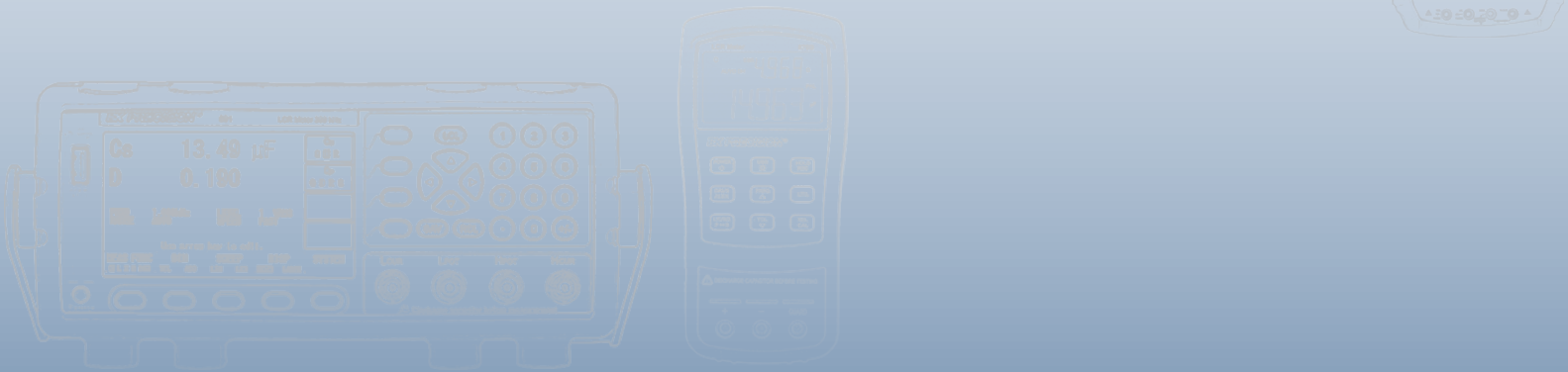


Programming Manual

HMR Series

ATE System DC Power Supplies



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About this Manual

This manual describes how to use the Standard Commands for Programming Instruments (SCPI) to communicate with the HMR Series.

1.1 Intended Audience

This document is designed for instrument programmers tasked with creating SCPI-based programs for the HMR Series.

1.2 Related Documents

Refer to the following documents for more information:

- HMR Series User's Manual. This manual describes the operation of the HMR Series.
- Standard Commands for Programming Instruments (SCPI), Volume1-4, Version 1990.0 May 1999, SCPI Consortium, 2515 Camino del Rio South, Suite 340, San Diego, Ca 92108.
- IEEE Std 488.2-1992, The Institute of Electrical and Electronics Engineers, Inc., 345 East 47th Street, New York, NY 10017-2394, USA (ISBN 1-55937-238-9)

Syntax Convention

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2.1 Introduction

SCPI (Standard Commands for Programmable Instruments) serves as a universal programming language designed for electronic test and measurement instruments. It is grounded in the IEEE 488.1 and IEEE 488.2 standards. The HMR series aligns with the SCPI language and incorporates the IEEE 488.2 STD status structure.

The commands can be issued over VISA or socket using TCP port 5025.

2.1.1 Types of SCPI Messages

In order to program an HMR instrument, it is necessary to create a program message. This message comprises one or more appropriately formatted SCPI commands transmitted from the controller to the HMR instrument. The program message, which can be sent at any time, requests the instrument to execute a specific action or provide data or status information. These requests are also referred to as queries.

Upon receiving a query, the HMR instrument responds by sending a response message back to the controller. This response message contains data formatted in a specific SCPI format.

The following documents provide more information about SCPI programming:

- Standard Commands for Programming Instruments (SCPI), Volume1-4, Version 1990.0 May 1999, SCPI Consortium, 2515 Camino del Rio South, Suite 340, San Diego, Ca 92108.
- IEEE Std 488.2-1992, The Institute of Electrical and Electronics Engineers, Inc., 345 East 47th Street, New York, NY 10017-2394, USA (ISBN 1-55937-238-9)

2.2 Types of SCPI Commands

Two types of SCPI commands are available: common commands, described below, and device-specific subsystem commands.

2.2.1 Common Commands

Common SCPI commands, as defined by IEEE 488.2, are responsible for controlling and managing generic system functions like reset, self-test, configuration storage, and device identification. Typically, common commands start with an asterisk (*), have a length of four to five characters, and may involve one or more parameters. The command keyword is separated from the initial parameter by a space. Multiple commands can be separated using a semicolon (;), as demonstrated below:

```
*RST; *CLS; *ESE 32; *OPC?
```

Refer to [Table 2.1](#) for a summary of these common SCPI commands applicable to programming the HMR series. For a detailed description of these commands, consult [Chapter 2.2.1](#).

Command	Description
*CLS	Clears all Event Registers summarized in the status byte.
*ESE?	Returns an <NR1>, representing the value of the Standard Event Status Enable Register. Reading the value of the register will result in its clearance.
*ESR?	Returns an <NR1>, representing the value of the Standard Event Status Register. Reading the value of the register will result in its clearance.
*IDN?	Returns the unique identification string of the instrument.
*OPC?	Returns a "+1", when all pending selected device operations have been finished.
*RST	The Reset command performs a device reset. The Reset command is the third level of reset in a three-level reset strategy.
*SRE?	The Service Request Enable query allows the programmer to determine the current contents of the Service Request Enable Register.
*STB?	Returns the current binary value of the Status Byte Register.

