

Keysight Wireless Test Set

This help file provides documentation for the following products:
E6640A EXM Wireless Test Set

V9065B Sequence Analyzer User's & Programmer's Reference

Notices

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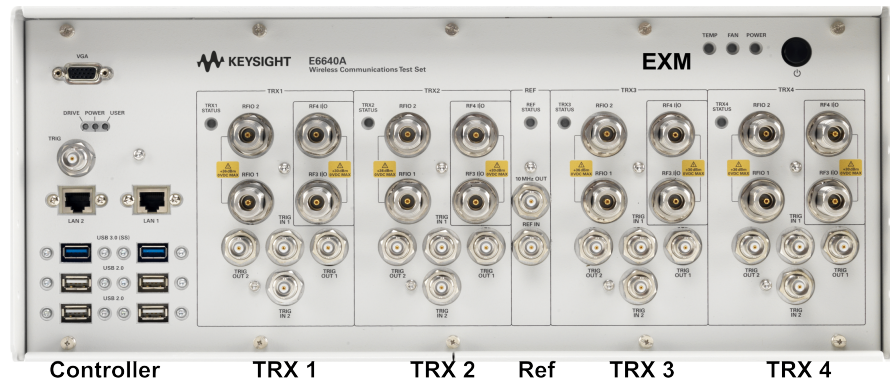
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1 About the Test Set

The X-Series E6640A EXM Wireless Test Set is a one-box tester consisting of instruments loaded into a M9018A PXI mainframe with a front impact cover. The mainframe has a common PC controller (located on the far left) and M9300A PXI Frequency Reference (located in the center of the rack). The test set has one to four Keysight M9430A TRX (transmit/receive) instruments installed.

Each TRX includes a signal analyzer and a signal source, both of which interface with the front panel of the test set through an input/output matrix, and is run by its own instance of the XSA firmware application (a fully loaded test set shows four independent XSA windows on its monitor display).

The E6640A can be configured to test cellular products with a standard 40 MHz of analysis bandwidth. It could also be configured to test Wireless products with 80 or 160 MHz of analysis bandwidth. If your requirement is to test both, the TRX instruments can be configured to test both products.



Installing Application Software

If you want to install a measurement application after your initial hardware purchase, you need only to license it. All of the available applications are loaded in your test set at the time of purchase.

Thus, when you purchase a new application, you will receive an entitlement certificate that you can use to obtain a license key for that application. To activate the new measurement application, enter the license key that you obtain into the test set.

For the latest information on Keysight X-series measurement applications and upgrade kits, visit the following internet URL.

<http://www.keysight.com/find/e6640a>

Viewing a License Key

Measurement applications that you purchased with your instrument have been installed and activated at the factory before shipment. The instrument requires a unique License Key for every measurement application purchased. The license key is a hexadecimal string that is specific to your measurement application, instrument model number and serial number. It enables you to install, or reactivate, that particular application.

Press **System, Show, System** to display the measurement applications that are currently licensed in your analyzer.

Go to the following location to view the license keys for the installed measurement applications:

C:\Program Files\Agilent\Licensing

You may want to keep a copy of your license key in a secure location. To do this, you can print out a copy of the display showing the license numbers. If you should lose your license key, call your nearest Keysight Technologies service or sales office for assistance.

Obtaining and Installing a License Key

If you purchase an additional application that requires installation, you will receive an "Entitlement Certificate", which may be redeemed for a license key for one instrument. To obtain your license key, follow the instructions that accompany the certificate.

Installing a license key for the selected application can be done automatically using a USB memory device. To do this, you copy the license file to the USB memory device, at the root level. Follow the instructions that come with your software installation kit.

Installing a license key can also be done manually using the built-in license management application, which may be found via the instrument front panel keys at **System, Licensing. . .**, or on-disk at:

C:\Programming Files\Agilent\Licensing

You can also use these procedures to reinstall a license key that has been accidentally deleted, or lost due to a memory failure.

Updating Measurement Application Software

All the software applications were loaded at the time of original instrument manufacture. It is a good idea to regularly update your software with the latest available version. This helps to ensure that you receive

any improvements and expanded functionality.

Because the software was loaded at the initial purchase, further additional measurement applications may now be available. If the application you are interested in licensing is not available, you will need to do a software update. (To display a list of installed applications, press **System, Show, System.**)

Check the appropriate page of the Keysight web site for the latest available software versions, according to the name of your instrument, as follows:

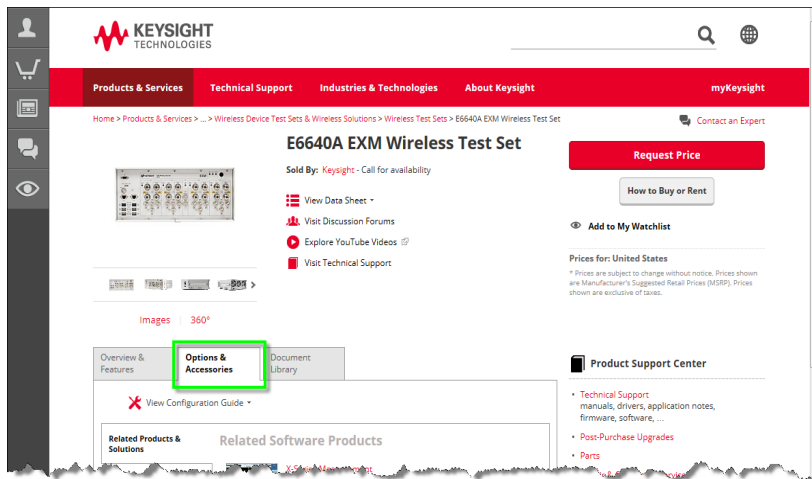
http://www.keysight.com/find/E6640A_software

You can load the updated software package into the analyzer either from a USB drive or directly from the internet. An automatic loading program is included with the files.

EXM Options and Accessories

You can view an online list of available Options and Accessories for your instrument as follows:

1. Browse to one of the following URLs, according to the product name of your analyzer:
www.keysight.com/find/e6640a
2. The home page for your instrument appears (in some cases, you may see an initial splash screen containing a button named View the Webpage, which you should click to display the home page).
3. Locate the **Options & Accessories** tab, as highlighted in the example below, which shows the home page for the E6640A.



4. Click the **Options & Accessories** tab, to display a list of available options and accessories for your instrument.

Front-Panel Features

The instrument Front-panel features are fully detailed in the section "Front-Panel Features" (under the chapter "Front and Rear Panel Features") of the document:

Latest available on line document: [E6640A Getting Started Guide](#)

Embedded PDF installed with the latest firmware revision:

If you are viewing this information as a Help file in the instrument, then you can click on the link above to open the PDF document.

Display Annotations

Display Annotations are fully detailed under the chapter "Front and Rear Panel Features" of the document:

Latest available on line document: [E6640A Getting Started Guide](#)

Embedded PDF installed with the latest firmware revision:

If you are viewing this information as a Help file in the instrument, then you can click on the links above to open the PDF document.

Rear-Panel Features

The instrument's Rear-panel features are fully detailed in the section "Rear-Panel Features" (under the chapter "Front and Rear Panel Features") of the document:

Latest available on line document: [E6640A Getting Started Guide](#)

Embedded PDF installed with the latest firmware revision:

If you are viewing this information as a Help file in the instrument, then you can click on the link above to open the PDF document.

Window Control Keys

The instrument provides three virtual-front-panel keys or four menu items for controlling windows.

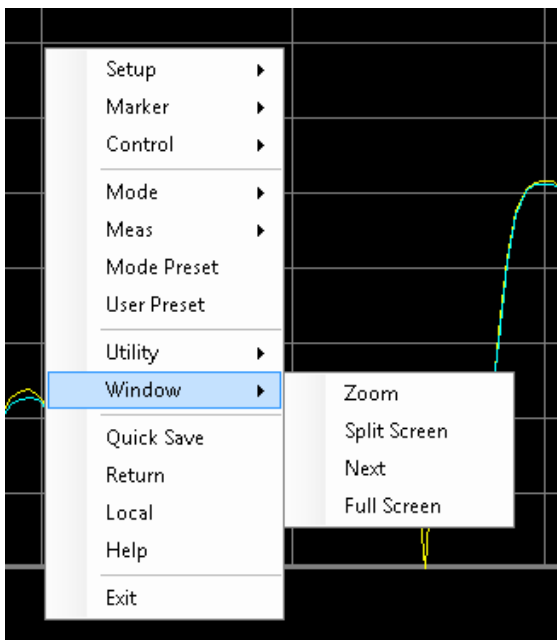
Virtual Front Panel

The virtual-front-panel keys are Multi Window, Zoom, and Next Window. These are all “immediate action” keys.



Windows Control Menu

The menu items are Zoom, Split Screen, Next [Window], and Full screen. These are all “immediate action” menu selections. Zoom and Full Screen are toggle functions.



Multi-Window



The Multi Window front-panel key will toggle you back and forth between the Normal View and the last Multi Window View (Zone Span, Trace Zoom or Spectrogram) that you were in, when using the Swept SA measurement of the Spectrum Analyzer Mode. It remembers which View you were in through a Preset. This “previous view” is set to Zone Span on a Restore Mode Defaults.

Key Path	Front-panel key
Initial S/W Revision	Prior to A.02.00

Zoom

Zoom is a toggle function. Pressing this key once increases the size of the selected window. Pressing the key again returns the window to the original size.

When Zoom is on for a window, that window will get the entire primary display area. The zoomed window, since it is the selected window, is outlined in green.

Zoom is local to each Measurement. Each Measurement remembers its Zoom state. The Zoom state of each Measurement is part of the Mode’s state.

NOTE

Data acquisition and processing for the other windows continues while a window is zoomed, as does all SCPI communication with the other windows.

Remote Command	:DISPlay:WINDow:FORMat:ZOOM
Remote Command	:DISPlay:WINDow:FORMat:TILE
Example	:DISP:WIND:FORM:ZOOM sets zoomed :DISP:WIND:FORM:TILE sets un-zoomed
Preset	TILE
Initial S/W Revision	Prior to A.02.00

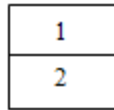
Next Window

Selects the next window of the current view. When the Next Window key is pressed, the next window in the order of precedence becomes selected. If the selected window was zoomed, the next window will also be zoomed.

The window numbers are as follows. Note that these numbers also determine the order of precedence (that is, Next Window goes from 1 to 2, then 2 to 3, etc.):



Four window display



Two window display

RTSA measurements:

Only two windows are available in the Spectrogram view under the Spectrum measurement and up to three windows are available in the Power vs. Time measurement, depending on the view set up.

Remote Command	:DISPlay:WINDow[:SElect] <number> :DISPlay:WINDow[:SElect]?
Example	:DISP:WIND 1
Preset	1
Min	1
Max	If <number> is greater than the number of windows, limit to <number of windows>
Initial S/W Revision	Prior to A.02.00

One and only one window is always selected. The selected window has the focus; this means that all window-specific key presses apply only to that window. You can tell which window is selected by the thick green border around it. If a window is not selected, its boundary is gray.

If a window in a multi-window display is zoomed it is still outlined in green. If there is only one window, the green outline is not used. This allows the user to distinguish between a zoomed window and a display with only one window.

The selected window is local to each Measurement. Each Measurement remembers which window is selected. The selected window for each Measurement is remembered in Mode state.

NOTE

When this key is pressed in Help Mode, it toggles focus between the table of contents window and the topic pane window.

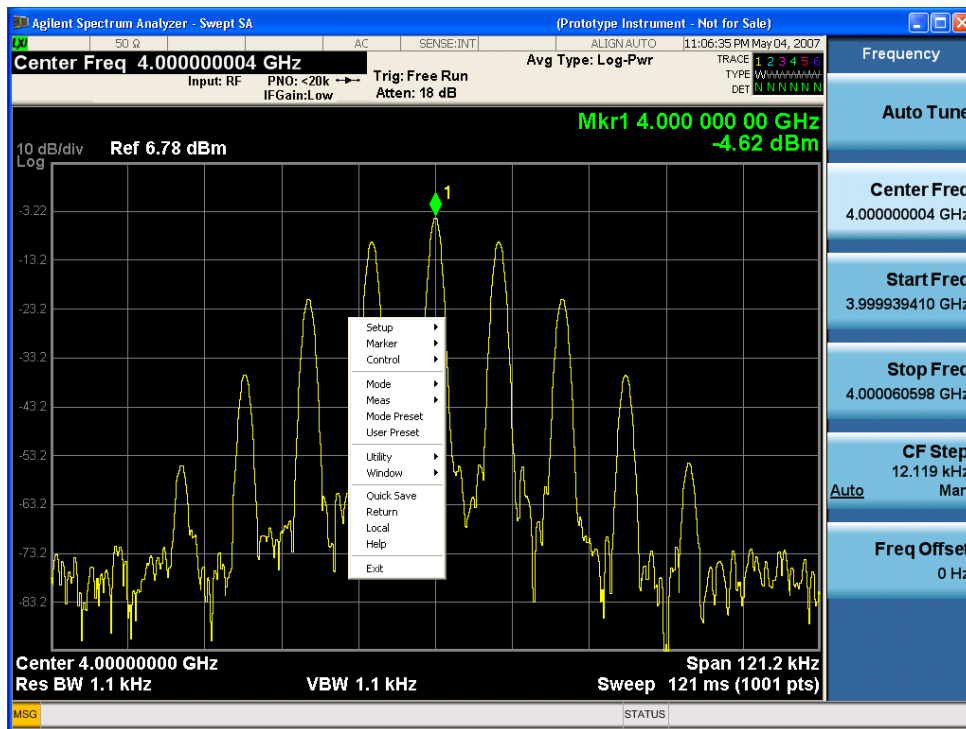
Mouse and Keyboard Control

If you do not have access to the instrument front-panel, there are several ways that a mouse and PC Keyboard can give you access to functions normally accessed using the front-panel keys.

For instrument lacking a physical front panel display, you can watch the instrument display via external monitor or remote desktop connection

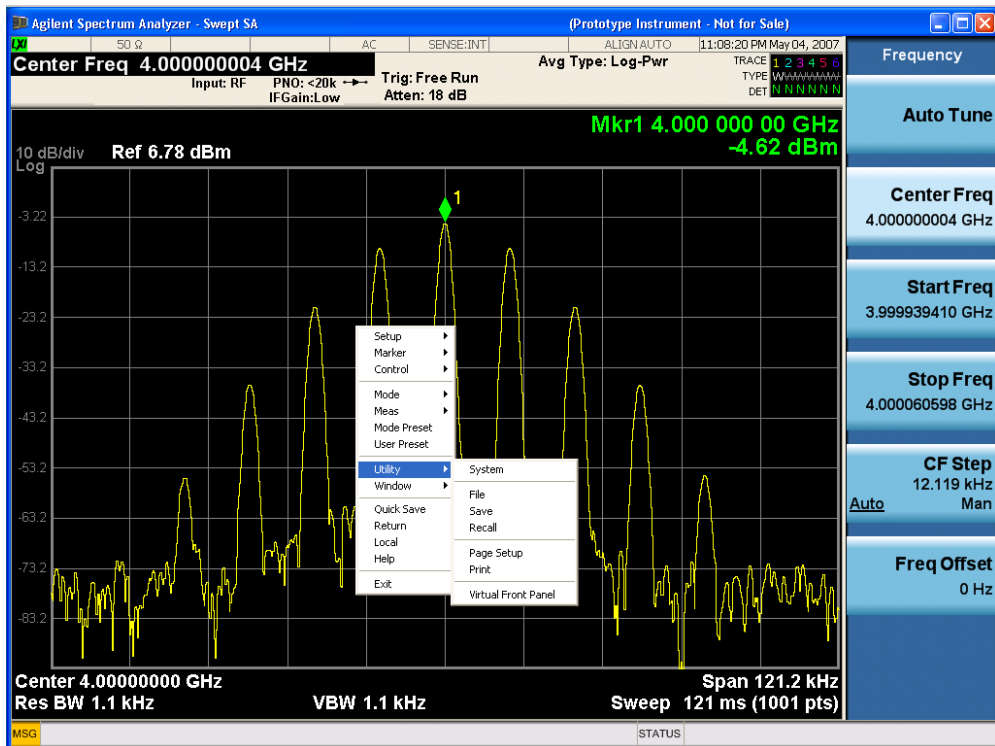
Right-Click

If you plug in a mouse and right-click on the analyzer screen, a menu will appear as below:



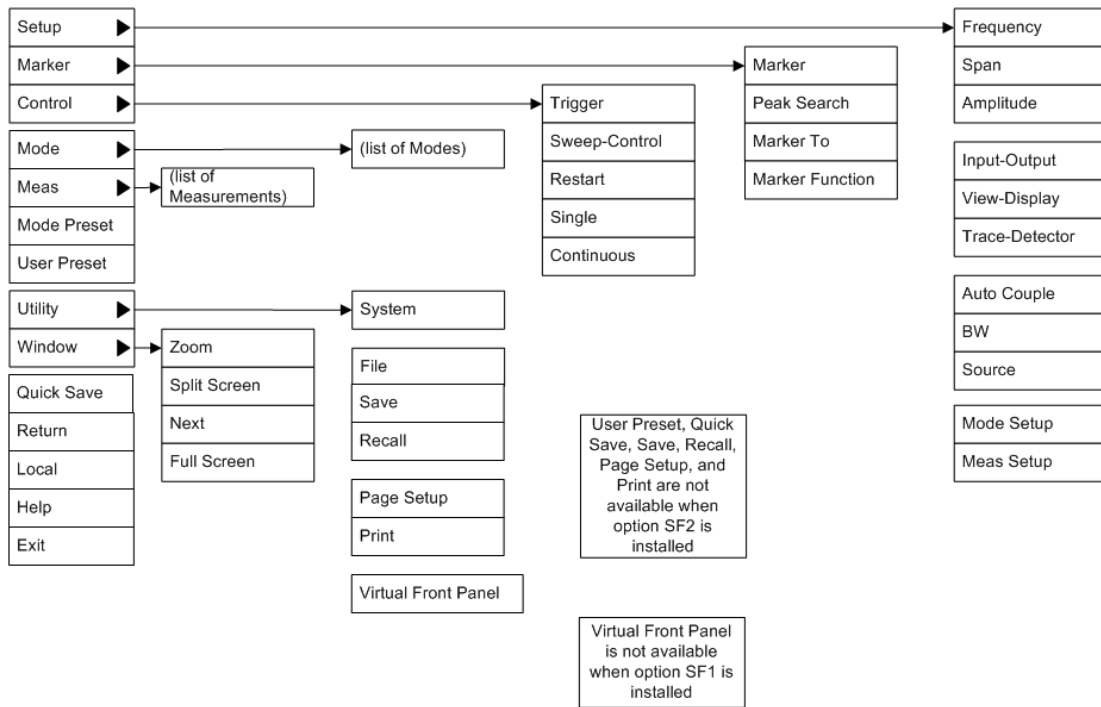
Placing the mouse on one of the rows marked with a right arrow symbol will cause that row to expand, as for example below where the mouse is hovered over the “Utility” row:

1 About the Test Set
 Mouse and Keyboard Control



This method can be used to access any of the front-panel keys by using a mouse; as for example if you are accessing the instrument through Remote Desktop.

The array of keys thus available is shown below:



PC Keyboard

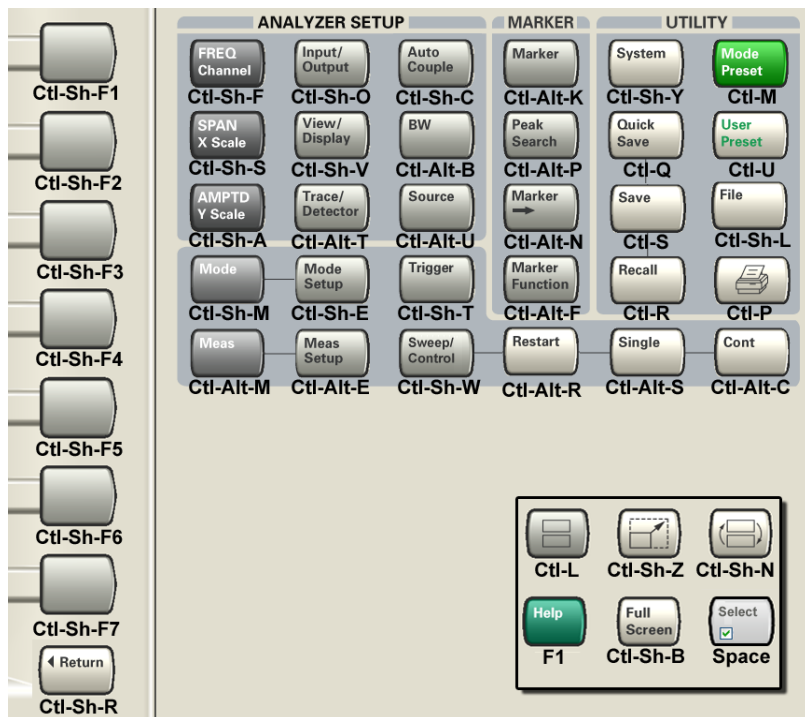
If you have a PC keyboard plugged in (or via Remote Desktop), certain key codes on the PC keyboard map to front-panel keys on the GPSA front panel. These key codes are shown below:

Front-panel key	Key code
Frequency	CTRL+SHIFT+F
Span	CTRL+SHIFT+S
Amplitude	CTRL+SHIFT+A
Input/Output	CTRL+SHIFT+O
View/Display	CTRL+SHIFT+V
Trace/Detector	CTRL+ALT+T
Auto Couple	CTRL+SHIFT+C
Bandwidth	CTRL+ALT+B
Source	CTRL+ALT-U
Marker	CTRL+ALT+K
Peak Search	CTRL+ALT+P
Marker To	CTRL+ALT+N
Marker Function	CTRL+ALT+F
System	CTRL+SHIFT+Y
Quick Save	CTRL+Q
Save	CTRL+S
Recall	CTRL+R
Mode Preset	CTRL+M
User Preset	CTRL+U
Print	CTRL+P
File	CTRL+SHIFT+L
Mode	CTRL+SHIFT+M
Measure	CTRL+ALT+M
Mode Setup	CTRL+SHIFT+E
Meas Setup	CTRL+ALT+E
Trigger	CTRL+SHIFT+T
Sweep/Control	CTRL+SHIFT+W
Restart	CTRL+ALT+R
Single	CTRL+ALT+S
Cont	CTRL+ALT+C
Zoom	CTRL+SHIFT+Z
Next Window	CTRL+SHIFT+N
Split Screen	CTRL+L

1 About the Test Set
Mouse and Keyboard Control

Front-panel key	Key code
Full Screen	CTRL+SHIFT+B
Return	CTRL+SHIFT+R
Mute	Mute
Inc Audio	Volume Up
Dec Audio	Volume Down
Help	F1
Control	CTRL
Alt	ALT
Enter	Return
Cancel	Esc
Del	Delete
Backspace	Backspace
Select	Space
Up Arrow	Up
Down Arrow	Down
Left Arrow	Left
Right Arrow	Right
Menu key 1	CTRL+SHIFT+F1
Menu key 2	CTRL+SHIFT+F2
Menu key 3	CTRL+SHIFT+F3
Menu key 4	CTRL+SHIFT+F4
Menu key 5	CTRL+SHIFT+F5
Menu key 6	CTRL+SHIFT+F6
Menu key 7	CTRL+SHIFT+F7
Backspace	BACKSPACE
Enter	ENTER
Tab	Tab
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
0	0

This is a pictorial view of the table:



Instrument Security & Memory Volatility

If you are using the instrument in a secure environment, you may need details of how to clear or sanitize its memory, in compliance with published security standards of the United States Department of Defense, or other similar authorities.

For X-Series test sets, this information is contained in the document "Security Features and Document of Volatility". This document is not included in the instrument on-disk library, but it may be downloaded from the Keysight web site.

To obtain a copy of the document, click on or browse to the following URL:

<http://www.keysight.com/find/security>

To locate and download the document, select Model Number, for example "E6607A", then click "Submit". Then, follow the on-screen instructions to download the file.

1 About the Sequence Analyzer Application

This section provides information about the Sequence Analyzer Mode.

What Does the Sequence Analyzer Application Do?

The Sequence Analyzer mode makes it possible to define, save, and execute a series of data acquisitions (controlled by the analyzer list sequencer) and/or a series of RF stimulus outputs (controlled by the source list sequencer). This defined series of acquisitions and/or outputs is known as a sequence.

The test set's source list sequencer and analyzer list sequencer, which are controlled and coordinated by the Sequence Analyzer mode, allows you to both set up a sequence of data to be output from the test set and also to set up a sequence of data acquisitions, and define the measurements to be performed on the data received at the test set input. The sequences are designed for calibration and verification of a mobile device, and are set up in the test set to correspond exactly with the sequences that are expected at the mobile device receiver and are generated by the mobile device transmitter, without the need for call processing.

The flexibility of the list sequencers allows you to set up and make many complex measurements on defined sets of data, using many different radio standards, all at high speed. It also allows the test set to be configured to suit the unique requirements of a particular testing situation.

You can run the source list sequencer independently of the analyzer list sequencer (in any mode), but to run the analyzer and source list sequencers simultaneously, you must be in the Sequence Analyzer mode.

The List Sequencer measurement of the Sequence Analyzer mode actually encompasses several possible measurements. In addition to the four basic measurements (power, phase & frequency, discrete PAVT, and IQ data) which are native to the Sequence Analyzer mode, the List Sequencer measurement can make use of several measurements "borrowed" from other measurement modes. However, in order for the List Sequencer to use a measurement from another mode, that mode must be licensed on the test set. (For example, the W-CDMA U9073A application must be licensed on the test set in order for the List Sequencer to use measurements from the W-CDMA mode.)

1 About the Sequence Analyzer Application
What Does the Sequence Analyzer Application Do?

2 Programming the Test Set

This section provides introductory information about the programming documentation included with your product.

"What Programming Information is Available?" on page 42

"STATus Subsystem " on page 61

"Common Commands" on page 101

What Programming Information is Available?

The X-Series Documentation can be accessed through the Additional Documentation page in the instrument Help system. It can also be found online at: <http://www.keysight.com/find/exm>.

The following resources are available to help you create programs for automating your X-Series measurements:

Resource	Description
X-Series Programmer's Guide	<p>Provides general SCPI programming information on the following topics:</p> <ul style="list-style-type: none">• Programming the X-Series Applications• Programming fundamentals• Programming examples <p>Note that SCPI command descriptions for measurement applications are not in this book, but are in the User's and Programmer's Reference.</p>
User's and Programmer's Reference manuals	<p>Describes all front-panel keys and softkeys, including SCPI commands for a measurement application. Note that:</p> <ul style="list-style-type: none">• Each measurement application has its own User's and Programmer's Reference.• The content in this manual is duplicated in the analyzer's Help (the Help that you see for a key is identical to what you see in this manual).
Embedded Help in your instrument	<p>Describes all front-panel keys and softkeys, including SCPI commands, for a measurement application. Note that the content that you see in Help when you press a key is identical to what you see in the User's and Programmer's Reference.</p>
X-Series Getting Started Guide	<p>Provides valuable sections related to programming including:</p> <ul style="list-style-type: none">• Licensing New Measurement Application Software - After Initial Purchase• Configuring instrument LAN Hostname, IP Address, and Gateway Address• Using the Windows XP Remote Desktop to connect to the instrument remotely• Using the Embedded Web Server Telnet connection to communicate SCPI <p>This printed document is shipped with the instrument.</p>
Keysight Application Notes	<p>Printable PDF versions of pertinent application notes.</p>
Keysight VISA User's Guide	<p>Describes the Keysight Virtual Instrument Software Architecture (VISA) library and shows how to use it to develop I/O applications and instrument drivers on Windows PCs.</p>

List of SCPI Commands

```

*CAL?
*CLS
*ESE <integer>
*ESE?
*ESR?
*IDN?
*OPC
*OPC?
*OPT?
*RCL <register#>
*RST
*SAV <register#>
*SRE <integer>
*SRE?
*STB?
*TRG
*TST?
*WAI
CALCulate:CLIMits:FAIL?
CALCulate:DATA<n>:COMPRESS? BLOCK | CFIT | MAXimum | MINimum | MEAN |
DMEan | RMS | RMSCubed | SAMPLE | SDEVIation | PPHase[, <soffset>[,
<length>[, <roffset>[, <rlimit>]]]]
CALCulate:DATA[n]?
CALCulate:DATA[1]|2|...|6:PEAKs? <threshold>, <excursion>[, AMPLitude |
FREQuency | TIME]
CALCulate:DATA[1]|2|...|6:PEAKs? <threshold>, <excursion>[, AMPLitude |
FREQuency | TIME[, ALL | GTDLine | LTDLine]]
CALCulate:LSEQuencer:MARKer:AOFF
CALCulate:LSEQuencer:MARKer:COUPLE[:STATE] OFF | ON | 0 | 1
CALCulate:LSEQuencer:MARKer:COUPLE[:STATE]?
CALCulate:LSEQuencer:MARKer[1]|2|...|12:MAXimum
CALCulate:LSEQuencer:MARKer[1]|2|...|12:MODE POSITION | DELTa | OFF
CALCulate:LSEQuencer:MARKer[1]|2|...|12:MODE?
CALCulate:LSEQuencer:MARKer[1]|2|...|12:REFerence <integer>
CALCulate:LSEQuencer:MARKer[1]|2|...|12:REFerence?
CALCulate:LSEQuencer:MARKer[1]|2|...|12:TRACe RFENvelope | MAXRfenvelop |
MINRfenvelop
CALCulate:LSEQuencer:MARKer[1]|2|...|12:TRACe?
CALCulate:LSEQuencer:MARKer[1]|2|...|12:X <real>
CALCulate:LSEQuencer:MARKer[1]|2|...|12:X?
CALCulate:LSEQuencer:MARKer[1]|2|...|12:X:POSition <real>
CALCulate:LSEQuencer:MARKer[1]|2|...|12:X:POSition?
CALCulate:LSEQuencer:MARKer[1]|2|...|12:Y?
CALibration[:ALL]
CALibration[:ALL]?
CALibration[:ALL]:NPENding
CALibration:EXPIred?
CALibration:IF
CALibration:IF?
CALibration:IF:NPENding

```

2 Programming the Test Set

List of SCPI Commands

```
CALibration:INTernal:SOURce[:ALL]
CALibration:INTernal:SOURce[:ALL]?
CALibration:INTernal:SOURce[:ALL]:NPENding
CALibration:NRF
CALibration:NRF?
CALibration:NRF:NPENding
CALibration:RF
CALibration:RF?
CALibration:RF:NPENding
CALibration:TEMPerature:CURRent?
CALibration:TEMPerature:LALL?
CALibration:TEMPerature:LIF?
CALibration:TEMPerature:LRF?
CALibration:TEMPerature:SOURce:LALL?
CALibration:TIME:LALL?
CALibration:TIME:LIF?
CALibration:TIME:LRF?
CALibration:TIME:SOURce:LALL?
CONF FSC
CONFigure?
CONFigure:LSEQuencer
CONFigure:LSEQuencer:NDEFault
DISPlay:<measurement>:ANNOtation:TITLe:DATA <string>
DISPlay:<measurement>:ANNOtation:TITLe:DATA?
DISPlay:ACTivefunc[:STATe] ON | OFF | 1 | 0
DISPlay:ACTivefunc[:STATe]?
DISPlay:ANNOtation:MBAR[:STATe] OFF | ON | 0 | 1
DISPlay:ANNOtation:MBAR[:STATe]?
DISPlay:ANNOtation:SCReen[:STATe] OFF | ON | 0 | 1
DISPlay:ANNOtation:SCReen[:STATe]?
DISPlay:LSEQuencer:VIEW[1][:SElect] RESult | RFENvelope
DISPlay:LSEQuencer:VIEW[1][:SElect]?
DISPlay:LSEQuencer:VIEW[1]:WINDow[1]:TRACe:MAXHold[:STATe ]?
DISPlay:LSEQuencer:VIEW[1]:WINDow[1]:TRACe:MAXHold[:STATe] ON | OFF | 1 |
0
DISPlay:LSEQuencer:VIEW[1]:WINDow[1]:TRACe:MINHold[:STATe ]?
DISPlay:LSEQuencer:VIEW[1]:WINDow[1]:TRACe:MINHold[:STATe] ON | OFF | 1 |
0
DISPlay:WINDow[1]:ANNOtation[:ALL] OFF | ON | 0 | 1
DISPlay:WINDow[1]:ANNOtation[:ALL]?
DISPlay:WINDow:FORMat:TILE
DISPlay:WINDow:FORMat:ZOOM
DISPlay:WINDow[:SElect] <number>
DISPlay:WINDow[:SElect]?
DISPlay:WINDow[1]:TRACe:GRATICule:GRID[:STATe] OFF | ON | 0 | 1
DISPlay:WINDow[1]:TRACe:GRATICule:GRID[:STATe]?
FEED:RF:PORT:OUTP RFIO1
FETCh:LSEQuencer[1]|2|3?
FETCh:LSEQuencer:ILPControl?
FORMat:BORDER NORMAL | SWAPPed
FORMat:BORDER?
FORMat[:TRACe][:DATA] ASCii | INTeger, 32 | REAL, 32 | REAL, 64
FORMat[:TRACe][:DATA]?
```

```

GLOBal:DEFault
GLOBal:FREQuency:CENTer[:STATe] 1 | 0 | ON | OFF
GLOBal:FREQuency:CENTer[:STATe]?
HCOpy:ABORT
HCOpy[:IMMediate]
INITiate[:IMMediate]
INITiate:LSEQuencer
INITiate:REStArt
INPut<1|2>:TYPE INPUT1 | INPUT2
INPut<1|2>:TYPE?
INPut:MIXer EXTernal | INTernal
INPut:MIXer?
INST:NSEL 102
INST:NSEL 105
INSTrument:CATalog?
INSTrument:COUPle:DEFault
INSTrument:COUPle:FREQuency:CENTer ALL | NONE
INSTrument:COUPle:FREQuency:CENTer?
INSTrument:DEFault
INSTrument:NSElect <integer>
INSTrument:NSElect?
INSTrument[:SElect] SANalyzer
INSTrument[:SElect] RECeiver
INSTrument[:SElect] GSM
INSTrument[:SElect] 'SA' | 'PNOISE' | 'EDGE' | 'GSM' | 'BASIC'
INSTrument[:SElect] SA | RTSA | SEQAN | EMI | BASIC | WCDMA | EDGE GSM |
WIMAXOFDMA | VSA | PNOISE | NFIGure | ADEMOD | BTooth | TDSCDMA | CDMA2K |
CDMA1XEV | LTE | LTETDD | LTEAFDD | LTEATDD | MSR | DVB | DTMB | DCATV |
ISDBT | CMMB | WLAN | CWLAN | CWIMAXOFDM | WIMAXFIXED | IDEN | RLC |
SCPILC | VSA89601
INSTrument[:SElect]?
INST:SEL SCPILC
INST:SEL EMI
INST:SEL LTETDD
INST:SEL LTE
MEASure:LSEQuencer[1]|2|3?
MMEMemory:CATalog? [<directory_name>]
MMEMemory:CDIRectory [<directory_name>]
MMEMemory:CDIRectory?
MMEMemory:COPY <string>, <string>[, <string>, <string>]
MMEMemory:COPY:DEvIce <source_string>, <dest_string>
MMEMemory:DATA <file_name>, <data>
MMEMemory:DATA? <file_name>
MMEMemory:DELeTe <file_name>[, <directory_name>]
MMEMemory:HEADer:ID? "<filename>"
MMEMemory:LOAD:CORRection ANTenna | CABLe | OTHer | USER, <filename>
MMEMemory:LOAD:CORRection 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8, <filename>
MMEMemory:LOAD:SEQuences:| SLIST | ALIST | SAAList | "MySequence.txt"
MMEMemory:LOAD:STATe <filename>
MMEMemory:LOAD:STATe 1, <filename>
MMEMemory:MDIRectory <directory_name>
MMEMemory:MOVE <string>, <string>[, <string>, <string>]

```

```

MMEMory:RDIRECTory <directory_name>
MMEMory:REGister:STATE:LABEL <regnumber>, "label"
MMEMory:REGister:STATE:LABEL? <regnumber>
MMEMory:STORE:CORRection 1 | 2 | 3 | 4 | 5 | 6, <filename>
MMEMory:STORE:CORRection ANTenna | CABLe | OTHer | USER, <filename>
MMEMory:STORE:SCREen <filename>
MMEMory:STORE:SCREen:THEME TDColor | TDMonochrome | FCOLor | FMNochrome
MMEMory:STORE:SCREen:THEME?
MMEMory:STORE:STATE <filename>
MMEMory:STORE:STATE 1, <filename>
MMEM:STOR:SEQuences:| SLIST | ALIST | SAAList | SStep"MySequence.txt"
NOTE:when theradiobandisNONE, theseSCPIcommandsaretoconfigureFrequency,
otherwise, thesecommandsaretoconfigurechannelnumber.
NOTE:when theradiobandisNONE, theseSCPIcommandsaretoconfigureFrequency,
otherwise, thesecommandsaretoconfigurechannelnumber.
OUTPut:ANALog OFF | SVIDeo | LOGVideo | LINVideo | DAUDio
OUTPut:ANALog?
OUTPut:ANALog:AUTO OFF | ON | 0 | 1
OUTPut:ANALog:AUTO?
OUTPut[:EXTErnal][:STATE] ON | OFF | 1 | 0
OUTPut[:EXTErnal][:STATE]?
OUTPut:MODulation[:STATE] ON | OFF | 1 | 0
OUTPut:MODulation[:STATE]?
READ:LSEQuencer[1]|2|3?
Result index0 :Numberofanalysissteps
Result index1 :Arrayofaverageoutputpowerorbasictxpower
[:SENSe] :LSEQuencer:PCALibration:STEP:WIDTh?
[:SENSe] :LSEQuencer:PCALibration:STEP:CENTEr?
[:SENSe] :LSEQuencer:PCALibration::STEP:COUNt?
[:SENSe]:CORRection:CSET:ALL:DELEte
[:SENSe]:CORRection:CSET:ALL[:STATE] ON | OFF | 1 | 0
[:SENSe]:CORRection:CSET:ALL[:STATE]?
[:SENSe]:CORRection:CSET[1]|2|...|8:COMMEnt "text"
[:SENSe]:CORRection:CSET[1]|2|...|8:COMMEnt?
[:SENSe]:CORRection:CSET[1]|2|...|8:DATA <freq>, <ampl>, ...
[:SENSe]:CORRection:CSET[1]|2|...|8:DATA?
[:SENSe]:CORRection:CSET[1]|2|...|8:DATA:MERGE <freq>, <ampl>, ...
[:SENSe]:CORRection:CSET[1]|2|...|6:DELEte
[:SENSe]:CORRection:CSET[1]|2|...|8:DESCRiption "text"
[:SENSe]:CORRection:CSET[1]|2|...|8:DESCRiption?
[:SENSe]:CORRection:CSET[1]|2|...|8:RF:PORT RFIN | RFIO1 | RFIO2 | RFOut |
GPSout | GNSSout | RFIO3 | RFIO4
[:SENSe]:CORRection:CSET[1]|2|...|8:RF:PORT?
[:SENSe]:CORRection:CSET[1]|2|...|8:RF:PORT:RFIO1 SOURce | ANALyzer | BOTH
[:SENSe]:CORRection:CSET[1]|2|...|8:RF:PORT:RFIO2 SOURce | ANALyzer | BOTH
[:SENSe]:CORRection:CSET[1]|2|...|8:RF:PORT:RFIO2?
[:SENSe]:CORRection:CSET[1]|2|...|8:RF:PORT:RFIO1?
[:SENSe]:CORRection:CSET[1]|2|...|8[:STATE] ON | OFF | 1 | 0
[:SENSe]:CORRection:CSET[1]|2|...|8[:STATE]?
[:SENSe]:CORRection:CSET[1]|2|...|8:X:SPACing LINear | LOGarithmic
[:SENSe]:CORRection:CSET[1]|2|...|8:X:SPACing?
[:SENSe]:CORRection:IMPedance[:INPut][:MAGNitude] 50 | 75

```

```

[:SENSE]:CORREction:IMPedance[:INPut][:MAGNitude]?
[:SENSE]:FEED IQ | IONLy | QONLy
[:SENSE]:FEED RF | AIQ | EMIXer
[:SENSE]:FEED AREFERENCE
[:SENSE]:FEED?
[:SENSE]:FEED?
[:SENSE]:FEED:RF:PORT[:INPut] RFIN | RFIN2 | RFIO1 | RFIO2 | RFIO3 | RFIO4
[:SENSE]:FEED:RF:PORT[:INPut]?
[:SENSE]:FEED:RF:PORT:OUTPut RFOut | RFIO1 | RFIO2 | GPSout | GNSSout |
RFIO3 | RFIO4
[:SENSE]:FEED:RF:PORT:OUTPut?
[:SENSE]:HDUPlex:PORT:INPut RFIO3 | RFIO4
[:SENSE]:HDUPlex:PORT:OUTPut RFIO3 | RFIO4
[:SENSE]:LSEQuencer:ABORT:ERROR[:STATe] ON | OFF | 1 | 0
[:SENSE]:LSEQuencer:ABORT:ERROR[:STATe]?
[:SENSE]:LSEQuencer:ABORT:LIMIT:FAIL[:STATe] ON | OFF | 1 | 0
[:SENSE]:LSEQuencer:ABORT:LIMIT:FAIL[:STATe]?
[:SENSE]:LSEQuencer:ACQuire [1]2 | 3 | 4...512:NUMBER:ASTeps<integer>
[:SENSE]:LSEQuencer:ACQuire [1]2 | 3 | 4...512:NUMBER:ASTeps?
[:SENSE]:LSEQuencer:ACQuire[1]|2|...|4..512:ASETup[1]|2|...|4...1000:SETup
<time>, <time>, <integer>, <ampl>
[:SENSE]:LSEQuencer:ACQuire[1]|2|...|4..512:SETup NONE | GSM | EDGE |
WCDMA | CDMA2K | CDMA1XEV | LTE | LTETDD | TDSCDMA | BTooth | WLAN, NONE |
PGSM | EGSM | RGSMS | DCS1800 | PCS1900 | TGSM810 | GSM450 | GSM480 |
GSM850 | GSM700 | BANDI | BANDII | BANDIII | BANDIV | BANDV | BANDVI |
BANDVII | BANDVIII | BANDIX | BANDX | BANDXI | BANDXII | BANDXIII |
BANDXIV | BANDXIX | USCELL | USPCS | JAPAN | KOREAN | NMT | IMT2K | UPPER
| SECOND | PAMR400 | PAMR800 | IMTEXT | PCS1DOT9G | AWS | US2DOT5G |
PUBLIC | LOWER | BAND1 | BAND2 | BAND3 | BAND4 | BAND5 | BAND6 | BAND7 |
BAND8 | BAND9 | BAND10 | BAND11 | BAND12 | BAND13 | BAND14 | BAND17 |
BAND18 | BAND19 | BAND20 | BAND21 | BAND24 | BAND25 | BAND26 | BAND27 |
BAND28 | BAND31 | BAND33 | BAND34 | BAND35 | BAND36 | BAND37 | BAND38 |
BAND39 | BAND40 | BAND41 | BAND42 | BAND43 | BAND44 | BANDA | BANDB |
BANDC | BANDD | BANDE | BANDF, BTS | MS, <real>, <integer>, <ampl>, LOW |
ZERO | HIGH, <time>, <time>, IMMEDIATE | VIDEo | Video2 | INTernal | EXT1
| EXT2, <amptd>, <time>, NONE | INT/, <relativeampl>, OFF | RFIO0 | RFIO1
| RFIO2 | RFIO3 | RFIO4 | RFIO5 | RFIO6 | RFIO7, ON | OFF, NORMAL |
PRIMary | LOWer | UPPer | RANGE | SMIMo, RFIO1 | RFIO2 | RFIN | RFIO3 |
RFIO4
[:SENSE]:LSEQuencer:ACQuire[1]|2|...|4..512:SETup?
[:SENSE]:LSEQuencer:ACQuire{1:512}:ASETup{1:1000}:SETup:EPOWER <amp>
[:SENSE]:LSEQuencer:ACQuire{1:512}:ASETup{1:1000}:SETup:EPOWER?
[:SENSE]:LSEQuencer:ACQuire{1:512}:ASETup{1:1000}:SETup:MBITmap <Integer>
[:SENSE]:LSEQuencer:ACQuire{1:512}:ASETup{1:1000}:SETup:MBITmap?
[:SENSE]:LSEQuencer:ACQuire{1:512}:ASETup{1:1000}:SETup:TIME:INTerval
<time>
[:SENSE]:LSEQuencer:ACQuire{1:512}:ASETup{1:1000}:SETup:TIME:INTerval?
[:SENSE]:LSEQuencer:ACQuire{1:512}:ASETup{1:1000}:SETup:TIME:OFFSet <time>
[:SENSE]:LSEQuencer:ACQuire{1:512}:ASETup{1:1000}:SETup:TIME:OFFSet?
[:SENSE]:LSEQuencer:ACQuire{1:512}:LIST:SETup:EPOWER <amp>, <amp>, <amp>,
....

```

```

[:SENSe]:LSEQuencer:ACQuire{1:512}:LIST:SETup:EPower?
[:SENSe]:LSEQuencer:ACQuire{1:512}:LIST:SETup:MBITmap <Integer>,
<Integer>, <Integer>, ....
[:SENSe]:LSEQuencer:ACQuire{1:512}:LIST:SETup:MBITmap?
[:SENSe]:LSEQuencer:ACQuire{1:512}:LIST:SETup:TIME:INTerval <time>,
<time>, <time>, ....
[:SENSe]:LSEQuencer:ACQuire{1:512}:LIST:SETup:TIME:INTerval?
[:SENSe]:LSEQuencer:ACQuire{1:512}:LIST:SETup:TIME:OFFSet <time>, <time>,
<time>, ....
[:SENSe]:LSEQuencer:ACQuire{1:512}:LIST:SETup:TIME:OFFSet?
[:SENSe]:LSEQuencer:ACQuire{1:1000}:MASTeps:SETup <stepNumber>,
<analysisOffset>, <analysisInterval>, <stepSeperation>, <startPower>,
<powerStep>, <measBitMap>, <append>
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:AVERage:NUMBer <integer>
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:AVERage:NUMBer?
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:CNFRequency <real>
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:CNFRequency <real>
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:CNFRequency?
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:CNFRequency?
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:INTegration NORMAL | PRIMARY |
LOWer | UPPer | RANGE | SMIMO
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:INTegration?
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:PPOWer <amp>
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:PPOWer?
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:RADio:BAND NONE | BAND1 | BAND2 |
BAND3 | BAND4 | BAND5 | BAND6 | BAND7 | BAND8 | BAND9 | BAND10 | BAND11 |
BAND12 | BAND13 | BAND14 | BAND17 | BAND18 | BAND19 | BAND20 | BAND21 |
BAND24 | BAND25 | BAND26 | BAND27 | BAND28 | BAND31
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:RADio:BAND NONE | BAND33 | BAND34
| BAND35 | BAND36 | BAND37 | BAND38 | BAND39 | BAND40 | BAND41 | BAND42 |
BAND43 | BAND44
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:RADio:BAND NONE | BANDA | BANDB |
BANDC | BANDD | BANDE | BANDF
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:RADio:BAND NONE | PGSM | EGSM |
RGSM | DCS1800 | PCS1900 | TGSM810 | GSM450 | GSM480 | GSM700 | GSM850
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:RADio:BAND NONE | BandI | BandII
| BandIII | BandIV | BandV | BandVI | BandVII | BandVIII | BandIX | BandX
| BandXI | BandXII | BandXIII | BandXIV | bandxix
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:RADio:BAND NONE
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:RADio:BAND NONE | PGSM | EGSM |
RGSM | DCS1800 | PCS1900 | TGSM810 | GSM450 | GSM480 | GSM700 | GSM850
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:RADio:BAND NONE | USCELL | USPCS
| JAPAN | KOREAN | NMT | IMT2K | UPPER | SECOND | PAMR400 | PAMR800 |
IMTEXT | PCS1DOT9G | AWS | US2DOT5G | PUBLIC | LOWER
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:RADio:BAND NONE | USCELL | USPCS
| JAPAN | KOREAN | NMT | IMT2K | UPPER | SECOND | PAMR400 | PAMR800 |
IMTEXT | PCS1DOT9G | AWS | US2DOT5G | PUBLIC | LOWER
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:RADio:BAND?
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:RADio:BAND?
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:RADio:BAND?
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:RADio:BAND?

```



```

[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:RADio:BAND?
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:RADio:BAND?
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:RADio:BAND?
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:RADio:BAND?
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:RADio:BAND?
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:RADio:DEvice <BTS | MS>
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:RADio:DEvice?
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:RADio:STANdard <NONE | GSM | EDGE
| WCDMA | CDMA2K | CDMA1XEV | LTE | LTETDD | TDSCDMA | BTooth | WLAN>
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:RADio:STANdard?
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:TIME:DUratiON <time>
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:TIME:DUratiON?
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:TIME:TRANsitiON <time>
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:TIME:TRANsitiON?
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:TRIGger[:INPut] IMMEDIATE | VIDEO
| INTernal | EXTernal1 | EXTernal2 | RFBurst
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:TRIGger[:INPut]?
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:TRIGger[:INPut]:DELay <time>
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:TRIGger[:INPut]:DELay?
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:TRIGger[:INPut]:LEVel <amp>
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:TRIGger[:INPut]:LEVel?
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:TRIGger:OUTPut NONE | INTernal
[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:TRIGger:OUTPut?
[:SENSe]:LSEQuencer:ADVanced:TDSCdma:LBer:CINdex1 ?
[:SENSe]:LSEQuencer:ADVanced:TDSCdma:LBer:CINdex1 <int>
[:SENSe]:LSEQuencer:ADVanced:TDSCdma:LBer:CINdex0 ?
[:SENSe]:LSEQuencer:ADVanced:TDSCdma:LBer:CINdex0 <int>
[:SENSe]:LSEQuencer:ADVanced:TDSCdma:LBer:CLEVel <int>
[:SENSe]:LSEQuencer:ADVanced:TDSCdma:LBer:CLEVel?
[:SENSe]:LSEQuencer:ADVanced:TDSCdma:LBer:RMC:SCODE TRUE | FALSE
[:SENSe]:LSEQuencer:ADVanced:TDSCdma:LBer:RMC:SCODE ?
[:SENSe]:LSEQuencer:ADVanced:TDSCdma:PVT:DEMod ON | OFF | 1 | 0
[:SENSe]:LSEQuencer:ADVanced:TDSCdma:PVT:DEMod?
[:SENSe]:LSEQuencer:ADVanced:TDSCdma:PVT:MOmentum ON | OFF | 1 | 0
[:SENSe]:LSEQuencer:ADVanced:TDSCdma:PVT:MOmentum?
[:SENSe]:LSEQuencer:ASET:GSM:PVT:TIME[:OFFSet]?
[:SENSe]:LSEQuencer:ASETup:GSM:IEAverage ON | OFF | 1 | 0
[:SENSe]:LSEQuencer:ASETup:GSM:IEAverage?
[:SENSe]:LSEQuencer:ASETup:GSM:PVT:TIME[:OFFSet] <time>, ...
[:SENSe]:LSEQuencer:ASRLevels:MSNRati <rel_ampl>
[:SENSe]:LSEQuencer:ASRLevels:MSNRati?
[:SENSe]:LSEQuencer:ASRLevels:PPMargin <rel_ampl>
[:SENSe]:LSEQuencer:ASRLevels:PPMargin?
[:SENSe]:LSEQuencer:BFERor:DIF:Bandwidth[:RESolution] <freq>
[:SENSe]:LSEQuencer:BFERor:DIF:Bandwidth[:RESolution]?
[:SENSe]:LSEQuencer:BFERor:LIMit:PPM OFF | ON | 0 | 1
[:SENSe]:LSEQuencer:BFERor:LIMit:PPM <real>
[:SENSe]:LSEQuencer:BFERor:LIMit:PPM STATE?
[:SENSe]:LSEQuencer:BFERor:LIMit:PPM?
[:SENSe]:LSEQuencer:BIQData:DIF:Bandwidth[:RESolution] <freq>
[:SENSe]:LSEQuencer:BIQData:DIF:Bandwidth[:RESolution]?
[:SENSe]:LSEQuencer:BIQData:TYPE RDATA | APHase
[:SENSe]:LSEQuencer:BIQData:TYPE?

```

2 Programming the Test Set
List of SCPI Commands

```

[:SENSe]:LSEQuencer:BTXPower:LIMit:LOWer <rel_amp>
[:SENSe]:LSEQuencer:BTXPower:LIMit:LOWer?
[:SENSe]:LSEQuencer:BTXPower:LIMit:LOWer:STATE OFF | ON | 0 | 1
[:SENSe]:LSEQuencer:BTXPower:LIMit:LOWer:STATE?
[:SENSe]:LSEQuencer:BTXPower:LIMit:UPPer <rel_amp>
[:SENSe]:LSEQuencer:BTXPower:LIMit:UPPer?
[:SENSe]:LSEQuencer:BTXPower:LIMit:UPPer:STATE OFF | ON | 0 | 1
[:SENSe]:LSEQuencer:BTXPower:LIMit:UPPer:STATE?
[:SENSe]:LSEQuencer:BTXPower:[NONE]:DIF:BANDwidth|BWIDth[:RESolution]
<freq>
[:SENSe]:LSEQuencer:BTXPower:[NONE]:DIF:BANDwidth|BWIDth[:RESolution]?
[:SENSe]:LSEQuencer:BTXPower:[NONE]:DIF:FILTer:ALPHa <real>
[:SENSe]:LSEQuencer:BTXPower:[NONE]:DIF:FILTer:ALPHa?
[:SENSe]:LSEQuencer:BTXPower:[NONE]:DIF:FILTer:BANDwidth|BWIDth
[:RESolution] <freq>
[:SENSe]:LSEQuencer:BTXPower:[NONE]:DIF:FILTer:BANDwidth|BWIDth
[:RESolution]?
[:SENSe]:LSEQuencer:BTXPower:[NONE]:DIF:FILTer:TYPE GAUSSian | FLATtop |
RRC | SNYQuist
[:SENSe]:LSEQuencer:BTXPower:[NONE]:DIF:FILTer:TYPE?
[:SENSe]:LSEQuencer:IF:GAIN[:STATE] LOW | HIGH
[:SENSe]:LSEQuencer:IF:GAIN[:STATE]?
[:SENSe]:LSEQuencer:INCLude:SOURce YES | NO | 0 | 1
[:SENSe]:LSEQuencer:INCLude:SOURce?
[:SENSe]:LSEQuencer:LIST:SETup:AVERage:NUMBER <integer>, <integer>,
<integer>, ....
[:SENSe]:LSEQuencer:LIST:SETup:AVERage:NUMBER?
[:SENSe]:LSEQuencer:LIST:SETup:CNFRrequency <real>, <real>, <real>, ....
[:SENSe]:LSEQuencer:LIST:SETup:CNFRrequency <real>, <real>, <real>, ....
[:SENSe]:LSEQuencer:LIST:SETup:CNFRrequency?
[:SENSe]:LSEQuencer:LIST:SETup:CNFRrequency?
[:SENSe]:LSEQuencer:LIST:SETup:EPOWER <amp>, <amp>, <amp>, ....
[:SENSe]:LSEQuencer:LIST:SETup:EPOWER?
[:SENSe]:LSEQuencer:LIST:SETup:INTEgration <enum>, <enum>, <enum>, ....
[:SENSe]:LSEQuencer:LIST:SETup:INTEgration?
[:SENSe]:LSEQuencer:LIST:SETup:PPOWER <amp>, <amp>, <amp>, ....
[:SENSe]:LSEQuencer:LIST:SETup:PPOWER?
[:SENSe]:LSEQuencer:LIST:SETup:RADio:BAND <enum>, <enum>, <enum>, ....
[:SENSe]:LSEQuencer:LIST:SETup:RADio:BAND <enum>, <enum>, <enum>, ....
[:SENSe]:LSEQuencer:LIST:SETup:RADio:BAND <enum>, <enum>, <enum>, ....
[:SENSe]:LSEQuencer:LIST:SETup:RADio:BAND <enum>, <enum>, <enum>, ....
[:SENSe]:LSEQuencer:LIST:SETup:RADio:BAND <enum>, <enum>, <enum>, ....
[:SENSe]:LSEQuencer:LIST:SETup:RADio:BAND <enum>, <enum>, <enum>, ....
[:SENSe]:LSEQuencer:LIST:SETup:RADio:BAND <enum>, <enum>, <enum>, ....
[:SENSe]:LSEQuencer:LIST:SETup:RADio:BAND <enum>, <enum>, <enum>, ....
[:SENSe]:LSEQuencer:LIST:SETup:RADio:BAND <enum>, <enum>, <enum>, ....
[:SENSe]:LSEQuencer:LIST:SETup:RADio:BAND <enum>, <enum>, <enum>, ....
[:SENSe]:LSEQuencer:LIST:SETup:RADio:BAND <enum>, <enum>, <enum>, ....
[:SENSe]:LSEQuencer:LIST:SETup:RADio:BAND?
[:SENSe]:LSEQuencer:LIST:SETup:RADio:BAND?
[:SENSe]:LSEQuencer:LIST:SETup:RADio:BAND?
[:SENSe]:LSEQuencer:LIST:SETup:RADio:BAND?
[:SENSe]:LSEQuencer:LIST:SETup:RADio:BAND?
[:SENSe]:LSEQuencer:LIST:SETup:RADio:BAND?

```

```

[:SENSE]:LSEQuencer:LIST:SETup:RADio:BAND?
[:SENSE]:LSEQuencer:LIST:SETup:RADio:BAND?
[:SENSE]:LSEQuencer:LIST:SETup:RADio:BAND?
[:SENSE]:LSEQuencer:LIST:SETup:RADio:DEVIce <enum>, <enum>, <enum>, ....
[:SENSE]:LSEQuencer:LIST:SETup:RADio:DEVIce?
[:SENSE]:LSEQuencer:LIST:SETup:RADio:STANdard <enum>, <enum>, <enum>, ....
[:SENSE]:LSEQuencer:LIST:SETup:RADio:STANdard?
[:SENSE]:LSEQuencer:LIST:SETup:TIME:DURation <time>, <time>, <time>, ....
[:SENSE]:LSEQuencer:LIST:SETup:TIME:DURation?
[:SENSE]:LSEQuencer:LIST:SETup:TIME:OFFSet <time>, <time>, <time>, ....
[:SENSE]:LSEQuencer:LIST:SETup:TIME:OFFSet?
[:SENSE]:LSEQuencer:LIST:SETup:TIME:TRANsition <time>, <time>, <time>,
....
[:SENSE]:LSEQuencer:LIST:SETup:TIME:TRANsition?
[:SENSE]:LSEQuencer:LIST:SETup:TRIGger[:INPut] <enum>, <enum>, <enum>,
....
[:SENSE]:LSEQuencer:LIST:SETup:TRIGger[:INPut]?
[:SENSE]:LSEQuencer:LIST:SETup:TRIGger[:INPut]:DELay <time>, <time>,
<time>, ....
[:SENSE]:LSEQuencer:LIST:SETup:TRIGger[:INPut]:DELay?
[:SENSE]:LSEQuencer:LIST:SETup:TRIGger[:INPut]:LEVel <amp>, <amp>, <amp>,
....
[:SENSE]:LSEQuencer:LIST:SETup:TRIGger[:INPut]:LEVel?
[:SENSE]:LSEQuencer:LIST:SETup:TRIGger:OUTPut <enum>, <enum>, <enum>, ....
[:SENSE]:LSEQuencer:LIST:SETup:TRIGger:OUTPut?
[:SENSE]:LSEQuencer:NUMBer:ACQuire <integer>
[:SENSE]:LSEQuencer:NUMBer:ACQuire?
[:SENSE]:LSEQuencer:PCALibration:FILTer
[:SENSE]:LSEQuencer:PCALibration:STEP:CENTer <time>, ..., <time>
[:SENSE]:LSEQuencer:PCALibration::STEP:COUNT <integer>
[:SENSE]:LSEQuencer:PCALibration:STEP:WIDTh <time>, ..., <time>
[:SENSE]:LSEQuencer:PORT:INPut:MODE FIXEd | LIST
[:SENSE]:LSEQuencer:PORT:INPut:MODE?
[:SENSE]:LSEQuencer:RESults:DISPlay ON | OFF | 1 | 0
[:SENSE]:LSEQuencer:RESults:DISPlay?
[:SENSE]:LSEQuencer:RTYPE MMETric
[:SENSE]:LSEQuencer:RTYPE?
[:SENSE]:LSEQuencer:TIMEout:TRIGger <time>
[:SENSE]:LSEQuencer:TIMEout:TRIGger?
[:SENSE]:LSEQuencer:TIMEout:TRIGger:STATE OFF | ON | 0 | 1
[:SENSE]:LSEQuencer:TIMEout:TRIGger:STATE?
[:SENSE]:LSEQuencer[:WCDMA]:ILPControl:SETup <frequency>, <ampl>,
<Integer>, <real>, <time>, UP | DOWN | BOTH, ON | OFF | 1 | 0, ON | OFF |
1 | 0
[:SENSE]:PVTime:LIMit:POFF:ULINK <real>
[:SENSE]:PVTime:LIMit:POFF:ULINK?
[:SENSE]:PVTime:THReshold:DOWN:END <rel_ampl>
[:SENSE]:PVTime:THReshold:DOWN:START <rel_ampl>
[:SENSE]:PVTime:THReshold:UP:END <rel_ampl>
[:SENSE]:PVTime:THReshold:UP:START <rel_ampl>
[:SENSE]:ROSCillator:EXTernal:FREQuency <freq>
[:SENSE]:ROSCillator:EXTernal:FREQuency?

```

```
[ :SENSe]:ROSCillator:SOURce INTernal | EXTernal
[ :SENSe]:ROSCillator:SOURce?
[ :SENSe]:ROSCillator:SOURce:TYPE INTernal | EXTernal | SENSE | PULSE
[ :SENSe]:ROSCillator:SOURce:TYPE?
SERvice[:PRODUCTION]:LSEQuencer:ADVanced:LTE:CCONdition NORMAL | EXTreme
SERvice[:PRODUCTION]:LSEQuencer:ADVanced:LTE:CCONdition?
SERvice[:PRODUCTION]:LSEQuencer:ADVanced:LTETdd:CCONdition NORMAL |
EXTreme
SERvice[:PRODUCTION]:LSEQuencer:ADVanced:LTETdd:CCONdition?
SERvice[:PRODUCTION]:LSEQuencer:ADVanced:TDSCdma:LBer:PATtern
<filepath+filename>
SERvice[:PRODUCTION]:LSEQuencer:ADVanced:TDSCdma:LBer:PATtern :LOAD
<String>
SERvice[:PRODUCTION]:LSEQuencer:ADVanced:TDSCdma:LBer:PATtern :LOAD?
SERvice[:PRODUCTION]:LSEQuencer:ADVanced:TDSCdma:LBer:TFCI <int>
SERvice[:PRODUCTION]:LSEQuencer:ADVanced:TDSCdma:LBer:TFCI?
SERvice[:PRODUCTION]:LSEQuencer:ADVanced:TDSCdma:LBer:TFCI:AUTO TRUE |
FALSE
SERvice[:PRODUCTION]:LSEQuencer:ADVanced:TDSCdma:LBer:TFCI:AUTO?
SERvice[:PRODUCTION]:LSEQuencer:ADVanced:WCDma:LBer:PATtern
<filepath+filename>
SERvice[:PRODUCTION]:LSEQuencer:ADVanced:WCDma:LBer:PATtern :LOAD <String>
SERvice[:PRODUCTION]:LSEQuencer:ADVanced:WCDma:LBer:PATtern :LOAD?
SERvice[:PRODUCTION]:LSEQuencer:ANALyzer:FILE:VERSion? <string>
SERvice[:PRODUCTION]:LSEQuencer:SOURce:FILE:VERSion? <string>
SOURce:AM[:DEPth][:LINear]
SOURce:AM[:DEPth][:LINear]?
SOURce:AM:INTernal:FREQuency
SOURce:AM:INTernal:FREQuency?
SOURce:AM:STATe
SOURce:AM:STATe?
SOURce:FM[:DEViatiOn]
SOURce:FM[:DEViatiOn]?
SOURce:FM:INTernal:FREQuency
SOURce:FM:INTernal:FREQuency?
SOURce:FM:STATe
SOURce:FM:STATe?
SOURce:FREQuency:CHANnels:BAND NONE | PGSM | EGSM | RGSM | DCS1800 |
PCS1900 | TGSM810 | GSM450 | GSM480 | GSM700 | GSM850 | BANDI | BANDII |
BANDIII | BANDIV | BANDV | BANDVI | BANDVII | BANDVIII | BANDIX | BANDX |
BANDXI | BANDXII | BANDXIII | BANDXIV | BANDXIX | USCELL | USPCS | JAPAN |
KOREAN | NMT | IMT2K | UPPER | SECOND | PAMR400 | PAMR800 | IMTEXT |
PCS1DOT9G | AWS | US2DOT5G | PUBLIC | LOWER | BAND1 | BAND2 | BAND3 |
BAND4 | BAND5 | BAND6 | BAND7 | BAND8 | BAND10 | BAND11 | BAND12 | BAND13
| BAND14 | BAND17 | BAND18 | BAND19 | BAND20 | BAND21 | BAND24 | BAND25 |
BAND26 | BAND27 | BAND28 | BAND31 | BAND33 | BAND34 | BAND35 | BAND36 |
BAND37 | BAND38 | BAND39 | BAND40 | BAND41 | BAND42 | BAND43 | BAND44 |
BANDA | BANDB | BANDC | BANDD | BANDE | BANDF
SOURce:FREQuency:CHANnels:BAND?
SOURce:FREQuency:CHANnels:NUMBer <int>
SOURce:FREQuency:CHANnels:NUMBer?
SOURce:FREQuency[:CW] <freq>
```

```

SOURCE:FREQUENCY[:CW]?
SOURCE:FREQUENCY:OFFSET <freq>
SOURCE:FREQUENCY:OFFSET?
SOURCE:FREQUENCY:REFERENCE <freq>
SOURCE:FREQUENCY:REFERENCE?
SOURCE:FREQUENCY:REFERENCE:SET
SOURCE:FREQUENCY:REFERENCE:STATE OFF | ON | 0 | 1
SOURCE:FREQUENCY:REFERENCE:STATE?
SOURCE:LIST:INITIATION:ARMED?
SOURCE:LIST:NUMBER:STEPS <integer>
SOURCE:LIST:NUMBER:STEPS?
SOURCE:LIST:SETUP:AMPLITUDE <ampl>, <ampl>, <ampl>, ...
SOURCE:LIST:SETUP:AMPLITUDE?
SOURCE:LIST:SETUP:CLEAR
SOURCE:LIST:SETUP:CNFREQUENCY <double>, <double>, <double>, ...
SOURCE:LIST:SETUP:CNFREQUENCY?
SOURCE:LIST:SETUP:DURATION:TYPE <enum>, <enum>, <enum>, ...
SOURCE:LIST:SETUP:DURATION:TYPE?
SOURCE:LIST:SETUP:INPUT:TRIGGER <enum>, <enum>, <enum>, ...
SOURCE:LIST:SETUP:INPUT:TRIGGER?
SOURCE:LIST:SETUP:OUTPUT:TRIGGER ?
SOURCE:LIST:SETUP:OUTPUT:TRIGGER <bool>, <bool>, <bool>, ...
SOURCE:LIST:SETUP:RADIO:BAND <enum>, <enum>, <enum>, ...
SOURCE:LIST:SETUP:RADIO:BAND?
SOURCE:LIST:SETUP:RADIO:BAND:LINK <enum>, <enum>, <enum>, ...
SOURCE:LIST:SETUP:RADIO:BAND:LINK?
SOURCE:LIST:SETUP:TOCOUNT <time/int>, <time/int>, <time/int>, ...
SOURCE:LIST:SETUP:TOCOUNT?
SOURCE:LIST:SETUP:TRANSITION:TIME <time>, <time>, <time>, ...
SOURCE:LIST:SETUP:TRANSITION:TIME?
SOURCE:LIST:SETUP:WAVEFORM <string>, <string>, <string>, ...
SOURCE:LIST:SETUP:WAVEFORM?
SOURCE:LIST[:STATE] ON | OFF | 1 | 0
SOURCE:LIST[:STATE]?
SOURCE:LIST:STEP[1]|2|...|4..1000:SETUP IMMEDIATE | INTERNAL | KEY | BUS |
EXTERNAL2, <time>, NONE | PGSM | EGSM | RGSM | DCS1800 | PCS1900 | TGSM810
| GSM450 | GSM480 | GSM700 | GSM850 | BANDI | BANDII | BANDIII | BANDIV |
BANDV | BANDVI | BANDVII | BANDVIII | BANDIX | BANDX | BANDXI | BANDXII |
BANDXIII | BANDXIV | BANDXIX | USCELL | USPCS | JAPAN | KOREAN | NMT |
IMT2K | UPPER | SECOND | PAMR400 | PAMR800 | IMTEXT | PCS1DOT9G | AWS |
US2DOT5G | PUBLIC | LOWER | NONE | BAND1 | BAND2 | BAND3 | BAND4 | BAND5 |
BAND6 | BAND7 | BAND8 | BAND10 | BAND11 | BAND12 | BAND13 | BAND14 |
BAND17 | BAND18 | BAND19 | BAND20 | BAND21 | BAND24 | BAND25 | BAND26 |
BAND33 | BAND34 | BAND35 | BAND36 | BAND37 | BAND38 | BAND39 | BAND40 |
BAND41 | BAND42 | BAND43 | BANDA | BANDB | BANDC | BANDD | BANDE | BANDF,
DOWN | UP, <freq>, <ampl>, <string>, TIME | COUNT | CONTINUOUS, <time>, ON
| OFF | 1 | 0, [<int>],
SOURCE:LIST:STEP[1]|2|...|4..1000:SETUP?
SOURCE:LIST:STEP[1]|2|3..1000:SETUP:AMPLITUDE <double>
SOURCE:LIST:STEP[1]|2|3..1000:SETUP:AMPLITUDE?
SOURCE:LIST:STEP[1]|2|3..1000:SETUP:CNFREQUENCY <double>
SOURCE:LIST:STEP[1]|2|3..1000:SETUP:CNFREQUENCY <double>

```

2 Programming the Test Set

List of SCPI Commands

```
SOURce:LIST:STEP[1]|2|3...1000:SETup:CNFRequency?
SOURce:LIST:STEP[1]|2|3...1000:SETup:CNFRequency?
SOURce:LIST:STEP[1]|2|3...1000:SETup:DURation:TCOunt <double>
SOURce:LIST:STEP[1]|2|3...1000:SETup:DURation:TCOunt?
SOURce:LIST:STEP[1]|2|3...1000:SETup:DURation:TYPE TIME | COUNT |
CONTinuous | CABort
SOURce:LIST:STEP[1]|2|3...1000:SETup:DURation:TYPE?
SOURce:LIST:STEP[1]|2|3...1000:SETup:INPut:TRIGger IMMEDIATE | INTERNAL |
EXTernal2 | KEY | BUS | EXTernal4
SOURce:LIST:STEP[1]|2|3...1000:SETup:INPut:TRIGger?
SOURce:LIST:STEP[1]|2|3...1000:SETup:OUTPut:TRIGger ON | OFF | 1 | 0
SOURce:LIST:STEP[1]|2|3...1000:SETup:OUTPut:TRIGger
SOURce:LIST:STEP[1]|2|3...1000:SETup:RADio:BAND NONE | PGSM | EGSM | RGSM
| DCS1800 | PCS1900 | TGSM810 | GSM450 | GSM480 | GSM700 | GSM850 | BANDI
| BANDII | BANDIII | BANDIV | BANDV | BANDVI | BANDVII | BANDVIII | BANDIX
| BANDX | BANDXI | BANDXII | BANDXIII | BANDXIV | BANDXIX | USCELL | USPCS
| JAPAN | KOREAN | NMT | IMT2K | UPPER | SECOND | PAMR400 | PAMR800 |
IMTEXT | PCS1DOT9G | AWS | US2DOT5G | PUBLIC | LOWER | NONE | BAND1 |
BAND2 | BAND3 | BAND4 | BAND5 | BAND6 | BAND7 | BAND8 | BAND10 | BAND11 |
BAND12 | BAND13 | BAND14 | BAND17 | BAND18 | BAND19 | BAND20 | BAND21 |
BAND24 | BAND25 | BAND26 | BAND27 | BAND28 | BAND31 | BAND33 | BAND34 |
BAND35 | BAND36 | BAND37 | BAND38 | BAND39 | BAND40 | BAND41 | BAND42 |
BAND43 | BAND44 | BANDA | BANDB | BANDC | BANDD | BANDE | BANDF
SOURce:LIST:STEP[1]|2|3...1000:SETup:RADio:BAND?
SOURce:LIST:STEP[1]|2|3...1000:SETup:RADio:BAND:LINK DOWN | UP
SOURce:LIST:STEP[1]|2|3...1000:SETup:RADio:BAND:LINK?
SOURce:LIST:STEP[1]|2|3...1000:SETup:TRANSition:TIME <time>
SOURce:LIST:STEP[1]|2|3...1000:SETup:TRANSition:TIME?
SOURce:LIST:STEP[1]|2|3...1000:SETup:WAVEform <string>
SOURce:LIST:STEP[1]|2|3...1000:SETup:WAVEform?
SOURce:LIST:TRIGger[:IMMEDIATE]
SOURce:LIST:TRIGger:INITiate[:IMMEDIATE]
SOURce:LIST:TRIGgerout:TYPE BEGinningofstep | DATAmarker
SOURce:PM[:DEVIation]
SOURce:PM[:DEVIation]?
SOURce:PM:INTernal:FREQuency
SOURce:PM:INTernal:FREQuency?
SOURce:PM:STATE
SOURce:PM:STATE?
SOURce:POWer[:LEVel][:IMMEDIATE][:AMPLitude] <ampl>
SOURce:POWer[:LEVel][:IMMEDIATE][:AMPLitude]?
SOURce:POWer[:LEVel][:IMMEDIATE]:OFFSet <rel_ampl>
SOURce:POWer[:LEVel][:IMMEDIATE]:OFFSet?
SOURce:POWer:REFerence <ampl>
SOURce:POWer:REFerence?
SOURce:POWer:REFerence:STATE OFF | ON | 0 | 1
SOURce:POWer:REFerence:STATE?
SOURce:PRESet
SOURce:RADio:ARB:BASEband:FREQuency:OFFSet <freq>
SOURce:RADio:ARB:BASEband:FREQuency:OFFSet?
SOURce:RADio:ARB:CATalog?
SOURce:RADio:ARB:DEFault:DIRectory <string>
```

```

SOURCE:RADio:ARB:DEFault:DIRectory?
SOURCE:RADio:ARB:DELeTe <string>
SOURCE:RADio:ARB:DELeTe:ALL
SOURCE:RADio:ARB:FCATalog?
SOURCE:RADio:ARB:HEADer:CLEAr
SOURCE:RADio:ARB:HEADer:SAVE
SOURCE:RADio:ARB:LOAD <string>
SOURCE:RADio:ARB:LOAD:ALL <string>
SOURCE:RADio:ARB:MDEStination:ALCHold NONE | M1 | M2 | M3 | M4
SOURCE:RADio:ARB:MDEStination:ALCHold?
SOURCE:RADio:ARB:MDEStination:PULSe NONE | M1 | M2 | M3 | M4
SOURCE:RADio:ARB:MDEStination:PULSe?
SOURCE:RADio:ARB:MPLicensed:NAME:LOCKed?
SOURCE:RADio:ARB:MPLicensed:UID:LOCKed?
SOURCE:RADio:ARB:MPOLarity:MARKer3 POSitive | NEGative
SOURCE:RADio:ARB:MPOLarity:MARKer1 POSitive | NEGative
SOURCE:RADio:ARB:MPOLarity:MARKer4 POSitive | NEGative
SOURCE:RADio:ARB:MPOLarity:MARKer2 POSitive | NEGative
SOURCE:RADio:ARB:MPOLarity:MARKer3?
SOURCE:RADio:ARB:MPOLarity:MARKer1?
SOURCE:RADio:ARB:MPOLarity:MARKer4?
SOURCE:RADio:ARB:MPOLarity:MARKer2?
SOURCE:RADio:ARB:RETRigger ON | OFF | IMMEDIATE
SOURCE:RADio:ARB:RETRigger?
SOURCE:RADio:ARB:RSCaling <real>
SOURCE:RADio:ARB:RSCaling?
SOURCE:RADio:ARB:SCLock:RATE <freq>
SOURCE:RADio:ARB:SCLock:RATE?
SOURCE:RADio:ARB:SEQUence[:MWAVEform] <filename>, <waveform1>, <reps>,
NONE | M1 | M2 | M3 | M4 | M1M2 | M1M3 | M1M4 | M2M3 | M2M4 | M3M4 |
M1M2M3 | M1M2M4 | M1M3M4 | M2M3M4 | M1M2M3M4 | ALL, {<waveform2>, <reps>,
NONE | M1 | M2 | M3 | M4 | M1M2 | M1M3 | M1M4 | M2M3 | M2M4 | M3M4 |
M1M2M3 | M1M2M4 | M1M3M4 | M2M3M4 | M1M2M3M4 | ALL, }...
SOURCE:RADio:ARB:SEQUence[:MWAVEform]? <filename>
SOURCE:RADio:ARB[:STATe] ON | OFF | 1 | 0
SOURCE:RADio:ARB[:STATe]?
SOURCE:RADio:ARB:TRIGger:INITiate
SOURCE:RADio:ARB:TRIGger[:SOURce] KEY | BUS | EXTERNAL2
SOURCE:RADio:ARB:TRIGger[:SOURce]?
SOURCE:RADio:ARB:TRIGger:TYPE CONTInuous | SINGle | SADVanceGATE
SOURCE:RADio:ARB:TRIGger:TYPE?
SOURCE:RADio:ARB:TRIGger:TYPE:CONTInuous[:TYPE] FREE | TRIGger | RESet
SOURCE:RADio:ARB:TRIGger:TYPE:CONTInuous[:TYPE]?
SOURCE:RADio:ARB:TRIGger:TYPE:SADVance[:TYPE] SINGle | CONTInuous
SOURCE:RADio:ARB:TRIGger:TYPE:SADVance[:TYPE]?
SOURCE:RADio:ARB:WAVEform <string>
SOURCE:RADio:ARB:WAVEform?
SOURCE:RADio:BAND:LINK DOWN | UP
SOURCE:RADio:BAND:LINK?
SOURCE:RADio:DEVICE BTS | MS
SOURCE:RADio:DEVICE?
SOURCE:SYNC:CONFig NONE | TWO | THRee | FOUR

```

```
SOURce:SYNC:CONFIg?
SOURce:SYNC:START
SOURce:SYNC:STOP
STATus:OPERation:CONDition?
STATus:OPERation:ENABle <integer>
STATus:OPERation:ENABle?
STATus:OPERation[:EVENT]?
STATus:OPERation:NTRansition <integer>
STATus:OPERation:NTRansition?
STATus:OPERation:PTRansition <integer>
STATus:OPERation:PTRansition?
STATus:PRESet
STATus:QUEStionable:CALibration:CONDition?
STATus:QUEStionable:CALibration:ENABle <integer>
STATus:QUEStionable:CALibration:ENABle?
STATus:QUEStionable:CALibration[:EVENT]?
STATus:QUEStionable:CALibration:EXTended:FAILure:CONDition?
STATus:QUEStionable:CALibration:EXTended:FAILure:ENABle <integer>
STATus:QUEStionable:CALibration:EXTended:FAILure:ENABle?
STATus:QUEStionable:CALibration:EXTended:FAILure[:EVENT]?
STATus:QUEStionable:CALibration:EXTended:FAILure:NTRansition <integer>
STATus:QUEStionable:CALibration:EXTended:FAILure:NTRansition?
STATus:QUEStionable:CALibration:EXTended:FAILure:PTRansition <integer>
STATus:QUEStionable:CALibration:EXTended:FAILure:PTRansition?
STATus:QUEStionable:CALibration:EXTended:NEEDed:CONDition?
STATus:QUEStionable:CALibration:EXTended:NEEDed:ENABle <integer>
STATus:QUEStionable:CALibration:EXTended:NEEDed:ENABle?
STATus:QUEStionable:CALibration:EXTended:NEEDed[:EVENT]?
STATus:QUEStionable:CALibration:EXTended:NEEDed:NTRansition <integer>
STATus:QUEStionable:CALibration:EXTended:NEEDed:NTRansition?
STATus:QUEStionable:CALibration:EXTended:NEEDed:PTRansition <integer>
STATus:QUEStionable:CALibration:EXTended:NEEDed:PTRansition?
STATus:QUEStionable:CALibration:NTRansition <integer>
STATus:QUEStionable:CALibration:NTRansition?
STATus:QUEStionable:CALibration:PTRansition <integer>
STATus:QUEStionable:CALibration:PTRansition?
STATus:QUEStionable:CALibration:SKIPPed:CONDition?
STATus:QUEStionable:CALibration:SKIPPed:ENABle <integer>
STATus:QUEStionable:CALibration:SKIPPed:ENABle?
STATus:QUEStionable:CALibration:SKIPPed[:EVENT]?
STATus:QUEStionable:CALibration:SKIPPed:NTRansition <integer>
STATus:QUEStionable:CALibration:SKIPPed:NTRansition?
STATus:QUEStionable:CALibration:SKIPPed:PTRansition <integer>
STATus:QUEStionable:CALibration:SKIPPed:PTRansition?
STATus:QUEStionable:CONDition?
STATus:QUEStionable:ENABle <integer>
STATus:QUEStionable:ENABle?
STATus:QUEStionable[:EVENT]?
STATus:QUEStionable:FREQuency:CONDition?
STATus:QUEStionable:FREQuency:ENABle <integer>
STATus:QUEStionable:FREQuency:ENABle?
STATus:QUEStionable:FREQuency[:EVENT]?
STATus:QUEStionable:FREQuency:NTRansition <integer>
```



```

STATUS:QUESTIONABLE:FREQUENCY:NTRANSITION?
STATUS:QUESTIONABLE:FREQUENCY:PTRANSITION <integer>
STATUS:QUESTIONABLE:FREQUENCY:PTRANSITION?
STATUS:QUESTIONABLE:INTEGRITY:CONDITION?
STATUS:QUESTIONABLE:INTEGRITY:ENABLE <integer>
STATUS:QUESTIONABLE:INTEGRITY:ENABLE?
STATUS:QUESTIONABLE:INTEGRITY[:EVENT]?
STATUS:QUESTIONABLE:INTEGRITY:NTRANSITION <integer>
STATUS:QUESTIONABLE:INTEGRITY:NTRANSITION?
STATUS:QUESTIONABLE:INTEGRITY:PTRANSITION <integer>
STATUS:QUESTIONABLE:INTEGRITY:PTRANSITION?
STATUS:QUESTIONABLE:INTEGRITY:SIGNAL:CONDITION?
STATUS:QUESTIONABLE:INTEGRITY:SIGNAL:ENABLE <integer>
STATUS:QUESTIONABLE:INTEGRITY:SIGNAL:ENABLE?
STATUS:QUESTIONABLE:INTEGRITY:SIGNAL[:EVENT]?
STATUS:QUESTIONABLE:INTEGRITY:SIGNAL:NTRANSITION <integer>
STATUS:QUESTIONABLE:INTEGRITY:SIGNAL:NTRANSITION?
STATUS:QUESTIONABLE:INTEGRITY:SIGNAL:PTRANSITION <integer>
STATUS:QUESTIONABLE:INTEGRITY:SIGNAL:PTRANSITION?
STATUS:QUESTIONABLE:INTEGRITY:UNCALIBRATED:CONDITION?
STATUS:QUESTIONABLE:INTEGRITY:UNCALIBRATED:ENABLE
STATUS:QUESTIONABLE:INTEGRITY:UNCALIBRATED:ENABLE?
STATUS:QUESTIONABLE:INTEGRITY:UNCALIBRATED[:EVENT]?
STATUS:QUESTIONABLE:INTEGRITY:UNCALIBRATED:NTRANSITION <integer>
STATUS:QUESTIONABLE:INTEGRITY:UNCALIBRATED:NTRANSITION?
STATUS:QUESTIONABLE:INTEGRITY:UNCALIBRATED:PTRANSITION <integer>
STATUS:QUESTIONABLE:INTEGRITY:UNCALIBRATED:PTRANSITION?
STATUS:QUESTIONABLE:NTRANSITION <integer>
STATUS:QUESTIONABLE:NTRANSITION?
STATUS:QUESTIONABLE:POWER:CONDITION?
STATUS:QUESTIONABLE:POWER:ENABLE <integer>
STATUS:QUESTIONABLE:POWER:ENABLE?
STATUS:QUESTIONABLE:POWER[:EVENT]?
STATUS:QUESTIONABLE:POWER:NTRANSITION <integer>
STATUS:QUESTIONABLE:POWER:NTRANSITION?
STATUS:QUESTIONABLE:POWER:PTRANSITION <integer>
STATUS:QUESTIONABLE:POWER:PTRANSITION?
STATUS:QUESTIONABLE:PTRANSITION <integer>
STATUS:QUESTIONABLE:PTRANSITION?
STATUS:QUESTIONABLE:TEMPERATURE:CONDITION?
STATUS:QUESTIONABLE:TEMPERATURE:ENABLE <integer>
STATUS:QUESTIONABLE:TEMPERATURE:ENABLE?
STATUS:QUESTIONABLE:TEMPERATURE[:EVENT]?
STATUS:QUESTIONABLE:TEMPERATURE:NTRANSITION <integer>
STATUS:QUESTIONABLE:TEMPERATURE:NTRANSITION?
STATUS:QUESTIONABLE:TEMPERATURE:PTRANSITION <integer>
STATUS:QUESTIONABLE:TEMPERATURE:PTRANSITION?
SYSTEM:APPLICATION:CATALOG[:NAME]?
SYSTEM:APPLICATION:CATALOG[:NAME]:COUNT?
SYSTEM:APPLICATION:CATALOG:OPTION? <model>
SYSTEM:APPLICATION:CATALOG:REVISION? <model>
SYSTEM:APPLICATION[:CURRENT][:NAME]?
SYSTEM:APPLICATION[:CURRENT]:OPTION?

