Reference tables

Table 18-1 through Table 18-11 summarize the commands for each SCPI subsystem. The following list includes the SCPI subsystem, table number where each command is summarized, and the page number where detailed reference information begins.

Summary table	Subsystem	Reference page
Table 18-1	CALCulate *	page 18-26
Table 18-2	DISPlay	page 18-44
Table 18-3	FORMat	page 18-47
Table 18-4	OUTPut	page 18-55
Table 18-5	ROUTe	page 18-57
Table 18-6	SENSe	page 18-58
Table 18-7	SOURce *	page 18-71
Table 18-8	STATus	page 18-101
Table 18-9	SYSTem	page 18-103
Table 18-10	TRACe	page 18-114
Table 18-11	TRIGger	page 18-116

* Invalid CALCulate2 commands for the Model 2401 are listed in Table 12-2. All SOURce2 commands are invalid for the Model 2401 and are listed in Table 12-3. They will cause undefined header errors.

General notes:

- Brackets ([ ]) are used to denote optional character sets. These optional characters do not have to be included in the program message. Do not use brackets in the program message.
- Angle brackets (< >) are used to indicate parameter type. Do not use angle brackets in the program message.
- The Boolean parameter (<b>) is used to enable or disable an instrument operation. 1 or ON enables the operation, and 0 or OFF disables the operation.
- Upper case characters indicate the short-form version for each command word.
- Default Parameter — Listed parameters are both the *RST and :SYSTem:PRESet defaults, unless noted otherwise. Notes are located at the end of each table.
- SCPI — A checkmark (✓) indicates that the command and its parameters are SCPI confirmed. An unmarked command indicates that it is a SCPI command, but does not conform to the SCPI standard set of commands. It is not a recognized command by the SCPI consortium. SCPI confirmed commands that use one or more non-SCPI parameters are explained by notes.
- Source Memory — A checkmark (✓) indicates that the parameters associated with the specified command are saved in any one of 100 memory locations by the :SOURce[1]:MEMory:SAVE command.

Table 18-1
CALCulate command summary

Command	Description	Default parameter	SCPI	Source memory
:CALCulate[1]	Subsystem to control CALC1:		✓	
:MATH	Path to configure and control math expressions:		✓	
[:EXPRession] <form>	Define math expression using standard math operator symbols.		✓	
[:EXPRession]?	Query math expression.		✓	
:CATalog?	Query list of math expression names.		✓	
:NAME <name>	Create name for new user-defined expression.	Power	✓	✓
:NAME?	Query created name.		✓	
[:DEFine] <form>	Same as :EXPRession <form> command.		✓	
:DELete	Path to delete user-defined expressions.		✓	
[:SEL] <name>	Delete specified expression.		✓	
:ALL	Delete all user-defined expressions.		✓	
:UNITs <name>	Define units name for math expression (3ASCII characters).	"W"		✓
:UNITs?	Query math expression units name.			
:STATe <b>	Enable or disable math expression.	OFF	✓	✓
:STATe?	Query state of math expression.		✓	
:DATA	Path to CALC1 data.		✓	
:LATest?	Return only most recent math result.			
:DATA?	Read result of math expression.		✓	
:CALCulate2	Subsystem to control CALC2:		✓	
:FEED <name>	Select input path (CALCulate[1], CURRent, VOLTage, or RESistance).	VOLT	✓	✓
:FEED?	Query CALC2 feed.		✓	
:NULL	Path to configure and control REL:			
:OFFSet <NRf>	Specify REL value (-9.999999e20 to 9.999999e20).	0		✓
:OFFSet?	Query REL value.			
:STATe <b>	Enable or disable REL.	OFF		✓
:STATe?	Query state of REL.			
:ACQuire	Automatically acquire REL value.			
:DATA	Path to CALC2 data.		✓	
:LATest?	Return only most recent REL or LIMIT result.			
:DATA?	Read math result of CALC2.		✓	

Table 18-1 (continued)
CALCulate command summary

Command	Description	Default parameter	SCPI	Source memory
:CALCulate2				
:LIMit[1]	Path to control LIMIT 1 test:		✓	
:COMPliance	Configure Limit 1 test:			
:FAIL <name>	Specify fail condition (IN or OUT of compliance).	IN		✓
:FAIL?	Query fail condition.			
:SOURce2 <NRf> | <NDN>	Specify output fail pattern (0 to 7, 3-bit; 0 to 15, 4-bit).	15		✓
:SOURce2?	Query fail bit pattern.*			
:STATe <b>	Enable or disable Limit 1 test.	OFF	✓	✓
:STATe?	Query state of Limit 1 test.		✓	
:FAIL?	Returns result of Limit 1 test: 0 (pass) or 1 (fail).		✓	
:LIMit2	Path to control LIMIT 2 test:		✓	
:UPPer	Configure upper limit:		✓	
[:DATA] <n>	Specify upper limit (-9.999999e20 to 9.999999e20).	1	✓	✓
[:DATA]?	Query upper limit.		✓	
:SOURce2 <NRf> | <NDN>	Specify output fail pattern for grading mode (0 to 7, 3-bit; 0 to 15, 4-bit).	15		✓
:SOURce2?	Query fail bit pattern.*			
:LOWer	Configure lower limit:		✓	
[:DATA] <n>	Specify lower limit (-9.999999e20 to 9.999999e20).	-1	✓	✓
[:DATA]?	Query lower limit.		✓	
:SOURce2 <NRf> | <NDN>	Specify output fail pattern for grading mode (0 to 7, 3-bit; 0 to 15, 4-bit).	15		✓
:SOURce2?	Query fail bit pattern.*			
:PASS	Path to specify pass pattern for sorting mode:			
:SOURce2 <NRf> | <NDN>	Specify output pass pattern (0 to 7, 3-bit; 0 to 15, 4-bit).	15	✓	✓
:SOURce2?	Query pass bit pattern.*			
:STATe <b>	Enable or disable Limit 2 test.	OFF	✓	✓
:STATe?	Query state of Limit 2 test.		✓	
:FAIL?	Return result of Limit 2 test: 0 (pass) or 1 (fail).		✓	

