

MK2000B FW SCPI Command Reference Document

V3.16

Document Revision Notes

Rev.	Modification
V1.0	Original release.
V2.0	<ul style="list-style-type: none"> - Remove commands “COMMs:EENabled” and “COMMs:EENabled?” - Add commands “COMMs:PORT” and “COMMs:PORT?” - Add command “TEMPerature:ERRor?” - Add commands “TEMPerature:OPSLave? “, “TEMPerature:OPSLave” and ” TEMPerature:SLAVes?” - Add commands “TEMPerature:BATCh?” and “TEMPerature:BATCh”
V3.0	<ul style="list-style-type: none"> - Add command “TEMPerature:PURGe”
V3.1	<ul style="list-style-type: none"> - Modify return information of “TEMP:RTINformation?” command
V3.2	<ul style="list-style-type: none"> - Revise the description of profile loop begin command. - Add parameters for “TEMPerature:PURGe” command.
V3.3	<ul style="list-style-type: none"> - Add “PARAmeters:PBRW” command. - Add “PARAmeters:PBRW?” command. - Add “PARAmeters:PBFWversion?” command. - Add “TEMPerature:PRUpdate” command. - Add “TEMPerature:PR?” command. - Add “TEMPerature:PADupdate” command. - Add “TEMPerature:PAD?” command. - Add “UPGRade:PREPare” command.
V3.4	<ul style="list-style-type: none"> - Add “Temperature:UNIT?” command. - Add “Temperature:UNIT” command.
V3.5	<ul style="list-style-type: none"> - Remove “Temperature:UNIT?” command. - Remove “Temperature:UNIT” command. - Add “Temperature:TCUNit?” command. - Add “Temperature:TCUNit” command. - Add “Temperature:TMUNit?” command. - Add “Temperature:TMUNit” command.
V3.6	<ul style="list-style-type: none"> - Add “Temperature:R1AD?” command - Add “Temperature:R2AD?” command
V3.7	<ul style="list-style-type: none"> - Add “Temperature:SRANge?” command - Add “Temperature:SRANge” command - Add “Temperature:SPID” command - Add “Temperature:GPID” command - Add “Temperature:PID?” command - Add “Temperature:CHSWitch?” command - Add “Temperature:CHSWitch” command - Remove “Temperature:COOLing?” command - Remove “Temperature:COOLing” command - Remove “Temperature:HPID” command

	<ul style="list-style-type: none"> - Remove "Temperature:HPID?" command - Remove "Temperature:CPID" command - Remove "Temperature:CPID?" command -
V3.8	<ul style="list-style-type: none"> - Add "RTDH:I1Vimax" command - Add "RTDH:I1Vimax?" command - Add "RTDH:I2Vimax" command - Add "RTDH:I2Vimax?" command
V3.9	<ul style="list-style-type: none"> - Add "PARAMeters:BLVersion?" command
V3.10	<ul style="list-style-type: none"> - Remove "RTDH:I1Vimax" command - Remove "RTDH:I1Vimax?" command - Remove "RTDH:I2Vimax" command - Remove "RTDH:I2Vimax?" command - Add "TEMPerature:I1Source?" command - Add "TEMPerature:I2Source?" command - Add "TEMPerature:RTRange?" command
V3.11	<ul style="list-style-type: none"> - Add "PARAMeters:BRTIme?" command - Add "PARAMeters:BRTIme" command - Add "PARAMeters BUSER?" command - Add "PARAMeters BUSER" command - Add "PARAMeters:BFACTory?" command - Add "PARAMeters:BFACTory" command - Add "PARAMeters: BSAVe" command
V3.12	<ul style="list-style-type: none"> - Add "TEMPerature:PRECision?" command - Add "TEMPerature:STYPe?" command - Add "TEMPerature:STYPe:RSTChanged" command
V3.13	<ul style="list-style-type: none"> - Add "TEMPerature:PTEMPerature?" command
V3.15	<ul style="list-style-type: none"> - Add "TEMPerature:I1Range?" command - Add "TEMPerature:I2Range?" command - Add "TEMPerature:DPSWitch" command - Add "TEMPerature:DPOWER" command
V3.16	<ul style="list-style-type: none"> - Add "CALib:GCName" - Add "CALib:SCName" - Add "CALib:STAGe:STABLE" - Add "CALib:STAGe:GTABLE" - Add "PARAMeters:RPBParams" - Add "PARAMeters:BISTate?" - Add "PARAMeters:REStart" - Add "PARAMeters:SYS:SUSer" - Add "PARAMeters:SYS:SFACTory" - Add "PARAMeters:SYS:SBUSer" - Add "PARAMeters:SYS:SBFACTory" - Add "PARAMeters:SYS:GET:SUSer" - Add "PARAMeters:SYS:GET:SFACTory"

	<ul style="list-style-type: none">- Add "PARameters:SYS:GET:SBUSer"- Add "PARameters:SYS:GET:SBFactory"- Add "PARameters:SYS:LDEFault"- Add "PARameters:OWIN?"- Add "PARameters:STAGe:SAVe"- Add "PARameters:STAGe:LOAD"- Add "PARameters:GET:THERmocouple"- Add "PARameters:SET:THERmocouple"- Add "PARameters:FORMat"- Remove "PARameters:RTIME?"- Remove "PARameters:RTIME"- Remove "PARameters:USER?"- Remove "PARameters:USER"- Remove "PARameters:FACTory?"- Remove "PARameters:FACTory"- Remove "PARameters:BRTime?"- Remove "PARameters:BRTime"- Remove "PARameters:BUSer?"- Remove "PARameters:BUSer"- Remove "PARameters:BFACTory?"- Remove "PARameters:BFACTory"- Remove "PARameters:SAVe"- Remove "PARameters:BSAVe"
--	--

Index

Document Revision Notes	2
Index	5
1. Introduction.....	6
2. Commands	6
2.1 Using Commands.....	6
2.2 Device-Dependent Commands.....	7
2.2.1 Temperature Commands	12
2.2.2 Parameters Commands.....	26
2.2.3 Communication commands.....	30
2.2.4 Calibration commands	33
2.2.5 Profile commands.....	35
2.2.6 Upgrade commands.....	39
2.2.7 System command	39

1. Introduction

The document introduces the SCPI commands supported by MK2000B, which is only a simplified version of SCPI standard.