```

2 Programming the Test Set

List of SCPI Commands

```
SYSTEM:APPLICATION[:CURRENT]:REVISION?
SYSTEM:COMMUNICATE:LAN:SCPI:HISLIP:ENABLE OFF | ON | 0 | 1
SYSTEM:COMMUNICATE:LAN:SCPI:HISLIP:ENABLE?
SYSTEM:COMMUNICATE:LAN:SCPI:SICL:ENABLE OFF | ON | 0 | 1
SYSTEM:COMMUNICATE:LAN:SCPI:SICL:ENABLE?
SYSTEM:COMMUNICATE:LAN:SCPI:SOCKET:CONTROL?
SYSTEM:COMMUNICATE:LAN:SCPI:SOCKET:ENABLE OFF | ON | 0 | 1
SYSTEM:COMMUNICATE:LAN:SCPI:SOCKET:ENABLE?
SYSTEM:COMMUNICATE:LAN:SCPI:TELNET:ENABLE OFF | ON | 0 | 1
SYSTEM:COMMUNICATE:LAN:SCPI:TELNET:ENABLE?
SYSTEM:CONFIGURE[:SYSTEM]?
SYSTEM:CSYSTEM?
SYSTEM:DATE "<year>, <month>, <day>"
SYSTEM:DATE?
SYSTEM:DEFAULT [ALL] | ALIGN | INPUT | MISC | MODES | PON
SYSTEM:ERROR[:NEXT]?
SYSTEM:ERROR:OVERLOAD[:STATE] 0 | 1 | OFF | ON
SYSTEM:ERROR:VERBOSE OFF | ON | 0 | 1
SYSTEM:ERROR:VERBOSE?
SYSTEM:HELP:HEADERS?
SYSTEM:HID?
SYSTEM:KLOCK OFF | ON | 0 | 1
SYSTEM:KLOCK?
SYSTEM:LICENSE[:FPACK]:WAVEFORM:ADD <string>
SYSTEM:LICENSE[:FPACK]:WAVEFORM:CLEAR <int>
SYSTEM:LICENSE[:FPACK]:WAVEFORM:FREE?
SYSTEM:LICENSE[:FPACK]:WAVEFORM:LOCK <int>
SYSTEM:LICENSE[:FPACK]:WAVEFORM:NAME? <int>
SYSTEM:LICENSE[:FPACK]:WAVEFORM:REPLACE <int>, <string>
SYSTEM:LICENSE[:FPACK]:WAVEFORM:STATUS? <int>
SYSTEM:LICENSE[:FPACK]:WAVEFORM:UID? <int>
SYSTEM:LICENSE[:FPACK]:WAVEFORM:USED?
SYSTEM:LKEY <"OptionInfo">, <"LicenseInfo">
SYSTEM:LKEY? <"OptionInfo">
SYSTEM:LKEY:DELETE <"OptionInfo">, <"LicenseInfo">
SYSTEM:LKEY:LIST?
SYSTEM:LKEY:WAVEFORM:ADD <string>
SYSTEM:LKEY:WAVEFORM:CLEAR <int>
SYSTEM:LKEY:WAVEFORM:FREE?
SYSTEM:LKEY:WAVEFORM:LOCK <int>
SYSTEM:LKEY:WAVEFORM:NAME? <int>
SYSTEM:LKEY:WAVEFORM:REPLACE <int>, <string>
SYSTEM:LKEY:WAVEFORM:STATUS? <int>
SYSTEM:LKEY:WAVEFORM:UID? <int>
SYSTEM:LKEY:WAVEFORM:USED?
SYSTEM:MODULE:DEFAULT "<mnemonic>"
SYSTEM:MODULE:DEFAULT?
SYSTEM:MODULE:ENABLE "<mnemonic>", 0 | 1
SYSTEM:MODULE:ENABLE? "<mnemonic>"
SYSTEM:MODULE:INDEX?
SYSTEM:MODULE:LIST?
SYSTEM:MODULE:MNEMONIC?
SYSTEM:MODULE:MODEL?
```

```

SYSTEM:MODULE:NAME?
SYSTEM:MODULE:SERIAL?
SYSTEM:OPTIONS?
SYSTEM:PDOWN [NORMAL | FORCE]
SYSTEM:PON:APPLICATION:LLIST <stringofINSTRUMENT:SELECTnames>
SYSTEM:PON:APPLICATION:LLIST?
SYSTEM:PON:APPLICATION:VMEMORY[:AVAILABLE]?
SYSTEM:PON:APPLICATION:VMEMORY:TOTAL?
SYSTEM:PON:APPLICATION:VMEMORY:USED?
SYSTEM:PON:APPLICATION:VMEMORY:USED:NAME? <INSTRUMENT:SELECTname>
SYSTEM:PON:MODE SA | BASIC | AEMOD | NFIGURE | PNOISE | CDMA2K | TDSCDMA
| VSA | VSA89601 | WCDMA | WIMAXOFDMA
SYSTEM:PON:MODE?
SYSTEM:PON:TIME?
SYSTEM:PON:TYPE PRESet
SYSTEM:PON:TYPE MODE | USER | LAST
SYSTEM:PON:TYPE?
SYSTEM:PRESet
SYSTEM:PRESet:TYPE FACTory | MODE | USER
SYSTEM:PRESet:TYPE?
SYSTEM:PRESet:USER
SYSTEM:PRESet:USER:ALL
SYSTEM:PRESet:USER:SAVE
SYSTEM:PRINT:THEME TDColor | TDMonochrome | FColor | FMONochrome
SYSTEM:PRINT:THEME?
SYSTEM:PUP:PROCESS
SYSTEM:SECURITY:USB:WPROTECT[:ENABLE] ON | OFF | 0 | 1
SYSTEM:SECURITY:USB:WPROTECT[:ENABLE]?
SYSTEM:SHOW OFF | ERROR | SYSTEM | HARDWARE | LXI | HWSTATISTICS |
ALIGNMENT | SOFTWARE | CAPPLICATION
SYSTEM:SHOW?
SYSTEM:TEST:WCTS:[ALL]
SYSTEM:TEST:WCTS:FEC
SYSTEM:TEST:WCTS:FEC:RESULT?
SYSTEM:TEST:WCTS:SHOW:RESULT FEC
SYSTEM:TIME "<hour>, <minute>, <second>"
SYSTEM:TIME?
SYSTEM:VERSION?
TRIGGER:LSEQUENCER:EXTERNAL2:LEVEL <level>
TRIGGER:LSEQUENCER:EXTERNAL1:LEVEL <level>
TRIGGER:LSEQUENCER:EXTERNAL1:LEVEL?
TRIGGER:LSEQUENCER:EXTERNAL2:LEVEL?
TRIGGER:LSEQUENCER:EXTERNAL1:SLOPE POSITIVE | NEGATIVE
TRIGGER:LSEQUENCER:EXTERNAL2:SLOPE POSITIVE | NEGATIVE
TRIGGER:LSEQUENCER:EXTERNAL1:SLOPE?
TRIGGER:LSEQUENCER:EXTERNAL2:SLOPE?
TRIGGER:LSEQUENCER:RFBURST:SLOPE POSITIVE | NEGATIVE
TRIGGER:LSEQUENCER:RFBURST:SLOPE?
TRIGGER:LSEQUENCER[:SEQUENCE]:HOLDOFF <time>
TRIGGER:LSEQUENCER[:SEQUENCE]:HOLDOFF TYPE?
TRIGGER:LSEQUENCER[:SEQUENCE]:HOLDOFF?
TRIGGER:LSEQUENCER[:SEQUENCE]:HOLDOFF:STATE OFF | ON | 0 | 1
TRIGGER:LSEQUENCER[:SEQUENCE]:HOLDOFF:STATE?

```

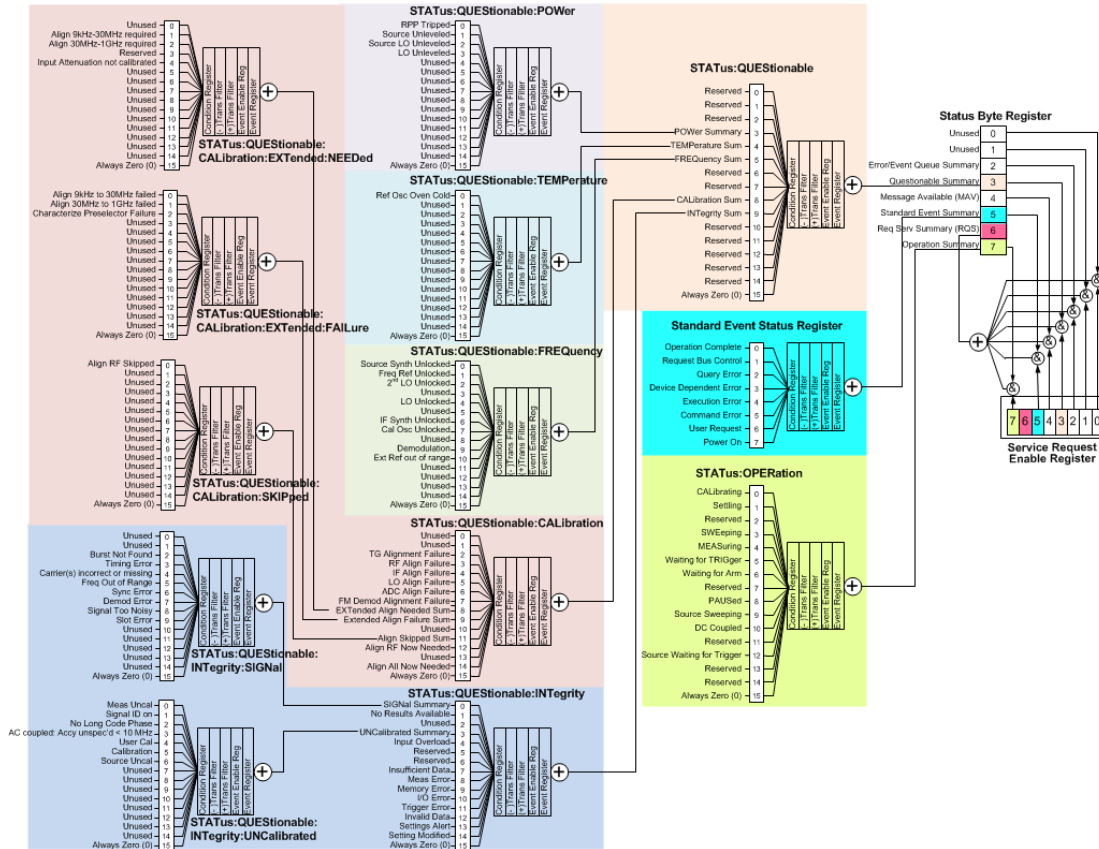
2 Programming the Test Set

List of SCPI Commands

```
TRIGger:LSEQuencer[:SEQuence]:HOLDoff:TYPE BELow | ABOVE
TRIGger:LSEQuencer:VIDeo:SLOPe POSitive | NEGative
TRIGger:LSEQuencer:VIDeo:SLOPe?
TRIGger|TRIGger1|TRIGger2[:SEQuence]:OUTPut HSWP | MEASuring | MAIN | GATE
| GTRigger | OEVEN | SPOint | SSWeep | SSETtled | S1Marker | S2Marker |
S3Marker | S4Marker | OFF
TRIGger|TRIGger1|TRIGger2[:SEQuence]:OUTPut?
TRIGger|TRIGger1|TRIGger2[:SEQuence]:OUTPut:POLarity POSitive | NEGative
TRIGger|TRIGger1|TRIGger2[:SEQuence]:OUTPut:POLarity?
```

STATUS Subsystem

The following diagram shows the entire Status Register Subsystem implementation of the X Series instruments.



Detailed Description

The STATUS subsystem remote commands set and query the status hardware registers. This system of registers monitors various events and conditions in the instrument. Software written to control the instrument may need to monitor some of these events and conditions.

NOTE All status register commands are sequential. Most commands can be started immediately and will overlap with any existing commands that are already running. This is not true of status commands. All the commands in the spectrum analyzer are assumed to be overlapped unless a command description specifically says that it is sequential.

What Are Status Registers

The status system contains multiple registers that are arranged in a hierarchical order. The lower-level status registers propagate their data to the higher-level registers in the data structures by means of summary bits. The status byte register is at the top of the hierarchy and contains general status information for the instrument's events and conditions. All other individual registers are used to determine the specific events or conditions. For a diagram of the registers and their interconnections, see above.

The operation and questionable status registers are sets of registers that monitor the overall instrument condition. They are accessed with the STATus:OPERation and STATus:QUEStionable commands in the STATus command subsystem. Each register set is made up of five registers:

- Condition Register—It reports the real-time state of the signals monitored by this register set. There is no latching or buffering for a condition register.
- Positive Transition Register—This filter register controls which signals will set a bit in the event register when the signal makes a low to high transition (when the condition bit changes from 0 to 1).
- Negative Transition Register—This filter register controls which signals will set a bit in the event register when the signal makes a high to low transition (when the condition bit changes from 1 to 0).
- Event Register—It latches any signal state changes, in the way specified by the filter registers. Bits in the event register are never cleared by signal state changes. Event registers are cleared when read. They are also cleared by *CLS and by presetting the instrument.
- Event Enable Register—It controls which of the bits, being set in the event register, will be summarized as a single output for the register set. Summary bits are then used by the next higher register.

The STATus:QUEStionable registers report abnormal operating conditions. The status register hierarchy is:

1. The summary outputs from the six STATus:QUEStionable:<keyword> detail registers are inputs to the STATus:QUEStionable register.
2. The summary output from the STATus:QUEStionable register is an input to the Status Byte Register. See the overall system in Figure at the beginning of this section.

The STATus:OPERation register set has no summarized inputs. The inputs to the STATus:OPERation:CONDition register indicate the real time state of the instrument. The STATus:OPERation:EVENT register summary output is an input to the Status Byte Register.

What Are Status Register SCPI Commands

Most monitoring of the instrument conditions is done at the highest level using the IEEE common commands indicated below. Complete command descriptions are available in the IEEE commands section at the beginning of the language reference. Individual status registers can be set and queried using the commands in the STATus subsystem of the language reference.

- *CLS (clear status) clears the status byte by emptying the error queue and clearing all the event registers.
- *ESE, *ESE? (event status enable) sets and queries the bits in the enable register part of the standard event status register.
- *ESR? (event status register) queries and clears the event register part of the standard event status register.
- *OPC, *OPC? (operation complete) sets the standard event status register to monitor the completion of all commands. The query stops any new commands from being processed until the current processing is complete, then returns a '1'.
- *PSC, *PSC? (power-on state clear) sets the power-on state so that it clears the service request enable register and the event status enable register at power on.
- *SRE, *SRE? (service request enable) sets and queries the value of the service request enable register.

- *STB? (status byte) queries the value of the status byte register without erasing its contents.

How to Use the Status Registers

A program often needs to be able to detect and manage error conditions or changes in instrument status. There are two methods you can use to programmatically access the information in status registers:

- The polling method
- The service request (SRQ) method

In the polling method, the instrument has a passive role. It only tells the controller that conditions have changed when the controller asks the right question. In the SRQ method, the instrument takes a more active role. It tells the controller when there has been a condition change without the controller asking. Either method allows you to monitor one or more conditions.

The polling method works well if you do not need to know about changes the moment they occur. The SRQ method should be used if you must know immediately when a condition changes. To detect a change using the polling method, the program must repeatedly read the registers.

Use the SRQ method when:

- you need time-critical notification of changes
- you are monitoring more than one device which supports SRQs
- you need to have the controller do something else while waiting
- you can't afford the performance penalty inherent to polling

Use polling when:

- your programming language/development environment does not support SRQ interrupts
- you want to write a simple, single-purpose program and don't want the added complexity of setting up an SRQ handler
- To monitor a condition:
 - a. Determine which register contains the bit that reports the condition.
 - b. Send the unique SCPI query that reads that register.
 - c. Examine the bit to see if the condition has changed.

You can monitor conditions in different ways.

- Check the current instrument hardware and firmware status.

Do this by querying the condition registers which continuously monitor status. These registers represent the current state of the instrument. Bits in a condition register are updated in real time. When the condition monitored by a particular bit becomes true, the bit is set to 1. When the condition becomes false, the bit is reset to 0.

- Monitor a particular condition (bit).

You can enable a particular bit(s), using the event enable register. The instrument will then monitor that particular condition(s). If the bit becomes true (0 to 1 transition) in the event register, it will stay set until the

event register is cleared. Querying the event register allows you to detect that this condition occurred even if the condition no longer exists. The event register can only be cleared by querying it or sending the *CLS command.

- Monitor a particular type of change in a condition (bit).
 - The transition registers are preset to register if the condition goes from 0 to 1 (false to true, or a positive transition).
 - This can be changed so the selected condition is detected if the bit goes from 1 to 0 (true to false, or a negative transition).
 - It can also be set for both types of transitions occurring.
 - Or it can be set for neither transition. If both transition registers are set to 0 for a particular bit position, that bit will not be set in the event register for either type of change.

Using a Status Register

Each bit in a register is represented by a numerical value based on its location. See figure below. This number is sent with the command to enable a particular bit. If you want to enable more than one bit, you would send the sum of all the bits that you want to monitor.

Figure: Status Register Bit Values

Decimal Value																				
			32768	16384	8192	4096	2048	1024	512	256	128	64	32	16	8	4	2	1		
Bit Number	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0				

STATus:OPERation:ENABLE <num>
 STATus:OPERation:ENABLE?

Standard Operation Event Enable Register

ck730a

Bit 15 is not used to report status.

Example 1:

1. To enable bit 0 and bit 6 of standard event status register, you would send the command *ESE 65 because $1 + 64 = 65$.
2. The results of a query are evaluated in a similar way. If the *STB? command returns a decimal value of 140, ($140 = 128 + 8 + 4$) then bit 7 is true, bit 3 is true and bit 2 is true.

Example 2:

1. Suppose you want to know if an Auto-trigger Timeout occurs, but you only cared about that specific condition. So you would want to know what was happening with bit 10 in the Status Questionable Integrity register, and not about any other bits.

2. It's usually a good idea to start by clearing all the status registers with *CLS.
3. Sending the STAT:QUES:INT:ENAB 1024 command lets you monitor only bit 10 events, instead of the default monitoring all the bits in the register. The register default is for positive transition events (0 to 1 transition). That is, when an auto-trigger timeout occurs. If instead, you wanted to know when the Auto-trigger timeout condition is cleared, then you would set the STAT:QUES:INT:PTR 0 and the STAT:QUES:INT:NTR 32767.
4. So now the only output from the Status Questionable Integrity register will come from a bit 10 positive transition. That output goes to the Integrity Sum bit 9 of the Status Questionable register.
5. You can do a similar thing with this register to only look at bit 9 using, STAT:QUES:ENAB 512.
6. The Status Questionable register output goes to the "Status Questionable Summary" bit 3 of the Status Byte Register. The output from this register can be enabled using the *SRE 8 command.
7. Finally, you would use the serial polling functionality available for the particular bus/software that you are using to monitor the Status Byte Register. (You could also use *STB? to poll the Status Byte Register.)

Using the Service Request (SRQ) Method

Your language, bus, and programming environment must be able to support SRQ interrupts. (For example, BASIC used with VXI-11.3 (GPIB over LAN). When you monitor a condition with the SRQ method, you must:

1. Determine which bit monitors the condition.
2. Determine how that bit reports to the request service (RQS) bit of the status byte.
3. Send SCPI commands to enable the bit that monitors the condition and to enable the summary bits that report the condition to the RQS bit.
4. Enable the controller to respond to service requests.

When the condition changes, the instrument sets its RQS bit. The controller is informed of the change as soon as it occurs. As a result, the time the controller would otherwise have used to monitor the condition can be used to perform other tasks. Your program determines how the controller responds to the SRQ.

Generating a Service Request

To use the SRQ method, you must understand how service requests are generated. Bit 6 of the status byte register is the request service (RQS) bit. The *SRE command is used to configure the RQS bit to report changes in instrument status. When such a change occurs, the RQS bit is set. It is cleared when the status byte register is queried using *SRE? (with a serial poll.) It can be queried without erasing the contents with *STB?.

When a register set causes a summary bit in the status byte to change from 0 to 1, the instrument can initiate the service request (SRQ) process. However, the process is only initiated if both of the following conditions are true:

- The corresponding bit of the service request enable register is also set to 1.
- The instrument does not have a service request pending. (A service request is considered to be pending between the time the instrument's SRQ process is initiated and the time the controller reads the status byte register.)

The SRQ process sets the SRQ true. It also sets the status byte's request service (RQS) bit to 1. Both actions are necessary to inform the controller that the instrument requires service. Setting the SRQ line only informs the controller that some device on the bus requires service. Setting the RQS bit allows the controller to determine which instrument requires service.

If your program enables the controller to detect and respond to service requests, it should instruct the controller to perform a serial poll when the SRQ is set true. Each device on the bus returns the contents of its status byte register in response to this poll. The device whose RQS bit is set to 1 is the device that requested service.

When you read the instrument's status byte register with a serial poll, the RQS bit is reset to 0. Other bits in the register are not affected.

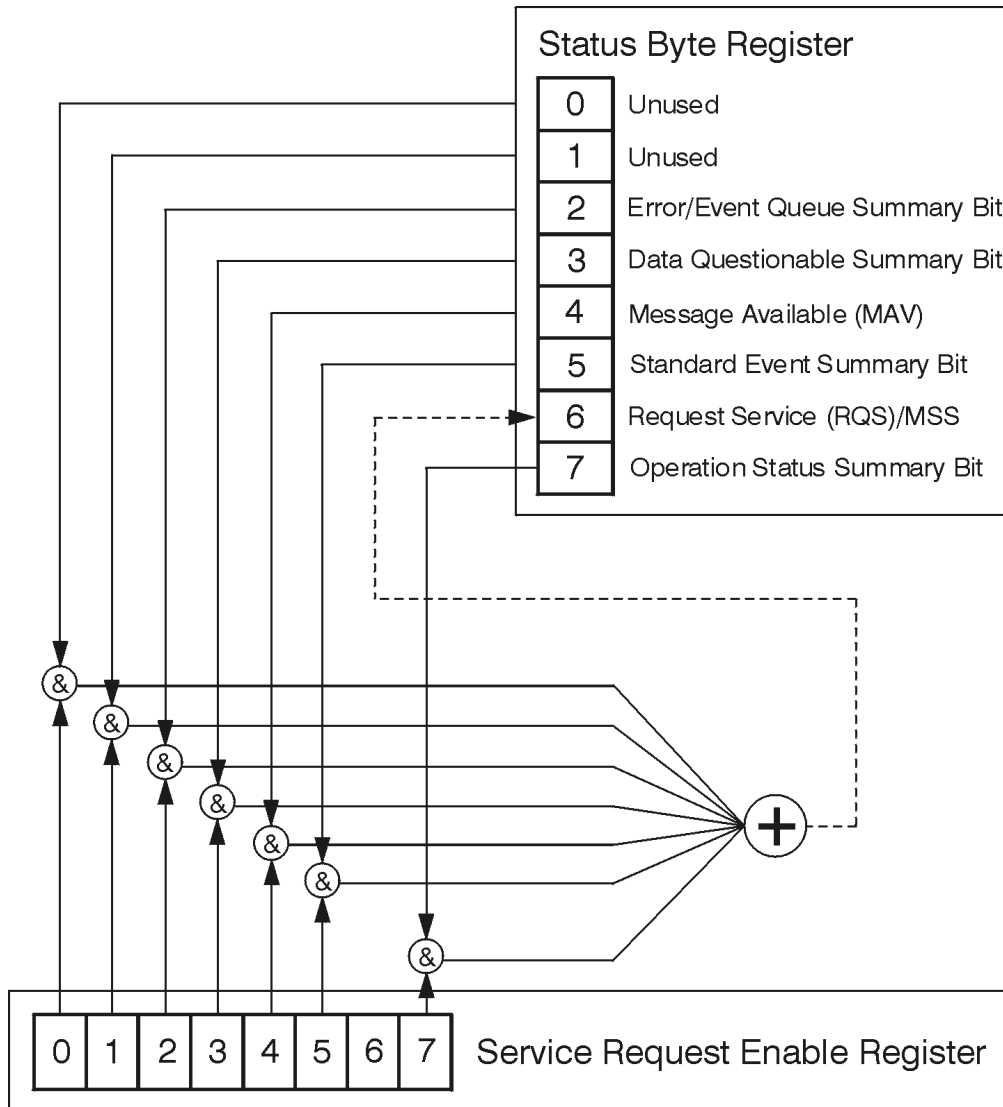
If the status register is configured to SRQ on end-of-measurement and the measurement is in continuous mode, then restarting a measurement (INIT command) can cause the measuring bit to pulse low. This causes an SRQ when you have not actually reached the "end-of-measurement" condition. To avoid this:

1. Set INITiate:CONTInuous off.
2. Set/enable the status registers.
3. Restart the measurement (send INIT).

Status Register System

The hardware status registers are combined to form the instrument status system. Specific status bits are assigned to monitor various aspects of the instrument operation and status. See the diagram of the status system above for information about the bit assignments and status register interconnections.

The Status Byte Register



ck776a

The RQS bit is read and reset by a serial poll. The same bit position (MSS) is read, non-destructively by the *STB? command. If you serial poll bit 6 it is read as RQS, but if you send *STB it reads bit 6 as MSS. For more information refer to IEEE 488.2 standards, section 11.

	Description	Standard Operation Status Summary Bit	Request Service (RQS) Summary Bit	Standard Event Status Summary Bit	Message Available (MAV)	Data Questionable Status Summary Bit	Error/Event Queue Summary Bit	Unused	Unused
Bit Number	7	6	5	4	3	2	1	0	

*STB?

Status Byte Register

ck725a

Bit	Description
0, 1	These bits are always set to 0.
2	A 1 in this bit position indicates that the SCPI error queue is not empty which means that it contains at least one error message.
3	A 1 in this bit position indicates that the data questionable summary bit has been set. The data questionable event register can then be read to determine the specific condition that caused this bit to be set.
4	A 1 in this bit position indicates that the instrument has data ready in the output queue. There are no lower status groups that provide input to this bit.
5	A 1 in this bit position indicates that the standard event summary bit has been set. The standard event status register can then be read to determine the specific event that caused this bit to be set.
6	A 1 in this bit position indicates that the instrument has at least one reason to report a status change. This bit is also called the master summary status bit (MSS).
7	A 1 in this bit position indicates that the standard operation summary bit has been set. The standard operation event register can then be read to determine the specific condition that caused this bit to be set.

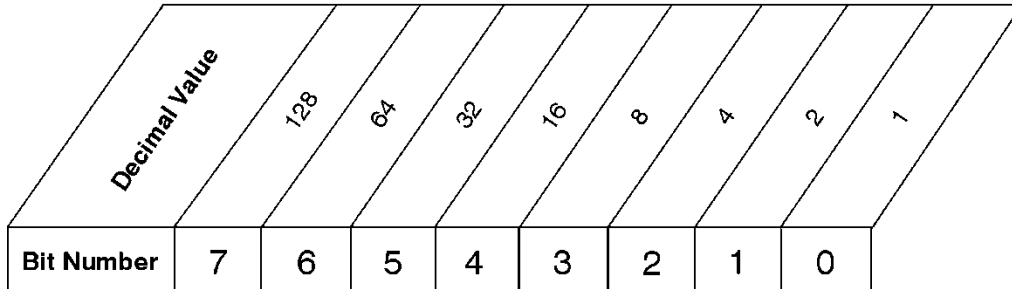
To query the status byte register, send the command *STB?. The response will be the decimal sum of the bits which are set to 1. For example, if bit number 7 and bit number 3 are set to 1, the decimal sum of the 2 bits is 128 plus 8. So the decimal value 136 is returned. The *STB command does not clear the status register.

In addition to the status byte register, the status byte group also contains the service request enable register. This register lets you choose which bits in the status byte register will trigger a service request.

Send the *SRE <integer> command where <integer> is the sum of the decimal values of the bits you want to enable plus the decimal value of bit 6. For example, assume that you want to enable bit 7 so that whenever the standard operation status register summary bit is set to 1 it will trigger a service request. Send the command *SRE 192 (because 192 = 128 + 64). You must always add 64 (the numeric value of RQS

bit 6) to your numeric sum when you enable any bits for a service request. The command *SRE? returns the decimal value of the sum of the bits previously enabled with the *SRE <integer> command.

The service request enable register presets to zeros (0).

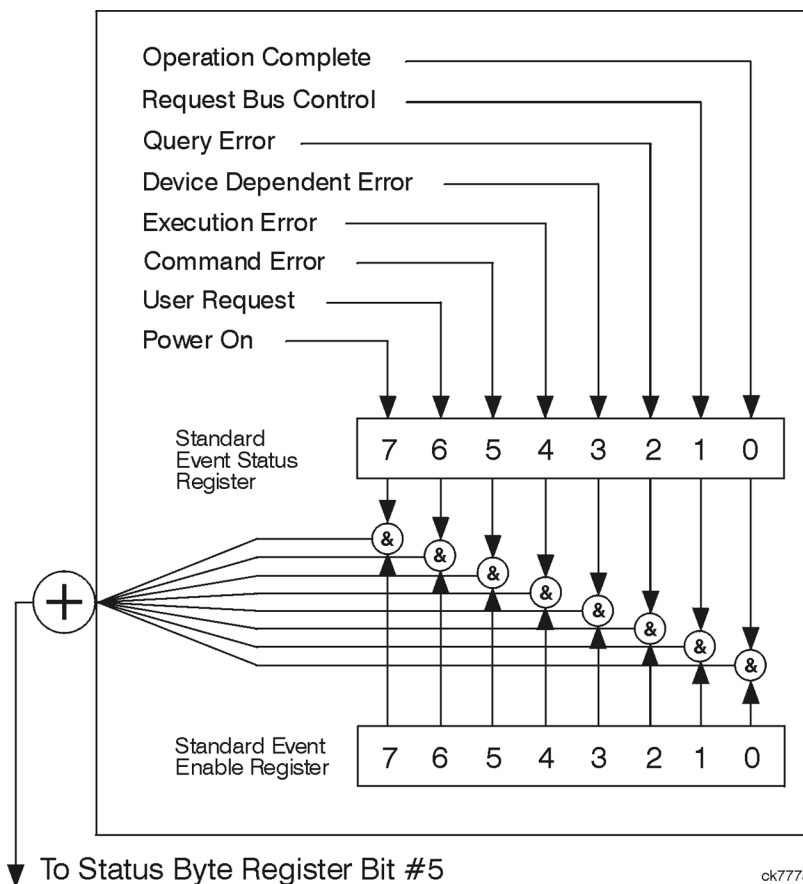


*SRE <num>
 *SRE?

Service Request Enable Register

ck726a

Standard Event Status Register



ck777a

The standard event status register contains the following bits:

	<i>Description</i>	<i>Power On</i>	<i>User Request Key (Local)</i>	<i>Command Error</i>	<i>Execution Error</i>	<i>Device Dependent Error</i>	<i>Query Error</i>	<i>Request Control</i>	<i>Operation Complete</i>
Bit Number	7	6	5	4	3	2	1	0	

*ESR?

Standard Event Status Register

ck727a

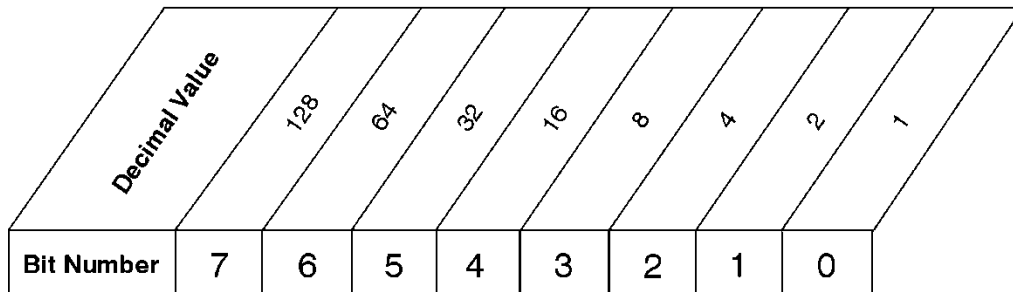
Bit	Description
0	A 1 in this bit position indicates that all pending operations were completed following execution of the *OPC command.
1	This bit is for GPIB handshaking to request control. Currently it is set to 0 because there are no implementations where the spectrum analyzer controls another instrument.
2	A 1 in this bit position indicates that a query error has occurred. Query errors have SCPI error numbers from -499 to -400.
3	A 1 in this bit position indicates that a device dependent error has occurred. Device dependent errors have SCPI error numbers from -399 to -300 and 1 to 32767.
4	A 1 in this bit position indicates that an execution error has occurred. Execution errors have SCPI error numbers from -299 to -200.
5	A 1 in this bit position indicates that a command error has occurred. Command errors have SCPI error numbers from -199 to -100.
6	A 1 in this bit position indicates that the LOCAL key has been pressed. This is true even if the instrument is in local lockout mode.
7	A 1 in this bit position indicates that the instrument has been turned off and then on.

The standard event status register is used to determine the specific event that set bit 5 in the status byte register. To query the standard event status register, send the command *ESR?. The response will be the decimal sum of the bits which are enabled (set to 1). For example, if bit number 7 and bit number 3 are enabled, the decimal sum of the 2 bits is 128 plus 8. So the decimal value 136 is returned.

In addition to the standard event status register, the standard event status group also contains a standard event status enable register. This register lets you choose which bits in the standard event status register will set the summary bit (bit 5 of the status byte register) to 1. Send the *ESE <integer> command where <integer> is the sum of the decimal values of the bits you want to enable. For example, to enable bit 7 and bit 6 so that whenever either of those bits is set to 1, the standard event status summary bit of the status

byte register will be set to 1, send the command *ESE 192 (128 + 64). The command *ESE? returns the decimal value of the sum of the bits previously enabled with the *ESE <integer> command.

The standard event status enable register presets to zeros (0).



*ESE <num>
 *ESE?

Standard Event Status Enable Register

ck728a

Operation and Questionable Status Registers

The operation and questionable status registers are registers that monitor the overall instrument condition. They are accessed with the STATUS:OPERation and STATUS:QUESTionable commands in the STATUS command subsystem. See the figure at the beginning of this chapter.

Operation Status Register

The operation status register monitors the current instrument measurement state. It checks to see if the instrument is calibrating, sweeping, or waiting for a trigger. For more information see the *OPC? command located in the IEEE Common Commands section.

Bit	Condition	Operation
0	Calibrating	The instrument is busy executing its Align Now process
3	Sweeping	The instrument is busy taking a sweep.
4	Measuring	The instrument is busy making a measurement. Measurements often require multiple sweeps. They are initiated by keys under the MEASURE key or with the MEASure group of commands. The bit is valid for most X-Series Modes.
5	Waiting for trigger	The instrument is waiting for the trigger conditions to be met, then it will trigger a sweep or measurement.

Questionable Status Register

The questionable status register monitors the instrument's condition to see if anything questionable has happened to it. It is looking for anything that might cause an error or a bad measurement like a hardware problem, an out of calibration situation, or a unusual signal. All the bits are summary bits from lower-level event registers.

Bit	Condition	Operation
-----	-----------	-----------

3	Power summary	The instrument hardware has detected a power unlevelled condition.
4	Temperature summary	The instrument is still warming up.
5	Frequency summary	The instrument hardware has detected an unlocked condition or a problem with the external frequency reference.
8	Calibration summary	The instrument has detected a hardware problem while doing the automatic internal alignment process.
9	Integrity summary	The instrument has detected a questionable measurement condition such as: bad timing, bad signal/data, timeout problem, signal overload, or "meas uncal".

STATus Subsystem Command Descriptions

The STATus subsystem controls the SCPI-defined instrument status reporting structures. Each status register has a set of five commands used for querying or masking that particular register.

Numeric values for bit patterns can be entered using decimal or hexadecimal representations. (i.e. 0 to 32767 is equivalent to #H0 to #H7FFF. It is also equal to all ones, 11111111111111) See the SCPI Basics information about using bit patterns for variable parameters.

Operation Register

"Operation Condition Query" on page 72

"Operation Enable" on page 73

"Operation Event Query" on page 73

"Operation Negative Transition" on page 73

"Operation Positive Transition" on page 74

Operation Condition Query

This query returns the decimal value of the sum of the bits in the Status Operation Condition register.

NOTE The data in this register is continuously updated and reflects the current conditions.

Mode	All
Remote Command	:STATus:OPERation:CONDition?
Example	STAT:OPER:COND?
Preset	0
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Operation Enable

This command determines which bits in the Operation Event register, will set the Operation Status Summary bit (bit 7) in the Status Byte Register. The variable <integer> is the sum of the decimal values of the bits you want to enable.

NOTE

The preset condition is to have all bits in this enable register set to 0. To have any Operation Events reported to the Status Byte Register, one or more bits need to be set to 1.

Mode	All
Remote Command	:STATus:OPERation:ENABle <integer> :STATus:OPERation:ENABle?
Example	STAT:OPER:ENAB 1 Sets the register so that Align Now operation will be reported to the Status Byte Register.
Preset	0
Min	0
Max	32767
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Operation Event Query

This query returns the decimal value of the sum of the bits in the Operation Event register.

NOTE

The register requires that the associated PTR or NTR filters be set before a condition register bit can set a bit in the event register. The data in this register is latched until it is queried. Once queried, the register is cleared.

Mode	All
Remote Command	:STATus:OPERation[:EVENT]?
Example	STAT:OPER?
Preset	0
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Operation Negative Transition

This command determines which bits in the Operation Condition register will set the corresponding bit in the Operation Event register when the condition register bit has a negative transition (1 to 0). The variable <integer> is the sum of the decimal values of the bits that you want to enable.

Mode	All
Remote Command	:STATus:OPERation:NTRansition <integer> :STATus:OPERation:NTRansition?
Example	STAT:OPER:NTR 1 Align Now operation complete will be reported to the Status Byte Register.
Preset	0
Min	0
Max	32767
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Operation Positive Transition

This command determines which bits in the Operation Condition register will set the corresponding bit in the Operation Event register when the condition register bit has a positive transition (0 to 1). The variable <integer> is the sum of the decimal values of the bits that you want to enable.

Mode	All
Remote Command	:STATus:OPERation:PTRansition <integer> :STATus:OPERation:PTRansition?
Example	STAT:OPER:PTR 1 Align Now operation beginning will be reported to the Status Byte Register.
Preset	32767
Min	0
Max	32767
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Preset the Status Byte

Sets bits in most of the enable and transition registers to their default state. It presets all the Transition Filters, Enable Registers, and the Error/Event Queue Enable. It has no effect on Event Registers, Error/Event QUEUE, IEEE 488.2 ESE, and SRE Registers as described in IEEE Standard 488.2-1992, IEEE Standard Codes, Formats, Protocols, and Common Commands for Use with ANSI/IEEE Std 488.1-1987. New York, NY, 1992.

Remote Command	:STATus:PRESet
Example	STAT:PRES
Initial S/W Revision	Prior to A.02.00

Questionable Register

"Questionable Condition " on page 75

"Questionable Enable " on page 75

"Questionable Event Query " on page 76

"Questionable Negative Transition " on page 76

"Questionable Positive Transition" on page 76

Questionable Condition

This query returns the decimal value of the sum of the bits in the Questionable Condition register.

NOTE The data in this register is continuously updated and reflects the current conditions.

Mode	All
Remote Command	:STATus:QUEStionable:CONDition?
Example	STAT:QUES:COND?
Preset	0
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Enable

This command determines which bits in the Questionable Event register will set the Questionable Status Summary bit (bit3) in the Status Byte Register. The variable <integer> is the sum of the decimal values of the bits you want to enable.

NOTE The preset condition is all bits in this enable register set to 0. To have any Questionable Events reported to the Status Byte Register, one or more bits need to be set to 1. The Status Byte Event Register should be queried after each measurement to check the Questionable Status Summary (bit 3). If it is equal to 1, a condition during the test may have made the test results invalid. If it is equal to 0, this indicates that no hardware problem or measurement problem was detected by the analyzer.

Mode	All
Remote Command	:STATus:QUEStionable:ENABle <integer> :STATus:QUEStionable:ENABle?
Example	STAT:OPER:PTR 1 Align Now operation beginning will be reported to the Status Byte Register.
Preset	0
Min	0
Max	32767
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Event Query

This query returns the decimal value of the sum of the bits in the Questionable Event register.

NOTE

The register requires that the associated PTR or NTR filters be set before a condition register bit can set a bit in the event register. The data in this register is latched until it is queried. Once queried, the register is cleared.

Mode	All
Remote Command	:STATus:QUEStionable[:EVENT]?
Example	STAT:QUES?
Preset	0
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Negative Transition

This command determines which bits in the Questionable Condition register will set the corresponding bit in the Questionable Event register when the condition register bit has a negative transition (1 to 0). The variable <integer> is the sum of the decimal values of the bits that you want to enable.

Mode	All
Remote Command	:STATus:QUEStionable:NTRansition <integer> :STATus:QUEStionable:NTRansition?
Example	STAT:QUES:NTR 16 Temperature summary 'questionable cleared' will be reported to the Status Byte Register.
Preset	0
Min	0
Max	32767
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Positive Transition

This command determines which bits in the Questionable Condition register will set the corresponding bit in the Questionable Event register when the condition register bit has a positive transition (0 to 1). The variable <integer> is the sum of the decimal values of the bits that you want to enable.

Mode	All
------	-----

Remote Command	:STATus:QUESTionable:PTRansition <integer> :STATus:QUESTionable:PTRansition?
Example	STAT:QUES:PTR 16 Temperature summary 'questionable asserted' will be reported to the Status Byte Register.
Preset	32767
Min	0
Max	32767
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Calibration Register

"Questionable Calibration Condition " on page 77

"Questionable Calibration Enable " on page 77

"Questionable Calibration Event Query " on page 78

"Questionable Calibration Negative Transition " on page 78

"Questionable Calibration Positive Transition " on page 79

Questionable Calibration Condition

This query returns the decimal value of the sum of the bits in the Questionable Calibration Condition register.

NOTE The data in this register is continuously updated and reflects the current conditions.

Mode	All
Remote Command	:STATus:QUESTionable:CALibration:CONDition?
Example	STAT:QUES:CAL:COND?
Preset	0
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Calibration Enable

This command determines which bits in the Questionable Calibration Condition Register will set bits in the Questionable Calibration Event register, which also sets the Calibration Summary bit (bit 8) in the Questionable Register. The variable <integer> is the sum of the decimal values of the bits you want to enable.

Mode	All
Remote Command	:STATus:QUESTionable:CALibration:ENABLe <integer> :STATus:QUESTionable:CALibration:ENABLe?
Example	STAT:QUES:CAL:ENAB 16384 Can be used to query if an alignment is needed, if you have turned off the automatic alignment process.
Min	0
Max	32767
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Calibration Event Query

This query returns the decimal value of the sum of the bits in the Questionable Calibration Event register.

NOTE

The register requires that the associated PTR or NTR filters be set before a condition register bit can set a bit in the event register. The data in this register is latched until it is queried. Once queried, the register is cleared.

Mode	All
Remote Command	:STATus:QUESTionable:CALibration[:EVENT]?
Example	STAT:QUES:CAL?
Preset	0
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Calibration Negative Transition

This command determines which bits in the Questionable Calibration Condition register will set the corresponding bit in the Questionable Calibration Event register when the condition register bit has a negative transition (1 to 0). The variable <integer> is the sum of the decimal values of the bits that you want to enable.

Mode	All
Remote Command	:STATus:QUESTionable:CALibration:NTRansition <integer> :STATus:QUESTionable:CALibration:NTRansition?
Example	STAT:QUES:CAL:NTR 16384 Alignment is not required.
Preset	0
Min	0

Max	32767
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Calibration Positive Transition

This command determines which bits in the Questionable Calibration Condition register will set the corresponding bit in the Questionable Calibration Event register when the condition register bit has a positive transition (0 to 1). The variable <integer> is the sum of the decimal values of the bits that you want to enable.

Mode	All
Remote Command	:STATus:QUESTionable:CALibration:PTRansition <integer> :STATus:QUESTionable:CALibration:PTRansition?
Example	STAT:QUES:CAL:PTR 16384 Alignment is required.
Preset	32767
Min	0
Max	32767
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Calibration Skipped Register

"Questionable Calibration Skipped Condition " on page 79

"Questionable Calibration Skipped Enable " on page 80

"Questionable Calibration Skipped Event Query " on page 80

"Questionable Calibration Skipped Negative Transition " on page 81

"Questionable Calibration Skipped Positive Transition " on page 81

Questionable Calibration Skipped Condition

This query returns the decimal value of the sum of the bits in the Questionable Calibration Skipped Condition register.

NOTE The data in this register is continuously updated and reflects the current conditions.

Mode	All
Remote Command	:STATus:QUESTionable:CALibration:SKIpped:CONDition?

Example	STAT:QUES:CAL:SKIP:COND?
Preset	0
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Calibration Skipped Enable

This command determines which bits in the Questionable Calibration Skipped Condition Register will set bits in the Questionable Calibration Skipped Event register, which also sets bit 11 of the Questionable Calibration Register. The variable <integer> is the sum of the decimal values of the bits you want to enable.

Mode	All
Remote Command	:STATus:QUESTionable:CALibration:SKIpped:ENABle <integer> :STATus:QUESTionable:CALibration:SKIpped:ENABle?
Example	STAT:QUES:CAL:SKIP:ENAB 1 Can be used to query if an EMI alignment skipped condition is detected
Preset	32767
Min	0
Max	32767
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Calibration Skipped Event Query

This query returns the decimal value of the sum of the bits in the Questionable Calibration Event register.

NOTE

The register requires that the associated PTR or NTR filters be set before a condition register bit can set a bit in the event register. The data in this register is latched until it is queried. Once queried, the register is cleared.

Mode	All
Remote Command	:STATus:QUESTionable:CALibration:SKIpped[:EVENT]?
Example	STAT:QUES:CAL:SKIP?
Preset	0
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Calibration Skipped Negative Transition

This command determines which bits in the Questionable Calibration Skipped Condition register will set the corresponding bit in the Questionable Calibration Skipped Event register when the condition register bit has a negative transition (1 to 0). The variable <integer> is the sum of the decimal values of the bits that you want to enable.

Mode	All
Remote Command	:STATus:QUEStionable:CALibration:SKIpped:NTRansition <integer> :STATus:QUEStionable:CALibration:SKIpped:NTRansition?
Example	STAT:QUES:CAL:SKIP:NTR 1 Align RF skipped is not required.
Preset	0
Min	0
Max	32767
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Calibration Skipped Positive Transition

This command determines which bits in the Questionable Calibration Skipped Condition register will set the corresponding bit in the Questionable Calibration Skipped Event register when the condition register bit has a positive transition (0 to 1). The variable <integer> is the sum of the decimal values of the bits that you want to enable.

Mode	All
Remote Command	:STATus:QUEStionable:CALibration:SKIpped:PTRansition <integer> :STATus:QUEStionable:CALibration:SKIpped:PTRansition?
Example	STAT:QUES:CAL:SKIP:PTR 1 Align RF skipped is required.
Preset	32767
Min	0
Max	32767
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Calibration Extended Failure Register

"Questionable Calibration Extended Failure Condition " on page 82

"Questionable Calibration Extended Failure Enable " on page 82

"Questionable Calibration Extended Failure Event Query " on page 82

"Questionable Calibration Extended Failure Negative Transition " on page 83

"Questionable Calibration Extended Failure Positive Transition " on page 83

Questionable Calibration Extended Failure Condition

This query returns the decimal value of the sum of the bits in the Questionable Calibration Extended Failure Condition register.

NOTE	The data in this register is continuously updated and reflects the current conditions.
Mode	All
Remote Command	:STATus:QUESTionable:CALibration:EXTended:FAILure:CONDition?
Example	STAT:QUES:CAL:EXT:FAIL:COND?
Preset	0
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Calibration Extended Failure Enable

This command determines which bits in the Questionable Calibration Extended Failure Condition Register will set bits in the Questionable Calibration Extended Failure Event register, which also sets bit 9 of the Questionable Calibration Register. The variable <integer> is the sum of the decimal values of the bits you want to enable.

Mode	All
Remote Command	:STATus:QUESTionable:CALibration:EXTended:FAILure:ENABle <integer> :STATus:QUESTionable:CALibration:EXTended:FAILure:ENABle?
Example	STAT:QUES:CAL:EXT:FAIL:ENAB 1 Can be used to query if an EMI conducted alignment is needed.
Preset	32767
Min	0
Max	32767
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Calibration Extended Failure Event Query

This query returns the decimal value of the sum of the bits in the Questionable Calibration Extended Failure Event register.

NOTE	The register requires that the associated PTR or NTR filters be set before a condition register bit can set a bit in the event register. The data in this register is latched until it is queried. Once queried, the register is cleared.
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Mode	All
Remote Command	:STATus:QUESTionable:CALibration:EXTended:FAILure[:EVENT]?
Example	STAT:QUES:CAL:EXT:FAIL?
Preset	0
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Calibration Extended Failure Negative Transition

This command determines which bits in the Questionable Calibration Extended Failure Condition register will set the corresponding bit in the Questionable Calibration Extended Failure Event register when the condition register bit has a negative transition (1 to 0). The variable <integer> is the sum of the decimal values of the bits that you want to enable.

Mode	All
Remote Command	:STATus:QUESTionable:CALibration:EXTended:FAILure:NTRansition <integer> :STATus:QUESTionable:CALibration:EXTended:FAILure:NTRansition?
Example	STAT:QUES:CAL:EXT:FAIL:NTR 1 EMI conducted align failure is not required.
Preset	0
Min	0
Max	32767
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Calibration Extended Failure Positive Transition

This command determines which bits in the Questionable Calibration Extended Failure Condition register will set the corresponding bit in the Questionable Calibration Extended Failure Event register when the condition register bit has a positive transition (0 to 1). The variable <integer> is the sum of the decimal values of the bits that you want to enable.

Mode	All
Remote Command	:STATus:QUESTionable:CALibration:EXTended:FAILure:PTRansition <integer> :STATus:QUESTionable:CALibration:EXTended:FAILure:PTRansition?
Example	STAT:QUES:CAL:EXT:FAIL:PTR 1 EMI conducted align failure is required.
Preset	32767
Min	0
Max	32767

Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Calibration Extended Needed Register

"Questionable Calibration Extended Needed Condition " on page 84

"Questionable Calibration Extended Needed Enable " on page 84

"Questionable Calibration Extended Needed Event Query " on page 85

"Questionable Calibration Extended Needed Negative Transition " on page 85

"Questionable Calibration Extended Needed Positive Transition " on page 86

Questionable Calibration Extended Needed Condition

This query returns the decimal value of the sum of the bits in the Questionable Calibration Extended Needed Condition register.

NOTE The data in this register is continuously updated and reflects the current conditions.

Mode	All
Remote Command	:STATus:QUESTionable:CALibration:EXTended:NEEDed:CONDition?
Example	STAT:QUES:CAL:EXT:NEED:COND?
Preset	0
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Calibration Extended Needed Enable

This command determines which bits in the Questionable Calibration Extended Needed Condition Register will set bits in the Questionable Calibration Extended Needed Event register, which also sets bit 14 of the Questionable Calibration Register. The variable <integer> is the sum of the decimal values of the bits you want to enable.

Mode	All
Remote Command	:STATus:QUESTionable:CALibration:EXTended:NEEDed:ENABle <integer> :STATus:QUESTionable:CALibration:EXTended:NEEDed:ENABle?
Example	STAT:QUES:CAL:EXT:NEED:ENAB 2 Can be used to query if an EMI conducted alignment is needed.
Preset	32767
Min	0

Max	32767
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Calibration Extended Needed Event Query

This query returns the decimal value of the sum of the bits in the Questionable Calibration Extended Needed Event register.

NOTE The register requires that the associated PTR or NTR filters be set before a condition register bit can set a bit in the event register. The data in this register is latched until it is queried. Once queried, the register is cleared.

Mode	All
Remote Command	:STATus:QUESTionable:CALibration:EXTended:NEEDED[:EVENT]?
Example	STAT:QUES:CAL:EXT:NEED?
Preset	0
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Calibration Extended Needed Negative Transition

This command determines which bits in the Questionable Calibration Extended Needed Condition register will set the corresponding bit in the Questionable Calibration Extended Needed Event register when the condition register bit has a negative transition (1 to 0). The variable <integer> is the sum of the decimal values of the bits that you want to enable.

Mode	All
Remote Command	:STATus:QUESTionable:CALibration:EXTended:NEEDED:NTRansition <integer> :STATus:QUESTionable:CALibration:EXTended:NEEDED:NTRansition?
Example	STAT:QUES:CAL:EXT:NEED:NTR 2 Align EMI conducted is not required.
Preset	0
Min	0
Max	32767
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Calibration Extended Needed Positive Transition

This command determines which bits in the Questionable Calibration Extended Needed Condition register will set the corresponding bit in the Questionable Calibration Extended Needed Event register when the condition register bit has a positive transition (0 to 1). The variable <integer> is the sum of the decimal values of the bits that you want to enable.

Mode	All
Remote Command	:STATus:QUESTionable:CALibration:EXTended:NEEDed:PTRansition <integer> :STATus:QUESTionable:CALibration:EXTended:NEEDed:PTRansition?
Example	STAT:QUES:CAL:EXT:NEED:PTR 2 Align EMI conducted is required.
Preset	32767
Min	0
Max	32767
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Frequency Register

"Questionable Frequency Condition " on page 86

"Questionable Frequency Enable " on page 87

"Questionable Frequency Event Query " on page 87

"Questionable Frequency Negative Transition " on page 87

"Questionable Frequency Positive Transition " on page 88

Questionable Frequency Condition

This query returns the decimal value of the sum of the bits in the Questionable Frequency Condition register.

NOTE The data in this register is continuously updated and reflects the current conditions.

Mode	All
Remote Command	:STATus:QUESTionable:FREQuency:CONDition?
Example	STAT:QUES:FREQ:COND?
Preset	0
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Frequency Enable

This command determines which bits in the Questionable Frequency Condition Register will set bits in the Questionable Frequency Event register, which also sets the Frequency Summary bit (bit 5) in the Questionable Register. The variable <integer> is the sum of the decimal values of the bits you want to enable.

Mode	All
Remote Command	:STATus:QUEStionable:FREQuency:ENABle <integer> :STATus:QUEStionable:FREQuency:ENABle?
Example	STAT:QUES:FREQ:ENAB 2 Frequency Reference Unlocked will be reported to the Frequency Summary of the Status Questionable register.
Preset	32767
Min	0
Max	32767
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Frequency Event Query

This query returns the decimal value of the sum of the bits in the Questionable Frequency Event register.

NOTE

The register requires that the associated PTR or NTR filters be set before a condition register bit can set a bit in the event register. The data in this register is latched until it is queried. Once queried, the register is cleared.

Mode	All
Remote Command	:STATus:QUEStionable:FREQuency[:EVENT]?
Example	STAT:QUES:FREQ?
Preset	0
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Frequency Negative Transition

This command determines which bits in the Questionable Frequency Condition register will set the corresponding bit in the Questionable Frequency Event register when the condition register bit has a negative transition (1 to 0). The variable <integer> is the sum of the decimal values of the bits that you want to enable.

Mode	All
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Remote Command	:STATus:QUESTionable:FREQuency:NTRansition <integer> :STATus:QUESTionable:FREQuency:NTRansition?
Example	STAT:QUES:FREQ:NTR 2 Frequency Reference 'regained lock' will be reported to the Frequency Summary of the Status Questionable register.
Preset	0
Min	0
Max	32767
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Frequency Positive Transition

This command determines which bits in the Questionable Frequency Condition register will set the corresponding bit in the Questionable Frequency Event register when the condition register bit has a positive transition (0 to 1). The variable <integer> is the sum of the decimal values of the bits that you want to enable.

Mode	All
Remote Command	:STATus:QUESTionable:FREQuency:PTRansition <integer> :STATus:QUESTionable:FREQuency:PTRansition?
Example	STAT:QUES:FREQ:PTR 2 Frequency Reference 'became unlocked' will be reported to the Frequency Summary of the Status Questionable register.
Preset	32767
Min	0
Max	32767
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Integrity Register

"Questionable Integrity Condition " on page 88

"Questionable Integrity Enable " on page 89

"Questionable Integrity Event Query " on page 89

"Questionable Integrity Negative Transition " on page 90

"Questionable Integrity Positive Transition " on page 90

Questionable Integrity Condition

This query returns the decimal value of the sum of the bits in the Questionable Integrity Condition register.

NOTE

The data in this register is continuously updated and reflects the current conditions.

Mode	All
Remote Command	:STATus:QUESTionable:INTEgrity:CONDition?
Example	STAT:QUES:INT:COND?
Preset	0
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Integrity Enable

This command determines which bits in the Questionable Integrity Condition Register will set bits in the Questionable Integrity Event register, which also sets the Integrity Summary bit (bit 9) in the Questionable Register. The variable <integer> is the sum of the decimal values of the bits you want to enable.

Mode	All
Remote Command	:STATus:QUESTionable:INTEgrity:ENABle <integer> :STATus:QUESTionable:INTEgrity:ENABle?
Example	STAT:QUES:INT:ENAB 8 Measurement Uncalibrated Summary will be reported to the Integrity Summary of the Status Questionable register.
Preset	32767
Min	0
Max	32767
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Integrity Event Query

This query returns the decimal value of the sum of the bits in the Questionable Integrity Event register.

NOTE

The register requires that the associated PTR or NTR filters be set before a condition register bit can set a bit in the event register. The data in this register is latched until it is queried. Once queried, the register is cleared.

Mode	All
Remote Command	:STATus:QUESTionable:INTEgrity[:EVENT]?
Example	STAT:QUES:INT?
Preset	0
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Integrity Negative Transition

This command determines which bits in the Questionable Integrity Condition register will set the corresponding bit in the Questionable Integrity Event register when the condition register bit has a negative transition (1 to 0)

The variable <integer> is the sum of the decimal values of the bits that you want to enable.

Mode	All
Remote Command	:STATus:QUEStionable:INTEgrity:NTRansition <integer> :STATus:QUEStionable:INTEgrity:NTRansition?
Example	STAT:QUES:INT:NTR 8 Measurement 'regained calibration' Summary will be reported to the Integrity Summary of the Status Questionable register.
Preset	0
Min	0
Max	32767
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Integrity Positive Transition

This command determines which bits in the Questionable Integrity Condition register will set the corresponding bit in the Questionable Integrity Event register when the condition register bit has a positive transition (0 to 1). The variable <integer> is the sum of the decimal values of the bits that you want to enable.

Mode	All
Remote Command	:STATus:QUEStionable:INTEgrity:PTRansition <integer> :STATus:QUEStionable:INTEgrity:PTRansition?
Example	STAT:QUES:INT:PTR 8 Measurement 'became uncalibrated' Summary will be reported to the Integrity Summary of the Status Questionable register.
Preset	32767
Min	0
Max	32767
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Integrity Signal Register

"Questionable Integrity Signal Condition" on page 91

"Questionable Integrity Signal Enable" on page 91

"Questionable Integrity Signal Event Query" on page 92

"Questionable Integrity Signal Negative Transition" on page 92

"Questionable Integrity Signal Positive Transition" on page 92

Questionable Integrity Signal Condition

This query returns the decimal value of the sum of the bits in the Questionable Integrity Signal Condition register.

NOTE The data in this register is continuously updated and reflects the current conditions.

Mode	All
Remote Command	:STATus:QUEStionable:INTEgrity:SIGNal:CONDition?
Example	STAT:QUES:INT:SIGN:COND?
Preset	0
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Integrity Signal Enable

This command determines which bits in the Questionable Integrity Signal Condition Register will set bits in the Questionable Integrity Signal Event register, which also sets the Integrity Summary bit (bit 9) in the Questionable Register. The variable <integer> is the sum of the decimal values of the bits you want to enable.

Mode	All
Remote Command	:STATus:QUEStionable:INTEgrity:SIGNal:ENABle <integer> :STATus:QUEStionable:INTEgrity:SIGNal:ENABle?
Example	STAT:QUES:INT:SIGN:ENAB 4 Burst Not Found will be reported to the Integrity Summary of the Status Questionable register.
Preset	32767
Min	0
Max	32767
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Integrity Signal Event Query

This query returns the decimal value of the sum of the bits in the Questionable Integrity Signal Event register.

NOTE

The register requires that the associated PTR or NTR filters be set before a condition register bit can set a bit in the event register. The data in this register is latched until it is queried. Once queried, the register is cleared.

Mode	All
Remote Command	:STATus:QUESTionable:INTEgrity:SIGNal[:EVENT]?
Example	STAT:QUES:INT:SIGN?
Preset	0
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Integrity Signal Negative Transition

This command determines which bits in the Questionable Integrity Signal Condition register will set the corresponding bit in the Questionable Integrity Signal Event register when the condition register bit has a negative transition (1 to 0). The variable <integer> is the sum of the decimal values of the bits that you want to enable.

Mode	All
Remote Command	:STATus:QUESTionable:INTEgrity:SIGNal:NTRansition <integer> :STATus:QUESTionable:INTEgrity:SIGNal:NTRansition?
Example	STAT:QUES:INT:SIGN:NTR 4 Burst found will be reported to the Integrity Summary of the Status Questionable register.
Preset	0
Min	0
Max	32767
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Integrity Signal Positive Transition

This command determines which bits in the Questionable Integrity Signal Condition register will set the corresponding bit in the Questionable Integrity Signal Event register when the condition register bit has a positive transition (0 to 1). The variable <integer> is the sum of the decimal values of the bits that you want to enable.

Mode	All
Remote Command	:STATus:QUESTionable:INTEgrity:SIGNal:PTRansition <integer> :STATus:QUESTionable:INTEgrity:SIGNal:PTRansition?
Example	STAT:QUES:INT:SIGN:PTR 4 Burst not found will be reported to the Integrity Summary of the Status Questionable register.
Preset	32767
Min	0
Max	32767
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Integrity Uncalibrated Register

"Questionable Integrity Uncalibrated Condition " on page 93

"Questionable Integrity Uncalibrated Enable " on page 93

"Questionable Integrity Uncalibrated Event Query " on page 94

"Questionable Integrity Uncalibrated Negative Transition " on page 94

"Questionable Integrity Uncalibrated Positive Transition " on page 95

Questionable Integrity Uncalibrated Condition

This query returns the decimal value of the sum of the bits in the Questionable Integrity Uncalibrated Condition register.

NOTE

The data in this register is continuously updated and reflects the current conditions.

Mode	All
Remote Command	:STATus:QUESTionable:INTEgrity:UNCalibrated:CONDition?
Example	STAT:QUES:INT:UNC:COND?
Preset	0
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Integrity Uncalibrated Enable

This command determines which bits in the Questionable Integrity Uncalibrated Condition Register will set bits in the Questionable Integrity Uncalibrated Event register, which also sets the Data Uncalibrated Summary bit (bit 3) in the Questionable Integrity Register. The variable <integer> is the sum of the decimal values of the bits you want to enable.

Mode	All
Remote Command	:STATus:QUEStionable:INTEgrity:UNCalibrated:ENABle :STATus:QUEStionable:INTEgrity:UNCalibrated:ENABle?
Example	STAT:QUES:INT:UNC:ENAB 1 Oversweep (Meas Uncal) will be reported to the Integrity Summary of the Status Questionable register.
Preset	32767
Min	0
Max	32767
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Integrity Uncalibrated Event Query

This query returns the decimal value of the sum of the bits in the Questionable Integrity Uncalibrated Event register.

NOTE

The register requires that the associated PTR or NTR filters be set before a condition register bit can set a bit in the event register. The data in this register is latched until it is queried. Once queried, the register is cleared.

Mode	All
Remote Command	:STATus:QUEStionable:INTEgrity:UNCalibrated[:EVENT]?
Example	STAT:QUES:INT:UNC?
Preset	0
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Integrity Uncalibrated Negative Transition

This command determines which bits in the Questionable Integrity Uncalibrated Condition register will set the corresponding bit in the Questionable Integrity Uncalibrated Event register when the condition register bit has a negative transition (1 to 0). The variable <integer> is the sum of the decimal values of the bits that you want to enable.

Mode	All
Remote Command	:STATus:QUEStionable:INTEgrity:UNCalibrated:NTRansition <integer> :STATus:QUEStionable:INTEgrity:UNCalibrated:NTRansition?
Example	STAT:QUES:INT:UNC:NTR 1 Oversweep cleared will be reported to the Integrity Summary of the Status Questionable register.

Preset	0
Min	0
Max	32767
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Integrity Uncalibrated Positive Transition

This command determines which bits in the Questionable Integrity Uncalibrated Condition register will set the corresponding bit in the Questionable Integrity Uncalibrated Event register when the condition register bit has a positive transition (0 to 1). The variable <integer> is the sum of the decimal values of the bits that you want to enable.

Mode	All
Remote Command	:STATus:QUEStionable:INTEgrity:UNCalibrated:PTRansition <integer> :STATus:QUEStionable:INTEgrity:UNCalibrated:PTRansition?
Example	STAT:QUES:INT:UNC:PTR 1 Oversweep (Meas Uncal) occurred will be reported to the Integrity Summary of the Status Questionable register.
Preset	32767
Min	0
Max	32767
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Power Register

["Questionable Power Condition " on page 95](#)

["Questionable Power Enable " on page 96](#)

["Questionable Power Event Query " on page 96](#)

["Questionable Power Negative Transition " on page 97](#)

["Questionable Power Positive Transition " on page 97](#)

Questionable Power Condition

This query returns the decimal value of the sum of the bits in the Questionable Power Condition register.