Table 18-1 (continued)
CALCulate command summary

Command	Description	Default parameter	SCPI	Source memory
:CALCulate2				
:LIMit3	Path to control LIMIT 3 test:		✓	
:UPPer	Configure upper limit:		✓	
[:DATA] <n>	Specify upper limit (-9.999999e20 to 9.999999e20).	1	✓	✓
[:DATA]?	Query upper limit.		✓	
:SOURce2 <NRf> | <NDN>	Specify output fail pattern (0 to 7, 3-bit; 0 to 15, 4-bit).	15		✓
:SOURce2?	Query fail bit pattern.*			
:LOWer	Configure lower limit:		✓	
[:DATA] <n>	Specify lower limit (-9.999999e20 to 9.999999e20).	-1	✓	✓
[:DATA]?	Query lower limit.		✓	
:SOURce2 <NRf> | <NDN>	Specify output fail pattern for grading mode. (0 to 7, 3-bit; 0 to 15, 4-bit).	15		✓
:SOURce2?	Query fail bit pattern.*			
:PASS	Path to specify pass pattern for sorting mode:			
:SOURce2 <NRf> | <NDN>	Specify output pass pattern (0 to 7, 3-bit; 0 to 15, 4-bit).	15	✓	✓
:SOURce2?	Query pass bit pattern.*			
:STATe <b>	Enable or disable Limit 3 test.	OFF	✓	✓
:STATe?	Query state of Limit 3 test.		✓	
:FAIL?	Return result of Limit 3 test: 0 (pass) or 1 (fail).		✓	
:LIMit4	Path for LIMIT 4 test (contact check option only).			
:SOURce2 <NRf> | <NDN>	Specify output fail pattern (0 to 7, 3-bit; 0 to 15, 4-bit).	15		
:SOURce2?	Query fail bit pattern.*			
:STATe <b>	Enable or disable Limit 4 test.	OFF	✓	✓
:STATe?	Query state of Limit 4 test.		✓	
:FAIL?	Return result of Limit 4 test: 0 (pass) or 1 (fail).		✓	

Table 18-1 (continued)
CALCulate command summary

Command	Description	Default parameter	SCPI	Source memory
:CALCulate2				
:LIMit5…12	Path to control LIMIT 5 to LIMIT 12 tests (see Note):		✓	
:UPPer	Configure upper limit:		✓	
[:DATA] <n>	Specify upper limit (-9.999999e20 to 9.999999e20).	1	✓	✓
[:DATA]?	Query upper limit.		✓	
:SOURce2 <NRf> | <NDN>	Specify output fail pattern for grading mode (0 to 7, 3-bit; 0 to 15, 4-bit).	15		✓
:SOURce2?	Query fail bit pattern.*			
:LOWer	Configure lower limit:		✓	
[:DATA] <n>	Specify lower limit (-9.999999e20 to 9.999999e20).	-1	✓	✓
[:DATA]?	Query lower limit.		✓	
:SOURce2 <NRf> | <NDN>	Specify output fail pattern for grading mode (0 to 7, 3-bit; 0 to 15, 4-bit).	15		✓
:SOURce2?	Query fail bit pattern.*			
:PASS	Path to specify pass pattern for sorting mode:			
:SOURce2 <NRf> | <NDN>	Specify output pass pattern (0 to 7, 3-bit; 0 to 15, 4-bit).	15	✓	✓
:SOURce2?	Query pass bit pattern.			
:STATe <b>	Enable or disable Limit 5 to 12 tests.	OFF	✓	✓
:STATe?	Query state of Limit 5 to 12 tests.		✓	
:FAIL?	Return result of Limit 5 to 12 tests: 0 (pass) or 1 (fail).		✓	
:CLIMits	Composite limits for Limit 1 through Limit 12:			
:BCONtrol <name>	Specify when to send binning info to handler. A limit test is performed (IMMediate) or after a sweep, list, or memory sequence (END).	IMM		
:BCONtrol?	Query binning control.			
:MODE <name>	Set how limit results control Digital I/O lines (GRADing or SORTing).	GRAD		
:MODE?	Query limit results control of Digital I/O lines.			

Note: Use LIMit5 through LIMit12 to control Limit 5 through Limit 12 tests respectively. For example, send :LIM5:STAT ON to enable Limit 5; send LIM10:FAIL? to return the result of Limit 10.