2. Commands

2.1 Using Commands

Syntax

All commands use a common syntax for command construction and parameter passing. Commands are case-insensitive, and some commands have optional characters, which are denoted as lower-case characters in the command definition. For example, TEMPerature:CTEMperature? Can be shortened to TEMP:CTEM?. This allows for command abbreviation and therefore reduced communication times.

If a command requires one or more parameters, place a space between the command and the first parameter, then use a comma to separate additional parameters. For example, the set cooling PID command might look like:

TEMP:CPID 2,0.1,0.01

Command Terminator

When sending commands to the instrument, you must terminate the command string with a carriage return (ASCII 13) or line feed (ASCII 10, or both. The instrument will not start processing a command, or go into remote mode until it has received a carriage return or feed command terminator.

Concatenation

It is also possible to concatenate multiple commands together as a single communication to the instrument. By using a semicolon, multiple commands can be sent to the instrument at once, but command processing will not start until all commands and the command terminator have been received. For example, to get system identification and set instrument to hold on 30°C, the command would look like:

***IDN?; TEMP:HOLD 30**

Command Paths

The command set is structured in a tree-like organization, where commands for a common

device or function are grouped together. For example, all commands specific to the device dependent command start with a “TEMPerature:” prefix. This is called the command path. When issuing multiple concatenated commands to the instrument, it “remembers” the command path of the previous command, and must omit the common path from the second command. For example, to set range and get range, it is shortened by omitting the second “TEMPerature” portion because when the RANG command is processed, the command parser “remembers” it’s position in the command tree and starts looking for the command at that level. The command therefore is shortened to this:

TEMP:RANG 300,-200; RANG?

2.2 Device-Dependent Commands

This section introduces the MK2000B dependent commands. Table 2.4 lists all the commands.

Table2.4 Interpreting Command Tables

KEYWORD	PARAMETER FORM	COMMENTS
*idn?	<string>,<string>,<string>,<string>	Query system id
:TEMPerature		
:RTINformation?		Query the runtime information.
:CTEMperature?		Query TC
:MTEMperature?		Query TM
:PTEMperature?		Query temperature of protection sensor
:HOLD	<numeric_value>	Set hold action
:RAMP	<numeric_value>,<numeric_value>	Set ramp action
:RPP	<numeric_value>	Set pp run action
:STOP		Set stop action
:PID?		Get current PID mode
:SPID	<numeric_value>,<numeric_value>,<numeric_value>,<numeric_value>,<numeric_value>	Set PID parameters
:GPID	<numeric_value>,<numeric_value>	Get PID parameters
:CHSWitch?		Query heating/cooling enabled status
:CHSWitch	<numeric_value>	Set heating/cooling enabled status
:RANGe?		Query TF range
:RANGe	<numeric_value>,<numeric_value>	Set TF range
:SRANGe?		Query stage range
:SRANGe	<numeric_value>,<numeric_value>	Set stage range
:I1Range?		Query input1 range
:I2Range?		Query input2 range
:TCSType	<numeric_value>	Set TC sensor type
:TCSType?		Query TC sensor type
:STATus?		Query system status
:SNUMber?		Query the serial number
:SPOint?		Query TF
:RATe?		Query RT
:POWer?		Query PP
:POWer	<numeric_value>	Set PP
:I1AD?		Query the AD value of input1
:I2AD?		Query the AD value of input2
:R1AD?		Query the AD value of input1 Room
:R2AD?		Query the AD value of input2 Room
:AUTo	<Boolean>	Enable or Disable the auto uploading real time information
:AUTo?		Get the status of auto uploading real time information
:TP?		Query temperature from power board
:ERRor?		Query current error number

:OPSLave?		Query current operation slave
:OPSLave	<numeric_value>	Set current operating slave
:SLAVes?		Query total slave number
:BATCh?		Query if batch mode is enabled
:BATCh	<Boolean>	Enable/disable batch mode
:PURGe	<numeric_value>,<numeric_value>	Set purge action
:PRUPdate		Update Powerboard RTD R value
:PR?		Get Power RTD R value
:PADupdate		Update Powerboard RTD AD value
:PAD?		Get Powerboard RTD AD value
:TCUNit	<numeric_value>	Get input1 unit
:TCUNit?		Set input1 unit
:TMUNit	<numeric_value>	Get input2 unit
:TMUNit?		Set input2 unit
:I1Source?		Get input1 source
:I2Source?		Get input2 source
:RTRange?		Get RT range
:DRANge?		Get default TF range
:PRECision?		Get PV/MV precision
:STYPe?		Get stage type, stage change switch, is stage type changed
:STYPe:RSTChanged		Reset stage type changed to 0
:DPSWitch	<numeric_value>	Enable/Disable dial power
:DPOWer	<numeric_value>	Set the value of dial power
PARameters:		
:SYS:GET:SUSer	<numeric_value>,<numeric_value>,<numeric_value>	Query the partial of the user parameters1
:SYS:SUSer	<numeric_value>,<numeric_value>,<ArbitraryBlock >	Set the partial of the user parameters1
:SYS:GET:SFACtory	<numeric_value>,<numeric_value>,<numeric_value>	Query partial of the factory parameters1
:SYS:SFACtory	<numeric_value>,<numeric_value>,<ArbitraryBlock >	Set partial of the user parameters1
:SYS:GET:SBUSer	<numeric_value>,<numeric_value>,<numeric_value>	Query partial of the user parameters2
:SYS:SBUSer	<numeric_value>,<numeric_value>,<ArbitraryBlock >	Set partial of the user parameters2
:SYS:GET:SBFACtory	<numeric_value>,<numeric_value>,<numeric_value>	Query partial of the factory parameters2
:SYS:SBFACtory	<numeric_value>,<numeric_value>,<ArbitraryBlock >	Set partial of the user parameters2
:SYS:LDEFault	<numeric_value>	Load factor default
:OWIN?		Query if there is a storage inside stage
:STAGe:SAVe	<numeric_value>	Save factory default parameters to stage
:STAGe:LOAD	<numeric_value>,<numeric_value>	Preload factory default parameters to RAM
:GET:THERmocouple	<numeric_value>	Get thermocouple parameters
:SET:THERmocouple	<numeric_value>,<ArbitraryBlock >	Set thermocouple parameters
:FORMat		Format EEPROM on board
:LDEFault		Load the factory parameters as the runtime parameters and user parameters.
:PBRW	<ArbitraryBlock >	Set powerboard parameters

