ON

:[:SOURce]:BATtery:CAPAcity[:REAL]?

Format	[SOURce]:BATtery:CAPAcity[:REAL]?
Function	Query the measured battery capacity in battery test

Description	mode.	
Parameter	None.	
Instruction	Default unit is Ah.	
Return format	<NR2>	
Example	Query	BAT:CAPA? //Query measured battery capacity.
	Return	9.496

:[SOURce]:BATtery:ENERGY[:REAL]?

Format	[SOURce]:BATtery:ENERGY[:REAL]?	
Function Description	Query the measured battery energy in battery test mode.	
Parameter	None.	
Instruction	Default unit is Wh.	
Return format	<NR2>	
Example	Query	BAT:ENERGY? //Query measured battery energy.
	Return	5.000

:[SOURce]:BATtery:TIME[:ELAPsed]?

Format	[SOURce]:BATtery:TIME[:ELAPsed]?	
Function Description	Query the measured battery charge time in battery test mode.	
Parameter	None.	
Instruction	Default unit is S.	
Return format	None.	
Example	Query	BAT:TIME? //Query measured battery charge time.

	Return	10
--	---------------	----

:[SOURce]:BATtery:STATe?

Format	[SOURce]:BATtery:STATe?	
Function Description	Query the measured battery measurement state in battery test mode.	
Parameter	None.	
Instruction	0: Not Started; 1: In Progress; 2: Test Completed; 3: Test Failed	
Return format	None.	
Example	Query	BAT:STAT? //Query the measured battery measurement state.
	Return	0

:[SOURce]:BATtery:ALL?

Format	[SOURce]:BATtery:ALL?	
Function Description	Query all measurement information in battery test mode.	
Parameter	None.	
Instruction	Return information: voltage, current, capacity, energy, charge time	
Return format	None.	
Example	Sent	BAT:ALL? //Query measurement state.
	Return	12.000,2.0000,1.123,3.500,10

4.8 OCP Test Mode Command

[SOURce:]OCP:VON <NRf+>

Format	[SOURce:]OCP:VON <NRf+> [SOURce:]OCP:VON?	
Function Description	Set or query start voltage in OCP test mode.	
Parameter	MIN~MAX	
Instruction	Default unit is V.	
Return format	<NR2>	
Example	Sent	OCP:VON 5 //Set start voltage to 5V.
	Query	OCP:VON? //Query start voltage.
	Return	5.0

[:SOURce]:OCP:ISET <NRf+>

Format	[:SOURce]:OCP:ISET <NRf+> [:SOURce]:OCP:ISET?	
Function Description	Set or query OCP initial current in measurement mode.	
Parameter	MIN~MAX	
Instruction	Default unit is A.	
Return format	<NR2>	
Example	Sent	OCP:ISET 5 //Set initial current to 5A.
	Query	OCP:ISET? //Query initial current.

	Return	5.0
--	---------------	-----

[:SOURce]:OCP:ISTep <NRf+>

Format	[:SOURce]:OCP:ISTep <NRf+> [:SOURce]:OCP:ISTep?	
Function Description	Set or query OCP step current in measurement mode.	
Parameter	MIN~MAX	
Instruction	Default unit is A.	
Return format	<NR2>	
Example	Sent	OCP:IST 5 //Set step current to 5A.
	Query	OCP:IST? //Query step current.
	Return	5.0

[:SOURce]:OCP:IDELaystep

Format	[:SOURce]:OCP:IDELaystep [:SOURce]:OCP:IDELaystep?	
Function Description	Set or query OCP delay step in measurement mode.	
Parameter	MIN~MAX	
Instruction	Default unit is ms.	
Return format	<NR2>	
Example	Sent	OCP:IDEL 100 //Set delay step to 100ms.
	Query	OCP:IDEL? //Query delay step.

	Return	100
--	---------------	-----

[:SOURce]:OCP:VOCP <NRf+>

Format	[:SOURce]:OCP:VOCP <NRf+> [:SOURce]:OCP:VOCP?	
Function Description	Set or query OCP protection voltage in measurement mode.	
Parameter	MIN~MAX	
Instruction	Default unit is V.	
Return format	<NR2>	
Example	Sent	OCP:VOCP 5 //Set protection voltage to 5V.
	Query	OCP:VOCP? //Query protection voltage.
	Return	5.0

[:SOURce]:OCP:IMAX <NRf+>

Format	[:SOURce]:OCP:IMAX <NRf+> [:SOURce]:OCP:IMAX?	
Function Description	Set or query OCP maximum current in measurement mode.	
Parameter	MIN~MAX	
Instruction	Default unit is A.	
Return format	<NR2>	
Example	Sent	OCP:IMAX 5 //Set the maximum current to 5A.
	Query	OCP:IMAX? //Query the maximum current.

	Return	5.0
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4.9 OPP Test Mode Command

[SOURce:]OPP:VON <NRf+>

Format	[SOURce:]OPP:VON <NRf+> [SOURce:]OPP:VON?	
Function Description	Set or query start voltage in OPP test mode.	
Parameter	MIN~MAX	
Instruction	Default unit is V.	
Return format	<NR2>	
Example	Sent	OPP:VON 5 //Set start voltage to 5V.
	Query	OPP:VON? //Query start voltage.
	Return	5.0

[:SOURce]:OPP:PSET <NRf+>

Format	[:SOURce]:OPP:PSET <NRf+> [:SOURce]:OPP:PSET?	
Function Description	Set or query OPP initial power in measurement mode.	
Parameter	MIN~MAX	
Instruction	Default unit is W.	
Return format	<NR2>	
Example	Sent	OPP:PSET 50 //Set initial power to 50W.
	Query	OPP:PSET? //Query initial power.