Table 18-1 (continued)
CALCulate command summary

Command	Description	Default parameter	SCPI	Source memory
:CALCulate2				
:CLEar	Clear test results:			
[:IMMediate]	Clear latest limit test result and reset Digital I/O port back to :SOURce2:TTL settings.			
:AUTO <b>	Enable or disable clearing of test results when :INITiate command is sent.	ON		
:AUTO?	Query state of auto clear.			
:PASS	Define pass digital output pattern. Sorting mode only if limits 2, 3, 5-12 disabled.			
:SOURce2 <NRf> | <NDN>	Specify output pass pattern: (0 to 7, 3-bit; 0 to 15, 4-bit).	15		✓
:SOURce2?	Query pass bit pattern.*			
:SMLocation <NRf> | NEXT	Specify next PASS Source Memory Sweep location (NEXT location or 1 to 100).	NEXT		✓
:SMLocation?	Query PASS memory location.			
:FAIL	Define fail digital output pattern:			
:SOURce2 <NRf> | <NDN>	Specify output fail pattern: (0 to 7, 3-bit; 0 to 15, 4-bit).	15		✓
:SOURce2?	Query fail bit pattern.*			
:SMLocation <NRf> | NEXT	Specify next FAIL Source Memory location (NEXT location or 1 to 100).	NEXT		
:SMLocation?	Query FAIL memory location.			
:CALCulate3	Subsystem to control CALC3:		✓	
:FORMat <name>	Specify math format (MEAN, SDEViation, MAXimum, MINimum, or PKPK).	MEAN	✓	
:FORMat?	Query math format.		✓	
:DATA?	Read math result of CALC3.		✓	

* The format (ASCII, hexadecimal, octal, or binary) for the returned value is set by FORMat:SOURce2 <name>.

Table 18-2
DISPlay command summary

Command	Description	Default parameter	SCPI
:DISPlay			
:ENABle <b>	Turn on or turn off front panel display.	(Note 1)	✓
:ENABle?	Query state of display.		✓
:CNDisplay	Return to source-measure display state.		
[:WINDow[1]]	Path to locate message to top display:		✓
:TEXT	Control user test message:	(Note 2)	✓
:DATA <a>	Define ASCII message "a" (up to 20 characters).		✓
:DATA?	Query text message.		✓
:STATe <b>	Enable or disable message mode.	(Note 3)	✓
:STATe?	Query text message state.		✓
:DATA?	Query data on top portion of display.		
:ATTRibutes?	Query attributes of message characters: blinking (1) or not blinking (0).		
:WINDow2	Path to locate message to bottom display:		✓
:TEXT	Control user test message:	(Note 2)	✓
:DATA <a>	Define ASCII message "a" (up to 32 characters).		✓
:DATA?	Query text message.		✓
:STATe <b>	Enable or disable message mode.	(Note 3)	✓
:STATe?	Query text message state.		✓
:DATA?	Query data on bottom portion of display.		
:ATTRibutes?	Query attributes of message characters: blinking (1) or not blinking (0).		
:DIGits <n>	Specify display resolution (4 to 7).	6	
:DIGits?	Query display resolution		

Notes:
1. *RST and :SYSTem:PRESet has no effect on the display circuitry. Pressing LOCAL or cycling power enables (ON) the display circuit.
2. *RST and :SYSTem:PRESet has no effect on a user-defined message. Pressing LOCAL or cycling power cancels all user-defined messages.
3. *RST and :SYSTem:PRESet has no effect on the state of the message mode. Pressing LOCAL or cycling power disables (OFF) the message mode.

Table 18-3
FORMat command summary

Command	Description	Default parameter	SCPI
:FORMat			
:SREGister <name>	Select data format for reading status event registers (ASCii, HEXadecimal, OCTal or BINary).	ASCii	✓
:SREGister?	Query format for reading status event registers.		
[:DATA] <type>[<,length>]	Specify data format (ASCii, REAL, 32 or SREal).	ASCii	✓
[:DATA]?	Query data format.		✓
:BORDer <name>	Specify byte order (NORMal or SWAPped).	(Note)	✓
:BORDer?	Query byte order.		✓
:ELEMents			
[:SENSe[1]] <item list>	Specify data elements (VOLTage, CURRent, RESistance, TIME, and STATus).	All	
[:SENSe[1]]?	Query data format elements.		
:CALCulate <item list>	Specify CALC data elements (CALC, TIME, or STATus).	CALC	
:CALCulate?	Query CALC data elements.		
:SOURce2 <name>	Specify SOURce2 data format (ASCii, HEXadecimal, OCTal, or BIN).	ASCii	
:SOURce2?	Query SOURce2 data format.		

Note: Byte order — *RST default is NORMal. :SYSTem:PRESet default is SWAPped.

Table 18-4
OUTPut command summary

Command	Description	Default parameter	SCPI	Source memory
:OUTPut[1]			✓	
:STATe <b>	Turn source on or off.	OFF	✓	
:STATe?	Query state of source.		✓	
:ENABle	Path to control output enable:			
[:STATe] <b>	Enable or disable output enable.	OFF		
[:STATe?]	Query state of output enable.			
:TRIPped?	Output enable tripped?: 1 (no) or 0 (yes)			
:SMODe <name>	Select output off mode (HIMPedance, NORMal, ZERO or GUARd).[1]	NORMal[2]		✓
:SMODe?	Query output off mode.			

1. For the Model 2430 Pulse Mode, the output off mode is always NORMal. This command is invalid (error +831).
2. For the Model 2410, default is GUARd.

