VIAVI

ALT-9000

Radio Altimeter Test Set
Remote Commands Manual

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Remote Commands Manual

22159915 / Rev 002

Part of CD: 22149666

Table of Contents

1

Introduction

Introduction

This chapter contains basic information for ALT-9000 remote operation. Refer to the ALT-9000 Operation Manual for general Test Set operation.

General Information

The ALT-9000 has the ability to be remotely controlled using the SCPI (Standard Commands for Programmable Instruments) communications protocol. SCPI is an instrument command language that promotes consistency, from the remote programming standpoint, between instruments of the same class and between instruments with the same functionality. SCPI is hardware independent and the commands are very verbose and easy to learn.

This document describes detailed information for operating the ALT-9000 in the remote operation mode, including configuration of the remote controller, syntactic meanings of the command set, and descriptions of the parameters used by the command set.

SCPI Structure

SCPI starts with a high-level block diagram of the functions of an instrument. Each functional block is broken down into smaller block diagrams. SCPI contains a hierarchy of commands called a subsystem that maps directly to the hierarchy of the block diagram.

Figure 1-1

All SCPI commands are based on a hierarchical tree structure consisting of keywords and parameters. Associated commands are grouped together under a common node in the hierarchy.

In the command tree the command on the left (A) is the root command. A tree pointer is used to decode the SCPI commands. On power up the pointer is at the root command

```
        Root         Level 1       Level 2

        A ──────────── B ──────────── E

                                      F

                                      G


                       C

                       D ──────────── H

                                      J
```
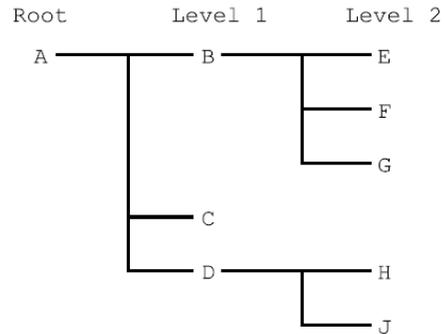
Figure 1-2

All SCPI commands are terminated by a line feed (0x0A). After termination the pointer is returned to the root.

Command Guidelines

The following guidelines should be followed when writing remote commands.

Command Short and Long Form

The elements of compound and query headers have a long and a short form, as defined by SCPI. Either the long or the short form may be entered as a command; other abbreviations are not permissible.

The short form is marked by upper case letters.

Long form corresponds to spelling out commands as complete words. Uppercase and lowercase syntax identify long form.

Queries always return the short form, or a numeric response in cases where the command provides a choice of numeric or character data.

Case Sensitivity

As indicated in the section titled `Command Short and Long Form`, ALT-9000 remote commands are not case sensitive. Upper and lowercase characters are completely interchangeable.

> **Example:**
>
> AFCounter1:AVERage 100 is interpreted the same as AFC1:AVER 100

Command Punctuation

Arrow Brackets < >

Text within angle brackets represents an actual value that needs to be inserted in the command string. For example, <n> or <x> indicate a variable that must be inserted in the command at this point.

> **Example:**
>
> AFCounter<n>:AVERage 100
>
> <n> must be defined with a valid value as follows: AFCounter1:AVERage 100

Choice Indicator

The vertical bar (|) separates a choice of parameters or commands.
For example, 0 | 1 means '0 or 1.'

Square Brackets [ ]

Square brackets [ ] indicate optional variables that do not need to be included in the command string, such as units of measurement.

Colon

A colon moves the current path down one level in the command tree. For example the colon in SYSTEM:MODE specifies MODE is one level below SYSTEM. When the colon is the first character of a command, it specifies that it is a root level command, e.g. :SYSTEM specifies that SYSTEM is a root level command.

Semicolon

A semicolon separates two commands in the same message without changing the command pointer.

For example, referencing the tree above:

> :A:B:E;F;G

This is the same as sending the three messages:

> :A:B:E
>
> :A:B:F
>
> :A:B:G

Commas

If a command requires more than one parameter, you must use a comma to separate adjacent parameters. Commas do not affect the command pointer. To execute a command the full path to it must be specified.

e.g.   :SYSTem:FADing:STATe ON

would turn fading on for simulation. Note that there must be a space between the command and the parameters.

In addition a node can be default node and these keywords are optional when using the command, the instrument will process the command to have the same effect whether the option node is omitted or not. This is denoted in throughout this manual by square brackets [].

e.g.   RALTimeter:DIAGnostics:TRANsmit:LEVel?

RALTimeter:DIAGnostics:LEVel?

Program Headers

Program headers are keywords that identify the command. There are two types of headers, common command and instrument control. Instruments do not distinguish between upper and lower case.

The common command syntax is:

> *<PROGRAM MNEMONIC>

These are used to control and extract data from the instrument. The instrument control syntax is:

> :<MNEMONIC>

> :<MNEMONIC><PARAMETER>

Most SCPI commands can be queried. A query is a command header with a question mark (?) appended to it. When a query command is received, the current settings associated with the command are placed into the output buffer.   Execution of the query will have no effect on the operation of the instrument

Queries have the syntax:

> *<PROGRAM MNEMONIC>?For common command

> :<MNEMONIC>?For instrument control

The parameter field of a command can contain several different types of data. These are explained in the subsections below.

The errors can be read by issuing the following command:

> :SYSTem:ERRor?

The response consists of an error number followed by a string that describes the error. When the Error Queue is empty the instrument responds with:

> 0,"No error"

Querying the error clears the storage location in the error buffer.

Table 1-1

Command	Description
*CLS	Clears the status and event registers.
*ESE	Standard Event Status Enable Register.
*ESE?	Returns the Standard Event Status Enable Register.
*ESR?	Returns the contents of the Standard Events Status.
*IDN?	Return Identity.
*OPC	Set bit 0 of the Standard Event Status Register when it completes all pending operations. Since there are no overlapped commands this will always return immediately.
*OPC?	Output '1' when pending operations complete.
*OPT?	Identify any reportable device options.*
*RST	System Reset.

*SRE	Service Request Enable.
*SRE?	Returns contents of Service Request Enable.
*STB?	Status Byte Register.
*TST?	Self Test.*
*WAI	Wait until all pending operations complete. Since there are no overlapped commands this will always return immediately.

* Not supported.

Program Data Elements

ALT-9000 Remote programming commands use the following data program elements:

Character Program Data (CPD)

Character Program Data is used to define a parameter best described as a short alpha or alphanumeric string.

Example:

AUD1

DEMod

Numeric Program Data

ALT-9000 Remote programming commands use the following numeric program elements:

Integer

Variable is numeric and does not contain a defined decimal point.

Example:

10

175

Decimal

Variable is numeric and does contain a defined decimal point.

Example:

12.5

825.0625

Binary

Variable is in binary format. Binary values are preceded with #b or #B.

Example:

#B1010

#B10101111

Hexadecimal

Variable is in hexadecimal format. Hexadecimal values are preceded with #h or #H.

Example:

#H3E8

#H1D4C

String Program Data

String program data consists of a number of ASCII characters enclosed in quotes. Use either pairs of single (ASCII 39) or double (ASCII 34) quotes, but do not mix single and double in a string. A quote within a string must be enclosed within an extra pair of quotes.

Example:

'This string contains the word ' 'Hello' ' '

is interpreted as

This string contains the word 'Hello'

and

"This string contains the word " "Hello" " "

is interpreted as

This string contains the word "Hello"

Hex-string

Uses characters 0-9 and A-F to produce hex pairs representing values from 0 to 255. There are no white spaces within the string.

ASCII-string

Example:

"Script File Test 1" which refers to the file being loaded.

Program Response Elements

ALT-9000 Remote programming commands use the following formats for response data:

Character Response Data (CRD)

Variable is returned as a short alpha or alphanumeric string.

Example:

DEM

AUD1

Numeric Response Data

ALT-9000 Remote programming commands use the following numeric response elements:

Integer

Variable is numeric and does not contain a defined decimal point.

Example:

10

175

Decimal

Variable is numeric and does contain a defined decimal point.

Example:

12.5

825.0625

Binary

Variable is in binary format. Binary values are preceded with #B.

Example:

#B1010

#B10101111

Hexadecimal

Variable is in hexadecimal format. Hexadecimal values are preceded with #H.

Example:

#H3E8

#H1D4C

String Response Data

This takes a similar form to String Program Data except that the delimiting character is always a double quote ("ASCII34").

Hex-string

Returns characters 0-9 and A-F to produce hex pairs representing values within specified parameter range. There are no white spaces within the string.

ASCII-string

Example:

"Call in progress."

Command Types

Set/Query Commands

The majority of the commands used within the ALT-9000's remote command structure support set and query functionality.

Set Commands

Set commands define a parameter.

Example:

RALTimeter:SETup:AID:MODE FIXed

The Set Command defines the type of AID to use.

Query Commands

Query commands use the same command structure as the set command, but contain a '?' at the end of the command string instead of a variable.

Example:

RALTimeter:SETup:CHANnel1:LEVel 50

RALTimeter:SETup:CHANnel1:LEVel?

The Set Command sets the power level to 50 dBm. The Query Command returns the current power level.

Action Only Commands

Action only commands initiate a specific function or action. These commands do not require parameters and can not be queried. Typical use of Action Only commands is to clear average or peak readings and to move markers on the instrument tiles and measurement graph tiles.

Example:

RALTimeter:TEST:STARt

Command starts a simulation. Command does not require a parameter, nor can it be queried.

Query Only Commands

Query only commands return information only. These commands do not define parameters. Measurement query commands or status commands are the main use of query only commands. All query commands must include a '?' at the end of the command string.

Example:

> RALTimeter:TEST:RUNNing?

Query command returns if simulation is running.

Some commands that are used to define a parameter can also be used as a query command by adding a '?' to the end of the command.

NOTE	Query response always returns short form. For example, VARiable and FIXed are returned as VAR and FIX.

Beginning a Session

To begin a session, telnet into the ALT-9000 using port 5025.

Linux

Telnet is provided on most Linux distributions. If the ALT-9000 has an IP address of 192.168.0.0, the command to begin a session would be: telnet 192.168.0.0 5025

Windows

A suitable program needs to be installed to allow telenet access. PUTTY is one program that works well in conjunction with Windows.

In PUTTY configuration, on the terminal page, select 'implicit CR in every LF'.

In PUTTY session page, enter the IP address, set port to 5025 and click telnet, then click open.
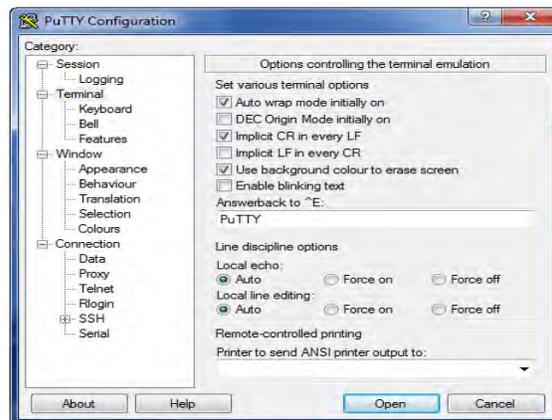
Figure 1-3 PUTTY setup options screen
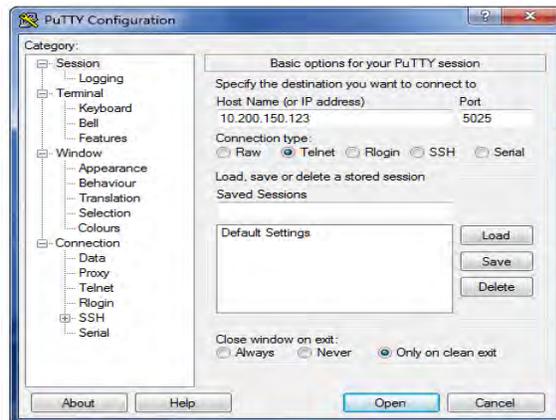
Figure 1-4 PUTTY setup basic options screen

2

Common Remote Commands

General

The following are IEEE mandated Remote Commands supported by the ALT-9000.