:PBRW?		Get powerboard parameters
:PBFWversion?		Get powerboard fw version
:BLVersion?		Get bootloader version
:RPBParams		Read powerboard parameters to system
:BISate?		Query if the powerboard is bi-direction
:REStart		Restart system
COMMs:		
:PORT	<numeric_value>	Set communication port
:PORT?		Get current communication port
:IPMode	<numeric_value>	Set static IP or DHCP
:IPMode?		Query IP mode
:SIP	<numeric_value>,<numeric_value>,<numeric_value>,<n umeric_value>	Set the static IP
:SIP?		Query the static IP
:SMASK	<numeric_value>,<numeric_value>,<numeric_value>,<n umeric_value>	Set the static net mask
:SMASK?		Query the static net mask
:SGWay	<numeric_value>,<numeric_value>,<numeric_value>,<n umeric_value>	Set the static gateway
:SGWay?		Query the static gateway
:IP?		Query the runtime IP
:MASK?		Query the runtime net mask
:GWAY?		Query the runtime gateway
:MAC	<numeric_value>,<numeric_value>,<numeric_value>,<n umeric_value>,<numeric_value>,<numeric_value>	Set the mac address
:MAC?		Query the mac address
CALib:		
:PASSword	<numeric_value>	Input the calibration table password
:PVERified?		Query the correctness of the password input
:SPASSword	<numeric_value>	Set the calibration table password
:STABLE	<ArbitraryBlock >	Set the calibration table
:GTABLE	<numeric_value>	Query the calibration table
:ATCTable	<numeric_value>	Set the active TC calibration table
:ATCTable?	<numeric_value>	Query the active TC calibration table
:GCName	<numeric_value>	Query the name of a calibration table
:SCName	<numeric_value>,"<string>"	Set the name of a calibration table
:STAGe:STABLE	<ArbitraryBlock >	Set the calibration table of stage
:STAGe:GTABLE	<numeric_value>	Query the calibration table of stage
PROFile		
:RTStare?		Query the profile status
:STARt	<numeric_value>	Start to run the profile
:PAUSE		Pause the profile running
:RESume		Resume the profile running

2.2.1 Temperature Commands

TEMPerature:RTINformation?

Synopsis Query current runtime information of all attached slaves

Syntax TEMPerature:RTINformation?

Details Return current runtime information of all attached slaves in string format.

MK:sx:tc:tm:tf:tt:rt:pp:s_status:p_status,p,i

Argument	Value	Description
MK	MK	fixed chars
Sx	1~4	current operating slave
tc		TC
tm		TM
tf		TF
tt		TT
rt		RT
pp	-1.0~1.0	PP
s_status		system status: 0-stop, 1-hold, 2-ramp, 5-pp_run 6-purge
p_status		Profile status: 0-stop, 1-run, 2-paused
p	0~4	Current Profile number
i	0~255	Current item number

TEMPerature:CTEMperature?

Synopsis Query current TC temperature

Syntax TEMPerature:CTEMperature?

Details Return current PV in the form of
subsys1[,subsys2][,subsys3][,subsys4]

TEMPerature:MTEMperature?

Synopsis Query current TM temperature

Syntax TEMPerature:MTEMperature?

Details Return current PV in the form of
subsys1[,subsys2][,subsys3][,subsys4]

TEMPerature:PTEMperature?

Synopsis Query current temperature of protection sensor

Syntax TEMPerature:PTEMperature?

Details Return current temperature of protection sensor in
the form of subsys1[,subsys2][,subsys3][,subsys4]

TEMPerature:HOLD

Synopsis Run hold temperature control.

Syntax TEMPerature:HOLD tf

Details Set the set point temperature and start hold

Argument	Value	Description
tf	min to max value of range	tf, the set point temperature in °C

TEMPerature:RAMP

Synopsis Run ramp temperature control.

Syntax TEMPerature:RAMP tf,rt

Details Set the set point temperature and changing rate and start ramp.

Argument	Value	Description
tf	min to max value of range	The set point temperature in °C
rt	>0	Temperature change rate per minute in °C

TEMPerature:RPP

Synopsis Run PP control.

Syntax TEMPerature:RPP pp

Details start run pp

Argument	Value	Description
pp	-1~1	pp, power percentage

TEMPerature:STOP

Synopsis Stop temperature control

Syntax TEMPerature:STOP

Details Stop temperature control if the controller is in hold /ramp/pp run. Do nothing if the controller is in idle.

TEMPerature:HPID

Synopsis Set the heating PID.

Syntax TEMPerature:HPID P,I,D

Details Set the heating PID values.