	Return	50.0
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[:SOURce]:OPP:PSTep <NRf+>

Format	[:SOURce]:OPP:PSTep <NRf+> [:SOURce]:OPP:PSTep?	
Function Description	Set or query OPP delay power in measurement mode.	
Parameter	MIN~MAX	
Instruction	Default unit is W.	
Return format	<NR2>	
Example	Sent	OPP:PST 5 //Set delay power to 5W.
	Query	OPP:PST? //Query step power.
	Return	5.0

[:SOURce]:OPP:IDELaystep

Format	[:SOURce]:OPP:IDELaystep [:SOURce]:OPP:IDELaystep?	
Function Description	Set or query OPP delay step in measurement mode.	
Parameter	MIN~MAX	
Instruction	Default unit is ms.	
Return format	<NR2>	
Example	Sent	OPP:IDEL 100 //Set delay step to 100ms.
	Query	OPP:IDEL? //Query delay step.

	Return	100.0
--	---------------	-------

[:SOURce]:OPP:VOPP <NRf+>

Format	[:SOURce]:OPP:VOPP <NRf+> [:SOURce]:OPP:VOPP?	
Function Description	Set or query OPP protection voltage in measurement mode.	
Parameter	MIN~MAX	
Instruction	Default unit is V.	
Return format	<NR2>	
Example	Sent	OPP:VOPP 5 //Set protection voltage to 5V.
	Query	OPP:VOPP? //Query protection voltage.
	Return	5.0

[:SOURce]:OPP:PMAX <NRf+>

Format	[:SOURce]:OPP:PMAX <NRf+> [:SOURce]:OPP:PMAX?	
Function Description	Set or query OPP maximum power in measurement mode.	
Parameter	MIN~MAX	
Instruction	Default unit is W.	
Return format	<NR2>	
Example	Sent	OPP:PMAX 50 //Set the maximum power to 50W.
	Query	OPP:PMAX?

		//Query the maximum power.
	Return	50.0

:[:SOURce]:OPP:PMIN <NRf+>

Format	[:SOURce]:OPP:PMIN <NRf+> [:SOURce]:OPP:PMIN?	
Function Description	Set or query OPP minimum power in measurement mode.	
Parameter	MIN~MAX	
Instruction	Default unit is W.	
Return format	<NR2>	
Example	Sent	OPP:PMIN 50 //Set the minimum power to 50W.
	Query	OPP:PMIN? //Query the minimum power.
	Return	50.0

5. Measurement Command

This chapter mainly introduces the following commands:

- [MEASure\[:SCALar\]:VOLTage\[:DC\]?](#)
- [MEASure\[:SCALar\]:CURRent\[:DC\]?](#)
- [MEASure\[:SCALar\]:POWer\[:DC\]?](#)
- [MEASure\[:SCALar\]:ALL\[:DC\]:INFO?](#)

MEASure[:SCALar]:VOLTage[:DC]?

Format	MEASure[:SCALar]:VOLTage[:DC]?	
Function Description	Query the average voltage value.	
Parameter	None.	
Instruction	None.	
Return format	<NR2>	
Example	Sent	MEAS:VOLT? //Query the average voltage value.
	Return	3.0

MEASure[:SCALar]:CURRent[:DC]?

Format	MEASure[:SCALar]:CURRent[:DC]?	
Function Description	Query the average current value.	
Parameter	None.	
Instruction	None.	
Return format	<NR2>	
Example	Sent	MEAS:CURR? //Query the average current value.
	Return	3.0

MEASure[:SCALar]:POWer[:DC]?

Format	MEASure[:SCALar]:POWer[:DC]?	
Function Description	Query the average power value.	
Parameter	None.	

Instruction	None.	
Return format	<NR2>	
Example	Sent	MEAS:POWer? //Query the average current value.
	Return	3.0

MEASure[:SCALar]:ALL[:DC]:INFO?

Format	MEASure[:SCALar]:ALL[:DC]:INFO?	
Function Description	Query the fault status of OVP, OCP, and OPP.	
Parameter	None.	
Instruction	None.	
Return format	<NR2>	
Example	Sent	MEAS:ALL:INFO? //Query the fault status.
	Return	9.496,20.000,189.918,OFF,OFF,OFF

6. Parallel Command

This chapter mainly introduces the following commands:

- [:PARallel\[:STATe\]?](#)
- [:PARallel:Identity?](#)
- [:PARallel:NUMber?](#)

:PARallel[:STATE]?

Format	:PARallel[:STATE]?	
Function Description	Query the parallel operation enable status.	
Parameter	None.	
Instruction	None.	
Return format	<NR2>	
Example	Sent	:PARallel[:STATE]? //Query the parallel operation enable status.
	Return	<NR2>

:PARallel:Identity?

Format	:PARallel:Identity?	
Function Description	Query whether it is a slave or master in parallel mode.	
Parameter	None.	
Instruction	None.	
Return format	<NR2>	
Example	Sent	:PARallel:Identity? //Query the parallel mode.
	Return	Master

:PARallel:NUMber?

Format	:PARallel:NUMber?	
Function Description	Query the number of units in parallel mode.	

Parameter	None.	
Instruction	None.	
Return format	<NR2>	
Example	Sent	:PARallel:NUMber? //Query the number of units.
	Return	2