NOTE

The data in this register is continuously updated and reflects the current conditions.

Mode	All
Remote Command	:STATus:QUESTionable:POWer:CONDition?
Example	STAT:QUES:POW:COND?
Preset	0
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Power Enable

This command determines which bits in the Questionable Power Condition Register will set bits in the Questionable Power Event register, which also sets the Power Summary bit (bit 3) in the Questionable Register. The variable <integer> is the sum of the decimal values of the bits you want to enable.

Mode	All
Remote Command	:STATus:QUESTionable:POWer:ENABle <integer> :STATus:QUESTionable:POWer:ENABle?
Example	STAT:QUES:POW:ENAB 32 50 MHz Input Pwr too High for Cal will be reported to the Power Summary of the Status Questionable register.
Preset	32767
Min	0
Max	32767
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Power Event Query

This query returns the decimal value of the sum of the bits in the Questionable Power Event register.

NOTE

The register requires that the associated PTR or NTR filters be set before a condition register bit can set a bit in the event register. The data in this register is latched until it is queried. Once queried, the register is cleared.

Mode	All
Remote Command	:STATus:QUESTionable:POWer[:EVENT]?
Example	STAT:QUES:POW?
Preset	0
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Power Negative Transition

This command determines which bits in the Questionable Power Condition register will set the corresponding bit in the Questionable Power Event register when the condition register bit has a negative transition (1 to 0). The variable <integer> is the sum of the decimal values of the bits that you want to enable.

Mode	All
Remote Command	:STATus:QUESTionable:POWer:NTRansition <integer> :STATus:QUESTionable:POWer:NTRansition?
Example	STAT:QUES:POW:NTR 32 50 MHz Input Power became OK for Cal will be reported to the Power Summary of the Status Questionable register.
Preset	0
Min	0
Max	32767
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Power Positive Transition

This command determines which bits in the Questionable Power Condition register will set the corresponding bit in the Questionable Power Event register when the condition register bit has a positive transition (0 to 1). The variable <integer> is the sum of the decimal values of the bits that you want to enable.

Mode	All
Remote Command	:STATus:QUESTionable:POWer:PTRansition <integer> :STATus:QUESTionable:POWer:PTRansition?>
Example	STAT:QUES:POW:PTR 32 50 MHz Input Power became too high for Cal will be reported to the Power Summary of the Status Questionable register.
Preset	32767
Min	0
Max	32767
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Temperature Register

"Questionable Temperature Condition" on page 98

"Questionable Temperature Enable" on page 98

"Questionable Temperature Event Query" on page 98

"Questionable Temperature Negative Transition" on page 99

"Questionable Temperature Positive Transition" on page 99

Questionable Temperature Condition

This query returns the decimal value of the sum of the bits in the Questionable Temperature Condition register.

NOTE

The data in this register is continuously updated and reflects the current conditions.

Mode	All
Remote Command	:STATus:QUESTionable:TEMPerature:CONDition?
Example	STAT:QUES:TEMP:COND?
Preset	0
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Temperature Enable

This command determines which bits in the Questionable Temperature Condition Register will set bits in the Questionable Temperature Event register, which also sets the Temperature Summary bit (bit 4) in the Questionable Register. The variable <integer> is the sum of the decimal values of the bits you want to enable.

Mode	All
Remote Command	:STATus:QUESTionable:TEMPerature:ENABle <integer> :STATus:QUESTionable:TEMPerature:ENABle?
Example	STAT:QUES:TEMP:ENAB 1 Reference Oscillator Oven Cold will be reported to the Temperature Summary of the Status Questionable register.
Preset	32767
Min	0
Max	32767
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Temperature Event Query

This query returns the decimal value of the sum of the bits in the Questionable Temperature Event register.

NOTE

The register requires that the associated PTR or NTR filters be set before a condition register bit can set a bit in the event register. The data in this register is latched until it is queried. Once queried, the register is cleared

Mode	All
Remote Command	:STATus:QUEStionable:TEMPerature[:EVENT]?
Example	STAT:QUES:TEMP?
Preset	0
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Temperature Negative Transition

This command determines which bits in the Questionable Temperature Condition register will set the corresponding bit in the Questionable Temperature Event register when the condition register bit has a negative transition (1 to 0). The variable <integer> is the sum of the decimal values of the bits that you want to enable.

Mode	All
Remote Command	:STATus:QUEStionable:TEMPerature:NTRansition <integer> :STATus:QUEStionable:TEMPerature:NTRansition?
Example	STAT:QUES:TEMP:NTR 1 Reference Oscillator Oven not cold will be reported to the Temperature Summary of the Status Questionable register.
Preset	0
Min	0
Max	32767
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Questionable Temperature Positive Transition

This command determines which bits in the Questionable Temperature Condition register will set the corresponding bit in the Questionable Temperature Event register when the condition register bit has a positive transition (0 to 1). The variable <integer> is the sum of the decimal values of the bits that you want to enable.

Mode	All
Remote Command	:STATus:QUEStionable:TEMPerature:PTRansition <integer> :STATus:QUEStionable:TEMPerature:PTRansition?
Example	STAT:QUES:TEMP:PTR 1 Reference Oscillator Oven became cold will be reported to the

	Temperature Summary of the Status Questionable register.
Preset	32767
Min	0
Max	32767
Status Bits/OPC dependencies	Sequential command
Initial S/W Revision	Prior to A.02.00

Common Commands

- "All (Daily use)" on page 189
- "Clear Status " on page 103
- "Standard Event Status Enable " on page 104
- "Standard Event Status Register Query " on page 104
- "Identification Query " on page 105
- "Operation Complete " on page 105
- "Query Instrument Options " on page 106
- "Recall Instrument State " on page 106
- "*RST (Remote Command Only)" on page 107
- "Save Instrument State " on page 107
- "Service Request Enable " on page 108
- "Status Byte Query " on page 108
- "Trigger " on page 108
- "Self Test Query " on page 109
- "Wait-to-Continue " on page 109

All (Daily use)

Immediately executes an alignment of all subsystems which includes both the source and the analyzer in the TRX module. The "All" alignment is sufficient to maintain specified performance, provided that (1) the TRX's internal temperature has not drifted more than +/-5 degree C since the previous alignment, and (2) no more than 8 hours have elapsed since the previous "All" alignment., and (3) no more than 1 week has elapsed since these three alignments have all been run: IF, RF, and Source, and (4) a 45 minute warm-up period between power-up of the TRX and invoking the "All" alignment. The instrument stops any measurement currently underway, performs the alignment, then restarts the measurement from the beginning (similar to pressing the Restart key).

If an interfering user signal is present at the RF Input, the alignment is performed on all subsystems except the RF. After completion, the Error Condition message "Align skipped: 50 MHz interference" or "Align skipped: 4.8 GHz interference" is generated. In addition the Error Condition message "Align Now, RF required" is generated, and bits 11 and 12 are set in the Status Questionable Calibration register.

The query form of the remote commands (:CALibration[:ALL]? or *CAL?) invokes the alignment of all subsystems and returns a success or failure value. An interfering user signal is not grounds for failure; if the alignment was able to succeed on all portions but unable to align the RF because of an interfering signal, the resultant will be the success value.

Successful completion of Align Now, All will clear the "Align Now, All required" Error Condition, and clear bit 14 in the Status Questionable Calibration register. It will also begin the elapsed time counter for Last Align Now, All Time, and capture the Last Align Now, All Temperature.

If the Align RF subsystem succeeded in aligning (no interfering signal present), the elapsed time counter begins for Last Align Now, RF Time, and the temperature is captured for the Last Align Now, RF Temperature. In addition the Error Conditions “Align skipped: 50 MHz interference” and “Align skipped: 4.8 GHz interference” are cleared, the Error Condition “Align Now, RF required” is cleared, and bits 11 and 12 are cleared in the Status Questionable Calibration register

Align Now, All can be interrupted by pressing the Cancel (ESC) front-panel key or remotely with Device Clear followed by the :ABORt SCPI command. When this occurs the Error Condition message “Align Now, All required” is generated, and bit 14 is set in the Status Questionable Condition register. This is because new alignment data may be employed for an individual subsystem, but not a cohesive set of data for all subsystems.

In many cases, you might find it more convenient to change alignments to Normal, instead of executing Align Now, All. When the Auto Align process transitions to Normal, the analyzer will immediately start to update only the alignments that have expired, thus efficiently restoring the alignment process.

NOTE

In EXM, Source ARB play will be turned off and the source states will not be restored after Align Now, All.

Key Path	System, Alignments, Align Now
Mode	All
Remote Command	:CALibration[:ALL] :CALibration[:ALL]?
Example	:CAL
Notes	:CALibration[:ALL]? returns 0 if successful :CALibration[:ALL]? returns 1 if failed :CALibration[:ALL]? is the same as *CAL? While Align Now, All is performing the alignment, bit 0 in the Status Operation register is set. Completion, or termination, will clear bit 0 in the Status Operation register. This command is sequential; it must complete before further SCPI commands are processed. Interrupting the alignment from remote is accomplished by invoking Device Clear followed by the :ABORt command. Successful completion will clear bit 14 in the Status Questionable Calibration register. An interfering user signal is not grounds for failure of Align Now, All. However, bits 11 and 12 are set in the Status Questionable Calibration register to indicate Align Now, RF is required. An interfering user supplied signal will result in the instrument requiring an Align Now, RF with the interfering signal removed.
Couplings	Initializes the time for the Last Align Now, All Time. Records the temperature for the Last Align Now, All Temperature. If Align RF component succeeded, initializes the time for the Last Align Now, RF Time. If Align RF component succeeded, records the temperature for the Last Align Now, RF Temperature.
Status Bits/OPC dependencies	Bits 11, 12, or 14 may be set in the Status Questionable Calibration register.
Initial S/W Revision	Prior to A.02.00

Mode	All
Remote Command	*CAL?
Example	*CAL?
Notes	*CAL? returns 0 if successful *CAL? returns 1 if failed :CALibration[:ALL]? is the same as *CAL? See additional remarks described with :CALibration[:ALL]? Everything about :CALibration[:ALL]? is synonymous with *CAL? including all conditions, status register bits, and couplings
Initial S/W Revision	Prior to A.02.00

Mode	All
Remote Command	:CALibration[:ALL]:NPENding
Example	CAL:NPEN
Notes	:CALibration[:ALL]:NPENding is the same as :CALibration[:ALL] including all conditions, status register bits, except this scpi command does not BLOCK the scpi session, so the user should use status register bits to query if the calibration is successfully completed or not. Typical usage is: 1) :CALibration:ALL:NPENding (Start a calibration) 2) :STATus:OPERation:CONDition? (Check if the calibration is completed or not, If bit 0 is set, then the system is doing calibration, the user should repeat this scpi query until the bit is cleared) 3) :STATus:QUESTionable:CALibration:CONDition? (Check if there are any errors/failures in previous calibration procedure
Initial S/W Revision	X.14.20

Clear Status

Clears the status byte register. It does this by emptying the error queue and clearing all bits in all of the event registers. The status byte register summarizes the states of the other registers. It is also responsible for generating service requests.

Key Path	No equivalent key. Related key System, Show Errors, Clear Error Queue
Remote Command	*CLS
Example	*CLS Clears the error queue and the Status Byte Register.
Notes	For related commands, see the SYSTem:ERRor[:NEXT]? command. See also the STATus:PRESet command and all commands in the STATus subsystem.
Status Bits/OPC dependencies	Resets all bits in all event registers to 0, which resets all the status byte register bits to 0 also.
Backwards Compatibility Notes	In general the status bits used in the X-Series status system will be backwards compatible with ESA and PSA. However, note that all conditions will generate events that go into the event log, and some

	will also generate status bits.
Initial S/W Revision	Prior to A.02.00

Standard Event Status Enable

Selects the desired bits from the standard event status enable register. This register monitors I/O errors and synchronization conditions such as operation complete, request control, query error, device dependent error, status execution error, command error, and power on. The selected bits are OR'd to become a summary bit (bit 5) in the byte register which can be queried.

The query returns the state of the standard event status enable register.

Key Path	No equivalent key. Related key System, Show Errors, Clear Error Queue
Remote Command	*ESE <integer> *ESE?
Example	*ESE 36 Enables the Standard Event Status Register to monitor query and command errors (bits 2 and 5). *ESE? Returns a 36 indicating that the query and command status bits are enabled.
Notes	For related commands, see the STATus subsystem and SYSTem:ERRor[:NEXT]? commands.
Preset	255
State Saved	Not saved in state.
Min	0
Max	255
Status Bits/OPC dependencies	Event Enable Register of the Standard Event Status Register.
Initial S/W Revision	Prior to A.02.00

Standard Event Status Register Query

Queries and clears the standard event status event register. (This is a destructive read.) The value returned is a hexadecimal number that reflects the current state (0/1) of all the bits in the register.

Remote Command	*ESR?
Example	*ESR? Returns a 1 if there is either a query or command error, otherwise it returns a zero.
Notes	For related commands, see the STATus subsystem commands.
Preset	0
Min	0
Max	255
Status Bits/OPC dependencies	Standard Event Status Register (bits 0 - 7).
Initial S/W Revision	Prior to A.02.00

Identification Query

Returns a string of instrument identification information. The string will contain the model number, serial number, and firmware revision.

The response is organized into four fields separated by commas. The field definitions are as follows:

- Manufacturer
- Model
- Serial number
- Firmware version

Key Path	No equivalent key. See related key System, Show System.
Remote Command	*IDN?
Example	*IDN? Returns instrument identification information, such as: Keysight Technologies, E6640A, US01020004, E.14.50
Initial S/W Revision	Prior to A.02.00
Modified at S/W Revision	x.14.50

Operation Complete

The *OPC command sets bit 0 in the standard event status register (SER) to “1” when pending operations have finished, that is when all overlapped commands are complete. It does not hold off subsequent operations. You can determine when the overlapped commands have completed either by polling the OPC bit in SER, or by setting up the status system such that a service request (SRQ) is asserted when the OPC bit is set.

The *OPC? query returns a “1” after all the current overlapped commands are complete. So it holds off subsequent commands until the “1” is returned, then the program continues. This query can be used to synchronize events of other instruments on the external bus.

Remote Command	*OPC *OPC?
Example	INIT:CONT 0 Selects single sweeping. INIT:IMM Initiates a sweep. *OPC? Holds off any further commands until the sweep is complete.
Status Bits/OPC dependencies	Not global to all remote ports or front panel. *OPC only considers operation that was initiated on the same port as the *OPC command was issued from. *OPC is an overlapped command, but *OPC? is sequential.
Backwards Compatibility Notes	1. The ESA/PSA/VSA products do not meet all the requirements for the *OPC command specified by IEEE 488.2. This is corrected for X-Series. This will sometimes cause behavior that is not backward compatible, but it will work as customers expect.

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2. Commands such as, *OPC/*OPC?/*WAI/*RST used to be global. They considered front panel operation in conjunction with the GPIB functionality. Now they are evaluated on a per channel basis. That is, the various rear panel remote ports and the front panel i/o are all considered separately. Only the functionality initiated on the port where the *OPC was sent, is considered for its operation.
 3. *OPC used to hold off until the operation bits were cleared. Now it holds off until all overlapping commands are completed. Also, earlier instruments did not wait for completion of all processes, only the ones identified here (in the STATus:OPERation register):
 - Calibrating: monitored by PSA, ESA, VSA (E4406A)
 - Sweeping: monitored by PSA, ESA, VSA (E4406A)
 - Waiting for Trigger: monitored by PSA, ESA, VSA (E4406A)
 - Measuring: monitored by PSA and ESA (but not in all Modes).
 - Paused: monitored by VSA (E4406A).
 - Printing: monitored by VSA (E4406A).
 - Mass memory busy: monitored by VSA (E4406A).
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Initial S/W Revision	Prior to A.02.00
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Query Instrument Options

Returns a string of all the installed instrument options. It is a comma separated list with quotes, such as: "503,P03,PFR".

To be IEEE compliant, this command should return an arbitrary ascii variable that would not begin and end with quotes. But the quotes are needed to be backward compatible with previous SA products and software. So, the actual implementation will use arbitrary ascii. But quotes will be sent as the first and last ascii characters that are sent with the comma-separated option list.

Remote Command	*OPT?
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Initial S/W Revision	Prior to A.02.00
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Recall Instrument State

This command recalls the instrument state from the specified instrument memory register.

- If the state being loaded has a newer firmware revision than the revision of the instrument, no state is recalled and an error is reported
- If the state being loaded has an equal firmware revision than the revision of the instrument, the state will be loaded.
- If the state being loaded has an older firmware revision than the revision of the instrument, the instrument will only load the parts of the state that apply to the older revision.

Remote Command	*RCL <register #>
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Example	*RCL 7 Recalls the instrument state that is currently stored in register 7.
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Notes	Registers 0 through 6 are accessible from the front panel in menu keys for Recall Registers.
Min	0
Max	127
Status Bits/OPC dependencies	The command is sequential.
Initial S/W Revision	Prior to A.02.00

*RST (Remote Command Only)

*RST is equivalent to :SYST:PRES::INIT:CONT OFF, which is a Mode Preset in the Single measurement state. This remote command is preferred over Mode Preset remote command - :SYST:PRES, as optimal remote programming occurs with the instrument in the single measurement state.

Remote Command	*RST
Example	*RST
Notes	Sequential Clears all pending OPC bits and the Status Byte is set to 0.
Couplings	A *RST will cause the currently running measurement to be aborted and cause the default measurement to be active. *RST gets the mode to a consistent state with all of the default couplings set.
Backwards Compatibility Notes	In legacy analyzers *RST did not set the analyzer to Single, but in the X-Series it does, for compliance with the IEEE 488.2 specification. In the X-Series, *RST does not do a *CLS (clear the status bits and the error queue). In legacy analyzers, *RST used to do the equivalent of SYSTem:PRESet, *CLS and INITiate:CONTinuous OFF. But to be 488.2 compliant, *RST in the X-Series does not do a *CLS.
Initial S/W Revision	Prior to A.02.00

Save Instrument State

This command saves the current instrument state and mode to the specified instrument memory register.

Remote Command	*SAV <register #>
Example	*SAV 9 Saves the instrument state in register 9.
Notes	Registers 0 through 6 are accessible from the front panel in menu keys for Save Registers.
Min	0
Max	127
Status Bits/OPC dependencies	The command is sequential.
Initial S/W Revision	Prior to A.02.00

Service Request Enable

This command enables the desired bits of the service request enable register.

The query returns the value of the register, indicating which bits are currently enabled.

Remote Command	*SRE <integer> *SRE?
Example	*SRE 22 Enables bits 1, 2, and 4 in the service request enable register.
Notes	For related commands, see the STATus subsystem and SYSTem:ERRor[:NEXT]? commands.
Preset	0
Min	0
Max	255
Status Bits/OPC dependencies	Service Request Enable Register (all bits, 0 – 7).
Initial S/W Revision	Prior to A.02.00

Status Byte Query

Returns the value of the status byte register without erasing its contents.

Remote Command	*STB?
Example	*STB? Returns a decimal value for the bits in the status byte register. For example, if a 16 is returned, it indicates that bit 5 is set and one of the conditions monitored in the standard event status register is set.
Notes	See related command *CLS.
Status Bits/OPC dependencies	Status Byte Register (all bits, 0 – 7).
Initial S/W Revision	Prior to A.02.00

Trigger

This command triggers the instrument. Use the :TRIGger[:SEQUence]:SOURce command to select the trigger source.

Key Path	No equivalent key. See related keys Single and Restart.
Remote Command	*TRG
Example	*TRG Triggers the instrument to take a sweep or start a measurement, depending on the current instrument settings.
Notes	See related command :INITiate:IMMEDIATE.
Initial S/W Revision	Prior to A.02.00

Self Test Query

This query performs the internal self-test routines and returns a number indicating the success of the testing. A zero is returned if the test is successful, 1 if it fails.

Remote Command	*TST?
Example	*TST? Runs the self-test routines and returns 0=passed, 1=some part failed.
Initial S/W Revision	Prior to A.02.00

Wait-to-Continue

This command causes the instrument to wait until all overlapped commands are completed before executing any additional commands. There is no query form for the command.

Remote Command	*WAI
Example	INIT:CONT OFF; INIT;*WAI Sets the instrument to single sweep. Starts a sweep and waits for its completion.
Status Bits/OPC dependencies	Not global to all remote ports or front panel. *OPC only considers operation that was initiated on the same port as the *OPC command was issued from.
Initial S/W Revision	Prior to A.02.00

3 Input/Output Functions

Input/Output

The Input/Output features are common across multiple Modes and Measurements. These common features are described in this section. See the Measurement description for information on features that are unique.

The Input/Output key accesses the keys that control the Input/Output parameters of the instrument. In general, these are functions associated with external connections to the analyzer, either to the inputs or the outputs. Since these connections tend to be fairly stable within a given setup, in general, the input/output settings do not change when you Preset the analyzer.

Other functions related to the input/output connections, but which tend to change on a measurement by measurement basis, can be found under the Trigger and AMPTD Y Scale keys. In addition, some of the digital I/O bus configurations can be found under the System key.

NOTE

The functions in the Input/Output menu are "global" (common) to all Modes (applications). But individual Input/Output functions only appear in a Mode if they apply to that Mode. Functions that apply to a Mode but not to all measurements in the Mode may be grayed-out in some measurements.

["Input/Output variables - Preset behavior" on page 113](#)

The Input Port selection is the first menu under the Input/Output key:

Key Path	Front-panel key
Remote Command	<code>[:SENSe] :FEED RF AIQ EMIXer</code> <code>[:SENSe] :FEED?</code>
Example	<code>:FEED RF</code> <code>:FEED?</code>
Couplings	The <code>[:SENSe] :FEED RF</code> command turns the calibrator OFF
Preset	This setting is unaffected by a Preset or power cycle. It survives a Mode Preset and mode changes. It is set to RF on a "Restore Input/Output Defaults" or "Restore System Defaults->All"
State Saved	Saved in instrument state
Backwards Compatibility SCPI	<code>[:SENSe] :FEED AREFERENCE</code> In the PSA the calibrator was one of the inputs and selected using the AREF parameter to the same <code>:FEED</code> command that switched the inputs. In the X-Series it is controlled in a separate menu and overrides the input selection. For code compatibility the <code>[:SENSe] :FEED AREFERENCE</code> command is provided, and is aliased to <code>[:SENSe] :FEED :AREF REF50</code> , which causes the input to be switched to the 50 MHz calibrator. The <code>[:SENSe] :FEED RF</code> command switches the input back to the RF port and turns the calibrator OFF, thus providing full compatibility with the PSA calibrator function. Note that after sending this, the query <code>[:SENSe] :FEED?</code> will NOT return "AREF" but instead the currently selected input.
Backwards Compatibility SCPI	<code>[:SENSe] :FEED IQ IONLy QONLy</code> <code>[:SENSe] :FEED?</code> The parameters <code>IQ IONLy QONLy</code> are supported for backwards compatibility with the E44406A. <code>[:SENSe] :FEED IQ</code> aliases to <code>[:SENSe] :FEED :IQ :TYPE IQ</code> <code>[:SENSe] :FEED IONLy</code> aliases to <code>[:SENSe] :FEED :IQ :TYPE IONLy</code>

	<p>[;SENSe]:FEED QONLY aliases to [;SENSe]:FEED:IQ:TYPE QONLY</p> <p>The query [;SENSe]:FEED? will always returns AIQ whatever the type of legacy parameters IQ IONLY QONLY has been used.</p>
Backwards Compatibility Notes	<p>Most of the settings in the X-Series Input/Output system, including External Gain, Amplitude Corrections settings and data, etc., are shared by all modes and are not changed by a mode switch. Furthermore, most variables in the Input/Output system key are not affected by Mode Preset. Both of these behaviors represent a departure from legacy behavior.</p> <p>In the X-Series. Input/Output settings are reset by using the "Restore Input/Output Defaults" function. They can also be reset to their default values through the System->Restore System Defaults-> In/Out Config key or through the System ->Restore System Defaults -> All key (and corresponding SCPI).</p> <p>While this matches most use cases better, it does create some code compatibility issues. For example, Amplitude Corrections are no longer turned off by a Mode Preset, but instead by using the "Restore Input/Output Defaults" key/SCPI.</p> <p>Although Input/Output settings are not part of each Mode's State, they are saved in the Save State files, so that all of the instrument settings can be recalled with Recall State, as in legacy instruments.</p>
Initial S/W Revision	Prior to A.02.00
Remote Command	<p>:INPut:MIXer EXTernal INTernal</p> <p>:INPut:MIXer?</p>
Example	<p>INP:MIX INT</p> <p>INP:MIX?</p>
Notes	<p>In legacy analyzers you choose between the Internal mixer or an External Mixer. In the X-Series, the External Mixer is one of the choices for the Input and is selected using the FEED command (:SENSe:FEED EXTMIxer).</p> <p>For compatibility, the INPut:MIXer EXTernal INTernal legacy command is mapped as follows:</p> <ol style="list-style-type: none"> 1. When INPut:MIXer EXTernal is received, SENSe:FEED EMIXer is executed. 2. When INPut:MIXer INTernal is received, SENSe:FEED RF is executed. 3. When INPut:MIXer? is received, the response will be INT if any input other than the external mixer is selected and EXT if the external mixer is selected
Preset	INT
Backwards Compatibility Notes	<p>PSA supports the following SCPI Command :</p> <p>:INPut:MIXer:TYPE PRESelected UNPReselect</p> <p>:INPut:MIXer:TYPE?</p> <p>PXA does not support the :INPut:MIXer:TYPE command.</p>
Initial S/W Revision	A.08.01

Input/Output variables - Preset behavior

Virtually all the input/output settings are NOT a part of mode preset. They can be set to their default value

by one of the three ways:

- by using the Restore Input/Output Defaults key on the first page of the input/output menu,
- by using the System->Restore System Defaults->Input/Output Settings or,
- by using the System -> Restore System Defaults->All. Also, they survive a Preset and a Power cycle.

A very few of the Input/Output settings do respond to a Mode Preset; for example, if the Calibrator is on it turns off on a Preset, and if DC coupling is in effect it switches to AC on a Preset. These exceptions are made in the interest of reliability and usability, which overrides the need for absolute consistency. Exceptions are noted in the SCPI table for the excepted functions.

RF Input

Selects the front-panel RF input port to be the analyzer signal input. If RF is already selected, pressing this key accesses the RF input setup functions.

Key Path	Input/Output
Example	[:SENSe]:FEED RF
Couplings	The act of connecting the U7227A USB Preamplifier to one of the analyzer's USB ports will cause the Input to automatically switch to the RF Input. If the RF Calibrator is on, it is turned off. Subsequently disconnecting the USB Preamp from USB does not change the Input selection nor restore the previous selection.
Readback	The RF input port, RF coupling, and current input impedance settings appear on this key as: "XX, YY, ZZ" where XX is RF, RF2, RFIO1, RFIO2, depending on what input is selected (only appears on analyzers with multiple RF inputs) YY is AC or DC ZZ is 50Ω or 75Ω
Initial S/W Revision	Prior to A.02.00
Modified at S/W Revision	A.14.00

Input Z Correction

Sets the input impedance for unit conversions. This affects the results when the y-axis unit is voltage or current units (dBmV, dBμV, dBμA, V, A), but not when it is power units (dBm, W). The impedance you select is for computational purposes only, since the actual impedance is set by internal hardware to 50 ohms. Setting the computational input impedance to 75 ohms is useful when using a 75 ohm to 50 ohm adapter to measure a 75 ohm device on an analyzer with a 50 ohm input impedance.

There are a variety ways to make 50 to 75 ohm transitions, such as impedance transformers or minimum loss pads. The choice of the solution that is best for your measurement situation requires balancing the amount of loss that you can tolerate with the amount of measurement frequency range that you need. If you are using one of these pads/adaptors with the Input Z Corr function, you might also want to use the Ext Gain key. This function is used to set a correction value to compensate for the gain (loss) through your pad. This correction factor is applied to the displayed measurement values.

Key Path	Input/Output, RF Input
Remote Command	[:SENSe] :CORRection:IMPedance [:INPut] [:MAGNitude] 50 75 [:SENSe] :CORRection:IMPedance [:INPut] [:MAGNitude] ?
Example	CORR:IMP 75 sets the input impedance correction to 75 ohms. CORR:IMP?
Preset	This is unaffected by a Preset but is set to 50 ohms on a "Restore Input/Output Defaults" or "Restore System Defaults->All" Some instruments/options may have 75 ohms available.
State Saved	Saved in instrument state
Readback	50 Ω or 75 Ω . Current setting reads back to the RF key.
Initial S/W Revision	Prior to A.02.00

RF Input Port

Specifies the RF input port used. The RF Input Port key only appears on units with multiple inputs, and lets you switch between the two inputs.

Switching from the RF input port to one of the RFIO ports, on units that have them, changes the receiver performance of the instrument.

Key Path	Input/Output, RF Input
Remote Command	[:SENSe] :FEED:RF:PORT [:INPut] RFIN RFIN2 RFIO1 RFIO2 RFIO3 RFIO4 [:SENSe] :FEED:RF:PORT [:INPut] ?
Example	:FEED:RF:PORT RFIN
Dependencies	This key only appears in models that support multiple inputs. If the SCPI command is sent with unsupported parameters in any other model, an error is generated, -221.1900, "Settings conflict;option not installed" When any input is selected in a measurement that does not support it, the "No result; Meas invalid with this input" error condition occurs, and the measurement returns invalid data when queried.
Preset	This is unaffected by Mode Preset but is set to RF on a "Restore Input/Output Defaults" or "Restore System Defaults -> All"
State Saved	Saved in instrument state
Readback	The current RF Input Port selected is read back to this key
Backwards Compatibility SCPI	INPut<1 2>:TYPE INPUT1 INPUT2 INPut<1 2>:TYPE? Included for R&S ESU compatibility. In the MXE, the INPUT1 parameter is aliased to RFIN and the INPUT2 parameter is aliased to RFIN2
Initial S/W Revision	A.05.01
Modified at S/W Revision	A.14.00

RF Input

Specifies using the main RF port for the current measurement

Key Path	Input/Output, RF Input, RF Input Port
Example	:FEED:RF:PORT RFIN
Notes	On E6640A with hardware M9430A, if RF Input is selected as RF Input Port, you need to choose the settings in the Half Duplex Config menu to determine which port (RFIO3 or RFIO4) will be used. On E6640A with hardware M9431A, this setting is not supported. If the SCPI command is sent with this setting, an error is generated, -221, "Settings conflict;option not installed"
ReadBack	RF Input
Initial S/W Revision	A.05.01
Modified at S/W Revision	A.14.00

RFIO1

Specifies using the RFIO 1 port for the current measurement

Key Path	Input/Output, RF Input, RF Input Port
Example	:FEED:RF:PORT RFIO1
Dependencies	RFIO1 is not available inE6607C. If Multiport Adapter is ON, Select RF Input to RFIO1, an error message is generated: "-221, Settings conflict; RFIO1 or RFIO2 Port unavailable when Multiport Adapter is ON".
ReadBack	RFIO 1
Initial S/W Revision	A.05.01

RFIO2

Specifies using the RFIO 2 port for the current measurement

Key Path	Input/Output, RF Input, RF Input Port
Example	:FEED:RF:PORT RFIO2
Dependencies	RFIO2 is not available inE6607C. If Multiport Adapter is ON, Select RF Input to RFIO2, an error message is generated: "-221, Settings conflict; RFIO1 or RFIO2 Port unavailable when Multiport Adapter is ON".
ReadBack	RFIO 2
Initial S/W Revision	A.05.01

Restore Input/Output Defaults

This selection causes the group of settings and data associated with the Input/Output key to be a reset to their default values. In addition, when a Source is installed, licensed and selected, Restore Input/Output defaults will initiate a Source Preset.

This level of Restore System Defaults does not affect any other system settings or mode settings and does not cause a mode switch. All the features described in this section are reset using this key, including Input Corrections and Data (described in the Corrections section).

Key Path	Input/Output
Example	:SYST:DEF INP presets all the Input/Output variables to their factory default values.
Notes	Refer to the Utility Functions for information about Restore System Defaults and the complete description of the :SYSTem:DEFault INPut: command.
Initial S/W Revision	Prior to A.02.00

Corrections

This key accesses the Amplitude Corrections menu.

Amplitude Corrections arrays can be entered, sent over SCPI, or loaded from a file. They allow you to correct the response of the analyzer for various use cases. The X-series supports four separate Corrections arrays, each of which can contain up to 2000 points. They can be turned on and off individually and any or all can be on at the same time.

Trace data is in absolute units and corrections data is in relative units, but we want to be able to display trace data at the same time as corrections data. Therefore we establish a reference line to be used while building or editing a Corrections table. The reference line is halfway up the display and represents 0 dB of correction. It is labeled "0 dB CORREC". It is drawn in blue.

Corrections data is always in dB. Whatever dB value appears in the correction table represents the correction applied to that trace at that frequency. So if a table entry shows 30 dB that means we ADD 30 dB to each trace to correct it before displaying it.

In zero span, where the frequency is always the center frequency of the analyzer, we apply the (interpolated) correction for the center frequency to all points in the trace. In the event where there are two correction amplitudes at the center frequency, we apply the first one in the table.

Note that the corrections are applied as the data is taken; therefore, a trace in View (Update Off) will not be affected by changes made to the corrections table after the trace is put in View.

On the RF Input/Output panel, there are two full-duplex RF ports (RFIO1 and RFIO2), RF Input and RF Output. When RF Input is selected, it will correspond to one input port from two half-duplex RF ports (RFIO3 and RFIO4), and when RF Output is selected, it will correspond to one output port from two half-duplex RF ports (RFIO3 and RFIO4). So there are 8 sets of corrections in all that can be applied to the RF ports. Ports cannot share the same set of corrections but a single port can have multiple corrections applied to it. The correction data is applied to incoming signals as well as transmitted signals and is in the form of a list of spot frequencies and amplitude correction levels.

Key Path	Input/Output, Corrections
Mode	SA, I/Q Analyzer, Phase Noise, VXA, RTSA, EMI Receiver, DVB-T/H, DTMB, DVB-T/H, DTMB, W-CDMA, LTE & LTE-Adv FDD, LTE & LTE-Adv TDD, Sequence Analyzer, BTooth
Dependencies	This key will only appear if you have the proper option installed in your instrument. Amplitude correction may not be available in all modes; if a mode does not support amplitude correction, the Corrections key should be blanked while in that mode. If an application supports corrections but the current measurement does not, then the key should be grayed out in that measurement
Preset	Corrections arrays are reset (deleted) by Restore Input/Output Defaults. They survive shutdown and restarting of the analyzer application, which means they will survive a power cycle.
Initial S/W Revision	A.02.00
Modified at S/W Revision	x.14.50

Select Correction

Specifies the selected correction. The term "selected correction" is used throughout this document to specify which correction will be affected by the functions.

Key Path	Input/Output, Corrections
Mode	SA, I/Q Analyzer, Phase Noise, VXA, RTSA, EMI Receiver, DVB-T/H, DTMB, DVB-T/H, DTMB, W-CDMA, LTE & LTE-Adv FDD, LTE & LTE-Adv TDD, Sequence Analyzer, BTooth
Notes	The selected correction is remembered even when not in the correction menu.
Preset	Set to Correction 1 by Restore Input/Output Defaults
Readback	Correction 1 Correction 2 Correction 3 Correction 4 Correction 5 Correction 6 Correction 7 Correction 8
Initial S/W Revision	A.02.00
Modified at S/W Revision	x.14.50

Correction On/Off

Turning the Selected Correction from the OFF state to the ON state allows the values in it to be applied to the data. This state transition also automatically turns on "Apply Corrections" (sets it to ON), otherwise the correction would not take effect.

A new sweep is initiated if an amplitude correction is switched on or off. Note that changing, sending or loading corrections data does NOT directly initiate a sweep, however in general these operations will turn corrections on, which DOES initiate a sweep.

Key Path	Input/Output, Corrections
Remote Command	[[:SENSe]:CORRection:CSET[1] 2 ... 8[:STATe] ON OFF 1 0 [:SENSe]:CORRection:CSET[1] 2 ... 8[:STATe]?

Example	SENS:CORR:CSET1 ON
Dependencies	<p>Changing this from the OFF state to the ON state automatically turns on "Apply Corrections".</p> <p>Only the first correction array (Correction 1) supports antenna units. When this array is turned on, and it contains an Antenna Unit other than "None", the Y Axis Unit of the analyzer is forced to that Antenna Unit. All other Y Axis Unit choices are grayed out.</p> <p>Note that this means that a correction file with an Antenna Unit can only be loaded into the Corrections 1 register. Consequently only for Correction 1 does the dropdown in the Recall dialog include.ant, and if an attempt is made to load a correction file into any other Correction register which DOES contain an antenna unit, a Mass Storage error is generated.</p> <p>This command will generate an "Option not available" error unless you have the proper option installed in your instrument.</p>
Preset	Not affected by a Preset. Set to OFF by Restore Input/Output Defaults
State Saved	Saved in instrument state.
Backwards Compatibility Notes	Unlike legacy analyzers, Preset does not turn Corrections off (Restore Input/Output Defaults does).
Initial S/W Revision	A.02.00
Modified at S/W Revision	A.14.00

Properties

Accesses a menu that lets you set the properties of the selected correction.

Key Path	Input/Output, Corrections
Initial S/W Revision	A.02.00

Select Correction

Specifies the selected correction. The term "selected correction" is used throughout this document to specify which correction will be affected by the functions.

Key Path	Input/Output, Corrections
Mode	SA, I/Q Analyzer, Phase Noise, VXA, RTSA, EMI Receiver, DVB-T/H, DTMB, DVB-T/H, DTMB, W-CDMA, LTE & LTE-Adv FDD, LTE & LTE-Adv TDD, Sequence Analyzer, BTooth
Notes	The selected correction is remembered even when not in the correction menu.
Preset	Set to Correction 1 by Restore Input/Output Defaults
Readback	Correction 1 Correction 2 Correction 3 Correction 4 Correction 5 Correction 6 Correction 7 Correction 8
Initial S/W Revision	A.02.00
Modified at S/W Revision	x.14.50

Frequency Interpolation

This setting controls how the correction values per-bucket are calculated. We interpolate between frequencies in either the logarithmic or linear scale.

This setting is handled and stored individually per correction set.

See ["Interpolation" on page 120](#)

Key Path	Input/Output, Corrections, Properties
Remote Command	[:SENSe] :CORRection:CSET[1] 2 ... 8:X:SPACing LINear LOGarithmic [:SENSe] :CORRection:CSET[1] 2 ... 8:X:SPACing?
Example	CORR:CSET:X:SPAC LIN
Preset	Unaffected by a Preset. Set to Linear by Restore Input/Output Defaults.
State Saved	Saved in instrument state.
Initial S/W Revision	A.02.00
Modified at S/W Revision	A.14.00

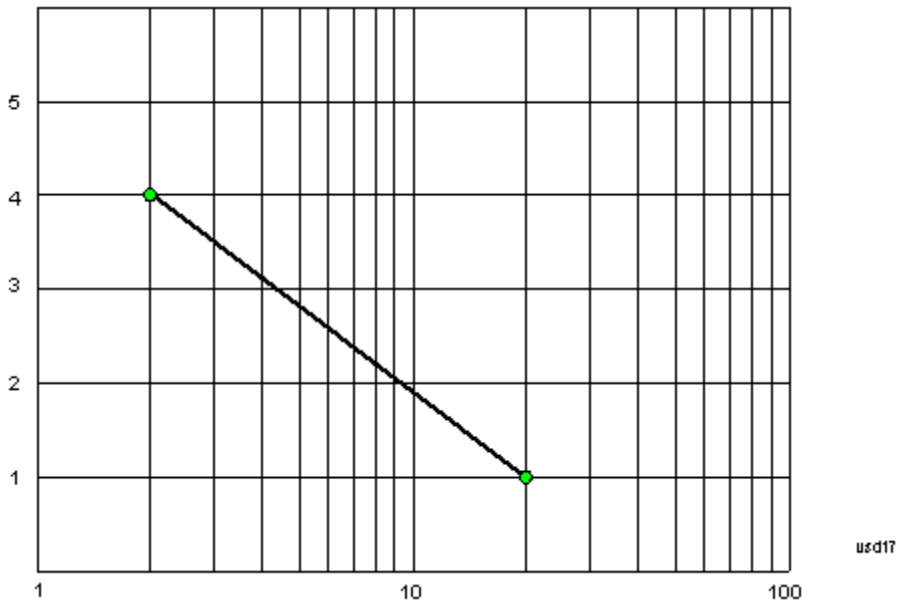
Interpolation

For each bucket processed by the application, all of the correction factors at the frequency of interest (center frequency of each bucket) are summed and added to the amplitude. All trace operations and post processing treat this post-summation value as the true signal to use.

To effect this correction, the goal, for any particular start and stop frequency, is to build a correction trace, whose number of points matches the current Sweep Points setting of the instrument, which will be used to apply corrections on a bucket by bucket basis to the data traces.

For amplitudes that lie between two user specified frequency points, we interpolate to determine the amplitude value. You may select either linear or logarithmic interpolation between the frequencies.

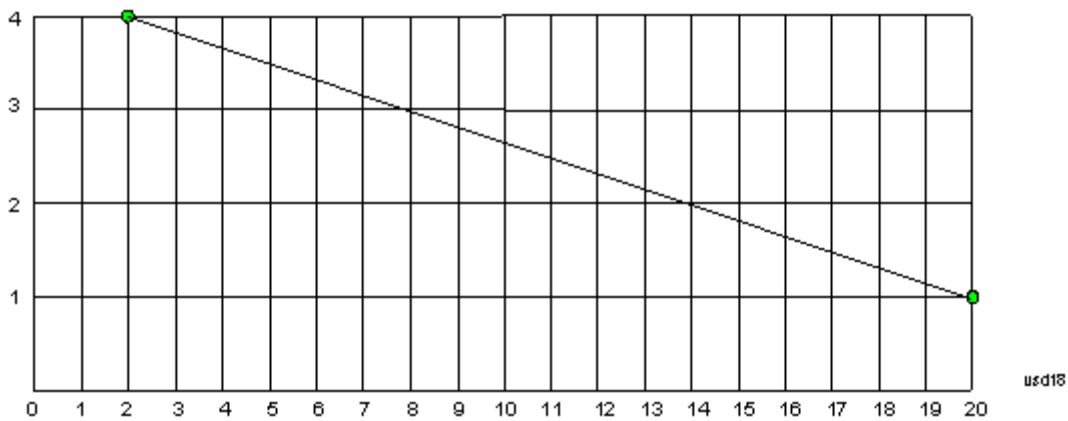
If we interpolate on a log scale, we assume that the line between the two points is a straight line on the log scale. For example, let's say the two points are (2,4) and (20,1). A straight line between them on a log scale looks like:



On a linear scale (like that of the spectrum analyzer), this translates to:



If we interpolate on a linear scale, we assume that the two points are connected by a straight line on the linear scale, as below:



The correction to be used for each bucket is taken from the interpolated correction curve at the center of the bucket.

Description

Sets an ASCII description field which will be stored in an exported file. Can be displayed in the active function area by selecting as the active function, if desired to appear in a screen capture.

Key Path	Input/Output, Corrections, Properties
Remote Command	<code>[[:SENSe]:CORRection:CSET[1] 2 ... 8:DESCRiption "text"</code> <code>[[:SENSe]:CORRection:CSET[1] 2 ... 8:DESCRiption?</code>
Example	<code>:CORR:CSET1:DESC "11941A Antenna correction"</code>
Notes	45 chars max; may not fit on display if max chars used
Preset	Unaffected by a Preset. Set to empty by Restore Input/Output Defaults
State Saved	Saved in instrument state.
Initial S/W Revision	A.02.00
Modified at S/W Revision	A.14.00

Comment

Sets an ASCII comment field which will be stored in an exported file. Can be displayed in the active function area by selecting as the active function, if desired to appear in a screen capture.

Key Path	Input/Output, Corrections, Properties
Remote Command	<code>[[:SENSe]:CORRection:CSET[1] 2 ... 8:COMMent "text"</code> <code>[[:SENSe]:CORRection:CSET[1] 2 ... 8:COMMent?</code>
Example	<code>:CORR:CSET1:COMM "this is a comment"</code>
Notes	60 chars max; may not fit on display if max chars used
Preset	Unaffected by Preset. Set to empty by Restore Input/Output Defaults
State Saved	Saved in instrument state
Initial S/W Revision	A.02.00
Modified at S/W Revision	A.14.00

RF Port

Maps one of the sets of corrections to one of the IO ports.

Key Path	Input/Output, Corrections, Properties
Mode	SEQAN
Remote Command	<code>[[:SENSe]:CORRection:CSET[1] 2 ... 8:RF:PORT RFIN RFIO1 RFIO2 </code> <code>RFOut GPSout GNSSout RFIO3 RFIO4</code> <code>[[:SENSe]:CORRection:CSET[1] 2 ... 8:RF:PORT?</code>

Example	:CORR:CSET:RF:PORT RFIN
Remote Command Notes	
Dependencies	RFIO1 and RFIO2 are not available in E6607C and E6630A GPSout (GNSSout) are only available in E6607C and E6630A RFIO3 and RFIO4 are only available on E6640A with hardware M9431A. RFIN and RFOut are not available on E6640A with hardware M9431A
Couplings	
Preset	Unaffected by Preset. Set to RF by Restore Input/Output Defaults
State Saved	Saved in State
Initial S/W Revision	A.05.01
Modified at S/W Revision	A.14.00

RF Input

The port that the current corrections will be applied to.

Key Path	Input/Output, Corrections, Properties, RF Port
Example	:CORR:CSET:RF:PORT RFIN
Dependencies	Not available in E6607C Not available on E6640A with hardware M9431A
ReadBack	RF IN
Initial S/W Revision	A.05.01
Modified at S/W Revision	A.14.00

RFOut

The port that the current corrections will be applied to.

Key Path	Input/Output, Corrections, Properties, RF Port
Example	:CORR:CSET:RF:PORT RFO
Dependencies	Not available in E6607C Not available on E6640A with hardware M9431A
ReadBack	RFOut
Initial S/W Revision	A.05.01
Modified at S/W Revision	A.14.00

RFIO1

The port that the current corrections will be applied to. Pressing this key again allows the user access to the menu for specifying which internal device the corrections for RFIO 1 will be applied to.

Key Path	Input/Output, Corrections, Properties, RF Port
Remote Command	<code>[[:SENSe]:CORRection:CSET[1] 2 ... 8:RF:PORT:RFIO1 SOURce ANALyzer BOTH</code> <code>[[:SENSe]:CORRection:CSET[1] 2 ... 8:RF:PORT:RFIO1?</code>
Example	<code>:CORR:CSET:RF:PORT:RFIO1 BOTH</code>
Preset	Both
State Saved	Saved in State

Correct Source

Sets the corrections for the RFIO1 port to be applied to the source.

Key Path	Input/Output, Corrections, Properties, RF Port
Example	<code>:CORR:CSET:RF:PORT:RFIO1 SOUR</code>
Readback	"Correct Source"

Correct Analyzer

Sets the corrections for the RFIO1 port to be applied to the analyzer.

Key Path	Input/Output, Corrections, Properties, RF Port
Example	<code>:CORR:CSET:RF:PORT:RFIO1 ANAL</code>
Readback	"Correct Analyzer"

Correct Source and Analyzer

Sets the corrections for the RFIO1 port to be applied to both the source and the analyzer.

Key Path	Input/Output, Corrections, Properties, RF Port
Example	<code>:CORR:CSET:RF:PORT:RFIO1 BOTH</code>
Readback	"Correct Source and Analyzer"

RFIO2

The port that the current corrections will be applied to. Pressing this key again allows the user access to the menu for specifying which internal device the corrections for RFIO 2 will be applied to.

Key Path	Input/Output, Corrections, Properties, RF Port
Remote Command	<code>[:SENSe] :CORRection:CSET[1] 2 ... 8:RF:PORT:RFIO2 SOURCE ANALyzer BOTH</code> <code>[:SENSe] :CORRection:CSET[1] 2 ... 8:RF:PORT:RFIO2?</code>
Example	<code>:CORR:CSET:RF:PORT:RFIO2 BOTH</code>
Preset	Both
State Saved	Saved in State

Correct Source

Sets the corrections for the RFIO2 port to be applied to the source.

Key Path	Input/Output, Corrections, Properties, RF Port
Example	<code>:CORR:CSET:RF:PORT:RFIO2 SOUR</code>
Readback	"Correct Source"

Correct Analyzer

Sets the corrections for the RFIO2 port to be applied to the analyzer.

Key Path	Input/Output, Corrections, Properties, RF Port
Example	<code>:CORR:CSET:RF:PORT:RFIO2 ANAL</code>
Readback	"Correct Analyzer"

Correct Source and Analyzer

Sets the corrections for the RFIO2 port to be applied to both the source and the analyzer.

Key Path	Input/Output, Corrections, Properties, RF Port
Example	<code>:CORR:CSET:RF:PORT:RFIO2 BOTH</code>
Readback	"Correct Source and Analyzer"

Delete Correction

Deletes the correction values for this set. When this key is pressed a prompt is placed on the screen that says "Please press Enter or OK key to delete correction. Press ESC or Cancel to close this dialog." The deletion is only performed if you press OK or Enter.

Key Path	Input/Output, Corrections
Remote Command	<code>[:SENSe] :CORRection:CSET[1] 2 ... 6:DELeTe</code>

Example	CORR:CSET:DEL CORR:CSET1:DEL CORR:CSET4:DEL
Notes	Pressing this key when no corrections are present is accepted without error.
Initial S/W Revision	A.02.00

Apply Corrections

Applies amplitude corrections, which are marked as ON to the measured data. If this is set to OFF, then no amplitude correction sets will be used, regardless of their individual on/off settings. If set to ON, the corrections that are marked as ON (see ["Correction On/Off" on page 118](#)) are used.

Key Path	Input/Output, Corrections
Remote Command	[:SENSe] :CORRection:CSET:ALL [:STATe] ON OFF 1 0 [:SENSe] :CORRection:CSET:ALL [:STATe] ?
Example	SENS:CORR:CSET:ALL OFF This command makes sure that no amplitude corrections are applied, regardless of their individual on/off settings.
Preset	Not affected by Preset. Set to OFF by Restore Input/Output Defaults
State Saved	Saved in instrument state.
Initial S/W Revision	A.02.00

Delete All Corrections

Erases all correction values for all 4 Amplitude Correction sets.

When this key is pressed a prompt is placed on the screen that says "Please press Enter or OK key to delete all corrections. Press ESC or Cancel to close this dialog." The deletion is only performed if you press OK or Enter.

Key Path	Input/Output, Corrections
Remote Command	[:SENSe] :CORRection:CSET:ALL:DELeTe
Example	CORR:CSET:ALL:DEL
Initial S/W Revision	A.02.00

Remote Correction Data Set Commands

This section describes the remote (SCPI) commands used to put values into correction sets. See the correction / table editor section of the Input/Output section for the information on front panel entry of correction data.

["Set \(Replace\) Data \(Remote Command Only\)" on page 127](#)

"Merge Correction Data (Remote Command Only)" on page 127

Set (Replace) Data (Remote Command Only)

The command takes an ASCII series of alternating frequency and amplitude points, each value separated by commas.

The values sent in the command will totally replace all existing correction points in the specified set.

An Ampcor array can contain 2000 points maximum.

Remote Command	<code>[:SENSe] :CORRection:CSET[1] 2 ... 8:DATA <freq>, <ampl>, . . .</code> <code>[:SENSe] :CORRection:CSET[1] 2 ... 8:DATA?</code>
Example	<code>CORR:CSET1:DATA 10000000, -1.0, 20000000, 1.0</code> This defines two correction points at (10 MHz, -1.0 dB) and (20 MHz, 1.0 dB) for correction set 1.
Preset	Empty after Restore Input/Output Defaults. Survives a shutdown or restart of analyzer application (including a power cycle).
State Saved	Saved in instrument state.
Min	Freq: 0 Hz Amptd: -1000 dBm
Max	Freq: 1 THz Amptd: +1000 dBm
Initial S/W Revision	A.02.00
Modified at S/W Revision	A.14.00

Merge Correction Data (Remote Command Only)

The command takes an ASCII series of alternating frequency and amplitude points, each value separated by commas. The difference between this command and Set Data is that this merges new correction points into an existing set.

Any new point with the same frequency as an existing correction point will replace the existing point's amplitude with that of the new point.

An Ampcor array can contain 2000 total points, maximum.

Remote Command	<code>[:SENSe] :CORRection:CSET[1] 2 ... 8:DATA:MERGE <freq>, <ampl>, ...</code>
Example	<code>CORR:CSET1:DATA:MERGE 15000000, -5.0, 25000000, 5.0</code> This adds two correction points at (15 MHz, -5.0 dB) and (25 MHz, 5.0 dB) to whatever values already exist in correction set 1.
Preset	Empty after Restore Input/Output Defaults. Survives shutdown/restart of analyzer application (including power cycle)
Min	Freq: 0 Hz Amptd: -1000 dBm
Max	Freq: 1 THz Amptd: +1000 dBm

Initial S/W Revision	A.02.00
Modified at S/W Revision	A.14.00

Freq Ref In

Specifies the frequency reference as being the internal reference at the rear panel input labeled EXT REF IN, a 1 pulse per second signal at the EXT REF IN input,, external reference or sensing the presence of a signal at the EXT REF IN input.

When the frequency reference is set to internal, the internal 10 MHz reference is used even if an external reference is connected.

When the frequency reference is set to external, the instrument will use the external reference. However, if there is no external signal present, or it is not within the proper amplitude range, a condition error message is generated. When the external signal becomes valid, the error is cleared.

When the frequency reference is set to Pulse, the instrument expects a 1 pulse per second signal at the EXT REF IN input. The instrument uses this signal to adjust the frequency of the internal reference.

If Sense is selected, the instrument checks whether a signal is present at the external reference connector. If it senses a signal within 5 ppm of the External Ref Freq (as set on the External Ref Freq softkey), it will automatically switch to the external reference. If it senses a 1 pulse per second signal, it enters Pulse mode, wherein the signal is used to adjust the internal reference. When no signal is present, it automatically switches to the internal reference. No message is generated as the reference switches between pulse, external and internal. The monitoring of the external reference occurs approximately on 1 millisecond intervals, and never occurs in the middle of a measurement acquisition, only at the end of the measurement (end of the request).

If for any reason the instrument's frequency reference is not able to obtain lock, Status bit 1 in the Questionable Frequency register will be true and a condition error message is generated. When lock is regained, Status bit 1 in the Questionable Frequency register will be cleared and the condition error will be cleared.

If an external frequency reference is being used, you must enter the frequency of the external reference if it is not exactly 10 MHz. The External Ref Freq key is provided for this purpose.

NOTE:

A common frequency reference module serves all instrument instances, but only one instance of the software application can change the reference input type (INT or EXT or SENSE). The software application allowed to change the reference input is called the controlling instance; by default, the left most instrument instance is the controlling instance. This can be changed in the config file "E66XXModules.config" located under the folder E:\Agilent\Instrument. For the non-controlling instance (s) the reference input types (in SCPI commands, and in the Virtual Front Panel menus) are blanked and unavailable for use.

Key Path	Input/Output
Remote Command	[:SENSe] :ROSCillator :SOURce :TYPE INTernal EXTernal SENSE PULSe [:SENSe] :ROSCillator :SOURce :TYPE?

Dependencies	The PULSe parameter, and support of the 1 pps signal at the EXT REF IN input, are not available in firmware prior to A.13.00. They are also not available in some model numbers. If not available, the Pulse key will be blank, and sending the PULSe parameter via SCPI will generate an error:
Preset	This is unaffected by a Preset but is set to SENSE on a "Restore Input/Output Defaults" or "Restore System Defaults->All".
State Saved	Saved in instrument state.
Status Bits/OPC dependencies	STATus:QUESTionable:FREQUency bit 1 set if unlocked. Note: The status bit is not set for non-controlling instances. To determine if the frequency reference is unlocked, the controlling instance must be queried.
Backwards Compatibility Notes	Freq Ref In was not saved in state in the legacy instruments. It is a part of state in the X-Series.
Initial S/W Revision	Prior to A.02.00
Modified at S/W Revision	A.14.00

Remote Command	<code>[[:SENSe]:ROSCillator:SOURce?</code>
Notes	The query <code>[SENSe]:ROSCillator:SOURce?</code> returns the current switch setting. This means: <ol style="list-style-type: none"> 1. If it was set to SENSE but there is no external reference nor 1 pps signal so the instrument is actually using the internal reference, then this query returns INTERNAL and not SENSE. 2. If it was set to SENSE and there is an external reference present, the query returns EXTERNAL and not SENSE. 3. If it was set to SENSE and there is a 1 pps signal present, the query returns PULSe and not SENSE. 4. If it was set to EXTERNAL, then the query returns "EXTERNAL" 5. If it was set to INTERNAL, then the query returns "INTERNAL". 6. If it was set to PULSe, then the query returns "PULSe" <p>Note: The SCPI query always returns "INTERNAL" for non-controlling instances.</p>
Preset	SENSe
Backwards Compatibility Notes	The query <code>[[:SENSe]:ROSCillator:SOURce?</code> was a query-only command in ESA which always returned whichever reference the instrument was using. The instrument automatically switched to the ext ref if it was present. In PSA (which had no sensing) the command <code>[[:SENSe]:ROSCillator:SOURce</code> set the reference (INT or EXT), so again its query returned the actual routing. Thus the query form of this command is 100% backwards compatible with both instruments.
Initial S/W Revision	Prior to A.02.00

Remote Command	<code>[[:SENSe]:ROSCillator:SOURce INTERNAL EXTERNAL</code>
Notes	For PSA compatibility the command form is provided and is directly mapped to <code>[[:SENSe]:ROSCillator:SOURce:TYPE</code> Note: The SCPI command does nothing for non-controlling instances.
Initial S/W Revision	Prior to A.02.00

Sense

If Sense is selected, the instrument checks whether a signal is present at the external reference connector. If it senses a signal within 5 ppm of the External Ref Freq (as set on the External Ref Freq softkey), it will use this signal as an External Reference. If it senses a 1 pulse per second signal, it will use this signal to adjust the internal reference by adjusting the User setting of the Timebase DAC. When no signal is present, it automatically switches to the internal reference.

Key Path	Input/Output, Freq Ref In
Example	:ROSC:SOUR:TYPE SENS
Couplings	If set to SENSE and the analyzer senses a 1 pulse per second signal, it sets the System, Alignments, Timebase DAC setting to "User". This setting survives Preset and Power Cycle but is set to "Calibrated" on a System, Restore Defaults, Align or a System, Restore Defaults, All
Readback	Sense
Initial S/W Revision	Prior to A.02.00
Modified at S/W Revision	A.14.00

Internal

The internal reference is used. A 1 pps signal at the EXT REF IN port, or a signal there between 1 and 50 MHz, will cause a warning triangle to appear in the settings panel next to the word "INTERNAL", but will otherwise be ignored.

Key Path	Input/Output, Freq Ref In
Example	:ROSC:SOUR:TYPE INT
Readback	Internal
Initial S/W Revision	Prior to A.02.00
Modified at S/W Revision	A.14.00

External

The external reference is used.

Key Path	Input/Output, Freq Ref In
Example	:ROSC:SOUR:TYPE EXT
Readback	External
Initial S/W Revision	Prior to A.02.00

Ext Ref Freq

This key tells the analyzer the frequency of the external reference. When the external reference is in use (either because the reference has been switched to External or because the Reference has been switched

to Sense and there is a valid external reference present) this information is used by the analyzer to determine the internal settings needed to lock to that particular external reference signal.

For the instrument to stay locked, the value entered must be within 5 ppm of the actual external reference frequency. So it is important to get it close, or you risk an unlock condition.

Note that this value only affects the instrument's ability to lock. It does not affect any calculations or measurement results. See "Freq Offset" in the Frequency section for information on how to offset frequency values.

Key Path	Input/Output, Freq Ref In
Remote Command	[:SENSE] :ROSCillator:EXTernal:FREQuency <freq> [:SENSE] :ROSCillator:EXTernal:FREQuency?
Example	ROSC:EXT:FREQ 20 MHz sets the external reference frequency to 20 MHz, but does not select the external reference. ROSC:SOUR:TYPE EXT selects the external reference.
Dependencies	Still available with Internal or Pulse selected, to allow setup for when External is in use. However, the setting has no effect if the Internal Reference is in use (Freq Ref In set to Internal, Pulse, or SENSE:INT or SENSE:PULSE).
Preset	This is unaffected by a Preset but is set to 10 MHz on a "Restore Input/Output Defaults" or "Restore System Defaults->All"
Min	1 MHz
Max	50 MHz
Default Unit	Hz
Initial S/W Revision	Prior to A.02.00
Modified at S/W Revision	A.14.00

RF Output & Test Set Config

The RF Output & Test Set Config key allows you to set the RF Output Port and multipoint adapter unit which is connected to the instrument by USB for download of calibration data and additional control.

This menu also allows you to set Trigger Config which is used to set the input/output type of the 4 Bi-directional Trigger ports.

Key Path	Input/Output
Preset	All settings under this key are returned to their default state when Restore Input/Output Defaults is pressed.
State Saved	Saved in State
Initial S/W Revision	A.09.49

RF Output

Specifies the RF Output Port used.

Switching from the RF Output port to one of the RFIO ports changes the transmitter performance of the instrument.

Key Path	Input/Output, RF Output & Test Set Config
Remote Command	<code>[:SENSe] :FEED:RF:PORT:OUTPut RFOut RFIO1 RFIO2 GPSout GNSSout RFIO3 RFIO4</code> <code>[:SENSe] :FEED:RF:PORT:OUTPut?</code>
Example	<code>:FEED:RF:PORT:OUTP RFIO1</code>
Preset	This is unaffected by Mode Preset but is set to RFOut on a "Restore Input/Output Defaults" or "Restore System Defaults -> All"
State Saved	Saved in State
Readback	The current RF Output Port selected is read back to this key
Initial S/W Revision	A.05.01
Modified at S/W Revision	A.14.00

RF Output

The RF port that will be used for the current output.

Key Path	Input/Output, RF Output & Test Set Config, RF Output
Example	<code>:FEED:RF:PORT:OUTP RFO</code>
Notes	On E6640A with hardware M9430A, if RF Output is selected as RF Output Port, you need to choose the settings in the Half Duplex Config menu to determine which port (RFIO3 or RFIO4) will be used. On E6640A with hardware M9431A, this setting is not supported. If the SCPI command is sent with this setting, an error is generated, -221, "Settings conflict;option not installed"
ReadBack	RF Output
Initial S/W Revision	A.05.01
Modified at S/W Revision	A.14.00

RFIO1

The RF port that will be used for the current output

Key Path	Input/Output, RF Output & Test Set Config, RF Output
Example	<code>:FEED:RF:PORT:OUTP RFIO1</code>
Dependencies	Not available in E6607C.
ReadBack	RFIO1
Initial S/W Revision	A.05.01

RFIO2

The RF port that will be used for the current output

Key Path	Input/Output, RF Output & Test Set Config, RF Output
Example	:FEED:RF:PORT:OUTP RFIO2
Dependencies	Not available in E6607C.
ReadBack	RFIO2
Initial S/W Revision	A.05.01

HalfDuplex Config

The HalfDuplex Config key allows you to set “RF Input” of RF Input Port menu and “RF Output” of RF Output Port menu, which will correspond to RFIO3 and RFIO4.

Key Path	Input/Output, RF Output & Test Set Config
Dependencies	This menu is available on E6640A with hardware M9430A. It's not available on E6640A with hardware M9431A.
State Saved	Saved in State
Initial S/W Revision	A.14.00

RF Input

Specify the RF Input port from RFIO3 and RFIO4.

Key Path	Input/Output, RF Output & Test Set Config, HalfDuplex Config
Remote Command	<code>[:SENSe] :HDUPlex:PORT:INPut RFIO3 RFIO4</code>
Example	:HDUPlex:PORT:INPut RFIO3 :HDUPlex:PORT:INPut?
Dependencies	If RFIO3 is selected as “RF Output”, then “RF Input” will be set to RFIO4 automatically. And if RFIO4 is selected as “RF Output”, “RF Input” will be set to RFIO3 automatically.
Preset	RFIO3
State Saved	Saved in State
Initial S/W Revision	A.14.00

RF Output

Specify the RF Output port from RFIO3 and RFIO4.

Key Path	Input/Output, RF Output & Test Set Config, HalfDuplex Config
Remote Command	[:SENSe] :HDUPlex:PORT:OUTPut RFIO3 RFIO4
Example	:HDUPlex:PORT:OUTPut RFIO3 :HDUPlex:PORT:OUTPut?
Dependencies	If RFIO3 is selected as "RF Input", then "RF Output" will be set to RFIO4 automatically. And if RFIO4 is selected as "RF Input", "RF Output" will be set to RFIO3 automatically.
Preset	RFIO4
State Saved	Saved in State
Initial S/W Revision	A.14.00

Output Config

Accesses keys that configure various output settings, like the frequency reference output, trigger output and analog output.

Key Path	Input/Output
Backwards Compatibility Notes	In ESA there was not a user interface to enable the Video Output (Analog Output), Trigger Output, or Gate Output. In the X-Series each of these physical connectors requires configuration, thus the user interface has been added for X-Series, along with the potential for an output you think is always on to be switched off.
Initial S/W Revision	Prior to A.02.00

Trig Out

Select the type of output signal that will be output from the Trig 1 Out, or Trig 2 Out connectors.

Key Path	Input/Output, Output Config
Remote Command	:TRIGger TRIGger1 TRIGger2[:SEquence]:OUTPut HSWP MEASuring MAIN GATE GTRigger OEVen SPOint SSweep SSETtled S1Marker S2Marker S3Marker S4Marker OFF :TRIGger TRIGger1 TRIGger2[:SEquence]:OUTPut?
Example	TRIG:OUTP HSWP TRIG2:OUTP GATE
Dependencies	The second Trigger output (Trig 2 Out) does not appear in all models; in models that do not support it, the Trig 2 Out key is blanked, and sending the SCPI command for this output generates an error, "Hardware missing; Not available for this model number" In models that do not support the Trigger 2 output, this error is returned if trying to set Trig 2 Out and a query of Trig 2 Out returns OFF.
Preset	Trigger 1: Sweeping (HSWP) Trigger 2: Gate This is unaffected by a Preset but is preset to the above values on a "Restore Input/Output Defaults"

	or "Restore System Defaults->All"
State Saved	Saved in instrument state
Initial S/W Revision	Prior to A.02.00

Polarity

Sets the output to the Trig 1 Out, or Trig 2 Out, connector to trigger on either the positive or negative polarity.

Key Path	Input/Output, Output Config, Trig 1/2 Output
Remote Command	:TRIGger TRIGger1 TRIGger2[:SEquence]:OUTPut:POLarity POSitive NEGative :TRIGger TRIGger1 TRIGger2[:SEquence]:OUTPut:POLarity?
Example	TRIG1:OUTP:POL POS
Preset	This is unaffected by a Preset but is set to POSitive on a "Restore Input/Output Defaults" or "Restore System Defaults->All"
State Saved	Saved in instrument state
Initial S/W Revision	Prior to A.02.00

Off

Selects no signal to be output to the Trig 1 Out, or Trig 2 Out, connector.

Key Path	Input/Output, Output Config, Trig 1/2 Output
Example	TRIG1:OUTP OFF
Readback	Off
Initial S/W Revision	Prior to A.02.00

Sweeping (HSWP)

Selects the Sweeping Trigger signal to be output to the Trig 1 Out, or Trig 2 Out, connector when a measurement is made. This signal has historically been known as "HSWP" (High = Sweeping), and is 5 V TTL level with 50 ohm output impedance.

Key Path	Input/Output, Output Config, Trig 1/2 Output
Example	TRIG1:OUTP HSWP
Readback	Sweeping
Initial S/W Revision	Prior to A.02.00

Measuring

Selects the Measuring trigger signal to be output to the Trig 1 Out, or Trig 2 Out, connector. This signal is true while the Measuring status bit is true.

Key Path	Input/Output, Output Config, Trig 1/2 Output
Example	TRIG1:OUTP MEAS
Readback	Measuring
Initial S/W Revision	Prior to A.02.00

Main Trigger

Selects the current instrument trigger signal to be output to the Trig 1 Out, or Trig 2 Out, connector.

Key Path	Input/Output, Output Config, Trig 1/2 Output
Example	TRIG1:OUTP MAIN
Readback	Main Trigger
Initial S/W Revision	Prior to A.02.00

Gate Trigger

Selects the gate trigger signal to be output to the Trig 1 Out, or Trig 2 Out, connector. This is the source of the gate timing, not the actual gate signal.

Key Path	Input/Output, Output Config, Trig 1/2 Output
Example	TRIG1:OUTP GTR
Readback	Gate Trigger
Initial S/W Revision	Prior to A.02.00

Gate

Selects the gate signal to be output to the Trig 1 Out, or Trig 2 Out, connector. The gate signal has been delayed and its length determined by delay and length settings. When the polarity is positive, a high on the Trig 1 Out, or Trig 2 Out, represents the time the gate is configured to pass the signal.

Key Path	Input/Output, Output Config, Trig 1/2 Output
Example	TRIG1:OUTP GATE
Readback	Gate
Initial S/W Revision	Prior to A.02.00

Odd/Even Trace Point

Selects either the odd or even trace points as the signal to be output to the Trig 1 Out, or Trig 2 Out, connector when performing swept spectrum analysis. When the polarity is positive, this output goes high during the time the analyzer is sweeping past the first point (Point 0) and every other following trace point. The opposite is true if the polarity is negative.

Key Path	Input/Output, Output Config, Trig 1/2 Output
Example	TRIG1:OUTP OEV
Readback	Odd/Even
Initial S/W Revision	Prior to A.02.00

Trig Out

Select the type of output signal that will be output from the Trig 1 Out, or Trig 2 Out connectors.

Key Path	Input/Output, Output Config
Remote Command	:TRIGger TRIGger1 TRIGger2[:SEquence]:OUTPut HSWP MEASuring MAIN GATE GTRigger OEVEN SPOint SSWeep SSEttled S1Marker S2Marker S3Marker S4Marker OFF :TRIGger TRIGger1 TRIGger2[:SEquence]:OUTPut?
Example	TRIG:OUTP HSWP TRIG2:OUTP GATE
Dependencies	The second Trigger output (Trig 2 Out) does not appear in all models; in models that do not support it, the Trig 2 Out key is blanked, and sending the SCPI command for this output generates an error, "Hardware missing; Not available for this model number" In models that do not support the Trigger 2 output, this error is returned if trying to set Trig 2 Out and a query of Trig 2 Out returns OFF.
Preset	Trigger 1: Sweeping (HSWP) Trigger 2: Gate This is unaffected by a Preset but is preset to the above values on a "Restore Input/Output Defaults" or "Restore System Defaults->All"
State Saved	Saved in instrument state
Initial S/W Revision	Prior to A.02.00

Off

Selects no signal to be output to the Trig 1 Out, or Trig 2 Out, connector.

Key Path	Input/Output, Output Config, Trig 1/2 Output
Example	TRIG1:OUTP OFF
Readback	Off
Initial S/W Revision	Prior to A.02.00

Source Marker 1

Trigger output at marker 1 in current playing Waveform file.

Key Path	Input/Output, Output Config, Trig 1/2 Output
Example	:TRIG1:OUTP S1M
ReadBack	Marker 1
Initial S/W Revision	A.05.01

Source Marker 2

Trigger output at marker 2 in current playing Waveform file.

Key Path	Input/Output, Output Config, Trig 1/2 Output
Example	:TRIG1:OUTP S2M
ReadBack	Marker 2
Initial S/W Revision	A.05.01

Source Marker 3

Trigger output at marker 3 in current playing Waveform file.

Key Path	Input/Output, Output Config, Trig 1/2 Output
Example	:TRIG1:OUTP S3M
ReadBack	Marker 3
Initial S/W Revision	A.05.01

Source Marker 4

Trigger output at marker 4 in current playing Waveform file.

Key Path	Input/Output, Output Config, Trig 1/2 Output
Example	:TRIG1:OUTP S4M
ReadBack	Marker 4
Initial S/W Revision	A.05.01

Analog Out

This menu lets you control which signal is fed to the “Analog Out” connector on the analyzer rear panel.

See ["More Information" on page 139](#)

Key Path	Input/Output, Output Config
Remote Command	:OUTPut:ANALog OFF SVIDeo LOGVideO LINVideO DAUDio :OUTPut:ANALog?
Example	OUTP:ANAL SVIDeo ! causes the analog output type to be Screen Video
Preset	This is unaffected by Preset but is set to DAUDio on a "Restore Input/Output Defaults" or "Restore System Defaults->All
Preset	OFF
State Saved	Saved in Input/Output State
Readback line	1-of-N selection [variable]
Backwards Compatibility Notes	Prior to A.04.00, OFF was the default functionality except when in the Analog Demod application or with Tune and Listen, in which case it was DAUDio, and there was no selection menu. So for backwards compatibility with earlier X-Series firmware versions, Auto (:OUTP:ANAL:AUTO ON) will duplicate the prior behavior. The DNWB and SANalyzer parameters, which were legal in PSA but perform no function in the X-Series, are accepted without error.
Initial S/W Revision	A.04.00

More Information

The table below gives the range for each output.

Analog Out	Nominal Range exc. (10% overrange)	Scale Factor	Notes
Off	0 V		
Screen Video	0 – 1 V open circuit	10%/division	8566 compatible
Log Video	0 – 1 V terminated	1/(192.66 dB/V)	dB referenced to mixer level, 1V out for –10 dBm at the mixer.
Linear Video	0 – 1 V terminated	100%/V	Linear referenced to Ref Level, 1 V out for RF envelope at the Ref Level.
Demod Audio	(varies with analyzer setting)		

Auto

Selects the Auto state for the Analog Output menu. In this state, the Analog Output will automatically be set to the most sensible setting for the current mode or measurement.

If you make a selection manually from the Analog Out menu, this selection will remain in force until you change it (or re-select Auto), even if you go to a mode or measurement for which the selected output does not apply.

Key Path	Input/Output, Output Config, Analog Out
Remote Command	OUTPut:ANALog:AUTO OFF ON 0 1 OUTPut:ANALog:AUTO?
Example	OUTP:ANAL:AUTO ON
Preset	ON
State Saved	Saved in Input/Output State
Initial S/W Revision	A.04.00

Off

Turns off the analog output.

Key Path	Input/Output, Output Config, Analog Out
Example	OUTP:ANAL OFF ! causes the analog output to be off
Readback Text	Off
Initial S/W Revision	A.04.00

4 Mode Functions

Mode

The Mode key allows you to select the available measurement applications or “Modes”. Modes are a collection of measurement capabilities packaged together to provide an instrument personality that is specific to your measurement needs. Each application software product is ordered separately by Model Number and must be licensed to be available. Once an instrument mode is selected, only the commands that are valid for that mode can be executed.

NOTE

Key operation can be different between modes. The information displayed in Help is about the current mode.

To access Help for a different Mode you must first exit Help (by pressing the Cancel (Esc) key). Then select the desired mode and re-access Help.