*CLS

Parameters:	None
Description:	Clear Status clears the Standard Event Status Register, the Error Queue, the Operation Status Event Register and the Questionable Status Event Register.
Example:	*CLS Clear the status reporting structure.

*ESE

Parameters:	Mask
Valid values:	Mask: integer. Valid values are 0 to 255. Values outside range are rejected and an error generated.
Description:	The Standard Event Status Enable command sets the Standard Event Status Enable Register. This is an eight bit register.
Example:	*ESE 1 Set the Standard Event Status Enable Register to 1 (00000001 in binary). This will allow OPC (Operation Complete) messages generated by the instrument to be reported in the Event Summary Bit. (OPC is issued by the instrument when an overlapped command completes and a *OPC command has been received).

*ESE?

Parameters:	None
Response:	Mask
Returned values:	Mask: integer. Values are in the range 0 to 255.
Description:	Read the Standard Event Status Enable Register. This is an eight bit register.
Example:	*ESE?

*ESR?

Parameters:	None
Response:	Register contents
Returned values:	Register contents: integer. Values are in the range 0 to 255.
Description:	Read the value of the Standard Event Status Register. This is an eight bit register.
Example:	*ESR?

*IDN?

Parameters:	None
Response:	Instrument Identification
Returned values:	Instrument Identification: string

Description:	The Identification Query command allows information about the instrument to be read.
	The Instrument Identification is split into five fields:
	    Manufacturer
	    Model
	    Serial number
	    Software Issue No.
	    Software build date
	
	Manufacturer returns name of manufacture
	
	Model returns the instrument model number ALT-9000.
	
	Serial number is in the form sssssssss (10 digits) where s is an ASCII digit in the range 0 to 9.
	
	Software Issue No. is in the form n.n.n where n are numbers in the range 0 to 99. Software build date is YYYYMMDDHHMM

Example:	*IDN? Read information on the instrument.
Example response:	Aeroflex, ALT-9000, 104000139, 2.5.0, 201409091525

*OPC

Parameters:	None
Description:	The Operation Complete command sets the Operation Complete bit in the Standard Event Status Register when execution of all overlapped commands have completed. This command is really only useful after an overlapped command when it will indicate when that command has been completed. Other (non-overlapped) commands can be executed whilst the overlapped command is still being executed. If there is more than one overlapped command being executed, the Operation Complete bit will only be set once all of the overlapped commands complete. *OPC should be the final <PROGRAM MESSAGE UNIT> of the <PROGRAM MESSAGE>.
Example:	*OPC Since there are no overlapped commands in the instrument, the Operation Complete bit will be set in the Standard Event Status Register immediately.

*OPC?

Parameters:	None
Response:	Operation complete
Returned values:	Operation complete: integer. Value is 1
Description:	The Operation Complete Query returns a '1' when all overlapped commands have completed.

This command is really only useful after an overlapped command when it will indicate when that command has been completed.

*OPC? should be the final <QUERY MESSAGE UNIT> of the <PROGRAM MESSAGE>.

Example:	*OPC?

Since there are no overlapped commands in the instrument, the value '1' will be placed in the output queue immediately.

*RST

Parameters:	None
Description:	Reset the instrument. This command places the instrument in its default state. This is the same state as when the instrument is first powered on. Appendix A lists reset settings and which parameters are not reset.
Example:	*RST Reset instrument to known state.

*SRE

Parameters:	Mask
Valid values:	Mask: integer. Valid values are 0 to 255. Values outside range are rejected and an error generated.
Description:	Set the Service Request Enable Register. This is an eight bit register.
Example:	*SRE 32 Set the Service Request Enable Register to 32 (0010 0000 in binary) to enable service requests when the Standard Event Status Register Summary Bit is set.

*SRE?

Parameters:	None
Response:	Mask
Returned values:	Mask: integer. Values are in the range 0 to 255.
Description:	Read the Service Request Enable Register. This is an eight bit register.
Example:	*SRE?

*STB?

Parameters:	None
Response:	Status byte
Returned values:	Status byte: integer. Values are in the range 0 to 255.
Description:	Read the Status Byte Register. This is an eight bit register. Bit 6 of the register contains the Master Summary Status. See Appendix A for details.
Example:	*STB?

*WAI

Parameters:	None
Description:	The Wait to Continue command inhibits execution of a command until the execution of all overlapped commands has been completed. This command is really only useful after an overlapped command when it will hold off further commands until that command has been completed. If there is more than one overlapped command being executed, the next command will be held off until all of the overlapped commands complete.
Example:	*WAI Since there are no overlapped commands in the instrument, *WAI will complete immediately.

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3

Configuration Remote Commands

Configuration Remote Command List

:CONFigure

    :BACKlight

    :BACKlight?

    :DATE

    :DATE?

    :DISK

        :AVAilable?

        :TOTal?

    :MEMory

        :AVAilable?

        :TOTal?

    :OTIMe?

    :SDCard

:FORMat

    :TCALibration

    :TEMPeratures?

    :TIME

    :TIME?

:VERSions?

Configuration Remote Command Descriptions

The set of CONFIgure remote commands control the ALT-9000 `configuration`.

CONFigure:BACKlight <var>

Description	Sets Test Set's LCD backlight.
Parameter	Integer Percentage of backlight
Range	0 - 100
Example	CONF:BACK 50 Sets backlight to 50%

CONFigure:BACKlight?

Description	Returns LCD backlight value
Return Value	Integer Backlight as a percentage
Example	CONF:BACK? 50

CONFigure:DATE <var>

Description	Sets Test Set's internal calendar.
Parameter	Date, string, formatted as "YYYY/MM/DD"
Range	NA
Example	CONF:DATE "2013/09/12" Sets internal calendar to September 12, 2013.

CONFigure:DATE?

Description	Returns current date setting.
Return Value	YYYY/MM/DD
Example	CONF:DATE? 2013/09/12

CONFigure:DISK:AVAilable?

Description	Amount of space available on the SD card.
Return Value	Integer - in bytes
Example	CONF:DISK:AVA? 3354368000

CONFigure:DISK:TOTal?

Description	Total amount of space available on the SD card.
Return Value	Integer - in bytes
Example	CONF:DISK:TOT? 3557776000

CONFigure:MEMory:AVAilable?

Description	Amount of RAM available.
Return Value	Integer - in bytes
Example	CONF:MEM:AVA? 14036000

CONFigure:MEMory:TOTal?

Description	Total amount of RAM.
Return Value	Integer - in bytes
Example	CONF:MEM:TOT? 124936000

CONFigure:OTIMe?

Description	Length of time the unit has been on.
Return Value	Integer - in seconds
Example	CONF:OTIM? 1240

CONFigure:SDCard:FORMat

Description	Formats the SD card. This will erase user data.
Parameter	NA
Range	NA
Example	CONF:SDC:FORM

CONFigure:TCALibration

Description	Touch Screen Calibration will be run on next boot.
Parameter	NA
Range	NA
Example	CONF:TCAL

CONFigure:TEMPeratures?

Description	Returns temperatures of system hardware in Celsius.
Return Value	ascii string
Example	CONF:TEMP? "RF Temperature Off (Temp Invalid!): 0,0;Power Supply Temperature: 35.0;Battery Temp Off (Temp Invalid!): 0.0;Slot 1 MIC284 Temperature: 38.0;Slot 1 OMAP Temperature: 49.8;Digital Board Temperature: 31.8"

CONFigure:TIME <var>

Description	Sets Test Set's internal clock.
Parameter	String time
Range	HH:MM:SS (24 Hour format)
Example	CONF:TIME "19:25:44" Sets internal clock to 7:25:44 PM.

CONFigure:TIME?

Description	Returns internal time.
Return Value	HH:MM:SS (24 Hour format)
Example	CONF:TIME? 19:25:44

CONFigure:VERSions?

Description	Returns hardware version information.
Return Value	ascii string
Example	CONF:VERS? "RF Card ID:139047 (8015);RF Card Revision: 4;RF Firmware Version: 1.02.00;Digital Board Card ID: 92879;Digital Board Card Revision: 1;Digital Board Firmware Version: 1.05.03;Slot 1 Actel PCI FPGA version: 1.0.03 12-14-2010;Slot 1 Control Board Revision: 1;Slot 1 Actel JTAG CPLD version: 1.0.04 11-19-2010;Power Supply Version: 1.00.08"

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4

Options Remote Commands

Options Remote Command List

- :OPTions
- :LIST?
- :UID?

Options Remote Commands

The following are Options Remote Commands for the ALT-9000.

OPTions:LIST?

Description	Returns a list of options enabled on the Test Set.
Return Value	String data, comma delimited
Example	OPT:LIST? ALT9000,ALL,1,-1,

OPTions:UID?

Description	Returns the Test Set's unique ID.
Return Value	Alphanumeric (hexadecimal), 12 characters
Example	OPT:UID? d4b417000000

Simulation Remote Commands

Command List

:RALTimeter

:ASIMulation

:CHANnel1:

ActualALTitude?

:MANual

:CHANnel1

:ALTitude

:ALTitude?

:RATE

:RATE?

:STARt

:STARt?

:STOP

:STOP?

:MODE

:MODE ?

:PROFile

:CHANnel1

:DATA

:DATA?

:MODified?

:NAME?

:RECall

:STORe

:RALTimeter

:ASIMulation

:PROFile (cont)

:COUNt?

:DELete

:DURation?

:LIST?

Simulation Remote Command Descriptions

The set of ASIMulation remote commands control the ALT-9000 altitude simulation.

There are three ways that the altitude simulation can be set up:

A single altitude.

A single ramp from one altitude to another at a fixed rate.

A sequence of single altitude/ramped altitude legs.

The first two of these are performed in manual mode. To select manual mode send RALT:ASIM:MAN:CHAN1:MODE MAN.

To setup a single altitude, set the rate to zero and set the start altitude to the required altitude.

Example for 250 ft:

RALT:ASIM:MAN:CHAN1:RATE 0

RALT:ASIM:MAN:CHAN1:STAR 250

To setup a single ramp, set the rate, then set the start and stop altitudes.

Example:

RALT:ASIM:MAN:CHAN1:RATE 300

RALT:ASIM:MAN:CHAN1:STAR 100

RALT:ASIM:MAN:CHAN1:STOP 400

The ramp from 100 ft to 400 ft will take exactly one minute at a rate of 300 ft/min.

To run a sequence of legs it is first necessary to create a profile and select it. The first leg of the profile is shown on the screen and the manual rate, start and stop query commands will return the current data (leg 1 when not running).

RALTimeter:ASIMulation:CHANnel1:ActualALTitude?

Description	Returns the Simulated Actual Altitude while running a simulation.
Return Value:	Altitude in Feet, Integers 0 to 10000 without option ALT-9000OPT1 **Note:** Additional altitudes of 16000 & 25000 feet with option ALT-9000OPT1
Example	RALT:ASIM:CHAN1:AALT? 1000

RALTimeter:ASIMulation:MANual:CHANnel1:ALTitude <var>

Description	Sets the simulated altitude. Can only set while running a simulation in Manual Mode and test paused. Used for static altitude entry.
Parameter	Altitude in Feet.
Range	Integers -20 to 8000. Values outside range are rejected and an error generated.
Example	:RALT:ASIM:MAN:CHAN1:ALT 1000 Set altitude simulation channel 1 altitude to 1000 feet.

RALTimeter:ASIMulation:MANual:CHANnel1:ALTitude?

