

# SCPI Command Reference

This appendix gives an overview of the Standard Commands for Programmable Instruments (SCPI) that the PLZ-4W/PLZ-4WL/PLZ-4WH Series Electronic Load supports.

## Summary of SCPI commands

The SCPI commands that the PLZ-4W/PLZ-4WL/PLZ-4WH supports are described in the tables following this section. The tables use the following headings.

- SCPI command: Full command name in long form (lowercase characters can be omitted)
- Description: Gives a description of the command function.
- Query?: Indicates whether the PLZ-4W/PLZ-4WL/PLZ-4WH supports the query version of the listed command.
- Note 1: 1, 2, and 3 indicate SCPI standard command, command in review, and KIKUSUI original command, respectively.
- Note 2: † indicates commands that are affected by \*RCL, \*SAV, and \*RST.

## Conventions used in the tables

The following conventions are used in the command list.

- N/A (not applicable) (There are no settings that relate to the command.)

### Expressions

Expression	Details
conductance	Value defined by SCPI. It can be MAXimum or MINimum. May include suffix units such as mS, $\mu$ S, and S.
current	Value defined by SCPI. It can be MAXimum or MINimum. May include suffix units related to current such as mA, $\mu$ A, and A.
power	Value defined by SCPI. It can be MAXimum or MINimum. May include suffix units related to wattage such as mW, $\mu$ W, and W.
status-enable	A 16-bit status mask for any CONDition register that determines which bits are to be used for synthesizing the summary bit of that register.
slew	Numeric data defined by SCPI, representing the current change with respect to a time interval.
step	Step number of a sequence program. In normal sequence mode, up to 256 steps can be shared among all programs (10 programs).
string	String data. ASCII codes 20H to 7EH can be used.
time	Time of the auto sequence step represented using hh:mm:ss.s format. May contain suffix units related to time such as S, MIN, and HR. By default, the value is in seconds.
value	Numerical data including MAXimum and MINimum. See the program data of each command.
voltage	Value defined by SCPI. It can be MAXimum or MINimum. May include suffix units related to voltage such as mV, $\mu$ V, and V.

## IEEE 488.2 commands

SCPI command	Description	Query
*CLS	Clears the status data structures.	N/A
*ESE	Sets the standard event status enable register bits.	Yes
*ESR?	Queries the standard event status register.	Query only
*IDN?	Queries the identification string. (Manufacturer information)	Query only
*OPC	Causes the device to generate the operation complete message in the standard event status register when all pending selected device operations have been finished.	Yes
*RCL <value>	Restores the current settings of the device from a copy stored in local memory.	N/A
*RST	Performs a device reset. Configures the PLZ-4W/PLZ-4WL/PLZ-4WH to a known condition independent from the usage history of the device.	N/A
*SAV <value>	Stores the current settings of the device to local memory.	N/A
*SRE	Sets the service request enable register bits.	Yes
*STB?	Reads the status byte and the master summary status bit.	Query only
*TRG	Trigger command. This is analogous to the Group Execute Trigger interface message defined in IEEE 488.1. See section 6.1.4.2.5 of IEEE 488.2.	N/A
*TST?	Since there is no self-test function built into the PLZ-4W/PLZ-4WL/PLZ-4WH, an ASCII character 0 is always returned in the output queue in response to this query.	Query only
*WAI	Prevents the device from executing any further commands or queries until the No Operation Pending flag is true. (*OPC?)	N/A

## Measurement commands

SCPI command	Description	Query	Note 1	Note 2
MEASure[:SCALar]:				
:CURRent[:DC]?	Reads the measured current.	Query only	1	
:POWer[:DC]?	Reads the measured power.	Query only	1	
:VOLTage[:DC]?	Reads the measured voltage.	Query only	1	
MEASure:ETIME?	Reads the elapsed time of measurement.	Query only	3	