For more information on Modes, preloading Modes, and memory requirements for Modes,

see ["More Information" on page 143](#)

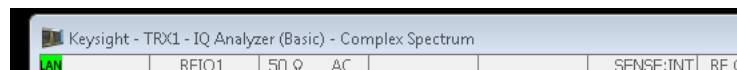
Key Path	Front-panel key
Remote Command	:INSTrument[:SElect] SA RTSA SEQAN EMI BASIC WCDMA EDGE GSM WIMAX OFDMA VSA PNOISE NFIGure ADEMOD BTooth TDSCDMA CDMA2K CDMA1XEV LTE LTE TDD LTE AFDD LTE ATDD MSR DVB DTMB DCATV ISDBT CM MB WLAN CWLAN CWIMAX OFDM WIMAX FIXED IDEN RLC SCPI LC VSA89601 :INSTrument[:SElect]?
Example	:INST SA
Notes	The available parameters are dependent upon installed and licensed applications resident in the instrument. Parameters given here are an example, specific parameters are in the individual Application. A list of the valid mode choices is returned with the INST:CAT? Query.
Preset	This is unaffected by a Preset but is set on a “Restore System Defaults->All” to: SEQAN
State Saved	Saved in instrument state
Backwards Compatibility SCPI	:INSTrument[:SElect] GSM provided for backwards compatibility. Mapped to EDGE GSM.
Backwards Compatibility SCPI	:INSTrument[:SElect] SANalyzer provided for ESU compatibility. When this command is received, the analyzer aliases it to the following: INST:SEL SCPI LC This results in the analyzer being placed in SCPI Language Compatibility Mode, in order to emulate the ESU Spectrum Analyzer Mode.
Backwards Compatibility SCPI	:INSTrument[:SElect] RECeiver provided for ESU compatibility. When this command is received, the analyzer aliases it to the following: :INST:SEL EMI

	:CONF FSC
	This results in the analyzer being placed in the EMI Receiver Mode, running the Frequency Scan measurement, in order to emulate the ESU Receiver Mode.
Initial S/W Revision	Prior to A.02.00
Modified at S/W Revision	A.13.00

Example	:INST 'SA'
Notes	The query is not a quoted string. It is an enumeration as indicated in the Instrument Select table above. The command must be sequential: i.e. continued parsing of commands cannot proceed until the instrument select is complete and the resultant SCPI trees are available.
Backwards Compatibility SCPI	:INSTrument[:SElect] 'SA' 'PNOISE' 'EDGE' 'GSM' 'BASIC'
Initial S/W Revision	Prior to A.02.00

More Information

The Mode name appears on the banner after the word “Keysight” followed by the Measurement Title. For example, for the IQ Analyzer mode with the Complex Spectrum measurement running:



It is possible to specify the order in which the Modes appear in the Mode menu, using the Configure Applications utility (System, Power On, Configure Applications). It is also possible, using the same utility, to specify a subset of the available applications to load into memory at startup time, which can significantly decrease the startup time of the analyzer. During runtime, if an application that is not loaded into memory is selected (by either pressing that applications Mode key or sending that applications :INST:SEL command over SCPI), there will be a pause while the Application is loaded. During this pause a message box that says “Loading application, please wait...” is displayed.

Each application (Mode) that runs in the X-Series signal analyzers consumes virtual memory. The various applications consume varying amounts of virtual memory, and as more applications run, the memory consumption increases. Once an application is run, some of its memory remains allocated even when it is not running, and is not released until the analyzer program (xSA.exe) is shut down.

Keysight characterizes each Mode and assigns a memory usage quantity based on a conservative estimate. There is a limited amount of virtual memory available to applications (note that this is virtual memory and is independent of how much physical RAM is in the instrument). The instrument keeps track of how much memory is being used by all loaded applications – which includes those that preloaded at startup, and all of those that have been run since startup.

When you request a Mode that is not currently loaded, the instrument looks up the memory estimate for that Mode, and adds it to the residual total for all currently loaded Modes. If there is not enough virtual memory to load the Mode, a dialog box and menu will appear that gives you four options:

1. Close and restart the analyzer program without changing your configured preloads. This may free up enough memory to load the requested Mode, depending on your configured preloads
2. Clear out all preloads and close and restart the analyzer program with only the requested application preloaded, and with that application running. This choice is guaranteed to allow you to run the requested application; but you will lose your previously configured preloads. In addition, there may be little or no room for other applications, depending on the size of the requested application.
3. Bring up the Configure Applications utility in order to reconfigure the preloaded apps to make room for the applications you want to run (this will then require restarting the analyzer program with your new configuration). This is the recommended choice because it gives you full flexibility to select exactly what you want.
4. Exit the dialog box without doing anything, which means you will be unable to load the application you requested.

In each case except 4, this will cause the analyzer software to close, and you will lose all unsaved traces and results.

If you attempt to load a mode via SCPI that will exceed memory capacity, the Mode does not load and an error message is returned:

```
-225,"Out of memory;Insufficient resources to load Mode (mode name)"
```

where "mode name" is the SCPI parameter for the Mode in question, for example, SA for Spectrum Analyzer Mode.

Sequence Analyzer

Selects the Sequence Analyzer mode for sequenced measurements. Depending on licensed applications there may be a number of different measurements available in this mode. These measurements are all done on IQ captured data and can be set up to calculated on any part of the capture.

If you are using the Help feature, this mode must be currently active to access its detailed information. If it is not active, exit the Help feature (Esc key), select the mode, and re-access Help.

Key Path	Mode
Example	INST:SEL SEQAN INST:NSEL 400
Initial S/W Revision	A.05.01

IQ Analyzer (Basic)

The IQ Analyzer Mode makes general purpose frequency domain and time domain measurements. These measurements often use alternate hardware signal paths when compared with a similar measurement in the Signal Analysis Mode using the Swept SA measurement. These frequency domain and time domain measurements can be used to output I/Q data results when measuring complex modulated digital signals.

If you are using the Help feature, this mode must be currently active to access its detailed information. If it is not active, exit the Help feature (Esc key), select the mode, and re-access Help.

Key Path	Mode
Example	INST:SEL BASIC INST:NSEL 8
Initial S/W Revision	Prior to A.02.00

W-CDMA with HSPA+

Selects the W-CDMA with HSPA+ mode for general purpose measurements of signals following this standard. There are several measurements available in this mode.

If you are using the Help feature, this mode must be currently active to access its detailed information. If it is not active, exit the Help feature (Esc key), select the mode, and re-access Help.

Key Path	Mode
Example	INST:SEL WCDMA INST:NSEL 9
Initial S/W Revision	Prior to A.02.00

GSM/EDGE/EDGE Evo

Selects the GSM with EDGE mode for general purpose measurements of signals following this standard. There are several measurements available in this mode.

If you are using the Help feature, this mode must be currently active to access its detailed information. If it is not active, exit the Help feature (Esc key), select the mode, and re-access Help.

Key Path	Mode
Example	INST:SEL EDGEGSM INST:NSEL 13
Initial S/W Revision	Prior to A.02.00
Modified at S/W Revision	A.02.00

Analog Demod

Selects the Analog Demod mode for making measurements of AM, FM and phase modulated signals.

If you are using the Help feature, this mode must be currently active to access its detailed information. If it is not active, exit the Help feature (Esc key), select the mode, and re-access Help.

Key Path	Mode
Example	INST:SEL ADEMOM INST:NSEL 234
Initial S/W Revision	Prior to A.02.00

Bluetooth

Selects the Bluetooth mode for Bluetooth specific measurements. There are several measurements available in this mode.

If you are using the Help feature, this mode must be currently active to access its detailed information. If it is not active, exit the Help feature (Esc key), select the mode, and re-access Help.

Key Path	Mode
Example	INST:SEL BT INST:NSEL 228
Initial S/W Revision	A.06.01

TD-SCDMA with HSPA/8PSK

Selects the TD-SCDMA mode for general purpose measurements of signals following this standard. There are several measurements available in this mode.

If you are using the Help feature, this mode must be currently active to access its detailed information. If it is not active, exit the Help feature (Esc key), select the mode, and re-access Help.

Key Path	Mode
Example	INST:SEL TDSCDMA INST:NSEL 211
Initial S/W Revision	Prior to A.02.00

cdma2000

Selects the cdma2000 mode for general purpose measurements of signals following this standard. There are several measurements available in this mode.

If you are using the Help feature, this mode must be currently active to access its detailed information. If it is not active, exit the Help feature (Esc key), select the mode, and re-access Help.

Key Path	Mode
Example	INST:SEL CDMA2K INST:NSEL 10
Initial S/W Revision	Prior to A.02.00

1xEV-DO

Selects the 1xEV-DO mode for general purpose measurements of signals following this standard. There are several measurements available in this mode.

If you are using the Help feature, this mode must be currently active to access its detailed information. If it is not active, exit the Help feature (Esc key), select the mode, and re-access Help.

Key Path	Mode
Example	INST:SEL CDMA1XEV INST:NSEL 15
Initial S/W Revision	Prior to A.02.00

LTE

Selects the LTE mode for general purpose measurements of signals following the LTE FDD standard. There are several measurements available in this mode.

If you are using the Help feature, this mode must be currently active to access its detailed information. If it is not active, exit the Help feature (Esc key), select the mode, and re-access Help.

Key Path	Mode
Example	INST:SEL LTE INST:NSEL 102
Initial S/W Revision	Prior to A.02.00

LTE TDD

Selects the LTE TDD mode for general purpose measurements of signals following the LTE TDD standard. There are several measurements available in this mode.

If you are using the Help feature, this mode must be currently active to access its detailed information. If it is not active, exit the Help feature (Esc key), select the mode, and re-access Help.

Key Path	Mode
Example	INST:SEL LTE TDD INST:NSEL 105
Initial S/W Revision	A.03.00

WLAN

Selects the WLAN mode for general purpose measurements of signals following this standard. There are several measurements available in this mode.

If you are using the Help feature, this mode must be currently active to access its detailed information. If it is not active, exit the Help feature (Esc key), select the mode, and re-access Help.

Key Path	Mode
Example	INST:SEL WLAN

	INST:NSEL 217
Initial S/W Revision	A.09.491

Vector Signal Analyzer (VXA)

The N9064A (formerly 89601X) VXA Vector signal and WLAN modulation analysis application provides solutions for basic vector signal analysis, analog demodulation, and digital demodulation. The digital demodulation portion of N9064A allows you to perform measurements on standard-based formats such as cellular, wireless networking and digital video as well as general purpose flexible modulation analysis for wide range of digital formats, FSK to 1024QAM, with easy-to-use measurements and display tools such as constellation and eye diagram, EVM traces and up to four simultaneous displays. Analog baseband analysis is available using the MXA and PXA with option BBA. Option 3FP WLAN has been discontinued.

N9064A honors existing 89601X licenses with all features and functionalities found on X-Series software versions prior to A.06.00. Specifically:

N9064A-1 is equivalent to 89601X-205

N9064A-2 is equivalent to 89601X-AYA

If you are using the Help feature, this mode must be currently active to access its detailed information. If it is not active, exit the Help feature (Esc key), select the mode, and re-access Help.

Key Path	Mode
Example	INST:SEL VSA INST:NSEL 100
Initial S/W Revision	Prior to A.02.00

802.16 OFDMA (WiMAX/WiBro)

Selects the OFDMA mode for general purpose measurements of WiMAX signals. There are several measurements available in this mode.

If you are using the Help feature, this mode must be currently active to access its detailed information. If it is not active, exit the Help feature (Esc key), select the mode, and re-access Help.

Key Path	Mode
Example	INST:SEL WIMAXOFDMA INST:NSEL 75
Initial S/W Revision	Prior to A.02.00

Application Mode Number Selection (Remote Command Only)

Select the measurement mode by its mode number. The actual available choices depend upon which applications are installed in your instrument. The modes appear in this table in the same order they appear

in the Mode menu (if the order is not changed by the Configure Applications utility found in the System, Power On menu). See "[Detailed List of Modes](#)" on page 153 for Mode details.

The Mode Number is the parameter for use with the :INSTrument:NSElect command. The Mode Parameter is the parameter for use with the :INSTrument[:SElect] command.

Mode	Mode Number	Mode Parameter
Sequence Analyzer	400	SEQAN
I/Q Analyzer (Basic)	8	BASIC
WCDMA with HSPA+	9	WCDMA
GSM/EDGE/EDGE Evo	13	EDGE GSM
Analog Demod	234	ADEMOD
Bluetooth	228	BTtooth
TD-SCDMA with HSPA/8PSK	211	TDSCDMA
cdma2000	10	CDMA2K
1xEV-DO	15	CDMA1XEV
LTE	102	LTE
LTE TDD	105	LTETDD
LTE-Advanced FDD	107	LTEAFDD
LTE-Advanced TDD	108	LTEATDD
WLAN	217	WLAN
802.16 OFDM (Fixed WiMAX)	104	WIMAXFIXED

Remote Command	:INSTrument:NSElect <integer> :INSTrument:NSElect?
Example	:INST:NSEL 1
Notes	SA mode is 1 The command must be sequential: i.e. continued parsing of commands cannot proceed until the instrument select is complete and the resultant SCPI trees are available.
Preset	Not affected by Preset. Set to default mode (1 for SA mode) following Restore System Defaults.
State Saved	Saved in instrument state
Initial S/W Revision	Prior to A.02.00

Application Mode Catalog Query (Remote Command Only)

Returns a string containing a comma separated list of names of all the installed and licensed measurement modes (applications). These names can only be used with the :INSTrument[:SElect] command.

Remote Command	:INSTrument:CATalog?
Example	:INST:CAT?
Notes	Query returns a quoted string of the installed and licensed modes separated with a comma. Example: "SA,PNOISE,WCDMA"
Backwards Compatibility Notes	VSA (E4406A) :INSTrument:CATalog? returned a list of installed INSTrument:SELEct items as a comma separated list of string values: "BASIC","GSM","EDGEgSM","CDMA","NADC","PDC","WCDMA","CDMA2K","CDMA1XEV","IDEN","WIDEN","WLAN","SERVICE" X-Series uses the ESA/PSA compatible query of a string contain comma separated values: "SA,PNOISE,NFIGURE,BASIC,CDMA,CDMA2K,WCDMA,CDMA1XEV,EDGEgSM,GSM,NADC,PDC,TDSCDMA,DMODULATION,WLAN"
Initial S/W Revision	Prior to A.02.00

Application Identification (Remote Commands Only)

Each entry in the Mode Menu will have a Model Number and associated information: Version, and Options. This information is displayed in the Show System screen. The corresponding SCPI remote commands are defined here.

["Current Application Model " on page 150](#)

["Current Application Revision" on page 151](#)

["Current Application Options" on page 151](#)

Current Application Model

Returns a string that is the Model Number of the currently selected application (mode).

Remote Command	:SYSTem:APPLication[:CURRent] [:NAME]?
Example	:SYST:APPL?
Notes	Query returns a quoted string that is the Model Number of the currently selected application (Mode). Example: "N9060A" String length is 6 characters.
Preset	Not affected by Preset
State Saved	Not saved in state, the value will be the selected application when a Save is done.
Initial S/W Revision	Prior to A.02.00

Current Application Revision

Returns a string that is the Revision of the currently selected application (mode).

Remote Command	:SYSTem:APPLication[:CURRent]:REVision?
Example	:SYST:APPL:REV?
Notes	Query returns a quoted string that is the Revision of the currently selected application (Mode). Example: "1.0.0.0" String length is a maximum of 23 characters. (each numeral can be an integer + 3 decimal points)
Preset	Not affected by a Preset
State Saved	Not saved in state, the value will be the selected application when a Save is done.
Initial S/W Revision	Prior to A.02.00

Current Application Options

Returns a string that is the Options list of the currently selected application (Mode).

Remote Command	:SYSTem:APPLication[:CURRent]:OPTion?
Example	:SYST:APPL:OPT?
Notes	Query returns a quoted string that is the Option list of the currently selected application (Mode). The format is the name as the *OPT? or SYSTem:OPTion command: a comma separated list of option identifiers. Example: "1FP,2FP" String length is a maximum of 255 characters.
Preset	Not affected by a Preset
State Saved	Not saved in state per se, the value will be the selected application when a Save is invoked.
Initial S/W Revision	Prior to A.02.00

Application Identification Catalog (Remote Commands Only)

A catalog of the installed and licensed applications (Modes) can be queried for their identification.

["Application Catalog Number of Entries" on page 151](#)

["Application Catalog Model Numbers" on page 152](#)

["Application Catalog Revision" on page 152](#)

["Application Catalog Options" on page 152](#)

Application Catalog Number of Entries

Returns the number of installed and licensed applications (Modes).

Remote Command	:SYSTem:APPLication:CATalog[:NAME]:COUNT?
Example	:SYST:APPL:CAT:COUN?
Preset	Not affected by Preset
State Saved	Not saved in instrument state.
Initial S/W Revision	Prior to A.02.00

Application Catalog Model Numbers

Returns a list of Model Numbers for the installed and licensed applications (Modes).

Remote Command	:SYSTem:APPLication:CATalog[:NAME]?
Example	:SYST:APPL:CAT?
Notes	Returned value is a quoted string of a comma separated list of Model Numbers. Example, if SAMS and Phase Noise are installed and licensed: "N9060A,N9068A" String length is COUNT * 7 - 1. (7 = Model Number length + 1 for comma. -1 = no comma for the 1st entry.)
Preset	Not affected by a Preset
State Saved	Not saved in instrument state.
Initial S/W Revision	Prior to A.02.00

Application Catalog Revision

Returns the Revision of the provided Model Number.

Remote Command	:SYSTem:APPLication:CATalog:REVision? <model>
Example	:SYST:APPL:CAT:REV? 'N9060A'
Notes	Returned value is a quoted string of revision for the provided Model Number. The revision will be a null-string ("") if the provided Model Number is not installed and licensed. Example, if SAMS is installed and licensed: "1.0.0.0"
Preset	Not affected by a Preset.
State Saved	Not saved in instrument state.
Initial S/W Revision	Prior to A.02.00

Application Catalog Options

Returns a list of Options for the provided Model Number

Remote Command	:SYSTem:APPLication:CATalog:OPTion? <model>
Example	:SYST:APPL:CAT:OPT? 'N9060A'
Notes	Returned value is a quoted string of a comma separated list of Options, in the same format as *OPT? or :SYSTem:OPTion?. If the provided Model Number is not installed and licensed a null-string ("") will be returned. Example, if SAMS is installed and licensed: "2FP" String length is a maximum of 255 characters.
Preset	Not affected by a Preset
State Saved	Not saved in instrument state.
Initial S/W Revision	Prior to A.02.00

Detailed List of Modes

This section contains an alphabetical list of Modes available in the X-Series, along with a brief description of each Mode.

Note that with the exception of the 89601 VSA, only licensed applications appear in the Mode menu. The 89601 will always appear, because it's licensing is handled differently.

1xEV-DO

Selects the 1xEV-DO mode for general purpose measurements of signals following this standard. There are several measurements available in this mode.

If you are using the Help feature, this mode must be currently active to access its detailed information. If it is not active, exit the Help feature (Esc key), select the mode, and re-access Help.

Key Path	Mode
Example	INST:SEL CDMA1XEV INST:NSEL 15
Initial S/W Revision	Prior to A.02.00

802.16 OFDMA (WiMAX/WiBro)

Selects the OFDMA mode for general purpose measurements of WiMAX signals. There are several measurements available in this mode.

If you are using the Help feature, this mode must be currently active to access its detailed information. If it is not active, exit the Help feature (Esc key), select the mode, and re-access Help.

Key Path	Mode
Example	INST:SEL WIMAXOFDMA INST:NSEL 75
Initial S/W Revision	Prior to A.02.00

Analog Demod

Selects the Analog Demod mode for making measurements of AM, FM and phase modulated signals.

If you are using the Help feature, this mode must be currently active to access its detailed information. If it is not active, exit the Help feature (Esc key), select the mode, and re-access Help.

Key Path	Mode
Example	INST:SEL ADEMODO INST:NSEL 234
Initial S/W Revision	Prior to A.02.00

Bluetooth

Selects the Bluetooth mode for Bluetooth specific measurements. There are several measurements available in this mode.

If you are using the Help feature, this mode must be currently active to access its detailed information. If it is not active, exit the Help feature (Esc key), select the mode, and re-access Help.

Key Path	Mode
Example	INST:SEL BT INST:NSEL 228
Initial S/W Revision	A.06.01

cdma2000

Selects the cdma2000 mode for general purpose measurements of signals following this standard. There are several measurements available in this mode.

If you are using the Help feature, this mode must be currently active to access its detailed information. If it is not active, exit the Help feature (Esc key), select the mode, and re-access Help.

Key Path	Mode
Example	INST:SEL CDMA2K INST:NSEL 10
Initial S/W Revision	Prior to A.02.00

GSM/EDGE/EDGE Evo

Selects the GSM with EDGE mode for general purpose measurements of signals following this standard. There are several measurements available in this mode.

If you are using the Help feature, this mode must be currently active to access its detailed information. If it is not active, exit the Help feature (Esc key), select the mode, and re-access Help.

Key Path	Mode
Example	INST:SEL EDGE GSM INST:NSEL 13
Initial S/W Revision	Prior to A.02.00
Modified at S/W Revision	A.02.00

IQ Analyzer (Basic)

The IQ Analyzer Mode makes general purpose frequency domain and time domain measurements. These measurements often use alternate hardware signal paths when compared with a similar measurement in the Signal Analysis Mode using the Swept SA measurement. These frequency domain and time domain measurements can be used to output I/Q data results when measuring complex modulated digital signals.

If you are using the Help feature, this mode must be currently active to access its detailed information. If it is not active, exit the Help feature (Esc key), select the mode, and re-access Help.

Key Path	Mode
Example	INST:SEL BASIC INST:NSEL 8
Initial S/W Revision	Prior to A.02.00

LTE

Selects the LTE mode for general purpose measurements of signals following the LTE FDD standard. There are several measurements available in this mode.

If you are using the Help feature, this mode must be currently active to access its detailed information. If it is not active, exit the Help feature (Esc key), select the mode, and re-access Help.

Key Path	Mode
Example	INST:SEL LTE INST:NSEL 102
Initial S/W Revision	Prior to A.02.00

LTE TDD

Selects the LTE TDD mode for general purpose measurements of signals following the LTE TDD standard. There are several measurements available in this mode.

If you are using the Help feature, this mode must be currently active to access its detailed information. If it is not active, exit the Help feature (Esc key), select the mode, and re-access Help.

Key Path	Mode
Example	INST:SEL LTETDD INST:NSEL 105
Initial S/W Revision	A.03.00

LTE-Advanced FDD

As LTE-Advanced FDD and LTE modes are converged into one single application, the single softkey under Mode menu is designed to select the covered mode. The display mode of the LTE and LTE-Advanced FDD are distinguished by the licenses.

If you are using the Help feature, this mode must be currently active to access its detailed information. If it is not active, exit the Help feature (Esc key), select the mode, and re-access Help.

Key Path	Mode
Example	INST:SEL LTEAFDD INST:NSEL 107
Notes	When the N9080A/80B-1FP exists, the display mode name is LTE. When the N9080A/80B-1FP and N9080B-2FP all exist, the display mode name is LTE FDD & LTE-A FDD.
Backwards Compatibility SCPI	INST:SEL LTE INST:NSEL 102
Initial S/W Revision	A.14.00
Modified at S/W Revision	A.14.50

LTE-Advanced TDD

As LTE-Advanced TDD and LTE TDD modes are converged into one single application, the single softkey under Mode menu is designed to select the covered mode. The display mode of the LTE TDD and LTE-Advanced TDD are distinguished by the licenses.

If you are using the Help feature, this mode must be currently active to access its detailed information. If it is not active, exit the Help feature (Esc key), select the mode, and re-access Help.

Key Path	Mode
Example	INST:SEL LTEATDD INST:NSEL 108
Notes	When the N9082A/82B-1FP exists, the display mode name is LTE TDD. When the N9082A/82B-1FP and N9082B-2FP all exist, the display mode name is LTE TDD & LTE-A TDD.
Backwards Compatibility SCPI	INST:SEL LTETDD INST:NSEL 105

Initial S/W Revision	A.14.00
Modified at S/W Revision	A.14.50

Sequence Analyzer

Selects the Sequence Analyzer mode for sequenced measurements. Depending on licensed applications there may be a number of different measurements available in this mode. These measurements are all done on IQ captured data and can be set up to calculated on any part of the capture.

If you are using the Help feature, this mode must be currently active to access its detailed information. If it is not active, exit the Help feature (Esc key), select the mode, and re-access Help.

Key Path	Mode
Example	INST:SEL SEQAN INST:NSEL 400
Initial S/W Revision	A.05.01

TD-SCDMA with HSPA/8PSK

Selects the TD-SCDMA mode for general purpose measurements of signals following this standard. There are several measurements available in this mode.

If you are using the Help feature, this mode must be currently active to access its detailed information. If it is not active, exit the Help feature (Esc key), select the mode, and re-access Help.

Key Path	Mode
Example	INST:SEL TDSCDMA INST:NSEL 211
Initial S/W Revision	Prior to A.02.00

W-CDMA with HSPA+

Selects the W-CDMA with HSPA+ mode for general purpose measurements of signals following this standard. There are several measurements available in this mode.

If you are using the Help feature, this mode must be currently active to access its detailed information. If it is not active, exit the Help feature (Esc key), select the mode, and re-access Help.

Key Path	Mode
Example	INST:SEL WCDMA INST:NSEL 9
Initial S/W Revision	Prior to A.02.00

WLAN

Selects the WLAN mode for general purpose measurements of signals following this standard. There are several measurements available in this mode.

If you are using the Help feature, this mode must be currently active to access its detailed information. If it is not active, exit the Help feature (Esc key), select the mode, and re-access Help.

Key Path	Mode
Example	INST:SEL WLAN INST:NSEL 217
Initial S/W Revision	A.09.491

Global Settings

Opens a menu that allows you to switch certain Meas Global parameters to a Mode Global state. These switches apply to all Modes that support global settings. No matter what Mode you are in when you set the “Global Center Frequency” switch to on, it applies to all Modes that support Global Settings.

Key Path	Mode Setup
Initial S/W Revision	Prior to A.02.00

Global Center Freq

The software maintains a Mode Global value called “Global Center Freq”.

When the Global Center Freq key is switched to On in any mode, the current mode’s center frequency is copied into the Global Center Frequency, and from then on all modes that support global settings use the Global Center Frequency. So you can switch between any of these modes and the Center Freq will remain unchanged.

Adjusting the Center Freq of any mode which supports Global Settings, while Global Center Freq is On, will modify the Global Center Frequency.

When Global Center Freq is turned Off, the Center Freq of the current mode is unchanged, but now the Center Freq of each mode is once again independent.

When Mode Preset is pressed while Global Center Freq is On, the Global Center Freq is preset to the preset Center Freq of the current mode.

This function is reset to Off when the Restore Defaults key is pressed in the Global Settings menu, or when System, Restore Defaults, All Modes is pressed.

Key Path	Mode Setup, Global Settings
Scope	Mode Global
Remote Command	:INSTrument:COUple:FREQuency:CENTer ALL NONE :INSTrument:COUple:FREQuency:CENTer?

Example	INST:COUP:FREQ:CENT ALL INST:COUP:FREQ:CENT?
Preset	Set to Off on Global Settings, Restore Defaults and System, Restore Defaults, All Modes
Range	On Off
Initial S/W Revision	Prior to A.02.00

Remote Command	:GLOBal:FREQuency:CENTer[:STATe] 1 0 ON OFF :GLOBal:FREQuency:CENTer[:STATe]?
Preset	Off
Initial S/W Revision	Prior to A.02.00

Restore Defaults

This key resets all of the functions in the Global Settings menu to Off. This also occurs when System, Restore Defaults, All Modes is pressed.

Key Path	Mode Setup, Global Settings
Remote Command	:INSTrument:COUPle:DEFault
Example	INST:COUP:DEF
Backwards Compatibility SCPI	:GLOBal:DEFault
Initial S/W Revision	Prior to A.02.00

5 System Functions

File

Opens a menu that enables you to access various standard and custom Windows functions. Press any other front-panel key to exit

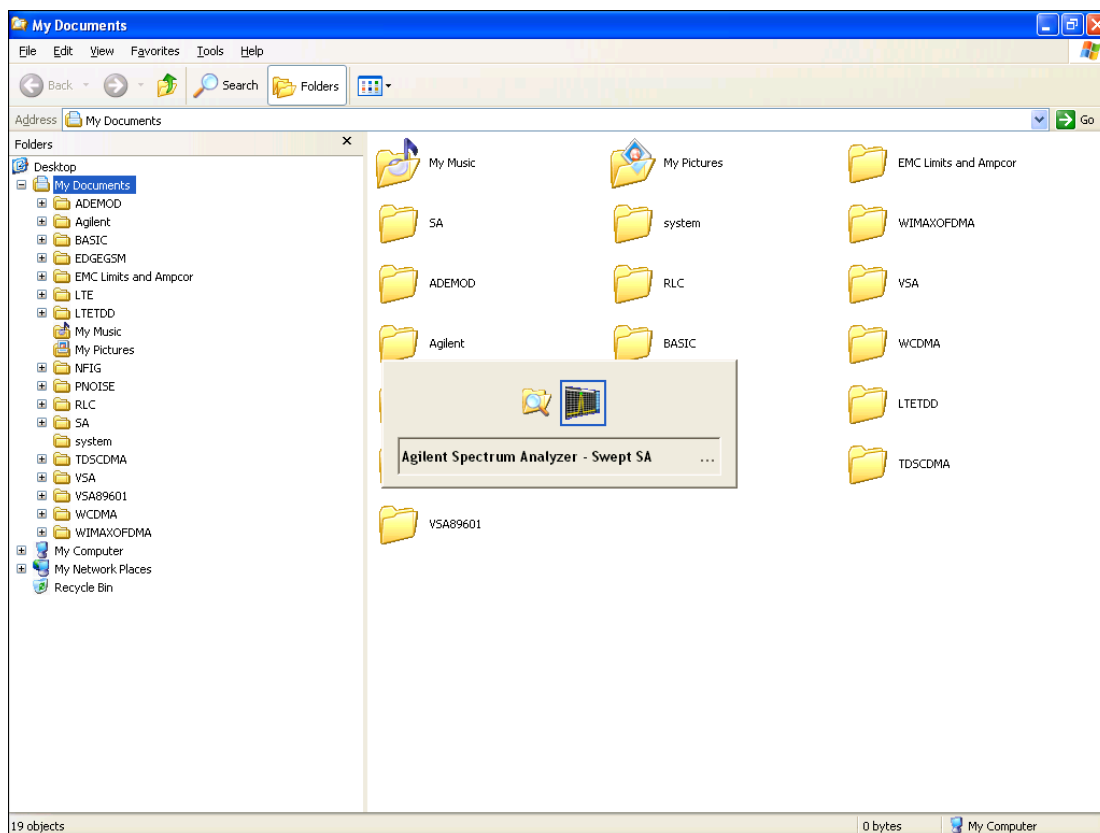
Key Path	Front-panel key
Initial S/W Revision	Prior to A.02.00

File Explorer

Opens the standard Windows File Explorer. The File Explorer opens in the My Documents directory for the current user.

The File Explorer is a separate Windows application, so to return to the analyzer once you are in the File Explorer, you may either:

Exit the File Explorer by clicking on the red X in the upper right corner, with a mouse



Or use Alt-Tab: press and hold the Alt key and press and release the Tab key until the Analyzer logo is showing in the window in the center of the screen, as shown above, then release the Alt key.

The ability to access File Explorer is not available if Option SF1 is installed.

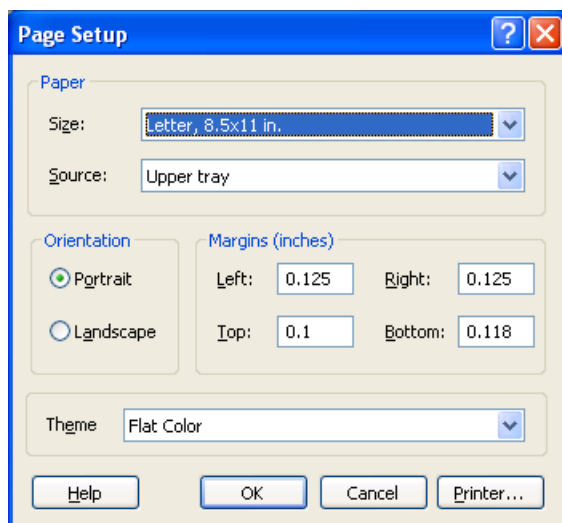
Key Path	File
Initial S/W Revision	Prior to A.02.00

Page Setup

The Page Setup key brings up a Windows Page Setup dialog that allows you to control aspects of the pages sent to the printer when the PRINT hardkey is pressed.

Key Path	File
Initial S/W Revision	Prior to A.02.00

Paper size, the printer paper source, the page orientation and the margins are all settable. Just like any standard Windows dialog, you may navigate the dialog using the front-panel keys, or a mouse. There are no SCPI commands for controlling these parameters.



Also contained in this dialog is a drop-down control that lets you select the Theme to use when printing. For more on Themes, see information under View/Display, Display, System Display Settings, Theme. The Theme control has a corresponding SCPI command.

Parameter Name	Print Themes
Parameter Type	Enum
Mode	All
Remote Command	:SYSTem:PRINt:THEME TDCoLor TDMonochrome FCOLor FMONochrome :SYSTem:PRINt:THEME?
Example	:SYST:PRIN:THEM FCOL
Setup	:SYSTem:DEFault MISC
Preset	FCOL; not part of Preset, but is reset by Restore Misc Defaults or Restore System Defaults All and

	survives subsequent running of the modes.
State Saved	No
Initial S/W Revision	Prior to A.02.00

Print

This front-panel key is equivalent to performing a File, Print, OK. It immediately performs the currently configured Print to the Default printer.

The :HCOPY command is equivalent to pressing the PRINT key. The HCOpy:ABORt command can be used to abort a print which is already in progress. Sending HCOpy:ABORt will cause the analyzer to stop sending data to the printer, although the printer may continue or even complete the print, depending on how much data was sent to the printer before the user sent the ABORt command.

Key Path	Front-panel key
Remote Command	:HCOPY[:IMMediate]
Initial S/W Revision	Prior to A.02.00


Key Path	SCPI command only
Remote Command	:HCOPY:ABORt
Initial S/W Revision	Prior to A.02.00

Restore Down

This key allows you to Restore Down the Instrument Application and reverses the action taken by Maximize. This key is only visible when the application has been maximized, and after the Restore Down action has been completed this key is replaced by the Maximize key.

Key Path	File
Mode	All
Notes	No equivalent remote command for this key.
State Saved	No
Initial S/W Revision	A.05.01

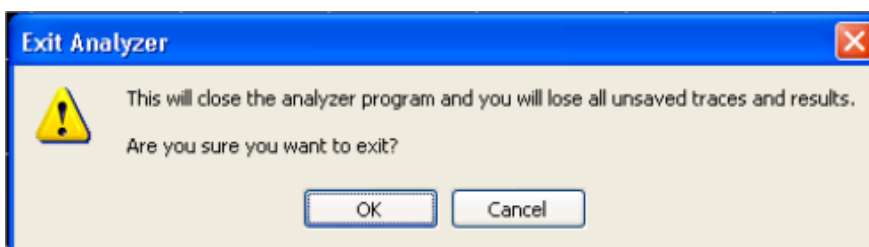
Minimize

The Minimize key causes the analyzer display to disappear down into the task bar, allowing you to see the Windows Desktop. You can use Alt-Tab (press and hold the Alt  key and press and release the Tab key) to restore the analyzer display.

Key Path	File
Mode	All
Notes	No equivalent remote command for this key.
State Saved	No
Initial S/W Revision	A.05.01

Exit

This key, when pressed, will exit the Instrument Application. A dialog box is used to confirm that you intended to exit the application:



Key Path	File
Mode	All
Notes	The Instrument Application will close. No further SCPI commands can be sent. Use with caution!
Initial S/W Revision	Prior to A.02.00

Print

This front-panel key is equivalent to performing a File, Print, OK. It immediately performs the currently configured Print to the Default printer.

The :HCOPY command is equivalent to pressing the PRINT key. The HCOPY:ABORT command can be used to abort a print which is already in progress. Sending HCOPY:ABORT will cause the analyzer to stop sending data to the printer, although the printer may continue or even complete the print, depending on how much data was sent to the printer before the user sent the ABORT command.

Key Path	Front-panel key
Remote Command	:HCOPY[:IMMEDIATE]
Initial S/W Revision	Prior to A.02.00

Key Path	SCPI command only
Remote Command	:HCOPY:ABORT
Initial S/W Revision	Prior to A.02.00

System

Opens a menu of keys that access various configuration menus and dialogs.

Key Path	Front-panel key
Notes	No remote command for this key specifically.
Initial S/W Revision	Prior to A.02.00

Show

Accesses a menu of choices that enable you to select the information window you want to view.

Key Path	System
Mode	All
Remote Command	:SYSTem:SHOW OFF ERRor SYSTem HARDware LXI HWSTatistics ALIGNment SOFTware CAPPllication :SYSTem:SHOW?
Example	:SYST:SHOW SYST
Notes	This command displays (or exits) the various System information screens.
Preset	OFF
State Saved	No
Range	OFF ERRor SYSTem HARDware LXI HWSTatistics ALIGNment SOFTware CAPPllication
Initial S/W Revision	Prior to A.02.00

Errors

There are two modes for the Errors selection, History and Status.

The list of errors displayed in the Errors screen does not automatically refresh. You must press the Refresh key or leave the screen and return to it to refresh it.

History brings up a screen displaying the event log in chronological order, with the newest event at the top. The history queue can hold up to 100 messages (if a message has a repeat count greater than 1 it only counts once against this number of 100). Note that this count bears no relation to the size of the SCPI queue. If the queue extends onto a second page, a scroll bar appears to allow scrolling with a mouse. Time is displayed to the second.

Status brings up a screen summarizing the status conditions currently in effect. Note that the time is displayed to the second.

The fields on the Errors display are:

Type (unlabeled) - Displays the icon identifying the event or condition as an error or warning.

ID - Displays the error number.

Message - Displays the message text.

Repeat (RPT) - This field shows the number of consecutive instances of the event, uninterrupted by other events. If an event occurs 5 times with no other intervening event, the value of repeat will be 5.

If the value of Repeat is 1 the field does not display. If the value of Repeat is >1, the time and date shown are those of the most recent occurrence. If the value of repeat reaches 999,999 it stops there.

Time - Shows the most recent time (including the date) at which the event occurred.

Key Path	System, Show
Mode	All
Remote Command	:SYSTem:ERRor[:NEXT]?
Example	:SYST:ERR?
Notes	The return string has the format: “<Error Number>,<Error>” Where <Error Number> and <Error> are those shown on the Show Errors screen
Backwards Compatibility Notes	In some legacy analyzers, the Repeat field shows the number of times the message has repeated since the last time the error queue was cleared. In the X-Series, the Repeat field shows the number of times the error has repeated since the last intervening error. So the count may very well be different than in the past even for identical signal conditions Unlike previous analyzers, in the X-Series all errors are reported through the Message or Status lines and are logged to the event queue. They never appear as text in the graticule area (as they sometimes do in previous analyzers) and they are never displayed in the settings panel at the top of the screen (as they sometimes do, by changing color, in previous analyzers). As a consequence of the above, the user can only see one status condition (the most recently generated) without looking at the queue. In the past, at least in the Spectrum Analyzer, multiple status conditions might display on the right side of the graticule. In general, there is no backwards compatibility specified or guaranteed between the error numbers in the X-Series and those of earlier products. Error, event, and status processing code in customers' software will probably need to be rewritten to work with X-Series. In the legacy analyzers, some conditions report as errors and others simply turn on status bits. Conditions that report as errors often report over and over as long as the condition exists. In the X-series, all conditions report as start and stop events. Consequently, software that repeatedly queries for a condition error until it stops reporting will have to be rewritten for the X-series.
Initial S/W Revision	Prior to A.02.00

Previous Page

See ["Next Page" on page 169.](#)

Key Path	System, Show, Errors
Initial S/W Revision	Prior to A.02.00

Next Page

Next Page and Previous Page menu keys move you between pages of the log, if it fills more than one page. These keys are grayed out in some cases:

- If on the last page of the log, the Next Page key is grayed-out
- If on the first page of the log, the Previous Page key is grayed-out.
- If there is only one page, both keys are grayed out.

Key Path	System, Show, Errors
Initial S/W Revision	Prior to A.02.00

History

The History and Status keys select the Errors view. The Status key has a second line that shows a number in [square brackets]. This is the number of currently open status items.

Key Path	System, Show, Errors
Initial S/W Revision	Prior to A.02.00

Verbose SCPI On/Off

When you turn Verbose SCPI on, additional information is returned when you send the :SYSTem:ERRor? query. The additional information consists of the characters that stimulated the error. This can aid you in debugging your test programs by indicating where in the parsing of a SCPI command the instrument encountered an invalid command or query.

Specifically, with Verbose SCPI on, the SYSTem:ERRor? query is expanded to show the SCPI data received, with the indicator <Err> at the point in the stream that the error occurred.

Verbose SCPI has no effect on the Show Errors screen or front panel Message Line; it only changes the response to the :SYST:ERR? query.

See the example below, where the invalid command "SENS:BOGUS" is sent:

Normal response to :SYST:ERR (using the Telnet window):

```
SCPI> SENS:BOGUS
```

```
SCPI> SYST:ERR?
```

```
-113,"Undefined header"
```

Now after turning on Verbose SCPI:

```
SCPI> SYST:BOGUS
```

```
SCPI> SYST:ERR?
```

```
-113,"Undefined header;SYST:BOGUS<Err>"
```

Key Path	System, Show, Errors
Mode	All
Remote Command	:SYSTem:ERRor:VERBoSe OFF ON 0 1 :SYSTem:ERRor:VERBoSe?
Example	:SYST:ERR:VERB ON
Preset	This is unaffected by Preset but is set to OFF on a "Restore System Defaults->Misc"
State Saved	No
Range	On Off
Initial S/W Revision	Prior to A.02.00

Refresh

When pressed, refreshes the Show Errors display.

Key Path	System, Show, Errors
Initial S/W Revision	Prior to A.02.00

Clear Error Queue

This clears all errors in all error queues.

Note the following:

- Clear Error Queue does not affect the current status conditions.
- Mode Preset does not clear the error queue.
- Restore System Defaults will clear all error queues.
- *CLS only clears the queue if it is sent remotely and *RST does not affect any error queue.
- Switching modes does not affect any error queues.

Key Path	System, Show, Errors
Initial S/W Revision	Prior to A.02.00

Status

See "[History](#)" on page 169.

Input Overload Enable (Remote Command Only)

Input Overload errors are reported using the Input Overload status bit (bit 12 in the Measurement Integrity status register). Input Overloads (for example, ADC Overload errors) can come and go with great frequency, generating many error events (for example, for signals just on the verge of overload), and so are

not put into the SCPI error queue by default. Normally the status bit is the only way for detecting these errors remotely.

It is possible to enable Input Overload reporting to the SCPI queue, by issuing the :SYSTEM:ERROR:OVERload ON command. To return to the default state, issue the :SYSTEM:ERROR:OVERload OFF command. In either case, Input Overloads always set the status bit.

NOTE

For versions of firmware before A.10.01, the Input Overload was only a Warning and so was never available in the SCPI queue, although it did set the status bit. For A.10.01 and later, the Input Overload is an error and can be enabled to the SCPI queue using this command.

Key Path	SCPI only
Remote Command	:SYSTEM:ERROR:OVERload[:STATe] 0 1 OFF ON
Example	:SYST:ERR:OVER 1 Enable overload errors
Preset	Set to OFF by Restore Misc Defaults (no Overload errors go to SCPI)
State Saved	Saved in instrument state.
Initial S/W Revision	A.10.01

System

The System screen is formatted into three groupings: product descriptive information, options tied to the hardware, and software products:

```

<Product Name> <Product Description>
Product Number: N9020A
Serial Number: US46220924
Firmware Revision: A.01.01
Computer Name: <hostname>
Host ID: N9020A,US44220924

N9020A-503      Frequency Range to 3.6 GHz
N9020A-PFR     Precision Frequency Reference
N9020A-P03     Preamp 3.6 GHz

N9060A-2FP     Spectrum Analysis Measurement Suite  1.0.0.0
N9073A-1FP     WCDMA                               1.0.0.0
N9073A-2FP     WCDMA with HSDPA                       1.0.0.0
  
```

The Previous Page is grayed-out if the first page of information is presently displayed. The Next Page menu key is grayed-out if the last page is information is presently displayed.

Key Path	System, Show
----------	--------------

Mode	All
Example	SYST:SHOW SYST
Backwards Compatibility Notes	The hardware statistics that are displayed in the PSA Show System screen have been moved to a dedicated Show Hardware Statistics screen in the Service Menu.
Initial S/W Revision	Prior to A.02.00

Show System contents (Remote Command Only)

A remote command is available to obtain the contents of the Show System screen (the entire contents, not just the currently displayed page).

Remote Command	:SYSTem:CONFigure [:SYSTem] ?
Example	:SYST:CONF?
Notes	The output is an IEEE Block format of the Show System contents. Each line is separated with a new-line character.
Initial S/W Revision	Prior to A.02.00

Computer System description (Remote Command Only)

A remote command is available to obtain the Computer System description. The Computer System is the operating system and patch level as reported by operating system.

Remote Command	:SYSTem:CSYSem?
Example	:SYST:CSYS?
Notes	The return value is the Computer System name and service pack level.
Initial S/W Revision	Prior to A.12.00

Hardware

The show hardware screen is used to view details of the installed hardware. This information can be used to determine versions of hardware assemblies and field programmable devices, in the advent of future upgrades or potential repair needs.

The screen is formatted into two groupings: product descriptive information and hardware information. The hardware information is listed in a table format:

Hardware Information									
Agilent EXM Wireless Test Set									
Product Number: E6640A									
Serial Number: US12341234									
Instrument S/W Revision: E.14.00_R0133									
Revision Date: 1/23/2014 10:33:35 AM									
Assembly Name	Part #	Serial #	Matl Rev	Rev	OF Rev	Hw Id	Cal Date	Cal Interval	Misc
Reference	M9300A	MY53000146				0165			
Reference Carrier	M9300A	W1312-63281-23-1306-00076		01	1.2.1	0166			
Reference Plugin	M9300A	W1312-63386-30-1306-00038		01	1.3.0	0167			
Wideband Digitizer	M943063005	111111111111	001	0	0	138			
Downconverter	M943063006	111111111111	001	0	A	139			
RFIO	M943063009	111111111111	001	0	A	140			
Power Supply	M943063002	111111111111	001	0	A	141			
M9430 TRX	1234567890	SN12344321	0	0	0	142	2013.10.02	2 years	
Baseband Generator	M943063007	111111111111	002	0	0	136			
ModulatorSrcOutput	M943063008	111111111111	001	0	A	137			

The Previous Page is grayed-out if the first page of information is presently displayed. The Next Page menu key is grayed-out if the last page is information is presently displayed.

Key Path	System, Show
Mode	All
Example	SYST:SHOW HARD
Initial S/W Revision	Prior to A.02.00

System Remote Commands (Remote Commands Only)

The commands in this section have no front-panel key equivalent.

"System Powerdown (Remote Command Only)" on page 174

"List installed Options (Remote Command Only)" on page 174

"Lock the Front-panel keys (Remote Command Only)" on page 174

"List SCPI Commands (Remote Command Only)" on page 175

"SCPI Version Query (Remote Command Only)" on page 175

"Date (Remote Command Only)" on page 175

"Time (Remote Command Only)" on page 175

Initial S/W Revision	Prior to A.02.00
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System Powerdown (Remote Command Only)

Remote Command	<code>SYSTem:PDOWn [NORMal FORCe]</code>
Notes	Shuts down the instrument in the normal way (NORMal) or forced way (FORCe). In case there is another application with modified data pending for saving, the application prompt the user. The system waits until the user responds in the normal mode. It will go off after 20 seconds of wait in the force mode and all data will be lost.

List installed Options (Remote Command Only)

Lists the installed options that pertain to the instrument (signal analyzer). .

Mode	All
Remote Command	<code>:SYSTem:OPTions?</code>
Example	<code>:SYST:OPT?</code>
Notes	The return string is a comma separated list of the installed options. For example: "503,P03,PFR" :SYSTem:OPTions? and *OPT? are the same.
State Saved	No
Initial S/W Revision	Prior to A.02.00

Lock the Front-panel keys (Remote Command Only)

Disables the instrument keyboard to prevent local input when the instrument is controlled remotely. Annunciation showing a "K" for 'Klock' (keyboard lock) alerts the local user that the keyboard is locked. Klock is similar to the GPIB Local Lockout function; namely that no front-panel keys are active with the exception of the Power Standby key. (The instrument is allowed to be turned-off if Klock is ON.) The Klock command is used in remote control situations where Local Lockout cannot be used.

Although primary intent of Klock is to lock-out the front panel, it will lock-out externally connected keyboards through USB. Klock has no effect on externally connected pointing devices (mice).

The front panel 'Local' key (Cancel/Esc) has no effect if Klock is ON.

Mode	All
Remote Command	<code>:SYSTem:KLOCK OFF ON 0 1</code> <code>:SYSTem:KLOCK?</code>
Example	<code>:SYST:KLOC ON</code>
Notes	Keyboard lock remains in effect until turned-off or the instrument is power-cycled
Preset	Initialized to OFF at startup, unaffected by Preset
State Saved	No
Initial S/W Revision	Prior to A.02.00

List SCPI Commands (Remote Command Only)

Outputs a list of the valid SCPI commands for the currently selected Mode.

Remote Command	:SYSTem:HELP:HEADers?
Example	:SYST:HELP:HEAD?
Notes	The output is an IEEE Block format with each command separated with the New-Line character (hex 0x0A)
Initial S/W Revision	Prior to A.02.00

SCPI Version Query (Remote Command Only)

Returns the SCPI version number with which the instrument complies. The SCPI industry standard changes regularly. This command indicates the version used when the instrument SCPI commands were defined.

Remote Command	:SYSTem:VERSion?
Example	:SYST:VERS?
Initial S/W Revision	Prior to A.02.00

Date (Remote Command Only)

The recommended access to the Date, Time, and Time zone of the instrument is through the Windows native control (Control Panel or accessing the Task Bar). You may also access this information remotely, as shown in this command and Time (below).

Sets or queries the date in the instrument.

Mode	All
Remote Command	:SYSTem:DATE "<year>, <month>, <day>" :SYSTem:DATE?
Example	:SYST:DATE "2006,05,26"
Notes	<year> is the four digit representation of year. (for example, 2006) <month> is the two digit representation of year. (for example. 01 to 12) <day> is the two digit representation of day. (for example, 01 to 28, 29, 30, or 31) depending on the month and year Unless the current account has Power User or Administrator privileges, an error will be generated by this command and no action will be taken.
Initial S/W Revision	Prior to A.02.00

Time (Remote Command Only)

Sets or queries the time in the instrument.

Mode	All
Remote Command	:SYSTem:TIME "<hour>,<minute>,<second>" :SYSTem:TIME?
Example	:SYST:TIME "13,05,26"
Notes	<hour> is the two digit representation of the hour in 24 hour format <minute> is the two digit representation of minute <second> is the two digit representation of second Unless the current account has Power User or Administrator privileges, an error will be generated by this command and no action will be taken.
Initial S/W Revision	Prior to A.02.00

Module Name (Remote Command Only)

Query only. This will return the name of the instance as displayed on the xSA main window.

Mode	All
Remote Command	:SYSTem:MODule:NAME?
Example	:SYST:MOD:NAME?
Notes	If the first instance displays on the xSA main window, the return string is "TRX1". If the second instance displays on the main window, the return string is "TRX2". If the third instance displays on the main window, the return string is "TRX3". If the fourth instance displays on the main window, the return string is "TRX4".
Preset	Not affected by Preset, reset to "Left" with Restore System Defaults Misc.
State Saved	No
Initial S/W Revision	A.13.80

Module Index (Remote Command Only)

Query only. This will return the index of this xSA instance. This index is used as the device number in a VISA address ("hlistip#").

Mode	All
Remote Command	:SYSTem:MODule:INDex?
Example	:SYST:MOD:IND?
Notes	It returns 0 if this instance's device number in a VISA address is 0. It returns 1 if this instance's device number in a VISA address is 1. It returns 2 if this instance's device number in a VISA address is 2. It returns 3 if this instance's device number in a VISA address is 3.

Preset	Not affected by Preset, reset to 0 with Restore System Defaults Misc.
State Saved	No
Initial S/W Revision	A.13.80

Module Mnemonic (Remote Command Only)

Query only. This will return the mnemonic of the instance as used in the command line “/Process:<mnemonic>” argument.

Mode	All
Remote Command	:SYSTem:MODule:MNEMonic?
Example	:SYST:MOD:MNEM?
Notes	This will return the mnemonic of the instance as used in the command line “/Process:<mnemonic>” argument.
Preset	Not affected by Preset and Restore System Defaults Misc.
State Saved	No
Initial S/W Revision	A.13.80

Module List (Remote Command Only)

Query only. This will return the list of defined mnemonics that can be used in the command line “/Process:<mnemonic>” argument with corresponding configuration information. The comma separated return values are: mnemonic, display name, Enabled/Disabled, VISA device id (instr# or hislip#), telnet port, socket port, Physics port, Physics configuration tag.

Mode	All
Remote Command	:SYSTem:MODule:LIST?
Example	:SYST:MOD:LIST?
Notes	Example: it returns: TRX1,TRX1,Enabled,0,5023,5025,3574,E6640AModules.config#TRX1 TRX2,TRX2,Disabled,1,5123,5125,3575,E6640AModules.config#TRX2 TRX3,TRX3,Disabled,2,5223,5225,3576,E6640AModules.config#TRX3 TRX4,TRX4,Disabled,3,5323,5325,3577,E6640AModules.config#TRX4
Preset	Not affected by Preset, reset to 0 with Restore System Defaults Misc.
State Saved	No
Initial S/W Revision	A.13.80

Module Enable (Remote Command Only)

Query and command. The query SYST:MOD:ENAB? "<mnemonic>" returns "0" for disabled, "1" for enabled. The command SYST:MOD:ENAB "<mnemonic>" 0|1 will disable/enable the configuration.

Notes: Enabling a configuration that does not have a HW will result in run-time errors when trying to start that configuration. Trying to disable the default configuration will result in the error: -221, "Setting conflict:Cannot disable default process configuration '<mnemonic>'".

Example:

```

}
SCPI>>syst:mod:enab? "TRX1"
<<1
SCPI>>syst:mod:enab? "TRX2"
<<0
SCPI>>syst:err?
<<+0,"No error"
SCPI>>syst:mod:enab "TRX1",0
SCPI>>syst:err?
<<-221,"Settings conflict;Cannot disable default process configuration 'TRX1'"

```

Mode	All
Remote Command	:SYSTem:MODule:ENABle? "<mnemonic>" :SYSTem:MODule:ENABle "<mnemonic>","0 1
Example	:SYST:MOD:ENAB? "TRX1" :SYST:MOD:ENAB "TRX4",0
Preset	Not affected by Preset and Restore System Defaults Misc.
State Saved	No
Initial S/W Revision	A.13.80

Module Default (Remote Command Only)

Query and command. The query SYST:MOD:DEF? returns the mnemonic of the default configuration. The command SYST:MOD:DEF "<mnemonic>" will set that configuration as the default. If the configuration was disabled, the module default command on it will enable this configuration.

Example:

```

SCPI>>syst:mod:def?
<<"TRX1"

```

SCPI>>syst:mod:enab "TRX2",0

SCPI>>syst:mod:enab? "TRX2"

<<0

SCPI>>syst:mod:def "TRX2"

SCPI>>syst:mod:enab? "TRX2"

<<1

SCPI>>syst:mod:def?

<<"TRX2"

Mode	All
Remote Command	:SYSTem:MODule:DEFault? :SYSTem:MODule:DEFault "<mnemonic>"
Example	:SYST:MOD:DEF? :SYST:MOD:DEF "TRX1"
Preset	Not affected by Preset, reset to "Left" with Restore System Defaults Misc.
State Saved	No
Initial S/W Revision	A.13.80

Module Model Number (Remote Command Only)

Query only. The query ":SYST:MODule:MODEL?" will return model number of the current module.

Mode	All
Remote Command	:SYSTem:MODule:MODEL?
Example	:SYSTem:MODule:MODEL?
Notes	This query will return model number. e.g. "M9430A"
Preset	Not affected by Preset,
State Saved	No
Initial S/W Revision	E.14.14

Module Model Serial Number (Remote Command Only)

Query only. The query ":SYST: MODule:SERial?" will return model serial number of the current module.

Mode	All
Remote Command	:SYSTem:MODule:SERial?

Example	:SYSTem:MODUle:SERial?
Notes	This query will return model serial number like “SN12344321”
Preset	Not affected by Preset
State Saved	No
Initial S/W Revision	E.14.14

Power On

Enables you to select how the instrument should power on. The options are: Mode and Input/Output Defaults, User Preset and Last State.

NOTE

In products that run multiple instances of the X-Series Application, the same Power On type is shared between all the instances.

Key Path	System
Mode	All
Remote Command	:SYSTem:PON:TYPE MODE USER LAST :SYSTem:PON:TYPE?
Example	:SYST:PON:TYPE MODE
Preset	This is unaffected by a Preset but is set to Mode on a “Restore System Defaults->All”
State Saved	No
Backwards Compatibility SCPI	:SYSTem:PON:TYPE PRESet the “PRESet” parameter is supported for backward compatibility only and behaves the same as MODE.
Backwards Compatibility Notes	The Preset Type key in legacy analyzers has been removed, and the Power On toggle key has been replaced by this 1-of-N key in the System menu.
Initial S/W Revision	Prior to A.02.00

Mode and Input/Output Defaults

When the analyzer is powered on in Mode and Input/Output Defaults, it performs a Restore Mode Defaults to all modes in the instrument and also performs a Restore Input/Output Defaults.

Persistent parameters (such as Amplitude Correction tables or Limit tables) are not affected at power on, even though they are normally cleared by Restore Input/Output Defaults and/or Restore Mode Defaults.

Key Path	System, Power On
Mode	All
Example	SYST:PON:TYPE MODE
Readback Text	Defaults
Initial S/W Revision	Prior to A.02.00

User Preset

Sets Power On to User Preset. When the analyzer is powered on in User Preset, it will User Preset each mode and switch to the power-on mode. Power On User Preset will not affect any settings beyond what a normal User Preset affects.

NOTE In products that run multiple instances of the X-Series Application, the same User Preset is shared between all the instances.

An instrument could never power up for the first time in User Preset.

Key Path	System, Power On
Mode	All
Example	SYST:PON:TYPE USER
Readback Text	User Preset
Backwards Compatibility Notes	Power On User Preset will cause the instrument to power up in the power-on mode, not the last mode the instrument was in prior to shut down. Also, Power On User Preset will User Preset all modes. This does not exactly match legacy behavior.
Initial S/W Revision	Prior to A.02.00

Last State

Sets Power On to **Last**. When the analyzer is powered on, it will put all modes in the last state they were in prior to when the analyzer was put into Power Standby and it will wake up in the mode it was last in prior to powering off the instrument. The saving of the active mode prior to shutdown happens behind the scenes when a controlled shutdown is requested by using the front panel power Standby key or by using the remote command SYSTem:PDOWn. The non-active modes are saved as they are deactivated and recalled by Power On Last State.

NOTE In products that run multiple instances of the X-Series Application, each instance has a unique Last State. An instrument can never power up for the first time in Last.

If line power to the analyzer is interrupted, for example by pulling the line cord plug or by switching off power to a test rack, Power On Last State may not work properly. For proper operation, Power On Last State depends on you shutting down the instrument using the Standby key or the SYSTem:PDOWn SCPI command. This will ensure the last state of each mode is saved and can be recalled during a power up.

Key Path	System, Power On
Mode	All
Example	SYST:PON:TYPE LAST
Notes	Power on Last State only works if you have done a controlled shutdown prior to powering on in Last. If a controlled shutdown is not done when in Power On Last State, the instrument will power up in the last active mode, but it may not power up in the active mode's last state. If an invalid mode state is detected, a Mode Preset will occur. To control the shutdown under remote control use the :SYSTem:PDOWn command.

Readback Text	Last State
Backwards Compatibility Notes	It is no longer possible to power-up the analyzer in the last mode the analyzer was running with that mode in the preset state. (ESA/PSA SYST:PRESET:TYPE MODE with SYST:PON:PRESET) You can power-on the analyzer in the last mode the instrument was running in its last state (SYST:PON:TYPE LAST), or you can specify the mode to power-up in its preset state (SYST:PON:MODE <mode>).
Initial S/W Revision	Prior to A.02.00

Power On Application

Accesses a menu that lists the available Modes and lets you select which Mode is to be the power-on application.

This application is used for Power On Type “Mode and Input/Output Defaults” and Restore System Defaults All.

NOTE

In products that run multiple instances of the X-Series Application, the same Power On Application is shared between all the instances.

Key Path	System, Power On
Mode	All
Remote Command	:SYSTem:PON:MODE SA BASIC ADEMOM NFIGURE PNOISE CDMA2K TDSCDMA VSA VSA89601 WCDMA WIMAXOFDMA :SYSTem:PON:MODE?
Example	SYST:PON:MODE SA
Notes	The list of possible modes (and remote parameters) to choose from is dependent on which modes are installed in the instrument.
Preset	This is unaffected by a Preset but is set on a “Restore System Defaults->All” to: SEQAN
State Saved	No
Initial S/W Revision	Prior to A.02.00

Configure Applications

The Configure Applications utility can be used to:

- select applications for preload
- determine how many applications can fit in memory at one time
- specify the order of the Modes in the Mode menu.

This utility consists of a window with instructions, a set of “Select Application” checkboxes, a “fuel bar” style memory gauge, and keys that help you set up your configuration.

NOTE

In products that run multiple instances of the X-Series Application, the same Configure Applications Utility is shared between all the instances.

For more information, see the following topics:

["Preloading Applications" on page 183](#)

["Access to Configure Applications utility" on page 183](#)

["Virtual memory usage" on page 183](#)

Key Path	System, Power On
Example	:SYST:SHOW CAPP Displays the Config Applications screen
Initial S/W Revision	A.02.00

Preloading Applications

During runtime, if a Mode that is not preloaded is selected using the Mode menu or sending SCPI commands, there will be a pause while the Application is loaded. During this pause a message that says "Loading application, please wait ..." is displayed. Once loaded, the application stays loaded, so the next time you select it during a session, there is no delay.

Preloading enables you to "preload" at startup, to eliminate the runtime delay. Preloading an application will cause it to be loaded into the analyzer's memory when the analyzer program starts up. If you do this, the delay will increase the time it takes to start up the analyzer program, but this may be preferable to having to wait the first time you select an application. Note that, once an application is loaded into memory, it cannot be unloaded without exiting and restarting the analyzer program.

Note that there are more applications available for the X-Series than can fit into Windows Virtual Memory. By allowing you to choose which licensed applications to load at startup, the Configure Applications utility allows you to make optimal use of your memory.

Access to Configure Applications utility

A version of the utility runs the first time you power up the analyzer after purchasing it from Keysight. The utility automatically configures preloads so that as many licensed applications as possible are preloaded while keeping the total estimated virtual memory usage below the limit. This auto-configuration only takes place at the very first run, and after analyzer software upgrades.

You may, at any time, manually call up the Configure Applications utility by pressing System, Power On, Configure Applications, to find a configuration that works best for you, and then restart the analyzer program.

The utility may also be called if, during operation of the analyzer, you attempt to load more applications than can fit in memory at once.

Virtual memory usage

There are more applications available for the X-Series than can fit into memory at any one time, so the Configure Applications utility includes a memory tracker that serves two purposes:

1. It will not let you preload more applications than will fit into memory at once.

2. You can determine how many of your favorite applications can reside in memory at one time.

The utility provides a graphical representation of the amount of memory (note that the memory in question here is Virtual memory and is a limitation imposed by the operating system, not by the amount of physical memory you have in your analyzer). You select applications to preload by checking the boxes on the left. Checked applications preload at startup. The colored fuel bar indicates the total memory required when all the checked applications are loaded (either preloaded or selected during runtime).

Here is what the fuel bar colors mean:

RED: the applications you have selected cannot all fit into the analyzer's memory. You must deselect applications until the fuel bar turns yellow.

YELLOW: the applications you have selected can all fit into the analyzer's memory, but there is less than 10% of the memory left, probably not enough to load any other applications, either via preload or by selecting a Mode while the analyzer is running..

GREEN: The indicator is green when <90% of the memory limit is consumed. This means the applications you have selected can all fit into the analyzer's memory with room to spare. You will likely be able to load one or more other applications without running out of memory.

Select All

Marks all applications in the selection list. This allows you to enable all applications licensed on the instrument for pre-loading, or is a convenience for selecting all applications in one operation and then letting you deselect individual applications.

Key Path	System, Power On, Configure Applications
Initial S/W Revision	A.02.00

Deselect All

Clears the marks from all applications in the selection list, except the Power On application. The Power On application cannot be eliminated from the pre-load list.

Key Path	System, Power On, Configure Applications
Initial S/W Revision	A.02.00

Move Up

The application list is the order that applications appear in the Mode Menu. This key enables you to shift the selected application up in the list, thus moving the selected application earlier in the Mode Menu.

Key Path	System, Power On, Configure Applications
Initial S/W Revision	A.02.00

Move Down

The application list is the order that applications appear in the Mode Menu. This key enables you to shift the selected application down in the list, thus moving the selected application later in the Mode Menu.

Key Path	System, Power On, Configure Applications
Initial S/W Revision	A.02.00

Select/Deselect

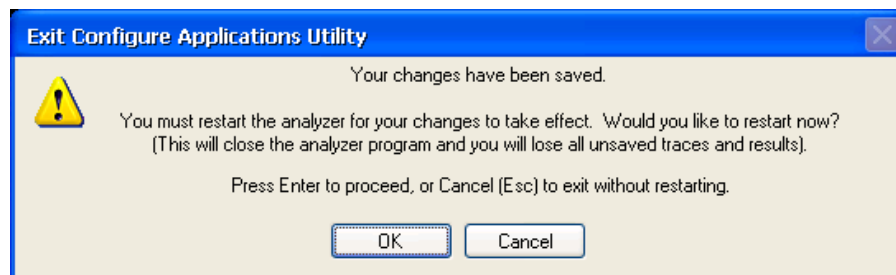
Toggles the currently highlighted application in the list.

Key Path	System, Power On, Configure Applications
Initial S/W Revision	A.02.00

Save Changes and Exit

Applies the configuration of the applications list. The marked applications will be pre-loaded in memory the next time the instrument application is started, and the order of the applications in the list will be the order of the applications in the Mode Menu.

After saving your changes, the analyzer asks you if you would like it to restart so that your changes can take effect (see dialog box, below). If you choose not to restart, the changes will not take effect until the next time you shut down and restart the analyzer.



Key Path	System, Power On, Configure Applications
Remote Command	:SYSTem:PUP:PROcEss
Example	:SYST:PUP:PROc This is the SCPI command for restarting the analyzer. You must Wait after this command for the instrument application to restart
Notes	The softkey will be grayed-out when the virtual memory of the selected applications exceeds 100% of the limit.
Notes	You cannot use *WAI or *OPC? to synchronize operation after a restart. This command stops and restarts the instrument application, thus the SCPI operation is terminated and restarted. A remote program must use fixed wait time to resume sending commands to the instrument. The wait time will be dependent upon which applications are pre-loaded.
Initial S/W Revision	A.02.00
Modified at S/W Revision	A.04.00

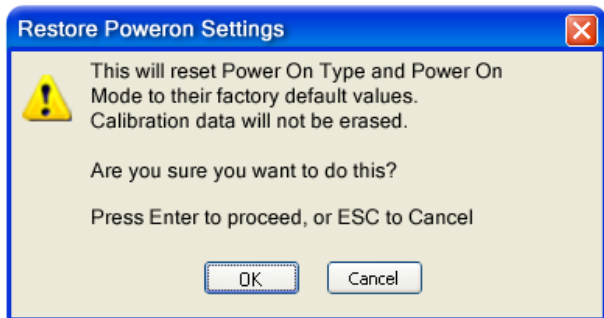
Exit Without Saving

Pressing this key will exit the Configure Applications utility without saving your changes.

Key Path	System, Power On, Configure Applications
Initial S/W Revision	A.02.00
Modified at S/W Revision	A.04.00

Restore Power On Defaults

This selection causes the Power On Type and Power On Application settings to be a reset to their default values. This level of Restore System Defaults does not affect any other system settings, mode settings and does not cause a mode switch. The Power On key, under the Restore System Defaults menu, causes the same action.



If you press any key other than OK or Enter, it is construed as a Cancel, because the only path that will actually cause the reset to be executed is through OK or Enter.

Key Path	System, Power On
Example	:SYST:DEF PON
Initial S/W Revision	Prior to A.02.00

Configure Applications - Instrument boot-up

At start-up of the analyzer programa dialog box similar to the one under the System, Power On, Configure Applications key will be displayed allowing you to choose which licensed applications are to be loaded. This dialog will only be displayed if the memory required to pre-load all of the licensed applications exceeds the Virtual Memory available.

Configure Applications - Windows desktop

The Configure Applications Utility may be run from the Windows Desktop. The utility is launched by double-clicking the



icon on the desktop, which brings-up a dialog box similar to the one under the System, Power On, Configure Applications key, allowing you to choose which licensed applications are to be loaded when the analyzer program starts up. This dialog box has mouse buttons on it that do the job the softkeys normally do in the System, Power On, Configure Applications menu.

NOTE

In products that run multiple instances of the X-Series Application, the same Configure Applications Utility launched from the Windows Desktop will apply to all the instances.

Configure Applications - Remote Commands

The following topics provide details on using remote commands to configure the list of applications you want to load into the instrument memory or query the Virtual Memory utilization for your applications.

- ["Configuration list \(Remote Command Only\)" on page 187](#)
- ["Configuration Memory Available \(Remote Command Only\)" on page 187](#)
- ["Configuration Memory Total \(Remote Command Only\)" on page 188](#)
- ["Configuration Memory Used \(Remote Command Only\)" on page 188](#)
- ["Configuration Application Memory \(Remote Command Only\)" on page 188](#)

Configuration list (Remote Command Only)

This remote command is used to set or query the list of applications to be loaded in-memory.

Remote Command	:SYSTem:PON:APPLication:LLISt <string of INSTRument:SElect names> :SYSTem:PON:APPLication:LLISt?
Example	:SYST:PON:APPL:LLIS "SA,BASIC,WCDMA"
Notes	<string of INSTRument:SElect names> are from the enums of the :INSTRument:SElect command. The order of the <INSTRument:SElect names> is the order that the applications are loaded into memory, and the order that they appear in the Mode Menu. Error message -225 "Out of Memory" is reported when more applications are listed than can reside in Virtual Memory. When this occurs, the existing applications load list is unchanged.
Preset	Not affected by Preset
State Saved	Not saved in instrument state
Initial S/W Revision	A.02.00

Configuration Memory Available (Remote Command Only)

This remote command is used to query the amount of Virtual Memory remaining.

Remote Command	:SYSTem:PON:APPLication:VMEMory[:AVAILable]?
Example	:SYST:PON:APPL:VMEM?
Preset	Not affected by Preset
Initial S/W Revision	A.02.00

Configuration Memory Total (Remote Command Only)

This remote command is used to query the limit of Virtual Memory allowed for applications.

Remote Command	:SYSTem:PON:APPLication:VMEMory:TOTal?
Example	:SYST:PON:APPL:VMEM:TOT?
Preset	Not affected by Preset
Initial S/W Revision	A.02.00

Configuration Memory Used (Remote Command Only)

This remote command is a query of the amount of Virtual Memory used by all measurement applications.

Remote Command	:SYSTem:PON:APPLication:VMEMory:USED?
Example	:SYST:PON:APPL:VMEM:USED?
Preset	Not affected by Preset
Initial S/W Revision	A.02.00

Configuration Application Memory (Remote Command Only)

This remote command is used to query the amount of Virtual Memory a particular application consumes.

Remote Command	:SYSTem:PON:APPLication:VMEMory:USED:NAME? <INSTRument:SElect name>
Example	:SYST:PON:APPL:VMEM:USED:NAME? CDMA2K
Notes	<INSTRument:SElect name> is from the enums of the :INSTRument:SElect command Value returned will be 0 (zero) if the name provided is invalid.
Preset	Not affected by Preset
Initial S/W Revision	Prior to A.02.00

Alignments

The Alignments Menu controls and displays the automatic alignment of the instrument, and provides the ability to restore the default alignment values.

The current setting of the alignment system is displayed in the system Settings Panel along the top of the display, including a warning icon for conditions that may cause specifications to be impacted.



Key Path	System
Initial S/W Revision	Prior to A.02.00

Align Now

Accesses alignment processes that are immediate action operations. They perform complete operations and run until they are complete.

Key Path	System, Alignments
Initial S/W Revision	Prior to A.02.00

All (Daily use)

Immediately executes an alignment of all subsystems which includes both the source and the analyzer in the TRX module. The “All” alignment is sufficient to maintain specified performance, provided that (1) the TRX’s internal temperature has not drifted more than ± 5 degree C since the previous alignment, and (2) no more than 8 hours have elapsed since the previous “All” alignment., and (3) no more than 1 week has elapsed since these three alignments have all been run: IF, RF, and Source, and (4) a 45 minute warm-up period between power-up of the TRX and invoking the “All” alignment. The instrument stops any measurement currently underway, performs the alignment, then restarts the measurement from the beginning (similar to pressing the Restart key).

If an interfering user signal is present at the RF Input, the alignment is performed on all subsystems except the RF. After completion, the Error Condition message “Align skipped: 50 MHz interference” or “Align skipped: 4.8 GHz interference” is generated. In addition the Error Condition message “Align Now, RF required” is generated, and bits 11 and 12 are set in the Status Questionable Calibration register.

The query form of the remote commands (:CALibration[:ALL]? or *CAL?) invokes the alignment of all subsystems and returns a success or failure value. An interfering user signal is not grounds for failure; if the alignment was able to succeed on all portions but unable to align the RF because of an interfering signal, the resultant will be the success value.

Successful completion of Align Now, All will clear the “Align Now, All required” Error Condition, and clear bit 14 in the Status Questionable Calibration register. It will also begin the elapsed time counter for Last Align Now, All Time, and capture the Last Align Now, All Temperature.

If the Align RF subsystem succeeded in aligning (no interfering signal present), the elapsed time counter begins for Last Align Now, RF Time, and the temperature is captured for the Last Align Now, RF Temperature. In addition the Error Conditions “Align skipped: 50 MHz interference” and “Align skipped: 4.8 GHz interference” are cleared, the Error Condition “Align Now, RF required” is cleared, and bits 11 and 12 are cleared in the Status Questionable Calibration register

Align Now, All can be interrupted by pressing the Cancel (ESC) front-panel key or remotely with Device Clear followed by the :ABORt SCPI command. When this occurs the Error Condition message “Align Now, All required” is generated, and bit 14 is set in the Status Questionable Condition register. This is because new alignment data may be employed for an individual subsystem, but not a cohesive set of data for all subsystems.

In many cases, you might find it more convenient to change alignments to Normal, instead of executing Align Now, All. When the Auto Align process transitions to Normal, the analyzer will immediately start to update only the alignments that have expired, thus efficiently restoring the alignment process.

NOTE

In EXM, Source ARB play will be turned off and the source states will not be restored after Align Now, All.