Argument	Value	Description
P	>0	The Proportional term,
I	>=0	The Integral term
D	>=0	The Derivative term

TEMPerature:HPID?

Synopsis Get the value of heating PID.

Syntax TEMPerature:HPID?

Details Return the value of heating PID in the order of P, I and D.

TEMPerature:CPID

Synopsis Set the cooling PID.

Syntax TEMPerature:CPID P,I,D

Details Set the cooling PID values.

Argument	Value	Description
P	>0	The Proportional term,
I	>=0	The Integral term
D	>=0	The Derivative term

TEMPerature:CPID?

Synopsis Get the value of cooling PID.

Syntax TEMPerature:CPID?

Details Return the value of cooling PID in the order of P, I and D.

TEMPerature:PID?

Synopsis Get the value of current PID.

Syntax TEMPerature:PID?

Details Return the value of current PID in the order of P, I and D.

TEMPerature:SPID

Synopsis Set PID.

Syntax TEMPerature:SPID Type,Index,T,P,I,D

Details Set the cooling PID values.

Argument	Value	Description
Type	0	Heating PID in Heating&Cooling
	1	Cooling PID in Heating&Cooling
	2	Heating PID in Heating only
	3	Cooling PID in Cooling only
Index	0~7	PID index in PID table
T		Temperature
P	>0	The Proportional term,
I	>=0	The Integral term
D	>=0	The Derivative term

TEMPerature:GPID

Synopsis Get PID.

Syntax TEMPerature:GPID Type,Index

Details Get the PID values in form of Type,Index,T,P,I,D.

Argument	Value	Description
Type	0	Heating PID in Heating&Cooling
	1	Cooling PID in Heating&Cooling
	2	Heating PID in Heating only
	3	Cooling PID in Cooling only
Index	0~7	PID index in PID table
T		Temperature
P	>0	The Proportional term,
I	>=0	The Integral term
D	>=0	The Derivative term

TEMPerature:CHSWitch

Synopsis Set cooling/heating state.

Syntax TEMPerature:CHSWitch status

Details Enable or disable cooling.

Argument	Value	Description
status	0	Heating Only
	1	Heating and Cooling
	2	Cooling Only

TEMPerature:CHSWitch?

Synopsis Get the cooling heating status.

Syntax TEMPerature:CHSWitch?

Details Return the cooling/heating status. 0 for heating only. 1 for heating&cooling, 2 for cooling only.

TEMPerature:RANGe

Synopsis Set the operation temperature range(TF range).

Syntax TEMPerature:RANGe maxTemp,minTemp

Details Set the operation temperature range.

Argument	Value	Description
minTemp	Depends on the stage type	minimum operation temperature
maxTemp	Depends on the stage type	maximum operation temperature

TEMPerature:RANGe?

Synopsis Get the operation temperature range(TF range).

Syntax TEMPerature:RANGe?

Details Return the max and min operation temperature.

TEMPerature:SRANge

Synopsis Set the stage temperature range(Stage range).

Syntax TEMPerature:SRANge maxTemp,minTemp

Details Set the operation temperature range.

Argument	Value	Description
minTemp	Depends on the stage type	minimum stage temperature
maxTemp	Depends on the stage type	maximum stage temperature

TEMPerature:SRANge?

Synopsis Get the stage temperature range(Stage range).

Syntax TEMPerature:SRANge?

Details Return the max and min stage temperature.

TEMPerature:I1Range?

Synopsis Get the input1 range.

Syntax TEMPerature:I1Range?

Details Return the max and min value of Input1.

TEMPerature:I2Range?

Synopsis Get the input2 range.

Syntax TEMPerature:I2Range?

Details Return the max and min value of Input2.

TEMPerature:TCSType

Synopsis Set the sensor type of TC channel.

Syntax TEMPerature:TCSType sensorType

Details Set the sensor type of TC channel.

Argument	Value	Description
sensorType	1	RTD
	2	Thermister
	3	Off
	6	Thermocouple

TEMPerature:TCSType?

Synopsis Get the sensor type of TC channel.

Syntax TEMPerature:TCSType?

Details Return the sensor type of TC channel.

Value	Description
1	RTD
2	Thermister
3	Off
6	Thermocouple

TEMPerature:STATUS?

Synopsis Get the system current status
Syntax TEMPerature:STATus?
Details Return the system current status.

Value	Description
0	Stop
1	Hold Run
2	Ramp Run
3	Pause
4	Profile Run
5	PP Run
6	Purge

TEMPerature:SNUMber?

Synopsis Get the system serial number.
Syntax TEMPerature:SNUMber?
Details Return the serial number.

TEMPerature:SPOint?

Synopsis Get the set point temperature.
Syntax TEMPerature:SPOint?
Details Return the set point temperature in °C.

TEMPerature:RATE?

Synopsis Get the temperature rate.
Syntax TEMPerature:RATE?
Details Return the temperature rate in °C/min.

TEMPerature:POWer?

Synopsis Get the runtime power value.
Syntax TEMPerature:POWer?
Details Return the runtime power value.

TEMPerature:POWer

Synopsis Set the power value.
Syntax TEMPerature:POWer pp
Details Set the power value.

Argument	Value	Description
pp	-1~1	Power value

TEMPerature:I1AD?

Synopsis Get the AD value of input1.
Syntax TEMPerature:I1AD?
Details Return the AD value of input1.

TEMPerature:I2AD?

Synopsis Get the AD value of input2.

Syntax TEMPerature:I2AD?

Details Return the AD value of input2.

TEMPerature:R1AD?

Synopsis Get the AD value of input1 Room.

Syntax TEMPerature:R1AD?

Details Return the AD value of input1 Room.

TEMPerature:R2AD?

Synopsis Get the AD value of input2 Room.

Syntax TEMPerature:R2AD?

Details Return the AD value of input2 Room.

TEMPerature:AUTo?