Table 2.1 Common SCPI Commands

2.3 Syntax of Program Messages

A program message consist of one or more properly formatted SCPI commands, a parameter (if necessary), and a terminator sent from the controller to the HMR instrument to request some action or to query the instrument for a response.

Figure 2.1 shows the syntax of a program message:

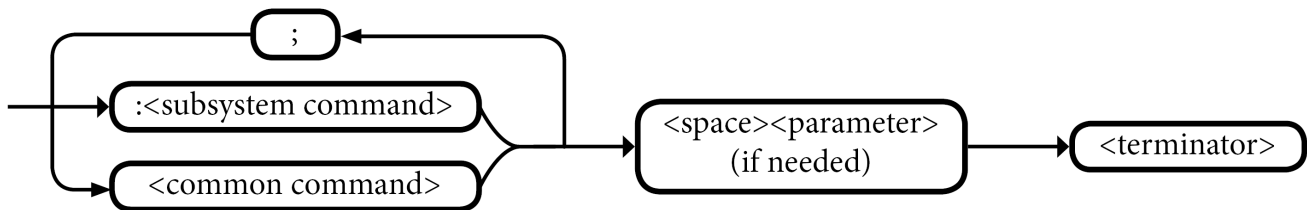


Figure 2.1 Syntax of Program Messages

A semicolon (;) is used to link commands from different groups.

SCPI Data Types

SCPI defines various data types for use in program messages and response messages.

The HMR series uses the following subset of SCPI data types:

- Character
- <NR1>
- <NR2>
- <NRf>
- <Boolean>

This section summarizes these data types. Refer to the SCPI standards document for more information about these data types.

3.1 <CRD> Character Data Types

If a command parameter takes a character data type, a specific number of settings are allowed for the parameter.

Description: Example

In the command DISPlay:PAGE the user can specify one of the following character data types:

{ MEAS |MANUMEM |MANUCOMM |PROGMEM1 |PROGMEM2 |PROGMEM3 |PROGCOMM |SYS-
TENV |SYSTCOM |SYSTTOOL |INTF |EXTF }

Character data types have the following characteristics:

- Can be expressed in either the short or long form, while response messages return them exclusively in the short form.
- Are case insensitive in program messages but in response messages are standardized to uppercase.
- Must have a specific length.

3.2 <NR1> Value Data Type

The data type <NR1> is utilized to indicate zero, positive, and negative integer values, including optional signs.

The following values are examples of the <NR1> data types:

0 100 -10

3.3 <NR2> Value Data Type

The data type <NR2> is utilized to indicate zero, positive, and positive and negative decimal values, including optional signs and decimal points. The difference between <NR1> and <NR2> is the explicit decimal point.

The following values are examples of the <NR2> data types:

200.50 100.0 0.0

NOTICE

0 is a special case and redundant decimal points are ignored.

3.4 <NRf> Value Data Type

The <NRf> data type is employed to define floating-point values. These values encompass digits with an implied decimal point, an explicit decimal point, or an explicit decimal point along with an exponent.

The following values are examples of the <NRf> data types:

200 15.000e-3 0.015

3.5 Boolean Data Type

A Boolean data type for a parameter and response represents a single binary condition that is either True or False. Boolean values are defined as follows:

- **0 or OFF:** Indicates that the condition is False.
- **1 or ON:** Indicates that the condition is True.

NOTICE

The characters OFF and ON are not case sensitive.

About Commands & Queries

This section lists and describes the remote control commands and queries recognized by the instrument. All commands and queries can be executed in either local or remote state.

The description, command syntax, query syntax, example and respond can be found in a section. The commands are given in both long and short form. All examples are shown in short form. Queries perform actions such as obtaining information, and are recognized by the question mark (?) following the header.

4.1 How They are Listed

The commands are listed by subsystem and alphabetical order according to their short form.

4.2 How They are Described

In the descriptions themselves, a brief explanation of the function performed is given. This is followed by a presentation of the formal syntax, with the header given in Upper-and-Lower-Case characters and the short form derived from it in ALL UPPER-CASE characters. Where applicable, the syntax of the query is given with the format of its response.

4.3 When can they be used?

The commands and queries listed here can be used for the HVL seires.

4.4 Command Notation

The following notation is used in the commands:

< > Angular brackets enclose words that are used as placeholders, of which there are two types: the header path and the data parameter of a command.

:= A colon followed by an equals sign separates a placeholder from the description of the type and range of values that may be used in a command instead of the placeholder.

{ } Braces enclose a list of choices, one of which one must be made.

[] Square brackets enclose optional items.

... An ellipsis indicates that the items both to its left and right may be repeated a number of times.

IEEE488.2 Common Commands

5.1 *CLS

Description: Clears status data. Clears the following registers without affecting the corresponding Enable Registers: Standard Event Status Register (ESR), Operation Status Event Register, Questionable Status Event Register, and Status Byte Register (STB). Also clears the Error Queue.

Syntax:

Command *CLS

Parameters: None

Example:

Command *CLS

5.2 *ESE

Description: Sets bits in the standard event status enable register.

Syntax:

Command *ESE <NR1>

Query *ESE?

Parameters: <NR1> : 0 to 255

Example:

Command *ESE 32

Query *ESE?

5.3 *ESR?

Description: Reads and clears the standard event status register.

Syntax:

Query *ESR?

Parameters: None

Example:

Query *ESR?

5.4 *IDN?

Description: Identifies the instrument. The power supply returns a string which contains the manufacturer name, the model, the serial number and the firmware level.

Syntax:

Query *IDN?

Parameters: None

Example:

Query *IDN?