Key Path	System, Alignments, Align Now
Mode	All
Remote Command	:CALibration[:ALL] :CALibration[:ALL]?
Example	:CAL
Notes	:CALibration[:ALL]? returns 0 if successful :CALibration[:ALL]? returns 1 if failed :CALibration[:ALL]? is the same as *CAL? While Align Now, All is performing the alignment, bit 0 in the Status Operation register is set. Completion, or termination, will clear bit 0 in the Status Operation register. This command is sequential; it must complete before further SCPI commands are processed. Interrupting the alignment from remote is accomplished by invoking Device Clear followed by the :ABORt command. Successful completion will clear bit 14 in the Status Questionable Calibration register. An interfering user signal is not grounds for failure of Align Now, All. However, bits 11 and 12 are set in the Status Questionable Calibration register to indicate Align Now, RF is required. An interfering user supplied signal will result in the instrument requiring an Align Now, RF with the interfering signal removed.
Couplings	Initializes the time for the Last Align Now, All Time. Records the temperature for the Last Align Now, All Temperature. If Align RF component succeeded, initializes the time for the Last Align Now, RF Time. If Align RF component succeeded, records the temperature for the Last Align Now, RF Temperature.
Status Bits/OPC dependencies	Bits 11, 12, or 14 may be set in the Status Questionable Calibration register.
Initial S/W Revision	Prior to A.02.00

Mode	All
Remote Command	*CAL?
Example	*CAL?
Notes	*CAL? returns 0 if successful *CAL? returns 1 if failed :CALibration[:ALL]? is the same as *CAL? See additional remarks described with :CALibration[:ALL]? Everything about :CALibration[:ALL]? is synonymous with *CAL? including all conditions, status register bits, and couplings
Initial S/W Revision	Prior to A.02.00

Mode	All
Remote Command	:CALibration[:ALL]:NPENding
Example	CAL:NPEN
Notes	:CALibration[:ALL]:NPENding is the same as :CALibration[:ALL] including all conditions, status register bits, except this scpi command does not BLOCK the scpi session, so the user should use status register bits to query if the calibration is successfully completed or not. Typical usage is: 1) :CALibration:ALL:NPENding (Start a calibration) 2) :STATus:OPERation:CONDition? (Check if the calibration is completed or not, If bit 0 is set, then the system is doing calibration, the user should repeat this scpi query until the bit is cleared) 3):STATus:QUESTionable:CALibration:CONDition? (Check if there are any errors/failures in previous calibration procedure)
Initial S/W Revision	X.14.20

All but RF

Immediately executes an alignment of all subsystems except the RF subsystem which includes both the source and the analyzer in the TRX module . The instrument will stop any measurement currently underway, perform the alignment, and then restart the measurement from the beginning (similar to pressing the Restart key). This can be used to align portions of the instrument that are not impacted by an interfering user input signal.

This operation might be chosen instead of All if you do not want the device under test to experience a large change in input impedance, such as a temporary open circuit at the analyzer input.

The query form of the remote commands (:CALibration:NRF?) will invoke the alignment and return a success or failure value.

Successful completion of Align Now, All but RF will clear the “Align Now, All required” Error Condition, and clear bit 14 in the Status Questionable Calibration register. If “Align Now, All required” was in effect prior to executing the All but RF, the Error Condition message “Align Now, RF required” is generated and bit 12 in the Status Questionable Calibration register is set. It will also begin the elapsed time counter for Last Align Now, All Time, and capture the Last Align Now, All Temperature.

Align Now, All but RF can be interrupted by pressing the Cancel (ESC) front-panel key or remotely with Device Clear followed by the :ABORT SCPI command. When this occurs the Error Condition message “Align Now, All required” is generated, and bit 14 is set in the Status Questionable Condition register. This is because new alignment data may be used for an individual subsystem, but not a full new set of data for all subsystems.

NOTE

In EXM, Source ARB play will be turned off and the source states will not be restored after Align Now, All but RF.

Key Path	System, Alignments, Align Now
Mode	All
Remote Command	:CALibration:NRF

	:CALibration:NRF?
Example	:CAL:NRF
Notes	:CALibration:NRF? returns 0 if successful :CALibration:NRF? returns 1 if failed While Align Now, All but RF is performing the alignment, bit 0 in the Status Operation register is set. Completion, or termination, will clear bit 0 in the Status Operation register. This command is sequential; it must complete before further SCPI commands are processed. Interrupting the alignment from remote is accomplished by invoking Device Clear followed by the :ABORt command. Successful completion will clear bit 14 in the Status Questionable Calibration register and set bit 12 if invoked with "Align Now, All required".
Couplings	Initializes the time for the Last Align Now, All Time. Records the temperature for the Last Align Now, All Temperature.
Status Bits/OPC dependencies	Bits 12 or 14 may be set in the Status Questionable Calibration register.
Initial S/W Revision	Prior to A.02.00

Mode	All
Remote Command	:CALibration:NRF:NPENding
Example	CAL:NRF:NPEN
Notes	:CALibration:NRF:NPENding is the same as :CALibration:NRF including all conditions, status register bits, except that this scpi command does not BLOCK the scpi session, so the user should use status register bits to query if the calibration is successfully completed or not. Typical usage is: 1):CALibration:NRF:NPENding (start theAll but RF calibration) 2):STATus:OPERation:CONDition? (If bit 0 is set, then the system is doing calibration, the user should do re-query until this bit is cleared) 3):STATus:QUESTionable:CALibration:CONDition? (to check if there are any errors/failures in previous calibration procedure)
Initial S/W Revision	X.14.20

RF (Weekly use)

Immediately executes an alignment of the RF subsystem which includes both the source and the analyzer in the TRX module . The instrument stops any measurement currently underway, performs the alignment, then restarts the measurement from the beginning (similar to pressing the Restart key).

This alignment corrects slow-rate drift which does not impair specifications for time periods shorter than one week. Thus, it is required to perform this alignment on a weekly basis to maintain specifications. This alignment typically takes >2 minutes to complete.

This operation might be desirable if the alignments had been set to not include RF alignments, or if previous RF alignments could not complete because of interference which has since been removed.

If an interfering user signal is present at the RF Input, the alignment will terminate and generate the Error Condition message “Align skipped: 50 MHz interference” or “Align skipped: 4.8 GHz interference”, and Error Condition “Align Now, RF required”. In addition, bits 11 and 12 will be set in the Status Questionable Calibration register.

The query form of the remote commands (:CALibration:RF?) will invoke the alignment of the RF subsystem and return a success or failure value. An interfering user signal is grounds for failure.

Successful completion of Align Now, RF will begin the elapsed time counter for Last Align Now, RF Time, and capture the Last Align Now, RF Temperature.

Align Now, RF can be interrupted by pressing the Cancel (ESC) front-panel key or remotely with Device Clear followed by the :ABORt SCPI command. When this occurs, the Error Condition message “Align Now, RF required” is generated, and bit 12 is set in the Status Questionable Condition register. None of the new alignment data is used.

NOTE

In EXM, Source ARB play will be turned off and the source states will not be restored after Align Now, All but RF.

Key Path	System, Alignments, Align Now
Mode	All
Remote Command	:CALibration:RF :CALibration:RF?
Example	:CAL:RF
Notes	:CALibration:RF? returns 0 if successful :CALibration:RF? returns 1 if failed (including interfering user signal) While Align Now, RF is performing the alignment, bit 0 in the Status Operation register is set. Completion, or termination, will clear bit 0 in the Status Operation register. This command is sequential; it must complete before further SCPI commands are processed. Interrupting the alignment from remote is accomplished by invoking Device Clear followed by the :ABORt command. Successful completion clears the Error Conditions “Align skipped: 50 MHz interference” and “Align skipped: 4800 MHz interference” and the Error Conditions “Align RF failed” and “Align Now, RF required”, and clears bits 3, 11, and 12 in the Status Questionable Calibration register. A failure encountered during alignment will generate the Error Condition message “Align RF failed” and set bit 3 in the Status Questionable Calibration register. An interfering user signal will result in bits 11 and 12 to be set in the Status Questionable Calibration register to indicate Align Now, RF is required. An interfering user supplied signal will result in the instrument requiring an Align Now, RF with the interfering signal removed.
Couplings	Initializes the time for the Last Align Now, RF Time. Records the temperature for the Last Align Now, RF Temperature.
Status Bits/OPC dependencies	Bits 11, 12, or 14 may be set in the Status Questionable Calibration register.
Initial S/W Revision	Prior to A.02.00

Mode	All
Remote Command	:CALibration:RF:NPending
Example	CAL:RF:NPEN
Notes	:CALibration:RF:NPending is the same as :CALibration:RF including all conditions, status register bits, except that this scpi command does not BLOCK the scpi session, so the user should use status register bits to query if the calibration is successfully completed or not. Typical usage is: 1):CALibration:RF:NPending (Start a RF calibration) 2):STATus:OPERation:CONDition? (If bit 0 is set, then the system is doing calibration, the user should do re-query until this bit is cleared) 3):STATus:QUEStionable:CALibration:CONDition? (to check if there are any errors/failures in previous calibration procedure)
Initial S/W Revision	X.14.20

Source (Weekly use)

Accesses source alignment processes that are immediate action operations. They perform complete operations and run until they are complete.

Immediately executes an IQ alignment, and power level alignment. The instrument stops any sequence of the source, performs the alignment, then restarts the sequence from the beginning.

This alignment corrects slow-rate drift which does not impair specifications for time periods shorter than one week. Thus, it is required to perform this alignment on a weekly basis to maintain specifications. This alignment typically takes >2 minutes to complete.

There is no alert available for the source alignment. The operators have the responsibility to check temperature shift since last Align Now, Source to determine if the source alignment needs to be executed.

Key Path	System, Alignments, Align Now
Mode	All
Remote Command	:CALibration:INTernal:SOURce[:ALL] :CALibration:INTernal:SOURce[:ALL]?
Example	:CAL:INT:SOUR
Notes	:CAL:SOUR? Initiates an Alignment and returns 0 if successful :CAL:SOUR? Initiates an Alignment and returns 1 if failed
Couplings	Initializes the time for the Last Align Source Now, All Time. Records the temperature for the Last Align Source Now, All Temperature.
Initial S/W Revision	A.05.00

Mode	All
Remote Command	:CALibration:INTernal:SOURce[:ALL]:NPENding
Example	CAL:INT:SOUR:NPEN
Notes	:CALibration:INTernal:SOURce[:ALL]:NPENding is the same as :CALibration:INTernal:SOURce[:ALL] including all conditions, status register bits, except that this scpi command does not BLOCK the scpi session, so the user should use status register bits to query if the calibration is successfully completed or not. Typical usage is: 1):CALibration:INTernal:SOURce:NPENding (start an internal source calibration) 2):STATus:OPERation:CONDition? (Check if the calibration is completed or not, If bit 0 is set, then the system is doing calibration, the user should repeat this scpi query until the bit is cleared) 3):STATus:QUESTionable:CALibration:EXTended:FAILure:CONDition? (Check if bit 14 is set or not. If this bit is set, that means there are some errors in previous internal source calibration)
Initial S/W Revision	X.14.20

IF Alignment (Weekly use) (Remote Command Only)

Immediately executes an alignment of the IF subsystem which includes both the source and the analyzer in the TRX module. The instrument stops any measurement currently underway, perform the alignment, and then restart the measurement from the beginning (similar to pressing the Restart key). This alignment corrects slow-rate which the drift does not impair specifications for time periods shorter than one week. Thus, it is required to perform this alignment on a weekly basis to maintain specifications. This alignment typically takes >4 minutes to complete.

A failure of IF will set the Error Condition “Align IF failed” and set bit 4 in the Status Questionable Calibration register. A failure will not employ new IF alignment data.

Successful completion of IF will clear the Error Condition “Align IF failed” and clear bit 6 in the Status Questionable Calibration register.

Align IF can be interrupted by pressing the Cancel (ESC) front-panel key or from remote with Device Clear followed by the :ABORt SCPI command. When this occurs, no new IF alignment data will be employed.

The query form of the remote commands (:CALibration:IF?) will invoke the alignment of the IF subsystem and return a success or failure value.

Note: In EXM, Source ARB play will be turned off and the source states will not be restored after IF Alignment.

Mode	All
Remote Command	:CALibration:IF :CALibration:IF?
Example	:CAL:IF
Notes	:CALibration:IF? returns 0 if successful :CALibration:IF? returns 1 if failed While Align Now, IF is performing the alignment, bit 0 in the Status Operation register is set.

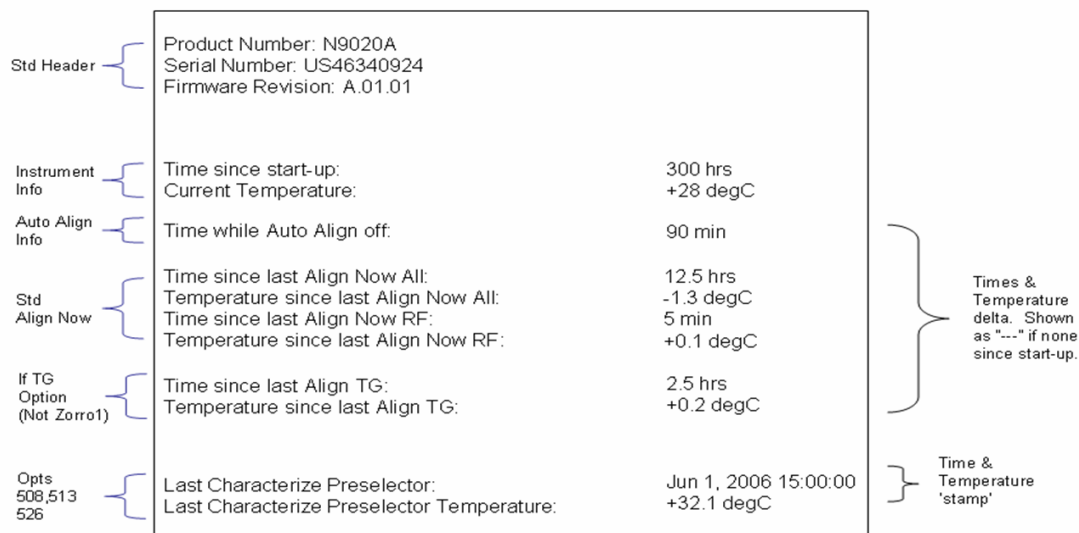
	<p>Completion, or termination, will clear bit 0 in the Status Operation register.</p> <p>This command is sequential; it must complete before further SCPI commands are processed. Interrupting the alignment from remote is accomplished by invoking Device Clear followed by the :ABORt command.</p> <p>Successful completion will clear bit 14 in the Status Questionable Calibration register.</p>
Preset	Not affected by Preset and Restore System Defaults Misc.
State Saved	No
Initial S/W Revision	E.14.00
<hr/>	
Mode	All
Remote Command	:CALibration:IF:NPENding
Example	CAL:IF:NPEN
Notes	<p>:CALibration:IF:NPENding is the same as :CALibration:IF including all conditions, status register bits, except that this scpi command does not BLOCK the scpi session, so the user should use status register bits to query if the calibration is successfully completed or not.</p> <p>Typical usage is:</p> <ol style="list-style-type: none"> 1) :CALibration:IF:NPENding (Start a IF calibration) 2) :STATus:OPERation:CONDition? (Check if the calibration is completed or not, If bit 0 is set, then the system is doing calibration, the user should repeat this scpi query until the bit is cleared) 3):STATus:QUEStionable:CALibration:CONDition? (Check if bit 4 is set or not. If this bit is set, that means there are some errors in previous internal source calibration)
Initial S/W Revision	X.14.20

Show Alignment Statistics

Shows alignment information you can use to ensure that the instrument is operating in a specific manner. The Show Alignment Statistics screen is where you can view time and temperature information.

Values which are displayed are only updated when the Show Alignment Statistics screen is invoked, they are not updated while the Show Alignment Statistics screen is being displayed. The remote commands that access this information obtain current values.

An example of the Show Alignment Statistics screen would be similar to:



A successful Align Now, RF will set the Last Align RF temperature to the current temperature, and reset the Last Align RF time. A successful Align Now, All or Align Now, All but RF will set the Last Align Now All temperature to the current temperature, and reset the Last Align Now All time. A successful Align Now, All will also reset the Last Align RF items if the RF portion of the Align Now succeeded.

Key Path	System, Alignments
Mode	All
Notes	The values displayed on the screen are only updated upon entry to the screen and not updated while the screen is being displayed.
Initial S/W Revision	Prior to A.02.00

Key Path	Visual annotation in the Show Alignment Statistics screen
Mode	All
Remote Command	:SYSTem:PON:TIME?
Example	:SYST:PON:TIME?
Notes	Value is the time since the most recent start-up in seconds.
State Saved	No
Initial S/W Revision	Prior to A.02.00

Key Path	Visual annotation in the Show Alignment Statistics screen
Mode	All
Remote Command	:CALibration:TEMPerature:CURREnt?
Example	:CAL:TEMP:CURR?

Notes	Value is in degrees Centigrade. Value is invalid if using default alignment data (Align Now, All required)
State Saved	No
Initial S/W Revision	Prior to A.02.00

Key Path	Visual annotation in the Show Alignment Statistics screen
Mode	All
Remote Command	:CALibration:TIME:LALL?
Example	:CAL:TIME:LALL?
Notes	Value is the elapsed time, in seconds, since the last successful Align Now, All or Align Now, All but RF was executed.
State Saved	No
Initial S/W Revision	Prior to A.02.00

Key Path	Visual annotation in the Show Alignment Statistics screen
Mode	All
Remote Command	:CALibration:TEMPerature:LALL?
Example	:CAL:TEMP:LALL?
Notes	Value is in degrees Centigrade at which the last successful Align Now, All or Align Now, All but RF was executed.
State Saved	No
Initial S/W Revision	Prior to A.02.00

Key Path	Visual annotation in the Show Alignment Statistics screen
Mode	All
Remote Command	:CALibration:TIME:LRF?
Example	:CAL:TIME:LRF?
Notes	Value is the elapsed time, in seconds, since the last successful Align Now, RF was executed, either individually or as a component of Align Now, All.
State Saved	No
Initial S/W Revision	Prior to A.02.00

Key Path	Visual annotation in the Show Alignment Statistics screen
Mode	All

Remote Command	:CALibration:TEMPerature:LRF?
Example	:CAL:TEMP:LRF?
Notes	Value is in degrees Centigrade at which the last successful Align Now, RF was executed, either individually or as a component of Align Now, All.
State Saved	No
Initial S/W Revision	Prior to A.02.00

Key Path	SCPI Only
Mode	All
Remote Command	:CALibration:TIME:LIF?
Example	:CAL:TIME:LIF?
Notes	Value is the elapsed time, in seconds, since the last successful Align IF was executed.
State Saved	No
Initial S/W Revision	A.14.50

Key Path	SCPI Only
Mode	All
Remote Command	:CALibration:TEMPerature:LIF?
Example	:CAL:TEMP:LIF?
Notes	Value is in degrees Centigrade at which the last successful Align IF was executed.
State Saved	No
Initial S/W Revision	A.14.50

Key Path	Visual annotation in the Show Alignment Statistics screen
Mode	All
Remote Command	:CALibration:TIME:SOURce:LALL?
Example	:CAL:TIME:SOUR:LALL?
Notes	Value is the date and time of the last successful Align Now, Source was performed on the instrument.
State Saved	No
Initial S/W Revision	A.05.00

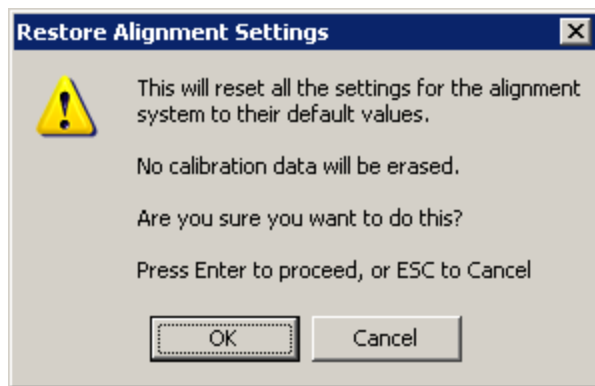
Key Path	Visual annotation in the Show Alignment Statistics screen
----------	---

Mode	All
Remote Command	:CALibration:TEMPerature:SOURce: LALL?
Example	:CAL:TEMP:SOUR:LALL?
Notes	Value is in degrees Centigrade at which the last successful Align Now, Source was performed on the instrument.
State Saved	No
Initial S/W Revision	A.05.00

Restore Align Defaults

Initializes the alignment user interface settings, not alignment data, to the factory default values. Align Now, All must be executed if the value of the Timebase DAC results in a change.

For front panel operation, you are prompted to confirm action before setting the alignment parameters to factory defaults:



The parameters affected are:

Parameter	Setting
Timebase DAC	Calibrated
Timebase DAC setting	Calibrated value
Auto Align State	Normal (if the instrument is not operating with default alignment data, Off otherwise)
Auto Align All but RF	Off
Auto Align Alert	Time & Temperature

Key Path	System, Alignments
Mode	All
Example	:SYST:DEF ALIG
Notes	Alignment processing that results as the transition to Auto Alignment Normal will be executed

sequentially; thus *OPC? or *WAI will wait until the alignment processing is complete.

Initial S/W Revision Prior to A.02.00

Execute Expired Alignments (Remote Command Only)

Alignments can be expired in the situation where Auto Align is in the state of Partial or Off. This feature runs the alignments that have expired. This is different than performing an Align All, Now operation. Align All, Now performs an alignment of all subsystems regardless of whether they are needed or not, with Execute Expired Alignments, only the individual subsystems that have become due are aligned.

Mode	All
Remote Command	:CALibration:EXPIred?
Example	:CAL:EXP?
Notes	:CALibration:EXPIred? returns 0 if successful :CALibration:EXPIred? returns 1 if failed
Initial S/W Revision	Prior to A.02.00

I/O Config

Activates a menu for identifying and changing the I/O configuration for remote control.

Key Path	System
Initial S/W Revision	Prior to A.02.00

SCPI LAN

Activates a menu for identifying and changing the SCPI over a LAN configuration. There are a number of different ways to send SCPI remote commands to the instrument over LAN. It can be a problem to have multiple users simultaneously accessing the instrument over the LAN. These keys limit that somewhat by disabling the telnet, socket, and/or SICL capability.

NOTE

Telnet port 5023, socket port 5025, SICL server 0 and HiSLIP server 0 will be assigned to first instance; Telnet port 5123, socket port 5125, SICL server 1 and HiSLIP server 1 will be assigned to second instance; Telnet port 5223, socket port 5225, SICL server 2 and HiSLIP server 2 will be assigned to third instance; Telnet port 5323, socket port 5325, SICL server 3 and HiSLIP server 3 will be assigned to the fourth instance.

Key Path	System, I/O Config
Initial S/W Revision	Prior to A.02.00

SCPI Telnet

Turns the SCPI LAN telnet capability On or Off allowing you to limit SCPI access over LAN through telnet.

Key Path	System, I/O Config, SCPI LAN
Mode	All
Remote Command	:SYSTem:COMMunicate:LAN:SCPI:TELNet:ENABle OFF ON 0 1 :SYSTem:COMMunicate:LAN:SCPI:TELNet:ENABle?
Example	:SYST:COMM:LAN:SCPI:TELN:ENAB OFF
Preset	This is unaffected by Preset but is set to ON with a "Restore System Defaults->Misc"
State Saved	No
Range	On Off
Initial S/W Revision	Prior to A.02.00

SCPI Socket

Turns the capability of establishing Socket LAN sessions On or Off. This allows you to limit SCPI access over LAN through socket sessions.

Key Path	System, I/O Config, SCPI LAN
Mode	All
Remote Command	:SYSTem:COMMunicate:LAN:SCPI:SOCKet:ENABle OFF ON 0 1 :SYSTem:COMMunicate:LAN:SCPI:SOCKet:ENABle?
Example	:SYST:COMM:LAN:SCPI:SOCK:ENAB OFF
Preset	This is unaffected by a Preset but is set to ON with a "Restore System Defaults->Misc"
State Saved	No
Range	On Off
Initial S/W Revision	Prior to A.02.00

SICL Server

Turns the SICL server capability On or Off, enabling you to limit SCPI access over LAN through the SICL server. (SICL IEEE 488.2 protocol.)

Parameter	Description	Setting
Maximum Connections	The maximum number of connections that can be accessed simultaneously	5
Instrument Name	The name (same as the remote SICL address) of your analyzer	inst0
Instrument Logical Unit	The unique integer assigned to your analyzer when using SICL LAN	8
Emulated GPIB Name	The name (same as the remote SICL address) of the device used	gpib7

	when communicating with your analyzer	
Emulated GPIB Logical Unit	The unique integer assigned to your device when it is being controlled using SICL LAN	8
Emulated GPIB Address	The emulated GPIB address assigned to your transmitter tester when it is a SICL server (the same as your GPIB address)	18

Key Path	System, I/O Config, SCPI LAN
Mode	All
Remote Command	:SYSTem:COMMunicate:LAN:SCPI:SICL:ENABle OFF ON 0 1 :SYSTem:COMMunicate:LAN:SCPI:SICL:ENABle?
Example	:SYST:COMM:LAN:SCPI:SICL:ENAB OFF
Preset	This is unaffected by Preset, but is set to ON with a "Restore System Defaults->Misc"
State Saved	No
Range	On Off
Initial S/W Revision	Prior to A.02.00

HiSLIP Server

Turns the HiSLIP server capability On or Off, enabling you to limit SCPI access over LAN through the HiSLIP server.

HiSLIP stands for High Speed LAN Instrument Protocol and is part of the IVI-6.1 specification.

Here is an example of a VISA connection string used to connect to the HiSLIP Server on an X-Series Spectrum Analyzer:

```
TCPIP0::a-n9030a-93016::hislip0::INSTR
```

In the example above, hislip0 is the HiSLIP device name that VISA users must include in their HiSLIP VISA Address strings. Your HiSLIP device name may be different depending on your VISA settings.

Key Path	System, I/O Config, SCPI LAN
Mode	All
Remote Command	:SYSTem:COMMunicate:LAN:SCPI:HISLip:ENABle OFF ON 0 1 :SYSTem:COMMunicate:LAN:SCPI:HISLip:ENABle?
Example	:SYST:COMM:LAN:SCPI:HISL:ENAB OFF
Preset	This is unaffected by Preset, but is set to ON with a "Restore System Defaults->Misc"
State Saved	No
Range	On Off
Initial S/W Revision	A.11.00

SCPI Socket Control Port (Remote Command Only)

Returns the TCP/IP port number of the control socket associated with the SCPI socket session. This query enables you to obtain the unique port number to open when a device clear is to be sent to the instrument. Every time a connection is made to the SCPI socket, the instrument creates a peer control socket. The port number for this socket is random. The user must use this command to obtain the port number of the control socket. To force a device clear on this socket, open the port and send the string "DCL" to the instrument.

If this SCPI command is sent to a non SCPI Socket interface, then 0 is returned.

Mode	All
Remote Command	:SYSTem:COMMunicate:LAN:SCPI:SOCKet:CONTrol?
Example	:SYST:COMM:LAN:SCPI:SOCK:CONT?
Preset	This is unaffected by Preset or "Restore System Defaults->Misc".
State Saved	No
Range	0 to 65534
Min	0
Max	65534
Initial S/W Revision	Prior to A.02.00

System IDN Response

This key allows you to specify a response to the *IDN? query, or to return the analyzer to the Factory response if you have changed it.

To choose the factory-set response, press the Factory key.

To specify your own response, press the User key, and enter your desired response.

If your test software is expecting the response to indicate Agilent Technologies as the Manufacturer, you can conveniently configure the response by pressing the Agilent key.

Key Path	System, I/O Config
Mode	All
Remote Command	
Notes	<ul style="list-style-type: none"> • This affects the response given in all Modes of the Analyzer, unless the current Mode has also specified a custom response, in which case the current Mode's custom IDN response takes precedence over the System's, but only while that Mode is the current Mode.. • It survives shutdown and restart of the software and therefore survives a power cycle
Preset	This is unaffected by Preset but is set to Factory on a "Restore System Defaults->Misc"
State Saved	No
Initial S/W Revision	A.06.00
Modified at S/W Revision	x.14.50

Factory

This key selects the factory setting, for example:

“Agilent Technologies,E6640,MY00012345, E.14.50”

where the fields are manufacturer, model number, serial number, firmware revision.

Note: In products that run multiple instances of the X-Series Application, all instances use the same factory System IDN response.

Key Path	System, I/O Config, IDN Response
Example	:SYST:IDN:CONF FACT
Initial S/W Revision	A.06.0

User

This key allows you to specify your own response to the *IDN? query. You may enter your desired response with the Alpha Editor or a plugin PC keyboard.

When you press this key, the active function becomes the current User string with the cursor at the end. This makes it easy to edit the existing string.

If you enter a null string (for example, by clearing the User String while editing and then pressing Done) the analyzer automatically reverts to the Factory setting.

Note: In products that run multiple instances of the X-Series Application, all instances use the same User System IDN response.

Key Path	System, I/O Config, IDN Response
Example	:SYST:IDN:CONF USER
Initial S/W Revision	A.06.00

Restore Defaults

Provides incremental initialization of the system setting groups along with supporting a comprehensive reset of the entire instrument back to a factory default state. The menu selections are the groups of system settings and when one is selected, that particular group of system settings is reset back to their default values.

NOTE

In products that run multiple instances of the X-Series Application, all instances have the same factory default states for Restore Defaults.

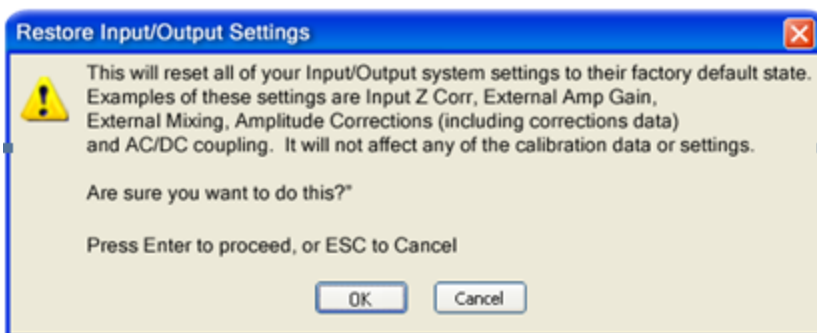
Key Path	System
Mode	All
Remote Command	:SYSTem:DEFault [ALL] ALIGn INPut MISC MODes PON

Example	SYST:DEF
State Saved	No
Initial S/W Revision	Prior to A.02.00

Restore Input/Output Defaults

Causes the group of settings and data associated with Input/Output front-panel key to be a reset to their default values. This level of Restore System Defaults does not affect any other system settings, mode settings and does not cause a mode switch. .

Confirmation is required to restore the Input/Output setting. The confirmation dialog is:

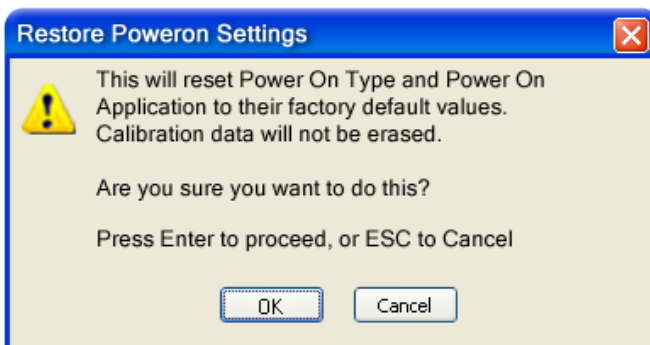


Key Path	System, Restore System Defaults
Example	:SYST:DEF INP
Initial S/W Revision	Prior to A.02.00

Restore Power On Defaults

This selection causes the Power On settings to be a reset to their default value. This level of Restore System Defaults does not affect any other system settings, mode settings and does not cause a mode switch. The Power On settings and their default values are Power On Type reset to Mode and Input/Output Defaults and Power On Application reset to whatever the factory set as its default value.

Confirmation is required to restore the factory default values. The confirmation dialog is:



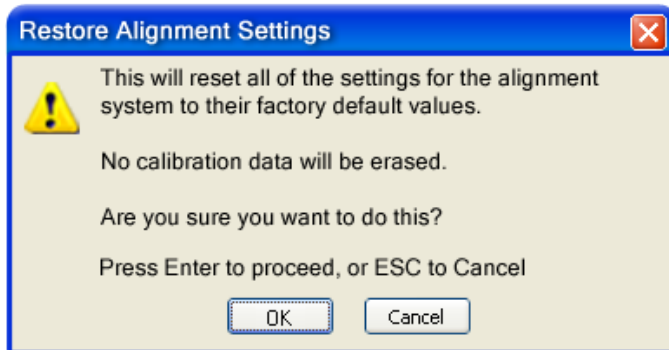
Key Path	System, Restore System Defaults
Example	:SYST:DEF PON
Initial S/W Revision	Prior to A.02.00

Restore Align Defaults

This selection causes the Alignment system settings to be a reset to their default values. This does not affect any Alignment data stored in the system. This level of Restore System Defaults does not affect any other system settings, mode settings and does not cause a mode switch.

After performing this function, it may impact the auto-alignment time of the instrument until a new alignment baseline has been established.

Confirmation is required to restore the factory default values. The confirmation dialog is:



Key Path	System, Restore System Defaults
Example	:SYST:DEF ALIG
Initial S/W Revision	Prior to A.02.00

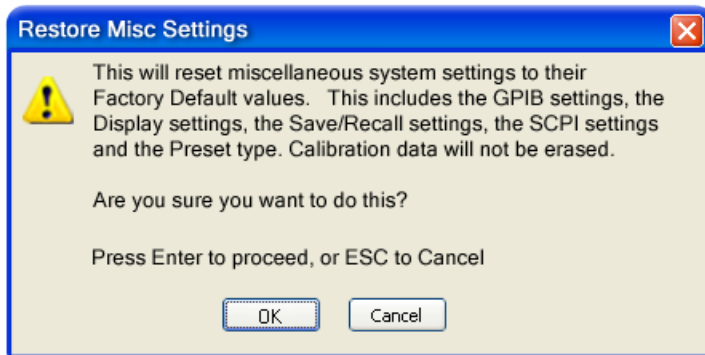
Restore Misc Defaults

This selection causes miscellaneous system settings to be reset to their default values. With this reset, you lose the GPIB address and it is reset to 18, so this should be used with caution. This level of Restore System Defaults does not affect any other system settings, mode settings and does not cause a mode switch. This miscellaneous group contains the rest of the settings that have not been part of the other Restore System Defaults groups. The following table is a complete list of settings associated with this group:

Miscellaneous Setting	Default Value
Verbose SCPI	Off
The SYST:PRES:TYPE	MODE
Auto File Name Number	000

Miscellaneous Setting	Default Value
Save Type	State
State Save To	Register 1
Screen Save To	SCREEN000.png
DISP:ENABle	ON
Full Screen	Off
SCPI Telnet	ON
SCPI Socket	ON
SICL Server	ON
Softkey Language	English
System Annotation	ON
Display Theme	TDColor
System IDN Response	Factory result of *IDN?
System IDN Response selection	Factory

Confirmation is required to restore the factory default values. The confirmation dialog is:

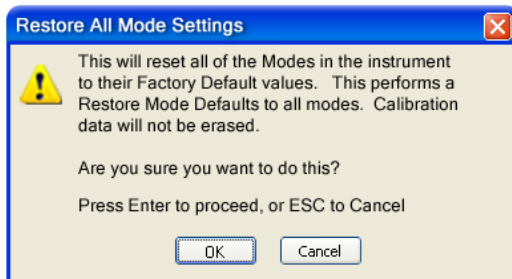


Key Path	System, Restore System Defaults
Example	:SYST:DEF MISC
Initial S/W Revision	Prior to A.02.00
Modified at S/W Revision	x.14.50

Restore Mode Defaults (All Modes)

This selection resets all of the modes in the instrument back to their default state just as a Restore Mode Defaults does and it switches the instrument to the power-on mode and causes the default measurement for the power-on mode to be active. This level of Restore System Defaults does not affect any system settings, but it does affect the state of all modes and does cause a mode switch unless the instrument was already in the power-on mode.

Confirmation is required to restore the factory default values. The confirmation dialog is:

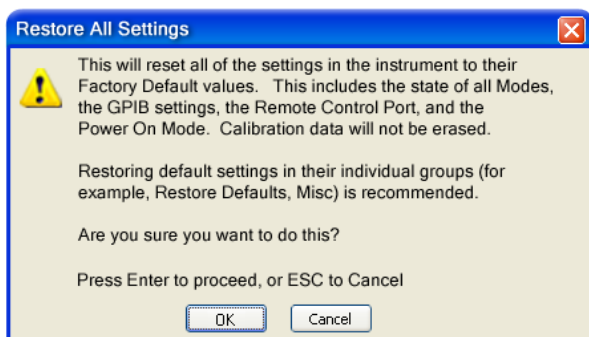


Key Path	System, Restore System Defaults
Example	:SYST:DEF MOD
Couplings	An All Mode will cause the currently running measurement to be aborted, mode switch to the power-on mode and activate the default measurement for the power-on mode.. It gets the mode to a consistent state with all of the default couplings set.
Initial S/W Revision	Prior to A.02.00

All

This performs a comprehensive reset of ALL analyzer settings to their factory default values. It resets all of the system setting groups, causes a Restore Mode Defaults for all modes in the instrument, and switches back to the power-on mode. It does not affect the User Preset file or any user saved files.

Confirmation is required to restore the factory default values. The confirmation dialog is:



NOTE

If you are using an Keysight USB External Mixer, then you will need to perform a Refresh USB Mixer Connection after Restoring All Defaults.

Key Path	System, Restore System Defaults
Example	:SYST:DEF ALL
Notes	If using Keysight USB External Mixer, perform a Refresh USB Mixer Connection (SCPI command :MIX:BAND USB) following a Restore All Defaults.
Couplings	An All will cause the currently running measurement to be aborted and get all modes to a consistent state, so it is unnecessary to couple any settings.
Initial S/W Revision	Prior to A.02.00
Modified at S/W Revision	A.14.00

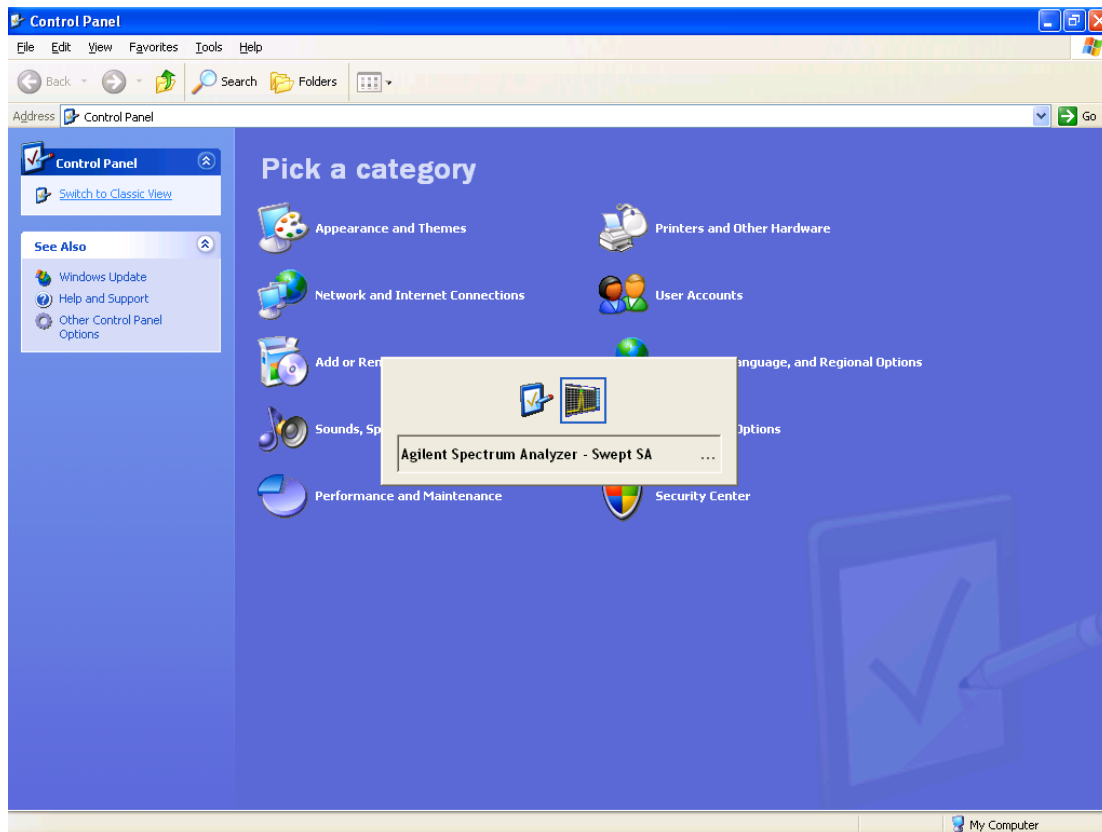
Control Panel...

Opens the Windows Control Panel. The Control Panel is used to configure certain elements of Windows that are not configured through the hardkey/softkey System menus.


NOTE This feature is not available if option SF1 is installed.

The Control Panel is a separate Windows application, so to return to the analyzer once you are in the Control Panel, you may either:

Exit the Control Panel by clicking on the red X in the upper right hand corner, with a mouse





Or use Alt-Tab: press and hold the Alt  key and press and release the Tab key until the Analyzer logo is showing in the window in the center of the screen, as above, then release the Alt key.

Key Path	System
Notes	No remote command for this key.
Initial S/W Revision	Prior to A.02.00

Licensing...

Opens the license explorer.

NOTE This feature is not available if option SF1 is installed.

For Help on this key, select Help in the menu bar at the top of the license explorer window.

Key Path	System
Notes	No equivalent remote command for this key.
Backwards Compatibility Notes	In ESA the SCPI command for displaying the Show Licenses screen is: :SYSTem:CONFigure:LKEY:STATe OFF ON 0 1 :SYSTem:CONFigure:LKEY:STATe? There are no equivalent SCPI commands in the X-Series for displaying the License Explorer.
Initial S/W Revision	Prior to A.02.00

Remote Command :SYSTem:LKEY <"OptionInfo">, <"LicenseInfo">

Example SYST:LKEY "N9073A-1FP",
"027253AD27F83CDA5673A9BA5F427FDA5E4F25AEB1017638211AC9F60D9C639FE539735909C551DE0A91"

Notes The <"OptionInfo"> contains the feature and the version. You must specify the feature but can omit the version. If you omit the version, the system regards it as the latest one, since the system knows which version is supported for each feature.

The <"LicenseInfo"> contains the signature, the expiration date, and serial number for transport if transportable. You must specify the signature, but you can omit the other information. If you omit the expiration date, the system regards it as permanent. If you omit the serial number, the system regards it as non-transportable. As a result, this supports reverse compatibility.

Initial S/W Revision Prior to A.02.00

Remote Command :SYSTem:LKEY:DELeTe <"OptionInfo">, <"LicenseInfo">

Example	SYST:LKEY:DEL 'N9073A-1FP', "027253AD27F83CDA5673A9BA5F427FDA5E4F25AEB1017638211AC9F60D9C639FE539735909C551DE0A91"
Notes	The <"OptionInfo"> contains the feature and the version. You must specify the feature but can omit the version. If you omit the version, the system regards it as the latest one, if more than one version is installed. The <"LicenseInfo"> contains the signature, the expiration date, and whether or not be transportable. You must specify the signature, but you can omit the other information. If you omit the expiration date, the system regards it as permanent. If you omit the transportability, the system regards it as non-transportable. As a result, this supports reverse compatibility.
Initial S/W Revision	Prior to A.02.00

Remote Command	:SYSTem:LKEY:LIST?
Notes	<p>Return Value: An <arbitrary block data> of all the installed instrument licenses. The format of each license is as follows. <Feature>,<Version>,<Signature>,<Expiration Date>,<Serial Number for Transport></p> <p>Return Value Example: #3136 N9073A-1FP,1.000,B043920A51CA N9060A-2FP,1.000,4D1D1164BE64 N9020A-508,1.000,389BC042F920 N9073A-1F1,1.000,5D71E9BA814C,13-aug-2005</p> <p><arbitrary block data> is: #NMMM<data></p> <p>Where: N is the number of digits that describes the number of MMM characters. For example if the data was 55 bytes, N would be 2. MMM would be the ASCII representation of the number of bytes. In the previous example, N would be 55. <data> ASCII contents of the data</p>
Initial S/W Revision	Prior to A.02.00

Remote Command	:SYSTem:LKEY? <"OptionInfo">
Example	SYST:LKEY? "N9073A-1FP"
Notes	The <"OptionInfo"> contains the feature and the version. You must specify the feature but can omit the version. If you omit the version, the system regards it as the latest one. Return Value: <"LicenseInfo"> if the license is valid, null otherwise.

	<"LicenseInfo"> contains the signature, the expiration date, and serial number if transportable. Return Value Example: "B043920A51CA"
Initial S/W Revision	Prior to A.02.00

Remote Command	:SYSTem:HID?
Notes	Return value is the host ID as a string
Initial S/W Revision	Prior to A.02.00

Security

Accesses capabilities for operating the instrument in a security controlled environment.

Key Path	System
Initial S/W Revision	A.04.00

USB

The Windows operating system can be configured to disable write access to the USB ports for users who are in a secure environment where transferring data from the instrument is prohibited. This user interface is a convenient way for the customer to disable write access to USB.

Key Path	System, Security
Mode	All
Scope	Mode Global
Remote Command	:SYSTem:SECurity:USB:WPRotect[:ENABle] ON OFF 0 1 :SYSTem:SECurity:USB:WPRotect[:ENABle]?
Example	:SYST:SEC:USB:WPR ON Will set USB ports to Read-only
Notes	When the USB ports are in Read-only mode then no data can be stored to USB, including the internal USB memory used for a back-up location for the calibration data.
Dependencies	This key is grayed-out unless the current user has administrator privileges.
Preset	This is unaffected by Preset or any Restore System Defaults. An Agilent Recovery will set the USB to write protect OFF
State Saved	No
Range	Read-Write Read only
Initial S/W Revision	A.04.00

Read-Write

Selection for allowing full read-write access to the USB ports.

Key Path	System, Security, USB	
Example	:SYST:SEC:USB:WPR OFF	Will set USB ports to Read-Write
Initial S/W Revision	A.04.00	

Read only

Selection for disabling write access to the USB ports.

Key Path	System, Security, USB	
Example	:SYST:SEC:USB:WPR ON	Will set USB ports to Read only
Initial S/W Revision	A.04.00	

Diagnostics

The Diagnostics key in the System menu gives you access to basic diagnostic capabilities of the instrument.

Key Path	System
Initial S/W Revision	Prior to A.02.00

Show Hardware Statistics

Provides a display of various hardware statistics. The statistics include the following:

- High and Low temperature extremes
- Elapsed time that the instrument has been powered-on (odometer)

The display should appear listing the statistics, product number, serial number, and firmware revision.

Hardware Statistical Information	
Agilent MXA Signal Analyzer	
Product Number: N9020A	
Serial Number: US00061145	
Instrument S/W Revision: A.12.00	
Revision Date: 7/11/2012 12:11:10 PM	
Component Name	Value
MechAtten #1 Count Total	457304
Calibrator Switch Cycles	105953
AC/DC Switch Cycles	114240
2 dB #1 Mechanical Atten Cycles	112655
2 dB #2 Mechanical Atten Cycles	124456
MechAtten #2 Count Total	472265
6 dB Mechanical Atten Cycles	115302
10 dB Mechanical Atten Cycles	93602
20 dB Mechanical Atten Cycles	144781
30 dB Mechanical Atten Cycles	118580
Low Noise Path Switch	45668
Preselector Bypass Cycles	31133
High temperature operating extreme	45.75
Low temperature operating extreme	-23.9375
Elapsed Time (On-Time)(hours)	134164

In some CXA models this field is called "Fixed Aten"

Some CXA models omit these fields

Only shown if LNP installed
Only shown if MPB installed

The CXA models in which the AC/DC Switch field is called Fixed Aten and that omit the mechanical attenuation fields are the N9000A-503/507 models.

Modular HWs only have time and temperature information in Show Hardware Statistics.

The data will be updated only when the Show Hardware Statistics menu key is pressed, it will not be updated while the screen is displayed.

The tabular data should be directly printable.

Key Path	System, Diagnostics
Mode	All
Notes	The values displayed on the screen are only updated upon entry to the screen and not updated while the screen is being displayed.
Initial S/W Revision	Prior to A.02.00

SCPI for Show Hardware Statistics (Remote Commands Only)

Each of the hardware statistic items can be queried via SCPI.

- Error! Reference source not found.
- Error! Reference source not found.
- Error! Reference source not found.

Self test

This key gives you access to diagnostic capabilities for self tests of the instrument.

Key Path	System, Diagnostics
Initial S/W Revision	Prior to A.10.00

All Self Test

This key invokes all the self tests defined in the Diagnostics Self Test section.

Key Path	System, Diagnostics, Self Test
Remote Command	SYSTem:TEST:WCTS:[ALL]
Example	SYST:TEST:WCTS:[ALL]
Initial S/W Revision	A.12.50

FEC Self Test

This key invokes the EXT E6607C front end control self test. When operation is complete, the generated test summary information is appended to log file E:\Agilent\Instrument\FECTestLog.txt. This test summary file can be retrieved from the instrument using the MMEM set of SCPI command, once you have the fully qualified the path and file name.

If the self test fails, the following error message will be generated:

“-330, Self-test failed, see log file E:\Agilent\Instrument\FECTestLog.txt”

If the self test passes, an advisory message “FEC self-test completed successfully” is generated.

Key Path	System, Diagnostics, Self Test
Remote Command	SYSTem:TEST:WCTS:FEC
Example	SYST:TEST:WCTS:FEC
Notes	Access log with command : MMEM:DATA? "E:\ Agilent\Instrument\FECTestLog.txt"
Initial S/W Revision	A.12.50

Show Result

This key gives you access to show results of the following self tests:

- Source self-test results
- E6607C embedded MPA or E6640A/E6650A RFIO self-test results
- E6607C FEC self-test results

Key Path	System, Diagnostics, Self Test
Initial S/W Revision	A.12.50

FEC Self Test Results

Provides a display of last FEC test results, the display should appear listing model number, serial number and test time at the top of display, and then list test date/time, test name, measured value, valid range and pass/fail of each FEC test item, the tabular data should be directly printable.

Key Path	System, Diagnostics, Self Test, Show Results
Remote Command	SYSTem:TEST:WCTS:SHOW:RESult FEC
Example	SYST:TEST:WCTS:SHOW:RES FEC
Initial S/W Revision	A.12.50

The example of FEC self test result display is as follows:

FEC Self Test Results					
Produce Number: E6607C					
Serial Number: MY51380437					
Instrument S/W: 11/16/2012 2:51:19 PM					
FpgaVersionTest					
Date	Time(GMT)	Name	MeasValue	ValidRange	Result
11/23/2012	16:13:56	Analog_FPGA	16.000	>= 16.000	Pass
11/23/2012	16:13:56	Digital_FPGA	50.000	>= 46.000	Pass
11/23/2012	16:13:56	CRFS_FPGA	38.000	>= 38.000	Pass
PowerSupplyTest					
Date	Time(GMT)	Name	MeasValue	ValidRange	Result
11/23/2012	16:13:56	ABUS_+32CHK	31.904	30.900 - 32.900	Pass
11/23/2012	16:13:56	ABUS_+12CHK	12.296	10.800 - 13.200	Pass
11/23/2012	16:13:56	+10VA	9.935	9.600 - 10.200	Pass
11/23/2012	16:13:56	+5VA	4.995	4.900 - 5.100	Pass
11/23/2012	16:13:56	+3.3VA	3.299	3.200 - 3.400	Pass
11/23/2012	16:13:56	-3.3VA	-3.311	-3.400 - - 3.200	Pass
11/23/2012	16:13:56	ACOM	0.00	-0.200 -	Pass

				0.200	
11/23/2012	16:13:56	-5VA	-5.036	-5.100 - - 4.900	Pass
11/23/2012	16:13:56	-6.1VA	-5.880	-6.200 - - 5.700	Pass
11/23/2012	16:13:56	-10VA	-10.116	-10.200 - - 9.800	Pass
11/23/2012	16:13:56	ABUS_-2.5V_REF	-2.508	-2.520 - - 2.470	Pass
11/23/2012	16:13:56	ABUS_+2.5V_REF	2.508	2.480 - 2.520	Pass
11/23/2012	16:13:56	ABUS_-10VPALC	-10.047	-10.200 - - 9.800	Pass
11/23/2012	16:13:57	ABUS_DET_MOD_FLT	18.000	7.800 - 100.000	Pass

Show FEC Self Test Results contents (Remote Command Only)

A remote command is available to obtain the contents of the Show FEC Self Test Results screen (the entire contents, not just the currently displayed page).

Remote Command	SYSTem:TEST:WCTS:FEC:RESult?
Example	SYST:TEST:WCTS:FEC:RES?
Notes	The output is an IEEE Block format of the Show FEC Self Test Results contents. Each line is separated with a new-line character.
Initial S/W Revision	A.12.50

	Keysight Converged	PSA
IP Address	SYSTem:COMMunicate:LAN:ADDRess <string> SYSTem:COMMunicate:LAN:ADDRess?	:SYSTem:COMMunicate:LAN[;SELF]:IP <string> :SYSTem:COMMunicate:LAN[;SELF]:IP?
Gateway	SYSTem:COMMunicate:LAN:DGATeway <string> SYSTem:COMMunicate:LAN:DGATeway?	:SYSTem:COMMunicate:LAN[;SELF]:GATEway <string> :SYSTem:COMMunicate:LAN[;SELF]:GATEway?
Subnet Mask	SYSTem:COMMunicate:LAN:SMASK <string> SYSTem:COMMunicate:LAN:SMASK?	:SYSTem:COMMunicate:LAN[;SELF]:SUBNetmask <string> :SYSTem:COMMunicate:LAN[;SELF]:SUBNetmask?

Internet Explorer...

This key launches Microsoft Internet Explorer. A mouse and external keyboard are highly desired for using Internet Explorer. When Internet Explorer is running, close Internet Explorer to return focus to the Instrument Application (or use Alt-Tab).

Key Path	System
Mode	All
Notes	No equivalent remote command for this key.
Initial S/W Revision	A.05.01

6 Trigger Functions

6 List Sequence Measurements

There is a List Sequencer in both the source and analyzer of the test set. The List Sequencer provides the ability to set up a Sequence of radio signals that you can generate from the source and a separate list of radio signals that you expect to receive in the analyzer. The List Sequencer, therefore, allows you to test the radio characteristics of a mobile device that uses multiple radio standards. A Sequence that you set up in the List Sequencer comprises multiple radio standards for user-defined periods of time, allowing you to set up stimuli and analysis that correspond to your existing production line test needs.

This section details the remote commands to fetch the measurement results and also what results are returned for each measurement.

See

Measurement Commands for List Sequencer

The following commands are used to retrieve the measurement results:

`:CONFigure:LSEQuencer`

`:CONFigure:LSEQuencer:NDEFault`

`:INITiate:LSEQuencer`

`:FETCh:LSEQuencer [1] | 2 | 3?`

`:READ:LSEQuencer [1] | 2 | 3?`

`:MEASure:LSEQuencer [1] | 2 | 3?`

`:CONFigure:LSEQuencer:NDEFault` stops the current measurement and changes to the specified measurement. It does not change the settings to the defaults. It does not initiate the taking of measurement data unless `INIT:CONTinuous` is ON.

Remote Command Results for List Sequencer Measurement

Condition	N	Results Returned
Mode = Sequence Analyzer	Not specified or n=1	<p>The return order is Acquisition 1 results in Analysis Step and Meas Bitmap order for all selected measurements followed by Acquisition 2 results etc. The table below shows the order. See the Integrity Indicator section for more details on the integrity values.</p> <p>Results for each step:</p> <ol style="list-style-type: none"> 1. Total number of real values returned for the Sequence, including this one. 2. Reserved for Keysight use. 3. Summary Integrity value for entire Sequence. All integrity values OR'd together. 4. Total number of Acquisitions for entire Sequence. 5. Summary Integrity value for Acquisition 1. 6. Number of Analysis Steps in Acquisition 1 7. Summary Integrity value for Analysis Interval 1 8. Analysis Interval 1 Measurement Bit Map - decimal representation 9. Integrity value for 1st measurement in Analysis Interval 1 10. Number of results in first measurement in Analysis Interval 1 11. Measurement results for first measurement in Analysis Interval 1 12. Integrity value for 2nd measurement in Analysis Interval 1 13. Number of results in 2nd measurement in Analysis Interval 1 14. Measurement results for 2nd measurement in Analysis Interval 1 15. ...repeat 12 to 14 for all other measurements in Analysis Interval 1 16. Summary Integrity value for Analysis Interval 2 17. Analysis Interval 2 Measurement Bit Map - decimal representation 18. Integrity value for 1st measurement in Analysis Interval 2 19. Number of results in first measurement in Analysis Interval 2 20. Measurement results for first measurement in Analysis Interval 2 21. Integrity value for 2nd measurement in Analysis Interval 2 22. Number of results in 2nd measurement in Analysis Interval 2 23. Measurement results for 2nd measurement in Analysis Interval 2 24. ...repeat 21 to 23 for all other measurements in Analysis Interval 2 25. ...repeat 16 to 24 for all other Analysis Intervals in Acquisition 1 26. ...repeat 5 to 25 for Acq 2 and for all subsequent Acq's in the Sequence <p>The format of the results for each measurement is detailed in the following sections. Each measurement returns all results when queried remotely.</p> <p>If the Sequence is aborted manually, then NANs are returned. If the Sequence is aborted due to "Abort on Limit Fail", then results return NANs from point of failure and valid results prior to that. To find out where Limit failed use FETC:LSEQ3?</p>

		If the Sequence is aborted due to “Abort on Error”, then results return NANs from point of failure and valid results prior to that. To find out where error occurred use FETC:LSEQ3?
Mode = Sequence Analyzer	2	Returns a pass fail < AcqNum> 0 for the entire Sequence. This returns a fail if any meas limit fails OR if an error occurs. “0” means entire Sequence passed limits and no error occurred. If fail then the number returned is the Acquisition number (AcqNum) of first acquisition to fail a limit OR first acquisition that invoked an error. If the Sequence is aborted manually, then results return -1.
Mode = Sequence Analyzer	3	Returns three integer numbers, Acquisition number, followed by Analysis Interval Number, followed by the Meas Bitmap Number of first detected position to fail a limit OR that invoked an error. Note: since the measurements are made in multiple threads the first limit fail or error to be detected may not necessarily be the first one sequentially. If the Sequence is aborted manually, then results return -1, -1, -1.

For an example of the results returned see ["Example for two Acquisitions, each containing two Analysis Steps" on page 240e](#).

In addition an Acquisition’s results can be queried on its own using:

```
:FETCh:LSEQuencer[1]:ACQuire[1]|2|3|4..512?
```

```
:READ:LSEQuencer[1]:ACQuire[1]|2|3|4..512?
```

```
:MEASure:LSEQuencer[1]:ACQuire[1]|2|3|4..512?
```

This returns all result metrics for the specific acquisition “AcqNum”. Performing a READ initiates the full Sequence and returns only the AcqNum’s results. If the Sequence is aborted manually, then results return NANs. If the Sequence is aborted due to “Abort on Limit Fail”, then results return NANs from point of failure and valid results prior to that. If Sequence is aborted due to “Abort on Error”, then results return NANs from point of failure and valid results prior to that. To find out where Limit failed or error occurred use FETC:LSEQ3?

The result structure is very like the table for FETC:LSEQ1? above, but some fields about the whole sequence are removed.

Step	Result
1	Total number of real values returned for this scpi command, including this one.
2	Reserved for Keysight use.

3	Summary Integrity value for the specified acquisition.
4	Number of Analysis Steps in the specified acquisition.
5	Summary Integrity value for Analysis interval 1
6	Analysis Interval 1 Measurement Bit Map - decimal representation
7	Integrity value for 1st measurement in Analysis Interval 1
8	Number of results in first measurement in Analysis Interval 1
9	Measurement results for first measurement in Analysis Interval 1
10	Integrity value for 2nd measurement in Analysis Interval 1
11	Number of results in 2nd measurement in Analysis Interval 1
12	Measurement results for 2nd measurement in Analysis Interval 1
13	..repeat 10 to 12 for all other measurements in Analysis Interval 1
14	Summary Integrity value for Analysis Interval 2
15	Analysis Interval 2 Measurement Bit Map - decimal representation
16	Integrity value for 1st measurement in Analysis Interval 2
17	Number of results in first measurement in Analysis Interval 2
18	Measurement results for first measurement in Analysis Interval 2
19	Integrity value for 2nd measurement in Analysis Interval 2
20	Number of results in 2nd measurement in Analysis Interval 2
21	Measurement results for 2nd measurement in Analysis Interval 2
22	..repeat 19 to 21 for all other measurements in Analysis Interval 2
23	..repeat 14 to 22 for all other Analysis Intervals in Acquisition 1

And it is also supported to query the results by specifying the acquisition step and the analysis step:

```
:FETCh:LSEQuencer[1]:ACQuire[1]|2|...|512:ASTep[1]|2|...|1000?
```

```
:READ:LSEQuencer[1]:ACQuire[1]|2|...|512:ASTep[1]|2|...|1000?
```

```
:MEASure:LSEQuencer[1]:ACQuire[1]|2|...|512:ASTep[1]|2|...|1000?
```

The returned results are defined as the following table

Step	Result
1	Total number of real values returned for this scpi command, including this one.
2	Reserved for Keysight use.
3	Summary Integrity value for the specified Analysis interval
4	Measurement Bit Map - decimal representation
5	Integrity value for 1st measurement in this Analysis Interval
6	Number of results in first measurement in Analysis Interval
7	Measurement results for first measurement in Analysis Interval

8	Integrity value for 2nd measurement in Analysis Interval
9	Number of results in 2nd measurement in Analysis Interval
10	Measurement results for 2nd measurement in Analysis Interval
11	..repeat 8 to 10 for all other measurements in Analysis Interval

The entire Sequence results can still be queried using the FETC:LSEQ1? detailed above.

To query the actual average count of specified analysis step, the following SCPI commands are provided:

```
:FETCh:LSEQuencer[1]: ACQuire[1]2|...|512:ASTep[1]2|...|1000:AVERage?
```

```
:READ:LSEQuencer[1]: ACQuire[1]2|...|512:ASTep[1]2|...|1000:AVERage?
```

```
:MEASure:LSEQuencer[1]: ACQuire[1]2|...|512:ASTep[1]2|...|1000:AVERage?
```

The returned actual average count should be equal to the "Avg Number" on page 380 if "Ignore Error In Average" on page 298 is OFF, and might be less than or equal to the user setting "Avg Number" on page 380 when "Ignore Error In Average" on page 298 is set to ON. "Avg Number" on page 380

Asynchronized FETCh scpi commands are used to get the results back as soon as possible once the queried results are available. Comparing with the normal FETCh scpi commands, the user don't need to wait for the whole sequence completion. For example, the user might get the results of the 1st acquisition while the instrument is performing the 2nd or the 3rd acquisition.

```
:FETCh:LSEQuencer:ASYNc:ACQuire{1:512}:STATe?/qonly/
```

This scpi command is to query if the results of the specified acquisition are available.

If it returns 0, that means the results are still in calculation. Otherwise, it means the specified acquisition results are ready to query.

```
:FETCh:LSEQuencer:ASYNc:ACQuire{1:512}?/qonly/
```

Return the results of specified acquisition once the results are available no matter if the whole sequence is completed or not.

NOTE This scpi command will be blocked until the results are ready.
The results definition is the same as :FETCh:LSEQuencer:ACQuire{1:512}?/qonly/

```
:FETCh:LSEQuencer:ASYNc:ACQuire{1:512}:ASTep{1:1000}?/qonly/
```

Return the results of specified analysis step once the results are available no matter if the whole sequence is completed or not.

NOTE This scpi command will be blocked until the results are ready.
The results definition is the same as :FETCh:LSEQuencer:ACQuire{1:512}:ASTep{1:1000}?/qonly/

```
:INITiated:LSEQuencer:ARMed?
```

This scpi command provides the capability to indicate if the sequence has finished its initialization. It won't return until the instrument is ready to perform capture.

NOTE

The MEASure query MEAS:LSEQ1|2|3? presets the test set to the default state and returns default results. This has limited use since a preset returns the Sequence settings and meas setup parameters to their default settings, and hence the results are not useful.

Key Path	Meas
Mode	Sequence Analyzer
Initial S/W Revision	A.05.00

6 List Sequence Measurements
File

File

See ["File" on page 162](#)

Input/Output

See ["Input/Output" on page 112](#)

Marker

The Marker key accesses the Marker menu. A marker can be placed on a trace to allow the value of the trace at the marker point to be determined precisely. The functions in this menu include a 1-of-N selection of the control mode Normal, Delta, or Off for the selected marker.

Markers may also be used in pairs to read the difference (or delta) between two data points. They can be used in Marker Functions to do advanced data processing, or to specify operating points in functions like Signal Track and N dB Points.

Key Path	Front-Panel
Initial S/W Revision	A.05.00

Marker Select

Specifies the selected marker. The term “selected marker” is used specify which marker is affected by the functions.

Key Path	Marker
Notes	The selected marker is remembered even when not in the Marker menu and is used if a Search is done or a Band Function is turned on or for Signal Track or Continuous Peak.
Preset	Marker 1
State Saved	The number of the selected marker is saved in instrument state.
Initial S/W Revision	A.05.00

Marker Control Mode

There are three control modes for markers:

Normal (POSition) - A marker that can be moved to any point on the X Axis by specifying its X Axis value; its absolute Y Axis value is then the value of the trace point at that X Axis value.

D Delta (DELTA) - A marker that can be moved to any point on the X Axis by specifying its X Axis offset from a reference marker; its absolute Y Axis value is then the value of the trace point at that X Axis value.

Off (OFF) - A marker which is not in use.

The command in the table below selects the marker and sets the marker control mode as described under Normal, Delta, and Off, below. All interactions and dependencies detailed under the key description are enforced when the remote command is sent.

Remote Command	:CALCulate:LSEQuencer:MARKer[1] 2 ... 12:MODE POSition DELTA OFF :CALCulate: LSEQuencer:MARKer[1] 2 ... 12:MODE?
Preset	OFF (all markers)
State Saved	The marker control mode is saved in instrument state
Initial S/W Revision	A.05.00

Normal

Sets the control mode for the selected marker to Normal and turns on the active function for setting its value. If the selected marker was Off, it is placed at the center of the screen on the trace specified by the marker's Trace attribute.

A Normal mode (POSition type) marker can be moved to any point on the X Axis by specifying its X Axis value. Its absolute Y Axis value is then the value of the trace point at that X Axis value.

Key Path	Marker
Example	:CALC:LSEQ:MARK:MODE POS
Notes	See the description under the "Marker" key.
Couplings	The marker addressed by this command becomes the selected marker on the front panel.
State Saved	The marker control mode (Normal, Delta, Fixed) and X Axis value are saved in instrument state.
Initial S/W Revision	A.05.00

Delta

Sets the control mode for the selected marker to Delta and turns on the active function for setting its delta value. If the selected marker was Off, it is placed at the center of the screen on the trace specified by the marker's Trace attribute.

In Delta mode the marker result shows the relative result between the selected (Delta) marker and its reference marker. A delta marker can be moved to any point on the X Axis by specifying its X Axis offset from a reference marker. Its absolute Y Axis value is then the value of the trace point at that X Axis value.

Key Path	Marker
Example	:CALC:LSEQ:MARK:MODE DELT
Notes	See the description under the "Marker" key.
State Saved	The marker control mode (Normal, Delta, Off) and X Axis value are saved in instrument state
Initial S/W Revision	A.05.00

Off

Turns off the selected marker and any of its marker function settings. However, Off does not affect which marker is selected.

Key Path	Marker
Example	:CALC:LSEQ:MARK:MODE OFF
Notes	See the description under the "Marker" key.
State Saved	The marker control mode (Normal, Delta, Off) is saved in instrument state
Initial S/W Revision	A.05.00

Properties

Opens a menu used to set certain properties of the selected marker.

Key Path	Marker
Initial S/W Revision	A.05.00

Select Marker

Duplicate of the Select Marker key under Marker. Selecting a marker here causes the same marker to be selected under Marker. (That is, there is only one “selected marker”.)

Relative To

Determines which marker that the selected marker is relative to (its reference marker).

Every marker has another marker to which it is relative. This marker is referred to as the “reference marker” for that marker. This attribute is set by the Marker, Properties, Relative To key. The marker must be a Delta marker to make this attribute relevant. If it is a Delta marker, the reference marker determines how the marker is controlled and how its value is displayed. A marker cannot be relative to itself.

Key Path	Marker, Properties
Remote Command	:CALCulate:LSEQuencer:MARKer[1] 2 ... 12:REFerence <integer> :CALCulate:LSEQuencer:MARKer[1] 2 ... 12:REFerence?
Example	CALC:LSEQ:MARK1:REF 2
Notes	A marker cannot be relative to itself so that choice is unavailable, and if sent from SCPI generates error -221: "Settings conflict; marker cannot be relative to itself." You must be in the SEQAN mode to use this command. Use INSTRument:SElect to set the mode. When queried a single value is returned (the specified marker numbers relative marker).
Couplings	The act of specifying the selected marker's reference marker makes the selected marker a Delta marker.
Preset	The preset default “Relative To” marker (reference marker) is the next higher numbered marker (current marker +1). For example, , if marker 2 is selected, , then its default reference marker is marker 3. The exception is marker 12, , which has a default reference of marker 1. Set to the defaults by using Restore Mode Defaults. This is not reset by Marker Off, , All Markers Off, , or Preset.
State Saved	Saved in instrument state. Not affected by Marker Off and hence not affected by Preset or power cycle.
Min	1
Max	12
Initial S/W Revision	A.05.00

Marker Trace

Assigns the specified marker to the designated trace.

Key Path	Marker, Properties
Remote Command	:CALCulate:LSEQuencer:MARKer[1] 2 ... 12:TRACe RFENvelope MAXRfenvelop MINRfenvelop :CALCulate:LSEQuencer:MARKer[1] 2 ... 12:TRACe?
Example	CALC:LSEQ:MARK1:TRAC RFEN CALC:LSEQ:MARK1:TRAC?
Notes	You must be in the SEQAN mode to use this command. Use INSTRument:SElect to set the mode.
Couplings	Max Hold RF Envelop is only available when Max Hold Trace is set to On. Min Hold RF Envelop is only available when Min Hold Trace is set to On. Otherwise, the menu keys are unavailable and the commands are unavailable.
Preset	RFENvelope
State Saved	Saved in instrument state.
Range	RFENvelope MAXHold MINHold
Initial S/W Revision	A.05.00

Setting the Marker X Axis Value (Remote Command Only)

The command below sets the marker X Axis value in the current marker X Axis Scale unit. In each case the marker that is addressed becomes the selected marker. It has no effect (other than to cause the marker to become selected) if the control mode is s Off, but it is the SCPI equivalent of entering an X value if the control mode is Normal or Delta.

Key Path	Remote Only
Remote Command	:CALCulate:LSEQuencer:MARKer[1] 2 ... 12:X <real> :CALCulate:LSEQuencer:MARKer[1] 2 ... 12:X?
Notes	If no suffix is sent, uses the fundamental units for the current marker X-axis scale. If a suffix is sent that does not match the current marker X-axis scale unit, an error "Invalid suffix" is generated. The query returns the marker's absolute X-axis value if the control mode is Normal, or the offset from the marker's reference marker if the control mode is Delta. The query is returned in the fundamental units for the current marker X-axis scale. If the marker is Off the response is not a number. You must be in the SEQAN mode to use this command. Use INSTRument:SElect to set the mode.
Preset	After a preset, , all markers are turned OFF, , so Marker X-axis Value query returns a not a number (NAN).
Min	-9.9E37
Max	9.9E37
Initial S/W Revision	A.05.00

Setting the Marker X Position in Trace Points (Remote Command Only)

Sets the marker X position in trace points. It has no effect if the control mode is Off, but is the SCPI equivalent of entering a value if the control mode is Normal or Delta, except in trace points rather than X-axis scale units. The entered value is immediately translated into the current X-axis scale units for setting the value of the marker

Key Path	Remote Only
Remote Command	:CALCulate:LSEQuencer:MARKer[1] 2 ... 12:X:POSition <real> :CALCulate:LSEQuencer:MARKer[1] 2 ... 12:X:POSition?
Notes	The query returns the marker's absolute X-axis value in trace points if the control mode is Normal, or the offset from the marker's reference marker in trace points if the control mode is Delta. If the marker is Off the response is not a number. You must be in the SEQAN mode to use this command. Use INSTRument:SElect to set the mode.
Preset	After a preset, , all markers are turned OFF, , so Marker X-axis Value query returns a not a number (NAN).
Min	0
Max	19999
Initial S/W Revision	A.05.00

Marker Y-axis Value (Remote Command Only)

The command below selects the marker and sets the marker Y Axis value in the current marker Y Axis Scale unit.

Key Path	Remote Only
Remote Command	:CALCulate:LSEQuencer:MARKer[1] 2 ... 12:Y?
Example	CALC:LSEQ:MARK2:Y?
Preset	Trace value at center of screen. There is no way to predict what this will be after a preset.
Initial S/W Revision	A.05.00

Select Marker

Specifies the selected marker. The term “selected marker” is used to specify which marker is affected by the functions.

Key Path	Marker
Notes	The selected marker is remembered even when not in the Marker menu and is used if a Search is done or a Band Function is turned on or for Signal Track or Continuous Peak.
Preset	Marker 1
State Saved	The number of the selected marker is saved in instrument state.
Initial S/W Revision	A.05.00

Couple Markers

When this function is On, moving any marker causes an equal X Axis movement of every other marker which is On. An “equal X Axis movement” means the difference is preserved between each marker’s X Axis value (in the fundamental x-axis units of the trace that marker is on) and the X Axis value of the marker being moved (in the same fundamental x-axis units).

Key Path	Marker
Remote Command	:CALCulate:LSEQuencer:MARKer:COUPle[:STATe] OFF ON 0 1 :CALCulate:LSEQuencer:MARKer:COUPle[:STATe]?
Example	:CALC:LSEQ:MARK:COUP ON
Preset	Off, , presets on Mode Preset and All Markers Off
State Saved	Saved in State
Initial S/W Revision	A.05.00

All Markers Off

Turns off all markers.

Key Path	Marker
Remote Command	:CALCulate:LSEQuencer:MARKer:AOFF
Example	CALC:LSEQ:MARK:AOFF
Couplings	sets the selected marker to 1.
Preset	n/a.
Initial S/W Revision	A.05.00

Peak Search

Sequence Analyzer mode provides a limited peak search function on the RF envelope display. Pressing the Peak Search front-panel key places the selected marker on the trace point with the maximum y-axis value for that marker’s trace

Remote Command	:CALCulate:LSEQuencer:MARKer[1] 2 ... 12:MAXimum
Example	CALC:LSEQ:MARK2:MAX CALC:LSEQ:MARK2:Y? CALC:LSEQ:MARK2:X?
Notes	Sending this command selects the subopcoded marker.
Initial S/W Revision	A.05.00

List Sequence Measurements

There is a List Sequencer in both the source and analyzer of the test set. The List Sequencer provides the ability to set up a Sequence of radio signals that you can generate from the source and a separate list of radio signals that you expect to receive in the analyzer. The List Sequencer, therefore, allows you to test the radio characteristics of a mobile device that uses multiple radio standards. A Sequence that you set up in the List Sequencer comprises multiple radio standards for user-defined periods of time, allowing you to set up stimuli and analysis that correspond to your existing production line test needs.

This section details the remote commands to fetch the measurement results and also what results are returned for each measurement.

See

Measurement Commands for List Sequencer

The following commands are used to retrieve the measurement results:

```
:CONFigure:LSEQuencer
:CONFigure:LSEQuencer:NDEFault
:INITiate:LSEQuencer
:FETCh:LSEQuencer [1] | 2 | 3?
:READ:LSEQuencer [1] | 2 | 3?
:MEASure:LSEQuencer [1] | 2 | 3?
```

:CONFigure:LSEQuencer:NDEFault stops the current measurement and changes to the specified measurement. It does not change the settings to the defaults. It does not initiate the taking of measurement data unless INIT:CONTinuous is ON.