Synopsis Get the status of auto uploading real time information.

Syntax TEMPerature:AUTo?

Details Return the status of auto uploading real time information.

TEMPerature:AUTo

Synopsis Enable or Disable the auto uploading real time information.

Syntax TEMPerature:AUTo status

Details When enable the function, controller will upload the real time data automatically every second.

Argument	Value	Description
status	OFF	Disable
	On	Enable
	0	Disable
	1	Enable

TEMPerature:TP?

Synopsis Query the temperature of powerboard RTD .

Syntax TEMPerature:TP?

Details Return the temperature of Powrboard RTD.

TEMPerature:ERRor?

Synopsis Query the current error.

Syntax TEMPerature:ERRor?

Details Return the error number.

Value	Description
0	No error
1	TC is out of stage range
2	TC is out of TC range
3	TC is out of TM range
4	Hold/Ramp temperature if out of range
5	TCTM delta is out of rang

TEMPerature:OPSLave?

Synopsis Query the current operating slave.

Syntax TEMPerature:OPSLave?

Details Return the number of current operating slave.

TEMPerature:OPSLave

Synopsis Set the current operating slave.

Syntax TEMPerature:OPSLave n

Details Set the current operation slave. n <= total slave numbers

TEMPerature:SLAVes?

Synopsis Query the total slave number.

Syntax TEMPerature:SLAVes?

Details Return the number of total slaves.

TEMPerature:BATCh?

Synopsis Query the status of batch mode.

Syntax TEMPerature:BATCh?

Details Return the status of batch mode

Value	Description
0	Disabled
1	Enabled

TEMPerature:BATCh

Synopsis Enable or Disable the batch mode.

Syntax TEMPerature:BATCh status

Details Enable or disable the batch mode.

Argument	Value	Description
status	OFF	Disable
	On	Enable
	0	Disable
	1	Enable

TEMPerature:PURGe

Synopsis Configure/Enable purge action.

Syntax TEMPerature:PURGe [t1,t2]

Details Set purge action. If no t1 and t2, purge delay&hold time will use the values set in the user parameters.

Argument	Value	Description
t1	>=0	purge delay time(second).
t2	>0	purge hold time(second).

TEMPerature:PRUpdate

Synopsis Update Powerboard RTD R value in controller RAM.

Syntax TEMPerature:PRUpdate

Details Update Powerboard RTD R value in controller RAM. No return value.

TEMPerature:PR?

Synopsis Get Powerboard RTD R value

Syntax TEMPerature: PR?

Details Return powerboard RTD R value. Please execute “TEMPerature:PRUpdate” command before this command.

TEMPerature:PADupdate

Synopsis Update Powerboard RTD AD value in controller RAM.

Syntax TEMPerature: PADupdate

Details Update Powerboard RTD AD value in controller RAM. No return value.

TEMPerature:PAD?

Synopsis Get Powerboard RTD AD value

Syntax TEMPerature: PR?

Details Return powerboard RTD AD value. Please execute “TEMPerature:PADupdate” before this command.

TEMPerature:TCUNit?

Synopsis Get unit type of input1

Syntax TEMPerature:TCUNit?

Details Return the unit type.

Argument	Value	Description
	1	Temperature °C
	2	Temperature °F
	3	Temperature K
	4	Humidity %
	5	Pressure Pa
	6	Pressure Bar
	7	Pressure Psi
	8	Pressure Torr
	9	Pressure kPa

TEMPerature:TCUNit

Synopsis Get unit type of input1

Syntax TEMPerature:TCUNit u

Details Return

Argument	Value	Description
u	1	Temperature °C
	2	Temperature °F
	3	Temperature K
	4	Humidity %
	5	Pressure Pa
	6	Pressure Bar
	7	Pressure Psi
	8	Pressure Torr
	9	Pressure kPa

TEMPerature:TMUNit?

Synopsis Get unit type of input2

Syntax TEMPerature:TMUNit?

Details Return the unit type.

Argument	Value	Description
	1	Temperature °C
	2	Temperature °F
	3	Temperature K
	4	Humidity %
	5	Pressure Pa
	6	Pressure Bar
	7	Pressure Psi
	8	Pressure Torr
	9	Pressure kPa

TEMPerature:TMUNit

Synopsis Get unit type of input2

Syntax TEMPerature:TMUNit u

Details Return

Argument	Value	Description
u	1	Temperature °C
	2	Temperature °F
	3	Temperature K
	4	Humidity %
	5	Pressure Pa
	6	Pressure Bar
	7	Pressure Psi
	8	Pressure Torr
	9	Pressure kPa

RTDH:I1Vimax

Synopsis Set the Vamax and Iamax for input1 RTD_H.

Syntax RTDH:I1Vimax Vamax,Iamax

Details Set the Vamax and Iamax for input1 RTD_H.

Argument	Value	Description
Vamax	Depends on the stage type	Va max
Iamax	Depends on the stage type	Ia max

RTDH:I1Vimax?

Synopsis Get the Vamax and Iamax for input1 RTD_H.

Syntax RTDH:I1Vimax?

Details Return the Va max and Ia max.

RTDH:I2Vimax

Synopsis Set the Vamax and Iamax for input2 RTD_H.

Syntax RTDH:I2Vimax Vamax,Iamax

Details Set the Vamax and Iamax for input2 RTD_H.

Argument	Value	Description
Vamax	Depends on the stage type	Va max
Iamax	Depends on the stage type	Ia max

RTDH:I2Vimax?

Synopsis Get the Vamax and Iamax for input2 RTD_H.

Syntax RTDH:I2Vimax?

Details Return the Va max and Ia max.

TEMPerature:RTRange?

Synopsis Get the RT range.

Syntax TEMPerature:RTRange?

Details Return the max and min RT.

TEMPerature:I1Source?