NOTICE

Returns: B&K Precision, HMRxxxx, XXXXXXXXX, 0.90-1.00

5.5 *OPC

Description: Generates the OPC message in the standard event status register when all pending overlapped operations have been completed.

Syntax:

Command *OPC

Query *OPC?

Parameters: None

Example:

Command *OPC

Query *OPC?

5.6 *RST

Description: Resets power supply to the power on default state. After sending *RST, output voltage, current, and power are set to 0. OVP and OCP are set to rated value +10%.

Syntax:

Command *RST

Parameters: None

Example:

Command *RST

5.7 *SRE

Description: Sets bits in the service request enable register.

Syntax:

Command *SRE <NR1>

Query *SRE?

Parameters: <NR1> : 0 to 255

Example:

Command *SRE 255

Query *SRE?

5.8 *STB?

Description: Reads the value of the instrument status byte. The register is cleared only when the registers feeding it are cleared.

Syntax:

Query *STB?

Parameters: None

Example:

Query *STB?

5.9 *TRG

Description: Generates a trigger when the trigger system has BUS selected as its source.

Syntax:

Command *TRG

Parameters: None

Example:

Command *TRG

5.10 *TST?

Description: Initiates a self-test and returns 0 for pass or 1 for fail.

Syntax:

Query *TST?

Parameters: None

Example:

Query *TST?

5.11 *WAI

Description: Configures the instrument's output buffer to wait for all pending operations to complete before executing any additional commands.

Syntax:

Command *WAI

Parameters: None

Example:

Command *WAI

VOLTage Subsystem

This section describes commands specifically for configuring the instrument's behavior in Constant Voltage (CV) mode, including protection, slew rates, and static levels.

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6.1 Standard Voltage Commands

6.1.1 [SOURce:]VOLTage

Description: Sets the output voltage value.

Syntax:

Command [SOURce:]VOLTage <NRf> |MIN |MAX

Query [SOURce:]VOLTage?

Parameters: <NRf> : 0 to Rated Voltage

Example:

Command VOLT 60

Query VOLT?

6.1.2 [SOURce:]VOLTage:TRIGgered

Description: Sets the voltage value to be output after a trigger event occurs.

Syntax:

Command [SOURce:]VOLTage:TRIGgered <NRf> |MIN |MAX

Query [SOURce:]VOLTage:TRIGgered?

Parameters: <NRf> : 0 to Rated Voltage

Example:

Command VOLT:TRIG 120

Query VOLT:TRIG?

6.1.3 [SOURce:]VOLTage:MODE

Description: Sets the voltage output mode to Fixed or Step.

Syntax:

Command [SOURce:]VOLTage:MODE <CRD>

Query [SOURce:]VOLTage:MODE?

Parameters: <CRD> : FIXed |STEP

Example:

Command VOLT:MODE FIX

Query VOLT:MODE?

6.1.4 [SOURce:]VOLTage:PROTection

Description: Sets the over voltage protection (OVP) level.

Syntax:

Command [SOURce:]VOLTage:PROTection <NRf> |MIN |MAX

Query [SOURce:]VOLTage:PROTection?

Parameters: <NRf> : 0 to 110% of Rated Voltage

Example:

Command VOLT:PROT 300

Query VOLT:PROT?

6.1.5 [SOURce:]VOLTage:SLEW:RATE

Description: Sets the slew rate for programmed changes in the output voltage level.

Syntax:

Command [SOURce:]VOLTage:SLEW:RATE <NRf> |MIN |MAX

Query [SOURce:]VOLTage:SLEW:RATE?

Parameters: <NRf> : Value in V/ms (Model dependent)

Example:

Command VOLT:SLEW:RATE 50

Query VOLT:SLEW:RATE?

6.2 Static Voltage Commands

6.2.1 VOLTage:STATic:L1

Description: Sets the static voltage level 1.

Syntax:

Command VOLTage:STATic:L1 <NRf>

Query VOLTage:STATic:L1?

Parameters: <NRf> : Numeric voltage value

Example:

Command VOLT:STAT:L1 1

Query VOLT:STAT:L1?

6.2.2 VOLTage:STATic:L2

Description: Sets the static voltage level 2.

Syntax:

Command VOLTage:STATic:L2 <NRf>

Query VOLTage:STATic:L2?

Parameters: <NRf> : Numeric voltage value

Example:

Command VOLT:STAT:L2 2

Query VOLT:STAT:L2?

6.2.3 VOLTage:STATic:TYPE

Description: Sets the execution category (related to power supply type) in constant voltage mode.

Syntax:

Command VOLTage:STATic:TYPE <CRD> |<NR1>

Query VOLTage:STATic:TYPE?

Parameters: <NR1> : CURRent |0 (Current Type PSU), VOLTage |1 (Voltage Type PSU)

Example:

Command VOLT:STAT:TYPE 0

Query VOLT:STAT:TYPE?

6.2.4 VOLTage:STATic:RESponse

Description: Sets the response speed in constant voltage mode.

Syntax:

Command VOLTage:STATic:RESponse <CRD> |<NR1>

Query VOLTage:STATic:RESponse?

Parameters: <NR1> : FAST |0, NORMAL |1, SLOW |2

Example:

Command VOLT:STAT:RES 0

Query VOLT:STAT:RES?

CURRent Subsystem

This chapter describes commands for controlling the instrument's Constant Current (CC) related operation modes.

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7.1 Current Commands

7.1.1 [SOURce:]CURRent

Description: Sets the output current value.

Syntax:

Command [SOURce:]CURRent[:LEVel][:IMMediate][:AMPLitude] <NRf+> |MIN |MAX

Query [SOURce:]CURRent?