Remote Command Results for List Sequencer Measurement

Condition	N	Results Returned
Mode = Sequence Analyzer	Not specified or n=1	<p>The return order is Acquisition 1 results in Analysis Step and Meas Bitmap order for all selected measurements followed by Acquisition 2 results etc. The table below shows the order. See the Integrity Indicator section for more details on the integrity values.</p> <p>Results for each step:</p> <ol style="list-style-type: none"> 1. Total number of real values returned for the Sequence, including this one. 2. Reserved for Keysight use. 3. Summary Integrity value for entire Sequence. All integrity values OR'd together. 4. Total number of Acquisitions for entire Sequence. 5. Summary Integrity value for Acquisition 1. 6. Number of Analysis Steps in Acquisition 1 7. Summary Integrity value for Analysis Interval 1 8. Analysis Interval 1 Measurement Bit Map - decimal representation 9. Integrity value for 1st measurement in Analysis Interval 1 10. Number of results in first measurement in Analysis Interval 1

-
11. Measurement results for first measurement in Analysis Interval 1
 12. Integrity value for 2nd measurement in Analysis Interval 1
 13. Number of results in 2nd measurement in Analysis Interval 1
 14. Measurement results for 2nd measurement in Analysis Interval 1
 15. ...repeat 12 to 14 for all other measurements in Analysis Interval 1
 16. Summary Integrity value for Analysis Interval 2
 17. Analysis Interval 2 Measurement Bit Map - decimal representation
 18. Integrity value for 1st measurement in Analysis Interval 2
 19. Number of results in first measurement in Analysis Interval 2
 20. Measurement results for first measurement in Analysis Interval 2
 21. Integrity value for 2nd measurement in Analysis Interval 2
 22. Number of results in 2nd measurement in Analysis Interval 2
 23. Measurement results for 2nd measurement in Analysis Interval 2
 24. ...repeat 21 to 23 for all other measurements in Analysis Interval 2
 25. ...repeat 16 to 24 for all other Analysis Intervals in Acquisition 1
 26. ...repeat 5 to 25 for Acq 2 and for all subsequent Acq's in the Sequence

The format of the results for each measurement is detailed in the following sections. Each measurement returns all results when queried remotely.

If the Sequence is aborted manually, then NANs are returned. If the Sequence is aborted due to "Abort on Limit Fail", then results return NANs from point of failure and valid results prior to that. To find out where Limit failed use FETC:LSEQ3?

If the Sequence is aborted due to "Abort on Error", then results return NANs from point of failure and valid results prior to that. To find out where error occurred use FETC:LSEQ3?

Mode = 2 Sequence Analyzer	<p>Returns a pass fail < AcqNum > 0 for the entire Sequence. This returns a fail if any meas limit fails OR if an error occurs. "0" means entire Sequence passed limits and no error occurred. If fail then the number returned is the Acquisition number (AcqNum) of first acquisition to fail a limit OR first acquisition that invoked an error.</p> <p>If the Sequence is aborted manually, then results return -1.</p>
Mode = 3 Sequence Analyzer	<p>Returns three integer numbers, Acquisition number, followed by Analysis Interval Number, followed by the Meas Bitmap Number of first detected position to fail a limit OR that invoked an error. Note: since the measurements are made in multiple threads the first limit fail or error to be detected may not necessarily be the first one sequentially.</p> <p>If the Sequence is aborted manually, then results return -1, -1, -1.</p>

For an example of the results returned see ["Example for two Acquisitions, each containing two Analysis Steps" on page 240e](#) .

In addition an Acquisition's results can be queried on its own using:

```
:FETCh:LSEQuencer[1]:ACQuire[1]|2|3|4..512?
```

:READ:LSEQuencer[1]:ACQuire[1]|2|3|4..512?

:MEASure:LSEQuencer[1]:ACQuire[1]|2|3|4..512?

This returns all result metrics for the specific acquisition “AcqNum”. Performing a READ initiates the full Sequence and returns only the AcqNum’s results. If the Sequence is aborted manually, then results return NaNs. If the Sequence is aborted due to “Abort on Limit Fail”, then results return NaNs from point of failure and valid results prior to that. If Sequence is aborted due to “Abort on Error”, then results return NaNs from point of failure and valid results prior to that. To find out where Limit failed or error occurred use FETC:LSEQ3?

The result structure is very like the table for FETC:LSEQ1? above, but some fields about the whole sequence are removed.

Step	Result
1	Total number of real values returned for this scpi command, including this one.
2	Reserved for Keysight use.
3	Summary Integrity value for the specified acquisition.
4	Number of Analysis Steps in the specified acquisition.
5	Summary Integrity value for Analysis interval 1
6	Analysis Interval 1 Measurement Bit Map - decimal representation
7	Integrity value for 1st measurement in Analysis Interval 1
8	Number of results in first measurement in Analysis Interval 1
9	Measurement results for first measurement in Analysis Interval 1
10	Integrity value for 2nd measurement in Analysis Interval 1
11	Number of results in 2nd measurement in Analysis Interval 1
12	Measurement results for 2nd measurement in Analysis Interval 1
13	..repeat 10 to 12 for all other measurements in Analysis Interval 1
14	Summary Integrity value for Analysis Interval 2
15	Analysis Interval 2 Measurement Bit Map - decimal representation
16	Integrity value for 1st measurement in Analysis Interval 2
17	Number of results in first measurement in Analysis Interval 2
18	Measurement results for first measurement in Analysis Interval 2
19	Integrity value for 2nd measurement in Analysis Interval 2
20	Number of results in 2nd measurement in Analysis Interval 2
21	Measurement results for 2nd measurement in Analysis Interval 2
22	..repeat 19 to 21 for all other measurements in Analysis Interval 2
23	..repeat 14 to 22 for all other Analysis Intervals in Acquisition 1

And it is also supported to query the results by specifying the acquisition step and the analysis step:

:FETCh:LSEQuencer[1]:ACQuire[1]|2|...|512:ASTep[1]|2|...|1000?

:READ:LSEQuencer[1]:ACQuire[1]|2|...|512:ASTep[1]|2|...|1000?

:MEASure:LSEQuencer[1]:ACQuire[1]|2|...|512:ASTep[1]|2|...|1000?

The returned results are defined as the following table

Step	Result
1	Total number of real values returned for this scpi command, including this one.
2	Reserved for Keysight use.
3	Summary Integrity value for the specified Analysis interval
4	Measurement Bit Map - decimal representation
5	Integrity value for 1st measurement in this Analysis Interval
6	Number of results in first measurement in Analysis Interval
7	Measurement results for first measurement in Analysis Interval
8	Integrity value for 2nd measurement in Analysis Interval
9	Number of results in 2nd measurement in Analysis Interval
10	Measurement results for 2nd measurement in Analysis Interval
11	..repeat 8 to 10 for all other measurements in Analysis Interval

The entire Sequence results can still be queried using the FETC:LSEQ1? detailed above.

To query the actual average count of specified analysis step, the following SCPI commands are provided:

:FETCh:LSEQuencer[1]: ACQuire[1]|2|...|512:ASTep[1]|2|...|1000:AVERAge?

:READ:LSEQuencer[1]: ACQuire[1]|2|...|512:ASTep[1]|2|...|1000:AVERAge?

:MEASure:LSEQuencer[1]: ACQuire[1]|2|...|512:ASTep[1]|2|...|1000:AVERAge?

The returned actual average count should be equal to the "Avg Number" on page 380 if "Ignore Error In Average" on page 298 is OFF, and might be less than or equal to the user setting "Avg Number" on page 380 when "Ignore Error In Average" on page 298 is set to ON. "Avg Number" on page 380

Asynchronized FETch scpi commands are used to get the results back as soon as possible once the queried results are available. Comparing with the normal FETCh scpi commands, the user don't need to wait for the whole sequence completion. For example, the user might get the results of the 1st acquisition while the instrument is performing the 2nd or the 3rd acquisition.

:FETCh:LSEQuencer:ASYNc:ACQuire{1:512}:STATe?/qonly/

This scpi command is to query if the results of the specified acquisition are available.

If it returns 0, that means the results are still in calculation. Otherwise, it means the specified acquisition results are ready to query.

:FETCh:LSEQuencer:ASYNc:ACQuire{1:512}?/qonly/

Return the results of specified acquisition once the results are available no matter if the whole sequence is completed or not.

NOTE

This scpi command will be blocked until the results are ready.
The results definition is the same as :FETCh:LSEQuencer:ACQuire{1:512}?/qonly/

:FETCh:LSEQuencer:ASYNc:ACQuire{1:512}:ASTep{1:1000}?/qonly/

Return the results of specified analysis step once the results are available no matter if the whole sequence is completed or not.

NOTE

This scpi command will be blocked until the results are ready.
The results definition is the same as :FETCh:LSEQuencer:ACQuire{1:512}:ASTep{1:1000}?/qonly/

:INITiated:LSEQuencer:ARMed?

This scpi command provides the capability to indicate if the sequence has finished its initialization. It won't return until the instrument is ready to perform capture.

NOTE

The MEASure query MEAS:LSEQ1|2|3? presets the test set to the default state and returns default results. This has limited use since a preset returns the Sequence settings and meas setup parameters to their default settings, and hence the results are not useful.

Key Path	Meas
Mode	Sequence Analyzer
Initial S/W Revision	A.05.00

Example for two Acquisitions, each containing two Analysis Steps

Condition	N	Results Returned
Mode = Sequence Analyzer	Not specified or n=1	<p>For example, 2 Acquisitions with 2 Analysis Steps in each, the first step in Acq1 making a GSMK PFER measurement and the second step in Acq1 making a Basic Transmit Power and WCDMA Mod Acc, Acq2 returns the same as Acq1 but at a different freq. The results would return the following:</p> <ul style="list-style-type: none"> 1 value: Total number of real values returned for the Sequence, including this one. 1 value: Reserved for Keysight use. 1 value: Summary Integrity value for entire Sequence. All integrity values OR'd together. 1 value: Total number of Acquisitions for entire Sequence = 2 1 value: Summary Integrity value for Acquisition 1. 1 value: Number of Analysis Steps in Acquisition 1=2 1 value: Summary Integrity value for Analysis Interval 1 1 value: Analysis Interval 1 Measurement Bit Map - decimal representation 1 value: Integrity value for 1st measurement in Analysis Interval 1 1 value: Number of results in GSMK PFER in Analysis Interval 1 = 17 17 values: Measurement results for first measurement in Analysis Interval 1 1 value: Summary Integrity value for Analysis Interval 2 1 value: Analysis Interval 2 Measurement Bit Map - decimal representation 1 value: Integrity value for Transmit Power in Analysis Interval 2 1 value: Number of results in Transmit Power in Analysis Interval 2 = 4

Condition	N	Results Returned
		4 values: Measurement results for Transmit Power in Analysis Interval 2 1 value: Integrity value for W-CDMA Mod Acc in Analysis Interval 2 1 value: Number of results in W-CDMA Mod Acc in Analysis Interval 2 = 24 24 values: Measurement results for W-CDMA Mod Acc in Analysis Interval 2 1 value: Summary Integrity value for Acquisition 2 1 value: Number of Analysis Steps in Acquisition 1=2 1 value: Summary Integrity value for Analysis Interval 1 1 value: Analysis Interval 1 Measurement Bit Map - decimal representation 1 value: Integrity value for 1st measurement in Analysis Interval 1 1 value: Number of results in GMSK PFER in Analysis Interval 1 = 17 17 values: Measurement results for first measurement in Analysis Interval 1 1 value: Summary Integrity value for Analysis Interval 2 1 value: Analysis Interval 2 Measurement Bit Map - decimal representation 1 value: Integrity value for Transmit Power in Analysis Interval 2 1 value: Number of results in Transmit Power in Analysis Interval 2 4 values: Measurement results for Transmit Power in Analysis Interval 2 1 value: Integrity value for W-CDMA Mod Acc in Analysis Interval 2 1 value: Number of results in W-CDMA Mod Acc in Analysis Interval 2 24 values: Measurement results for W-CDMA Mod Acc in Analysis Interval 2 Total values: 118
Key Path		Mesa
Mode		Sequence Analyzer
Initial S/W Revision		A.05.00

Measurement Results

These are the measurement result metrics that are returned either to the front panel or over SCPI.

With SCPI results, two values are returned which are not included in the front panel Results Metric View, because they are used only in parsing the SCPI return values. First, the measurement results for an analysis interval (following the pass/fail “integrity value” for the interval as a whole) are preceded by a value that is a decimal representation of the meas bitmap (the selection of measurements included). Second, the results for each measurement within the analysis interval (following the pass/fail “integrity value” for the measurement as a whole) are preceded by a value which indicates the number of results returned by that measurement. The results for individual measurements are returned in ascending order of their bitmap values (Tx Power, having the lowest value, always appears before any other measurement if it is included in the interval).

For example, if an analysis interval includes one measurement, GMSK Phase & Frequency Error, the results for the interval are preceded by a value of 64 (the decimal weight of bit 6 in the meas bitmap), and the results for the measurement are preceded by a value of 17 (because it returns 17 result metrics).

An alternative example: if an analysis interval includes two measurements, Tx Power and cdma2000 Mod Accuracy, the results for the interval are preceded by a value of 2049 (the decimal weight of bit 11 plus bit 0 in the meas bitmap), the results for Tx Power are preceded by a value of 4 (because that measurement returns 4 result metrics), and the results for cdma2000 Mod Accuracy are preceded by a value of 18 (because that measurement returns 18 result metrics).

Basic Transmit Power Results

This measurement returns four results for Transmit Power; the limits are set by parameters detailed in the Meas Setup section for Basic Transmit Power.

The SCPI-only header values are as follows:

Meas Bitmap is a floating point number which appears ahead of the results for the analysis interval; it is a decimal representation of the meas bitmap value for the measurements included in the interval. The value returned for Basic Transmit Power results is 1. If more than one measurement is included in this analysis step, then the value returned represents the combined meas bitmap value for all included measurements, and the results are returned in ascending order of their meas bitmap values.

Number Of Results is a floating point number which appears ahead of the results of a measurement within the analysis interval; it represents the number of results metrics returned by the measurement. The value returned for Basic Transmit Power is 4.

Metric Results returned are:

Index	Result Details
0	Overall Pass/Fail Result shows the test result 0:Pass, 1:Fail, -1:Not tested
1	Upper Limit Pass/Fail Result shows the Upper limit test result. 0:Pass, 1:Fail, -1:Not tested
2	Lower Limit Pass/Fail Result shows the Lower limit test result. 0:Pass, 1:Fail, -1:Not tested
3	Basic Tx Power is the accumulated power over the Meas interval set for this Analysis Step. It is a floating point number.

Key Path	Meas
Initial S/W Revision	A.05.00

Basic Frequency and Phase Error Results

Two results are returned, which are the Phase Error and Frequency Error over the analysis interval set for this measurement, with reference to the frequency set for the acquisition.

The SCPI-only header values are as follows:

Meas Bitmap is a floating point number which appears ahead of the results for the analysis interval; it is a decimal representation of the meas bitmap value for the measurements included in the interval. The value returned for Basic Frequency and Phase Error results is 2. If more than one measurement is included in this analysis step, then the value returned represents the combined meas bitmap value for all included measurements, and the results are returned in ascending order of their meas bitmap values.

Number Of Results is a floating point number which appears ahead of the results of a measurement within the analysis interval; it represents the number of results metrics returned by the measurement. The value returned for Basic Frequency and Phase Error results is 3.

Metric Results returned are:

Index	Result Details
0	Pass/Fail Result shows the test result against the "Limit: Freq Error" ppm value. 0:Pass, 1:Fail, -1:Not tested
1	Frequency Error is a floating point number that represents the frequency error in Hz between the test set's tuned analyzer freq for the acquisition and the current analysis step. The frequency error is the average of all samples in the measurement interval of the analysis step. This is the difference between the measured phase trajectory and the reference phase trajectory.
2	Phase Error is a floating point number that represents the phase error in degrees between the test set's tuned analyzer phase for the acquisition and the current analysis step. The phase of each sample in the analysis interval is calculated and averaged. The result returned is an average of the phase of each sample.

Key Path	Meas
Initial S/W Revision	A.05.00

Basic Discrete PAVT Results

Basic Discrete PAVT cannot be averaged. If Average number is set to anything other than 1, the Sequence returns a validation error, and the Sequence does not execute.

The SCPI-only header values are as follows:

Meas Bitmap is a floating point number which appears ahead of the results for the analysis interval; it is a decimal representation of the meas bitmap value for the measurements included in the interval. The value returned for Basic Discrete PAVT results is 4. Basic Discrete PAVT is exclusive with other measurements because it will set the channel filter. Once the Basic PAVT measurement is selected in one analysis of one acquisition, the other measurements are not selectable in this acquisition. It allows multi-analyses in this acquisition with Basic PAVT measurement selected, but only Basic discrete PAVT measurement is allowed for each analysis. If there are multi-acquisitions, those acquisitions without Basic Discrete PAVT measurement selected are normal and other measurements selectable.

Number Of Results is a floating point number which appears ahead of the results of a measurement within the analysis interval; it represents the number of results metrics returned by the measurement. The value returned for Basic Discrete PAVT results is 1537. (Although there are only 4 result index values, three of the results consist of very long lists of numbers.)

Metric Results returned are:

Index	Result Details
0	Number of steps to be measured
1	Returns a 512 length list of comma-separated values for the amplitude of each step. The first step amplitude result is absolute value. The results of other steps are referenced to the first step and they are relative value.
2	Returns a 512 length list of comma-separated values for the phase error of each step. The first step phase error result is as the zero. The results of other steps are referenced to the first step phase.
3	Returns a 512 length list of comma-separated values for the frequency error of each step. The first step frequency error result is referenced to the frequency set fo the acquisition. The results of other steps are referenced to the first step frequency error result.

Key Path	Meas
Initial S/W Revision	A.05.00

PVT Results

The Power Versus Time or Transmit On/Off Power measurement used in the other supported modes is used in the sequencer. The Meas parameters usable within the List Sequencer measurement are listed below.

["GSM/EDGE PVT Results" on page 244](#)

["LTE-TDD PVT Results" on page 246](#)

[TDSCDMA PVT Results](#)

GSM/EDGE PVT Results

The PVT measurement used in the GSM mode is used in the Sequencer to return results for both GMSK and EDGE modulated signals. The results 12 and 13 are only applicable for EDGE signals and return NAN if a GMSK signal is used. If the analysis step has requested this measurement then the results returned for the analysis step within the List Sequencer Measurement are listed below.

For more information on each result, see the online help for the relevant radio standard measurement mode.

The SCPI-only header values are as follows:

Meas Bitmap Header is a floating point number which appears ahead of the results for the analysis interval; it is a decimal representation of the meas bitmap value for the measurements included in the interval. The value returned for PVT results is 16. If more than one measurement is included in this analysis step, then the value returned represents the combined meas bitmap value for all included measurements, and the results are returned in ascending order of their meas bitmap values.

Number Of Results is a floating point number which appears ahead of the results of a measurement within the analysis interval; it represents the number of results metrics returned by the measurement. The value returned for PvT results is 15.

PvT measurement returns the following comma-separated scalar results.

Index	Result Details
0	Overall Pass/Fail Result shows the mask test result. This is the only pass fail result. 0:Pass, 1:Fail, -1:Not tested
1	Power single burst is the mean power (in dBm) across the useful part of the selected burst in the most recently acquired data, or in the worst data acquired at the end of a set of averages. If averaging is on, the power is for the worst burst.
2	Power averaged is the power (in dBm) of N averaged analysis step intervals, if averaging is on. The power is averaged across the useful part of the analysis step interval. Average m is a single timeslot from the acquisition. If there are multiple timeslots in the analysis step interval, only one timeslot is used for average m. This means that N analysis steps are acquired to make the complete average. If averaging is off, the value of power averaged is the same as the power single burst value.
3	Start is the index of the data point at the start of the useful part of the burst
4	Stop is the index of the data point at the end of the useful part of the burst
5	T0 is the index of the data point where t0 occurred
6	Burst width is the width of the burst measured at 3 dB below the mean power in the useful part of the burst.
7	Maximum value is the maximum value of the most recently acquired data (in dBm).
8	Minimum value is the minimum value of the most recently acquired data (in dBm).
9	Burst search threshold is the value (in dBm) of the threshold where a valid burst is identified, after the data has been acquired.
10	1st Error point is the time (in second) which indicates the point on the X Scale where the first failure of a signal was detected. If the limit passes, returned data has no meaning.
11	Detected TSC is the most recently detected TSC. The returned value is 0~7 (Burst Type : Normal/Higher Symbol Rate (HSR)) if TSC detected. If TSC not detected, the returned value is -999.0. If Amptd or NONE (Power vs Time only) specified in Sync Type, the returned value is -999.0. In multi slot condition, the returned value is the detected TSC of the specified slot(Time Slot ON) or the first evaluated slot(Time Slot OFF). Note: The returned value in Sync (Synchronization Burst) is 10 if (BN42, BN43..BN105) = (1,0,1,1,1,0,0,1,0,1,1,0,0,0,1,0,0,0,0,0,0,1,0,0,0,0,0,0,1, 1,1,1,0,0,1,0,1,1,0,1,0,1,0,0,0,1,0,1,0,1,1,1,0,1,1,0,0,0,0,1,1,0,1,1) 11 if (BN42, BN43..BN105) = (1,1,1,0,1,1,1,0,0,1,1,0,1,0,1,1,0,0,1,0,1,0,0,0,0,0,1,1,1,1,0,1, 1,1,1,0,1,0,0,0,1,1,1,1,1,0,1,1,0,0,1,0,1,1,0,0,0,1,0,1,0,1) 12 if (BN42, BN43..BN105) = (1,1,1,0,1,1,0,0,0,0,1,1,0,1,1,1,0,1,0,1,0,0,0,1,0,1,0,1,1,0, 1,0,0,1,1,1,1,0,0,0,0,0,0,1,0,0,0,0,0,1,0,0,0,1,1,0,1,0,0,1,1,1,0) The returned value in Access (Access Burst) is 20 if (BN8, BN9..BN48) = (0,1,0,0,1,0,1,1,0,1,1,1,1,1,1,1,0,0,1,1,0,0,1,1,0,1,0,1,0,0,0,1,1,1,1,0,0,0) 21 if (BN8, BN9..BN48) = (0,1,0,1,0,1,0,0,1,1,1,1,1,0,0,0,1,0,0,0,0,1,1,0,0,0,1,0,1,1,1,0,0,1,0,0,1,1,0,1) 22 if (BN8, BN9..BN48) = (1,1,1,0,1,1,1,1,0,0,1,0,0,1,1,1,0,1,0,1,0,1,1,0,0,0,0,1,1,0,1,1,0,1,1,1,0,1,1,1)
12	Detected Mod scheme is the most recently detected modulation scheme. The returned value is as follows. 0 for GMSK, 1 for Normal Burst (NB) 8PSK, 2 for NB 16QAM, 3 for NB 32QAM, 11 for Higher symbol rate Burst (HB) QPSK, 12 for HB 16QAM, 13 for HB 32QAM
13	Estimated Carrier Power (ECP) in dBm
14	Time Offset Power Results in dB If averaged number N = 1, the power measured and calculated at Offset Times relative to the mean power

across the useful part of the burst
 If averaged number $N > 1$, Time Offset Results return the limit margin worst case results. That is, 12 time offset results of the burst which has the worst limit margin are returned
 12 Time Offsets can be set by SCPI commands, please see **PVT Time Offsets** for details

Key Path	Meas
Initial S/W Revision	A.05.00

LTE-TDD PVT Results

The LTE-TDD Transmit ON/OFF Power measurement used in the LTE-TDD mode is used in the Sequencer to return results for LTE-TDD modulated signals. If the analysis step has requested this measurement then the results returned for the analysis step within the List Sequencer Measurement are listed below.

For complete details of result 5 to 14, please see the PD Meas – Transmit On/Off Power of LTE TDD epsg1129259. Result table below is based on the results from the table in section 4 of this document.

For more information on each result, see the online help for the relevant radio standard measurement mode.

The SCPI-only header values are as follows:

Meas Bitmap Header is a floating point number which appears ahead of the results for the analysis interval; it is a decimal representation of the meas bitmap value for the measurements included in the interval. The value returned for PVT results is 16. If more than one measurement is included in this analysis step, then the value returned represents the combined meas bitmap value for all included measurements, and the results are returned in ascending order of their meas bitmap values.

Number Of Results is a floating point number which appears ahead of the results of a measurement within the analysis interval; it represents the number of results metrics returned by the measurement. The value returned for LTE-TDD PvT results is 18.

LTE-TDD PvT measurement returns the following comma-separated scalar results

Index	Result Details
0	Overall Pass/Fail Result shows the limits test result. 0:Pass, 1:Fail, -1:Not tested
1	Ramp Up Time Pass/Fail Result shows ramp up time limit test result. The time mask defines the ramping up time allowed for the UE between transmit OFF power and transmit ON power.
2	Ramp Down Time Pass/Fail Result shows ramp down time limit test result. The time mask defines the ramping down time allowed for the UE between transmit ON power and transmit OFF power.
3	Off Power Before Pass/Fail Result shows uplink transmit off power limit test result which occurs before the burst.
4	Off Power After Pass/Fail Result show uplink transmit off power limit test result which occurs after the burst.
5	On Power/Mean Power Result is the mean power (in dBm) of the active part in the range specified by Analysis

	Time Slot and Measured Time Slots in the most recently acquired data, or in the last data acquired at the end of a set of average.
6	Burst Width Result is the width of continuous active slots in the range specified by Analysis Time slot and Measured Time Slots.
7	Trigger Diff Result is the time difference between the position of the trigger line and the start point of the detected burst. (This result is NaN 9.91E+37 when trigger is Video Trigger or Free Run)
8	Ramp Up Time Result is the time difference between 10% and 90% voltage points (relative to peak) on the positive slope of the burst, here burst has the same meaning in Burst width
9	Ramp Down Time Result is the time difference between 90% and 10% voltage points (relative to peak) on the negative slope of the burst, here burst has the same meaning in Burst width.
10	Off Power/Off Power Before Result is the mean power measured during the transmitter OFF period. When Direction is Uplink, this result is the OFF power during the sub-frame prior to the active sub-frame.
11	Off Power After Result is the OFF power during the sub-frame following the active burst.
12	Maximum Power Result is maximum peak level in the range specified by Analysis Time Slot and Measured Time Slots (in dBm).
13	Minimum Power Result is the minimum peak level in the range specified by Analysis Time Slot and Measured Time Slots (in dBm)
14	Actual Sample Interval Result is a floating point number representing the time between samples of uncompressed I/Q trace data.
15	Actual Number of Samples Result is the number of data points in the uncompressed I/Q trace data.
16	Trace Sample Interval Result is a floating point number representing the time between samples of compressed/decimated I/Q trace data which could be got by trace query.
17	Number of Trace Samples Result is the number of data points in the compressed/decimated I/Q trace data which could be got by trace query.

The following command is used to retrieve the measurement trace

```
MEAS|READ|FETCh:LSEQuencer:ACQuire{1...512}:ASTep{1...1000}:LTETdd:PVT:TRACe
```

This command returns acquired I/Q trace data used in analysis step interval as a series of comma-separated trace point values. The I values are listed in each pair, using 0 through even-indexed values. The Q values are odd-indexed values.

At most 2000 sample data can be returned (one sample contains one I data and one Q data). If the actual number of samples exceeds 2000, then actual trace data will be compressed/decimated to 2000 and be returned as the trace data.

Example:

```
FETCh:LSEQ:ACQ1:ASTep1:LTETdd:PVT:TRACe?
```

Key Path	Meas
Initial S/W Revision	A.12.00

ORFS Results

The Output RF Spectrum measurement used in the GSM mode is used in the sequencer to return results for both GMSK and EDGE modulated signals. If the analysis step has requested this measurement then the results returned for the analysis step within the List Sequencer measurement are listed below.

The measurement Method used in the GSM application is not used; only the Multi offset method is used.

For more information on each result see the online help for the relevant radio standard measurement mode.

The SCPI-only header values are as follows:

Meas Bitmap Header is a floating point number which appears ahead of the results for the analysis interval; it is a decimal representation of the meas bitmap value for the measurements included in the interval. The value returned for ORFS results is 32. If more than one measurement is included in this analysis step, then the value returned represents the combined meas bitmap value for all included measurements, and the results are returned in ascending order of their meas bitmap values.

Number Of Results is a floating point number which appears ahead of the results of a measurement within the analysis interval; it represents the number of results metrics returned by the measurement. The value returned for ORFS results is 242. (Although there are only 4 result index values, two of the results consist of very long lists of numbers.)

Metric Results for the ORFS measurement returns the following comma-separated scalar results:

Index	Result Details
0	Pass/Fail Result shows the mask test result 0:Pass, 1:Fail, -1:Not tested
1	Returns a list of comma-separated values for the modulation spectrum at all the offsets (lower and upper). This is followed by the switching transient results at all the offsets (lower and upper). The carrier is considered offset zero (0) and is the first set of results sent. Four values are provided for each of the offsets (including the carrier), in this order: Negative offset(a) - power relative to carrier (dB) Negative offset(a) - absolute average power (dBm) Positive offset(a) - power relative to carrier (dB) Positive offset(a) - absolute average power (dBm) Values for all possible offsets are sent. Zeros are sent for offsets that have not been defined. The total number of values sent $(120) = (4 \text{ results/offset}) * (15 \text{ offsets}) * (2 \text{ measurement types: modulation \& switching})$ Carrier - modulation measurement values Offset 1 - modulation measurement values and so on ~ Offset 14 - modulation measurement values Carrier - switching transients measurement values Offset 1 - switching transients measurement values ~ Offset 14 - switching transients measurement values and so on
2	Returns a list of relative level to the test limit, the relative test limit and the absolute test limit for all the offset

frequencies. The relative level to the test limit is returned for both lower and upper offsets. Four values are returned for each offset in the following order:

1. Relative level to the test limit (dB) at the negative offset frequency
2. Relative level to the test limit (dB) at the positive offset frequency
3. Relative test limit used (dB)
4. Absolute test limit used (dBm)

Values for all possible offsets are returned.

The carrier frequency is considered offset zero (0.0 Hz) and is the first set of values returned.

Zeros are returned for offsets that have not been defined.

Zeros are returned for the measurement that was not performed. For example, if Meas Type is Modulation, all switching transient measurement results are 0.0.

The total number of values returned is:

$$120 = (4 \text{ results / offset}) * (15 \text{ offset frequencies}) * (2 \text{ measurement types})$$

Carrier (Offset A) - modulation measurement results

Offset 1 (Offset B) - modulation measurement results

.....

Offset 14 (Offset O) - modulation measurement results

Carrier (Offset A)- switching transients measurement results

Offset 1 (Offset B) - switching transients measurement results

.....

Offset 14 (Offset O) - switching transients measurement results

3

PCL is the Power Control Level that is determined by the Transmit Power and used to determine the limits

Key Path	Meas
Initial S/W Revision	A.05.00

GMSK Phase & Frequency (PFER) Results

The GMSK Phase & Frequency (PFER) measurement used in the GSM mode is used in the sequencer. If the analysis step has requested this measurement then the results returned for the analysis step within the List Sequencer measurement are listed below.

For more information on each result see the online help for the relevant radio standard measurement mode.

The SCPI-only header values are as follows:

Meas Bitmap Header is a floating point number which appears ahead of the results for the analysis interval; it is a decimal representation of the meas bitmap value for the measurements included in the interval. The value returned for PFER results is 64. If more than one measurement is included in this analysis step, then the value returned represents the combined meas bitmap value for all included measurements, and the results are returned in ascending order of their meas bitmap values.

Number Of Results is a floating point number which appears ahead of the results of a measurement within the analysis interval; it represents the number of results metrics returned by the measurement. The value returned for PFER results is 17.

GMSK PFER measurement metrics return the following comma-separated scalar results:

Index	Result Parameter
0	Overall PFER Pass/fail result. It combines all the pass fail values from the results below and OR's them together. If any fail this result is 1.0 = fail, 0,0 = pass
1	RMS Phase Error pass/fail result (1.0 = fail, 0,0 = pass)
2	Peak Phase Error pass/fail result (1.0 = fail, 0,0 = pass)
3	Frequency Error pass/fail result (1.0 = fail, 0,0 = pass)
4	Average RMS Phase Error A floating point number (in degrees) of the rms phase error between the measured phase and the ideal phase over the entire burst. The calculation is based on symbol decision points and points halfway between symbol decision points (that is, 2 points/symbol). If part of an average group, then the rms values are averaged
5	Maximum RMS Phase Error A floating point number (in degrees) of the rms phase error between the measured phase and the ideal phase over the entire burst. The calculation is based on symbol decision points and points halfway between symbol decision points (that is, 2 points/symbol). If part of an average group, then it takes the highest rms value.
6	Average of the Peak Phase Error A floating point number (in degrees) of the peak phase error of all the individual symbol decision points (prior to the rms averaging process). If part of an average group, then the rms values are averaged.
7	Maximum of the Peak Phase Error A floating point number (in degrees) of the peak phase error of all the individual symbol decision points (prior to the rms averaging process). If part of an average group, then it takes the highest.
8	Peak Phase Error Symbol Position A floating point number (in symbols) representing the symbol number at which the peak phase error occurred. If part of an average group, it just takes the last burst's result.
9	Maximum of the Peak Phase Error Symbol Position A floating point number (in symbols) representing the symbol number at which the peak phase error occurred.
10	Average Frequency Error A floating point number (in Hz) of the frequency error over the entire measurement area. This is the difference between the measured phase trajectory and the reference phase trajectory.
11	Maximum Frequency Error A floating point number (in Hz) of the peak frequency error through over the measurement area. Take the peak frequency error from each burst and identify the highest

12	<p>Average I/Q Origin Offset</p> <p>A floating point number (in dB) of the I and Q error (magnitude squared) offset from the origin over the entire measurement area.</p>
13	<p>Maximum I/Q Origin Offset</p> <p>A floating point number (in dB) of the maximum I and Q error (magnitude squared) offset over the measurement area.</p>
14	<p>Average T0 Offset</p> <p>A floating-point number of the time interval between the slot boundary to T0. T0 means the transition time from symbol 13 to symbol 14 of the midamble training Sequence for each time slot. Unit is sec. The 'RF Sync Delay' under 'Mode Setup' is not considered in this measurement.</p>
15	<p>Maximum T0 Offset</p> <p>A floating-point number of the time interval between the trigger point to T0. T0 means the transition time from symbol 13 to symbol 14 of the midamble training Sequence for each time slot. Unit is sec. Take the T0 offset from each burst and identify the highest. The 'RF Sync Delay' under 'Mode Setup' is not considered in this measurement.</p>
16	<p>Detected TSC</p> <p>A floating-point number of detected TSC of the last measured burst.</p> <p>The returned value is 0~7 (Burst Type: Normal), 10 (Burst Type: Sync), 20 (Burst Type: Access) if TSC detected. If TSC (Normal), Extended Training Sequence Bits (Sync) or Synch. Sequence Bits (Access) not detected, the returned value is -999.0. If Amptd or NONE (Power vs. Time only) specified in Sync Type, the returned value is -999.0. In multi slot condition, the returned value is the detected TSC of the specified slot (Time Slot ON) or the first evaluated slot (Time Slot OFF)</p>

The following GMSK Phase & Frequency results, which would be returned if the measurement were run in the native GSM/EDGE measurement mode, are not returned when the measurement is run in Sequence Analyzer mode:

- Unprocessed I/Q Trace Data
- Phase Error Trace
- Phase Error With Frequency Trace
- Log Magnitude Trace
- I/Q Corrected Trace
- Demodulated Data
- Trace Phase Sample
- Trace Bit 0 Decision Offset
- Trace Sync Start
- Trace Time Sample

Key Path	Meas
Initial S/W Revision	A.05.00

EDGE EVM Results

General Results

The TDSCDMA PVT measurement used in the TDSCDMA mode is used in the Sequencer to return results for TDSCDMA modulated signals.

The traces captured in primary acquisition and range extension acquisition are merged first. If averaging is on and average number is N, the N PVT merged traces are averaged point by point aligning to the start of the burst. Then, the trace is compared with the upper limit at the power off range and transition range according to the standard. Please see the following table for details.

For more information on each result, see the online help for the relevant radio standard measurement code.

The SCPI-only header values are as follows:

Meas Bitmap Header is a floating point number which appears ahead of the results for the analysis interval; it is a decimal representation of the meas bitmap value for the measurements included in the interval. The value returned for PVT results is 16. If more than one measurement is included in this analysis step, then the value returned represents the combined meas bitmap value for all included measurements, and the results are returned in ascending order of their meas bitmap values.

Number Of Results is a floating point number which appears ahead of the results of a measurement within the analysis interval; it represents the number of results metrics returned by the measurement. The value returned for PVT results is 15.

Index	Result Details
0	Overall Pass/Fail result shows the limit check result of Off power before, average power over -33rd ~ -14th chip, and Off power after to their upper limit: -65 dBm, -50 dBm and -65 dBm respectively. Only when all these 3 powers are below their upper limits, can this overall pass/fail result be pass. This is the only pass fail result. 0:Pass, 1:Fail, -1:Not tested
1	Mean power is the mean power (in dBm) of the range specified by Analysis Time Slot and Measurement Time Slots in the most recently acquired data. If averaging is on and average number is N, mean power is calculated after N PVT traces are merged.
2	Burst width is the width of the first set of continuous active slots in the range specified by Analysis Time slot and Measured Time Slots. If averaging is on and average number is N, burst width result is calculated by averaging N burst width results.
3	Burst start time is the start time of the burst referring to the start of the analysis interval. If averaging is on and average number is N, the final burst width results is calculated by averaging N burst start time results.
4	Rump up time is the time difference between 10% and 90% voltage points (relative to peak) on the positive slope of the burst, here burst has the same meaning in Burst width. If averaging is on and average number is N, rump up time is calculated after N PVT traces are merged.

5	Ramp down time is the time difference between 90% and 10% voltage points (relative to peak) on the negative slope of the burst, here burst has the same meaning in Burst width. If averaging is on and average number is N, ramp down time is calculated after N PVT traces are merged.
6	Off power is calculated as the averaged power between the -48th and -16th chip before the burst start time. If average is on and average number is N, the off power is calculated after N PVT traces are merged.
7	Maximum power is the maximum peak level in the range specified by Analysis Time Slot and Measured Time Slots (in dBm). If average is on and average number is N, the maximum power is calculated after N PVT traces are merged.
8	Minimum power is the minimum peak level in the range specified by Analysis Time Slot and Measured Time Slots (in dBm). If average is on and average number is N, the minimum power is calculated after N PVT traces are merged.
9	Trace sample interval is a floating point number representing the time between samples of the merged envelop trace data, which could be read by using FETCh:LSEQuencer<l>:ACQuire<m>:ASTep<n>:TDPVt:TRACe? If average is on and average number is N, this result is calculated after N PVT traces are merged.
10	Trace sample number is the number of data points in the merged envelop trace data, which could be read by using FETCh:LSEQuencer<l>:ACQuire<m>:ASTep<n>:TDPVt:TRACe? Only up to 2000 envelop trace points can be returned. So, the envelop trace returned may be decimated. If average is on and average number is N, this result is calculated after N PVT traces are merged.
11	Off power before is the averaged power between the start time of the analysis interval and the -34th chip before the burst start time. This value is used for the limit check. The upper limit is -65 dBm. Though limited by analysis interval, this result is derived from 8960 Tdscdma Transmit ON/OFF Power result: Range 1 OFF Power, whereas it is the averaged power or the highest chip power between -160th to -34th chips of the averaged trace for TS1, and -864th to -34th chips of the averaged trace for UpPTS. Please see 3.8.5 of TDSCDMA Meas PD 1131831 for details. If average is on and average number is N, this result is calculated after N PVT traces are merged.
12	Average power over -33rd ~ -14th chip is the averaged power between -33rd chip to -14th chip of the burst. This value is used for the limit check. Its upper limit is -50 dBm. This result is derived from the 8960 Tdscdma Transmit ON/OFF Power result: Range 2 OFF Power, which is the averaged or highest chip power between -33rd to -14th chips of the averaged trace. Please see 3.8.5 of TDSCDMA Meas PD 1131831 for details. If average is on and average number is N, this result is calculated after N PVT traces are merged.
13	Off power after is the averaged power between the 860th chips to the end of the analysis interval. This result is derived from the 8960 Tdscdma Transmit ON/OFF Power result: Range 3 OFF Power, which is the averaged power between 860th to 1711st chips of the averaged trace. Please see 3.8.5 of TDSCDMA Meas PD 1131831 for details. If average is on and average number is N, this result is calculated after N PVT traces are merged.
14	Max burst start time is the maximum start time of the burst referring to the start of the analysis interval. If averaging is on and average number is N, this results is the maximum value of the N burst start time results.

IQ Imbalance Result

The IQ Imbalance result (a double) is a value in dB, calculated from Gain Imbalance and Quadrature Skew as follows:

$$IQImbalance = 20 \log_{10} \left| \frac{1 - 10^{\frac{GainImbalance'}{20}} e^{jQuadratureSkew'}}{1 + 10^{\frac{GainImbalance'}{20}} e^{jQuadratureSkew'}} \right|$$

IQ imbalance is part of the EDGE EVM results, but to preserve backwards compatibility with earlier versions of firmware it is not included in the general results list. It can be queried using the command:

```
:FETCh:LSEQuencer:ACQuire{1:512}:ASTep{1:1000}:MEASurement? EEVM, "IqImbalance"
```

For example, :FETC:LSEQ:ACQ{1}:AST{1}:MEAS? EEVM, "IqImbalance"

Key Path	Meas
Initial S/W Revision	A.12.50

ACP Results

If the analysis step has requested this measurement then the results returned for the analysis step within the List Sequencer measurement are listed below.

For more information on each result see the online help for the relevant radio standard measurement mode.

The SCPI-only header values are as follows:

Meas Bitmap Header is a floating point number which appears ahead of the results for the analysis interval; it is a decimal representation of the meas bitmap value for the measurements included in the interval. The value returned for ACP results is 256. If more than one measurement is included in this analysis step, then the value returned represents the combined meas bitmap value for all included measurements, and the results are returned in ascending order of their meas bitmap values.

Number Of Results is a floating point number which appears ahead of the results of a measurement within the analysis interval; it represents the number of results metrics returned by the measurement. The value returned for ACP results is 75. (Although there are only 3 result index values, each of the results consist of lists of numbers.)

Index	Result Details
0	<p>Pass/fail results</p> <ol style="list-style-type: none"> 1. Overall Pass/Fail <p>Then, returns 24 scalar values of the pass/fail (0.0=pass, 1.0=fail) determined by testing the relative to the reference carrier and by testing the absolute power limit of the offset frequencies (measured as total power in dBm)</p> <ol style="list-style-type: none"> 2. Lower Offset A – relative limit test result 3. Lower Offset A – absolute limit test result 4. Upper Offset A – relative limit test result 5. Upper Offset A – absolute limit test result 6. Lower Offset B – relative limit test result 7. Lower Offset B – absolute limit test result

	<ul style="list-style-type: none"> 8. Upper Offset B – relative limit test result 9. Upper Offset B – absolute limit test result ... 22. Lower Offset F – relative limit test result 23. Lower Offset F – absolute limit test result 24. Upper Offset F – relative limit test result 25. Upper Offset F – absolute limit test result
1	<p>Carrier Powers</p> <p>Returns 3 scalar values representing overall pass/fail, carrier power, and reference carrier power</p> <p>1.Total Carrier Power</p> <p>2.Reference Carrier Power</p> <p>If Meas Type is Total Power Reference, these results are returned in units of dBm. If Meas Type is Power Spectral Density Reference, these results are returned in units of dBm/Hz or dBm/MHz</p>
2	<p>Power Results</p> <ul style="list-style-type: none"> 1. Channel (1) – relative power 2. Channel (1) – absolute power 3. Channel (2) – relative power 4. Channel (2) – absolute power ... 23. Channel (12) – relative power 24. Channel (12) – absolute power 25. Lower offset A – relative power 26. Lower offset A – absolute power 27. Upper offset A – relative power 28. Upper offset A – absolute power 29. Lower offset B – relative power 30. Lower offset B – absolute power 31. Upper offset B – relative power 32. Upper offset B – absolute power ... 45. Lower offset F – relative power 46. Lower offset F – absolute power 47. Upper offset F – relative power 48. Upper offset F – absolute power <p>If Meas Type is Total Power Reference, these results are returned in units of dBm. If Meas Type is Power Spectral Density Reference, these results are returned in units of dBm/Hz or dBm/MHz</p>

Key Path	Meas
Initial S/W Revision	A.05.00

Bluetooth ACP Results

The ACP measurement used in the Bluetooth mode is used in the sequencer, which is performed to verify the emissions levels within the operating frequency range conform to the limits. The results are only applicable for Bluetooth radio standard. If the analysis step has requested this measurement then the results returned for the analysis step within the List Sequencer Measurement are listed below.

For more information on each result see the online help for the relevant radio standard measurement mode.

The SCPI-only header values are as follows:

Meas Bitmap Header is a floating point number which appears ahead of the results for the analysis interval; it is a decimal representation of the meas bitmap value for the measurements included in the interval. The value returned for ACP results is 256. If more than one measurement is included in this analysis step, then the value returned represents the combined meas bitmap value for all included measurements, and the results are returned in ascending order of their meas bitmap values.

Number Of Results is a floating point number which appears ahead of the results of a measurement within the analysis interval; it represents the number of results metrics returned by the measurement. The value returned for ACP results is 85. (Although there are only 2 result index values, each of the results consist of lists of numbers.)

Index	Result Details
0	Overall Pass/Fail TxRefIndex TxRefPower AdjChanPowerUpper AdjChanPowerLower NumberofExceptions
1	Power Results Returns up to 79 scalar values (comma separated) of the Tx power per channel. The number of the meaningful results depends on the Span. And the meaningful value were placed the head of the array.

Key Path	Meas
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Bluetooth LE In-band Emission Results

The LE In-band Emission measurement used in the Bluetooth mode is used in the sequencer, which is performed to verify the emissions levels within the operating frequency range conform to the limits. The results are only applicable for Bluetooth radio standard. If the analysis step has requested this measurement then the results returned for the analysis step within the List Sequencer Measurement are listed below.

For more information on each result see the online help for the relevant radio standard measurement mode.

The SCPI-only header values are as follows:

Meas Bitmap Header is a floating point number which appears ahead of the results for the analysis interval; it is a decimal representation of the meas bitmap value for the measurements included in the interval. The value returned for LE In-band Emission results is 65536. If more than one measurement is included in this analysis step, then the value returned represents the combined meas bitmap value for all included measurements, and the results are returned in ascending order of their meas bitmap values.

Number Of Results is a floating point number which appears ahead of the results of a measurement within the analysis interval; it represents the number of results metrics returned by the measurement. The value returned for LE In-band Emission results is 87. (Although there are only 2 result index values, each of the results consist of lists of numbers.)

LE In-band Emission measurement returns the following comma-separated scalar results.

Index	Result Details
0	Overall Pass/Fail TxRefIndex TxRefPower AdjChanPowerUpper AdjChanPowerLower NumberofExceptions
1	Power Results Returns up to 81 scalar values (comma separated) of the Tx power per channel. The number of the meaningful results depends on the Span. And the meaningful value were placed the head of the array.

Key Path	Meas
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Bluetooth EDR In-band Spurious Emission Results

The EDR In-band Spurious Emission measurement used in the Bluetooth mode is used in the sequencer, which is performed to verify the emissions levels within the operating frequency range conform to the limits. The results are only applicable for Bluetooth radio standard. If the analysis step has requested this measurement then the results returned for the analysis step within the List Sequencer Measurement are listed below.

For more information on each result see the online help for the relevant radio standard measurement mode.

The SCPI-only header values are as follows:

Meas Bitmap Header is a floating point number which appears ahead of the results for the analysis interval; it is a decimal representation of the meas bitmap value for the measurements included in the interval. The value returned for LE In-band Emission results is 131072. If more than one measurement is included in this analysis step, then the value returned represents the combined meas bitmap value for all included measurements, and the results are returned in ascending order of their meas bitmap values.

Number Of Results is a floating point number which appears ahead of the results of a measurement within the analysis interval; it represents the number of results metrics returned by the measurement. The value

returned for EDR In-band Spurious Emission results is 85. (Although there are only 2 result index values, each of the results consist of lists of numbers.)

EDR In-band Spurious Emission measurement returns the following comma-separated scalar results.

Index	Result Details
0	Overall Pass/Fail TxRefIndex TxRefPower Adj500kHzPowerUpper Adj500kHzPowerLower NumberofExceptions
1	Power Results Returns up to 79 scalar values (comma separated) of the Tx power per channel. The number of the meaningful results depends on the Span. And the meaningful value were placed the head of the array.

Key Path	Meas
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SEM Results

Results include:

["General Results" on page 268](#)

[WLAN SEM Trace Results](#)

General Results

The EDGE EVM measurement used in the GSM mode is used in the sequencer. If the analysis step has requested this measurement then the results returned for the analysis step within the List Sequencer measurement are listed below.

For more information on each result see the online help for the relevant radio standard measurement mode.

The SCPI-only header values are as follows:

Meas Bitmap Header is a floating point number which appears ahead of the results for the analysis interval; it is a decimal representation of the meas bitmap value for the measurements included in the interval. The value returned for EDGE EVM results is 128. If more than one measurement is included in this analysis step, then the value returned represents the combined meas bitmap value for all included measurements, and the results are returned in ascending order of their meas bitmap values.

Number Of Results is a floating point number which appears ahead of the results of a measurement within the analysis interval; it represents the number of results metrics returned by the measurement. The value returned for EDGE EVM results is 24.

EDGE PVT measurement returns the following comma-separated scalar results:

Index	Result Parameter
0	Overall Pass/Fail Result shows the mask test result 0:Pass, 1:Fail, -1:Not tested
1	RMS EVM pass/fail result (1.0 = fail, 0.0 = pass)
2	Peak EVM pass/fail result (1.0 = fail, 0.0 = pass)
3	95%ile EVM pass/fail result (1.0 = fail, 0.0 = pass)
4	I/Q Origin Offset pass/fail result (1.0 = fail, 0.0 = pass)
5	Frequency Error pass/fail result (1.0 = fail, 0.0 = pass)
6	RMS 95th %ile EVM – a floating point number (in percent) of EVM over 95% of the entire measurement area
7	Average RMS EVM – a floating point number (in percent) of EVM over the entire measurement area.
8	Maximum RMS EVM – a floating point number (in percent) of highest EVM over the entire measurement area.
9	Average Peak EVM – a floating point number (in percent) of the average of the peak EVMs. Take the peak EVMs from each burst and average them together. If only one burst in measurement interval, then it returns the peak for the measurement interval.
10	Maximum Peak EVM – a floating point number (in percent) of the maximum peak EVM. Take the peak EVMs from each burst and identify the highest peak. If only one burst in measurement interval, then it returns the peak for the measurement interval.
11	Symbol position of the peak EVM – an integer number of the symbol position where the peak EVM error is detected.
12	Average Magnitude error – a floating point number (in percent) of average magnitude error over the entire measurement area. If only one burst in measurement interval, then it returns the error for the measurement interval.
13	Maximum Magnitude error – a floating point number (in percent) of maximum magnitude error over the entire measurement interval
14	Average Phase error – a floating point number (in degree) of average phase error over the entire measurement interval
15	Maximum Phase error – a floating point number (in degree) of maximum phase error over the entire measurement interval
16	Average Frequency error – a floating point number (in Hz) of the frequency error in the measured signal
17	Maximum Frequency error – a floating point number (in Hz) of the highest frequency error in the measured signal
18	I/Q origin offset – a floating point number (in dB) of the I and Q error (magnitude squared) offset from the origin
19	Amplitude Droop Error – a floating point number (in dB) of the amplitude droop measured across the 142 symbol burst
20	Trigger to T0 – a floating-point number (in sec) of the time interval between the trigger point to T0. T0 means the transition time from symbol 13 to symbol 14 of

	the midamble training Sequence for each time slot
21	Timing Offset of AM/PM path - a floating number (in sec) of the time interval between Amplitude Modulation path and Phase Modulation path
22	Detected TSC is the most recently detected TSC. The returned value is 0~7 (Burst Type : Normal) if TSC detected. If TSC not detected, the returned value is -999.0. If Amptd or NONE (Power vs Time only) specified in Sync Type, the returned value is -999.0. In multi slot condition, the returned value is the detected TSC of the specified slot(Time Slot ON) or the first evaluated slot(Time Slot OFF)
23	Detected Mod Scheme (0:GMSK, 1:NB 8PSK, 2:NB 16QAM, 3:NB 32QAM, 11:HB QPAK, 12:HB 16QAM, 13:HB 32QAM) Note that value except for GMSK and 8PSK return only when U9071A-3FP (EDGE Evo license) is installed
24	Peak Phase Error - a floating point number (in degree) of peak phase error over the entire measurement interval
25	Max Peak Phase Error - a floating point number (in degree) of maximum peak phase error over the entire measurement interval

The following EDGE EVM results, which would be returned if the measurement were run in the native GSM/EDGE measurement mode, are not returned when the measurement is run in Sequence Analyzer mode:

- Unprocessed I/Q Trace Data
- EVM Vector Trace
- Magnitude Error Vector Trace
- Phase Error Vector Trace
- I/Q Corrected Trace
- Demodulated Data
- I/Q Derotated Measured Data
- Max Hold EVM Vector Trace
- Min Hold EVM Vector Trace
- Max Hold Magnitude Error Trace
- Min Hold Magnitude Error Trace
- Max Hold Phase Error Trace
- Min Hold Phase Error Trace

Key Path	Meas
Initial S/W Revision	A.05.00

Occupied Bandwidth Results

If the analysis step has requested this measurement then the results returned for the analysis step within the List Sequencer measurement are listed below.

For more information on each result see the online help for the relevant radio standard measurement mode.

The SCPI-only header values are as follows:

Meas Bitmap Header is a floating point number which appears ahead of the results for the analysis interval; it is a decimal representation of the meas bitmap value for the measurements included in the interval. The value returned for OBW results is 1024. If more than one measurement is included in this analysis step, then the value returned represents the combined meas bitmap value for all included measurements, and the results are returned in ascending order of their meas bitmap values.

Number Of Results is a floating point number which appears ahead of the results of a measurement within the analysis interval; it represents the number of results metrics returned by the measurement. The value returned for OBW results is 4.

OBW measurement returns the following comma-separated scalar results:

Index	Result Details
0	Overall Pass/Fail
1	Main results <ol style="list-style-type: none"> 1. Occupied Bandwidth (Hz) 2. Transmit Frequency Error (Hz) 3. x dB bandwidth (Hz)

Key Path	Meas
Initial S/W Revision	A.05.00

Modulation Accuracy Results

The Modulation Accuracy (Rho) measurement used in the WCDMA, CDMA2000, 1xEV-DO, LTE-FDD, TD-SCDMA, LTE-TDD, and Bluetooth modes can be used in the sequencer. If the analysis step has requested this measurement then the results returned for the analysis step within the List Sequencer measurement are listed below.

For more information on each result see the online help for the relevant radio standard measurement mode.

["WCDMA Modulation Accuracy \(Rho\) Results" on page 262](#)

["CDMA2000 Modulation Accuracy \(Rho\) Results" on page 264](#)

["1xEVDO Modulation Accuracy \(Rho\) Results" on page 265](#)

["LTE FDD Modulation Accuracy Results" on page 268](#)

["TD-SCDMA Modulation Accuracy \(Rho\) Results" on page 273](#)

[LTE TDD Modulation Accuracy Results](#)

[Time Error Result](#)

["Bluetooth Transmit Analysis Results" on page 275](#)

["WLAN Modulation Accuracy Results" on page 276](#)

["WLAN MIMO Modulation Accuracy Results " on page 278](#)

WCDMA Modulation Accuracy (Rho) Results

WCDMA Modulation Accuracy (Rho) Results are detailed here.

The SCPI-only header values are as follows:

Meas Bitmap Header is a floating point number which appears ahead of the results for the analysis interval; it is a decimal representation of the meas bitmap value for the measurements included in the interval. The value returned for WCDMA Modulation Accuracy results is 2048. If more than one measurement is included in this analysis step, then the value returned represents the combined meas bitmap value for all included measurements, and the results are returned in ascending order of their meas bitmap values.

Number Of Results is a floating point number which appears ahead of the results of a measurement within the analysis interval; it represents the number of results metrics returned by the measurement. The value returned for WCDMA Modulation Accuracy results is 22.

WCDMA Modulation Accuracy (Rho) measurement returns the following comma-separated scalar results:

Index	Result Parameter
0	Overall Pass/Fail Result shows the mask test result 0:Pass, 1:Fail, -1:Not tested
1	RMS EVM pass/fail result (1.0 = fail, 0.0 = pass)
2	Peak EVM pass/fail result (1.0 = fail, 0.0 = pass)
3	Frequency Error pass/fail result (1.0 = fail, 0.0 = pass)
4	Rho pass/fail result (1.0 = fail, 0.0 = pass)
5	Peak Code Domain Error pass/fail result (1.0 = fail, 0.0 = pass)
6	RMS EVM (Average) is a floating point number (in percent) of EVM over the entire measurement area
7	Peak EVM (Peak Hold) is a floating point number (in percent) of the Peak EVM in the entire measurement area.
8	Magnitude Error (Average) is a floating point number (in percent) of the average magnitude error over the entire measurement area.
9	Phase Error (Average) is a floating point number (in degree) of the average phase error over the entire measurement area.
10	I/Q Origin Offset (Average) is a floating point number (in dB) of the I and Q error (magnitude squared) offset from the origin
11	Frequency Error (Average) is a floating point number (in Hz) of the frequency error in

	the measured signal
12	Rho (Average) is a floating point number of Rho
13	Peak Code Domain Error (Peak Hold) is a floating point number (in dB) of the Peak Code Domain Error relative to the mean reference power
14	Peak Code Domain Error Channel Number (Peak Hold) is the channel number in which the peak code domain error is detected
15	Number of active channels
16	Time Offset (Average) is a floating point number (in chips) of the pilot phase timing from the acquisition trigger point
17	Total power over a slot (Average) is a floating point number (in dBm) of the total RF power over a measurement slot
18	First Slot Number is an integer number of the first slot in Capture Interval. This is not averaged even if the averaging function is On. It is always the last cycle of the measurement
19	DPCCH Slot Format: (floating) If Sync Type is DPCCH, the DPCCH slot format value used for synchronization is returned. 0.0: Slot Format 0 1.0: Slot Format 1 2.0: Slot Format 2 3.0: Slot Format 3 4.0: Slot Format 4 5.0: Slot Format 5 - If Sync Type is PRACH, the value returned is -999.0. - In BTS mode, the value returned is -999.0
20	Preamble Signature: (floating) - BTS mode The returned value is always -999.0. - MS mode In Preamble Signature auto-detection mode, the detected signature code number (from 0.0 to 15.0) is returned when the Sync Type is PRACH Message. In Preamble Signature manual setting mode, the returned value is the same as the parameter setting. When the Sync Type is not PRACH Message, the returned value is NAN
21	Average Peak EVM (Average Peak) is a floating point number (in percent) of the averaging for Peak EVM readings on each slot over the entire measurement area.
22	Code Level: (floating) Defines the Code Level that the Peak CDE result is calculated. Should be the maximum one of all active channel.
23	Peak CDE At Code Level: (Peak Hold) is a floating point number (in dB) of the Peak Code Domain Error relative to the mean reference power but calculated at Code Level defined above.
24	Peak CDE Channel Number At Code Level: (floating) is the channel number in which the peak code domain error is detected at Code Level defined in 22. Contain two

information, one is IQ, the other is channel number. If Channel Number is N, IQ is defined by $N\%2$. "0" is I Channel, "1" is Q Channel. Channel number is defined by $\text{floor}(N/2)$.

Key Path	Meas
Initial S/W Revision	A.05.00

CDMA2000 Modulation Accuracy (Rho) Results

C2K Modulation Accuracy (Rho) Results are detailed here.

The SCPI-only header values are as follows:

Meas Bitmap Header is a floating point number which appears ahead of the results for the analysis interval; it is a decimal representation of the meas bitmap value for the measurements included in the interval. The value returned for C2K Modulation Accuracy results is 2048. If more than one measurement is included in this analysis step, then the value returned represents the combined meas bitmap value for all included measurements, and the results are returned in ascending order of their meas bitmap values.

Number Of Results is a floating point number which appears ahead of the results of a measurement within the analysis interval; it represents the number of results metrics returned by the measurement. The value returned for C2K Modulation Accuracy results is 18.

C2K Modulation Accuracy (Rho) measurement returns the following comma-separated scalar results:

Index	Result Parameter
0	Overall Pass/Fail Result shows the mask test result 0:Pass, 1:Fail, -1:Not tested
1	RMS EVM pass/fail result (1.0 = fail, 0.0 = pass)
2	Peak EVM pass/fail result (1.0 = fail, 0.0 = pass)
3	Rho pass/fail result (1.0 = fail, 0.0 = pass)
4	Peak Code Domain Error pass/fail result (1.0 = fail, 0.0 = pass)
5	Reserved result (always return -1.0)
6	Reserved result (always return -1.0)
7	RMS EVM (Average) is a floating point number (in percent) of EVM over the entire measurement area
8	Peak EVM (Peak Hold) is a floating point number (in percent) of the Peak EVM in the entire measurement area.
9	Magnitude Error (Average) is a floating point number (in percent) of the average magnitude error over the entire measurement area.
10	Phase Error (Average) is a floating point number (in degree) of the average phase error over the entire measurement area.
11	I/Q Origin Offset (Average) is a floating point number (in dB) of the I and Q error

	(magnitude squared) offset from the origin
12	Frequency Error (Average) is a floating point number (in Hz) of the frequency error in the measured signal
13	Rho (Average) is a floating point number of Rho
14	Peak Code Domain Error (Peak Hold) is a floating point number (in dB) of the Peak Code Domain Error relative to the mean reference power
15	Peak Code Domain Error Channel Number (Peak Hold) is the channel number in which the peak code domain error is detected
16	Number of active channels
17	Time Offset (Average) is a floating point number (in chips) of the pilot phase timing from the acquisition trigger point

The following Modulation Accuracy results, which would be returned if the measurement were run in the native cdma2000 measurement mode, are not returned when the measurement is run in Sequence Analyzer mode:

- Unprocessed I/Q Trace Data
- EVM Trace
- Magnitude Error Trace
- Phase Error Trace
- Corrected Measured Trace
- Pre-Channel Results

Key Path	Meas
Initial S/W Revision	A.05.00

1xEVDO Modulation Accuracy (Rho) Results

1xEVDO Modulation Accuracy (Rho) Results are detailed here.

The SCPI-only header values are as follows:

Meas Bitmap Header is a floating point number which appears ahead of the results for the analysis interval; it is a decimal representation of the meas bitmap value for the measurements included in the interval. The value returned for 1xEVDO Modulation Accuracy results is 2048. If more than one measurement is included in this analysis step, then the value returned represents the combined meas bitmap value for all included measurements, and the results are returned in ascending order of their meas bitmap values.

Number Of Results is a floating point number which appears ahead of the results of a measurement within the analysis interval; it represents the number of results metrics returned by the measurement. The value returned for 1xEVDO Modulation Accuracy results is 53.

1xEVDO Modulation Accuracy (Rho) measurement returns the following comma-separated scalar results:

Index	Result Parameter
0	Overall Pass/Fail Result shows the mask test result 0:Pass, 1:Fail, -1:Not tested
1	EVM pass/fail result (1.0 = fail, 0.0 = pass)
2	Peak EVM pass/fail result (1.0 = fail, 0.0 = pass)
3	Rho pass/fail result (1.0 = fail, 0.0 = pass)
4	Peak Code Domain Error pass/fail result (1.0 = fail, 0.0 = pass)
5	Frequency Error pass/fail result (1.0 = fail, 0.0 = pass)
6	Pilot Offset pass/fail result (1.0 = fail, 0.0 = pass)
7	Max Inactive Channel Code Domain Power pass/fail result (1.0 = fail, 0.0 = pass)
8	RRI Relative Power pass/fail result (1.0 = fail, 0.0 = pass)
9	ACK Channel Relative power pass/fail result (1.0 = fail, 0.0 = pass)
10	DRC Channel Relative power pass/fail result (1.0 = fail, 0.0 = pass)
11	Data Channel Relative power pass/fail result (1.0 = fail, 0.0 = pass)
12	DSC Channel Relative power pass/fail result (Subtype 2/3 only) (1.0 = fail, 0.0 = pass)
13	Auxiliary Pilot Channel Relative Power pass/fail result (Subtype 2/3 only) (1.0 = fail, 0.0 = pass)
14	Average RMS EVM – a floating point number (in percent) of EVM over the entire measurement area
15	Peak EVM – a floating point number (in percent) of peak EVM over the entire measurement area
16	Magnitude Error – a floating point number (in percent) of average magnitude error over the entire measurement area
17	Phase Error – a floating point number (in degrees) of average phase error over the entire measurement area
18	I/Q Origin Offset – a floating point number (in dB) of the I and Q error (magnitude squared) offset from the origin
19	Frequency Error – a floating point number (in percent) of average magnitude error over the entire measurement area
20	Rho – a floating point number of Rho
21	Peak Code Domain Error – a floating point number (in dB) of the Peak Code Domain Error relative to the main power
22	Peak Code Domain Error Channel Number – Returns the channel number that the peak is detected at the max spreading factor (In MS, number = peak channel + (max spread number * (code == Q))).
23	Number of active channels
24	Pilot Offset – a floating point number (in micro seconds) of Pilot offset from the trigger point
25	Max Inactive Channel Code Domain Power – a floating point number (in dB) of the Max Inactive Channel Code Domain Power

26	Pilot Power – a floating point number (in dB) of the Pilot power
27	RRI Power – a floating point number (in dB) of the RRI power
28	RRI Relative Power – a floating point number (in dB) of the RRI power relative to Pilot
29	DRC Power – a floating point number (in dB) of the DRC power
30	DRC Channel Relative Power – a floating point number (in dB) of the DRC Channel Power relative to Pilot
31	ACK Power – a floating point number (in dB) of the ACK power
32	ACK Channel Relative Power – a floating point number (in dB) of the ACK Channel Power relative to Pilot
33	Data Power – a floating point number (in dB) of the summed up Data Channel Power
34	Data Channel Relative Power – a floating point number (in dB) of the summed up Data Channel Power relative to Pilot
35	Auxiliary Pilot Power – a floating point number (in dB) of the Auxiliary Pilot power
36	Auxiliary Pilot Channel Relative Power – a floating point number (in dB) of Auxiliary Pilot Channel Power relative to Pilot
37	Total Power – a floating point number in dBm of total RF power over a measurement slot
38	Pilot & RRI Power – a floating point number (in dBc) of the Pilot & RRI power for Subtype 0/1 or -999 for Subtype2/3
39	DSC Channel Power – a floating point number (in dBc) of the DSC Channel Power
40	DSC Channel Relative Power – a floating point number (in dB) of the DSC Channel Power relative to Pilot
41	RMS EVM– a floating point number (in percent) of EVM on the half slot specified by Meas Offset
42	Peak EVM– a floating point number (in percent) of peak EVM on the half slot specified by Meas Offset
43	Magnitude error– a floating point number (in percent) of average magnitude error on the half slot specified by Meas Offset
44	Phase error– a floating point number (in degree) of average phase error on the half slot specified by Meas Offset
45	I/Q Origin Offset– a floating point number (in dB) of the I and Q error (magnitude squared) offset from the origin of the half slot specified by Meas Offset
46	Frequency error– a floating point number (in Hz) of the frequency error on the half slot specified by Meas Offset
47	Rho– a floating point number of Rho on the half slot specified by Meas Offset
48	Peak Code Domain Error– a floating point number (in dB) of the Peak Code Domain Error relative to the mean power over the half slot specified by Meas Offset
49	Peak Code Domain Error Channel Number– Returns the channel number that the peak is detected at the max spreading factor. (In MS, number = peak channel + (max spread number * (code == Q)))
50	Number of active channels- return the number of active channels on the half slot specified by Meas Offset

51	Pilot Offset- a floating point number (in micro seconds) of Pilot offset from the trigger point
52	Total Power- a floating point number in dBm of total RF power over the half slot specified by Meas Offset

The following Modulation Accuracy results, which would be returned if the measurement were run in the native 1xEVDO measurement mode, are not returned when the measurement is run in Sequence Analyzer mode:

- Unprocessed I/Q Trace Data
- EVM Trace
- Magnitude Error Trace
- Phase Error Trace
- Corrected Measured Trace
- From Code Domain Power View
- Code Domain Powers

Key Path	Meas
Initial S/W Revision	A.05.00

LTE FDD Modulation Accuracy Results

Results include:

["General Results" on page 276](#)

["Spectrum Flatness Equalizer Channel Frequency Results" on page 270](#)

["Spectrum Flatness Ripple Results" on page 271](#)

["Inband Emission Power Results" on page 271](#)

["Inband Emission Margin Results" on page 272](#)

["Detected Slot Number" on page 273](#)

Error! Reference source not found.

General Results

If the analysis step has requested this measurement then the results returned for the analysis step within the List Sequencer measurement are listed below.

For more information on each result see the online help for the relevant radio standard measurement mode.

The SCPI-only header values are as follows:

Meas Bitmap Header is a floating point number which appears ahead of the results for the analysis interval; it is a decimal representation of the meas bitmap value for the measurements included in the interval. The value returned for SEM results is 512. If more than one measurement is included in this analysis step, then the value returned represents the combined meas bitmap value for all included measurements, and the results are returned in ascending order of their meas bitmap values.

Number Of Results is a floating point number which appears ahead of the results of a measurement within the analysis interval; it represents the number of results metrics returned by the measurement. The value returned for SEM results is 75.

SEM measurement returns the following comma-separated scalar results:

Index	Result Details
0	Overall Pass/Fail Result shows the mask test result 0:Pass, 1:Fail, -1:Not tested
1	Main results <ol style="list-style-type: none"> 1. Absolute power at centre frequency (reference) area (dBm) 2. Peak frequency in the centre frequency (reference) area (Hz) 3. Relative integrated power on the negative offset A (dBc) 4. Absolute integrated power on the negative offset A 5. Relative peak power on the negative offset A (dBc) 6. Absolute peak power on the negative offset A 7. Peak power offset frequency from the centre frequency in the negative offset A (Hz) 8. Relative integrated power on the positive offset A (dBc) 9. Absolute integrated power on the positive offset A 10. Relative peak power on the positive offset A (dBc) 11. Absolute peak power on the positive offset A 12. Peak power offset frequency from the centre frequency in the positive offset A (Hz) 13. Relative integrated power on the negative offset B (dBc) ... 61. Absolute peak power on the positive offset F 62. Peak power offset frequency from the centre frequency in the positive offset A (Hz) 63. Minimum margin from the limit line on the negative offset A (db) 64. Minimum margin from the limit line on the positive offset A (db) 65. Minimum margin from the limit line on the negative offset B (db) 66. Minimum margin from the limit line on the positive offset B (db) 67. Minimum margin from the limit line on the negative offset C (db) 68. Minimum margin from the limit line on the positive offset C (db) 69. Minimum margin from the limit line on the negative offset D (db) 70. Minimum margin from the limit line on the positive offset D (db) 71. Minimum margin from the limit line on the negative offset E (db) 72. Minimum margin from the limit line on the positive offset E (db) 73. Minimum margin from the limit line on the negative offset F (db) 74. Minimum margin from the limit line on the positive offset F (db)

The unit for the absolute power results (listed in italics) varies depending on the Measurement Type:
 If the measurement type is Total Power Reference, these results are expressed in dBm
 If the measurement type is Power Spectral Density Reference, these results are expressed in dBm/Hz

Key Path	Meas
Initial S/W Revision	A.05.00

Spectrum Flatness Equalizer Channel Frequency Results

LTE FDD Modulation Accuracy Spectrum Flatness Results are detailed here.

These results are part of LTE FDD Modulation Accuracy measurement, and they can be queried by :MEAS|:READ|:FETCh:LSEQuencer:ACQuire{1:512}:ASTep{1:1000}:SFLatness[:ECFRequency]? Or Async fetch :FETCh:LSEQuencer:ASYNc:ACQuire{1:512}:ASTep{1:1000}:SFLatness[:ECFRequency]?/qonly/ This scpi command only available when LTE-FDD Modulation Accuracy measurement is configured in the specified analysis step.

LTE FDD Modulation Accuracy spectrum flatness results are defined as below, they are comma-separated and the length is 610.

Index	Result Parameter
0	Results Length - The total length of the results (includes the length field itself), currently fixed to 610
1	RP 1 Pass/Fail Result – 0:Pass, 1:Fail, -1:Not tested
2	RP 1 Value - maximum Ripple in Range 1
3	RP 2 Pass/Fail Result – 0:Pass, 1:Fail, -1:Not tested
4	RP 2 Value - maximum Ripple in Range 2
5	RP 12 Pass/Fail Result – 0:Pass, 1:Fail, -1:Not tested
6	RP 12 Value - the maximum ripple between the upper side of Range 1 and lower side of Range 2
7	RP 21 Pass/Fail Result – 0:Pass, 1:Fail, -1:Not tested
8	RP 21 Value - the maximum ripple between the upper side of Range 2 and lower side of Range 1
9	Number of subcarriers
10~609	600 Equalizer Coefficients - EC(f). Only the first Num_Of_SubCarriers values are valid

Key Path	Meas
Initial S/W Revision	A.09.50

Spectrum Flatness Ripple Results

LTE FDD Modulation Accuracy Spectrum Flatness Ripple Results are detailed here.

These results are part of LTE FDD Modulation Accuracy measurement, and they can be queried by :MEAS|:READ|:FETCh:LSEQuencer:ACQuire{1:512}:ASTep{1:1000}:SFLatness:RIPPlE? or Async Fetch :FETCh:LSEQuencer:ASYNc:ACQuire{1:512}:ASTep{1:1000}:SFLatness:RIPPlE?/qonly/

These scpi commands are only available when LTE-FDD Modulation Accuracy measurement is configured in the specified analysis step.

LTE FDD Modulation Accuracy spectrum flatness ripple results are defined as below, they are comma-separated and the length is 9.

Index	Result Parameter
0	Results Length - The total length of the results (includes the length field itself), currently fixed to 9
1	RP 1 Value - maximum Ripple in Range 1
2	RP 2 Value - maximum Ripple in Range 2
3	RP 12 Value - the maximum ripple between the upper side of Range 1 and lower side of Range 2
4	RP 21 Value - the maximum ripple between the upper side of Range 2 and lower side of Range 1
5	Min Ec(f)1 - the minimum EC(f) in Range 1
6	Max Ec(f)1 - the maximum EC(f) in Range 1
7	Min Ec(f)2 - the minimum EC(f) in Range 2
8	Max Ec(f)2 - the maximum EC(f) in Range 2

Key Path	Meas
Initial S/W Revision	A.09.40

Inband Emission Power Results

LTE FDD Modulation Accuracy Inband Emission Power Results are detailed here.

These results are part of LTE FDD Modulation Accuracy measurement, and they can be queried by :MEAS|:READ|:FETCh:LSEQuencer:ACQuire{1:512}:ASTep{1:1000}:IEMission[:POWer]? Or Async fetch :FETCh:LSEQuencer:ASYNc:ACQuire{1:512}:ASTep{1:1000}:IEMission[:POWer]?/qonly/ This scpi command only available when LTE-FDD Modulation Accuracy measurement is configured in the specified analysis step.

LTE FDD Modulation Accuracy Inband Emission Power results are defined as below, they are comma-separated and the length is 53.

Index	Result Parameter
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0	Results Length - The total length of the results (includes the length field itself), currently fixed to 53
1	Average Power of Active RBs - the average absolute power of allocated RBs in dBm
2	Number of RBs - the number of RBs in current configuration
3~52	Power Per RB - the absolute power (dBm) per RB. Only the first Number_OF_RB values are valid.

Key Path	Meas
Initial S/W Revision	A.09.50

Inband Emission Margin Results

LTE FDD Modulation Accuracy Inband Emission Margin Results are detailed here.