## Configuration and operation commands

SCPI command	Description	Query	Note 1	Note 2
[SOURCE:]FUNCTION[:MODE] {CC CV CP CR CCCV CRCV}	Sets the operation mode of the PLZ-4W/ PLZ-4WL/PLZ-4WH.	Yes	3	†
[SOURCE:]CONDUCTANCE				
[:LEVEL][:IMMEDIATE][:AMPLITUDE] {<conductance> MINIMUM MAXIMUM}	Sets the conductance of CR mode.	Yes	3	†
:RANGE {LOW MEDIUM HIGH}	Sets the conductance range.	Yes	3	†
[SOURCE:]CURRENT				
[:LEVEL][:IMMEDIATE][:AMPLITUDE] {<current> MINIMUM MAXIMUM}	Set the current value.	Yes	1	†
:SLEW <slew>	Sets the current change with respect to the programmed time interval.	Yes	1	†
:PROTECTION[:LEVEL][:OVER] {<value> MINIMUM MAXIMUM}	Set the overcurrent protection level.	Yes	1	†
:PROTECTION:ACTION {LIMIT TRIP}	Sets whether to turn off the load or limit the current when the OCP trips.	Yes	3	†
:RANGE {LOW MEDIUM HIGH}	Sets the current range.	Yes	1	†
[SOURCE:]POWER				
[:LEVEL][:IMMEDIATE][:AMPLITUDE] {<power> MINIMUM MAXIMUM}	Set the wattage value.	Yes	1	†
:PROTECTION[:LEVEL][:OVER] {<value> MINIMUM MAXIMUM}	Set the overpower protection level.	Yes	1	†
:PROTECTION:ACTION {LIMIT TRIP}	Sets whether to turn off the load or limit the current when the OPP trips.	Yes	3	†
:RANGE {LOW MEDIUM HIGH}	Sets the power range.	Yes	1	†
[SOURCE:]VOLTAGE				
[:LEVEL][:IMMEDIATE][:AMPLITUDE] {<voltage> MINIMUM MAXIMUM}	Set the voltage value.	Yes	1	†
:PROTECTION[:LEVEL]UNDER {<voltage> MINIMUM MAXIMUM}	Set the overvoltage protection level.	Yes	3	†
:PROTECTION:STATE {OFF ON}	Turns ON/OFF the undervoltage protec- tion.	Yes	1	†
:RANGE {LOW HIGH}	Sets the voltage range.	Yes	1	†
[SOURCE:]FUNCTION				
:CTIME {OFF ON}	Sets the count time.	Yes	3	†
:RESPONSE {0.1 0.2 0.5 1.0 MINIMUM MAXIMUM}	Set the transient response speed. (PLZ- 4W only)	Yes	3	†
:RESPONSE:CR {NORMAL FAST}	Set the transient response speed for CR mode. (PLZ-4WL only)			
PLZ4WL :RESPONSE:CV {NORMAL FAST}	Set the transient response speed for CV mode. (PLZ-4WL/PLZ-4WH only)			
PLZ4WH :RESPONSE:CV {<value> MINIMUM MAXI- MUM}				
PLZ-4W :SSTART {1MS 2MS 5MS 10MS 50MS 100 MS 200MS }	Sets the soft start time for CC mode or CR mode.	Yes	3	†
PLZ-4WL :SSTART {0 0.1MS 0.5MS 1MS 2MS 5MS  10MS 20MS }				
[SOURCE:]PRESET				
:STORE {MEMA MEMB MEMC}	Stores the settings to ABC preset mem- ory.	N/A	3	
:RECALL {MEMA MEMB MEMC}	Recalls settings from ABC preset mem- ory.	N/A	3	