Parameters: <NRf+> : 0 to Rated Current

Example:

Command CURR 188

Query CURR?

7.1.2 [SOURce:]CURRent:TRIGgered

Description: Sets the current value to be output after a trigger event occurs.

Syntax:

Command [SOURce:]CURRent[:LEVel]:TRIGgered <NRf+> |MIN |MAX

Query [SOURce:]CURRent:TRIGgered?

Parameters: <NRf+> : 0 to Rated Current

Example:

Command CURR:TRIG 120

Query CURR:TRIG?

7.1.3 [SOURce:]CURRent:MODE

Description: Sets the current output mode. When set to FIXed, the output current varies immediately. When set to STEP, the output current varies after a trigger.

Syntax:

Command [SOURce:]CURRent:MODE FIXed |STEP

Query [SOURce:]CURRent:MODE?

Parameters: <CRD> : FIXed |STEP

Example:

Command CURR:MODE STEP

Query CURR:MODE?

7.1.4 [SOURce:]CURRent:PROTection:DELaY

Description: Sets the OCP delay time. The OCP will be tripped when the over current exceeds the setting time.

Syntax:

Command [SOURce:]CURRent:PROTection:DELaY <NRf+>

Query [SOURce:]CURRent:PROTection:DELaY?

Parameters: <NRf+> : 0.05 to 65.535 Seconds

Example:

Command CURR:PROT:DEL 50

Query CURR:PROT:DEL?

7.1.5 [SOURce:]CURRent:PROTection:LEVel

Description: Sets the over current protection (OCP) value.

Syntax:

Command [SOURce:]CURRent:PROTection:LEVel <NRf+> |MIN |MAX

Query [SOURce:]CURRent:PROTection:LEVel?

Parameters: <NRf+> : 0% to 110% of Rated Current

Example:

Command CURR:PROT:LEV 200

Query CURR:PROT:LEV?

7.1.6 [SOURce:]CURRent:PROTection:STATe

Description: Controls whether the output protection circuit is enabled.

Syntax:

Command [SOURce:]CURRent:PROTection:STATe <Bool> |ON |OFF

Query [SOURce:]CURRent:PROTection:STATe?

Parameters: <Bool> : 0 (OFF) |1 (ON)

Example:

Command CURR:PROT:STAT 1

Query CURR:PROT:STAT?

7.1.7 [SOURce:]CURRent:SLEW:RATE

Description: Sets the slew rate for all programmed changes in the output current level.

Syntax:

Command [SOURce:]CURRent:SLEW:RATE <NR1> [MIN |MAX

Query [SOURce:]CURRent:SLEW:RATE?

Parameters: <NR1> : Value in A/ms (Model dependent)

Example:

Command CURR:SLEW:RATE 50

Query CURR:SLEW:RATE?

POWer Subsystem

This chapter describes commands for controlling the instrument's Constant Power (CP) related operation modes.

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8.1 Power Commands

8.1.1 [SOURce:]POWer

Description: Sets the output power value.

Syntax:

Command [SOURce:]POWer[:LEVel][:IMMediate][:AMPLitude] <NRf+> |MIN |MAX

Query [SOURce:]POWer?

Parameters: <NRf+> : 0 to Rated Power

Example:

Command POW 10000

Query POW?

8.1.2 [SOURce:]POWer:TRIGgered

Description: Sets the output power value after a trigger event occurs.

Syntax:

Command [SOURce:]POWer[:LEVel]:TRIGger <NRf+> |MIN |MAX

Query [SOURce:]POWer:TRIGgered?

Parameters: <NRf+> : 0 to Rated Power

Example:

Command POW:TRIG 12000

Query POW:TRIG?

8.1.3 [SOURce:]POWer:PROTection:LEVel

Description: Sets the over power protection (OPP) value.

Syntax:

Command [SOURce:]POWer:PROTection:LEVel <NRf+> |MIN |MAX

Query [SOURce:]POWer:PROTection:LEVel?

Parameters: <NRf+> : 10% to 110% of Rated Power

Example:

Command POW:PROT:LEV 10000

Query POW:PROT:LEV?

8.1.4 [SOURce:]POWer:SLEW:RATE

Description: Sets the slew rate for all programmed changes in the output power level.

Syntax:

Command [SOURce:]POWer:SLEW:RATE <NR1> [MIN |MAX

Query [SOURce:]POWer:SLEW:RATE?

Parameters: <NR1> : Value in W/ms (Model dependent)

Example:

Command POW:SLEW:RATE 80

Query POW:SLEW:RATE?

RESistance Subsystem

This chapter describes commands for configuring the internal resistance simulation of the instrument.

9.1	Internal Resistance Commands	33
9.1.1	[SOURce:]RESistance	33

9.1 Internal Resistance Commands

9.1.1 [SOURce:]RESistance

Description: Sets the internal resistance value.

Syntax:

Command [SOURce:]RESistance <NRf> |MIN |MAX

Query [SOURce:]RESistance?

Parameters: <NRf> : Value in Ohms (See table below for specific model ranges)

Example:

Command RES 1.05

Query RES?

Power	Model	Internal Resistance Range
10 kW	HMR80360	0 ~ 0.2222 Ω
10 kW	HMR65046	0 ~ 14.130 Ω
10 kW	HMR130023	0 ~ 56.521 Ω
18 kW	HMR500108	0 ~ 4.6296 Ω
18 kW	HMR195027	0 ~ 72.222 Ω

Table 9.1 Internal Resistance Setting Ranges

Output Time Command

10.1 Time Command

10.1.1 [SOURce:]TIME

Description: Sets the output timer. Output will turn off after this duration. Set to 0 for continuous operation.