These results are part of LTE FDD Modulation Accuracy measurement, and they can be queried by :MEAS]:READ]: FETCh:LSEQuencer:ACQuire{1:512}:ASTep{1:1000}:IEMission:MARGIn? Or Async fetch :FETCh:LSEQuencer:ASYNc:ACQuire{1:512}:ASTep{1:1000}:IEMission:MARGIn?/qonly/ This scpi command only available when LTE-FDD Modulation Accuracy measurement is configured in the specified analysis step.

LTE FDD Modulation Accuracy Inband Emission Margin results are defined as below, they are comma-separated and the length is 54.

Index	Result Parameter
0	Results Length - The total length of the results (includes the length field itself), currently fixed to 54
1	Minimal Inband Margin - Inband margin is the difference between the inband emission limit mask and actual measured power per non-allocated RB. Which means the margin = (Limit - Power) in dB, and a negative margin stands for the power exceeds the limit.
0 1	Minimal Inband Margin Index - the RB index of minimal margin results (ZERO based)
2	Number of RBs - the number of RBs in current configuration
4~53	Inband Margin per RB - The Margin result of each RB. (only the first Num_of_RB values are valid). If the RB is active (allocated), the inband margin result will be set to NAN.

Key Path	Meas
Initial S/W Revision	A.09.50

Detected Slot Number

LTE FDD Modulation Accuracy detected slot number results are detailed here.

These results are part of LTE FDD Modulation Accuracy measurement, and they can be queried by :MEAS[:READ]:FETCh:LSEQuencer:ACQuire{1:512}:ASTep{1:1000}:SLOT[:DETECT]? or Asnc Fetch :FETCh:LSEQuencer:ASYNc:ACQuire{1:512}:ASTep{1:1000}:SLOT[:DETECT]?

These scpi commands are only available when LTE-FDD Modulation Accuracy measurement is configured in the specified analysis step.

There is only one value returned which represents the actually detected slot number of LTE Modulation Accuracy.

Key Path	Meas
Initial S/W Revision	A.09.40

TD-SCDMA Modulation Accuracy (Rho) Results

TD-SCDMA Modulation Accuracy (Rho) Results are detailed here.

The SCPI-only header values are as follows:

Meas Bitmap Header is a floating point number which appears ahead of the results for the analysis interval; it is a decimal representation of the meas bitmap value for the measurements included in the interval. The value returned for TD-SCDMA Modulation Accuracy results is 2048. If more than one measurement is included in this analysis step, then the value returned represents the combined meas bitmap value for all included measurements, and the results are returned in ascending order of their meas bitmap values.

Number Of Results is a floating point number which appears ahead of the results of a measurement within the analysis interval; it represents the number of results metrics returned by the measurement. The value returned for TD-SCDMA Modulation Accuracy results is 25.

TD-SCDMA Modulation Accuracy (Rho) measurement returns the following comma-separated scalar results:

Index	Result Parameter
0	Overall Pass/Fail Result shows the mask test result 0:Pass, 1:Fail, -1:Not tested
1	RMS EVM pass/fail result (1.0 = fail, 0.0 = pass)
2	Peak EVM pass/fail result (1.0 = fail, 0.0 = pass)
3	Rho pass/fail result (1.0 = fail, 0.0 = pass)
4	Peak Code Domain Error pass/fail result (1.0 = fail, 0.0 = pass)
5	Frequency Error pass/fail result (1.0 = fail, 0.0 = pass)
6	RMS EVM (Average) is a floating point number (in percent) of EVM over the entire measurement area
7	Peak EVM (Peak Hold) is a floating point number (in percent) of the Peak EVM in the

	entire measurement area.
8	Magnitude Error (Average) is a floating point number (in percent) of the average magnitude error over the entire measurement area.
9	Magnitude Error (Peak Hold) is a floating point number (in percent) of the Peak magnitude error over the entire measurement area.
10	Phase Error (Average) is a floating point number (in degree) of the average phase error over the entire measurement area.
11	Phase Error (Peak Hold) is a floating point number (in degree) of the Peak phase error over the entire measurement area.
12	I/Q Origin Offset (Average) is a floating point number (in dB) of the I and Q error (magnitude squared) offset from the origin
13	Frequency Error (Average) is a floating point number (in Hz) of the frequency error in the measured signal
14	Rho (Average) is a floating point number of Rho
15	Quadrature Error (Average) is a floating point number (in degree) of the quadrature error in the measured signal
16	Gain Imbalance (Average) is a floating point number (in dB) of the gain imbalance in the measured signal
17	Peak Code Domain Error (Peak Hold) is a floating point number (in dB) of peak hold Peak Code Domain Error (of all the code channels, including active and inactive, in average cycle) of the selected timeslot.
18	Peak Code Domain Error - Code Length (Peak Hold) is the code length of peak hold Peak CDE (in average cycle) of the selected timeslot.
19	Peak Code Domain Error - Code Index (Peak Hold) is the code index of peak hold Peak CDE (in average cycle) of the selected timeslot.
20	Peak Active Code Domain Error (Peak Hold) is a floating point number (in dB) of the peak hold Peak Active CDE (of active code channels, in average cycle) of the selected timeslot
21	Peak Active Code Domain Error - Code Length (Peak Hold) is the code length of peak hold Peak Active CDE (in average cycle) of the selected timeslot.
22	Peak Active Code Domain Error - Code Index (Peak Hold) is the code index of peak hold Peak Active CDE (in average cycle) of the selected timeslot.
23	Number of active channels
24	Time Offset (Average) is a floating point number (in chips) of the averaged composite timing error (in average cycle) of the selected timeslot, relative to the timing reference (DwPTS/UpPTS/Trig).

Key Path	Meas
Initial S/W Revision	A.12.00

Bluetooth Transmit Analysis Results

The Transmit Analysis measurement used in the Bluetooth mode is used in the sequencer, which combines multiple measurements in a single package. If Radio Std is Basic or Low Energy, it includes Output Power, Modulation Characteristics, ICFT (Initial Carrier Frequency Tolerance) and Carrier Frequency Drift test specification. If Radio Std is EDR, it includes Relative Transmit Power, Freq Stability and Mod Accuracy, and Differential Phase Decoding test specification. If the analysis step has requested this measurement then the results returned for the analysis step within the List Sequencer Measurement are listed below.

For more information on each result see the online help for the relevant radio standard measurement mode.

The SCPI-only header values are as follows:

Meas Bitmap Header is a floating point number which appears ahead of the results for the analysis interval; it is a decimal representation of the meas bitmap value for the measurements included in the interval. The value returned for Bluetooth Transmit Analysis results is 2048. If more than one measurement is included in this analysis step, then the value returned represents the combined meas bitmap value for all included measurements, and the results are returned in ascending order of their meas bitmap values.

Number Of Results is a floating point number which appears ahead of the results of a measurement within the analysis interval; it represents the number of results metrics returned by the measurement. The value returned for Bluetooth Transmit Analysis results is 28.

Bluetooth Transmit Analysis measurement returns the following comma-separated scalar results:

Index	Result Parameter
0	Overall Pass/Fail Result shows the mask test result 0:Pass, 1:Fail, -1:Not tested
	GFSK Avg Power
	GFSK Peak Power
	f1 Avg (Hz)
	f2 Avg (Hz)
	Min f1 Max (Hz)
	Max f1 Max (Hz)
	Min f2 Max (Hz)
	Max f2 Max (Hz)
	f2 > 115 kHz
	f2 Avg/f1 Avg
	ICFT (Hz)
	Max Frequency Drift (Hz)
	Max Drift Rate (Hz)
	Freq Offset i (Hz)
	Freq Offset 0 (Hz)

	Freq Offset i+0 (Hz)
	RMS DEVM (%)
	Peak DEVM (%)
	99% DEVM for EDR modulation (%)
	GFSK Avg Power (dBm)
1	DPSK Avg Power (dBm)
	Relative Power (DPSK Avg Power - GFSK Avg Power) (dB)
	BER (%)
	Bit Errors
	Guard Interval (s)
	Packet Type
	Payload Length (bits)

Key Path	Meas
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WLAN Modulation Accuracy Results

Results include:

["General Results" on page 278](#)

["WLAN Spectral Flatness Trace Results" on page 277](#)

General Results

LTE FDD Modulation Accuracy Results are detailed here.

The SCPI-only header values are as follows:

Meas Bitmap Header is a floating point number which appears ahead of the results for the analysis interval; it is a decimal representation of the meas bitmap value for the measurements included in the interval. The value returned for LTE FDD Modulation Accuracy results is 2048. If more than one measurement is included in this analysis step, then the value returned represents the combined meas bitmap value for all included measurements, and the results are returned in ascending order of their meas bitmap values.

Number Of Results is a floating point number which appears ahead of the results of a measurement within the analysis interval; it represents the number of results metrics returned by the measurement. The value returned for LTE FDD Modulation Accuracy results is 31.

LTE FDD Modulation Accuracy measurement returns the following comma-separated scalar results:

Index	Result Parameter
0	Overall Pass/Fail Result 0:Pass, 1:Fail, -1:Not teste

1	EVM (%rms)
2	EVM Sym Time Adjust
3	EVM Pk (%)
4	EVM Pk Index
5	EVM Peak Sub Car Index
6	Data EVM (%rms) – Not available when Detection is Manual and no User is added.
7	3GPP-defined QPSK EVM (%rms)
8	3GPP-defined 16QAM EVM (%rms)
9	3GPP-defined 64QAM EVM (%rms)
10	RS EVM (%rms)
11	RS Tx. Power (dBm).
12	OFDM Sym. Tx. Power (dBm)
13	Freq Error (Hz)
14	Sync Corr (%)
15	Sync Type
16	Common Tracking Error (%rms)
17	Symbol Clock Error (ppm)
18	Time Offset (s)
19	IQ Offset (dB)
20	IQ Gain Imbalance (dB)
21	IQ Quad Error (deg)
22	IQ Timing Skew (s)
23	CP Length Mode
24	Cell ID.
25	Cell ID Group/Sector
26	RS-OS/PRS
27	Reference Signal Rx Power (Avg)
28	Reference Signal Rx Quality
29	Magnitude Error (%)
30	Phase Error (radian)

Key Path	Meas
Initial S/W Revision	A.09.50

WLAN Spectral Flatness Trace Results

WLAN Spectral Flatness Trace results are detailed here.

These results are part of WLAN Modulation Accuracy measurement, and they can be queried by MEAS|READ|FETCH:LSEQuencer:ACQuire{1...512}:ASTep{1...1000}:WLAN:FLATness:TRACe? Or Async fetch :FETCh:LSEQuencer:ASYNc:ACQuire{1:512}:ASTep{1:1000}:WLAN:FLATness:TRACe? This scpi commands are only available when WLAN Modulation Accuracy measurement is configured in the specified analysis step.

WLAN Modulation Accuracy Spectral Flatness trace results are energy flatness of sub-carriers in OFDM system.

WLAN MIMO Modulation Accuracy Results

Results include:

General Results

General Results

WLAN Modulation Accuracy Results are detailed here.

The SCPI-only header values are as follows:

Meas Bitmap Header is a floating point number which appears ahead of the results for the analysis interval; it is a decimal representation of the meas bitmap value for the measurements included in the interval. The value returned for WCDMA Modulation Accuracy results is 2048. If more than one measurement is included in this analysis step, then the value returned represents the combined meas bitmap value for all included measurements, and the results are returned in ascending order of their meas bitmap values.

Number Of Results is a floating point number which appears ahead of the results of a measurement within the analysis interval; it represents the number of results metrics returned by the measurement. The value returned for WLAN Modulation Accuracy results is 19.

WLAN Modulation Accuracy measurement returns the following comma-separated scalar results:

Index	Result Parameter
0	Overall Pass/Fail Result shows the mask test result 0:Pass, 1:Fail, -1:Not tested
1	RMS EVM pass/fail result (1.0 = fail, 0.0 = pass)
2	Frequency Error pass/fail result (1.0 = fail, 0.0 = pass)
3	Symbol Clock Error pass/fail result (1.0 = fail, 0.0 = pass)
4	Chip Clock Error pass/fail result (1.0 = fail, 0.0 = pass)
5	Carrier Suppression pass/fail result (1.0 = fail, 0.0 = pass)
6	IQ Offset pass/fail result (1.0 = fail, 0.0 = pass)
7	1000 Chips Peak EVM pass/fail (1.0 = fail, 0.0 = pass)
8	Spectral Flatness pass/fail (1.0 = fail, 0.0 = pass)
9	RMS EVM (Average) (dB)
10	Peak EVM (Peak Hold) (dB)
11	Frequency Error (Average) (Hz)

12	Symbol Clock Error (ppm)
13	Chip Clock Error (ppm)
14	Carrier Suppression (dB)
15	I/Q Origin Offset (dB)
16	802.11b 1000 Chips Peak Peak EVM (dB)
17	IQ Gain Imbalance (dB)
18	IQ Quadrature Error (degree)
19	Data Rate (Mbps)
20	Average Burst Power (dBm)
21	Peak Burst Power (dBm)

Key Path	Meas
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QPSK EVM Results

The QPSK EVM measurement used in the other supported modes is used in the sequencer. The Meas parameters usable within the List Sequencer measurement are listed below.

For more information on each result see the online help for the relevant radio standard measurement mode.

The SCPI-only header values are as follows:

Meas Bitmap Header is a floating point number which appears ahead of the results for the analysis interval; it is a decimal representation of the meas bitmap value for the measurements included in the interval. The value returned for QPSK EVM results is 4096. If more than one measurement is included in this analysis step, then the value returned represents the combined meas bitmap value for all included measurements, and the results are returned in ascending order of their meas bitmap values.

Number Of Results is a floating point number which appears ahead of the results of a measurement within the analysis interval; it represents the number of results metrics returned by the measurement. The value returned for QPSK EVM results is 18.

QPSK EVM measurement returns the following comma-separated scalar results:

Index	Result Parameter
0	Overall Pass/Fail Result shows the mask test result 0:Pass, 1:Fail, -1:Not tested
1	RMS EVM pass/fail result (1.0 = fail, 0.0 = pass) Returns the result of whether the RMS EVM passed the limit set in the measurement setup.
2	Reserved result (always return -1.0)
3	Reserved result (always return -1.0).

4	Reserved result (always return -1.0).
5	Frequency Error pass/fail result (1.0 = fail, 0.0 = pass) Returns the result of whether the Freq Error passed the limit set in the measurement setup.
6	Reserved result (always return -1.0).
7	RMS EVM (Average) is a floating point number (in percent) of EVM over the entire measurement interval
8	RMS EVM maximum is the maximum RMS EVM over the average group. If averaging is off, then it returns result for the measurement interval.
9	Peak EVM is a floating point number (in percent) of the Peak EVM in the measurement interval.
10	Peak EVM maximum is the maximum Peak EVM over the average group. If averaging is off, then it returns result for the measurement interval.
11	Magnitude Error is a floating point number (in percent) of averaged magnitude error over the entire measurement interval.
12	Magnitude Error maximum is a floating point number over the average group. If averaging is off, then it returns result for the measurement interval.
13	Phase Error is a floating point number (in degrees) of the averaged phase error over the entire measurement interval.
14	Phase Error maximum is the maximum Phase Error over the average group. If averaging is off, then it returns result for the measurement interval.
15	Frequency Error is a floating point number (in Hz) of the frequency error in the measured signal
16	Frequency Error maximum is the maximum frequency error over the average group. If averaging is off, then it returns result for the measurement interval.
17	I/Q Origin Offset is a floating point number (in dB) of the I and Q error (magnitude squared) offset from the origin.

The following QPSK EVM results, which would be returned if the measurement were run in the W-CDMA or cdma2000 measurement modes, are not returned when the measurement is run in Sequence Analyzer mode:

- Unprocessed I/Q Trace Data
- EVM Trace
- Magnitude Error Trace
- Phase Error Trace
- Corrected Measured Trace

Key Path	Meas
Initial S/W Revision	A.05.00

Code Domain Power Results

The Code Domain Power measurement used in the other supported modes is used in the sequencer. The Meas parameters usable within the List Sequencer measurement are listed below.

"WCDMA Code Domain Power Results" on page 281

"TD-SCDMA Code Domain Power Results" on page 281

For more information on each result see the online help for the relevant radio standard measurement mode.

WCDMA Code Domain Power Results

This measurement returns 256 I/Q pairs of the Code Domain Power result and 256 I/Q pairs of the Code Domain Error result.

The SCPI-only header values are as follows:

Meas Bitmap Header is a floating point number which appears ahead of the results for the analysis interval; it is a decimal representation of the meas bitmap value for the measurements included in the interval. The value returned for WCDMA CDP results is 8192. If more than one measurement is included in this analysis step, then the value returned represents the combined meas bitmap value for all included measurements, and the results are returned in ascending order of their meas bitmap values.

Number Of Results is a floating point number which appears ahead of the results of a measurement within the analysis interval; it represents the number of results metrics returned by the measurement. The value returned for WCDMA CDP results is 1024 (that is, 256 I/Q pairs of the Code Domain Power and 256 I/Q pairs of the Code Domain Error).

WCDMA CDP measurement returns the following comma-separated scalar results:

Index	Result Details
0	Code Domain Power is 256 I/Q Pairs, 512 floating point numbers. The I values are listed first in each pair, using the 0 through even-indexed values. The Q values are the odd-indexed values.
1	Code Domain Error is 256 I/Q Pairs, 512 floating point numbers. The I values are listed first in each pair, using the 0 through even-indexed values. The Q values are the odd-indexed values.

Key Path	Mesa
Initial S/W Revision	A.05.00

TD-SCDMA Code Domain Power Results

TD-SCDMA Code Domain Power Results are detailed here.

The SCPI-only header values are as follows:

Meas Bitmap Header is a floating point number which appears ahead of the results for the analysis interval; it is a decimal representation of the meas bitmap value for the measurements included in the interval. The value returned for TD-SCDMA Code Domain results is 8192. If more than one measurement is

included in this analysis step, then the value returned represents the combined meas bitmap value for all included measurements, and the results are returned in ascending order of their meas bitmap values.

Number Of Results is a floating point number which appears ahead of the results of a measurement within the analysis interval; it represents the number of results metrics returned by the measurement. The value returned for TD-SCDMA Code Domain results is 64.

TD-SCDMA Code Domain measurement returns the following comma-separated scalar results:

Index	Result Details
0	Unnormalized Code Domain Power Vector (float) [dBm] - Return the vector containing unnormalized CDP information for the specified code channel, as a series of comma-separated points. There are 16 numbers in this vector. If the channel's code length (indicated by the value on the same position within the Code Length Vector) is less than the max spreading code length 16, the power is duplicated (16/spreading code length) times. Its data are lined according to the increasing code index.
1	Normalized Code Domain Power Vector (float) [dB] - Return the vector containing normalized CDP information for the specified code channel, as a series of comma-separated points. There are 16 numbers in this vector. If the channel's code length (indicated by the value on the same position within the Code Length Vector) is less than the max spreading code length 16, the power is duplicated (16/spreading code length) times. Its data are lined according to the increasing code index.
2	Unnormalized Code Domain Error Vector (float) [dBm] - Return the vector containing unnormalized CDE information for the specified code channel, as a series of comma-separated points. There are 16 numbers in this vector. If the channel's code length (indicated by the value on the same position within the Code Length Vector) is less than the max spreading code length 16, the error is duplicated (16/spreading code length) times. Its data are lined according to the increasing code index.
3	Normalized Code Domain Error Vector (float) [dB] - Return the vector containing normalized CDE information for the specified code channel, as a series of comma-separated points. There are 16 numbers in this vector. If the active channel's code length (specified by the value on the same position within the Code Length Vector) is less than the max spreading code length 16, the error is duplicated (16/spreading code length) times. Its data are lined according to the increasing code index.

Key Path	Meas
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Phase Discontinuity Measurement Results

The slot phase mode of the WCDMA Power Control measurement used in the WCDMA modes is available in the sequencer, where it is called as Phase Discontinuity. The measurement results available within the List Sequencer measurement are listed below.

For more information on each result see the online help for the relevant radio standard measurement mode.

The SCPI-only header values are as follows:

Meas Bitmap Header is a floating point number which appears ahead of the results for the analysis interval; it is a decimal representation of the meas bitmap value for the measurements included in the interval. The value returned for Phase Discontinuity results is 16384. If more than one measurement is

included in this analysis step, then the value returned represents the combined meas bitmap value for all included measurements, and the results are returned in ascending order of their meas bitmap values.

Number Of Results is a floating point number which appears ahead of the other results of the measurement; it represents the number of results metrics returned by the measurement. The value returned for Phase Discontinuity measurement results is 721 (that are, 1 float value for number of slots, and 8 phase discontinuity results per slots X 90 slots).

Phase Discontinuity measurement returns the following comma-separated scalar results. The total number of measurement intervals are returned, as well as the phase discontinuity related results for each interval, the List Sequencer measurement supports to return results for up to 90 slots.

If the measurement interval can't be used to measure 90 slots, NAN will be returned for those slots that can't be covered by the analysis step with Phase Discontinuity measurement configured.

Index	Result Details
0	Number of slots: Number of slots found in the captured data.
1	Phase of slot 1
	...
90	Phase of slot 90
91	Phase Discontinuity of slot 1: Fixed to NAN
92	Phase Discontinuity of slot 2: Slot phase discontinuity from the previous slot. (Phase difference between the end of the previous slot and the beginning of the current slot.)
	...
180	Phase Discontinuity of slot 90
181	RMS EVM of slot 1: RMS EVM of slots based on the best-fit line excluding 25us at the beginning and the end of the slot.
	...
270	RMS EVM of slot 90
271	RMS Magnitude Error of slot 1: RMS Magnitude Error of the slot. It is an element of RMS EVM of the slot.
	..
360	RMS Magnitude Error of slot 90
361	RMS Phase Error of slot 1: RMS phase Error of the slot. It is an element of RMS EVM of the slot.
	...
450	RMS Phase Error of slot 90
451	Frequency Error of slot 1: Frequency Error of the best-fit line for slots excluding 25 us at the beginning and the end of the slot. It also includes the frequency error of the reference frequency that the measurement algorithm determines for synchronization.
	...
540	Frequency Error of slot 90
541	IQ Original Offset of slot 1: IQ Origin offset of the slot. It is an element of RMS EVM of the slot.

630	IQ Original Offset of slot 90
631	Slot power of slot 1: In-channel power of slot 1
720	Slot Power of slot1

Key Path	Meas
Initial S/W Revision	A.05.00

Loopback BER Results

The Loopback BER measurement is used in the Sequencer to perform the receiver reference sensitivity measurement. The results are only applicable for GSM, EDGE, WCDMA and TD-SCDMA radio standard. If the analysis step has requested this measurement then the results returned for the analysis step within the List Sequencer Measurement are listed below.

The SCPI-only header values are as follows:

Meas Bitmap Header is a floating point number which appears ahead of the results for the analysis interval; it is a decimal representation of the meas bitmap value for the measurements included in the interval. The value returned for Loopback BER results is 32768. If more than one measurement is included in this analysis step, then the value returned represents the combined meas bitmap value for all included measurements, and the results are returned in ascending order of their meas bitmap values.

Number Of Results is a floating point number which appears ahead of the results of a measurement within the analysis interval; it represents the number of results metrics returned by the measurement. The value returned for Loopback BER results is 4.

Loopabck BER measurement returns the following comma-separated scalar results.

Index	Result Details
0	Loopback bit error ratio.
1	Total tested bit number.
2	Failed bit number.
3	Reserve.

Key Path	Meas
Initial S/W Revision	A.11.50

Integrity Indicator

The integrity indicator values are returned with the measurement results as indicated in "[Measurement Results](#)" on page 241. The values returned are shown in the table below. The values returned are referenced to the Acquisition or Analysis Step. Errors outside these (for example, uncal and hardware errors that may occur outside of the Sequence) are returned over SCPI in the normal way. They appear in the error queue and can be returned via SCPI with `SYSTEM:ERROR?`

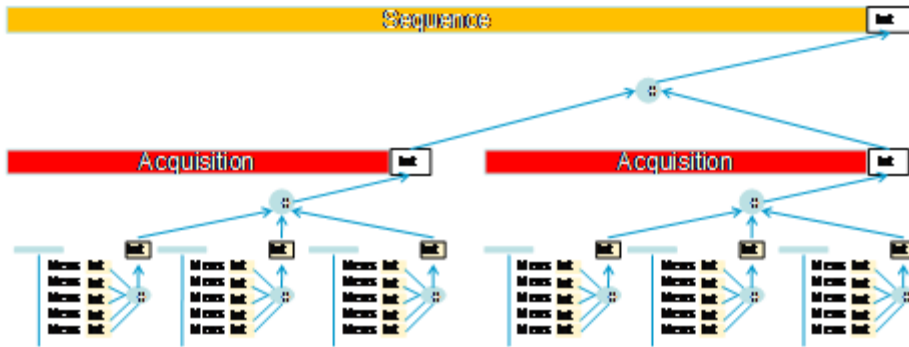
The integrity indicator values are coupled to the "Abort on Error" parameter if that parameter is On. In that case the Sequence aborts if any of the integrity values are set to 1, indicating a questionable value.

The integrity indicator values are only returned via SCPI. The front panel user interface does not return the integrity values.

Bit	Error Description	Level	This maps to Status Sub system bit
0	Trigger Error	Acq. Level	STATUS:QUESTIONABLE:INTEGRITY Trigger Error bit 11
1	Input overload	Acq. Level	STATUS:QUESTIONABLE:INTEGRITY IF/ADC Over Range bit 4
2	Mem Error	Acq. Level	STATUS:QUESTIONABLE:INTEGRITY Memory Error bit 9
3	Acq Failure	Acq. Level	STATUS:QUESTIONABLE:INTEGRITY Meas Error bit 8
4	Reserved	N/A	N/A
5	Reserved	N/A	N/A
6	Burst Not Found	Meas Level	STATUS:QUESTIONABLE:INTEGRITY:SIGNAl Burst Not Found bit 2
7	Sync Error	Meas Level	STATUS:QUESTIONABLE:INTEGRITY:SIGNAl Sync Error bit 6
8	Signal too noisy	Meas Level	STATUS:QUESTIONABLE:INTEGRITY:SIGNAl Signal too noisy bit 8
9	Insufficient Data	Meas Level	STATUS:QUESTIONABLE:INTEGRITY Insufficient Data bit 7
10	Meas Error	Meas Level	STATUS:QUESTIONABLE:INTEGRITY Meas Error bit 8
11	Reserved	N/A	N/A
12	Reserved	N/A	N/A

The diagram below represents the aggregation of the integrity indicator values as they are returned from individual measurements, to Analysis steps, to Acquisitions, and finally to the overall Sequence. If more than one integrity indicator value occurs, then the bits are AND'ed together and an integer value representing each bit is returned up the chain.

Integrity System



Key Path	Meas
Initial S/W Revision	A.05.00

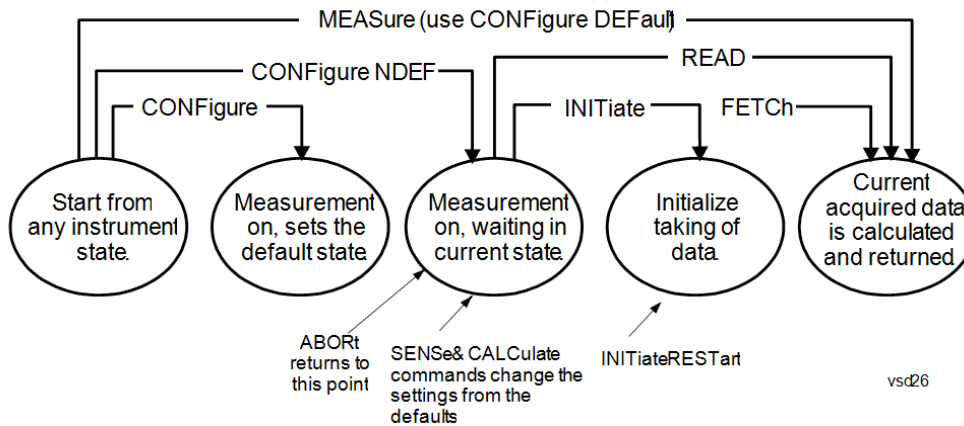
Remote Measurement Functions

This section contains the following topics:

- "Measurement Group of Commands" on page 287
- "Current Measurement Query (Remote Command Only)" on page 289
- "Limit Test Current Results (Remote Command Only)" on page 289
- "Data Query (Remote Command Only)" on page 289
- "Calculate/Compress Trace Data Query (Remote Command Only)" on page 290
- "Calculate Peaks of Trace Data (Remote Command Only)" on page 295
- Hardware-Accelerated Fast Power Measurement (Remote Command Only)
- "Format Data: Numeric Data (Remote Command Only)" on page 296
- "Format Data: Byte Order (Remote Command Only)" on page 297

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Measurement Group of Commands



Measure Commands:

:MEASure:<measurement>[n]?

This is a fast single-command way to make a measurement using the factory default instrument settings. These are the settings and units that conform to the Mode Setup settings (e.g. radio standard) that you have currently selected.

- Stops the current measurement (if any) and sets up the instrument for the specified measurement using the factory defaults
- Initiates the data acquisition for the measurement
- Blocks other SCPI communication, waiting until the measurement is complete before returning results.
- If the function does averaging, it is turned on and the number of averages is set to 10.
- After the data is valid it returns the scalar results, or the trace data, for the specified measurement. The type of data returned may be defined by an [n] value that is sent with the command.
- The scalar measurement results will be returned if the optional [n] value is not included, or is set to 1. If the [n] value is set to a value other than 1, the selected trace data results will be returned. See each command for details of what types of scalar results or trace data results are available.
- ASCII is the default format for the data output. (Older versions of Spectrum Analysis and Phase Noise mode measurements only use ASCII.) The binary data formats should be used for handling large blocks of data since they are smaller and faster than the ASCII format. Refer to the FORMat:DATA command for more information.

If you need to change some of the measurement parameters from the factory default settings you can set up the measurement with the CONFIgure command. Use the commands in the SENSe:<measurement> and CALCulate:<measurement> subsystems to change the settings. Then you can use the READ? command to initiate the measurement and query the results.

If you need to repeatedly make a given measurement with settings other than the factory defaults, you can use the commands in the SENSe:<measurement> and CALCulate:<measurement> subsystems to set up the measurement. Then use the READ? command to initiate the measurement and query results.

Measurement settings persist if you initiate a different measurement and then return to a previous one. Use READ:<measurement>? if you want to use those persistent settings. If you want to go back to the default settings, use MEASure:<measurement>?.

Configure Commands:

:CONFIgure:<measurement>

This command stops the current measurement (if any) and sets up the instrument for the specified measurement using

the factory default instrument settings. It does not initiate the taking of measurement data unless INIT:CONTinuous is ON. If you change any measurement settings after using the CONFigure command, the READ command can be used to initiate a measurement without changing the settings back to their defaults.

In the Swept SA measurement in Spectrum Analyzer mode the CONFigure command also turns the averaging function on and sets the number of averages to 10 for all measurements.

:CONFigure: <measurement>: NDEFault stops the current measurement and changes to the specified measurement. It does not change the settings to the defaults. It does not initiate the taking of measurement data unless INIT:CONTinuous is ON.

The CONFigure? query returns the current measurement name.

The CONFigure:CATalog? query returns a quoted string of all licensed measurement names in the current mode. For example, "SAN, CHP, OBW, ACP, PST, TXP, SPUR, SEM, LIST".

Fetch Commands:

:FETCh:<measurement>[n]?

This command puts selected data from the most recent measurement into the output buffer. Use FETCh if you have already made a good measurement and you want to return several types of data (different [n] values, for example, both scalars and trace data) from a single measurement. FETCh saves you the time of re-making the measurement. You can only FETCh results from the measurement that is currently active, it will not change to a different measurement. An error message is reported if a measurement other than the current one is specified.

If you need to get new measurement data, use the READ command, which is equivalent to an INITiate followed by a FETCh.

The scalar measurement results will be returned if the optional [n] value is not included, or is set to 1. If the [n] value is set to a value other than 1, the selected trace data results will be returned. See each command for details of what types of scalar results or trace data results are available. The binary data formats should be used for handling large blocks of data since they are smaller and transfer faster than the ASCII format. (FORMat:DATA)

FETCh may be used to return results other than those specified with the original READ or MEASure command that you sent.

INITiate Commands:

:INITiate:<measurement>

This command is not available for measurements in all the instrument modes:

- Initiates a trigger cycle for the specified measurement, but does not output any data. You must then use the FETCh<meas> command to return data. If a measurement other than the current one is specified, the instrument will switch to that measurement and then initiate it.
 - For example, suppose you have previously initiated the ACP measurement, but now you are running the channel power measurement. If you send INIT:ACP? it will change from channel power to ACP and will initiate an ACP measurement.
 - Does not change any of the measurement settings. For example, if you have previously started the ACP measurement and you send INIT:ACP? it will initiate a new ACP measurement using the same instrument settings as the last time ACP was run.
 - If your selected measurement is currently active (in the idle state) it triggers the measurement, assuming the trigger conditions are met. Then it completes one trigger cycle. Depending upon the measurement and the number of averages, there may be multiple data acquisitions, with multiple trigger events, for one full trigger cycle. It also holds off additional commands on GPIB until the acquisition is complete.
-

READ Commands:

:READ:<measurement>[n]?

- Does not preset the measurement to the factory default settings. For example, if you have previously initiated the ACP
-

measurement and you send READ:ACP? it will initiate a new measurement using the same instrument settings.

- Initiates the measurement and puts valid data into the output buffer. If a measurement other than the current one is specified, the instrument will switch to that measurement before it initiates the measurement and returns results.
 - For example, suppose you have previously initiated the ACP measurement, but now you are running the channel power measurement. Then you send READ:ACP? It will change from channel power back to ACP and, using the previous ACP settings, will initiate the measurement and return results.
 - Blocks other SCPI communication, waiting until the measurement is complete before returning the results
 - If the optional [n] value is not included, or is set to 1, the scalar measurement results will be returned. If the [n] value is set to a value other than 1, the selected trace data results will be returned. See each command for details of what types of scalar results or trace data results are available. The binary data formats should be used when handling large blocks of data since they are smaller and faster than the ASCII format. (FORMat:DATA)
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Current Measurement Query (Remote Command Only)

This command returns the name of the measurement that is currently running.

Remote Command	:CONFigure?
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Example	CONF?
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Limit Test Current Results (Remote Command Only)

Queries the status of the current measurement limit testing. It returns a 0 if the measured results pass when compared with the current limits. It returns a 1 if the measured results fail any limit tests.

Remote Command	:CALCulate:CLIMits:FAIL?
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Example	CALC:CLIM:FAIL? queries the current measurement to see if it fails the defined limits. Returns a 0 or 1: 0 it passes, 1 it fails.
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Data Query (Remote Command Only)

Returns the designated measurement data for the currently selected measurement and subopcode.

n = any valid subopcode for the current measurement. See the measurement command results table for your current measurement, for information about what data is returned for the subopcodes.

This command uses the data setting specified by the FORMat:BORDER and FORMat:DATA commands and can return real or ASCII data. (See the format command descriptions under Input/Output in the Analyzer Setup section.)

Remote Command	:CALCulate:DATA[n]?
Notes	The return trace depends on the measurement. In CALCulate:<meas>:DATA[n], n is any valid subopcode for the current measurement. It returns the same data as the FETCH:<measurement>? query where <measurement> is the current measurement.
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Calculate/Compress Trace Data Query (Remote Command Only)

Returns compressed data for the currently selected measurement and sub-opcode [n].

n = any valid sub-opcode for that measurement. See the MEASure:<measurement>? command description of your specific measurement for information on the data that can be returned.

The data is returned in the current Y Axis Unit of the analyzer. The command is used with a sub-opcode <n> (default=1) to specify the trace. With trace queries, it is best if the analyzer is not sweeping during the query. Therefore, it is generally advisable to be in Single Sweep, or Update=Off.

This command is used to compress or decimate a long trace to extract and return only the desired data. A typical example would be to acquire N frames of GSM data and return the mean power of the first burst in each frame. The command can also be used to identify the best curve fit for the data.

Remote Command	:CALCulate:DATA<n>:COMPRESS? BLOCK CFIT MAXimum MINimum MEAN DMEan RMS RMSCubed SAMPLE SDEVIation PPHase [,<soffset> [,<length>[,<roffset>[,<rlimit>]]]]
Example	To query the mean power of a set of GSM bursts: Supply a signal that is a set of GSM bursts. Select the IQ Waveform measurement (in IQ Analyzer Mode). Set the sweep time to acquire at least one burst. Set the triggers such that acquisition happens at a known position relative to a burst. Then query the mean burst levels using, CALC:DATA2:COMP? MEAN, 24e-6, 526e-6 (These parameter values correspond to GSM signals, where 526e-6 is the length of the burst in the slot and you just want 1 burst.)
Notes	The command supports 5 parameters. Note that the last 4 (<soffset>, <length>, <roffset>, <rlimit>) are optional. But these optional parameters must be entered in the specified order. For example, if you want to specify <length>, then you must also specify <soffset>. See details below for a definition of each of these parameters. This command uses the data in the format specified by FORMat:DATA, returning either binary or ASCII data.
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- BLOCK or block data - returns all the data points from the region of the trace data that you specify. For example, it could be used to return the data points of an input signal over several timeslots, excluding the portions of the trace data that you do not want. (This is x,y pairs for trace data and I,Q pairs for complex data.)

- CFIT or curve fit - applies curve fitting routines to the data. <soffset> and <length> are required to define the data that you want. <roffset> is an optional parameter for the desired order of the curve equation. The query will return the following values: the x-offset (in seconds) and the curve coefficients ((order + 1) values).

MIN, MAX, MEAN, DME, RMS, RMSC, SAMP, SDEV and PPH return one data value for each specified region (or <length>) of trace data, for as many regions as possible until you run out of trace data (using <roffset> to specify regions). Or they return the number of regions you specify (using <rlimit>) ignoring any data beyond that.

- MINimum - returns the minimum data point (y value) for the specified region(s) of trace data. For I/Q trace data, the minimum magnitude of the I/Q pairs is returned.
- MAXimum - returns the maximum data point (y value) for the specified region(s) of trace data. For I/Q trace data, the maximum magnitude of the I/Q pairs is returned.
- MEAN - returns a single value that is the arithmetic mean of the data point values (in dB/ dBm) for the specified region(s) of trace data. For I/Q trace data, the mean of the magnitudes of the I/Q pairs is returned. See the following equations.

-

NOTE

If the original trace data is in dB, this function returns the arithmetic mean of those log values, not log of the mean power which is a more useful value. The mean of the log is the better measurement technique when measuring CW signals in the presence of noise. The mean of the power, expressed in dB, is useful in power measurements such as Channel Power. To achieve the mean of the power, use the RMS option.

Equation 1

Mean Value of Data Points for Specified Region(s)

$$\text{MEAN} = \frac{1}{n} \sum_{X_i \in \text{region}(s)} X_i$$

where X_i is a data point value, and n is the number of data points in the specified region(s).

Equation 2

Mean Value of I/Q Data Pairs for Specified Region(s)

$$\text{MEAN} = \frac{1}{n} \sum_{X_i \in \text{region}(s)} |X_i|$$

where $|X_i|$ is the magnitude of an I/Q pair, and n is the number of I/Q pairs in the specified region(s).

- DMEan - returns a single value that is the mean power (in dB/ dBm) of the data point values for the specified region(s) of trace data. See the following equation:

Equation 3

DMEan Value of Data Points for Specified Region(s)

$$\text{DME} = 10 \times \log_{10} \left(\frac{1}{n} \sum_{X_i \in \text{region}(s)} 10^{\frac{X_i}{10}} \right)$$

- RMS - returns a single value that is the average power on a root-mean-squared voltage scale (arithmetic rms) of the data point values for the specified region(s) of trace data. See the following equation.

NOTE For I/Q trace data, the rms of the magnitudes of the I/Q pairs is returned. See the following equation. This function is very useful for I/Q trace data. However, if the original trace data is in dB, this function returns the rms of the log values which is not usually needed.

Equation 4

RMS Value of Data Points for Specified Region(s)

$$\text{RMS} = \sqrt{\frac{1}{n} \sum_{X_i \in \text{region}(s)} X_i^2}$$

where X_i is a data point value, and n is the number of data points in the specified region(s).

Equation 5

RMS Value of I/Q Data Pairs for Specified Region(s)

$$\text{RMS} = \sqrt{\frac{1}{n} \sum_{X_i \in \text{region}(s)} X_i X_i^*}$$

where X_i is the complex value representation of an I/Q pair, X_i^* its conjugate complex number, and n is the number of I/Q pairs in the specified region(s).

Once you have the rms value for a region of trace data (linear or I/Q), you may want to calculate the mean power. You must convert this rms value (peak volts) to power in dBm:

$$10 \times \log[10 \times (\text{rms value})^2]$$

- SAMPLe - returns the first data value (x,y pair) for the specified region(s) of trace data. For I/Q trace data, the first I/Q pair is returned.
- SDEViation - returns a single value that is the arithmetic standard deviation for the data point values for the specified region(s) of trace data. See the following equation.
- For I/Q trace data, the standard deviation of the magnitudes of the I/Q pairs is returned. See the following equation.

Equation 6

Standard Deviation of Data Point Values for Specified Region(s)

$$\text{SDEV} = \sqrt{\frac{1}{n} \sum_{X_i \in \text{region}(s)} (X_i - \bar{X})^2}$$

where X_i is a data point value, \bar{X} is the arithmetic mean of the data point values for the specified region (s), and n is the number of data points in the specified region(s).

$$\text{SDEV} = \sqrt{\frac{1}{n} \sum_{X_i \in \text{region}(s)} (|X_i| - \bar{X})^2}$$

where $|X_i|$ is the magnitude of an I/Q pair, \bar{X} is the mean of the magnitudes for the specified region(s), and n is the number of data points in the specified region(s).

- PPHase - returns the x,y pairs of both rms power (dBm) and arithmetic mean phase (radian) for every specified region and frequency offset (Hz). The number of pairs is defined by the specified number of regions. This parameter can be used for I/Q vector ($n=0$) in Waveform (time domain) measurement and all parameters are specified by data point in PPHase.

The rms power of the specified region may be expressed as:

$$\text{Power} = 10 \times \log [10 \times (\text{RMS I/Q value})] + 10.$$

The RMS I/Q value (peak volts) is:

$$\sqrt{\frac{1}{n} \sum_{X_i \in \text{region}} X_i X_i^*}$$

where X_i is the complex value representation of an I/Q pair, X_i^* its conjugate complex number, and n is the number of I/Q pairs in the specified region.

The arithmetic mean phase of the specified region may be expressed as:

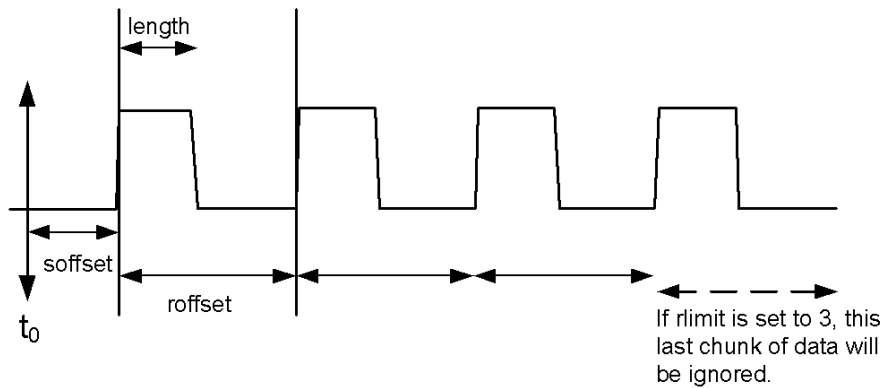
$$\frac{1}{n} \sum_{Y_i \in \text{region}} Y_i$$

where Y_i is the unwrapped phase of I/Q pair with applying frequency correction and n is the number of I/Q pairs in the specified region.

The frequency correction is made by the frequency offset calculated by the arithmetic mean of every specified region's frequency offset. Each frequency offset is calculated by the least square method against the unwrapped phase of I/Q pair.

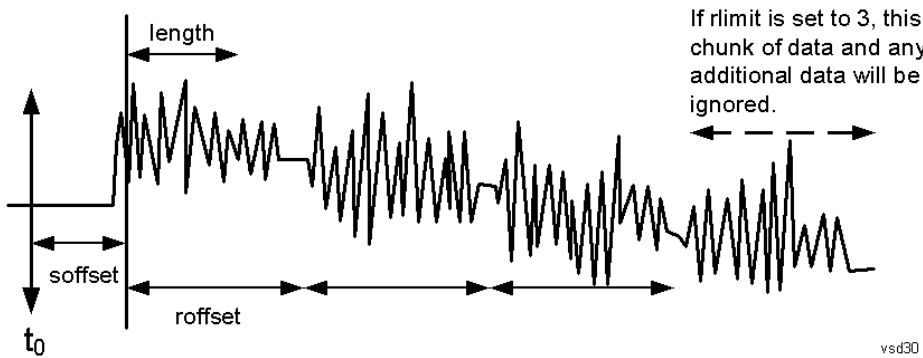
Sample Trace Data - Constant Envelope

(See below for explanation of variables.)



Sample Trace Data - Not Constant Envelope

(See below for explanation of variables.)



<soffset> - start offset is an optional real number. (It is in seconds for time-domain traces, and is a dimensionless index 0 to Npoints - 1, for frequency-domain traces). It specifies the amount of data at the beginning of the trace that will be ignored before the decimation process starts. It is the time or frequency change from the start of the trace to the point where you want to start using the data. The default value is zero.

<length> - is an optional real number. (It is in seconds for time-domain traces, and is a dimensionless index 0 to Npoints - 1, for frequency-domain traces). It defines how much data will be compressed into one value. This parameter has a default value equal to the current trace length.

<roffset> - repeat offset is an optional real number. (It is in seconds for time-domain traces, and is a dimensionless index 0 to Npoints - 1, for frequency-domain traces). It defines the beginning of the next field of trace elements to be compressed. This is relative to the beginning of the previous field. This parameter has a default value equal to the <length> variable. Note that this parameter is used for a completely different purpose when curve fitting (see CFIT above).

<rlimit> - repeat limit is an optional integer. It specifies the number of data items that you want returned. It will ignore any additional items beyond that number. You can use the Start offset and the Repeat limit to pick out exactly what part of the data you want to use. The default value is all the data.

Calculate Peaks of Trace Data (Remote Command Only)

Returns a list of all the peaks for the currently selected measurement and sub-opcode [n]. The peaks must meet the requirements of the peak threshold and excursion values.

n = any valid sub-opcode for the current measurement. See the MEASure:<measurement> command description of your specific measurement for information on the data that can be returned.

The command can only be used with specific sub-opcodes with measurement results that are trace data. Both real and complex traces can be searched, but complex traces are converted to magnitude in dBm. In many measurements the sub-opcode n=0, is the raw trace data which cannot be searched for peaks. And Sub-opcode n=1, is often calculated results values which also cannot be searched for peaks.

This command uses the data setting specified by the FORMat:BORDER and FORMat:DATA commands and can return real or ASCII data. If the format is set to INT,32, it returns REAL,32 data.

The command has four types of parameters:

- Threshold (in dBm)
- Excursion (in dB)
- Sorting order (amplitude, frequency, time)
- Optional in some measurements: Display line use (all, > display line, < display line)

Remote Command	<p>For Swept SA measurement:</p> <pre>:CALCulate:DATA[1] 2 ... 6:PEAKs? <threshold>,<excursion>[,AMPLitude FREQuency TIME[,ALL GTDLLine LTDLine]]</pre> <p>For most other measurements:</p> <pre>:CALCulate:DATA[1] 2 ... 6:PEAKs? <threshold>,<excursion>[,AMPLitude FREQuency TIME]</pre>
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Example	<p>Example for Swept SA measurement in Spectrum Analyzer Mode:</p> <p>CALC:DATA4:PEAK? -40, 10, FREQ, GTDL This will identify the peaks of trace 4 that are above -40 dBm, with excursions of at least 10 dB. The peaks are returned in order of increasing frequency, starting with the lowest frequency. Only the peaks that are above the display line are returned.</p> <p>Query Results 1:</p> <p>With FORMat:DATA REAL, 32 selected, it returns a list of floating-point numbers. The first value in the list is the number of peak points that are in the following list. A peak point consists of two values: a peak amplitude followed by its corresponding frequency (or time).</p> <p>If no peaks are found the peak list will consist of only the number of peaks, (0).</p>
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Notes	<p><n> - is the trace that will be used</p> <p><threshold> - is the level below which trace data peaks are ignored. Note that the threshold value is required and is always used as a peak criterion. To effectively disable the threshold criterion for this command, provide a substantially low threshold value such as -200 dBm. Also note that the threshold value used in this command is independent of and has no effect on the threshold value stored under the Peak Criteria menu.</p> <p><excursion> - is the minimum amplitude variation (rise and fall) required for a signal to be identified as peak. Note that the excursion value is required and is always used as a peak criterion. To effectively disable the excursion criterion for this command, provide the minimum value of 0.0 dB. Also note that the excursion value used in this command is independent of and has no effect on the</p>
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excursion value stored under the Peak Criteria menu.

Values must be provided for threshold and excursion. The sorting and display line parameters are optional (defaults are AMPLitude and ALL).

Note that there is always a Y-axis value for the display line, regardless of whether the display line state is on or off. It is the current Y-axis value of the display line which is used by this command to determine whether a peak should be reported

Sorting order:

AMPLitude - lists the peaks in order of descending amplitude, with the highest peak first (default if optional parameter not sent)

FREQuency - lists the peaks in order of occurrence, left to right across the x-axis.

TIME - lists the peaks in order of occurrence, left to right across the x-axis.

Peaks vs. Display Line:

ALL - lists all of the peaks found (default if optional parameter not sent).

GTDLine (greater than display line) - lists all of the peaks found above the display line.

LTDLine (less than display line) - lists all of the peaks found below the display line.

Initial S/W Revision Prior to A.02.00

Format Data: Numeric Data (Remote Command Only)

This command specifies the format of the trace data input and output. It specifies the formats used for trace data during data transfer across any remote port. It affects only the data format for setting and querying trace data for the :TRACe[:DATA], TRACe[:DATA]?, :CALCulate:DATA[n]? and FETCh:SANalyzer [n]? commands and queries.

Remote Command :FORMat [:TRACe] [:DATA] ASCii | INTeger, 32 | REAL, 32 | REAL, 64
:FORMat [:TRACe] [:DATA] ?

Notes The query response is:
ASCii: ASC,8
REAL,32: REAL,32
REAL,64: REAL,64
INTeger,32: INT,32

When the numeric data format is REAL or ASCii, data is output in the current Y Axis unit. When the data format is INTeger, data is output in units of m dBm (.001 dBm).

The INT,32 format returns binary 32-bit integer values in internal units (m dBm), in a definite length block.

Dependencies Sending a data format spec with an invalid number (for example, INT,48) generates no error. The analyzer simply uses the default (8 for ASCii, 32 for INTeger, 32 for REAL).

Sending data to the analyzer which does not conform to the current FORMat specified, results in an error. Sending ASCII data when a definite block is expected generates message -161 "Invalid Block Data" and sending a definite block when ASCII data is expected generates message -121 "Invalid Character in Number".

Preset ASCii

Backwards Compatibility Notes Note that the INT,32 format is only applicable to the command, TRACe:DATA. This preserves backwards compatibility for the Swept SA measurement. For all other commands/queries which honor FORMat:DATA, if INT,32 is sent the analyzer will behave as though it were set to REAL,32.

Initial S/W Revision Prior to A.02.00

The specs for each output type follow:

ASCIi - Amplitude values are in ASCII, in the current Y Axis Unit, one ASCII character per digit, values separated by commas, each value in the form:

SX.YYYYYEsZZ

Where:

S = sign (+ or -)

X = one digit to left of decimal point

Y = 5 digits to right of decimal point

E = E, exponent header

s = sign of exponent (+ or -)

ZZ = two digit exponent

REAL,32 - Binary 32-bit real values in the current Y Axis Unit, in a definite length block.

REAL,64 - Binary 64-bit real values in the current Y Axis Unit, in a definite length block.

Format Data: Byte Order (Remote Command Only)

This command selects the binary data byte order for data transfer and other queries. It controls whether binary data is transferred in normal or swapped mode. This command affects only the byte order for setting and querying trace data for the :TRACe[:DATA], TRACe[:DATA]? , :CALCulate:DATA[n]? and FETCh:SANalyzer[n]? commands and queries.

By definition any command that says it uses FORMat:DATA uses any format supported by FORMat:DATA.

The NORMal order is a byte sequence that begins with the most significant byte (MSB) first, and ends with the least significant byte (LSB) last in the sequence: 1|2|3|4. SWAPped order is when the byte sequence begins with the LSB first, and ends with the MSB last in the sequence: 4|3|2|1.

Remote Command	:FORMat:BORDER NORMal SWAPped :FORMat:BORDER?
Preset	NORMal
Initial S/W Revision	Prior to A.02.00

Advanced Setup (SCPI Only)

Advanced setup is for radio format specific parameters for the whole sequence. These parameters will affect all related measurements and acquisitions.

NOTE: Advanced setup is not available through menus; the parameters can be set only by means of SCPI commands.

"GSM/EDGE Setup" on page 298

"LTE-FDD Setup" on page 299

"LTE-TDD Setup" on page 300

"WCDMA Setup" on page 300

"TD-SCDMA Setup" on page 302

"Command to set up analyzer sequence for ILPC measurement" on page 307

"Command to query the sequence version for sequence studio" on page 308

"Command to setup multiple analysis steps" on page 309

GSM/EDGE Setup

The advanced setup for all GSM/EDGE related measurements:

"Ignore Error In Average" on page 298

"PVT Time Offsets" on page 299

Ignore Error In Average

Per GSM specification, the signal pattern transmitted by DUT would use 26 frames to build a multi-frame. Frames 0 to 11 and 13 to 24 carry speech or user data. Frame 12 is used as SACCH, Frame 25 is idle, allowing the base station to measure field strengths from mobiles in other cells, when needed for handovers. 26 frames last 120 msec. So the DUT has 2 Idle Slot on Frame 12 and Frame 25.

The GSM/EDGE related measurements will report errors when performing calculation on these idle slots.

In GSM, certain frames are "idle" (meaning that the mobile device does not send out a signal), and during measurement the idle frames generate synchronization errors. These errors can disrupt measurement in average mode.

In average mode, with this parameter OFF (the default setting), if an error is found, the measurement application terminates the analysis step currently in process, and proceeds to the next step. In this case, the averaged results are not available.

If this parameter is ON, the application does not terminate the analysis step when an error is found. The measurement is made, but all results with errors are excluded from the average. In this case, the actual number of averages may be less than the requested number of averages, because some results were excluded.

The actual number of averages included in the result for a particular analysis step can be found by including the AVERage parameter in a SCPI query (FETCh, READ, or MEASure). For example:

```
:FETCh:LSEQuencer[1]: ACQuire[1]2|...|512:ASTep[1]2|...|1000:AVERage?
```

Key Path	SCPI Only
Mode	Sequence Analyzer
Remote Command	[[:SENSe]:LSEQuencer:ASETup:GSM:IEAVerage ON OFF 1 0 [:SENSe]:LSEQuencer:ASETup:GSM:IEAVerage?
Example	LSEQ:ASET:GSM:IEAV 1

	LSEQ:ASET:GSM:IEAV?
Notes	This setting is only in scope when the average number is greater than 1.
Preset	OFF
State Saved	Saved in instrument state.
Range	ON OFF 1 0
Initial S/W Revision	A.05.00

PVT Time Offsets

The user may specify 12 offset time values, for which power levels can be queried. See [12.2.5 PVT Results](#) for details. The measurement offset results may be used by the user to perform a statistical analysis of the burst shape, and is derived from the Agilent 8960 Series Wireless Communications Test Set.

The PVT measurement has a fixed number of 12 offset time points for the burst captured by the List Sequencer. The offset times are referenced to the centre of symbol 0 for that burst (the start of the useful part of the burst). The power levels relative to the useful part at these time offsets are calculated using linear interpolation from the captured PVT IQ samples.

The Time Offsets are set for the entire Sequence.

Key Path	SCPI Only
Mode	Sequence Analyzer
Remote Command	[:SENSe] :LSEQuencer:ASETup:GSM:PVTtime:TIME[:OFFSet] <time>, <time>, <time>, <time>, <time>, <time>, <time>, <time>, <time>, <time>, <time>, <time> [:SENSe] :LSEQuencer:ASET:GSM:PVT:TIME[:OFFSet] ?
Example	LSEQ:ASET:GSM:PVT:TIME -28us, -18us, -10us, 0, 2us, 4us, , 538.2us, , 540.2us, 542.8us, 552.8us, 560.8us, 570.8us
Preset	-2.8e-5, -1.8e-5, -1e-5, 0, 2e-6, 4e-6, 5.382e-4, 5.402e-4, 5.428e-4, 5.528e-4, , 5.608e-4, 5.708e-4
State Saved	Saved in instrument state.
Range	-50 us to 593 us
Initial S/W Revision	A.05.00

LTE-FDD Setup

The advanced setup for all LTE-FDD related measurements:

["LTE-FDD Channel Condition" on page 299](#)

LTE-FDD Channel Condition

LTE-FDD Channel Condition determines the limit value of LTE-FDD spectrum flatness (Pass/Fail results of RP1, PR2 RP12 and RP21).

The LTE-FDD Channel Condition are set for the entire Sequence.

Key Path	SCPI Only
Mode	Sequence Analyzer
Remote Command	:SERvice[:PRODUCTION]:LSEQuencer:ADVanced:LTE:CConDition NORMal EXTReme :SERvice[:PRODUCTION]:LSEQuencer:ADVanced:LTE:CConDition?
Example	:SERV:LSEQ:ADV:LTE:CCON EXTR :SERV:LSEQ:ADV:LTE:CCON?
Preset	NORMal
State Saved	Saved in instrument state.
Range	NORMal EXTReme
Initial S/W Revision	A.50.00

LTE-TDD Setup

The advanced setup for all LTE-TDD related measurements:

["LTE-TDD Channel Condition" on page 300](#)

LTE-TDD Channel Condition

LTE-TDD Channel Condition determines the limit value of LTE-TDD spectrum flatness (Pass/Fail results of RP1, RP2, RP12 and RP21).

The LTE-TDD Channel Condition are set for the entire Sequence.

Key Path	SCPI Only
Mode	Sequence Analyzer
Remote Command	:SERvice[:PRODUCTION]:LSEQuencer:ADVanced:LTETdd:CConDition NORMal EXTReme :SERvice[:PRODUCTION]:LSEQuencer:ADVanced:LTETdd:CConDition?
Example	:SERV:LSEQ:ADV:LTET:CCON EXTR :SERV:LSEQ:ADV:LTET:CCON?
Preset	NORMal
State Saved	Saved in instrument state.
Range	NORMal EXTReme
Initial S/W Revision	A.12.00

WCDMA Setup

The advanced setup for all WCDMA related measurements:

["Loopback BER Pattern \(WCDMA\)" on page 301](#)

	character of the string stands for four bits.
Preset	“FF”
Force Restart	Yes
State Saved	Saved in instrument state.
Initial S/W Revision	A.11.50

TD-SCDMA Setup

"Loopback BER Setup (TD-SCDMA)" on page 302

"PVT Setup" on page 305

Demodulation Measurements (except for Loopback BER) Acquisition Setup

Loopback BER Setup (TD-SCDMA)

"Loopback BER Pattern(TD-SCDMA)" on page 302

"Loopback BER CodeRMC(TD-SCDMA)" on page 303

"Loopback BER CodeLevel(TD-SCDMA)" on page 304

"Loopback BER Code Index0(TD-SCDMA)" on page 304

"Loopback BER Code Index1(TD-SCDMA)" on page 304

"Loopback BER TFCI Detection Mode(TD-SCDMA)" on page 305

"Loopback BER TFCI Word(TD-SCDMA)" on page 305

Loopback BER Acquisition Setup

Loopback BER Pattern(TD-SCDMA)

This parameter specifies the reference bits used in TD-SCDMA Loopback BER calculation. There are two options: by file and by string.

Load Pattern Bits By File:

Key Path	SCPI Only
Mode	Sequence Analyzer
Remote Command	:SERVice[:PRODUCTION]:LSEQuencer:ADVanced:TDSCdma:LBer:PATtern <filepath+filename>
Example	SERV:LSEQ:ADV:TDSC:LBer:PATT "D:\pat.txt"
State Saved	Saved in instrument state.
Initial S/W Revision	A.12.00

Format of pattern file is as following:

```
#TD-SCDMA loopback BER
length = 244
pattern =
111111111111111111111111111111111111111111111111111111111111111111111111111111111111111111111111111
111111111111111111111111111111111111111111111111111111111111111111111111111111111111111111111111111
111111111111111111111111111111111111111111111111111111111111111111111111111111111111111111111111111
```

Load Pattern Bits By String:

Parameter Name	Load TD-SCDMA Loopback BER Pattern by string
Key Path	SCPI Only
Parameter Type	String
Mode	Sequence Analyzer
Remote Command	:SERvice[:PRODUCTION]:LSEQuencer:ADVanced:TDSCdma:LBer:PATtern :LOAD <String> :SERvice[:PRODUCTION]:LSEQuencer:ADVanced:TDSCdma:LBer:PATtern :LOAD?
Example	:SERV:LSEQ:ADV:TDSC:LBer:PATT:LOAD “ FF” :SERV:LSEQ:ADV:TDSC:LBer:PATT:LOAD?
Dependencies	The characters of the string must be '0'~'9', 'A'~'F' or 'a'~'f'. The length of string must be 61. Each character of the string stands for four bits.
Preset	“FF”
Force Restart	Yes
State Saved	Saved in instrument state.
Initial S/W Revision	A.12.00

Loopback BER CodeRMC(TD-SCDMA)

This parameter specifies the RMC(Reference Measurement Code) decoder type used in TD-SCDMA Loopback BER calculation. Its type is bool. TRUE means it is single code and FALSE means it is multi code.

Key Path	SCPI Only
Mode	Sequence Analyzer
Remote Command	[:SENSe]:LSEQuencer:ADVanced:TDSCdma:LBer:RMC:SCODE TRUE FALSE [:SENSe]:LSEQuencer:ADVanced:TDSCdma:LBer:RMC:SCODE ?
Example	:LSEQ:ADV:TDSC:LBer:RMC:SCOD true :LSEQ:ADV:TDSC:LBer:RMC:SCOD ?
State Saved	Saved in instrument state.
Initial S/W Revision	A.12.00

Loopback BER CodeLevel(TD-SCDMA)

This parameter specifies the code level of the Reference Measurement Code used in TD-SCDMA Loopback BER calculation.

Key Path	SCPI Only
Mode	Sequence Analyzer
Remote Command	[:SENSe] :LSEQuencer :ADVanced :TDSCdma :LBER :CLEVel <int> [:SENSe] :LSEQuencer :ADVanced :TDSCdma :LBER :CLEVel ?
Example	:LSEQ:ADV:TDSC: LBER:CLEV 4 :LSEQ:ADV:TDSC:LBER:CLEV ?
State Saved	Saved in instrument state.
Initial S/W Revision	A.12.00

Loopback BER Code Index0(TD-SCDMA)

This parameter specifies the code index of the Reference Measurement Code used in TD-SCDMA Loopback BER calculation.

Key Path	SCPI Only
Mode	Sequence Analyzer
Remote Command	[:SENSe] :LSEQuencer :ADVanced :TDSCdma :LBER :CINDeX0 <int> [:SENSe] :LSEQuencer :ADVanced :TDSCdma :LBER :CINDeX0 ?
Example	:LSEQ:ADV:TDSC: LBER:CIND0 0 :LSEQ:ADV:TDSC:LBER:CIND0?
State Saved	Saved in instrument state.
Initial S/W Revision	A.12.00

Loopback BER Code Index1(TD-SCDMA)

This parameter specifies the code index of the Reference Measurement Code used in TD-SCDMA Loopback BER calculation. If the parameter “singleCodeRMC ” is true, there is no need to set this value. Otherwise , it’s the multi RMC channel , under this condition, both “ Loopback BER Code Index1”and “ Loopback BER Code Index0”should be set to assure the correct Code index configuration.

Key Path	SCPI Only
Mode	Sequence Analyzer
Remote Command	[:SENSe] :LSEQuencer :ADVanced :TDSCdma :LBER :CINDeX1 <int> [:SENSe] :LSEQuencer :ADVanced :TDSCdma :LBER :CINDeX1 ?
Example	:LSEQ:ADV:TDSC: LBER:CIND1 8 :LSEQ:ADV:TDSC:LBER:CIND1?

Dependencies	The value should be set to 8 when the codeRMC is false.
State Saved	Saved in instrument state.
Initial S/W Revision	A.12.00

Loopback BER TFCI Detection Mode(TD-SCDMA)

This parameter specifies the detection state of TFCI used in TD-SCDMA Loopback BER calculation,Auto or Manual. Its type is bool. True means auto detection mode.

Key Path	SCPI Only
Mode	Sequence Analyzer
Remote Command	:SERvice[:PRODUCTION]:LSEQuencer:ADVanced:TDSCdma:LBer:TFCI:AUTO TRUE FALSE :SERvice[:PRODUCTION]:LSEQuencer:ADVanced:TDSCdma:LBer:TFCI:AUTO?
Example	:SERV:LSEQ:ADV:TDSC: LBER:TFCI :AUTO TRUE :SERV:LSEQ:ADV:TDSC: LBER :TFCI:AUTO?
State Saved	Saved in instrument state.
Initial S/W Revision	A.12.00

Loopback BER TFCI Word(TD-SCDMA)

This parameter specifies the TFCI word used in TD-SCDMA Loopback BER calculation. Its type is int.

Key Path	SCPI Only
Mode	Sequence Analyzer
Remote Command	:SERvice[:PRODUCTION]:LSEQuencer:ADVanced:TDSCdma:LBer:TFCI <int> :SERvice[:PRODUCTION]:LSEQuencer:ADVanced:TDSCdma:LBer:TFCI?
Example	:SERV:LSEQ:ADV:TDSC: LBER:TFCI 1 :SERV:LSEQ:ADV:TDSC: LBER:TFCI?
Dependencies	The value depends on the Detection mode. When the detection mode is manual, this value is used to de-service multiplexing.
State Saved	Saved in instrument state.
Initial S/W Revision	A.12.00

PVT Setup

"PVT Demodulation State" on page 305

"PVT Momentum Criterion" on page 306

PVT Demodulation State

The parameter specifies if demodulation is needed for TDSCDMA PVT measurement.

If this parameter is ON, the midamble of the analysis time slot will be searched and the burst start and stop time will be calculated accordingly; If this parameter is OFF, the burst start and stop timing are calculated by the burst powers. No demodulation is performed.

Key Path	SCPI Only
Mode	Sequence Analyzer
Remote Command	[:SENSe] :LSEQuencer :ADVanced :TDSCdma :PVT :DEMod ON OFF 1 0 [:SENSe] :LSEQuencer :ADVanced :TDSCdma :PVT :DEMod ?
Example	:SENS:LSEQ:ADV:TDSC:PVT:DEM 1 :SENS:LSEQ:ADV:TDSC:PVT:DEM?
Preset	ON
State Saved	Saved in instrument state.
Range	ON OFF 1 0
Initial S/W Revision	A.12.50

PVT Momentum Criterion

This parameter specifies Momentum Criterion will be used for limit check.

If this parameter is ON, Momentum TDSCDMA PVT limit check criterion will be used. That is, Off Power Before, Average Power over –33rd ~ –14th chip and Off Power After results (see [12.2.5.3.1 TDSCDMA PVT General Results](#) for details) will be used to compare upper limit –65 dBm, –50 dBm and –65 dBm respectively. If all of these 3 power values are below their upper limits, the TDSCDMA PVT Overall Pass/Fail result will be passed; otherwise, the Overall Pass/Fail result will be failed.

If this parameter is OFF, the TDSCDMA PVT envelop trace will be used to compare with the upper limit trace point by point. If any point of the envelop power trace is less than the upper limit trace, the TDSCDMA PVT Overall Pass/Fail result will be passed; otherwise, the Overall Pass/Fail result will be failed. For the details of envelop trace result and upper limit trace result, please refer to [12.2.5.3.2 Envelop Trace Result](#) and [12.2.5.3.3 Upper Limit Result](#).

Key Path	SCPI Only
Mode	Sequence Analyzer
Remote Command	[:SENSe] :LSEQuencer :ADVanced :TDSCdma :PVT :MOMentum ON OFF 1 0 [:SENSe] :LSEQuencer :ADVanced :TDSCdma :PVT :MOMentum ?
Example	:SENS:LSEQ:ADV:TDSC:PVT:MOM 1 :SENS:LSEQ:ADV:TDSC:PVT:MOM?
Preset	ON
State Saved	Saved in instrument state.
Range	ON OFF 1 0
Initial S/W Revision	A.12.50

Command to set up analyzer sequence for ILPC measurement

Inner Loop Power Control in the uplink is the ability of the UE to adjust its output power in accordance with TPC (transmit power control) commands received in the downlink. TPC_cmd, along with the power control step size, determines the UE transmit output power. The power change is applied in the timeslot adjacent to the timeslot in which the TPC command is received.

An RUI command is provided to facilitate the user to configure sequence for ILPC measurement. All the input parameters of the command are listed below:

- Frequency: specifies the frequency to measure of the whole sequence.
- Peak power: specifies the peak power of the whole sequence. Peak power along with test pattern determines the peak power for each acquisition.
- Step size: sets the power control step size for the UE transmitter which is the change in the UE transmitter output power in response to a single TPC_cmd derived at UE.
- Step count: sets the number of timeslots to be measured which equals to the total number of TPC commands sent for the whole sequence.
- Step Interval: specifies the measurement interval for each analysis step. The transient periods of 25us before each slot and 25us after each slot boundary shall not be included in the power measurement per the TS34.121.
- Test Pattern: specifies which test pattern is to be used, DOWN, UP or BOTH (equivalent to DOWN-THEN-UP). Due to the limitation of dynamic range, the whole power control sequence is segmented into two acquisitions when test pattern is set to DOWN or UP. For the BOTH pattern, three acquisitions are required.
- Fast Algorithm Enable: specifies which measurement is configured to acquire the UE output power, Basic TX Power or Basic IQ Power. If fast algorithm enable is on, Basic TX Power is configured on each analysis step, otherwise Basic IQ Power is configured.
- Append enable: optional node, used to specify whether the new generated acquisitions of ILPC will be appended or not. If ON, the new acquisitions will be appended at the end of sequence, otherwise the previous acquisitions will be overwritten by the acquisitions of ILPC.

Note: This command sets both Upper Limit and Lower Limit of Basic TX Power to OFF internally, therefore no pass or fail result is returned.

Note: The ILPC setup command is only applicable to WCDMA radio standard.

Key Path	SCPI Only
Mode	Sequence Analyzer
Remote Command	[:SENSE] :LSEQuencer [:WCDMa] :ILPControl :SETup <frequency> , < ampl > , < Integer > , < real > , < time > , UP DOWN BOTH , ON OFF 1 0 , ON OFF 1 0
Example	LSEQuencer:ILPControl:SETup 2.14GHz , 25dbm , , 80 , , 1 , , 200us , DOWN , , ON
Notes	The parameters are: <frequency> - specifies the frequency for the sequence. <ampl> - specifies the peak power for the sequence.

	<p><Integer> - specifies the number of timeslots to be measured.</p> <p><real> - specifies the power control step size.</p> <p><time> - specifies the measurement interval for each step.</p> <p><enum> - specifies the test pattern.</p> <p><boolean> - specifies the fast algorithm mode On/Off.</p> <p><boolean> - specifies the append mode On/Off. This value is optional. If it is not set, the default value Off is used.</p>
State Saved	Saved in instrument state.
Initial S/W Revision	A.12.00

Key Path	SCPI Only
Mode	Sequence Analyzer
Remote Command	<p>To fetch the results of ILPC:</p> <pre>:FETCh:LSEQuencer:ILPControl?</pre> <p>Result index 0 : Number of analysis steps</p> <p>Result index 1 : Array of average output power or basic tx power</p>
Example	:FETCh:LSEQuencer:ILPControl?
State Saved	Saved in instrument state.
Initial S/W Revision	A.12.00

Command to query the sequence version for sequence studio

This command is used by Sequence Studio to query the supported sequence file version of both Sequence Analyzer and Source. This command is query only.

Key Path	SCPI Only
Mode	Sequence Analyzer
Remote Command	<p>To query the supported sequence file version of Analyzer :</p> <pre>:SERVice[:PRODUCTION]:LSEQuencer:ANALyzer:FILE:VERSion? <string></pre> <p>To query the supported sequence file version of Source :</p> <pre>:SERVice[:PRODUCTION]:LSEQuencer:SOURce:FILE:VERSion? <string></pre>
Example	<pre>:SERVice:LSEQuencer:ANALyzer:FILE:VERSion ? "01.03.00"</pre> <pre>:SERVice:LSEQuencer:SOURce:FILE:VERSion ? "01.03.00"</pre>
State Saved	Saved in instrument state.
Initial S/W Revision	A.12.00

Command to setup multiple analysis steps

The RUI command is provided to facilitate user to generate a list of regular analysis steps for specified acquisition. All the input parameters of the command are listed below:

- **stepNumber**: specifies the number of analysis steps to be generated
- **analysisOffset**: specifies the analysis offset of the first analysis step. Along with the step separation, it is used to derive the analysis offset for the rest of analysis steps
- **analysisInterval**: specifies the analysis interval for each analysis step
- **stepSeparation**: sets the interval of slot to measure
- **startPower**: specifies the expected power of the first analysis step. Along with the power step, it is used to derive the expected power for the rest of analysis steps
- **powerStep**: sets the power step size
- **measBitMap**: specifies the measurement bit map for each analysis step
- **append**: If ON, the new generated analysis steps will be appended at the end of the specified acquisition, otherwise the existing analysis steps will be overwritten by the new generated analysis steps

Key Path	SCPI Only
Mode	Sequence Analyzer
Remote Command	[:SENSE] :LSEQuencer:ACQuire{1:1000}:MASTeps:SETup <stepNumber>,<analysisOffset>,<analysisInterval>,<stepSeperation>,< startPower >,< powerStep >,< measBitMap >,<append>
Example	LSEQuencer:ACQuire1:MASTeps:SETup 40, , 25us, , 300us, , 666.67us, , 20dbm, , -1, , 1, , OFF
State Saved	Saved in instrument state.
Initial S/W Revision	A.12.00

Measurement Parameter Setup (for measurements from other modes)

These are measurement parameters for a measurement from outside of Sequence Analyzer mode. When you use a measurement from another mode, the measurement parameters can be set remotely using SCPI commands, without leaving the Sequence Analyzer mode.

For each “Radio Standard” and “Meas Bitmap” that is set in the Analyzer Sequence table, there are associated parameters that set up particular measurements. These parameters are globally applied to all analysis steps over the entire Sequence.

To facilitate the many measurement global parameters, use of the Measurement Application Modes parameters is made. The measurement setup sections in ["Meas Setup" on page 376](#) describe each measurement's parameters.

If different Info Bandwidths were set for several measurements in an Acquisition then the List Sequencer has to choose the highest value, acquire the Acquisition data, and then re-sample later if required.

Key Path	Remote Commands
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PVT Meas Setup

"GSM/EDGE PVT Meas Setup" on page 310

"LTE-TDD PVT Meas Setup" on page 311

TDSCDMA PVT Meas Setup

GSM/EDGE PVT Meas Setup

The GSM/EDGE PVT measurement used in the GSM/EDGE mode is used in the Sequencer. The Meas parameters usable within the List Sequencer measurement are listed below. For complete details of each parameter, please see the online help associated with the measurement.