Description	Returns the currently simulated altitude while running a simulation.
Return Value	Altitude in Feet, Integers -20 to 8000 feet
Example	:RALT:ASIM:MAN:CHAN1:ALT? 1000

RALTimeter:ASIMulation:MANual:CHANnel1:RATE <var>

Description	Sets the simulated altitude rate. Can only be set in Manual Mode when a simulation is not running.
Parameter	Altitude Rate in ft/min.
Range	Integers 0 to 120000. Values outside range are rejected and an error generated. Set 0 for static altitude. **Note:** When simulating a linear ramp, RATE parameter must be set before START or STOP altitude parameters.
Example	:RALT:ASIM:MAN:CHAN1:RATE 1000 Set altitude simulation channel 1 altitude rate to 1000 ft/min.

RALTimeter:ASIMulation:MANual:CHANnel1:RATE?

Description	Returns the simulated altitude rate.
Return Value	Altitude Rate in ft/min, Integer 1 to 120000
Example	:RALT:ASIM:MAN:CHAN1:RATE? 1000

RALTimeter:ASIMulation:MANual:CHANnel1:STARt <var>

Description	Sets the simulated start altitude. Used for creating a linear altitude ramp or a fixed altitude. Can only be set in Manual mode when a simulation is not running.
Parameter	Altitude in Feet.
Range	Integers -20 to 8000. Values outside range are rejected and an error generated. **Note:** When simulating a linear ramp, RATE parameter must be set before START or STOP altitude parameters.
Example	:RALT:ASIM:MAN:CHAN1:START 550 Set altitude simulation channel 1 start altitude to 550 feet.

RALTimeter:ASIMulation:MANual:CHANnel1:STARt?

Description	Returns the simulated start altitude.
Return Value	Altitude in Feet, Integers -20 to 8000 feet.
Example	:RALT:ASIM:MAN:CHAN1:START? 550

RALTimeter:ASIMulation:MANual:CHANnel1:STOP \<var>

Description	Sets the simulated stop altitude. Used for creating a linear altitude ramp. Can only be set in Manual Mode when a simulation is not running.
Parameter	Altitude in Feet.
Range	Integers -20 to 8000. Values outside range are rejected and an error generated. Note: When simulating a linear ramp, RATE parameter must be set before START or STOP altitude parameters..
Example	:RALT:ASIM:MAN:CHAN1:STOP 2500 Set altitude simulation channel 1 stop altitude to 2500 feet.

RALTimeter:ASIMulation:MANual:CHANnel1:STOP?

Description	Returns the simulated stop altitude.
Return Value	Altitude in Feet, Integer between -20 and 5500 feet.
Example	:RALT:ASIM:MAN:CHAN1:STOP? 2500

RALTimeter:ASIMulation:MODE \<var>

Description	Sets Manual (linear altitude ramp mode) or Profile (multi-leg altitude mode).
Parameter	Enumeration
Range	MANual or PROFile
Example	:RALT:ASIM:MODE MAN Manual altitude mode selected.

RALTimeter:ASIMulation:MODE?

Description	Determines whether the Manual or Profile altitude simulation mode is selected.
Return Value	MAN or PROF
Example	RALT:ASIM:MODE? MAN

RALTimeter:ASIMulation:PROFile:CHANnel1:DATA <var>

Description	Sets the Profile leg parameters. Used for creating an altitude profile.
Parameter	Number of legs, start altitude ft, stop altitude ft, altitude rate ft/min...
Range	Number of Legs: 1 to 20 Start Altitude ft: integers -20 to 8000. Stop Altitude ft: integers -20 to 8000. Altitude Rate ft/min: integers 1 to 120000. Values outside range are rejected and an error generated. **Note:** Data for all 20 legs must be defined prior to command being sent. Zero should be entered for all parameters for those legs not in use. **Note:** Legs must be set to the number of legs in use. **Note:** For a given leg, if Start = Stop, then the rate value defines time in seconds for level flight.
Example	:RALT:ASIM:PROF:CHAN1:DATA 2,0,500,50,500,2500,100,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0, 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0, 0,0,0 Creates a profile with 2 legs, starting at 0ft climbing to 500ft at 50ft/min then continuing from 500ft to 2500ft at 100ft/min

RALTimeter:ASIMulation:PROFile:CHANnel1:DATA?

Description	Returns the data for the current profile.
Return Value	Number of legs: 1 to 20 Start Altitude ft: -20 to 8000 Stop Altitude ft: -20 to 8000 Altitude Rate ft/min: 1 to 120000
Example	:RALT:ASIM:PROF:CHAN1:DATA? 2,0,500,50,500,2500,100,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0, 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0, 0,0,0

RALTimeter:ASIMulation:PROFile:CHANnel1:MODified?

Description	Returns if the profile has been modified or not.
Return Value	0 = profile not modified, 1 = profile modified
Example	:RALT:ASIM:PROF:CHAN1:MOD? 1

RALTimeter:ASIMulation:PROFile:CHANnel1:NAME?

Description	Returns the current profile name..
Return Value	Alpha Numeric 1 to 20 characters
Example	:RALT:ASIM:PROF:CHAN1:NAME? "Profile1" Note: If the profile has been modified an asterisk will be added, e.g. "Profile1*"

RALTimeter:ASIMulation:PROFile:CHANnel1:RECall <var>

Description	Recalls a named profile. Becomes the current profile.
Parameter	String
Range	Alpha Numeric 1 to 20 characters.
Example	:RALT:ASIM:PROF:CHAN1:REC "my Profile" Recall file my Profile

RALTimeter:ASIMulation:PROFile:CHANnel1:STORe <var>

Description	Stores the current profile under file name
Parameter	String
Range	Up to 20 Alpha Numeric Characters including Space
Example	:RALT:ASIM:PROF:CHAN1:STORE "B-747-400 Autoland" Save profile as B-747-400 Autoland

RALTimeter:ASIMulation:PROFile:COUNt?

Description	Returns a count of stored profiles.
Return Value	Integer
Example	:RALT:ASIM:PROF:COUN? 4

RALTimeter:ASIMulation:PROFile:DELete <var>

Description	Deletes the named profile.
Parameter	String
Range	Alpha Numeric 1 to 20 Characters including Space
Example	:RALT:ASIM:PROF:DEL "B-747-400 Autoland" Delete profile B-747-400 Autoland from disk.

RALTimeter:ASIMulation:PROFile:DURation?

Description	Returns the current profile duration in minutes.
Return Value	Integer in minutes
Example	:RALT:ASIM:PROF:DUR? 10

RALTimeter:ASIMulation:PROFile:LIST?

Description	Returns a list of stored profile file names.
Return Value	Comma separated string
Example	:RALT:ASIM:PROF:LIST? "myProfile","B-747-400Autoland"

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6

Calibration Remote Commands

Calibration Remote Command List

RFDMCAL (Added)

:RALTimeter

:CALibration

:ABORt

:RCW

:ADC?

:NEXT?

:PROMpt

:FREQuency?

:POWer?

:SAVE

:STARt

:STEP

:CURRent?

:TOTal?

:RALTimeter

:CALibration (cont)

:RPULse

:ADC?

:NEXT?

:PROMpt?

:SAVE

:STARt

:STEP

:CURRent?

:TOTal?

:TCXO

:SAVE

:STARt

:VALue

:VALue?

:TRANsmit

:NEXT?

:PROMpt

:FREQuency?

:POWer?

:SGENerator?

:TATTenuator?

:RATTenuator

:SAVE

:STARt

:STEP

:CURRent?

:TOTal?

:TATTenuator

:RALTimeter

:CALibration (cont)

:USER

:ACTive?

:STARt

:VATTenuator

:ACTive?

:COMPlete?

:STARt

:RFDMCAL

:STEP

:NEXT?

:CURRENT?

:CUR?

:START

:SAVE

:SET:

COILDELAY <real64>

COILLOSS <real64>

:CDATa

:RCW

:DATE?

:VALid?

:RPULse

:DATE?

:VALid?

:TCXO

:DATE?

:VALid?

:TRANsmit

:DATE?

:VALid?

:USER

:DATA?

:DATE?

:VALid?

:VATTenuator

:DATE?

:VALid?

Calibration Command Descriptions

The set of CALibration Remote Commands control the ALT-9000 calibration.

RALTimeter:CALibration:ABORt

Description	Aborts the factory calibration.
Parameter	NA
Range	NA
Example	:RALT:CAL:ABOR

RALTimeter:CALibration:RCW:ADC?

Description	Returns the Receiver CW ADC value.
Return Value	ADC value
Example	:RALT:CAL:RCW:ADC? 1500

RALTimeter:CALibration:RCW:NEXT?

Description	Proceeds to the next Receiver CW calibration step.
Return Value	Returns 0 when command has completed.
Example	:RALT:CAL:RCW:NEXT? 0

RALTimeter:CALibration:RCW:PROMpt:FREQuency?

Description	Returns current Receiver CW calibration frequency.
Return Value	Frequency in MHz
Example	:RALT:CAL:RCW:PROM:FREQ? 4100

RALTimeter:CALibration:RCW:PROMpt:POWer?

Description	Returns current Receiver CW calibration frequency.
Return Value	Power in dBm
Example	:RALT:CAL:RCW:PROM:POW? 10

RALTimeter:CALibration:RCW:SAVE

Description	Saves the Receiver CW calibration value. Can only be issued if all steps have been completed.
Parameter	NA
Range	NA
Example	:RALT:CAL:RCW:SAVE

RALTimeter:CALibration:RCW:STARt

Description	Starts the Receiver CW factory calibration.
Parameter	NA
Range	NA
Example	:RALT:CAL:RCW:STAR

RALTimeter:CALibration:RCW:STEP:CURRent?

Description	Returns the current Receiver CW calibration step.
Return Value	Current step number
Example	:RALT:CAL:RCW:STEP:CURR? 1

RALTimeter:CALibration:RCW:STEP:TOTal?

Description	Returns the total number of steps in the Receiver CW calibration.
Return Value	Total number of steps in the calibration
Example	:RALT:CAL:RCW:STEP:TOT? 11

RALTimeter:CALibration:RPULse:ADC?

Description	Returns the Receiver Pulse ADC value.
Return value	ADC value
Example	:RALT:CAL:RPUL:ADC? 1500

RALTimeter:CALibration:RPULse:NEXT?

Description	Proceeds to the next Receiver Pulse calibration step.
Return value	Returns 0 when command has completed.
Example	:RALT:CAL:RPUL:NEXT? 0

RALTimeter:CALibration:RPULse:PROMpt?

Description	Returns the pulse width.
Return value	75, 300, or 0. 0 means siggen RF off.
Example	:RALT:CAL:RPUL:PROM? 75

RALTimeter:CALibration:RPULse:SAVE

Description	Saves the Receiver Pulse calibration value. Can only be issued if all steps have been completed.
Parameter	NA
Range	NA
Example	:RALT:CAL:RPUL:SAVE

RALTimeter:CALibration:RPULse:STARt

Description	Starts the Receiver Pulse factory calibration.
Parameter	NA
Range	NA
Example	:RALT:CAL:RPUL:STAR

RALTimeter:CALibration:RPULse:STEP:CURRent?

Description	Returns the current Receiver Pulse calibration step.
Return value	Current step number
Example	:RALT:CAL:RPUL:STEP:CURR? 1

RALTimeter:CALibration:RPULse:STEP:TOTal?