Table 18-5
ROUTe command summary

Command	Description	Default parameter	SCPI	Source memory
:ROUTe :TERMinals <name> :TERMinals?	Select in/out terminals: (FRONt or REAR). Query in/out terminals.	FRONt	✓	✓

Table 18-6
SENSe command summary

Command	Description	Default parameter	SCPI	Source memory
[:SENSe[1]]	Sense 1 Subsystem:		✓	
:DATA	Path to SENSe[1] data.		✓	
[:LATest?]	Return only most recent reading.			
:FUNCtion	Select measurement function(s):		✓	
:CONCurrent <b>	Enable or disable ability to measure more than one function simultaneously. When disabled, volts function is enabled.[1]	ON	✓	✓
:CONCurrent?	Query concurrent state.		✓	
[:ON] <function list>	Specify functions to enable (VOLTage[:DC], CURRent[:DC], or RESistance).	CURRent	✓	✓
:ALL	Enable all functions (concurrent enabled) or enable ohms function (concurrent disabled).[1]		✓	
:COUNt?	Query number of functions that are enabled.		✓	
[:ON]?	Returns list of functions that are enabled.		✓	
:OFF <function list>	Specify functions to disable: (VOLTage[:DC], CURRent[:DC], or RESistance).	VOLTage, RESis-tance	✓	✓
:ALL	Disable all measurement functions.		✓	
:COUNt?	Query number of functions that are disabled.		✓	
:OFF?	Returns list of functions that are disabled.		✓	
:STATe? <name>	Query state of specified function: 1 (on) or 0 (off).		✓	

1. For the Model 2430 Pulse Mode, concurrent measurements are always disabled. This command is invalid (error +831).

Table 18-6 (continued)
SENSe command summary

Command	Description	Default parameter	SCPI	Source memory
[:SENSe[1]]				
:CURRent[:DC]	Path to configure current:		✓	
:RANGe	Configure measurement range:		✓	
[:UPPer] <n>|UP|DOWN	Select range by specifying the expected current reading.[1]	1.05e-4	✓	✓[4]
[:UPPer]?	Query range.		✓	
:AUTO <b>	Enable or disable auto range.[2]	ON	✓	✓[4]
:AUTO?	Query auto range.		✓	
:ULIMit?	Returns I compliance range.		✓	
:LLIMit <n>	Set auto ranging lower limit (-105e-6 to 105e-6).	1e-6	✓	
:LLIMit?	Query auto ranging lower limit.		✓	
:NPLCycles <n>	Specify integration rate (in line cycles): 0.01 to 10.[3]	1.0	✓	✓[4]
:NPLCycles?	Query integration rate.		✓	
:PROTection	Path to configure current compliance:		✓	
[:LEVel] <n>	Specify current limit for V-Source.[1]	1.05e-4	✓	✓[4]
[:LEVel]?	Query current compliance limit.		✓	
:TRIPped?	In current compliance: 1 (yes), 0 (no).		✓	
:RSYNchronize <b>	Enable or disable measure and compliance range synchronization.	OFF		
:RSYNchronize?	Query range synchronization.			
:VOLTage[:DC]	Path to configure volts:		✓	
:RANGe	Configure measurement range:		✓	
[:UPPer] <n>|UP|DOWN	Select range by specifying the expected voltage reading.[1]	21	✓	✓[5]
[:UPPer]?	Query range.		✓	
:AUTO <b>	Enable or disable auto range.[2]	ON	✓	✓[5]
:AUTO?	Query auto range.		✓	
:ULIMit?	Returns V compliance range.		✓	
:LLIMit <n>	Set auto range lower limit.[1]	0.21	✓	
:LLIMit?	Query auto range lower limit.		✓	
:NPLCycles <n>	Specify integration rate (in line cycles): 0.01 to 10.[3]	1.0	✓	✓[5]
:NPLCycles?	Query integration rate.		✓	
:PROTection	Path to configure voltage compliance:		✓	
[:LEVel] <n>	Specify voltage limit for I-Source.[1]	21	✓	✓[5]

1. The parameter values for this command are provided with the detailed command reference information. Detailed information on SCPI commands follows the last command summary table in this section.
2. For the Model 2430 Pulse Mode, auto range is invalid (error +831).
3. For the Model 2430 Pulse Mode, <n> = 0.004 to 0.100.
4. If source V is active.
5. If source I is active and auto ohms is disabled.
6.

Table 18-6 (continued)
SENSe command summary

Command	Description	Default parameter	SCPI	Source memory
[:SENSe[1]]				
:VOLTage[:DC]				
:PROTection				
[:LEVel]?	Query voltage compliance limit.		✓	
:TRIPped?	In voltage compliance?: 1 (yes), 0 (no).		✓	
:RSYNchronize <b>	Enable or disable measure and compliance range synchronization.	OFF		
:RSYNchronize?	Query range synchronization.			
:RESistance	Path to configure resistance:		✓	
:MODE <name>	Select ohms mode (MANual or AUTO).	AUTO		✓
:MODE?	Query ohms mode.			
:OCOMpensated <b>	Enable or disable offset-compensated ohms.[1]	OFF	✓	✓
:OCOMpensated?	Query state of offset-compensated ohms.		✓	
:RANGe	Configure measurement range:		✓	
[:UPPer] <n>|UP|DOWN	Select range by specifying the expected resistance reading.[2]	2.1e5	✓	✓
[:UPPer]?	Query range.		✓	
:AUTO <b>	Enable or disable auto range.[3]	ON	✓	✓
:AUTO?	Query auto range.		✓	
ULIMit <n>	Set auto range upper limit.[2]		✓	
ULIMit?	Query auto range upper limit.		✓	
LLIMit <n>	Set auto range lower limit.[2]		✓	
LLIMit?	Query auto range lower limit.		✓	
:HOLDoff <b>	Enable/disable current range holdoff for source memory sweeps.			✓
:HOLDoff?	Query current range holdoff state.			
:DELay <NRf>	Set holdoff delay (sec.): 0 to 999.9999.			✓
:DELay?	Query holdoff delay.			
:NPLCycles <n>	Specify integration rate (in line cycles): 0.01 to 10.[4]	1.0	✓	✓
:NPLCycles?	Query integration rate.		✓	

1. For the Model 2430 Pulse Mode, offset-compensated ohms cannot be enabled using this command. This command is invalid (error +831).
2. The parameter values for this command are provided with the detailed command reference information. Detailed information on SCPI commands follows the last command summary table in this section.
3. For the Model 2430 Pulse Mode, auto range is invalid (error +831).
4. For the Model 2430 Pulse Mode, <n> = 0.004 to 0.100.