## Trigger commands

SCPI command	Description	Query	Note 1	Note 2
ABORT	Clears the trigger-wait status and returns to idle.	N/A	1	
INPut[:STATe]:TRIGgered {OFF ON}	Turns ON/OFF the trigger input.	N/A	1	
OUTPut[:STATe]:TRIGgered {OFF ON}	Turns ON/OFF the trigger input.	N/A	1	
INITiate				
[ :IMMediate]	Transitions to the trigger wait status, but automatically returns to idle when a trigger is activated.	N/A	1	
:CONTinuous {OFF ON}	Sets whether to continue the trigger wait status.	Yes	1	†
[SOURce:]				
CONDuctance[:LEVel]:TRIGgered[:AMP Litude] {<conductance> MINimum MAXimum}	Sets in advance the conductance generated when a trigger is activated.	N/A	3	†
CURRent[:LEVel]:TRIGgered[:AMPLitude] {<current> MINimum MAXimum}	Sets in advance the current when a trigger is activated.	N/A	1	†

## Switching function commands

SCPI command	Description	Query	Note 1	Note 2
[SOURce:]PULSe				
[ :STATe] {OFF ON}	Turns ON/OFF the switching mode.	Yes	3	†
:DCYcle <value>	Sets the switching duty cycle.	Yes	1	†
:PERiod <value>	Sets the pulse period.	Yes	1	†
:FREQuency <value>	Sets the pulse frequency.	Yes	3	†
[SOURce:]PULSe:LEVel				
[ :VALue]:CONDuctance <conductance>	Sets the conductance level.	Yes	3	†
:PERcentage:CONDuctance <value>	Sets the conductance level in terms of a percentage of the setting.	Yes	3	†
[ :VALue]:CURRent <current>	Sets the current level.	Yes	3	†
:PERcentage:CURRent <value>	Sets the current level in terms of a percentage of the setting.	Yes	3	†

## Input state commands

SCPI command	Description	Query	Note 1	Note 2
INPut/OUTPut				
[ :STATe][ :IMMediate] {OFF ON}	Turn ON/OFF the load.	Yes	1	†
:PROTection:CLEar	Clears the alarm.	N/A	3	
:SHORT[:STATe] {OFF ON}	Turns ON/OFF the short function.	Yes	3	
[ :STATe]:TIMer[:STATe] {<value> MINimum MAXimum}	Set the cutoff time.	Yes	3	†

## sequence commands

SCPI command	Description	Query	Note 1	Note 2
PROG:CLEar	Initializes the entire program.	N/A	3	
PROGRAM[:SELEcted]				
:STATe {TRUN RUN STOP PAUSE CONTinue}	Executes the selected program or changes the operating status.	N/A	1	
:EXECuting?	Queries the number of the program currently in operation.	Query only	1	
:NAME <value>	Specify the program name.	N/A	1	
:MEMO "<string>"	Sets the memo of the selected program.	Yes	3	
:MODE {NCC NCR NCV NCP FCC FCR}	Sets the mode of the selected program.	Yes	3	
:VRANge {LOW HIGH}	Sets the voltage range of the selected program.	Yes	3	
:CRANge {LOW MEDIum HIGH}	Sets the current range of the selected program.	Yes	3	
:LOOP <value>	Sets the number of program loops of the selected program.	Yes	3	
:LINPut {OFF ON}	Sets the load on/off condition after the sequence ends.	Yes	3	
:LOUTput {OFF ON}	Sets the load on/off condition after the sequence ends.	Yes	3	
:LVALue {<conductance> <current> <power> <voltage>}	When set to normal sequence, sets the current value after the specified program ends.	Yes	3	
:LVALue {<conductance> <current>}	When set to fast sequence, sets the current value after the specified program ends.	Yes	3	
:CHAIIn {OFF <value>}	Set the number of the program to be executed next.	Yes	3	
PROGRAM[:SELEcted]:NSPEEd[:STEP]				
:INSert <step>,{<conductance> <current> <power> <voltage>},<time>[,<input=1>][,<ramp=0>][,<trig=0>][,<pause=0>]	Inserts a normal sequence step into the selected program.	N/A	3	
:ADD {<conductance> <current> <power> <voltage>},<time>[,<input=1>][,<ramp=0>][,<trig=0>][,<pause=0>]	Adds a normal sequence step to the selected program.	N/A	3	
:DELEte[STEP]	Deletes the selected program sequence step.	N/A	3	
:DELEte:ALL	Deletes the all the steps of the selected program.	N/A	3	
:COUNT?	Queries the number of steps of the selected program.	Query only	3	
:EDIT <step>,{<conductance> <current> <power> <voltage>},<time>[,<input>][,<ramp>][,<trig>][,<pause>]	Edits an existing sequence step.	Yes	3	
PROGRAM[:SELEcted]:FSPEEd				
[ :STEP]:END <step>	Sets the end step of the fast sequence mode.	Yes	3	
[ :STEP]:EDIT[:POINT] <step>,<value>[,<trig>]	Edits an existing sequence step.	Yes	3	
:TIME <time>	Set the step execution time of the fast sequence mode.	Yes	3	
[ :STEP]:EDIT:LINEar <start-step>,<start-data>,<stop-step>,<stop-data>	Automatically calculates the values of each step using linear data between start and stop steps of the fast sequence mode.	N/A	3	
[ :STEP]:EDIT:WAVE <start-step>,<val1>,<val2>,<val3>,<val4>,<val5>,<val6>,<val7>,<val8>	Edits the waveform of the step of the fast sequence mode.	N/A	3	