Description	Returns the total number of steps in the Receiver Pulse calibration.
Return value	Total number of steps in the calibration
Example	:RALT:CAL:RPUL:STEP:TOT? 11

RALTimeter:CALibration:TCXO:SAVE

Description	Saves the Receiver TCXO calibration value. Can only be issued if all steps have been completed.
Parameter	NA
Range	NA
Example	:RALT:CAL:TCXO:SAVE

RALTimeter:CALibration:TCXO:STARt

Description	Starts the Receiver TCXO factory calibration.
Parameter	NA
Range	NA
Example	:RALT:CAL:TCXO:STAR

RALTimeter:CALibration:TCXO:VALue <var>

Description	Sets the TCXO value.
Parameter	Integer
Range	0-1023
Example	:RALT:CAL:TCXO:VAL 512

RALTimeter:CALibration:TCXO:VALue?

Description	Returns current TCXO value.
Return value	Integer
Example	:RALT:CAL:TCXO:VAL? 512

RALTimeter:CALibration:RFDMCAL:STEP:NEXT?

Description	Returns the next step number in the RFDM calibration.
Return value	Integer.
Example	:RALT:CAL:RFDMCAL:STEP:NEXT? 11

RALTimeter:CALibration:RFDMCAL:STEP:CUR?

Description	Returns the current step number in the RFDM calibration.
Return value	Integer.
Example	:RALT:CAL:RFDMCAL:STEP:CUR? 11

RALTimeter:CALibration:RFDMCAL:STARt

Description	Starts the RFDM factory calibration.
Parameter	NA
Range	NA
Example	:RALT:CAL:RFDMCAL:STAR

RALTimeter:CALibration:RFDMCAL:SAVE

Description	Saves the RFDM calibration value. Can only be issued if all steps have been completed.
Parameter	NA
Range	NA
Example	:RALT:CAL:RFDMCAL:SAVE

RALTimeter:CALibration:RDFMCAL:SET:COILDELAY <real64>

Description	Sets the delay for a specific coil
Parameter:	Real
Range:	Value in ns - No limits
Example	:RALT:CAL:RFDMCAL:SET:COILDELAY 42.7

RALTimeter:CALibration:RDFMCAL:SET:COILLOSS <real64>

Description	Sets the loss value for a specific coil
Parameter:	Real
Range:	Value in nB - No limits
Example	:RALT:CAL:RFDMCAL:SET:COILLOSS 3.57

RALTimeter:CALibration:USER:ACTive?

Description	Returns value indicating if Delay calibration is actively running.
Return Value	0 = not active, 1 = active
Example	:RALT:CAL:USER:ACT? 0

RALTimeter:CALibration:USER:STARt

Description	Starts the Delay calibration
Parameter range	NA
Example	:RALT:CAL:USER:STAR

RALTimeter:CALibration:VATTenuator:ACTive?

Description	Returns a value indicating whether the loopback calibration is actively running.
Return Value	0 = not active, 1 = active
Example	:RALT:CAL:VATT:ACT? 0

RALTimeter:CALibration:VATTenuator:COMPlete?

Description	Returns a value indicating how much of the loopback calibration is completed.
Return Value	0 - 100 percent
Example	:RALT:CAL:VATT:COMP? 42

RALTimeter:CALibration:VATTenuator:STARt

Description	Starts the Loopback calibration.
Parameter range	NA
Example	:RALT:CAL:VATT:STAR

RALTimeter:CDATa:RCW:DATE?

Description	Returns data and time of the last RX CW calibration.
Return Value	Comma separated time and date
Example	:RALT:CDAT:RCW:DATE? 10,32,55,2014,7,30 Shows time 10:32:55, Date July 30, 2014

RALTimeter:CDATa:RCW:VALid?

Description	Indicates if RX CW calibration is valid or invalid.
Return Value	1 = Valid, 0 = Invalid
Example	:RALT:CDAT:RCW:VAL? 1

RALTimeter:CDATa:RPULse:DATE?

Description	Returns date and time of the last RX Pulse calibration.
Return Value	Comma separated time and date
Example	:RALT:CDAT:RPUL:DATE? 10,32,55,2014,7,30 Shows time 10:32:55, Date July 30, 2014

RALTimeter:CDATa:RPULse:VALid?

Description	Indicates if RX Pulse calibration is valid or invalid.
Return Value	1 = Valid, 0 = Invalid
Example	:RALT:CDAT:RPUL:VAL? 1

RALTimeter:CDATa:TCXO:DATE?

Description	Returns date and time of the last TCXO calibration.
Return Value	Comma separated time and date
Example	:RALT:CDAT:TCXO:DATE? 10,32,55,2014,7,30 Shows time 10:32:55, Date July 30, 2014

RALTimeter:CDATa:TCXO:VALid?

Description	Indicates if TXCO calibration is valid or invalid.
Return Value	1 = Valid, 0 = Invalid
Example	:RALT:CDAT:TCXO:VAL? 1

RALTimeter:CDATa:TRANsmit:DATE?

Description	Returns date and time of the last TX calibration.
Return Value	Comma separated time and date
Example	:RALT:CDAT:TRAN:DATE? 10,32,55,2014,7,30 Shows time 10:32:55, Date July 30, 2014

RALTimeter:CDATa:TRANsmit:VALid?

Description	Indicates if TX calibration is valid or invalid.
Return Value	1 = Valid, 0 = Invalid
Example	:RALT:CDAT:TRAN:VAL? 1

RALTimeter:CDATa:USER:DATA?

Description	Returns the delay calibration values.
Return Value	Returns 2 integers, FMCW value first, then Pulse value (in ns)
Example	:RALT:CDAT:USER:DATA? 77, 77

RALTimeter:CDATa:USER:DATE?

Description	Returns date and time of the last delay calibration.
Return Value	Comma separated time and date
Example	:RALT:CDAT:USER:DATE? 10,32,55,2014,7,30 Shows time 10:32:55, Date July 30, 2014

RALTimeter:CDATa:USER:VALid?

Description	Indicates if delay calibration is valid or invalid.
Return Value	1 = Valid, 0 = Invalid
Example	:RALT:CDAT:USER:VAL? 1

RALTimeter:CDATa:VATTenuator:DATE?

Description	Returns date and time of the last loopback calibration.
Return Value	Comma separated time and date
Example	:RAL:CDAT:VATT:DATE? 10,32,55,2014,7,30 Shows time 10:32:55, Date July 30, 2014

RALTimeter:CDATa:VATTenuator:VALid?

Description	Indicates if delay loopback is valid or invalid.
Return Value	1 = Valid, 0 = Invalid
Example	:RAL:CDAT:VATT:VAL? 1

7

Diagnostic Remote Commands

Diagnostic Remote Command List

:RALTimeter

:DIAGnostics

:LOOPback

:FREQuency

:FREQuency?

:GAIN

:GAIN?

:MEASure

:MEASure?

:OUTPut

:OUTPut?

:POWer?

:RANalog

:RANalog?

:RX0

:RX0?

:SPA?

:TANalog

:TANalog?

:TX0

:RALTimeter

:DIAGnostics

:LOOPback (cont)

:TX0?

:TX1

:TX1?

:TX2

:TX2?

:PASSthrough

:DDS0

:DDS0?

:DDS1

:DDS1?

:FREQuency

:FREQuency?

:GAIN

:GAIN?

:POWer?

:RANalog

:RANalog?

:RUN

:RUN?

:RX0

:RX0?

:SPA?

:TANalog

:TANalog?

:TX0

:TX0?

:TX1

:TX1?

:TX2

:TX2?

:RALTimeter

:DIAGnostics

:RECeive

:ATTenuation

:ATTenuation?

:GAIN

:GAIN?

:MEASure

:MEASure?

:POWer?

:TATTenuator

:FREQuency

:FREQuency?

:OUTPut

:OUTPut?

:TX0

:TX0?

:TX1

:TX1?

:TX2

:TX2?

[:TRANsmit]

:FREQuency

:FREQuency?

:LEVel

:LEVel?

:MODE

:MODE?

:OUTPut

:OUTPut?

:RALTimeter

:DIAGnostics

[:TRANsmit] (cont)

:PRF

:PRF?

:PWIDth

:PWIDth ?

Diagnostic Remote Command Descriptions

RALTimeter:DIAGnostics:LOOPback:FREQuency <var>

Description	Sets diagnostics Frequency
Parameter	Frequency in MHz
Range	Integer 4200 to 4400 MHz
Example	RALT:DIAG:LOOP:FREQ 4315 *Sets Frequency to 4315 MHz*

RALTimeter:DIAGnostics:LOOPback:FREQuency?

Description	Returns set diagnostics Frequency in MHz
Parameter	Integer 4200 to 4400 MHz
Example	RALT:DIAG:LOOP:FREQ? 4300

RALTimeter:DIAGnostics:LOOPback:GAIN <var>

Description	Turn the receiver gain stage on or off
Parameter	Enumeration - state
Range	ON, OFF
Example	RALT:DIAG:LOOP:GAIN ON Sets Gain Stage to ON

RALTimeter:DIAGnostics:LOOPback:GAIN?

Description	Return the receiver gain stage setting
Return Value	ON, OFF
Example	RALT:DIAG:LOOP:GAIN? OFF

RALTimeter:DIAGnostics:LOOPback:MEASure <var>

Description	Starts or Stops receiver diagnostic measurements
Parameter	Boolean
Range	ON or 1 starts measurements OFF or 0 stops measurements
Example	RALT:DIAG:LOOP:MEAS ON Start receiver diagnostic measurements

RALTimeter:DIAGnostics:LOOPback:MEASure?

Description	Returns receiver diagnostics measurement state
Return Value	1 or 0
Example	RALT:DIAG:LOOP:MEAS? 1

RALTimeter:DIAGnostics:LOOPback:OUTPut <var>

Description	Turn diagnostics RF output on or off
Parameter	Boolean
Range	ON or 1 starts signal output OFF or 0 stops signal output
Example	RALT:DIAG:LOOP:OUTP 0 Set diagnostics output to OFF

RALTimeter:DIAGnostics:LOOPback:OUTPut?

Description	Returns diagnostics RF output state
Return Value	1 or 0
Example	RALT:DIAG:LOOP:OUTP? 0

RALTimeter:DIAGnostics:LOOPback:POWer?

Description	Returns raw reading corresponding to receiver input power level in mV
Return Value	Integer
Example	RALT:DIAG:LOOP:POW? 1846

RALTimeter:DIAGnostics:LOOPback:RANalog <var>

Description	Set receive analog attenuator
Parameter	Integer
Range	0 to 1023. Higher value sets higher attenuation.
Example	RALT:DIAG:LOOP:RAN 800 Set receive analog attenuator

RALTimeter:DIAGnostics:LOOPback:RANalog?

Description	Returns set receive analog attenuation
Return Value	Integer 0 to 1023
Example	RALT:DIAG:LOOP:RAN? 88

RALTimeter:DIAGnostics:LOOPback:RX0 <var>

Description	Set 31.5dB receive digital attenuator RX0
Parameter	Integer
Range	0 to 63, in half dB steps
Example	RALT:DIAG:LOOP:RX0 40 Set receive digital attenuator RX0 to 20dB

RALTimeter:DIAGnostics:LOOPback:RX0?

Description	Returns set receive digital attenuation RX0
Return Value	Integer 0 to 63, in half dB steps
Example	RALT:DIAG:LOOP:RX0? 62

RALTimeter:DIAGnostics:LOOPback:SPA?

Description	Returns raw reading corresponding to SPA measured power level in mV
Return Value	Integer
Example	RALT:DIAG:LOOP:SPA? 986

RALTimeter:DIAGnostics:LOOPback:TANalog <var>

Description	Set transmit analog attenuator
Parameter	Integer
Range	0 to 1023. Higher value sets higher attenuation.
Example	RALT:DIAG:LOOP:TAN 800 Set transmit analog attenuator

RALTimeter:DIAGnostics:LOOPback:TANalog?