Synopsis Get Input1 source

Syntax TEMPerature:I1Source?

Details Return the source of input1.

Argument	Value	Description
	0	Off
	1~13	Input Source 1~13

TEMPerature:I2Source?

Synopsis Get Input2 source

Syntax TEMPerature:I2Source?

Details Return the source of input2.

Argument	Value	Description
	0	Off
	1~13	Input Source 1~13

TEMPerature:DRANge?

Synopsis Get the default operation temperature range(TF range).

Syntax TEMPerature:DRANge?

Details Return the max and min default operation temperature.

TEMPerature:PRECision?

Synopsis Get the display precision of PV and MV.

Syntax TEMPerature:PRECision?

Details Return the display precision of PV and MV(0~4).

TEMPerature:STYPe?

Synopsis Get the stage type, stage change switch and stage type changed state.

Syntax TEMPerature:STYPe?

Details Return the information in the order of StageType,StageChangeSwitch,IsStageTypeChanged.

Argument	Value	Description
StageType		0-NA,1-TEC,2-RES,3-PWM,4-DAC
StageChangeSwitch		0-Off, 1-On
IsStageTypeChanged		0-Not changed, 1-Changed

TEMPerature :STYPe:RSTChanged

Synopsis Get the display precision of PV and MV.

Syntax TEMPerature:STYPe:RSTChanged

Details Set IsStageTypeChanged to 0

TEMPerature: DPSWitch

Synopsis Disable/Enable dial power.

Syntax TEMPerature: DPSWitch status

Details Disable/Enable dial power.

Argument	Value	Description
Status	0	Disable
	1	Enable

TEMPerature: DPOWer

Synopsis Set the value of dial power.

Syntax TEMPerature: DPOWer pp

Details Set the value of dial power.

Argument	Value	Description
pp	-1~0	add to cooling pp

2.2.2 Parameters Commands

PARAmeters:SYS:GET:SUSer

Synopsis Get partial of the user parameter 1

Syntax PARAmeters:SYS:GET;SUSer slave,offset,len

Details Return the user parameters data in ArbitraryBlock format.

Argument	Value	Description
Slave	1~4	slave number
Offset		data offset
Len		data len

PARAmeters:SYS:SUSer

Synopsis Set partial of the user parameter 1.

Syntax PARAmeters:SYS:SUSer slave,offset,data

Details .

Argument	Value	Description
Slave	1~4	slave number
Offset		data offset
Data		data

PARAmeters:SYS:GET:SFACTory

Synopsis Get partial of the factory parameter 1.

Syntax PARAmeters:SYS:GET:SFACTory slave,offset,len

Details Return the factory parameters data in ArbitraryBlock format.

Argument	Value	Description
Slave	1~4	slave number
Offset		data offset
Len		data len

PARAmeters:SYS:SFACTory

Synopsis Set partial of the factory parameter 1.

Syntax PARAmeters:SYS:SFACTory slave,offset,data

Details Set partial the factory parameter 1.

Argument	Value	Description
Slave	1~4	slave number
Offset		data offset
Data		data

PARAmeters:SYS:GET:SBUSer

Synopsis Get partial of the user parameter 2

Syntax PARAmeters:SYS:GET;SBUSer slave,offset,len

Details Return the user parameter 2 data in ArbitraryBlock format.

Argument	Value	Description
Slave	1~4	slave number
Offset		data offset
Len		data len

PARAmeters:SYS:SBUser

Synopsis Set partial of the user parameter 2.

Syntax PARAmeters:SYS:SBUser slave,offset,data

Details .

Argument	Value	Description
Slave	1~4	slave number
Offset		data offset
Data		data

PARAmeters:SYS:GET:SBFactory

Synopsis Get partial of the factory parameter 2.

Syntax PARAmeters:SYS:GET:SBFactory slave,offset,len

Details Return the factory parameters data in ArbitraryBlock format.

Argument	Value	Description
Slave	1~4	slave number
Offset		data offset
Len		data len

PARAmeters:SYS:SBFactory

Synopsis Set partial of the factory parameter 2.

Syntax PARAmeters:SYS:SBFactory slave,offset,data

Details Set partial the factory parameter 2.

Argument	Value	Description
Slave	1~4	slave number
Offset		data offset
Data		data

PARAmeters:SYS:LDEFault

Synopsis Load the factory parameters as the runtime parameters and user parameters.

Syntax PARAmeters:SYS:LDEFault slave

Details Load the factory parameters as the runtime parameters and user parameters.

Argument	Value	Description
Slave	1~4	slave number

PARAmeters:LDEFault

Synopsis Load the factory parameters as the runtime parameters and user parameters.

Syntax PARameters:LDEFault

Details Load the factory parameters as the runtime parameters and user parameters.

PARAmeters:OWIN?

Synopsis Query if there is a storage inside the stage

Syntax PARAmeters:OWIN?

Details Return 1 for yes. Return 0 for no.

PARAmeters:STAGe:SAVe

Synopsis Save the factory parameters to storage in stage.

Syntax PARAmeters:STAGe:SAVe slave

Details Save the factory parameters on board to storage in stage.

Argument	Value	Description
Slave	1~4	slave number

PARAmeters:STAGe:LOAD

Synopsis Preload factory default parameters to RAM.

Syntax PARAmeters:STAGe:LOAD slave,IsFromStage

Details Preload factory default parameters to RAM.

Argument	Value	Description
Slave	1~4	slave number
IsFromStage	0/1	0-load from EEPROM on board; 1-load from storage in stage

PARAmeters:GET:THERmocouple

Synopsis Get thermocouple related parameters.

Syntax PARAmeters:GET:THERmocouple type

Details Return thermocouple related parameters.

Argument	Value	Description
type	1~7	Thermocouple type K,B,S,E,T,J,N

PARAmeters:SET:THERmocouple

Synopsis Set thermocouple related parameters.