Table 18-6 (continued)
SENSe command summary

Command	Description	Default parameter	SCPI	Source memory
[:SENSe[1]]				
:VOLTage[:DC]				
:AVERage	Path to configure and control digital filter:	REPeat	✓	
:TCONtrol <name>	Specify filter type (MOVing or REPeat).[1]		✓	✓
:TCONtrol?	Query filter type.		✓	
:COUNt <n>	Specify filter count (1 to 100).[1]	10	✓	✓
:COUNt?	Query filter count.		✓	
[:STATe] <b>	Enable or disable filter.[2]	OFF	✓	✓
[:STATe]?	Query state of filter.		✓	

1. For the Model 2430 Pulse Mode, filtering is not used. This command is ignored.
2. For the Model 2430 Pulse Mode, the filter cannot be enabled. This command is invalid (error +831).

Table 18-7
SOURce command summary

Command	Description	Default parameter	SCPI	Source memory
[:SOURce[1]]	Path to control sourcing:		✓	
:CLEar	Path to clear source:			
[:IMMediate]	Turn selected source off.			
:AUTO <b>	Enable or disable auto clear for source.[1]			
:AUTO?	Query state of auto clear.	OFF		
:MODE <name>	Specify auto clear mode (ALWays or TCOunt).	ALWays		
:MODE?	Query auto clear mode.			
:FUNCtion	Source selection:		✓	
:SHAPe <name>	Model 2430 Only — Select output mode (DC or PULSe).	DC		✓
:SHAPe?	Query output mode.			
[:MODE] <name>	Select source mode (VOLTage, CURRent or MEMory).	VOLTage	✓	✓
[:MODE]?	Query source selection		✓	
:DELay <n>	Specify settling time (in sec): 0 to 9999.999.[2]	0		✓
:AUTO <b>	Enable or disable auto settling time.[2]	ON		✓
:AUTO?	Query state of auto settling time.			
:DELay?	Query source settling time.			
:CURRent	Path to configure I-Source:		✓	
:MODE <n>	Select I-Source mode (FIXed, SWEep, or LIST).	FIXed	✓	
:MODE?	Query I-Source mode.		✓	
:RANGe <n>|UP|DOWN|	Select fixed I-Source range.[3]	1.05e-4	✓	✓[4]
:AUTO <b>	Enable or disable autoranging.	ON	✓	
:AUTO?	Query state of autoranging.		✓	
:RANGe?	Query I-Source range setting.		✓	
[:LEVel]	Set I-Source level (in amps):		✓	
[:IMMediate]	Set level immediately:		✓	
[:AMPLitude] <n>	Specify current level.[3]	0	✓	✓[4]
[:AMPLitude]?	Query current level.		✓	

1. For the Model 2430 Pulse Mode, auto clear is always enabled. This command is ignored.
2. For the Model 2430 Pulse Mode, source delay is not used. This command is ignored.
3. The parameter values for this command are provided with the detailed command reference information. Detailed information on SCPI commands follows the last command summary table in this section.
4. If source V is active.

Table 18-7 (continued)
SOURce command summary

Command	Description	Default parameter	SCPI	Source memory
[:SOURce[1]]				
:CURRent				
[:LEVel]				
:TRIGgered	Set level when triggered:		✓	
[:AMPLitude] <n>	Specify current level.[1]	0	✓	
[:AMPLitude]?	Query current level.		✓	
:SFACtor <n>	Set current scaling factor (-999.9999e+18 to +999.999e+18).	1.0		✓[2]
:STATe <b>	Enable/disable current scaling factor.	OFF		✓[2]
:STATe?	Query current scaling factor state.			
:SFACtor?	Query current scaling factor.			
:STARt <n>	Specify start level for I-sweep.[1]	0	✓	
:STARt?	Query start level for current sweep.		✓	
:STOP <n>	Specify stop level for I-sweep.[1]	0	✓	
:STOP?	Query stop level for current sweep.		✓	
:STEP <n>	Specify step value for I-sweep.[1]	0		
:STEP?	Query step value for voltage sweep.			
:SPAN <n>	Specify span.[1]	0	✓	
:SPAN?	Query span.		✓	
:CENTer <n>	Specify center point.[1]	0	✓	
:CENTer?	Query center point.		✓	
:VOLTage	Path to configure V-Source:		✓	
:MODE <n>	Select V-Source mode (FIXed, SWEep, or LIST).	FIXed	✓	
:MODE?	Query V-Source mode.		✓	
:RANGe <n>|UP|DOWN|	Select fixed V-Source range.[1]	21	✓	✓[2]
:AUTO <b>	Enable or disable autoranging.	ON	✓	✓[2]
:AUTO?	Query state of autoranging.		✓	
:RANGe?	Query V-Source range setting.		✓	

1. The parameter values for this command are provided with the detailed command reference information. Detailed information on SCPI commands follows the last command summary table in this section.
2. If source V is active.