Description	Returns set transmit analog attenuation
Return Value	Integer 0 to 1023
Example	RALT:DIAG:LOOP:TAN? 88

RALTimeter:DIAGnostics:LOOPback:TX0 <var>

Description	Set 31.5dB transmit digital attenuator TX0
Parameter	Integer
Range	0 to 63, in half dB steps
Example	RALT:DIAG:LOOP:TX0 10 Set transmit digital attenuator TX0 to 5dB

RALTimeter:DIAGnostics:LOOPback:TX0?

Description	Returns set transmit digital attenuation TX0
Return Value	Integer 0 to 63, in half dB steps
Example	RALT:DIAG:LOOP:TX0? 6

RALTimeter:DIAGnostics:LOOPback:TX1 <var>

Description	Set 31.5dB transmit digital attenuator TX1
Parameter	Integer
Range	0 to 63, in half dB steps
Example	RALT:DIAG:LOOP:TX1 15 Set transmit digital attenuator TX1 to 7.5dB

RALTimeter:DIAGnostics:LOOPback:TX1?

Description	Returns set transmit digital attenuation TX1
Return Value	Integer 0 to 63, in half dB steps
Example	RALT:DIAG:LOOP:TX1? 18

RALTimeter:DIAGnostics:LOOPback:TX2 <var>

Description	Set 31.5dB transmit digital attenuator TX2
Parameter	Integer
Range	0 to 63, in half dB steps
Example	RALT:DIAG:LOOP:TX2 0 Set transmit digital attenuator TX2 to 0dB

RALTimeter:DIAGnostics:LOOPback:TX2?

Description	Returns set transmit digital attenuation TX2
Return Value	Integer 0 to 63, in half dB steps
Example	RALT:DIAG:LOOP:TX2? 8

RALTimeter:DIAGnostics:PASSthrough:DDS0 <var>

Description	For FMCW altimeters, changing the DDS value will change the simulated altitude. For all other altimeters, set this to zero. Generally DDS0 and DDS1 values will be set identically.
Parameter	DDS offset in tenths of Hz (e.g. 142 is 14.2 Hz)
Range	Integer -200 to 20000 (-20.0 Hz to 2000 Hz offset)
Example	RALT:DIAG:PASS:DDS0 -47 Set DDS0 frequency offset to -4.7 Hz

RALTimeter:DIAGnostics:PASSthrough:DDS0?

Description	Returns set DDS0 frequency offset.
Return Value	Integer -200 to 20000 (corresponding to -20.0 Hz to 2000 Hz)
Example	RALT:DIAG:PASS:DDS0? 470

RALTimeter:DIAGnostics:PASSthrough:DDS1 <var>

Description	For FMCW altimeters, changing the DDS value will change the simulated altitude. For all other altimeters, set this to zero. Generally DDS0 and DDS1 values will be set identically.
Parameter	DDS offset in tenths of Hz (e.g. 142 is 14.2 Hz)
Range	Integer -200 to 20000 (-20.0 Hz to 2000 Hz offset)
Example	RALT:DIAG:PASS:DDS1 -47 Set DDS1 frequency offset to -4.7 Hz

RALTimeter:DIAGnostics:PASSthrough:DDS1?

Description	Returns set DDS1 frequency offset.
Return Value	Integer -200 to 20000 (corresponding to -20.0 Hz to 2000 Hz)
Example	RALT:DIAG:PASS:DDS1? 471

RALTimeter:DIAGnostics:PASSthrough:FREQuency <var>

Description	Sets diagnostics Frequency
Parameter	Frequency in MHz
Range	Integer 4200 to 4400 MHz
Example	RALT:DIAG:PASS:FREQ 4290 Sets Frequency to 4290 MHz

RALTimeter:DIAGnostics:PASSthrough:FREQuency?

Description	Returns set diagnostics Frequency in MHz
Return Value	Integer 4200 to 4400 MHz
Example	RALT:DIAG:PASS:FREQ? 4301

RALTimeter:DIAGnostics:PASSthrough:GAIN <var>

Description	Turn the receiver gain stage on or off
Parameter	Enumeration - state
Range	ON, OFF
Example	RALT:DIAG:PASS:GAIN ON Sets Gain Stage to ON

RALTimeter:DIAGnostics:PASSthrough:GAIN?

Description	Return the receiver gain stage setting
Return Value	ON, OFF
Example	RALT:DIAG:PASS:GAIN? OFF

RALTimeter:DIAGnostics:PASSthrough:POWer?

Description	Returns raw reading corresponding to receiver input power level in mV
Return Value	Integer
Example	RALT:DIAG:PASS:POW? 971

RALTimeter:DIAGnostics:PASSthrough:RANalog <var>

Description	Set receive analog attenuator
Parameter	Integer
Range	0 to 1023. Higher value sets higher attenuation.
Example	RALT:DIAG:PASS:RAN 800 Set receive analog attenuator

RALTimeter:DIAGnostics:PASSthrough:RANalog?

Description	Returns set receive analog attenuation
Return Value	Integer 0 to 1023
Example	RALT:DIAG:PASS:RAN? 88

RALTimeter:DIAGnostics:PASSthrough:RUN <var>

Description	Start/Stop pass-through diagnostics
Parameter	Boolean
Range	ON or 1 starts signal output and measuring OFF or 0 stops signal output and measuring
Example	RALT:DIAG:PASS:RUN 0 Set diagnostics output/measuring to OFF

RALTimeter:DIAGnostics:PASSthrough:RUN?

Description	Returns diagnostics RF output/measuring state
Return Value	1 or 0
Example	RALT:DIAG:PASS:RUN? 0

RALTimeter:DIAGnostics:PASSthrough:RX0 <var>

Description	Set 31.5dB receive digital attenuator RX0
Parameter	Integer
Range	0 to 63, in half dB steps
Example	RALT:DIAG:PASS:RX0 40 Set receive digital attenuator RX0 to 20dB

RALTimeter:DIAGnostics:PASSthrough:RX0?

Description	Returns set receive digital attenuation RX0
Return Value	Integer 0 to 63, in half dB steps
Example	RALT:DIAG:PASS:RX0? 62

RALTimeter:DIAGnostics:PASSthrough:SPA?

Description	Returns raw reading corresponding to SPA measured power level in mV
Return Value	Integer
Example	RALT:DIAG:PASS:SPA? 1127

RALTimeter:DIAGnostics:PASSthrough:TANalog <var>

Description	Set transmit analog attenuator
Parameter	Integer
Range	0 to 1023. Higher value sets higher attenuation.
Example	RALT:DIAG:PASS:TAN 800 Set transmit analog attenuator

RALTimeter:DIAGnostics:PASSthrough:TANalog?

Description	Returns set transmit analog attenuation
Return Value	Integer 0 to 1023
Example	RALT:DIAG:PASS:TAN? 88

RALTimeter:DIAGnostics:PASSthrough:TX0 <var>

Description	Set 31.5dB transmit digital attenuator TX0
Parameter	Integer
Range	0 to 63, in half dB steps
Example	RALT:DIAG:PASS:TX0 30 Set transmit digital attenuator TX0 to 15dB

RALTimeter:DIAGnostics:PASSthrough:TX0?

Description	Returns set transmit digital attenuation TX0
Return Value	Integer 0 to 63, in half dB steps
Example	RALT:DIAG:PASS:TX0? 6

RALTimeter:DIAGnostics:PASSthrough:TX1 <var>

Description	Set 31.5dB transmit digital attenuator TX1
Parameter	Integer
Range	0 to 63, in half dB steps
Example	RALT:DIAG:PASS:TX1 10 Set transmit digital attenuator TX1 to 5dB

RALTimeter:DIAGnostics:PASSthrough:TX1?

Description	Returns set transmit digital attenuation TX1
Return Value	Integer 0 to 63, in half dB steps
Example	RALT:DIAG:PASS:TX1? 14

RALTimeter:DIAGnostics:PASSthrough:TX2 <var>

Description	Set 31.5dB transmit digital attenuator TX2
Parameter	Integer
Range	0 to 63, in half dB steps
Example	RALT:DIAG:PASS:TX2 50 Set transmit digital attenuator TX2 to 25dB

RALTimeter:DIAGnostics:PASSthrough:TX2?

Description	Returns set transmit digital attenuation TX2
Return Value	Integer 0 to 63, in half dB steps
Example	RALT:DIAG:PASS:TX2? 33

RALTimeter:DIAGnostics:RECeive:ATTenuation <var>

Description	Sets diagnostics receiver attenuation level
Parameter	Attenuation dB
Range	Integer 0 to 31. Values outside range are rejected and an error generated.
Example	:RALT:DIAG:REC:ATT 15

RALTimeter:DIAGnostics:RECeive:ATTenuation?

Description	Returns set Attenuation in dB
Return Value	Integer 0 to 31
Example	RALT:DIAG:REC:ATT? 15

RALTimeter:DIAGnostics:RECeive:GAIN <var>

Description	Turns the receiver gain stage on or off.
Parameter	Enumeration - Mode
Range	ON, OFF
Example	:RALT:DIAG:REC:GAIN ON Sets Gain Stage to ON

RALTimeter:DIAGnostics:RECeive:GAIN?

Description	Returns diagnostic gain stage setting
Return Value	ON, OFF
Example	:RALT:DIAG:REC:GAIN? ON

RALTimeter:DIAGnostics:RECeive:MEASure <var>

Description	Starts or Stops receiver diagnostics measurements
Parameter	Boolean
Range	ON or 1 starts measurements OFF or 0 stops measurements
Example	:RALT:DIAG:REC:MEAS 1 Starts receiver diagnostic measurements

RALTimeter:DIAGnostics:RECeive:MEASure?

Description	Returns receiver diagnostics measurement state
Return Value	1 or 0
Example	:RALT:DIAG:REC:MEAS? 1

RALTimeter:DIAGnostics:RECeive:POWer?

Description	Returns raw reading corresponding to receiver input power level in mV
Return Value	Integer
Example	RALT:DIAG:REC:POW? 2217

RALTimeter:DIAGnostics:TATTenuator:FREQuency <var>

Description	Sets diagnostics Frequency
Parameter	Frequency in MHz
Range	Integer 4200 to 4400 MHz
Example	RALT:DIAG:TATT:FREQ 4300 Sets Frequency to 4300 MHz

RALTimeter:DIAGnostics:TATTenuator:FREQuency?

Description	Returns set diagnostics Frequency in MHz
Return Value	Integer 4200 to 4400 MHz
Example	RALT:DIAG:TATT:FREQ? 4250

RALTimeter:DIAGnostics:TATTenuator:OUTPut

Description	Turns diagnostics RF output on or off
Parameter	Boolean
Range	ON or 1 starts signal output OFF or 0 stops signal output
Example	RALT:DIAG:TATT:OUTP 0 Set diagnostics output to OFF

RALTimeter:DIAGnostics:TATTenuator:OUTPut?

Description	Returns diagnostics RF output state
Return Value	1 or 0
Example	RALT:DIAG:TATT:OUTP? 0

RALTimeter:DIAGnostics:TATTenuator:TX0

Description	Set 31.5dB transmit digital attenuator TX0
Parameter	Integer
Range	0 to 63, in half dB steps
Example	Example RALT:DIAG:TATT:TX0 30 Set transmit digital attenuator TX0 to 15dB

RALTimeter:DIAGnostics:TATTenuator:TX0?

Description	Returns set transmit digital attenuation TX0
Return Value	Integer 0 to 63, in half dB steps
Example	RALT:DIAG:TATT:TX0? 6

RALTimeter:DIAGnostics:TATTenuator:TX1

Description	Set 31.5dB transmit digital attenuator TX1
Parameter	Integer
Range	0 to 63, in half dB steps
Example	RALT:DIAG:TATT:TX1 29 Set transmit digital attenuator TX0 to 14.5dB

RALTimeter:DIAGnostics:TATTenuator:TX1?