Syntax PARAmeters:SET:THERmocouple type,data

Details Set thermocouple related parameters.

Argument	Value	Description
type	1~7	Thermocouple type K,B,S,E,T,J,N
data		thermocouple parameters

PARAmeters:FORMAt

Synopsis Format EEPROM on board.

Syntax PARAmeters:FORMAt

Details Format the EEPROM on board.

PARAmeters:PBRW

Synopsis	Set the powerboard read&write parameters.	
Syntax	PARAmeters:PBRW strParams	
Details	Set the powerboard parameters.	
	Argument	Value Description
	strParams	powerboard read and write parameters struct data in ArbitraryBlock format

PARAmeters: PBRW?

Synopsis	Get the powerboard read&write parameters.
Syntax	PARAmeters: PBRW?
Details	Return the powerboard read and write parameters struct data in ArbitraryBlock format.

PARAmeters: PBFWversion?

Synopsis	Get the powerboard fw version parameters.
Syntax	PARAmeters: PBFWversion?
Details	Return the powerboard fw version.

PARAmeters: BLVersion?

Synopsis	Get the bootloader version.
Syntax	PARAmeters: BLVersion?
Details	Return the bootloader version.

PARAmeters:RPBParams

Synopsis	Read powerboard parameters to controller.
Syntax	PARAmeters:RPBParams
Details	Read powerboard parameters to controller.

PARAmeters:BIState

Synopsis	Get the bi-direction state of powerboard.
Syntax	PARAmeters:BIState
Details	Return 1 for bi-direction powerboard. Return 0 for single direction powerboard

PARAmeters:REStart

Synopsis	Restart system.
Syntax	PARAmeters:REStart
Details	Restart system.

2.2.3 Communication commands

COMMs:EEEnabled

Synopsis Enable or disable Ethernet.

Syntax COMMs:EEEnabled status

Details Enable or disable Ethernet.

Argument	Value	Description
status	OFF	Disable Ethernet
	On	Enable Ethernet
	0	Disable Ethernet
	1	Enable Ethernet

COMMs:EEEnabled?

Synopsis Query Ethernet status.

Syntax COMMs:EEEnabled?

Details Return the Ethernet status.

Value	Description
0	Ethernet Disabled
1	Ethernet Enabled

COMMs:PORT

Synopsis Set communication port. System performs a restart.

Syntax COMMs:PORT p

Details Set communication port to USB or Ethernet, then system performs a restart.

Argument	Value	Description
p	0	Ethernet
	1	USB

COMMs:PORT?

Synopsis Query current communication port.

Syntax COMMs:PORT?

Details Return the current communication port.

Value	Description
0	Ethernet
1	USB

COMMs:IPMode

Synopsis Set to use static IP or DHCP.

Syntax COMMs:IPMode mode

Details Set to use static IP or DHCP.

Argument	Value	Description
mode	0	using static IP
	1	using DHCP

COMMs:IPMode?

Synopsis Query Ethernet IP mode.
Syntax COMMs:IPMode?
Details Return the Ethernet IP Mode.

Value	Description
0	static IP
1	DHCP

COMMs:SIP

Synopsis Set the static IP.
Syntax COMMs:SIP ip0,ip1,ip2,ip3
Details Set the static IP.

COMMs:SIP?

Synopsis Query the static IP.
Syntax COMMs:SIP?
Details Return the static IP in ip0.ip1.ip2.ip3 format.

COMMs:SMASK

Synopsis Set the static net mask.
Syntax COMMs:SMASK ip0,ip1,ip2,ip3
Details Set the static net mask.

COMMs:SMASK?

Synopsis Query the static net mask.
Syntax COMMs:SMASK?
Details Return the static net mask in ip0.ip1.ip2.ip3 format.

COMMs:SGWay

Synopsis Set the static gateway.
Syntax COMMs:SGWay ip0,ip1,ip2,ip3
Details Set the static gateway.

COMMs:SGWay?

Synopsis Query the static gateway.
Syntax COMMs:SGWay?
Details Return the static gateway in ip0.ip1.ip2.ip3 format.

COMMs:IP?

Synopsis Query the runtime IP.
Syntax COMMs:IP?
Details Return the runtime IP in ip0.ip1.ip2.ip3 format.

COMMs:MASK?

Synopsis Query the runtime net mask.

Syntax COMMs:MASK?
Details Return the runtime net mask in ip0.ip1.ip2.ip3 format.

COMMs:GWAY?

Synopsis Query the runtime gateway.
Syntax COMMs:GWAY?
Details Return the runtime gateway in ip0.ip1.ip2.ip3 format.

COMMs:MAC

Synopsis Set the MAC address.
Syntax COMMs:MAC m1,m2,m3,m4,m5,m6
Details Set the MAC address.

Argument	Value	Description
m1~6	0~255	mac address

COMMs:MAC?

Synopsis Query the MAC address.
Syntax COMMs:MAC?
Details Return the MAC address. in m1-m2-m3-m4-m5-m6 format.

2.2.4 Calibration commands

CALib:PASSword

Synopsis Input calibration password to verify.
Syntax CALib:PASSword pwd
Details

Argument	Value	Description
pwd	0~999999	calibration password

CALib:PVERified?

Synopsis The correctness of the password input.
Syntax CALib:PVERified?
Details Return 1 when the input password is correct or 0 when the input password is not correct.

CALib:SPASsword

Synopsis Set the new calibration password.
Syntax CALib:SPASsword pwd

Details Set the new calibration password.

Argument	Value	Description
pwd	0~999999	calibration password

CALib:STABLE

Synopsis Set the calibration table.

Syntax CALib:STABLE tbl

Details Set the calibration table.

Argument	Value	Description
tbl	table struct	calibration table struct in ArbitraryBlock format

CALib:GTABLE

Synopsis Get the calibration table.