Table 18-7 (continued)
SOURce command summary

Command	Description	Default parameter	SCPI	Source memory
[:SOURce[1]]				
:VOLTage				
[:LEVel]	Set V-Source level (in volts):		✓	
[:IMMediate]	Set specified level immediately:		✓	
[:AMPLitude] <n>	Specify voltage level.[1]	0	✓	✓[3]
[:AMPLitude]?	Query voltage level.		✓	
:TRIGgered	Set specified level when triggered:		✓	
[:AMPLitude] <n>	Specify voltage level.[1]	0	✓	
[:AMPLitude]?	Query voltage level.		✓	
:SFACtor <n>	Set voltage scaling factor (-999.9999e+18 to +999.9999e+18).	0		✓[3]
:STATe <b>	Enable/disable voltage scaling factor.	OFF		✓[3]
:STATe?	Query voltage scaling factor state.			
:SFACtor?	Query voltage scaling factor.			
:PROTection	Path to limit output voltage:		✓	
[:LEVel] <NRf>	Specify voltage limit level.[1]	(Note 2)	✓	
[:LEVel]?	Query voltage limit.		✓	
:TRIPped?	Voltage limit detected: 1 (yes), 0 (no).		✓	
:STARt <n>	Specify start level for V-sweep.[1]	0	✓	
:STARt?	Query start level for voltage sweep.		✓	
:STOP <n>	Specify stop level for V-sweep.[1]	0	✓	
:STOP?	Query stop level for voltage sweep.		✓	
:STEP <n>	Specify step value for V-sweep.[1]	0		
:STEP?	Query step value for voltage sweep.			
:SPAN <n>	Specify span.[1]	0	✓	
:SPAN?	Query span.		✓	
:CENTer <n>	Specify center point.[1]	0	✓	
:CENTer?	Query center point.		✓	
:SOAK <NRf>	Set first sweep point soak time (0.00000 to 9999.999s).	0.00000	✓	
:SOAK?	Query soak time.		✓	

1. The parameter values for this command are provided with the detailed command reference information. Detailed information on SCPI commands follows the last command summary table in this section.
2. SYSTem:PRESet default is 40, *RST default is NONE.
3. If source V is active.

Table 18-7 (continued)
SOURce command summary

Command	Description	Default parameter	SCPI	Source memory
[:SOURce[1]]				
:SWEep	Configure SWEep source mode:		✓	
:SPACing <name>	Select sweep spacing type (LINear or LOGarithmic).	LINear	✓	
:SPACing?	Query sweep spacing.		✓	
:POINts <n>	Specify number of sweep points (2 to 2500).	2500	✓	
:POINts?	Query number of points in sweep.		✓	
:DIRection <name>	Sweep from start to stop (UP) or from stop to start (DOWN).	UP		
:DIRection?	Query sweep direction.			
:RANGing <name>	Select source ranging mode (BEST, AUTO, or FIXed).	BEST	✓	
:RANGing?	Query source ranging mode.		✓	
:CABort <name>	Abort on compliance (NEVer, EARLy, or LATE).	NEVer		
:CABort?	Query abort on compliance state.			
:LIST	Configure LIST source mode:		✓	
:CURRent <NRf>	Create list of I-Source values.[1]			
:APPend <NRf>	Add I-Source values to end of list.		✓	
:POINts?	Query number of source values in list.			
:STARt <n>	Specify list sweep start point.	1		
:STARt?	Query list sweep start point.			
:CURRent?	Query I-Source list.		✓	
:VOLTage <NRf>	Create list of V-Source values.	1		
:APPend <NRf>	Add V-Source values to end of list.			
:POINts?	Query number of source values in list.			
:STARt <n>	Specify list sweep start point.	1		
:STARt?	Query list sweep start point.			
:VOLTage?	Query V-Source list.			
:MEMory	Configure Source Memory Sweep:			
:SAVE <n>	Save settings at memory location (1 to 100).			
:RECall <n>	Recall settings from memory (1 to 100).	1		
:POINts <n>	Specify number of sweep points (1 to 100).			
:POINts?	Query number of sweep points.			
:STARt <NRf>	Specify start location for Source Memory Sweep (1 to 100).	1		
:STARt?	Query start location.			

1. The parameter values for this command are provided with the detailed command reference information. Detailed information on SCPI commands follows the last command summary table in this section.

Table 18-7 (continued)
SOURce command summary

Command	Description	Default parameter	SCPI	Source memory
[:SOURce[1]]				
:PULSe	Model 2430 — Configure pulse for Pulse Mode:		✓	
:WIDTh <n>	Set pulse width (0.00015 to 0.005 sec).		✓	✓
:WIDTh?	Query pulse width.		✓	
:DELay <n>	Set pulse delay (0 to 9999.999 sec).		✓	✓
:DELay?	Query pulse delay.		✓	
:SOURce2	Path to control digital output lines:			
:BSIZe <n>	Set Digital I/O bit size (3 or 4).[1]	4		
:BSIZe?	Query Digital I/O bit size.			
:TTL				
[:LEVel] [:DEFault] <NRf>, <NDN>	Specify digital output pattern.[2]	15		
[:LEVel] [:DEFault]?	Query default output pattern.[3]			
:ACTual?	Read actual output pattern.			
:TTL4				
:MODE <name>	Set Digital I/O mode (EOTest or BUSY).	EOTest		
:MODE?	Query Digital I/O line 4 mode.			
:BSTate <b>	Set BUSY and EOT polarity (HI or LO).	LO		
:BSTate?	Query BUSY and EOT polarity.			
:CLEar	Clear digital output:			
[:IMMediate]	Restore (clear) to :TTL output pattern.			
:AUTO <b>	Enable or disable auto-clear.	OFF		
:AUTO?	Query state of auto-clear.			
:DELay <n>	Specify pulse-width of pass/fail pattern (0.0000 to 60 sec).	0.00001		
:DELay?	Query delay.			