Description	Returns set transmit digital attenuation TX1
Return Value	Integer 0 to 63, in half dB steps
Example	RALT:DIAG:TATT:TX1? 12

RALTimeter:DIAGnostics:TATTenuator:TX2

Description	Set 31.5dB transmit digital attenuator TX2
Parameter	Integer
Range	0 to 63, in half dB steps
Example	RALT:DIAG:TATT:TX2 31 Set transmit digital attenuator TX2 to 15.5dB

RALTimeter:DIAGnostics:TATTenuator:TX2?

Description	Returns set transmit digital attenuation TX2
Return Value	Integer 0 to 63, in half dB steps
Example	RALT:DIAG:TATT:TX2? 38

RALTimeter:DIAGnostics[:TRANsmit]:FREQuency <var>

Description	Sets diagnostics Frequency
Parameter	Frequency in MHz
Range	Integer 4200 to 4400 MHz
Example	:RALT:DIAG:FREQ 4300 Set Frequency to 4300MHz

RALTimeter:DIAGnostics[:TRANsmit]:FREQuency?

Description	Returns set diagnostics Frequency in MHz
Return Value	Integer 4200 to 4400 MHz
Example	RALT:DIAG:FREQ? 4300

RALTimeter:DIAGnostics[:TRANsmit]:LEVel <var>

Description	Sets diagnostics RF Level
Parameter	Power Level dBm
Range	Signed integer 17 to -76. Values outside range are rejected and an error generated.
Example	:RALT:DIAG:LEV -14 Sets RF Level to -14dBm

RALTimeter:DIAGnostics[:TRANsmit]:LEVel?

Description	Returns set diagnostics RF Level in + or - dBm
Return Value	Signed integer 17 to - 76 dBm
Example	RALT:DIAG:LEV? -55

RALTimeter:DIAGnostics[:TRANsmit]:MODE <var>

Description	Sets diagnostic mode
Parameter	Enumeration - mode
Range	CW, FMCW, PULSe
Example	:RALT:DIAG:MODE FMCW Sets Mode to FMCW –fixed triangular modulated waveform

RALTimeter:DIAGnostics[:TRANsmit]:MODE?

Description	Returns diagnostic mode
Return Value	CW, FMCW, PULSE
Example	RALT:DIAG:MODE? CW

RALTimeter:DIAGnostics[:TRANsmit]:OUTPut <var>

Description	Sets diagnostics RF output to ON or OFF
Parameter	Boolean Output ON/OFF
Range	ON or 1 turns output on OFF or 0 turns output off
Example	:RALT:DIAG:OUTP 1 Sets diagnostic output to ON

RALTimeter:DIAGnostics[:TRANsmit]:OUTPut?

Description	Returns diagnostics RF output state
Return Value	1 or 0
Example	RALT:DIAG:OUTP? 1

RALTimeter:DIAGnostics[:TRANsmit]:PRF <var>

Description	Sets diagnostics PRF in Hz
Parameter	PRF Hz
Range	Integer 2000 to 30000. Values outside range are rejected and an error generated.
Example	:RALT:DIAG:PRF 10000 Sets PRF to 10000 Hz

RALTimeter:DIAGnostics[:TRANsmit]:PRF?

Description	Returns set diagnostics PRF in Hz
Return Value	Integer 2000 to 30000
Example	RALT:DIAG:PRF? 10000

RALTimeter:DIAGnostics[:TRANsmit]:PWIDth <var>

Description	Sets diagnostics Pulse Width in ns.
Parameter	Pulse Width ns
Range	Integer 20 to 400. Values outside range are rejected and an error generated. Value will be rounded to nearest valid value (4 ns steps).
Example	:RALT:DIAG:PWID 20 Sets Pulse Width to 20 ns

RALTimeter:DIAGnostics[:TRANsmit]:PWIDth?

Description	Returns set diagnostics Pulse Width in ns
Return Value	Integer 20 to 400
Example	:RALT:DIAG:PWID? 20

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8

Setup Remote Commands

General

Setup Remote Commands duplicate the functionality of the setup screen and also the altitude offset from the simulation screen.

Setup Remote Commands List

:RALTimeter

    :OSETup

    :DISPlay

    :FREQuency

    :FREQuency?

    :POWer

    :POWer?

    :PUNits

    :PUNits?

    :SETup

    :AID

    :MODE

    :MODE?

    :VALue

    :VALue?

    :CHANnel1

    :LEVel

    :LEVel?

    :LLOSs

    :LLOSs?

    :LOSS

    :CABLe

    :RX

    :RX?

    :TX

    :TX?

    :COUPler

:RX

:RX?

:TX

:TX?

:RALTimeter

:SETup

:CHANnel1

:LOSS (cont)

:EXTernal

:RX

:RX?

:TX

:TX?

:OFFSet

:OFFSet?

:CONNection

:CONNection?

:LEVel

:MODE

:MODE?

:OFFSet

:OFFSet?

:UNITs

:ALTitude

:ALTitude?

:DISTance

:DISTance?

:UUT

:TYPE?

Setup Remote Commands Description

RALTimeter:OSETup:DISPlay:FREQuency \<var\>

Description	Set the main simulation screen to show center & deviation or start & stop frequencies. This setting is held over a power off cycle and is not affected by recalling settings.
Parameter	Enumeration - mode
Range	DEViation, SSTop
Example	RALT:OSET:DISP:FREQ SST Sets display to show start frequency and stop frequency

RALTimeter:OSETup:DISPlay:FREQuency?

Description	Determine if displaying center & deviation or start/stop frequencies
Return Value	DEV, SST
Example	RALT:OSET:DISP:FREQ? SST

RALTimeter:OSETup:DISPlay:POWer \<var\>

Description	Set the main simulation screen to show absolute power level at UUT:RX or the simulated loop loss. This setting is held over a power off cycle and is not affected by recalling settings.
Parameter	Enumeration - mode
Range	ABSolute, LLOSs
Example	RALT:OSET:DISP:POW LLOS Sets display to show loop loss

RALTimeter:OSETup:DISPlay:POWer?

Description	Determine if displaying absolute level or loop loss
Return Value	ABS, LLOS
Example	RALT:OSET:DISP:POW? ABS

RALTimeter:OSETup:DISPlay:PUNits <var>

Description	Set the profile graph units to be feet or meters. This setting is held over a power off cycle and is not affected by recalling settings.
Parameter	Enumeration - mode
Range	METers, METRes, FEET
Example	RALT:OSET:DISP:PUN MET Sets profile graph to use meters for altitude

RALTimeter:OSETup:DISPlay:PUNits?

Description	Determine if profile graph is using feet or meters
Return Value	MET, FEET
Example	RALT:OSET:DISP:PUN? MET

RALTimeter:SETup:AID:MODE <var>

Description	Selects Fixed AID (ARINC AID Selections) or Variable (User entered AID)
Parameter	Enumeration
Range	FIXed or VARiable
Example	:RALT:SET:AID:MODE FIX *Fixed AID selected*.

RALTimeter:SETup:AID:MODE?

Description   Determines if the Fixed or Variable AID setting is selected.

Return Value   FIX or VAR

Example   RALT:SET:AID:MODE?
FIX

RALTimeter:SETup:AID:VALue <var>

Description   Sets AID in feet.If fixed AID is selected only 0, 20, 40, 57 or 80 is accepted.

Parameter   Integer

Range   Integer 0 to 99

Example   :RALT:SET:AID:VAL 40
40 ft AID selected.

RALTimeter:SETup:AID:VALue?

Description   Returns AID Value.

Return Value   Integer 0 to 99

Example   RALT:SET:AID:VAL?
40

RALTimeter:SETup:CHANnel1:LEVel <var>

Description   Sets RF Level if Level Mode is Manual.

Parameter   Level dBm

Range   Signed Integer 17 to -76. Values outside range are rejected and an error generated.

Example   :RALT:SET:CHAN1:LEV -14
Sets RF Level to -14 dBm

RALTimeter:SETup:CHANnel1:LEVel?

Description	Returns RF Level in + or - dBm
Return Value	Signed Integer 17 to -76
Example	RALT:SET:CHAN1:LEV? -14

RALTimeter:SETup:CHANnel1:LLOSs <var>

Description	Sets RF loop loss (UUT TX port to UUT RX port) if Level Mode is manual and Power Display Mode is loop loss.
Parameter	Loop loss dB
Range	Real 30.0 to 140.0 values outside range are rejected and an error generated.
Example	RALT:SET:CHAN1:LLOS 71.2

RALTimeter:SETup:CHANnel1:LLOSs?

Description	Returns loop loss in dB
Return Value	Real 30.0 to 140.0
Example	RALT:SET:CHAN1:LLOS? 87.9

RALTimeter:SETup:CHANnel1:LOSS:CABLe:RX <var>

Description	Sets Cable RX Loss in dB
Parameter	Cable RX Loss dB
Range	Real 0.0 to 9.9. Values outside range are rejected and an error generated.
Example	:RALT:SET:CHAN1:LOSS:CABL:RX 5.2 Sets Cable RX Loss to 5.2dB

RALTimeter:SETup:CHANnel1:LOSS:CABLe:RX?

Description	Returns set Cable RX Loss in dB
Return Value	Real 0.0 to 9.9
Example	RALT:SET:CHAN1:LOSS:CABL:RX? 5.2

RALTimeter:SETup:CHANnel1:LOSS:CABLe:TX <var>

Description	Sets Cable TX Loss in dB
Parameter	Cable TX Loss dB
Range	Real 0.0 to 9.9. Values outside range are rejected and an error generated.
Example	:RALT:SET:CHAN1:LOSS:CABL:TX 5.2 Sets Cable TX Loss to 5.2dB

RALTimeter:SETup:CHANnel1:LOSS:CABLe:TX?

Description	Returns set Cable TX Loss in dB
Return Value	Real 0.0 to 9.9
Example	RALT:SET:CHAN1:LOSS:CABL:TX? 5.2

RALTimeter:SETup:CHANnel1:LOSS:COUPler:RX <var>

Description	Sets Coupler RX Loss in dB
Parameter	Coupler RX Loss dB
Range	Real 0.0 to 19.9. Values outside range are rejected and an error generated.
Example	:RALT:SET:CHAN1:LOSS:COUP:RX 5.2 Sets Coupler RX Loss to 5.2dB

RALTimeter:SETup:CHANnel1:LOSS:COUPler:RX?

Description	Returns Coupler RX Loss in dB
Return Value	Real 0.0 to 19.9
Example	RALT:SET:CHAN1:LOSS:COUPI:RX? 5.2

RALTimeter:SETup:CHANnel1:LOSS:COUPler:TX <var>

Description	Sets Coupler TX Cable in dB
Parameter	Coupler TX Loss dB
Range	Real 0.0 to 19.9. Values outside range are rejected and an error generated.
Example	:RALT:SET:CHAN1:LOSS:COUP:TX 5.2 Sets Coupler TX Loss to 5.2dB

RALTimeter:SETup:CHANnel1:LOSS:COUPler:TX?

Description	Returns set Coupler TX Loss in dB
Return Value	Real 0.0 to 19.9
Example	RALT:SET:CHAN1:LOSS:COUP:TX? 5.2

RALTimeter:SETup:CHANnel1:LOSS:EXTernal:RX <var>

Description	Sets External RX Loss in dB
Parameter	External RX Loss dB
Range	Real 0.0 to 50.0. Values outside range are rejected and an error generated.
Example	:RALT:SET:CHAN1:LOSS:EXT:RX 25.2 Sets External RX Loss to 25.2dB

RALTimeter:SETup:CHANnel1:LOSS:EXTernal:RX?