Syntax CALib:GTABLE num

Details Return the calibration table struct in ArbitraryBlock format.

Argument	Value	Description
num	1~4	TC calibration table 1~4
	0	TM calibration table

CALib:ATCTable

Synopsis Choose the active TC calibration table.

Syntax CALib:ATCTable num

Details Choose the active TC calibration table.

Argument	Value	Description
num	1~4	TC calibration table 1~4

CALib:ATCTable?

Synopsis Require the active TC calibration table number.

Syntax CALib:ATCTable?

Details Return the active TC calibration table number 1~4.

CALib:GCName

Synopsis Query the name of a TC calibration table

Syntax CALib:GCName num

Details Return the name of the TC calibration table.

Argument	Value	Description
num	1~4	TC calibration table 1~4

CALib:SCName

Synopsis Set the name of a TC calibration table

Syntax CALib:SCName num,"string"

Details Set the name of the TC calibration table.

Argument	Value	Description
num	1~4	TC calibration table 1~4
string	length < 10	table name

CALib:STAGe:STABLE

Synopsis Set the calibration table of stage.

Syntax CALib:STAGe:STABLE tbl

Details Set the calibration table of stage.

Argument	Value	Description
tbl	table struct	calibration table struct in ArbitraryBlock format

CALib:STAGe:GTABLE

Synopsis Get the calibration table of stage.

Syntax CALib:STAGe:GTABLE num

Details Return the calibration table struct in ArbitraryBlock format.

Argument	Value	Description
num	1~4	TC calibration table 1~4
	0	TM calibration table

2.2.5 Profile commands

PROFile:RTStAtE?

Synopsis Query the run time profile running states.

Syntax PROFile:RTStAtE?

Details Return the states in this format <state,p,i,>.

Argument	Value	Description
p	0~4	Profile index
I	0~255	Item index
State	0	Stopped
	1	Running
	2	Paused

PROFile:STARt

Synopsis Start to run a profile

Syntax PROFile:STARt p

Details Run the profile of index p.

Argument	Value	Description
p	0~4	Profile index

PROFile:PAUSe

Synopsis Pause the running profile

Syntax PROFile:PAUSe

Details Pause the running while a profile is running.

PROFile:RESume

Synopsis Resume to run the paused profile

Syntax PROFile:RESume

Details Resume the running when a profile is paused.

PROFile:STOP

Synopsis Stop the running of the profile

Syntax PROFile:STOP

Details Stop the running while a profile is running or paused.

PROFile:EDIT:PDElete

Synopsis Delete the profile

Syntax PROFile:EDIT:PDElete p

Details Delete the profile of index p.

Argument	Value	Description
p	0~4	Profile index

PROFile:EDIT:IDELete

Synopsis Delete the item from the profile

Syntax PROFile:EDIT:IDELete p,i

Details Delete the item from the profile.

Argument	Value	Description
p	0~4	Profile index
i	0~255	Item index

PROFile:EDIT:IINSert

Synopsis Insert the item to the profile

Syntax PROFile:EDIT:IINSert p,i,c,[b1],[b2]

Details Insert the item to the profile.

Argument	Value	Description
p	0~4	Profile index
i	0~255	Item index
c	0	the end item of a profile

1	Hold, b1 ->TF
2	Ramp, b1->TF, b2->RT
3	Wait, b1->wait time in minute
4	Loop begin,b1->loop times
5	Loop end
6	Purge, b1->t1, b2->t2
7	Stop
8	Cooling on
9	Cooling off
10	Run pp, b1->pp

PROFile:EDIT:IEDit

Synopsis Edit the item of the profile

Syntax PROFile:EDIT:IEDit p,i,c,[b1],[b2]

Details Edit the item of the profile.

Argument	Value	Description
p	0~4	Profile index
i	0~255	Item index
c	0	the end item of a profile
	1	Hold, b1 ->TF
	2	Ramp, b1->TF, b2->RT
	3	Wait, b1->wait time in minute
	4	Loop begin
	5	Loop end
	6	Purge, b1->t1, b2->t2
	7	Stop
	8	Cooling on
	9	Cooling off
	10	Run pp, b1->pp

PROFile:EDIT:ICOunt

Synopsis Get the total item count of the profile

Syntax PROFile:EDIT:ICOunt p

Details Get the total item count of the profile.

Argument	Value	Description
p	0~4	Profile index

PROFile:EDIT:IREad

Synopsis Get the item from the profile

Syntax PROFile:EDIT:IREad p,i

Details Get the item from the profile in format of c,b1,b2.

Argument	Value	Description
p	0~4	Profile index
i	0~255	Item index
c	0	the end item of a profile
	1	Hold, b1 ->TF
	2	Ramp, b1->TF, b2->RT
	3	Wait, b1->wait time in minute
	4	Loop begin
	5	Loop end
	6	Purge, b1->t1, b2->t2
	7	Stop
	8	Cooling on
	9	Cooling off
	10	Run pp, b1->pp

PROFile:EDIT:GNAME

Synopsis Get the profile name.

Syntax PROFile:EDIT:GNAME p

Details Return the profile name in string.

Argument	Value	Description
p	0~4	Profile index

PROFile:EDIT:SNAME

Synopsis Set the profile name.

Syntax PROFile:EDIT:SNAME p,name

Details Set the profile name.

Argument	Value	Description
p	0~4	Profile index
name	"string"	Profile name string(limited to 15 characters)

2.2.6 Upgrade commands

UPGRade:PREPare

Synopsis Prepare for fw upgrade.

Syntax UPGRade:PREPare

Details Prepare for fw upgrade.

2.2.7 System command

***idn?**

Synopsis Query system ID.

Syntax *idn?

Details Return system ID, which includes; Manufacturer Name, Model Number, Serial number, Firmware Version