1. 16 with 2499-DIGIO 16-bit option.
2. Bit range set by :BSIZe.
3. Format set by FORMat:SOURce2 <name>.

Table 18-8
STATus command summary

Command	Description	Default parameter	SCPI
:STATus		(Note 1)	✓
:MEASurement	Control measurement event registers:		
[:EVENt]?	Read the event register.[6]	(Note 2)	✓
:ENABle <NDN> or <NRf>	Program the enable register.	(Note 3)	✓
:ENABle?	Read the enable register.[6]		✓
:CONDition?	Read the condition register.[6]		✓
:OPERation	Control operation status registers:		✓
[:EVENt]?	Read the event register.[6]	(Note 2)	✓
:ENABle <NDN> or <NRf>	Program the enable register.	(Note 3)	✓
:ENABle?	Read the enable register.[6]		✓
:CONDition?	Read the condition register.[6]		✓
:QUEStionable	Control questionable status registers:		✓
[:EVENt]?	Read the event register.[6]	(Note 2)	✓
:ENABle <NDN> or <NRf>	Program the enable register.	(Note 3)	✓
:ENABle?	Read the enable register.[6]		✓
:CONDition?	Read the condition register.[6]		
:PRESet	Return status registers to default states.		✓
:QUEue	Path to access error queue:		✓
[:NEXT]?	Read the most recent error message.	(Note 4)	✓
:ENABle <list>	Specify error/status messages for error queue.	(Note 5)	✓
:ENABle?	Read the enabled messages.		✓
:DISable <list>	Specify messages not to be placed in error queue.	(Note 5)	
:DISable?	Read the disabled messages.		
:CLEar	Clears all messages from error queue.		

Notes:
1. Commands in this subsystem are not affected by *RST and :SYSTem:PREset. The effects of cycling power, *CLS and :STATus:PRESet, are explained by the following notes.
2. Event Registers — Power-up and *CLS clears all bits. :STATus:PRESet has no effect.
3. Enable Registers — Power-up and :STATus:PRESet clears all bits. *CLS has no effect. Accepts the SCPI 1995.0 mandated (non-decimal numeric) format (#H, #Q, or #B).
4. Error Queue — Power-up and *CLS clears all bits of the registers.
5. Error Queue Messages — Power-up clears list of messages. *CLS and :STATus:PRESet have no effect.
6. Register Query Commands — The format for the response messages (ASCII, hexadecimal, octal, or binary) depends on which data format is presently selected (see "Status register format," page 18-54).

Table 18-9
SYSTem command summary

Command	Description	Default parameter	SCPI	Source memory
:SYSTem				
:PRESet	Return to :SYSTem:PRESet defaults.		✓	
:POSetup <name>	Select power-on setup (RST, PRESet or SAV 0-4).			
:POSetup?	Query power-on setup.			
:VERSion?	Query revision level of SCPI.		✓	
:ERRor	Path to read messages in error queue (Note 1).			
[:NEXT]?	Return and clear oldest error (code and message).		✓	
:ALL?	Return and clear all errors (codes and messages).			
:COUNt?	Return the number of errors.			
:CODE	Path to return error code numbers only:			
[:NEXT]?	Return and clear oldest error (code only).			
:ALL?	Return and clear all errors (codes only).			
:CCHeck <b>	Enable or disable contact check. Remote sensing must be enabled (:SYST:RSEN ON).			
:RES <Nrf>	Specify resistance threshold for contact check (50ohm default).			
:CLEar	Clears messages from error queue.			
:RSENse <b>	Enable or disable remote sensing.	OFF		✓
:RSENse?	Query state of remote sensing.			
:KEY <n>	Simulate key-press (1 to 31). See Figure 18-3.			
:KEY?	Query the last pressed key.		✓	
:GUARd <name>	Select guard type (OHMS or CABLe).	CABLe	✓	
:GUARd?	Query guard type.			
:BEEPer	Control beeper:			
[:IMMediate] <freq, time>	Beep at specified frequency (65 to 2e6 Hz) for specified time period (0 to 7.9 seconds).			
:STATe <b>	Enable or disable beeper.	ON		
:STATe?	Query state of beeper.		✓	

1. Clearing Error Queue — Power-up and *CLS clears the error queue. *RST, :SYSTem:PRESet, and :STATus:PRESet have no effect.

