1000 Series Remote Commands

All Commands are subject to change to accommodate improved functionality.

All commands followed by Carriage Return or Line Feed (ASCII 13 or 10) or both.

Replies:
Commands (excluding Reading commands) will give a response code.
Successful commands are followed by *0<cr><lf>.
Unrecognised commands are followed by *1<cr><lf>.
Commands with incorrect range are followed by *2<cr><lf>.
Commands with incorrect frequency are followed by *3<cr><lf>.
Commands with incorrect output values are followed by *4<cr><lf>.
Commands with incorrect calibration factors are followed by *5<cr><lf>.
Unauthorised commands are followed by *6<cr><lf>.
Correct commands with incorrect parameters are followed by *7<cr><lf>.
Overtemperature Error is *8<cr><lf>.
Output Error is *9<cr><lf>.

Command words are separated by a colon. A space is required between the command words and the parameters. Command words are not case sensitive.

Command	Format	Parameters
Transmit Reading	READ?	Only in: Adapter read-back ranges, Workstation Measure ranges
Set Output, autorange	o<value><prefix><unit>	<value> output value, defaults to current range units. <prefix> scales unit value, defaults to current range scale factor n u m k M <unit> defaults to current range units V - Voltage A - Current R - Resistance F - Capacitance H - Inductance
Set range	r<value>	<value> = 1-149 Allowed ranges dependent on selected options
Select AC Voltage Range	RANGE:AC:VOLTAGE<space> <value>,<accuracy> RANGE:AC:VOLT<space> <value>	value = 0.01 to 1000 Volts accuracy = 4-8 digits displayed
Select DC Voltage Range	RANGE:DC:VOLTAGE<space> <value> RANGE:DC:VOLT <space><value>	value = 0.1 to 1000
Select AC Current Range	RANGE:AC:CURRENT <space><value> RANGE:AC:CURR<space> <value>	value = 10^{-4} to 30

Select DC Current Range	RANGE:DC:CURRENT <space><value> RANGE:DC:CURR<space> <value>	value = 10^{-8} to 30
Select 2-Wire Resistance (previously selected measurement current)	RANGE:RES <space><value> RANGE:RESISTANCE <space><value>	value=1 to 10^{12}
Enter Workstation Mode	MODE:WORKSTATION 1	
Leave Workstation Mode	MODE:WORKSTATION 0	
Enter unlock code response	SYSTEM:UNLOCK <code>	code = unlock response Instrument will reboot to validate
Select adapter mode	adaptermode <n>	0=off
Select adapter subrange	adapterrange <n>	
Select adapter subrange - autorange	adapterrange a	
Adapter set zero	MODE:SETZERO	
Thermocouple Cold Junction : Manual (3000a)	KT<temp>	<temp> = -50 to 100 °C
Set Active PRT R0	PRTRZERO <resistance>	resistance = 25 to 1000 ohm
Select Active PRT	r95	
Reset to startup state	*RST	Returns to 200mV range and clears state
Reboot calibrator	SYSTEM:REBOOT	Processor reset
Reset to starting state	*RST	System state reset
Debug mode On	debug 1	Prints PWM Calculation
Debug mode Off	debug 0	
Identification String	*IDN?	