## Other commands

SCPI command	Description	Query	Note 1	Note 2
SYSTem:CAPability?	Queries the SCPI instrument class.	N/A	1	
SYSTem:ERRor[:NEXT]?	Reads the error message from the error queue.	Query only	1	
SYSTem:GTLocal	Sets to local. (PLZ-4W only) (RS232, USB only)	N/A	1	
SYSTem:KLOCK:SElect {ALL SET}	Key Lock (PLZ-4WH only)	Yes	3	
SYSTem:KLOCK {OFF ON}	Key lock setting (PLZ-4WH only)	Yes	3	
SYSTem:LLOut	Sets the operation to remote. Locks the panel operation. (PLZ-4W only) (RS232, USB only)	N/A	1	
SYSTem:LOCal	Sets to local. (RS232, USB only)	N/A	1	
SYSTem:RENable	Sets the operation to remote. Locks the panel keys except the LOCAL switch. (PLZ-4W only) (RS232, USB only).	N/A	1	
SYSTem:REMOte	Sets the operation to remote. Locks the panel keys except the LOCAL switch. (RS232, USB only).	N/A	3	
SYSTem:RENSing {OFF ON}	Sets the remote sensing condition. (PLZ-4WL only)	Yes	3	
SYSTem:RWL {OFF ON}	Sets the operation to remote. Locks the panel operation. (RS232, USB only).	N/A	3	
SYSTem:VERSion?	Queries the SCPI version to which the PLZ-4W/PLZ-4WL/PLZ-4WH conforms.	Query only	1	

## Status commands

SCPI command	Description	Query	Note 1	Note 2
STATus:PRESet	Controls the auto power-on clearing of the service request enable register, event status enable register, parallel poll enable register, and other event enable registers.	N/A	1	
STATus:OPERation				
:CONDition?	Queries the condition of the register	Query only	1	
:ENABle <status-enable>	Enable register	Yes	1	
[ :EVENT ]?	Queries the event	Query only	1	
:NTR	Negative transition	Yes	1	
:PTR	Positive transition	Yes	1	
STATus:QUESTionable				
:CONDition?	Queries the condition of the register	Query only	1	
:ENABle <status-enable>	Enable register	Yes	1	
[ :EVENT ]?	Queries the event	Query only	1	
:NTR	Negative transition	Yes	1	
:PTR	Positive transition	Yes	1	
STATus:CSUMmary				
:CONDition?	Queries the condition of the register	Query only	3	
:ENABle <status-enable>	Enable register	Yes	3	
[ :EVENT ]?	Queries the event	Query only	3	
:NTR	Negative transition	Yes	3	
:PTR	Positive transition	Yes	3	