Description	Returns External RX Loss in dB
Return Value	Real 0.0 to 50.0
Example	:RALT:SET:CHAN1:LOSS:EXT:RX? 25.2

RALTimeter:SETup:CHANnel1:LOSS:EXTernal:TX <var>

Description	Sets External TX Cable in dB
Parameter	External TX Loss dB
Range	Real 0.0 to 20.0. Values outside range are rejected and an error generated.
Example	:RALT:SET:CHAN1:LOSS:EXT:TX 10.1 Sets External TX Loss to 10.1dB

RALTimeter:SETup:CHANnel1:LOSS:EXTernal:TX?

Description	Returns External TX Loss in dB
Return Value	Real 0.0 to 20.0
Example	RALT:SET:CHAN1:LOSS:EXT:TX? 10.1

RALTimeter:SETup:CHANnel1:OFFSet <var>

Description	Sets Altitude Offset in ft
Parameter	Offset ft
Range	Real 0.0 to 100.0 in 0.5 ft increments. Values outside range are rejected and an error generated.
Example	:RALT:SET:CHAN1:OFFS 50 Sets Altitude Offset 50 ft

RALTimeter:SETup:CHANnel1:OFFSet?

Description	Returns Altitude Offset in ft
Return Value	Real 0.0 to 100.0
Example	RALT:SET:CHAN1:OFFSet? 50

RALTimeter:SETup:CONNection <var>

Description	Selects RF connection to Direct, Feeder or Coupler
Parameter	Enumeration
Range	DIRect, FEEDer, COUPler
Example	:RALT:SET:CONN COUP Coupler selected.

RALTimeter:SETup:CONNection?

Description	Determine whether the Direct, Feeder or Coupler RF connection is selected.
Return Value	DIR, FEED, COUP
Example	:RALT:SET:CONN? COUP

RALTimeter:SETup:LEVel:MODE <var>

Description	Sets RF Level Mode. MANual: User may set RF level. AUTO: RF Level set automatically referenced to TX power and simulated altitude path loss.
Parameter	Mode
Range	AUTO, MANual
Example	:RALT:SET:LEV:MODE AUTO Sets Mode to Auto

RALTimeter:SETup:LEVel:MODE?

Description	Returns RF Level Mode
Return Value	AUTO, MAN
Example	RALT:SET:LEV:MODE? AUTO

RALTimeter:SETup:LEVel:OFFSet <var>

Description	Sets RF Level Offset in dB Note: Only applicable in Auto RF Level Mode
Parameter	Offset dB
Range	Real integer -20.0 to 20.0 in 0.5 dB increments. Values outside range are rejected and an error generated.
Example	:RALT:SET:LEV:OFFS 4.5 Sets RF Level Offset to 4.5 dB

RALTimeter:SETup:LEVel:OFFSet?

Description	Returns RF Level Offset in dB
Return Value	Real integer -20.00 to 20.0
Example	RALT:SET:LEV:OFFS? 4.5

RALTimeter:SETup:UNITs:ALTitude <var>

Description   Select feet or meters entry mode for the commands that set altitude or altitude rate.

Affected commands are:
RALT:ASIM:MAN:CHAN1:ALT
RALT:ASIM:MAN:CHAN1:RATE
RALT:ASIM:MAN:CHAN1:STAR
RALT:ASIM:MAN:CHAN1:STOP

The query form of these commands are also affected.

Parameter   Enumeration

Range   FEET or METers or METRes

Example   :RALT:SET:UNIT:ALT MET
select meters entry

RALTimeter:SETup:UNITs:ALTitude ?

Description   Determine if altitude entry via rci is in feet or meters.

Return Value   FEET or MET

Example   :RALT:SET:UNIT:ALT?
FEET

RALTimeter:SETup:UNITs:DISTance <var>

Description   Select feet or meters entry mode for the command RALT:SET:CHAN1:OFFS and the query form of this command.

Parameter   Enumeration

Range   FEET or METers or METRes

Example   :RALT:SET:UNIT:DIST FEET
select feet units when setting or reading altitude offset

RALTimeter:SETup:UNITs:DISTance?

Description Determines if altitude offset entry via rci is in feet or meters.

Return Value FEET or MET

Example :RALT:SET:UNIT:DIST?
MET

RALTimeter:SETup:UUT:TYPE? <var>

Description Sets UUT Type

Parameter Enumeration

Range FMCW, CDF, PULS, GFMC, OTHer

Example RALT:SET:UUT:TYPE?
FMCW; OTHer

RALTimeter:SETup:UUT:TYPE?

Description Returns set UUT Type

Return Value FMCW, CDF, PULS, GFMC, OTHer

Example RALT:SET:UUT:TYPE?
FMCW; OTHer

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9

Settings Storage Remote Commands

General

Settings Remote Commands duplicate the functionality on the setup screen for storing, managing and recalling settings.

Settings Remote Commands List

:RALTimeter

:SETTings

:CHANnel1

:DEFault

:MODified?

:NAME?

:RECall

:STORe

:COUNt?

:DELete

:LIST?

Settings Remote Commands Description

RALTimeter:SETTings:CHANnel1:DEFault

Description	Sets Factory default settings
Parameter	NA
Range	NA
Example	:RALT:SETT:CHAN1:DEF

RALTimeter:SETTings:CHANnel1:MODified?

Description	Indicates if the settings have been modified since the store was last loaded or saved.
Return Value	0 = settings not modified, 1 = settings modified
Example	RALT:SETT:CHAN1:MOD? 1

RALTimeter:SETTings:CHANnel1:NAME?

Description	Returns the current settings file name.
Return Value	Up to 20 Alpha Numeric characters
Example	:RALT:SETT:CHAN1:NAME? Settings1 Note: If the name has been modified an asterisk will be added, e.g. "Settings1*"

RALTimeter:SETTings:CHANnel1:RECall <var>

Description	Recalls a named settings file. Becomes the current settings.
Parameter	String
Range	Up to 20 Alpha Numeric characters
Example	:RALT:SETT:CHAN1:REC "A-380" Recall file A-380

RALTimeter:SETTings:CHANnel1:STORe <var>

Description	Stores the current settings under a file name. The number of settings that may be stored is only limited by available memory.
Parameter	String
Range	Up to 20 Alpha Numeric Characters including Space
Example	:RALT:SETT:CHAN1:STORE "LRA-900 TEST" Store settings as LRA-900 TEST

RALTimeter:SETTings:COUNt?

Description	Returns a count of stored settings files
Return Value	Integer
Example	:RALT:SETT:COUN? 4

RALTimeter:SETTings:DELete <var>

Description	Deletes the named settings file.
Parameter	String
Range	Up to 20 Alpha Numeric Characters
Example	:RALT:SETT:DEL "B-757" Delete file B-757

RALTimeter:SETTings:LIST?

Description	Returns a list of stored settings file names , each up to 20 characters in length
Return Value	Comma separated string
Example	:RALT:SETT:LIST? "A-380","LRA-900TEST"

Status Remote Commands

General

Status Remote Commands duplicate the functionality of system info screen (maintenance menu).

Status Remote Commands List

:RALTimeter

:STATus

:CHANnel 1

:UNLock

:ALL?

OVERall?

Status Remote Commands Description

RALTimeter:STATus:CHANnel1:UNLock:ALL?

Description	Returns flags for hardware locked/unlock status Order is: Overall unlocked flag Tracking synth unlocked flag External ref unlocked flag (always zero) Receive LO unlocked flag Transmit LO unlocked flag Offset synth unlocked flag SPA unlocked flag DPLL unlocked flag
Return Value	0 = Locked, 1 = Unlocked
Example	:RALT:STAT:CHAN1:UNL:ALL? 0,0,0,0,0,0,0,0 Shows everything is locked

RALTimeter:STATus:CHANnel1:UNLock:OVERall?

Description	Returns flag for overall locked/unlock status
Return Value	1= Unlocked 0= Locked
Example	:RALT:STAT:CHAN1:UNL:OVER? 1

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Test Remote Commands

General

Test Remote Commands duplicate the functionality of the simulation screen Run/Stop button and Pause Altitude button.

Test Remote Commands List

:RALTimeter

    :TEST

    :PAUSe

    :PAUSed?

    :RESume

    :RUNNing?

    :STARt

    :STOP

    :MEASure

    :CHANnel1

    :DATA?

    :LEVel?

    :MARgin?

    :STALe?

Test Remote Commands Description

RALTimeter:TEST:PAUSe

Description	Pauses the test **Note:** Only valid while simulation is running
Parameter	NA
Range	NA
Example	:RALT:TEST:PAUS

RALTimeter:TEST:PAUSed?

Description	Returns flag for test paused status
Return Value	1= Paused 0= Running
Example	:RALT:TEST:PAUS? 1

RALTimeter:TEST:RESume

Description	Resumes the test **Note:** Only valid while simulation is running and test paused
Parameter	NA
Range	NA
Example	:RALT:TEST:RES

RALTimeter:TEST:RUNNing?

Description	Returns flag for test running status
Return Value	0 = not running, 1 = running
Example	:RALT:TEST:RUNN? 1

RALTimeter:TEST:STARt

Description   Starts the Simulation test

Parameter   NA

Range   NA

Example   :RALT:TEST:STAR

RALTimeter:TEST:STOP

Description   Stops the Simulation test

Parameter   NA

Range   NA

Example   :RALT:TEST:STOP

RALTimeter:MEASure:CHANnel1:DATA?

Description   Returns frequency, power, sweep rate, fm deviation, PRF, pulse width, altitude.

Return Value   Validity: 0 = invalid, 1 = valid
Frequency: 4200 to 4400 (**Note:** not hard clipped)
Power: in mW
Sweep Rate: 0 to 500 Hz (**Note:** not hard clipped)
FM Deviation: 0 to 100 MHz (**Note:** not hard clipped)
PRF: 1 to 30000 Hz
Pulse Width: 20 to 400 ns
Altitude: -20 to 8000 ft

Example   :RALT:MEAS:CHAN1:DATA?
1,4300,104.7,738,62,0,0,0

RALTimeter:MEASure:CHANnel1:LEVel?

Description   Returns auto RF level (dBm) or auto loop loss (dB) depending on setting of RALT:OSET:DISP:POW

Return Value   Real

Example   RALT:MEAS:CHAN1:LEV?
-38.5

RALTimeter:MEASure:CHANnel1:MARGin?

Description	Returns Link Margin for LPI pulse altimeters
Return Value	Integer
Example	RALT:MEAS:CHAN1:MARG? 25

RALTimeter:MEASure:CHANnel1:STALe?

Description	Returns an indication of whether uut measurements are stale
Return Value	six Booleans: frequency, power, sweep rate, fmdev, prf, pulse width
Example	RALT:MEAS:CHAN1:STAL? 1,0,1,1,0,0

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12

System Remote Commands

System Remote Commands List

:SYSTem

:ERRor?

:ERRor

:ALL?

:CODE

[:NEXT]?

:COUNt?

:GLOBal?

[:NEXT]?

:VERSion?

System Remote Commands Description

SYSTem:ERRor[:NEXT]?

Description	Returns oldest error message in the error queue and then clears the error message from the queue
Return Value	Integer, string
Example	:SYST:ERR? -113,"Undefined header;*ict;2014/10/10 17:03:49"

SYSTem:ERRor:ALL?

Description	Returns all error messages in the error queue and then clears all error messages from the queue.
Return Value	Comma separated list of error messages (integer, string)
Example	:SYST:ERR:ALL? -113,"Undefined header;*ict;2014/10/10 17:03:49", -113,"Undefined header;*ict;2014/10/10 17:05:30"

SYSTem:ERRor:CODE[:NEXT]?

Description	Returns first error message number in the error queue and then clears the error message from the queue.
Return Value	Integer
Example	:SYST:ERR:CODE:NEXT? -113

SYSTem:ERRor:COUNt?