TDS Compatible

Command	Format	Parameters / Notes

Set Frequency	F \<value\>	*value*: allowed values depend on instrument specification
PWM preset	H\<index\>	index=0-8: 10%,20%,30%,40%,50%,60%,70%,80%,90%
Frequency Range: presets	H\<index\>	index=0-11: 1,10,100,1k,10k,20k,50k,100k,300k,500k,1M,10M
Frequency Range: variable	O\<frequency\>	frequency=1 up to 1000000 or 10000000
2-wire Resistance	I0	
Active Resistance	I2	
Thermocouple Cold Junction : Manual Zero	K0	
Thermocouple Cold Junction : Auto	K1	
Thermocouple Cold Junction : Manual (3000a)	KT\<temp\>	\<temp\> = -50 to 100 °C
Thermocouple Type	L\<type\>	\<type\> = {1,2,3,4,5,6,7,8}
Thermocouple Type (3000a)	L\<type\>	\<type\> = {K,J,T,R,S,E,N,B}
Power: Set Phase	M\<phase\>	\<phase\> = 0.0 to 359.9°
Calibration: set negative cal factor	N\<calfactor\>	\<calfactor\> range-dependent
Set Output, locked to current range	O\<value\>	\<value\> range-dependent, specified in range units.
Calibration: set positive cal factor	P\<calfactor\>	\<calfactor\> range-dependent
Set Range (TDS compatible ranges)	R\<range\>	\<range\> = 1 to 79
Standby Off	S0	No space
Standby On	S1	
Print Version Information	T	reply: Firmware Version Initialise Version (Always 1.0) Model Date Time *0
Print Option Information	U	reply: (16 char strings) Model Options 1 Options 2 Serial Cal Date Cal Due Cal Period Cert No

		Spare
		Spare
		Address
		Prev Cal Date
		Prev Cert No
		Prev Cal Date 2
		Prev Cert No 2
Print Cal Factors	V	For TDS Compatibility only
Print R/C/Ind Cal Factors	W	For TDS Compatibility only
Print displayed reading	X	reply: Primary Display Text Frequency *0
Print displayed reading (on 1Gohm Range)	X	reply: Value in MOhms 0 *0
Transmit Calibration Factors for current range (TDS-compatible)	Y	**reply:** Positive factor Negative factor Zero factor Misc. factor *0 Except for the ranges below: **DC:** P N Z **AC:** P N Z 40* Frequency Points 1-20 interleaved with 21-25 **Resistance:** P N Active Zero Active FS **Ind/Cap:** P N Z **Scope BW 5-600MHz:** 30* 32-bit Pairs at 20MHz intervals treat 5 as 0 Low 16-bits = n MHz High 16-bits = n+10 MHz **Scope Amplitude:** P P P P **In power Mode (AC or DC):** P N Z 20*FrequencyPoints
Calibration: set zero cal factor	Z<calfactor>	<calfactor> range-dependent

Start Calibration	a1	Allows calibration changes (indicated by shift LED)
Store Calibration	a2	Stores changes to current range in EEPROM
Abort Calibration	a0	Reloads values from EEPROM
Output Error Disable Off	e0	
Output Error Disable On	e1	
Local Mode	l	
Set pod relays	p<value>	<value> 24 bits as decimal: bits 0-7 = Pod 1 Relays 1-8 bits 8-15 = Pod 2 Relays 1-8 bits 16-23 = Pod 3 Relays 1-8 If any bits 24-31 are set, latch will **not** be strobed.
Read adapter A/D input	v	reply: Voltage in μV *0
Reset calibration factors for current range to default	x	Must be in cal mode
Store Information explain behaviours	&<Address> <Information>	Address = 2 digits {00-20} Information = string up to 20 characters
Display Fullscreen Message	#<text>	
Clear Fullscreen Message	#	

Setup

Command	Format	Parameters
Set D/A Low Bits	d_lowbits <n>	n=-3519 to +3519
Set D/A Mid Bits	d_lowbits <n>	n=0 to 249
Set D/A High Bits	d_lowbits <n>	n=0 to 249
	d_vco1 <f>	
	d_vco1 <f>	
	d_powerda <n>	n=0 to 65535
	d_phasestep <n>	
	d_setdds <f>	
	d_arda <n>	
	d_setlatch <latch>,<value>	
	d_scopelatch <latch>,<value>	
Set range description	MODE:TITLE <text>	text = string up to 20 characters. Underscore is displayed as space

Read range description	MODE:TITLE <range> ?	range = 135-144
Set range unit	MODE:UNIT <text>	
Read range unit	MODE:UNIT <range> ?	
Set number of decimal places displayed	MODE:SETDP <n>	n=0-6
Calibrate A/D converter negative, zero, positive.	MODE:ADCAL <measured>	Measured value must be close to nominal values -10, 0, +10

Calibration

Commands that change the calibration memory require the correct calibration password to be sent.