Syntax:

Command [SOURce:]TIME <NRf> |MIN |MAX

Query [SOURce:]TIME?

Parameters: <NRf> : 0 to 99999.9 s

Example:

Command TIME 30

Query TIME?

OUTPut Subsystem

11.1 Output Commands

11.1.1 OUTPut[:STATe]

Description: Enables or disables the power supply output.

Syntax:

Command OUTPut[:STATe] <Bool> |ON |OFF

Query OUTPut[:STATe]?

Parameters: <Bool> : 0 (OFF) |1 (ON)

Example:

Command OUTP ON

Query OUTP?

11.1.2 OUTPut:PON

Description: Determines the output state after power-up.

Syntax:

Command OUTPut:PON <CRD>

Query OUTPut:PON?

Parameters: <CRD> : OFF |LAST

Example:

Command OUTP:PON OFF

Query OUTP:PON?

11.1.3 OUTPut:PRIOrity

Description: Sets the priority of operating mode. This command is not acceptable when output is ON.

Syntax:

Command OUTPut:PRIOrity <CRD>

Query OUTPut:PRIOrity?

Parameters: <CRD> : CV |CC |CP

Example:

Command `OUTP:PRIO CC`

Query `OUTP:PRIO?`

11.1.4 OUTPut:PROTection:CLEar

Description: Clears latched protection signals (OVP, OCP, OTP, etc.) that have disabled the output. The fault condition must be removed before the latch can be cleared.

Syntax:

Command `OUTPut:PROTection:CLEar`

Parameters: None

Example:

Command `OUTP:PROT:CLE`

11.1.5 OUTPut:RAMP:OFF

Description: Sets the time for the output to ramp down to 0 after the OUTPut OFF command is executed. Related to output priority (e.g., Voltage ramp down if Priority is CV).

Syntax:

Command `OUTPut:RAMP:OFF <NRf>`

Query `OUTPut:RAMP:OFF?`

Parameters: <NRf> : 0 to 99.99 s

Example:

Command `OUTP:RAMP:OFF 10`

Query `OUTP:RAMP:OFF?`

11.1.6 OUTPut:RAMP:ON

Description: Sets the time for the output to ramp up to the set value after the OUTPut ON command is executed.

Syntax:

Command `OUTPut:RAMP:ON <NRf>`

Query `OUTPut:RAMP:ON?`

Parameters: <NRf> : 0 to 99.99 s

Example:

Command OUTP:RAMP:ON 5

Query OUTP:RAMP:ON?

FUNCTION:SEQUence Subsystem

12.1 Sequence Commands

12.1.1 FUNCTION:SEQUence:STEP

Description: Specifies the step number for editing.

Syntax:

Command FUNCTION:SEQUence:STEP <NR1>

Query FUNCTION:SEQUence:STEP?

Parameters: <NR1> : 1 to 500

Example:

Command FUNC:SEQU:STEP 100

Query FUNC:SEQU:STEP?

12.1.2 FUNCTION:SEQUence:EDIT

Description: Specifies the sequence number and accesses edit mode.

Syntax:

Command FUNCTION:SEQUence:EDIT <NR1>

Query FUNCTION:SEQUence:EDIT?

Parameters: <NR1> : 1 to 16

Example:

Command FUNC:SEQU:EDIT 1

Query FUNC:SEQU:EDIT?

12.1.3 FUNCTION:SEQUence:VOLTage

Description: Sets the voltage for the specified step.

Syntax:

Command FUNCTION:SEQUence:VOLTage <NRf>

Query FUNCTION:SEQUence:VOLTage?

Parameters: <NRf> : 0 to 105% of Rated Voltage

Example:

Command `FUNC:SEQU:VOLT 80`

Query `FUNC:SEQU:VOLT?`

12.1.4 FUNCTION:SEQUence:CURRent

Description: Sets the current for the specified step.

Syntax:

Command `FUNCTION:SEQUence:CURRent <NRf>`

Query `FUNCTION:SEQUence:CURRent?`

Parameters: <NRf> : 0 to 105% of Rated Current

Example:

Command `FUNC:SEQU:CURR 100`

Query `FUNC:SEQU:CURR?`

12.1.5 FUNCTION:SEQUence:POWer

Description: Sets the output power for the specified step.

Syntax:

Command `FUNCTION:SEQUence:POWer <NRf>`

Query `FUNCTION:SEQUence:POWer?`

Parameters: <NRf> : 0 to 102% of Rated Power

Example:

Command `FUNC:SEQU:POW 5000`

Query `FUNC:SEQU:POW?`

12.1.6 FUNCTION:SEQUence:TIME

Description: Sets the duration for the specified step.

Syntax:

Command `FUNCTION:SEQUence:TIME <NRf>`

Query `FUNCTION:SEQUence:TIME?`

Parameters: <NRf> : 0.001 to 999999.999 s

Example:

Command FUNC:SEQU:TIME 0.5
Query FUNC:SEQU:TIME?

12.1.7 FUNCTION:SEQUence:LOOP

Description: Sets the loop number (repetitions) for the specified Sequence.

Syntax:

Command FUNCTION:SEQUence:LOOP <NR1>
Query FUNCTION:SEQUence:LOOP?

Parameters: <NR1> : 0 to 999999999

Example:

Command FUNC:SEQU:LOOP 50
Query FUNC:SEQU:LOOP?

12.1.8 FUNCTION:SEQUence:END

Description: Sets the end STEP of the specified Sequence.