Description	Returns the number of error messages currently in the queue.
Return Value	Integer
Example	:SYST:ERR:COUN? 3

SYSTem:ERRor:GLOBal?

Description	Returns oldest error message from the global error queue and clears the error message form the queue.
Return Value	Integer, String
Example	:SYST:ERR:GLOB? -200, "Execution error;Power too low at RF In. Testing stopped.;2016/11/07 16:10:02."

SYSTem:VERSion?

Description	Returns system version number.
Return Value	String
Example	:SYST:VERS? "1999"

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13

Self Test Remote Commands

Self Test Remote Commands List

:HHSelftest

:RALTimeter

:DCVoltage?

:TEMPerature?

:LPOWer?

:PLOCk?

:RDATtenuator?

:RAATtenuator?

:GSTage?

:T0Dattenuator?

:T1Dattenuator?

:T2Dattenuator?

:TAATtenuator?

:FREQuency?

:DDS?

:rfDMAMps?

:rfDMATtens?

:ALLStatus?

:RUN?

Self Test Remote Commands Description

HHSelftest:RALTimeter:DCVoltage?

Description After selftest has been run this will return the DC voltage test status. A return of "NOT RUN" indicates that the test has not been performed. A return of "PASS" indicates a passing test. A return similar to "FAIL 0002" indicates a test failure, the value being a hex error code.

Return Value String

Example HHS:RALT:DCV?
"PASS"

HHSelftest:RALTimeter:TEMPerature?

Description After selftest has been run this will return the temperature test status. A return of "NOT RUN" indicates that the test has not been performed. A return of "PASS" indicates a passing test. A return similar to "FAIL 0002" indicates a test failure, the value being a hex error code.

Return Value String

Example HHS:RALT:TEMP?
"PASS"

HHSelftest:RALTimeter:LPOWer?

Description After selftest has been run this will return the loopback power test status. A return of "NOT RUN" indicates that the test has not been performed. A return of "PASS" indicates a passing test. A return of "FAIL" indicates a test failure. If this test fails, the remaining tests cannot be run and will all return "UNABLE TO TEST".

Return Value String

Example HHS:RALT:LPOW?
"PASS"

HHSelftest:RALTimeter:PLOCk?

Description After selftest has been run this will return the PLL lock test status. A return of "NOT RUN" indicates that the test has not been performed. A return of "UNABLE TO TEST" indicates that the selftest failed the loopback power test and could not continue. A return of "PASS" indicates a passing test. A return similar to "FAIL 0002" indicates a test failure, the value being a hex error code.

Return Value String

Example HHS:RALT:PLOC?
"PASS"

HHSelftest:RALTimeter:RDATtenuator?

Description   After selftest has been run this will return the receive digital attenuator test status. A return of "NOT RUN" indicates that the test has not been performed. A return of "UNABLE TO TEST" indicates that the selftest failed the loopback power test and could not continue. A return of "PASS" indicates a passing test. A return similar to "FAIL 0002" indicates a test failure, the value being a hex error code.

Return Value   String

Example   HHS:RALT:RDAT?
"PASS"

HHSelftest:RALTimeter:RAATtenuator?

Description   After selftest has been run this will return the receive analog attenuator test status. A return of "NOT RUN" indicates that the test has not been performed. A return of "UNABLE TO TEST" indicates that the selftest failed the loopback power test and could not continue. A return of "PASS" indicates a passing test. A return similar to "FAIL 0002" indicates a test failure, the value being a hex error code.

Return Value   String

Example   HHS:RALT:RAAT?
"PASS"

HHSelftest:RALTimeter:GSTage?

Description   After selftest has been run this will return the gain stage test status. A return of "NOT RUN" indicates that the test has not been performed. A return of "UNABLE TO TEST" indicates that the selftest failed the loopback power test and could not continue. A return of "PASS" indicates a passing test. A return similar to "FAIL 0002" indicates a test failure, the value being a hex error code.

Return Value   String

Example   HHS:RALT:GST?
"PASS"

HHSelftest:RALTimeter:T0Dattenuator?

Description After selftest has been run this will return the transmit TX0 digital attenuator test status. A return of "NOT RUN" indicates that the test has not been performed. A return of "UNABLE TO TEST" indicates that the selftest failed the loopback power test and could not continue. A return of "PASS" indicates a passing test. A return similar to "FAIL 0002" indicates a test failure, the value being a hex error code.

Return Value String

Example HHS:RALT:T0D?
"PASS"

HHSelftest:RALTimeter:T1Dattenuator?

Description After selftest has been run this will return the transmit TX1 digital attenuator test status. A return of "NOT RUN" indicates that the test has not been performed. A return of "UNABLE TO TEST" indicates that the selftest failed the loopback power test and could not continue. A return of "PASS" indicates a passing test. A return similar to "FAIL 0002" indicates a test failure, the value being a hex error code.

Return Value String

Example HHS:RALT:T1D?
"PASS"

HHSelftest:RALTimeter:T2Dattenuator?

Description After selftest has been run this will return the transmit TX2 digital attenuator test status. A return of "NOT RUN" indicates that the test has not been performed. A return of "UNABLE TO TEST" indicates that the selftest failed the loopback power test and could not continue. A return of "PASS" indicates a passing test. A return similar to "FAIL 0002" indicates a test failure, the value being a hex error code.

Return Value String

Example HHS:RALT:T2D?
"PASS"

HHSelftest:RALTimeter:TAATtenuator?

Description After selftest has been run this will return the transmit analog attenuator test status. A return of "NOT RUN" indicates that the test has not been performed. A return of "UNABLE TO TEST" indicates that the selftest failed the loopback power test and could not continue. A return of "PASS" indicates a passing test. A return similar to "FAIL 0002" indicates a test failure, the value being a hex error code.

Return Value String

Example HHS:RALT:TAAT?
"PASS"

HHSelftest:RALTimeter:FREQuency?

Description After selftest has been run this will return the frequency test status. A return of "NOT RUN" indicates that the test has not been performed. A return of "UNABLE TO TEST" indicates that the selftest failed the loopback power test and could not continue. A return of "PASS" indicates a passing test. A return similar to "FAIL 0002" indicates a test failure, the value being a hex error code.

Return Value String

Example HHS:RALT:FREQ?
"PASS"

HHSelftest:RALTimeter:rfDMAMps?

Description After selftest has been run this will return the RF Delay Module Amplifier status

Return Value String

Example HHS:RALT:DMAM? "PASS"

HHSelftest:RALTimeter:rfDMATtens?

Description After selftest has been run this will return the RF Delay Module Attenuator status

Return Value String

Example HHS:RALT:DMAT? "PASS"

HHSelftest:RALTimeter:ALLStatus?

Description   After selftest has been run this will return the status of all selftests run

Return Value   String

Example   HHS:RALT:ALLS? "PASS"

HHSelftest:RUN?

Description   Run the self test for the ALT9000. Does not return until the selftest completes, and then returns a 1. Use the individual readback commands to determine which tests passed or failed.

Return Value   Integer

Example   HHS:RUN?
1

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A

*RST Settings

*RST Settings

Table A-1 RST Settings

(Start) Altitude	0
Stop Altitude	0
Altitude Rate	0
Simulation Mode	Manual
Uut Detect	Auto
Uut Type	FMCW
CDF Subtype	Sweeping
Altitude Offset	0
RF Level Mode	Auto
Manual RF Level	-55
Manual Loop Loss	48.9
Connection Type	Direct
Uut:tx Cable Loss	0
Uut:rx Cable Loss	0
Uut:tx Coupler Loss	0
Uut:rx Coupler Loss	0
Uut:tx Ext Attenuation	0
Uut:rx Ext Attenuation	0
Diagnostics Tx Power	-55
Diagnostics Tx Freq	4300
Diagnostics Tx Mode	CW
Diagnostics Tx Prf	2000
Diagnostics Tx Pulse Width	20
Diagnostics Rx Atten	31
Diagnostics Rx Gain Stage	Off
Diagnostics Tx Attens Freq	4300
Diagnostics Tx Attens Tx 0	63
Diagnostics Tx Attens Tx1	63
Diagnostics Tx Attens Tx2	63
Diagnostics Loopback Freq	4300
Diagnostics Loopback Tx Analog Atten	1023
Diagnostics Loopback Tx0 Digital Atten	63
Diagnostics Loopback Tx1 Digital Atten	63
Diagnostics Loopback Tx2 Digital Atten	63

Table A-1 RST Settings

Diagnostics Loopback Rx Analog Atten	1023
Diagnostics Loopback Rx0 Digital Atten	63
Diagnostics Loopback Gain Stage	Off
Diagnostics Passthrough Rx0 Digital Atten	63
Diagnostics Passthrough Rx Analog Atten	1023
Diagnostics Passthrough Gain Stage	Off
Diagnostics Passthrough Tx Analog Atten	1023
Diagnostics Passthrough Tx0 Digital Atten	63
Diagnostics Passthrough Tx1 Digital Atten	63
Diagnostics Passthrough Tx2 Digital Atten	63
Frequency Display Mode	Center/Deviation
Profile Display Units	Feet

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B

Error Handling

Remote Control Errors

Some remote control commands can cause global errors. These errors are accessed using SYST:ERR:GLOB? instead of SYST:ERR?.

The following commands generate errors that are reported via the global queue.

RALT:CAL:USER:STAR

Delay calibration failure:

No signal detected at RF In. Are the cables connected together using the supplied tnc to tnc adapter?

Delay calibration failure:

Too much loss. Remove any external attenuators. If there are no external attenuators attached then please use lower loss cables.

Delay calibration failure:

Failed to determine cable delay for pulse mode.

Delay calibration failure:

Failed to determine cable delay for FM CW mode.

RALT:CAL:VATT:STAR

Loopback calibration failure:

Unable to optimize signal level during analog attenuator offset calibration.

Loopback calibration failure:

Failed to detect pulses at receiver.

Loopback calibration failure:

Unable to measure consistant pulse width during vref5 calibration.

Loopback calibration failure:

Power too low - is the loop-back cable connected?

RALT:TEST:STAR

A level flight path has been entered with an Altitude Rate. Please change the Altitude Rate to 0 for a level flight. Testing stopped.

UUT frequency out of range. Test Stopping.

Unable to detect reasonable UUT signal. Testing stopped.

User set UUT type (FMCW/CDF) does not match detected UUT type (PULSE).

Pulses not detected. Check that the pulse radio is connected correctly.

Pulse Power too low at RF In. Testing stopped.

Power too low at RF In. Testing stopped.

Power level varying, cannot determine level. Testing stopped.

Invalid Pulse UUT Detected. Testing stopped.

UUT transmit frequency out of range. UUT measurements continue but no RF is output.

User set uut type (FMCW) does not match detected uut type (CDF FMCW). Testing will continue but results will be unpredictable.

User set uut type (CDF FMCW) does not match detected uut type (FMCW). Testing will continue but results will be unpredictable.

User set Search/Track subtype does not match detected Sweeping subtype. Testing will continue but results will be unpredictable.

User set Sweeping subtype does not match detected Search/Track subtype. Testing will continue but results will be unpredictable.Query both queues to determine if any errors have occurred.

Signal at RF In is CW. It is recommended that the test be stopped, check the uut connections and re-start the test. Query both queues to determine if any errors have occurred.

All other errors are reported via the per-parser queue, using SYST:ERR? to read them.Query both queues to determine if any errors have occurred.

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ALT-9000 Radio Altimeter Test Set

Remote Commands Manual

VIAVI Solutions

North America:	**1.844.GO VIAVI / 1.844.468.4284**
Latin America	**+52 55 5543 6644**
EMEA	**+49 7121 862273**
APAC	**+1 512 201 6534**
All Other Regions:	**viavisolutions.com/contacts**