Table 18-9 (continued)
SYSTem command summary

Command	Description	Default parameter	SCPI	Source memory
:SYSTem				
:AZERo	Control auto zero and NPLC caching.			✓
[:STATe] <name>	Control auto zero (OFF = disabled; ON = enabled; ONCE = force immediate update of auto zero.)	ON		✓
[:STATe]?	Query auto zero state.		✓	
:CACHing	Control NPLC caching.			
[:STATe]<b>	Enable (ON or 1) or disable (OFF or 0) NPLC caching.	OFF		
[:STATe]?	Query NPLC caching state.			
:REFResh	Force an immediate update for all NPLC values in cache.			
:RESet	Clear the cache of all NPLC values.			
:NPLCycles?	Return a list of NPLC values in the cache from oldest to newest.			
:LFRequency <freq>	Select line frequency: 50 or 60 (Hz):			
:AUTO <b>	Enable or disable auto frequency.	(Note 1)		
:AUTO?	Query state of auto frequency.			
:LFRequency?	Query line frequency.			
:TIME	Timestamp:			
:RESet	Reset timestamp to zero seconds.			
:AUTO <b>	Enable/disable timestamp reset when exiting idle.	OFF		
:TIME?	Query timestamp.			
:MEMory	Initialize memory:			
:INITialize	Initialize battery backed RAM.		✓	
:LOCal	Take unit out of remote (RS-232 only).		✓	
:RWLock <b>	Enable or disable local lockout (RS-232 only).			
:RCMode <name>	Set auto range on compliance mode (SINGle or MULTiple).	SINGle		
:RCMode?	Query auto range on compliance mode.			
:MEP	Path to 488.1 protocol (Appendix G).			
[:STATe]?	Query protocol (1 = SCPI, 0 = 488.1).			
:HOLDoff <b>	Enable/disable NDAC hold-off.	OFF		

1. The auto line frequency setting is not affected by *RST and :SYSTem:PRESet.

Table 18-10
TRACe command summary

Command	Description	Default parameter	SCPI
:TRACe|:DATA	Use :TRACe or :DATA as root command:	(Note)	✓
:DATA?	Read the contents of the buffer (data store).		✓
:CLEar	Clear readings from buffer.		
:FREE?	Query bytes available and bytes in use.		✓
:POINts <NRf>	Specify size of buffer (1 to 2500).		✓
:ACTual?	Queries number of readings stored in the buffer.		
:POINts?	Query buffer size.		✓
:FEED <name>	Select source of readings (SENSe[1], CALCulate[1], or CALCulate2).		✓
:CONTrol <name>	Specify buffer control mode (NEVER or NEXT).		✓
:CONTrol?	Query buffer control mode.		✓
:TSTamp	Path to set timestamp format:		
:FORMat <name>	Select format (ABSolute or DELTa).		
:FORMat?	Query timestamp format.		

Note: :SYSTem:PRESet and *RST have no effect on the commands in this subsystem.

Table 18-11
TRIGger command summary

Command	Description	Default parameter	SCPI
:INITiate[:IMMediate]	Initiate source-measure cycle(s).		✓
:ABORt	Reset trigger system. Goes to idle state.		✓
:ARM	Path to program Arm Layer:		✓
[:SEQuence[1]]			✓
[:LAYer[1]]			✓
:COUNt <n>	Specify arm count (1 to 2500 or INFinite).	1	✓
:COUNt?	Query arm count (INFinite = +9.9e37).		✓
:SOURce <name>	Specify control source (IMMediate, TIMer, MANual, BUS, TLINk, NSTest, PSTest, or BSTest).	IMMediate	✓
:SOURce?	Query control source.		✓
:TIMer <n>	Set timer interval in seconds (0.001 to 99999.99).	0.1	✓
:TIMer?	Query timer interval.		✓
[:TCONfigure]			✓
:DIRection <name>	Enable (SOURce) or disable (ACCeptor) bypass.	ACCeptor	✓
:DIRection?	Query state of bypass.		✓
[:ASYNchronous]	Configure output triggers:		✓
:ILINe <n>	Select input trigger line (1, 2, 3, or 4).	1	
:ILINe?	Query input trigger line.		
:OLINe <n>	Select output trigger line (1, 2, 3, or 4).	2	
:OLINe?	Query output trigger line.		
:OUTPut <name>	Output trigger (TENTer, TEXit, or NONE).	NONE	
:OUTPut?	Query arm output trigger status.		
:TRIGger	Path to program Trigger Layer:		✓
:CLEar	Clear any pending input triggers immediately.		✓
[:SEQuence[1]]			✓
:COUNt <n>	Specify trigger count (1 to 2500).	1	✓
:COUNt?	Query trigger count.		✓
:DELay <n>	Specify trigger delay: 0 to 999.9999 (sec).[1]	0	✓
:DELay?	Query source delay.		✓
:SOURce <name>	Specify control source (IMMediate or TLINk).	IMMediate	✓
:SOURce?	Query control source.		✓

1. For the Model 2430 Pulse Mode, trigger delay is not used. This command is ignored.

Table 18-11 (continued)
TRIGger command summary

Command	Description	Default parameter	SCPI
:TRIGger			
[:SEQuence[1]]			
[:TCONfigure]			✓
:DIRection <name>	Enable (SOURce) or disable (ACCeptor) bypass.		✓
:DIRection	Query state of bypass.		✓
[:ASYNchronous]	Configure output triggers:		✓
:ILINe <n>	Select input trigger line (1, 2, 3, or 4).	1	
:ILINe?	Query input trigger line.		
:INPut <event list>	Enable input event detectors (SOURce, DELay, SENSe, or NONE).	NONE	
:INPut?	Query enabled input event detectors.		
:OLINe <n>	Select output trigger line (1, 2, 3, or 4).	2	
:OLINe?	Query output trigger line.		
:OUTPut <event list>	Output trigger after SOURce, DELay, SENSe or not (NONE) at all.	NONE	
:OUTPut?	Query when output trigger is going to occur.		