Syntax:

Command FUNCTION:SEQUence:END <NR1>
Query FUNCTION:SEQUence:END?

Parameters: <NR1> : 1 to 500

Example:

Command FUNC:SEQU:END 50
Query FUNC:SEQU:END?

12.1.9 FUNCTION:SEQUence:COMPLete

Description: Completes the editing process and exits edit mode.

Syntax:

Command FUNCTION:SEQUence:COMPLete
Query FUNCTION:SEQUence:COMPLete?

Parameters: <Return> : PROCESSING | DONE

Example:

Command FUNC:SEQU:COMP
Query FUNC:SEQU:COMP?

12.1.10 FUNCTION:SEQUence:NOW?

Description: Queries the status of the running Sequence.

Syntax:

Query `FUNCTION:SEQUence:NOW?`

Parameters: <Return> : <sequence>, <step>, <loop>

Example:

Query `FUNC:SEQU:NOW?`

12.1.11 FUNCTION:SEQUence:LIST

Description: Specifies the execution order when chaining multiple Sequences.

Syntax:

Command `FUNCTION:SEQUence:LIST<NR1> <seq#>`

Query `FUNCTION:SEQUence:LIST<NR1>?`

Parameters: <NR1> : List Index (1 to 16)

<seq#> : Sequence Number (0 to 16)

Example:

Command `FUNC:SEQU:LIST2 3`

Query `FUNC:SEQU:LIST2?`

12.1.12 FUNCTION:SEQUence[:STATe]

Description: Starts, stops, or pauses the sequence execution.

Syntax:

Command `FUNCTION:SEQUence[:STATe] <CRD>`

Query `FUNCTION:SEQUence[:STATe]?`

Parameters: <CRD> : RUN | STOP | PAUSE

Example:

Command `FUNC:SEQU RUN`

Query `FUNC:SEQU?`

Measurement Subsystem

13.1 Measurement Commands

13.1.1 FETCH?

Description: Query the actual output voltage, current and power. The query performs a measurement and returns the value of DC output current in Amperes and DC output voltage in Volts and output power in Watts.

Syntax:

Query `FETCH:ALLCurrent?`

Parameters: None

Example:

Query `:FETC:ALLC?`

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

Description: Performs a new measurement and returns the current reading.

Syntax:

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

Parameters: None

Example:

Query `:MEAS:CURR?`

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

Description: Performs a new measurement and returns the power reading.

Syntax:

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

Parameters: None

Example:

Query `:MEAS:POW?`

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

Description: Performs a new measurement and returns the voltage reading.

Syntax:

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

Parameters: None

Example:

Query :MEAS:VOLT?

MEMory Subsystem

14.1 Memory Commands

14.1.1 MEMory:VOLTage<index>

Description: Sets the voltage value to specified memory location (1-3).

Syntax:

Command MEMory:VOLTage<index> <NRf>

Query MEMory:VOLTage<index>?

Parameters: <index> : 1 to 3

<NRf> : 0 to 105% of Rated Voltage

Example:

Command MEM:VOLT2 60

Query MEM:VOLT2?

14.1.2 MEMory:CURREnt<index>

Description: Sets the current value to specified memory location (1-3).

Syntax:

Command MEMory:CURREnt<index> <NRf>

Query MEMory:CURREnt<index>?

Parameters: <index> : 1 to 3

<NRf> : 0 to 105% of Rated Current

Example:

Command MEM:CURRE2 10

Query MEM:CURRE2?

14.1.3 MEMory:POWEr<index>

Description: Sets the power value to specified memory location (1-3).

Syntax:

Command MEMory:POWer<index> <NRf>

Query MEMory:POWer<index>?

Parameters: <index> : 1 to 3

<NRf> : 0 to 102% of Rated Power

Example:

Command MEM:POW2 500

Query MEM:POW2?

14.1.4 MEMory:TIME<index>

Description: Sets the output time to specified memory location (1-3).

Syntax:

Command MEMory:TIME<index> <NRf>

Query MEMory:TIME<index>?

Parameters: <index> : 1 to 3

<NRf> : 0.0 to 99999.9

Example:

Command MEM:TIME2 60

Query MEM:TIME2?

14.1.5 MEMory:RECall

Description: Recalls the settings (V, I, P, Time) from the specified memory location.

Syntax:

Command MEMory:RECall <NR1>

Query MEMory:RECall?

Parameters: <NR1> : 1 to 3

Example:

Command MEM:REC 1

Query MEM:REC?

14.1.6 MEMory:CLS

Description: Clears all memory locations used for storing and recalling power supply settings.

Syntax:

Command MEMory:CLS

Parameters: None

Example:

Command MEM:CLS

Parallel Commands

15.1 Parallel System Commands

15.1.1 SYSTem:MS:MODE

Description: Sets the unit to Independent, Master, or Slave mode.

Syntax:

Command SYSTem:MS:MODE <CRD>

Query SYSTem:MS:MODE?

Parameters: <CRD> : INDEpendent | MASTer | SLAVe

Example:

Command SYST:MS:MODE MAST

Query SYST:MS:MODE?

15.1.2 SYSTem:MS:NUMber?

Description: Queries the number of power supplies connected in parallel.

Syntax:

Query SYSTem:MS:NUMber?

Parameters: None

Example:

Query SYST:MS:NUM?

SYSTem Subsystem

16.1 System Commands

16.1.1 SYSTem:BEEP

Description: Sets the beep sound to on or off when a key or knob is pressed.

Syntax:

Command SYSTem:BEEP <Bool>

Query SYSTem:BEEP?