Command	Format	Parameters
Transmit Calibration Factors for current range	CALIBRATION:PRINT CAL:PRINT	
Transmit Calibration Factors for all ranges	CALIBRATION:PRINTALL CAL:PRINTALL	
Reset Calibration Factors for all ranges to default values	CALIBRATION: CLEARALLRANGES CAL: CLEARALLRANGES	
Set Calibration Factor Directly	CAL:SETCAL <range>,<type>,<calfactor>	<range>=1-149 <type> = 0,1,2,3 for P,N,Z,Misc 4-28 for AC factors 0-61 for Scope BW Factors <calfactor> depends on range
Transmit Calibration Event History	CAL:HISTORY	
Calibrate A/D input Zero	MODE:ADCAL 0	
Calibrate A/D input Positive Full Scale	MODE:ADCAL <value>	value > 5000 mV
Calibrate A/D input Negative Full Scale	MODE:ADCAL <value>	value < -5000 mV

Show Calibration History	CALIBRATE:HISTORY	

Frequency Limits

Range	Min	Max
200mV	10Hz	3010,3041: 500kHz 3050: 20kHz
2V	10Hz	3010: 1MHz 3041: 500kHz 3050: 100kHz
20V	10Hz	100kHz
200V	3010,3014: 30Hz 3050: 40Hz	3010: 40kHz 3050,3041: 20kHz
1kV	Up to 710V 3010,3014: 30Hz 3050: 40Hz Up to 1kV: 46Hz	3010,3041: 40kHz up to 350V 35kHz up to 450V 20kHz up to 710V 10kHz up to 1kV 3050: 10kHz all voltages
200uA	10Hz	10kHz
2mA	10Hz	10kHz
20mA	10Hz	10kHz
200mA	10Hz	10kHz
2A	10Hz	5kHz
30A	10Hz	1kHz

Calibration Points

AC Calibration Frequencies

Main full-scale and zero calibration at 206Hz.

Additional full-scale calibration at the following frequencies:
10,30,56,106,206,596,1000,2000,3500,5000,7500,10000,15000,20000,30000,40000,50000,60000,80000,100000,200000,400000,500000,750000,1000000;
Except 3050: 40Hz point replaces 30Hz.

Resistance Limits

	Low	High
1% default		
0R	.160	.220
0.1R	.260	.320
1R	1.15	1.3

10R	10	10.4
100R	100	100.4
1kR	990	1010
10kR	9.9k	10.1k
100kR	99k	101k
1MR	990k	1010k
10MR	9.9M	10.1M
100MR	99M	101M
1GR	950M	1050M
4-wire		
0R	0	
0.1R	0.09	0.11
1R	.95	1.05
10R	9.8	10.2
100R	99	101
1kR	990	1010
10kR	9.9k	10.1k
100kR	99k	101k
5% default		
1nF	1.01	1.12
10nF	9.5	10.5
20nF		
50nF		
100nF	95	105
1uF	950	1050
10uF	9.5	10.5
100uF	95	105
1mF		
10mF		
100mF		
10%		
1mH		
10m		
19m		
29m		
50m		
100m		
1		
10		

Procedure Commands

Command	Format	Parameters
Read Title	proc_title <number> ?	number=1-10
Set Title	proc_title <number>,<title>	title = string
Read Test Details	proc_test <number>,<test> ? Returns 5 lines: Nominal decimal point location Function Tolerance High Tolerance Low	
Set Test Details	proc_test <number>,<test>,<nominal>,<decimal>,<function>, <tolerance_high>,<tolerance_low>	<number> = procedure 1-10 <test> = test number 0-50 <nominal> = test nominal value (integer) <decimal> = decimal point location <function> = 1 : voltage 2 : current 3 : resistance <tolerance_high> <tolerance_low> floating-point value, maximum deviation from nominal
Example	proc_test 1,1,1234,3,1,0.001,0.001	Set procedure 1 test 1 to 1.234 V +-1mV