Parameters: <Bool> : 0 (OFF) | 1 (ON)

Example:

Command SYST:BEEP 1

Query SYST:BEEP?

16.1.2 SYSTem:BUZZer

Description: Sets the alarm buzzer to on or off.

Syntax:

Command SYSTem:BUZZer <Bool>

Query SYSTem:BUZZer?

Parameters: <Bool> : 0 (OFF) | 1 (ON)

Example:

Command SYST:BUZZ 0

Query SYST:BUZZ?

16.1.3 SYSTem:DATE

Description: Sets the date of the power supply.

Syntax:

Command SYSTem:DATE "YYYY/MM/DD"

Query SYSTem:DATE?

Parameters: <String> : "YYYY/MM/DD"

Example:

Command SYST:DATE "2025/06/15"

Query SYST:DATE?

16.1.4 SYSTem:ERRor?

Description: Queries the error queue for error codes and messages.

Syntax:

Query SYSTem:ERRor?

Parameters: None

Example:

Query SYST:ERR?

16.1.5 SYSTem:LOCal

Description: Sets the power supply to local mode.

Syntax:

Command SYSTem:LOCal

Parameters: None

Example:

Command SYST:LOC

16.1.6 SYSTem:LOG:LAST?

Description: Queries the last event in logged data.

Syntax:

Query SYSTem:LOG:LAST?

Parameters: None

Example:

Query SYST:LOG:LAST?

16.1.7 SYSTem:NTP

Description: Enables or disables the Network Time Protocol (NTP).

Syntax:

Command SYSTem:NTP <Bool>

Query SYSTem:NTP?

Parameters: <Bool> : 0 (OFF) | 1 (ON)

Example:

Command SYST:NTP 1

Query SYST:NTP?

16.1.8 SYSTem:NTP:SERVer

Description: Sets the IP address of the NTP server.

Syntax:

Command SYSTem:NTP:SERVer <String>

Query SYSTem:NTP:SERVer?

Parameters: <String> : "IP Address"

Example:

Command SYST:NTP:SERV "129.6.15.30"

Query SYST:NTP:SERV?

16.1.9 SYSTem:TIME

Description: Sets the system time.

Syntax:

Command SYSTem:TIME "HH:MM:SS"

Query SYSTem:TIME?

Parameters: <String> : "HH:MM:SS"

Example:

Command SYST:TIME "15:30:00"

Query SYST:TIME?

16.1.10 SYSTem:TOUCH

Description: Enables or disables the touchscreen function.

Syntax:

Command SYSTem:TOUCh <Bool>

Query SYSTem:TOUCh?

Parameters: <Bool> : 0 (OFF) | 1 (ON)

Example:

Command SYST:TOUC 1

Query SYST:TOUC?

16.1.11 SYSTem:REMOte

Description: Sets the power supply to remote mode.

Syntax:

Command SYSTem:REMOte

Parameters: None

Example:

Command SYST:REM

16.1.12 SYSTem:RWLock

Description: Sets the unit to remote mode and locks the Local key.

Syntax:

Command SYSTem:RWLock

Parameters: None

Example:

Command SYST:RWL

16.1.13 SYSTem:VERSion?

Description: Queries the SCPI version.

Syntax:

Query SYSTem:VERSion?

Parameters: None

Example:

Query SYST:VERS?

16.1.14 SYSTem:ZONE

Description: Sets the time zone.

Syntax:

Command SYSTem:ZONE <CRD>

Query SYSTem:ZONE?

Parameters: <CRD> : UTC $\pm$ HH:MM (e.g., UTC+08:00)

Example:

Command SYST:ZONE UTC+08:00

Query SYST:ZONE?

LAN/LXI Commands

17.1 LAN/LXI Commands

17.1.1 SYSTem:COMMunicate:RLState

Description: Sets or queries the control mode (Local/Remote/RWLock).

Syntax:

Command SYSTem:COMMunicate:RLState <CRD>

Query SYSTem:COMMunicate:RLState?

Parameters: <CRD> : LOC | REM | RWL

Example:

Command SYST:COMM:RLST REM

Query SYST:COMM:RLST?

17.1.2 SYSTem:COMMunicate:TCPip:CONTRol?

Description: Queries the SCPI-RAW Port number.

Syntax:

Query SYSTem:COMMunicate:TCPip:CONTRol?

Parameters: None

Example:

Query SYST:COMM:TCP:CONT?

17.1.3 LXI:IDENtify

Description: Sets the LAN indicator blinking to identify the unit.

Syntax:

Command LXI:IDENtify[:STATe] <Bool>

Query LXI:IDENtify[:STATe]?

Parameters: <Bool> : 0 (OFF) | 1 (ON)

Example:

Command LXI:IDEN 1

Query LXI:IDEN?

STATus Subsystem

18.1 Status Commands

18.1.1 STATus:OPERation:CONDition?

Description: Returns the value of the Operation Condition register (Real-time).

Syntax:

Query STATus:OPERation:CONDition?

Parameters: None

Example:

Query STAT:OPER:COND?

18.1.2 STATus:OPERation:ENABLE

Description: Sets the mask for enabling specific bits in the Operation Event register.

Syntax:

Command STATus:OPERation:ENABLE <NR1>

Query STATus:OPERation:ENABLE?

Parameters: <NR1> : 0 to 65535

Example:

Command STAT:OPER:ENAB 32

Query STAT:OPER:ENAB?

18.1.3 STATus:OPERation:EVENT?

Description: Queries the Operation Event register (Latched). Reading clears it.

Syntax:

Query STATus:OPERation:EVENT?

Parameters: None

Example:

Query STAT:OPER:EVEN?

18.1.4 STATus:QUEStionable:CONDition?

Description: Returns the value of the Questionable Condition register (Real-time).

Syntax:

Query STATus:QUEStionable:CONDition?

Parameters: None

Example:

Query STAT:QUES:COND?

18.1.5 STATus:QUEStionable:ENABLE

Description: Sets the mask for enabling specific bits in the Questionable Event register.

Syntax:

Command STATus:QUEStionable:ENABLE <NR1>

Query STATus:QUEStionable:ENABLE?

Parameters: <NR1> : 0 to 65535

Example:

Command STAT:QUES:ENAB 1

Query STAT:QUES:ENAB?

18.1.6 STATus:QUEStionable:EVENT?

Description: Queries the Questionable Event register (Latched). Reading clears it.

Syntax:

Query STATus:QUEStionable:EVENT?

Parameters: None

Example:

Query STAT:QUES:EVEN?

Configuration Commands

19.1 Configuration Commands

19.1.1 MODE

Description: Sets the operating mode (Simple, Complete, Sequence, Insertion).

Syntax:

Command MODE <CRD>

Query MODE?

Parameters: <CRD> : SIMPlE | COMPlEtE | SEQUence | INSErtion

Example:

Command MODE COMP

Query MODE?

19.1.2 DISPlay

Description: Sets the backlight ON or OFF.

Syntax:

Command DISPlay <Bool>

Query DISPlay?

Parameters: <Bool> : 0 (OFF) | 1 (ON)

Example:

Command DISP ON

Query DISP?

19.1.3 DISPlay:BRIGhtness

Description: Sets the brightness of the display.

Syntax:

Command DISPlay:BRIGhtness <NR1>

Query DISPlay:BRIGhtness?

Parameters: <NR1> : 1 to 9

Example:

Command DISP:BRIG 5

Query DISP:BRIG?

19.1.4 INITiate:TRANsient

Description: Initiates the transient mode. Once initiated, triggered values are applicable.

Syntax:

Command INITiate[:IMMediate]:TRANsient

Parameters: None

Example:

Command INIT:TRAN

19.1.5 INITiate:CONTinuous:TRANsient

Description: Sets the transient mode to continuous.

Syntax:

Command INITiate:CONTinuous:TRANsient <Bool>

Query INITiate:CONTinuous:TRANsient?

Parameters: <Bool> : 0 (OFF) | 1 (ON)

Example:

Command INIT:CONT:TRAN 1

Query INIT:CONT:TRAN?

19.1.6 ABORt:TRANsient

Description: Aborts the transient mode.

Syntax:

Command ABORt:TRANsient

Parameters: None

Example:

Command ABOR:TRAN

19.1.7 TRIGger:TRANsient

Description: Triggers the transient mode.

Syntax:

Command TRIGger:TRANsient[:IMMediate]

Parameters: None

Example:

Command TRIG:TRAN

19.1.8 TRIGger:TRANsient:SOURce

Description: Sets the trigger source for transient mode.

Syntax:

Command TRIGger:TRANsient:SOURce <CRD>

Query TRIGger:TRANsient:SOURce?

Parameters: <CRD> : BUS

Example:

Command TRIG:TRAN:SOUR BUS

Query TRIG:TRAN:SOUR?

Optional Analog Programming

20.1 Analog Programming Commands

20.1.1 SYSTem:CONFig:ANALog:REFerence

Description: Sets the programming source and monitor level to 5V or 10V.

Syntax:

Command SYSTem:CONFig:ANALog:REFerence <NR1>

Query SYSTem:CONFig:ANALog:REFerence?

Parameters: <NR1> : 5 | 10

Example:

Command SYST:CONF:ANA:REF 10

Query SYST:CONF:ANA:REF?

20.1.2 SYSTem:CONFig:ANALog:VOLTage

Description: Enables voltage adjustment via analog input.

Syntax:

Command SYSTem:CONFig:ANALog:VOLTage <Bool>

Query SYSTem:CONFig:ANALog:VOLTage?

Parameters: <Bool> : 0 (Disable) | 1 (Enable)

Example:

Command SYST:CONF:ANA:VOLT 1

Query SYST:CONF:ANA:VOLT?

20.1.3 SYSTem:CONFig:ANALog:CURRent

Description: Enables current adjustment via analog input.

Syntax:

Command SYSTem:CONFig:ANALog:CURRent <Bool>

Query SYSTem:CONFig:ANALog:CURRent?

Parameters: <Bool> : 0 (Disable) | 1 (Enable)

Example:

Command SYST:CONF:ANA:CURRE 1

Query SYST:CONF:ANA:CURRE?

20.1.4 SYSTem:CONFig:ANALog:POWer

Description: Enables power adjustment via analog input.

Syntax:

Command SYSTem:CONFig:ANALog:POWer <Bool>

Query SYSTem:CONFig:ANALog:POWer?

Parameters: <Bool> : 0 (Disable) | 1 (Enable)

Example:

Command SYST:CONF:ANA:POW 1

Query SYST:CONF:ANA:POW?

20.1.5 SYSTem:CONFig:ANALog:MONItor

Description: Enables the analog monitoring output.

Syntax:

Command SYSTem:CONFig:ANALog:MONItor <Bool>

Query SYSTem:CONFig:ANALog:MONItor?

Parameters: <Bool> : 0 (Disable) | 1 (Enable)

Example:

Command SYST:CONF:ANA:MONI 1

Query SYST:CONF:ANA:MONI?