The SCPI that is used within the Sequence Analyzer mode is the same as in the GSM/EDGE mode, except that two additional nodes are required in the Sequence Analyzer mode: one to identify the List Sequencer measurement and one to identify the mode from which the measurement comes. For example, [:SENSe]:Epvtime is replaced with [:SENSe]:LSEQuencer:EDGE:EPVTime: or :CALCulate:LSEQuencer:EDGE:EPVTime:

Command	Description	Notes
[:SENSe]:EPVTime:BANDwidth[:RESolution] <bandwidth> [:SENSe]:EPVTime:BANDwidth[:RESolution]?	Info BW	Maximum is 40MHz
[:SENSe]:EPVTime:BANDwidth[:RESolution]:TYPE FLATtop GAUSSian	Filter Type	
[:SENSe]:EPVTime:BANDwidth[:RESolution]:TYPE? [:SENSe]:EPVTime:BSYNc:SOURce TSEQUence RFBurst NONE RFAMPLitude	Burst Sync	
[:SENSe]:EPVTime:BSYNc:SOURce? :CALCulate:EPVTime:LIMit:TEST[:STATe] OFF ON 0 1 :CALCulate:EPVTime:LIMit:TEST[:STATe]?	Limit Test	
[:SENSe]:EPVTime:MASK:SElect STANdard CUSTom [:SENSe]:EPVTime:MASK:SElect?	Limit Mask	
[:SENSe]:EPVTime:MASK:RPOWER:TYPE UPARt MAMBle ESTimated [:SENSe]:EPVTime:MASK:RPOWER:TYPE?	Ref Pwr Type	
[:SENSe]:EPVTime:MASK:RPOWER <ampl> [:SENSe]:EPVTime:MASK:RPOWER?	Ref Power	
[:SENSe]:EPVTime:BSYNc:SENGth EVEN INTEger	Timeslot Length	
[:SENSe]:EPVTime:MASK:LIST:LOWer:ABSolute <real>, ... [:SENSe]:EPVTime:MASK:LIST:LOWer:ABSolute	Lower Mask Absolute Amplitude Levels	

<code>[[:SENSe]:EPVTime:MASK:LIST:LOWer:POINts?</code>	Lower Mask Points
<code>[[:SENSe]:EPVTime:MASK:LIST:LOWer:RELative <rel_ampl>, ... [[:SENSe]:EPVTime:MASK:LIST:LOWer:RELative?</code>	Lower Mask Relative Points
<code>[[:SENSe]:EPVTime:MASK:LIST:LOWer:TIME <seconds>, ... [[:SENSe]:EPVTime:MASK:LIST:LOWer:TIME?</code>	Lower Mask Time Points
<code>[[:SENSe]:EPVTime:MASK:LIST:UPPer:ABSolute <real>, ... [[:SENSe]:EPVTime:MASK:LIST:UPPer:ABSolute?</code>	Upper Mask Absolute Amplitude
<code>[[:SENSe]:EPVTime:MASK:LIST:UPPer:POINts?</code>	Upper Mask Points
<code>[[:SENSe]:EPVTime:MASK:LIST:UPPer:RELative <rel_ampl>, ... [[:SENSe]:EPVTime:MASK:LIST:UPPer:RELative?</code>	Upper Mask Relative Points
<code>[[:SENSe]:EPVTime:MASK:LIST:UPPer:TIME <seconds>, ... [[:SENSe]:EPVTime:MASK:LIST:UPPer:TIME?</code>	Upper Mask Time Points
<code>[[:SENSe]:EPVTime:MASK[:UPArT]:LOWer:NORMAl QAM16 QAM32, <rel_ampl> [[:SENSe]:EPVTime:MASK[:UPArT]:LOWer:NORMAl?</code>	Limit Mask Useful Part Lower Normal
<code>[[:SENSe]:EPVTime:MASK[:UPArT]:LOWer:HSRate QAM16 QAM32, <rel_ampl></code>	Limit Mask Useful Part Lower HSR

LTE-TDD PVT Meas Setup

The LTE-TDD Transmit On/Off Power measurement used in the LTE-TDD mode is used in the Sequencer. The Meas parameters usable within the List Sequencer measurement are listed below. For complete details of each parameter, please see the online help associated with the measurement.

The SCPI that is used within the Sequence Analyzer mode is the same as in the LTE-TDD mode, except that two additional nodes are required in the Sequence Analyzer mode: one to identify the List Sequencer measurement and one to identify the mode from which the measurement comes.

For example:

`[[:SENSe]:PVTime` is replaced with `[[:SENSe]:LSEQuencer:LTETdd:PVTime:`

`CALCulate:PVTime` is replaced with `:CALCulate:LSEQuencer:LTETdd:PVTime:`

[[:SENSe]:RADio is replaced with [[:SENSe]:LSEQuencer:LTETdd:RADio

Command	Description	Notes
[[:SENSe]:RADio:STANdard:PRESet B1M4 B3M B5M B10M B15M B20M [:SENSe]:RADio:STANdard:PRESet?	Preset to Standard	
[[:SENSe]:PVTime:BANDwidth <freq> [:SENSe]:PVTime:BANDwidth?	BW	Maximum is 40MHz
[[:SENSe]:PVTime:RAMP:SEARch:LENGth <time> [:SENSe]:PVTime:RAMP:SEARch:LENGth?	Ramp Time Length	
[[:SENSe]:PVTime:LIMit:RAMP:URTime <time> [:SENSe]:PVTime:LIMit:RAMP:URTime?	Ramp Up time limit	
[[:SENSe]:PVTime:LIMit:RAMP:DRTIME <time> [:SENSe]:PVTime:LIMit:RAMP:DRTIME?	Ramp Down time limit	
[[:SENSe]:PVTime:LIMit:POFF:ULINK <real> [:SENSe]:PVTime:LIMit:POFF:ULINK?	Uplink Off power limit	
[[:SENSe]:PVTime:THReshold:UP:STARt <rel_ampl> [:SENSe]:PVTime:THReshold:UP:STARt?	Ramp Up start level	
[[:SENSe]:PVTime:THReshold:UP:END <rel_ampl> [:SENSe]:PVTime:THReshold:UP:END?	Ramp Up end level	
[[:SENSe]:PVTime:THReshold:DOWN:STARt <rel_ampl> [:SENSe]:PVTime:THReshold:DOWN:STARt?	Ramp Down start level	
[[:SENSe]:PVTime:THReshold:DOWN:END <rel_ampl> [:SENSe]:PVTime:THReshold:DOWN:END?	Ramp Down end level	
[[:SENSe]:RADio:SLOT TS0 TS1 TS2 TS3 TS4 TS5 TS6 TS7 TS8 TS9 TS10 TS11 TS12 TS13 TS14 TS15 TS16 TS17 TS18 TS19 [:SENSe]:RADio:SLOT?	Analysis Slot (in Predefined Parameters)	
[[:SENSe]:RADio:MINTErval <integer> [:SENSe]:RADio:MINTErval?	Meas Interval (in Predefined Parameters)	
[[:SENSe]:PVTime:LIMit:POFF:DLINK [:SENSe]:PVTime:LIMit:POFF:DLINK?		

GMSK Phase & Frequency (PFER) Meas Setup

The GMSK Phase & Frequency measurement used in the GSM mode is used in the sequencer. The Meas parameters usable within the List Sequencer measurement are listed below. For complete details of each parameter, please see the online help associated with the measurement.

The SCPI that is used within the Sequence Analyzer mode is the same as in the GSM/EDGE mode, except that two additional nodes are required in the Sequence Analyzer mode: one to identify the List Sequencer measurement and one to identify the mode from which the measurement comes. For example, [:SENSe]:PFERror is replaced with [:SENSe]:LSEQuencer:EDGE:PFERror: or :CALCulate:LSEQuencer:EDGE:PFERror:

Command	Description	Notes
[:SENSe]:PFERror:BSYNc:SOURce	Burst Sync	
:CALCulate:PFERror:LIMit:TEST[:STATe]	Limit Test State	
:CALCulate:PFERror:LIMit:BTS:RPHase	RMS Phase Error limit for BTS	
:CALCulate:PFERror:LIMit:MS:RPHase	RMS Phase Error limit for MS	
:CALCulate:PFERror:LIMit:BTS:PPHase	Peak Phase Error limit for BTS	
:CALCulate:PFERror:LIMit:MS:PPHase	Peak Phase Error limit for MS	
:CALCulate:PFERror:LIMit:BTS:FERRor	Frequency Error limit for BTS	
:CALCulate:PFERror:LIMit:MBTS:FERRor	Frequency Error limit for mBTS	
:CALCulate:PFERror:LIMit:PBTS:FERRor	Frequency Error limit for pBTS	
:CALCulate:PFERror:LIMit:MS:FERRor	Frequency Error limit for MS	

ORFS Meas Setup

The ORFS measurement used in the GSM/EDGE mode is used in the sequencer. The measurement parameters usable within the List Sequencer measurement are listed below. For complete details of each parameter, please see the online help associated with the measurement.

The SCPI that is used within the Sequence Analyzer mode is the same as in the GSM/EDGE mode, except that two additional nodes are required in the Sequence Analyzer mode: one to identify the List Sequencer measurement and one to identify the mode from which the measurement comes. For example, [:SENSe]:EORFSpectrum is replaced with [:SENSe]:LSEQuencer:EDGE:EORFSpectrum.

Note that switching and modulation offsets are limited to within ± 1.8 MHz for release A.11.57 and before, and extended to 2.0 MHz for release A.11.58 and after. If offsets greater than maximum offset frequency are set, then the measurement will fail to complete. The integrity value is non zero.

Command	Description	Notes
[[:SENSE]:EORFSpectrum:TYPE MODulation MSWitching SWITching FFModulation [:SENSE]:EORFSpectrum:TYPE?	Meas Type	
[[:SENSE]:EORFSpectrum:MEASure MULTiple SINGLE SWEPT [:SENSE]:EORFSpectrum:MEASure MULTiple?	Meas Method	
[[:SENSE]:EORFSpectrum:LIST:SElect CUSTom SHORT STANDARD [:SENSE]:EORFSpectrum:LIST:SElect?	Multi-Offset Freq List	
[[:SENSE]:EORFSpectrum:OFRequency <freq> [:SENSE]:EORFSpectrum:OFRequency?	Single Offset Freq	
[[:SENSE]:EORFSpectrum:WBNoise ON OFF 1 0 [:SENSE]:EORFSpectrum:WBNoise?	Wideband Noise	
[[:SENSE]:EORFSpectrum:BANDwidth [:RESolution]:MODulation:CARRier <freq> [:SENSE]:EORFSpectrum:BANDwidth [:RESolution]:MODulation:CARRier?	Carrier RBW	For Modulation Meas BWs
[[:SENSE]:EORFSpectrum:BANDwidth [:RESolution]:MODulation:OFFSet:CLOSe <freq> [:SENSE]:EORFSpectrum:BANDwidth [:RESolution]:MODulation:OFFSet:CLOSe?	<1800 kHz Offset RBW	For Modulation Meas BWs
[[:SENSE]:EORFSpectrum:BANDwidth [:RESolution]:MODulation:OFFSet:FAR <freq> [:SENSE]:EORFSpectrum:BANDwidth [:RESolution]:MODulation:OFFSet:FAR?	>=1800 kHz Offset RBW	For Modulation Meas BWs
[[:SENSE]:EORFSpectrum:BANDwidth [:RESolution]:SWITching:CARRier <freq> [:SENSE]:EORFSpectrum:BANDwidth [:RESolution]:SWITching:CARRier?	Carrier RBW	For Switching Meas BWs
[[:SENSE]:EORFSpectrum:BANDwidth [:RESolution]:SWITching:OFFSet:CLOSe <freq> [:SENSE]:EORFSpectrum:BANDwidth [:RESolution]:SWITching:OFFSet:CLOSe?	<1800 kHz Offset RBW	For Switching Meas BWs
[[:SENSE]:EORFSpectrum:BANDwidth [:RESolution]:SWITching:OFFSet:FAR <freq> [:SENSE]:EORFSpectrum:BANDwidth [:RESolution]:SWITching:OFFSet:FAR?	>=1800 kHz Offset RBW	For Switching Meas BWs
[[:SENSE]:EORFSpectrum:LIST:MODulation[:FREquency] <freq>, ... [:SENSE]:EORFSpectrum:LIST:MODulation[:FREquency]?	Offset Freq List	For Custom Modulation
[[:SENSE]:EORFSpectrum:LIST:MODulation:BANDwidth <freq>, ...	RBW List	For Custom

[SENSe]:EORFSpectrum:LIST:MODulation:Bandwidth?		Modulation
[SENSe]:EORFSpectrum:LIST:MODulation:LOFFset[:RCARrier] <rel_ampl>, ...	Rel Limit Level Offset	For Custom Modulation
[SENSe]:EORFSpectrum:LIST:MODulation:LOFFset:ABSolute <rel_ ampl>, ...	Abs Limit Level Offset	For Custom Modulation
[SENSe]:EORFSpectrum:LIST:MODulation:LOFFset:ABSolute?		
[SENSe]:EORFSpectrum:LIST:MODulation:APPLY RELative BOTH ABSolute, ...	Apply Limit Level Offset List	For Custom Modulation
[SENSe]:EORFSpectrum:LIST:MODulation:APPLY?		
[SENSe]:EORFSpectrum:LIST:SWITching[:FREQuency] <freq>, ...	Offset Freq List	For Custom Switching
[SENSe]:EORFSpectrum:LIST:SWITching[:FREQuency]?		
[SENSe]:EORFSpectrum:LIST:SWITching:Bandwidth <freq>, ...	RBW List	For Custom Switching
[SENSe]:EORFSpectrum:LIST:SWITching:Bandwidth?		
[SENSe]:EORFSpectrum:LIST:SWITching:LOFFset[:RCARrier] <rel_ ampl>, ...	Rel Limit Level Offset	For Custom Switching
[SENSe]:EORFSpectrum:LIST:SWITching:LOFFset[:RCARrier]?		
[SENSe]:EORFSpectrum:LIST:SWITching:LOFFset:ABSolute <rel_ ampl>, ...	Abs Limit Level Offset	For Custom Switching
[SENSe]:EORFSpectrum:LIST:SWITching:LOFFset:ABSolute?		
[SENSe]:EORFSpectrum:LIST:SWITching:APPLY RELative BOTH ABSolute, ...	Apply Limit Level Offset List	For Custom Switching
[SENSe]:EORFSpectrum:LIST:SWITching:APPLY?		
[SENSe]:EORFSpectrum:MODulation:RPOWer <ampl>	Modulation Reference Power	Yes
[SENSe]:EORFSpectrum:MODulation:RPOWer?		
[SENSe]:EORFSpectrum:SWITching:RPOWer <ampl>	Switching Reference Power	Yes
[SENSe]:EORFSpectrum:SWITching:RPOWer?		

EDGE EVM Measurement Setup

The EDGE EVM measurement used in the GSM mode is used in the sequencer. The measurement parameters usable within the List Sequencer measurement are listed below. For complete details of each parameter, please see the online help associated with the measurement.

The SCPI that is used within the Sequence Analyzer mode is the same as in the GSM/EDGE mode, except that two additional nodes are required in the Sequence Analyzer mode: one to identify the List Sequencer measurement and one to identify the mode from which the measurement comes. For example, [:SENSe]:EEVM is replaced with [:SENSe]:LSEQuencer:EDGE:EEVM: or :CALCulate:LSEQuencer:EDGE:EEVM:

6 List Sequence Measurements
List Sequence Measurements

Command	Description	Notes
[[:SENSE]:EEVM:BSYNc:SOURce	Burst Sync	
:CALCulate:EEVM:LIMit:TEST[:STATe]	Limit Test State	
:CALCulate:EEVM:LIMit:TYPE	Test Condition	
:CALCulate:EEVM:LIMit:BTS:NORMAL:REVM	EVM Test Limit (BTS, Normal)	
:CALCulate:EEVM:LIMit:BTS:EXTRemE:REVM	EVM Test Limit (BTS, Extreme)	
:CALCulate:EEVM:LIMit:MS:NORMAL:REVM	EVM Test Limit (MS, Normal)	
:CALCulate:EEVM:LIMit:MS:EXTRemE:REVM	EVM Test Limit (MS, Extreme)	
:CALCulate:EEVM:LIMit:BTS:NORMAL:REVM:NSRate	NB 16/32 QAM EVM Test Limit (BTS, Normal)	
:CALCulate:EEVM:LIMit:BTS:EXTRemE:REVM:NSRate	NB 16/32 QAM EVM Test Limit (BTS, Extreme)	
:CALCulate:EEVM:LIMit:MS:NORMAL:REVM:NSRate	NB 16/32 QAM EVM Test Limit (MS, Normal)	
:CALCulate:EEVM:LIMit:MS:EXTRemE:REVM:NSRate	NB 16/32 QAM EVM Test Limit (MS, Extreme)	
:CALCulate:EEVM:LIMit:BTS:NORMAL:REVM:HSRate	HB 16/32 QAM / QPSK EVM Test Limit (BTS, Normal)	
:CALCulate:EEVM:LIMit:BTS:EXTRemE:REVM:HSRate	HB 16/32 QAM / QPSK EVM Test Limit (BTS, Extreme)	
:CALCulate:EEVM:LIMit:MS:NORMAL:REVM:HSRate	HB 16/32 QAM / QPSK EVM Test Limit (MS, Normal)	
:CALCulate:EEVM:LIMit:MS:EXTRemE:REVM:HSRate	HB 16/32 QAM / QPSK EVM Test Limit (MS, Extreme)	

CALCulate:EEVM:LIMit:BTS:NORMal:PEVM	Peak EVM Test Limit (BTS, Normal)
CALCulate:EEVM:LIMit:BTS:EXTReme:PEVM	Peak EVM Test Limit (BTS, Extreme)
CALCulate:EEVM:LIMit:MS:NORMal:PEVM	Peak EVM Test Limit (MS, Normal)
CALCulate:EEVM:LIMit:MS:EXTReme:PEVM	Peak EVM Test Limit (MS, Extreme)
CALCulate:EEVM:LIMit:BTS:NORMal:EVMP95	95%ile EVM Test Limit (BTS, Normal)
CALCulate:EEVM:LIMit:BTS:EXTReme:EVMP95	95%ile EVM Test Limit (BTS, Extreme)
CALCulate:EEVM:LIMit:MS:NORMal:EVMP95	95%ile EVM Test Limit (MS, Normal)
CALCulate:EEVM:LIMit:MS:EXTReme:EVMP95	95%ile EVM Test Limit (MS, Extreme)
CALCulate:EEVM:LIMit:BTS:NORMal:IQOOffset	IQ Origin Offset Test Limit (BTS, Normal)
CALCulate:EEVM:LIMit:BTS:EXTReme:IQOOffset	IQ Origin Offset Test Limit (BTS, Extreme)
CALCulate:EEVM:LIMit:MS:NORMal:IQOOffset	IQ Origin Offset Test Limit (MS, Normal)
CALCulate:EEVM:LIMit:MS:EXTReme:IQOOffset	IQ Origin Offset Test Limit (MS, Extreme)
CALCulate:EEVM:LIMit:BTS:NORMal:FERRor	Frequency Error Test Limit (Normal BTS, Normal)
CALCulate:EEVM:LIMit:BTS:EXTReme:FERRor	Frequency Error Test Limit (Normal BTS, Extreme)
CALCulate:EEVM:LIMit:MBTS:NORMal:FERRor	Frequency

	Error Test Limit (Micro BTS, Normal)
CALCulate:EEVM:LIMit:MBTS:EXTReme:FERRor	Frequency Error Test Limit (Micro BTS, Extreme)
CALCulate:EEVM:LIMit:PBTS:NORMal:FERRor	Frequency Error Test Limit (Pico BTS, Normal)
CALCulate:EEVM:LIMit:PBTS:EXTReme:FERRor	Frequency Error Test Limit (Pico BTS, Extreme)
CALCulate:EEVM:LIMit:MS:NORMal:FERRor	Frequency Error Test Limit (MS, Normal)
CALCulate:EEVM:LIMit:MS:EXTReme:FERRor	Frequency Error Test Limit (MS, Extreme)
[[:SENSe]:EEVM:DROop	Droop compensation
[[:SENSe]:EEVM:FERRor:TRANge	Freq Err Tolerance
[[:SENSe]:EEVM:BSYnc:PMODulation:ALIGnment	Polar Mod Align
Key Path	Meas Setup

ACP Meas Setup

The Adjacent Channel Power (ACP also known as ACLR Adjacent channel leakage ratio) measurement used in the other supported modes is used in the sequencer. The Meas parameters usable within the List Sequencer measurement are listed below. For complete details of each parameter, please see . the online help associated with the measurement.

The SCPI that is used within the Sequence Analyzer mode is the same as in the original mode of the measurement, except that two additional nodes are required in the Sequence Analyzer mode: one to identify the List Sequencer measurement and one to identify the mode from which the measurement comes. For example, [[:SENSe]:ACPower is replaced with

[[:SENSe]:LSEQuencer:WCDMa:ACPower:

[[:SENSe]:LSEQuencer:C2K:ACPower:

```
[[:SENSe]:LSEQuencer:EVDo:ACPower:
[:SENSe]:LSEQuencer:LTE:ACPower:
[:SENSe]:LSEQuencer:LTETdd:ACPower:
[:SENSe]:LSEQuencer:TDSCDMA:ACPower:
or
:CALCulate:LSEQuencer:WCDMa:ACPower:
:CALCulate:LSEQuencer:C2K:ACPower:
:CALCulate:LSEQuencer: EVDO:ACPower:
:CALCulate:LSEQuencer: LTE:ACPower:
:CALCulate:LSEQuencer: LTETdd:ACPower:
:CALCulate:LSEQuencer: TDSCDMA:ACPower:
```

[[:SENSe]:ACPower:BANDwidth[:RESolution]	Resolution BW	
[[:SENSe]:ACPower:BANDwidth:SHAPE	Filter shape	
[[:SENSe]:ACPower:BANDwidth:TYPE	Filter Bandwidth	
[[:SENSe]:ACPower:CARRier[1]]2:COUnT	Num carriers	
[[:SENSe]:ACPower:CARRier[1]]2:REFerence	Reference carrier	
[[:SENSe]:ACPower:CARRier[1]]2:RCARRier:AUTO	Auto Ref car state	
[[:SENSe]:ACPower:CARRier[1]]2:RCFrequency	Ref Carrier frequency	
[[:SENSe]:ACPower:CARRier[1]]2:RCFrequency:AUTO	Ref carrier frequency auto state	
[[:SENSe]:ACPower:CARRier[1]]2[:POWER]	Power reference	
[[:SENSe]:ACPower:CARRier[1]]2:AUTO[:STATe]	Power Reference State	
[[:SENSe]:ACPower:CARRier[1]]2:CPSD	PSD reference	
[[:SENSe]:ACPower:CARRier[1]]2:LIST:COUPle	Carrier Coupling	
[[:SENSe]:ACPower:CARRier[1]]2:LIST:PPResent	Carrier Power Present	
[[:SENSe]:ACPower:CARRier[1]]2:LIST:WIDTh	Carrier spacing	Maximum span is 40 MHz
[[:SENSe]:ACPower:CARRier[1]]2:LIST:BANDwidth[:INTegration]	Measurement noise bandwidth	Maximum span is 40 MHz
[[:SENSe]:ACPower:CARRier[1]]2:LIST:METHod	Method	
[[:SENSe]:ACPower:CARRier[1]]2:LIST:FILTer:ALPHa	Filter alpha	
[[:SENSe]:ACPower:OFFSet[1]]2:LIST[:FREQuency]	Offset frequency	Maximum is 20 MHz
[[:SENSe]:ACPower:OFFSet[1]]2:LIST:STATe	Offset frequency state	
[[:SENSe]:ACPower:OFFSet[1]]2:LIST:BANDwidth	Offset integration bandwidth	Maximum must be compatible with 40 MHz DIF
[[:SENSe]:ACPower:OFFSet[1]]2:LIST:BANDwidth:RESolution	Offset RBW	

<code>[.SENSe]:ACPower:OFFSet[1]</code> <code>]2:LIST:BANDwidth:RESolution:AUTO</code>	Offset RBW auto state
<code>[.SENSe]:ACPower:OFFSet[1]</code> <code>]2:LIST:BANDwidth:SHAPE</code>	Filter type
<code>[.SENSe]:ACPower:OFFSet[1]</code> <code>]2:LIST:BANDwidth:TYPE</code>	Filter BW
<code>[.SENSe]:ACPower:OFFSet[1]</code> <code>]2:LIST:ABSolute</code>	Abs limit
<code>[.SENSe]:ACPower:OFFSet[1]</code> <code>]2:LIST:TEST</code>	Fail
<code>[.SENSe]:ACPower:OFFSet[1]</code> <code>]2:LIST:RCARrier</code>	Rel Lim (Carr)
<code>[.SENSe]:ACPower:OFFSet[1]</code> <code>]2:LIST:RPSDensity</code>	Rel Lim (PSD)

Key Path	Meas Setup
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BLUETOOTH ACP Meas Setup

The Adjacent Channel Power (ACP also known as ACLR Adjacent channel leakage ratio) measurement used in the Bluetooth mode is used in the sequencer. The Meas parameters usable within the List Sequencer measurement are listed below. For complete details of each parameter, please see the online help associated with the measurement.

The SCPI that is used within the Sequence Analyzer mode is the same as in the original mode of the measurement, except that two additional nodes are required in the Sequence Analyzer mode: one to identify the List Sequencer measurement and one to identify the mode from which the measurement comes. For example, `[.SENSe]:ACPower` is replaced with

`[.SENSe]:LSEQuencer:BTtooth:ACPower:`

or

`:CALCulate:LSEQuencer:BTtooth:ACPower:`

<code>:CALCulate:ACPower:LIMit:FAR:UPPer</code> <code>[.DATA]</code>	Far Limit	Sets the far limit, in dBm for Adjacent channel power $ M-N \geq 3$.
<code>:CALCulate:ACPower:LIMit:NEAR:UPPer</code> <code>[.DATA]</code>	Near Limit	Sets the near limit, in dBm for Adjacent channel power $ M-N = 2$.
<code>[.SENSe]:ACPower:FREQUency:SPAN</code>	Span	Frequency Span

Key Path	Meas Setup
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BLUETOOTH LE In-band Emission Meas Setup

The LE In-band Emission measurement used in the Bluetooth mode is available in the sequencer, where it is called Bluetooth LE In-band Emission measurement. The measurement parameters usable within the

List Sequencer measurement are listed below. For complete details of each parameter, please see the online help associated with the measurement.

The SCPI that is used within the Sequence Analyzer mode is the same as in the original mode of the measurement, except that two additional nodes are required in the Sequence Analyzer mode: one to identify the List Sequencer measurement and one to identify the mode from which the measurement comes. For example, [:SENSe]:IBEMissions is replaced with

[:SENSe]:LSEQuencer:BT00th:IBEMissions:

or

:CALCulate:LSEQuencer:BT00th:IBEMissions:

Command	Description	Notes
IBEMissions		
:CALCulate:IBEMissions:LIMit:FAR:UPPer[:DATA]	Far Limit	Sets the far limit, in dBm for Adjacent channel power $ M-N \geq 3$.
:CALCulate:IBEMissions:LIMit:NEAR:UPPer[:DATA]	Near Limit	Sets the near limit, in dBm for Adjacent channel power $ M-N = 2$.
[:SENSe]:IBEMissions:FREQuency:SPAN	Span	

Key Path	Meas Setup
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BLUETOOTH EDR Spurious Emission Meas Setup

The EDR In-band Spurious Emission measurement used in the Bluetooth mode is available in the sequencer, where it is called Bluetooth EDR In-band Spurious Emission measurement. The measurement parameters usable within the List Sequencer measurement are listed below. For complete details of each parameter, please see the online help associated with the measurement.

The SCPI that is used within the Sequence Analyzer mode is the same as in the original mode of the measurement, except that two additional nodes are required in the Sequence Analyzer mode: one to identify the List Sequencer measurement and one to identify the mode from which the measurement comes. For example, [:SENSe]:IBSPurious is replaced with

[:SENSe]:LSEQuencer:BT00th:IBSPurious:

or

:CALCulate:LSEQuencer:BT00th:IBSPurious:

Command	Description	Notes
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IBSPurious		
:CALCulate: IBSPurious:LIMit:FAR:UPPer[:DATA]	Far Limit	Sets the far limit, in dBm for Adjacent channel power $ M-N \geq 3$.
:CALCulate: IBSPurious:LIMit:NEAR:UPPer[:DATA]	Near Limit	Sets the near limit, in dBm for Adjacent channel power $ M-N = 2$.
[:SENSe]: IBSPurious:FREQuency:SPAN	Span	

Key Path	Meas Setup
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SEM Meas Setup

The Spectral Emission Mask (SEM) measurement used in the other supported modes is used in the sequencer. The Meas parameters usable within the List Sequencer measurement are listed below. For complete details of each parameter, please see the online help associated with the measurement.

The SCPI that is used within the Sequence Analyzer mode is the same as in the original mode of the measurement, except that two additional nodes are required in the Sequence Analyzer mode: one to identify the List Sequencer measurement and one to identify the mode from which the measurement comes. For example, [:SENSe]:PVTime is replaced with

```
[:SENSe]:LSEQuencer:WCDMa:SEMAsk:
[:SENSe]:LSEQuencer:C2K:SEMAsk:
[:SENSe]:LSEQuencer:EVDO:SEMAsk:
[:SENSe]:LSEQuencer:LTE:SEMAsk:
[:SENSe]:LSEQuencer:LTETdd:SEMAsk:
[:SENSe]:LSEQuencer:TDSCDMA:SEMAsk:
or
:CALCulate:LSEQuencer:WCDMa:SEMAsk:
:CALCulate:LSEQuencer:C2K:SEMAsk:
:CALCulate:LSEQuencer:EVDO:SEMAsk:
:CALCulate:LSEQuencer:LTE:SEMAsk:
:CALCulate:LSEQuencer:LTETdd:SEMAsk:
:CALCulate:LSEQuencer:TDSCDMA:SEMAsk:
```

Command	Description	Notes
[[:SENSe]:SEMAsk:TYPE	Meas Type	
[[:SENSe]:SEMAsk:BANDwidth[1]]2[:INTEgration	Chan Integration Bandwidth	Maximum is 40 MHz
[[:SENSe]:SEMAsk:FREQUency[1]]2:SPAN	Chan Span	Maximum is 40 MHz
[[:SENSe]:SEMAsk:BANDwidth[1]]2[:RESolution]	Chan Res BW	
[[:SENSe]:SEMAsk:BANDwidth[1]]2[:RESolution]:AUTO	Chan Res BW auto state	
[[:SENSe]:SEMAsk:CARRier[:POWER]	Total Pwr Ref	
[[:SENSe]:SEMAsk:CARRier:AUTO[:STATE]	Total Pwr Ref Auto State	
[[:SENSe]:SEMAsk:CARRier:CPSD	PSD Ref	
[[:SENSe]:SEMAsk:CARRier:PEAK[:POWER]	Spectrum Peak Ref	
[[:SENSe]:SEMAsk:OFFSet[1]]2:LIST:FREQUency:START	Offset Start Freq	Maximum is 20 MHz
[[:SENSe]:SEMAsk:OFFSet[1]]2:LIST:STATE	Offset state list	
[[:SENSe]:SEMAsk:OFFSet[1]]2:LIST:FREQUency:STOP	Offset Stop Freq	Maximum is 20 MHz
[[:SENSe]:SEMAsk:OFFSet[1]]2:LIST:SIDE	Offset Side	
[[:SENSe]:SEMAsk:OFFSet[1]]2:LIST:BANDwidth[:RESolution]	Res BW	
[[:SENSe]:SEMAsk:OFFSet[1]]2:LIST:BANDwidth[:RESolution]:AUTO	Offset RBW Mode	
[[:SENSe]:SEMAsk:OFFSet[1]]2:LIST:BANDwidth:IMULti	Meas BW	
[[:SENSe]:SEMAsk:OFFSet[1]]2:LIST:START:ABSolute	Abs Start	
[[:SENSe]:SEMAsk:OFFSet[1]]2:LIST:STOP:ABSolute	Abs Stop	
[[:SENSe]:SEMAsk:OFFSet[1]]2:LIST:STOP:ABSolute:COUPle	Abs stop coupling	
[[:SENSe]:SEMAsk:OFFSet[1]]2:LIST:START:RCARrier	Rel Start	
[[:SENSe]:SEMAsk:OFFSet[1]]2:LIST:STOP:RCARrier	Rel Stop	
[[:SENSe]:SEMAsk:OFFSet[1]]2:LIST:STOP:RCARrier:COUPle	Rel stop coupling	
[[:SENSe]:SEMAsk:OFFSet[1]]2:LIST:TEST	Fail Mask	
[[:SENSe]:SEMAsk:FILTer[:RRC][:STATE]	Method	

<code>[[:SENSe]:SEMAsk:FILTer[:RRC]:ALPHa</code>	Filter Alpha	
<code>[[:SENSe]:SEMAsk:LIMits</code>	Limits state	TD-SCDMA only
<code>[[:SENSe]:SEMAsk:LIMits:TYPE</code>	Limits Type	Only for DVB-T/H
<code>TRACe:SEMAsk:TYPE</code>	Trace Type	This applies to the temporal averaging

Occupied Bandwidth Meas Setup

The Occupied Bandwidth (OBW) measurement used in the other supported modes is used in the sequencer. The Meas parameters usable within the List Sequencer measurement are listed below. For complete details of each parameter, please see the online help associated with the measurement.

The SCPI that is used within the Sequence Analyzer mode is the same as in the original mode of the measurement, except that two additional nodes are required in the Sequence Analyzer mode: one to identify the List Sequencer measurement and one to identify the mode from which the measurement comes. For example, `[[:SENSe]:OBWidth` is replaced with

`[[:SENSe]:LSEQuencer:WCDMa:OBWidth:`

`[[:SENSe]:LSEQuencer:C2K:OBWidth:`

`[[:SENSe]:LSEQuencer:EVDO:OBWidth:`

`[[:SENSe]:LSEQuencer:LTE:OBWidth:`

`[[:SENSe]:LSEQuencer:LTETdd:OBWidth:`

`[[:SENSe]:LSEQuencer:TDSCDMA:OBWidth:`

`[[:SENSe]:LSEQuencer:BTooth:OBWidth:`

or

`:CALCulate:LSEQuencer:WCDMa:OBWidth:`

`:CALCulate:LSEQuencer:C2K:OBWidth:`

`:CALCulate:LSEQuencer:EVDO:OBWidth:`

`:CALCulate:LSEQuencer:LTE:OBWidth:`

`:CALCulate:LSEQuencer:LTETdd:OBWidth:`

`:CALCulate:LSEQuencer:TDSCDMA:OBWidth:`

`:CALCulate:LSEQuencer:BTooth:OBWidth:`

Command	Description	Notes
[SENSE]:OBW:BANDwidth[:RESolution]	Res bandwidth	
[SENSE]:OBW:BANDwidth:SHAPE	Filter shape	
[SENSE]:OBW:PERCent	OBW % Power	
[SENSE]:OBW:XDB	OBW x dB	
CALCulate:[SENSE]:OBW:LIMit:FBLimit CALCulate:[SENSE]:OBW:LIMit[:TEST]	Limit / Limit Test State	
[SENSE]:OBW:FREQuency:SPAN	Span	Max value is 40MHz.
[SENSE]:OBW:FREQuency:SPAN:FULL	Set Full Span	
[SENSE]:OBW:FREQuency:SPAN:PREVious	Use Previous Span	

Modulation Accuracy Meas Setup

The Modulation Accuracy (Rho) measurement used in the other supported modes is used in the sequencer. The measurement parameters usable within the List Sequencer measurement are listed below. For complete details of each parameter, please see the online help associated with the measurement. The SCPI commands with strikethroughs are in the one button meas but are not allowed to be used within the List Sequencer measurement.

The SCPI that is used within the Sequence Analyzer mode is the same as in the original mode of the measurement, except that two additional nodes are required in the Sequence Analyzer mode: one to identify the List Sequencer measurement and one to identify the mode from which the measurement comes. For example, [:SENSe]:RHO is replaced with

[:SENSe]:LSEQuencer:WCDMa:RHO:

[:SENSe]:LSEQuencer:C2K:RHO:

[:SENSe]:LSEQuencer:EVDO:RHO:

or

:CALCulate:LSEQuencer:WCDMa:RHO:

:CALCulate:LSEQuencer:C2K:RHO:

:CALCulate:LSEQuencer: EVDO:RHO:

NOTE:

The node name of LTE-FDD and LTE-TDD Modulation accuracy is CEVM, so:

[:SENSe]:CEVM is replaced with [:SENSe]:LSEQuencer:LTE:CEVM

[:SENSe]:CEVM is replaced with [:SENSe]:LSEQuencer:LTETdd:CEVM

or

:CALCulate:CEVM is replaced with :CALCulate:LSEQuencer:LTE:CEVM

:CALCulate:CEVM is replaced with :CALCulate:LSEQuencer:LTETdd:CEVM

NOTE:

The node name of Bluetooth Transmit Analysis is TX, so:

[:SENSe]:TX is replaced with [:SENSe]:LSEQuencer:BTtooth:TX

or

:CALCulate:TX is replaced with :CALCulate:LSEQuencer:BTtooth:TX

NOTE:

The node name of WLAN Modulation Accuracy is EVM, so:

[:SENSe]:EVM is replaced with [:SENSe]:LSEQuencer:WLAN:EVM

or

:CALCulate:EVM is replaced with :CALCulate:LSEQuencer:WLAN:EVM

The node name of WLAN MIMO Modulation Accuracy is EVMMimo, so:

[:SENSe]:EVMMimo is replaced with [:SENSe]:LSEQuencer:WLAN:EVMMimo

or

:CALCulate:EVMMimo is replaced with :CALCulate:LSEQuencer:WLAN:EVMMimo

The node name of WLAN Spectral Flatness is FLATness, so:

[:SENSe]:FLATness is replaced with [:SENSe]:LSEQuencer:WLAN:FLATness

Or

:CALCulate:FLATness is replaced with :CALCulate:LSEQuencer:WLAN:FLATness

"WCDMa RHO" on page 327

"C2KRHO" on page 328

"EVDO Rho" on page 329

LTE CEVM (for both FDD and TDD)

"TDSCDMA RHO" on page 330

"BLUETOOTHTransmit Analysis" on page 331

"WLAN Modulation Accuracy" on page 334

"WLAN MIMO Modulation Accuracy " on page 339

WCDMA RHO

Command	Description	Notes
[SENSe]:RHO:CAPTure:TIME[:FRAMe]	Frame Capture Interval	
[SENSe]:RHO:SWEep:OFFSet	Measurement Offset	
:CALCulate:RHO:LIMit:RMS	RMS EVM Limit	
:CALCulate:RHO:LIMit:PEAK	Peak EVM Limit	
:CALCulate:RHO:LIMit:RHO	Rho (Composite) Limit	
:CALCulate:RHO:LIMit:CDERror	Peak Code Domain Error Limit	
:CALCulate:RHO:LIMit:FERRor	Frequency Error Limit	
:CALCulate:RHO:LIMit:CPiCh[:BTS]:POWer	CPiCh Reference Limit	
:CALCulate:RHO:LIMit:CPiCh[:BTS]	CPiCh Tolerance Limit	
[SENSe]:RHO:SYNC[:BTS]	Sync Type For BTS	
[SENSe]:RHO:SYNC:SYMBol:SRATe	Synchronisation Symbol Rate (BTS Only)	
[SENSe]:RHO:SYNC:SYMBOL:SPRead	Synchronisation Code Number (BTS Only)	
[SENSe]:RHO:SYNC:MS	Sync Type for MS	
[SENSe]:RHO:SYNC:SCRamble[:BTS]	Primary Scramble Code (BTS Only)	
[SENSe]:RHO:SFOrmat:MS	Slot Format (MS Only)	
[SENSe]:RHO:PRACH:SIGNature	Preamble signature (MS Only)	
[SENSe]:RHO:SYNC:SCRamble[:BTS]:OFFSet	Scramble Code Offset (BTS only)	
[SENSe]:RHO:SYNC:SCRamble:MS	Scramble Code (MS Only)	
[SENSe]:RHO:SYNC:SCRamble[:BTS]:TYPE	Scramble Code Type (BTS Only)	
[SENSe]:RHO:SBOundary[:BTS]	Symbol boundary (BTS Only)	
[SENSe]:RHO:SBOundary:LIST[:BTS]:INIT	Initialize List	
[SENSe]:RHO:SBOundary:LIST[:BTS]:APPend	Append List	
[SENSe]:RHO:SBOundary:LIST[:BTS]:REPLace	Replace List	
[SENSe]:RHO:SBOundary:LIST[:BTS]:CHANnel?	Query List	
[SENSe]:RHO:SBOundary:LIST[:BTS]:NCHannels?	Query Num Channels	
[SENSe]:RHO:SBOundary:LIST[:BTS]:PRESet	Load preset channel list	
[SENSe]:RHO:SBOundary:MS	Symbol boundary (MS Only)	
[SENSe]:RHO:SBOundary:LIST:MS:INIT	Initialize List	
[SENSe]:RHO:SBOundary:LIST:MS:APPend	Append List	
[SENSe]:RHO:SBOundary:LIST:MS:REPLace	Replace List	
[SENSe]:RHO:SBOundary:LIST:MS:CHANnel?	Query List	
[SENSe]:RHO:SBOundary:LIST:MS:NCHannels?	Query num channels	
[SENSe]:RHO:SSLot:NUMBer	Sync Start Slot (BTS Only)	

[.SENSe]:RHO:SWEp:TIME:TRANsient	Transient Period Exclude (MS Only)
[.SENSe]:RHO:SPECTrum	Spectrum Inversion
:CALCulate:RHO:IQOffset:INCLude	IQ Origin Offset Inclusion
:CALCulate:RHO:ASET:THReshold	Active Set Threshold
:CALCulate:RHO:ASET:THReshold:AUTO	Active Set Threshold Auto State
[.SENSe]:RHO:FILTer[:RRC][:STATe]	RRC Filter Control
[.SENSe]:RHO:FILTer[:RRC]:ALPHA	RRC Filter Alpha
[.SENSe]:RHO:CRATe	Chip Rate
:CALCulate:RHO:DTXBurst	DTX/Burst Detect
[.SENSe]:RHO:MCEStimator	Multi Channel Estimator
[.SENSe]:RHO:MCEStimator:TIMing	Timing Estimation
[.SENSe]:RHO:FERRor:TRANge	Frequency Error Tolerance Range
[.SENSe]:RHO:PICH:SPRead	PICH Code Number
[.SENSe]:RHO:MICH:SPRead	MICH Code Number (BTS Only)

C2KRHO

:CALCulate:RHO:LIMit:RMS	RMS EVM limit
:CALCulate:RHO:LIMit:PEAK	Peak EVM limit
:CALCulate:RHO:LIMit:RHO	Rho limit
:CALCulate:RHO:LIMit:CDErRor	Peak CDE limit
:CALCulate:RHO:LIMit:TIMing	Timing Error limit
:CALCulate:RHO:LIMit:PHASe	Phase Error limit
:CALCulate:RHO:PNOffset	Pseudo-random noise offset
[.SENSe]:RHO:SYNC[:BTS]	Sync type for BTS
[.SENSe]:RHO:SYNC:LCMask	Long code mask for BS
[.SENSe]:RHO:RCONfig	Radio config
[.SENSe]:RHO:SPECTrum	Spectrum inversion
:CALCulate:RHO:IQOffset:INCLude	EVM Result IQ Offset
:CALCulate:RHO:ASET:THReshold	Active Threshold
[.SENSe]:RHO:ALPHA	Filter alpha
[.SENSe]:RHO:CRATe	Chip Rate
[.SENSe]:RHO:MCEStimator	Multi channel estimator

EVDO Rho

:CALCulate:RHO:MS:WCODe:ORDer	Code Order
:CALCulate:RHO:MS:IQ:COMBined[:STATe]	IQ Combined Power State
:CALCulate:RHO:MS:LIMit:RMS[:SUB0]	RMS EVM (Composite) [Subtype 0/1] limit
:CALCulate:RHO:MS:LIMit:RMS:SUB2	RMS EVM (Composite) [Subtype 2/3 (NFM)] limit
:CALCulate:RHO:MS:LIMit:PEAK[:SUB0]	Peak EVM (Composite) [Subtype 0/1] limit
:CALCulate:RHO:MS:LIMit:PEAK:SUB2	Peak EVM (Composite) [Subtype 2/3 (NFM)] limit
:CALCulate:RHO:MS:LIMit:RHO[:SUB0]	Rho (Composite) [Subtype 0/1] limit
:CALCulate:RHO:MS:LIMit:RHO:SUB2	Rho (Composite) [Subtype 2/3 (NFM)] limit
:CALCulate:RHO:MS:LIMit:CDErRor[:SUB0]	Peak Code Domain Error [Subtype 0/1] limit
:CALCulate:RHO:MS:LIMit:CDErRor:SUB2	Peak Code Domain Error [Subtype 2/3 (NFM)] limit
:CALCulate:RHO:MS:LIMit:FERRor[:SUB0]	Frequency Error [Subtype 0/1] limit
:CALCulate:RHO:MS:LIMit:FERRor:SUB2	Frequency Error [Subtype 2/3 (NFM)] limit
:CALCulate:RHO:MS:LIMit:POFFset[:SUB0]	Pilot Offset [Subtype 0/1] limit
:CALCulate:RHO:MS:LIMit:POFFset:SUB2	Pilot Offset [Subtype 2/3 (NFM)] limit
:CALCulate:RHO:MS:LIMit:ICDPower[:SUB0]	Inactive channel CDP [Subtype 0/1] limit
:CALCulate:RHO:MS:LIMit:ICDPower:SUB2	Inactive channel CDP [Subtype 2/3 (NFM)] limit
:CALCulate:RHO:MS:LIMit:RRI[:SUB0]	Reverse Rate Indicator [Subtype 0/1] limit
:CALCulate:RHO:MS:LIMit:ACDPower[:SUB0]	Active CDP [Subtype 0/1] tolerance
:CALCulate:RHO:MS:LIMit:ACDPower:SUB2	Active CDP [Subtype 2/3 (NFM)] tolerance
:CALCulate:RHO:MS:LIMit:DRC:GAIN[:SUB0]	DRC channel gain [Subtype 0/1] limit
:CALCulate:RHO:MS:LIMit:DRC:GAIN:SUB2	DRC channel gain [Subtype 2/3 (NFM)] limit
:CALCulate:RHO:MS:LIMit:RRI:SUB2	Reverse Rate Indicator [Subtype 2/3 (NFM)] limit
:CALCulate:RHO:MS:LIMit:ACK:GAIN[:SUB0]	ACK channel gain [Subtype 0/1] limit
:CALCulate:RHO:MS:LIMit:ACK:GAIN:SUB2	ACK channel gain [Subtype 2/3 (NFM)] limit
:CALCulate:RHO:MS:LIMit:DSC:GAIN:SUB2	DSC channel gain [Subtype 2/3 (NFM)] limit
:CALCulate:RHO:MS:LIMit:DATA:GAIN[:SUB0]	Data channel gain [Subtype 0/1] limit
:CALCulate:RHO:MS:LIMit:T2P:TOTal:GAIN:SUB2	T2P (total) channel gain [Subtype 2/3 (NFM)] limit
:CALCulate:RHO:MS:LIMit:AUXPilot:GAIN:SUB2	Auxiliary pilot gain [Subtype 2/3 (NFM)] limit
:CALCulate:RHO:MS:SWEep:OFFSet	Measurement offset
[:SENSe]:RHO:MS:SYNC	Sync Type

[.SENSe]:RHO:MS:SYNC:ILCMask	I long Code Mask	
[.SENSe]:RHO:MS:SYNC:QLCMask	Q long Code Mask	
[.SENSe]:RHO:MS:ACODE	Active code channel	
[.SENSe]:RHO:MS:ACODE:PIlot	Pilot/RRI Channel	
[.SENSe]:RHO:MS:ACODE:DRC	DRC Channel Definition	
[.SENSe]:RHO:MS:ACODE:ACK	ACK channel Definition	Subtype 0/1 only
[.SENSe]:RHO:MS:ACODE:DATA	Data Channel Definition	Subtype 0/1 only
[.SENSe]:RHO:MS:ACODE:RRI	RRI Channel Definition	Subtype 2 & 3 (NFM)
[.SENSe]:RHO:MS:ACODE:ACKDsc	ACK/DSC Channel Definition	Subtype 2 & 3 (NFM)
[.SENSe]:RHO:MS:ACODE:APIlot	Aux Pilot Channel Definition	Subtype 2 & 3 (NFM)
[.SENSe]:RHO:MS:ACODE:DATA:SUB2	Data Channel Definition	Subtype 2 & 3 (NFM)
[.SENSe]:RHO:MS:SSLot:NUMBer	Sync Start Slot	
[.SENSe]:RHO:MS:SPECTrum	Spectrum Inversion	
:CALCulate:RHO:MS:IQOffset:INCLude	EVM Result I/Q Offset	
:CALCulate:RHO:MS:ASET:THReshold	Active Set Threshold	
[.SENSe]:RHO:MS:CRATe	Chip Rate	
[.SENSe]:RHO:MS:ALPHa	Filter Alpha	
[.SENSe]:RHO:MS:MCEStimator	Multi Channel Estimator	
[.SENSe]:RHO:MS:MCEStimator:TIMing	Timing Estimation	
[.SENSe]:RHO:MS:FERRor:TRANge	Freq Error Tolerance Range	

TDSCDMA RHO

Command	Description	Notes
[.SENSe]:EVM:RINterval	Result Length	Sets the result length in terms of sub-frames. It is the number of sub-frame user intends to analyze. For example, when it is necessary to estimate the S1/S2 phase on DwPTS, Result Length should be set to a number no less than 4.
[.SENSe]:EVM:ANALysis:SUBFrame	Analysis Subframe	Specifies which sub-frame, within the acquired result length, is used for analysis and trace data measurement results. The available selections should include the acquired sub-frames.
:CALCulate:EVM:LIMit[1]:RMS	RMS EVM Limit for BTS	The default RMS EVM limit for BTS is 12.5%, which is defined in 3GPP TS 25.142, 6.8.1.
:CALCulate:EVM:LIMit2:RMS	RMS EVM Limit for MS	The default RMS EVM limit for MS is 17.5%, which is defined in 3GPP TS34.122, 5.7.1.

:CALCulate:EVM:LIMit[1]:PEAK	Peak EVM Limit for BTS	
:CALCulate:EVM:LIMit2:PEAK	Peak EVM Limit for MS	
:CALCulate:EVM:LIMit[1]:RHO	Rho (Composite) Limit for BTS	
:CALCulate:EVM:LIMit2:RHO	Rho (Composite) Limit for MS	
:CALCulate:EVM:LIMit[1]:PCDE	Peak Code Domain Error Limit for BTS	The default value for BTS is -28.0 dB, which is defined in 3GPP TS25.142, 6.8.2.
:CALCulate:EVM:LIMit2:PCDE	Peak Code Domain Error Limit for MS	The default value for MS is -21.0 dB, which is defined in 3GPP TS34.122, 5.7.2.
:CALCulate:EVM:LIMit[1]:FERRor	Frequency Error Limit for BTS	The default value for BTS is 0.05ppm (relative to carrier frequency) defined in 3GPP TS25.142, 6.3.2.
:CALCulate:EVM:LIMit2:FERRor	Frequency Error Limit for MS	The default value for MS is 0.1 ppm (relative to carrier frequency) defined in 3GPP TS34.122, 5.3.2.

BLUETOOTHTransmit Analysis

Command	Description	Notes
[:SENSe]:TX:BSYNc PREamble RAMPtD NONE	Burst Sync	Used to select how the measurement will synchronize with the correct part of the burst.
	Limit Test	Turns limit checking on and off.
:CALCulate:TX:OPOWer:LIMit:AVERAge:UPPer	Average Upper	Sets the upper limit used when testing the Average Output Power metric.
:CALCulate:TX:OPOWer:LIMit:AVERAge:LOWer	Average Lower	Sets the lower limit used when testing the Average Output Power metric.
:CALCulate:TX:OPOWer:LIMit:PEAK:UPPer	Peak Upper	Sets the upper limit used when testing the Peak Output Power metric.
:CALCulate:TX:ICFT:LIMit:UPPer	ICFT Upper	Sets the upper limit used when testing the ICFT metric.

:CALCulate:TX:ICFT:LIMit:LOWer	ICFT Lower		Sets the lower limit used when testing the ICFT metric.
:CALCulate:TX:MCHar:LIMit:DF1:AVERAge:UPPer	$\Delta f1$ Average Upper		Sets the upper limit used when testing the $\Delta f1$ Avg metric.
:CALCulate:TX:MCHar:LIMit:DF1:AVERAge:LOWer	$\Delta f1$ Average Lower		Sets the lower limit used when testing the $\Delta f1$ Avg metric.
:CALCulate:TX:MCHar:LIMit:DF2:MAX:LOWer	$\Delta f2$ Max Lower		Sets the lower limit used when testing the $\Delta f2$ Max metric.
:CALCulate:TX:MCHar:LIMit:RATio:LOWer	$\Delta f2$ Average/ $\Delta f1$ Average Lower		Sets the lower limit used when testing the $\Delta f2$ Average/ $\Delta f1$ Average metric.
:CALCulate:TX:CFDRift:LIMit:DH1:DRIFt:UPPer	DH1 Freq Drift Upper	Yes	Sets the upper limit used when testing the Freq Drift metric for DH1 packets.
:CALCulate:TX:CFDRift:LIMit:DH1:DRIFt:LOWer	DH1 Freq Drift Lower	Yes	Sets the lower limit used when testing the Freq Drift metric for DH1 packets.
:CALCulate:TX:CFDRift:LIMit:DH1:RATE:UPPer	DH1 Max Drift Rate Upper	Yes	Sets the upper limit used when testing the Max Drift metric for DH1 packets.
:CALCulate:TX:CFDRift:LIMit:DH1:RATE: LOWer	DH1 Max Drift Rate Lower	Yes	Sets the lower limit used when testing the Max Drift metric for DH1 packets.
:CALCulate:TX:CFDRift:LIMit:DH3:DRIFt:UPPer	DH3 Freq Drift Upper	Yes	Sets the upper limit used when testing the Freq Drift metric for DH3 packets.
:CALCulate:TX:CFDRift:LIMit:DH3:DRIFt:LOWer	DH3 Freq Drift Lower	Yes	Sets the lower limit used when testing the Freq Drift metric for DH3 packets.
:CALCulate:TX:CFDRift:LIMit:DH3:RATE:UPPer	DH3 Max Drift Rate Upper	Yes	Sets the upper limit used when testing the Max Drift metric for DH3 packets.
:CALCulate:TX:CFDRift:LIMit:DH3:RATE: LOWer	DH3 Max Drift Rate Lower	Yes	Sets the lower limit used when testing the Max Drift metric for DH3 packets.
:CALCulate:TX:CFDRift:LIMit:DH5:DRIFt:UPPer	DH5 Freq Drift Upper	Yes	Sets the upper limit used when testing the Freq Drift metric for DH5 packets.
:CALCulate:TX:CFDRift:LIMit:DH5:DRIFt:LOWer	DH5 Freq Drift Lower	Yes	Sets the lower limit used when testing the Freq Drift

			metric for DH5 packets.
:CALCulate:TX:CFDRift:LIMit:DH5:RATE:UPPer	DH5 Max Drift Rate Upper	Yes	Sets the upper limit used when testing the Max Drift metric for DH5 packets.
:CALCulate:TX:CFDRift:LIMit:DH5:RATE:LOWer	DH5 Max Drift Rate Lower	Yes	Sets the lower limit used when testing the Max Drift metric for DH5 packets.
:CALCulate:TX:CFDRift:LIMit:LREference:DRIFt:UPPer	LE Freq Drift Upper	Yes	Sets the upper limit used when testing the Freq Drift metric for LE packets.
:CALCulate:TX:CFDRift:LIMit:LREference:DRIFt:LOWer	LE Freq Drift Lower	Yes	Sets the lower limit used when testing the Freq Drift metric for LE packets.
:CALCulate:TX:CFDRift:LIMit:LREference:RATE:UPPer	LE Max Drift Rate Upper	Yes	Sets the upper limit used when testing the Max Drift metric for LE packets.
:CALCulate:TX:CFDRift:LIMit:LREference:RATE:LOWer	LE Max Drift Rate Lower	Yes	Sets the lower limit used when testing the Max Drift metric for LE packets.
:CALCulate:TX:RPOWER:LIMit:UPPer	Relative Power Upper	Yes	Sets the upper limit (y) used in the formula $x < PDPSK - PGFSK < y$ when testing the Relative Power metric.
:CALCulate:TX:RPOWER:LIMit:LOWer	Relative Power Lower	Yes	Sets the lower limit x used in the formula $x < PDPSK - PGFSK < y$ when testing the Relative Power metric.
:CALCulate:TX:FSMaccuracy:LIMit:FERRor:INITial:UPPer	Initial Frequency Upper	Yes	Sets the upper limit used when testing the Initial Frequency Offset metric.
:CALCulate:TX:FSMaccuracy:LIMit:FERRor:INITial:LOWer	Initial Frequency Lower	Yes	Sets the lower limit used when testing the Initial Frequency Offset metric.
:CALCulate:TX:FSMaccuracy:LIMit:FERRor:BLOCK:UPPer	Block Frequency Upper	Yes	Sets the upper limit used when testing the Block Frequency Offset metric.
:CALCulate:TX:FSMaccuracy:LIMit:FERRor:BLOCK:LOWer	Block Frequency Lower	Yes	Sets the lower limit used when testing the Block Frequency Offset metric.
:CALCulate:TX:FSMaccuracy:LIMit:FERRor:TOTal:UPPer	Total Frequency Upper	Yes	Sets the upper limit used when testing the Total Frequency Offset metric.
:CALCulate:TX:FSMaccuracy:LIMit:FERRor:TOTal:LOWer	Total	Yes	Sets the lower limit used

	Frequency Lower		when testing the Total Frequency Offset metric.
:CALCulate:TX:FSMaccuracy:LIMit:DEVM:RMS:DQPSk:UPPer	RMS DEVM DQPSK Upper	Yes	Sets the upper limit used when testing the RMS DEVM metric for $\pi/4$ -DQPSK blocks.
:CALCulate:TX:FSMaccuracy:LIMit:DEVM:RMS:DPSK:UPPer	RMS DEVM 8DPSK Upper	Yes	Sets the upper limit used when testing the RMS DEVM metric for 8DPSK blocks.
:CALCulate:TX:FSMaccuracy:LIMit:DEVM:PEAK:DQPSk:UPPer	Peak DEVM DQPSK Upper	Yes	Sets the upper limit used when testing the Peak DEVM metric for $\pi/4$ -DQPSK symbols.
:CALCulate:TX:FSMaccuracy:LIMit:DEVM:PEAK:DPSK:UPPer	Peak DEVM 8DPSK Upper	Yes	Sets the upper limit used when testing the Peak DEVM metric for 8DPSK symbols.
:CALCulate:TX:FSMaccuracy:LIMit:DEVM:NNPercentile:DQPSk:UPPer	99% DEVM DQPSK Upper	Yes	Sets the upper limit used when testing the 99% DEVM metric for $\pi/4$ -DQPSK symbols.
:CALCulate:TX:FSMaccuracy:LIMit:DEVM:NNPercentile:DPSK:UPPer	99% DEVM 8DPSK Upper	Yes	Sets the upper limit used when testing the 99% DEVM metric for 8DPSK symbols.
[[:SENSe]:TX:FREQuency:SPAN	Span	Yes	

WLAN Modulation Accuracy

Command	Description	Notes
[[:SENSe]:EVM:TIME:INTERval <integer>	Meas Interval	Specifies the measurement interval (length), in symbol times, of the portion of the OFDM burst that will be analyzed. This analyzed portion of the OFDM burst starts at a measurement offset specified by Meas Offset
[[:SENSe]:EVM:TIME:OFFSet <integer>	Meas Offset	Specifies the measurement offset, in symbol times (for 802.11 a/g OFDM, 802.11g DSSS-OFDM, 802.11n 20MHz, 802.11n 40MHz), or in chips (for 802.11b/g DSSS/CCK/PBCC), of

[:SENSe]:EVM:TIME:RESult[:STATe]:AUTO OFF ON 0 1	Result Length State	<p>the portion of the burst that will be analyzed</p> <p>For 802.11a/g (OFDM) and 801.11g (DSSS-OFDM), when Result Length is Auto, the length of the burst is auto-detected; When Result Length is Man, you can specify the result length of the burst regardless of the actual length of the burst.</p> <p>For 802.11n, if From HT-Sig is Off, When Result Length is Auto, the analyzer automatically determines the measurement result length by burst search</p>
[:SENSe]:EVM:TIME:RESult:LENGth <integer>	Result Length	<p>For 802.11a/g (OFDM) and 801.11g (DSSS-OFDM), when Result Length is Auto, the length of the burst is auto-detected. The result length is determined from the decoded SIGNAL symbol; When Result Length is Man, you can specify the result length of the burst regardless of the actual length of the burst.</p> <p>For 802.11n, if From HT-Sig is On, The result length is detected from the High Throughput Signal Field; For 802.11n, if From HT-Sig is Off, When Result Length is Auto, the analyzer automatically determines the measurement result length by burst search. When Result Length is Man, it compares the input result length to the Result Length parameter and uses the smaller value as the measurement.</p>
[:SENSe]:EVM:TIME:RESult:MAX <integer>	Max Result Length	<p>Max Result Length specifies a maximum result length.</p> <p>If the auto-detected length is greater than the specified maximum result length, the maximum result length is used instead</p>
[:SENSe]:EVM:TIME:RESult:SIG OFF ON 0 1	From SIG Symbols	<p>For 802.11n, if From SIG Syms is On:</p> <p>The result length is detected from the High Throughput Signal Field.</p>

		<p>It compares the decoded length information to the Max Result Length parameter and uses the smaller value as the measurement result length.</p> <p>For 802.11 n, if From SIG Syms Off:</p> <p>When Result Length is Auto, the analyzer automatically determines the measurement result length by burst search. It compares the detected result length to Max Result Length parameter and uses the smaller value as the measurement result length.</p>
:CALCulate:EVM:SUBCarrier ALL PILOT SINGLE	Subcarrier	This parameter specifies whether the demodulation results are for all subcarriers in the signal, or for a single subcarrier, or for just the pilot subcarriers.
:CALCulate:EVM:SUBCarrier:COUNT <integer>	Subcarrier Number	This parameter specifies the demodulation results are for which subcarrier. When Subcarrier selects "Single", this number will indicate which subcarrier is used to do demodulation
[.SENSe]:EVM:FILTer:REFerence:TYPE GAUSSian RECT RC	Reference Filter	This parameter controls the reference filter type used when computing the reference data for computing EVM
[.SENSe]:EVM:FILTer:ALPHa <real>	Alpha/BT	This parameter is used only when the Reference Filter is set to "GAUSSIAN" or "Raised Cosine", or the Measurement filter is set to "RRC". In these cases, this parameter controls the bT value for the Guassian filter and alpha values for Raised Cosine and RRC filters
[.SENSe]:EVM:FILTer:MEASurement:TYPE NONE RRC	Measurement Filter	controls the measurement filter type used for computing EVM
[.SENSe]:EVM:SYMBOL:ADJust <percent>	Symbol Timing Adjust	controls how far the FFT part of the symbol is adjusted away from the end of the symbol time. Note that this parameter value is negative, because the FFT start time is moved back by this parameter

[;SENSe];EVM:STSequence LONG SHORT	Sync Training Sequence	specifies synchronization method to use when synchronizing to the start of the OFDM burst
CALCulate:EVM:PILot:TRACk:AMPLitude OFF ON 0 1	Track Amplitude	specifies whether the analyzer tracks amplitude changes in the pilot subcarriers
:CALCulate:EVM:PILot:TRACk:PHASe OFF ON 0 1	Track Phase	specifies whether the analyzer tracks phase changes in the pilot subcarriers
:CALCulate:EVM:PILot:TRACk:TIMing OFF ON 0 1	Track Timing	specifies whether the analyzer tracks timing changes in the pilot subcarriers
:CALCulate:EVM:PILot:TRACk:MODE POSTeq PREeq	Pilot Tracking Mode	This specifies the Pilot Tracking Mode. The valid values are Post EQ and Pre EQ.
:CALCulate:EVM:EQualizer:TMODE SEQUENCE SDATa	Equalizer Training	This specifies how the equalizer is initialized, or “trained”. The valid values are Channel Estimation Seq Only and Channel Estimation Seq & Data
:CALCulate:EVM:IQNorm OFF ON 0 1	I/Q Normalize	specifies if the I/Q signals will be normalized
[;SENSe];EVM:COMPensate OFF ON 0 1	I/Q Compensation	allows to turn On or Off the compensation for IQ Gain Imbalance
:CALCulate:EVM:SPECTrum INVert NORMal	Spectrum	Sets a spectrum to either normal or to inverted for demodulation related measurements
[;SENSe];EVM:CRATe <frequency>	Chip Rate	specifies the fundamental chip rate of the signal to be analyzed. The value should be positive and default is 11 MHz, which matches the chip rate of 802.11 b/g
[;SENSe];EVM:CADJust <real>	Clock Adjust	allows the user to specify a timing offset which is added to the chip timing detected
[;SENSe];EVM:EQualizer[:STATe] OFF ON 0 1	Equalizer State	If turned on, an equalizer filter will be applied to the entire burst
[;SENSe];EVM:EQualizer:LENGth <integer>	Equalizer Filter Length	specifies the total length of the equalizer filter’s impulse response, in chips
[;SENSe];EVM:DESCramble ALL NONE PONLy PHONLy	Descramble	specifies what type of descrambling to do when producing bit vector results
:CALCulate:EVM:TRACk:PHASe OFF ON 0 1	Track Phase	specifies whether to perform

		phase tracking, to track carrier frequency changes during the course of the WLAN burst
:CALCulate:EVM:LIMit:RMS:M6 <rel_ampl>	6 Mbits/s RMS EVM	Sets 6 Mbits/s RMS EVM limit
:CALCulate:EVM:LIMit:RMS:M9 <rel_ampl>	9 Mbits/s RMS EVM	Sets 9 Mbits/s RMS EVM limit
:CALCulate:EVM:LIMit:RMS:M12 <rel_ampl>	12 Mbits/s RMS EVM	Sets 12 Mbits/s RMS EVM limit
:CALCulate:EVM:LIMit:RMS:M18 <rel_ampl>	18 Mbits/s RMS EVM	Sets 18 Mbits/s RMS EVM limit
:CALCulate:EVM:LIMit:RMS:M24 <rel_ampl>	24 Mbits/s RMS EVM	Sets 24 Mbits/s RMS EVM limit
:CALCulate:EVM:LIMit:RMS:M36 <rel_ampl>	36 Mbits/s RMS EVM	Sets 36 Mbits/s RMS EVM limit
:CALCulate:EVM:LIMit:RMS:M48 <rel_ampl>	48 Mbits/s RMS EVM	Sets 48 Mbits/s RMS EVM limit
:CALCulate:EVM:LIMit:RMS:M54 <rel_ampl>	54 Mbits/s RMS EVM	Sets 54 Mbits/s RMS EVM limit
:CALCulate:EVM:LIMit:FERRor <real>	Freq Error	Sets a frequency error limit
:CALCulate:EVM:LIMit:CLKerror <real>	Clock Error	Sets a clock error limit
:CALCulate:EVM:LIMit:CFLeakage <rel_ampl>	Center Freq Leakage	Sets Center Freq Leakage limit
:CALCulate:EVM:LIMit:RMS:BPSK:R1B2 <rel_ampl>	BPSK-1/2 RMS EVM	Sets BPSK coding rate 1/2 RMS EVM limit
:CALCulate:EVM:LIMit:RMS:QPSK:R1B2 <rel_ampl>	QPSK-1/2 RMS EVM	Sets QPSK coding rate 1/2 RMS EVM limit
:CALCulate:EVM:LIMit:RMS:QPSK:R3B4 <rel_ampl>	QPSK-3/4 RMS EVM	Sets QPSK coding rate 3/4 RMS EVM limit
:CALCulate:EVM:LIMit:RMS:QA16:R1B2 <rel_ampl>	16QAM-1/2 RMS EVM	Sets 16QAM coding rate 1/2 RMS EVM limit
:CALCulate:EVM:LIMit:RMS:QA16:R3B4 <rel_ampl>	16QAM-3/4 RMS EVM	Sets 16QAM coding rate 3/4 RMS EVM limit
:CALCulate:EVM:LIMit:RMS:QA64:R2B3 <rel_ampl>	64QAM-2/3 RMS EVM	Sets 64QAM coding rate 2/3 RMS EVM limit
:CALCulate:EVM:LIMit:RMS:QA64:R3B4 <rel_ampl>	64QAM-3/4 RMS EVM	Sets 64QAM coding rate 3/4 RMS EVM limit

:CALCulate:EVM:LIMit:RMS:QA64:R5B6 <rel_amp>	64QAM-5/6 RMS EVM	Sets 64QAM coding rate 5/6 RMS EVM limit
:CALCulate:EVM:LIMit:RMS:QA256:R3B4 <rel_amp>	256QAM-3/4 RMS EVM	Sets 256QAM coding rate 3/4 RMS EVM limit
:CALCulate:EVM:LIMit:RMS:QA256:R5B6 <rel_amp>	256QAM-5/6 RMS EVM	Sets 256QAM coding rate 5/6 RMS EVM limit
:CALCulate:EVM:LIMit:RMS <percent>	RMS EVM	Sets an RMS EVM limit
:CALCulate:EVM:LIMit:CHIP <percent>	1000 Chips EVM	Sets an 1000 Chips EVM limit
:CALCulate:EVM:LIMit:CARRier <rel_amp>	RF Carrier Suppression	Sets an RF Carrier Suppression limit
:CALCulate:FLATness:LIMit:UPPer:SECTion1 <rel_amp>	Upper Limit Section 1	specify upper deviation limit (dB) of the Section 1
:CALCulate:FLATness:LIMit:LOWer:SECTion1 <rel_amp>	Lower Limit Section 1	specify lower deviation limit (dB) of the Section 1
:CALCulate:FLATness:LIMit:UPPer:SECTion2 <rel_amp>	Upper Limit Section 2	specify upper deviation limit (dB) of the Section 2
:CALCulate:FLATness:LIMit:LOWer:SECTion2 <rel_amp>	Lower Limit Section 2	specify lower deviation limit (dB) of the Section 2

WLAN MIMO Modulation Accuracy

Command	Description	Notes
:CALCulate:EVMMimo:LIMit:FERRor <real>	Freq Error	Sets a frequency error limit
:CALCulate:EVMMimo:LIMit:CLKerror <real>	Clock Error	Sets a clock error limit
:CALCulate:EVMMimo:LIMit:CFLeakage <rel_amp>	Center Freq Leakage	Sets Center Freq Leakage limit
:CALCulate:EVMMimo:LIMit:RMS:BPSK:R1B2 <rel_amp>	BPSK-1/2 RMS EVM	Sets BPSK coding rate 1/2 RMS EVM limit
:CALCulate:EVMMimo:LIMit:RMS:QPSK:R1B2 <rel_amp>	QPSK-1/2 RMS EVM	Sets QPSK coding rate 1/2 RMS EVM limit
:CALCulate:EVMMimo:LIMit:RMS:QPSK:R3B4 <rel_amp>	QPSK-3/4 RMS EVM	Sets QPSK coding rate 3/4 RMS EVM limit
:CALCulate:EVMMimo:LIMit:RMS:QA16:R1B2	16QAM-1/2	Sets 16QAM coding rate 1/2

<rel_ampl>	RMS EVM	RMS EVM limit
:CALCulate:EVMMimo:LIMit:RMS:QA16:R3B4 <rel_ampl>	16QAM-3/4 RMS EVM	Sets 16QAM coding rate 3/4 RMS EVM limit
:CALCulate:EVMMimo:LIMit:RMS:QA64:R2B3 <rel_ampl>	64QAM-2/3 RMS EVM	Sets 64QAM coding rate 2/3 RMS EVM limit
:CALCulate:EVMMimo:LIMit:RMS:QA64:R3B4 <rel_ampl>	64QAM-3/4 RMS EVM	Sets 64QAM coding rate 3/4 RMS EVM limit
:CALCulate:EVMMimo:LIMit:RMS:QA64:R5B6 <rel_ampl>	64QAM-5/6 RMS EVM	Sets 64QAM coding rate 5/6 RMS EVM limit
:CALCulate:EVMMimo:LIMit:RMS:QA256:R3B4 <rel_ampl>	256QAM-3/4 RMS EVM	Sets 256QAM coding rate 3/4 RMS EVM limit
:CALCulate:EVMMimo:LIMit:RMS:QA256:R5B6 <rel_ampl>	256QAM-5/6 RMS EVM	Sets 256QAM coding rate 5/6 RMS EVM limit
:CALCulate:EVMMimo:EQualizer:TMODe SEquence SDATa	Equalizer Training	Specifies how the equalizer is initialized or trained.
:CALCulate:EVMMimo:PILot:TRACk:AMPLitude OFF ON 0 1	Track Amplitude	specifies whether analyzer tracks amplitude changes in the pilot subcarriers
:CALCulate:EVMMimo:PILot:TRACk:PHASe OFF ON 0 1	Track Phase	specifies whether analyzer tracks phase changes in the pilot subcarriers
:CALCulate:EVMMimo:PILot:TRACk:TIMing OFF ON 0 1	Track Timing	specifies whether analyzer tracks timing changes in the pilot subcarriers
:CALCulate:EVM:PILot:TRACk:MODE POSTeq PREeq	Pilot Tracking Mode	This specifies the Pilot Tracking Mode. The valid values are Post EQ and Pre EQ.
[[:SENSe]:EVMMimo:MTYPe DMAP FOURier	Matrix Type	specifies MIMO matrix type

QPSK EVM Meas Setup

The QPSK EVM measurement used in the other supported modes is used in the sequencer. The Meas parameters usable within the List Sequencer measurement are listed below. For complete details of each parameter, please see the online help associated with the measurement.

The SCPI that is used within the Sequence Analyzer mode is the same as in the original mode of the measurement, except that two additional nodes are required in the Sequence Analyzer mode: one to identify the List Sequencer measurement and one to identify the mode from which the measurement comes. For example, [:SENSe]:EVMQpsk is replaced with

[[:SENSe]:LSEQuencer:WCDMa:EVMQpsk:

[[:SENSe]:LSEQuencer:C2K:EVMQpsk:

or

:CALCulate:LSEQuencer:WCDMa:EVMQpsk:

:CALCulate:LSEQuencer:C2K:EVMQpsk:

Command	Description	Notes
[[:SENSe]:EVMQpsk:BANDwidth [:RESolution]	Info BW	
[[:SENSe]:EVMQpsk:BANDwidth:SHAPE	Filter shape	
:CALCulate:EVMQpsk:LIMit:RMS	RMS EVM Limit	
:CALCulate:EVMQpsk:LIMit:FERRor	Freq Error Limit	
[[:SENSe]:EVMQpsk:MEAS:OFFSet	Measurement Offset	
[[:SENSe]:EVMQpsk:MEAS:LENGth	Measurement Interval	
[[:SENSe]:EVMQpsk:SPECtrum	Spectrum Inversion	
[[:SENSe]:EVMQpsk:FILTer[:RRC][::STATe]	RRC Filter Control	
[[:SENSe]:EVMQpsk:FILTer:ALPHa	Filter Alpha Control	
[[:SENSe]:EVMQpsk:CRATe	Chip Rate	

Code Domain Power Meas Setup

The Code Domain Power measurement used in the other supported modes is used in the sequencer. The measurement parameters usable within the List Sequencer measurement are listed below. For complete details of each parameter, please see . the online help associated with the measurement.

The SCPI that is used within the Sequence Analyzer mode is the same as in the original mode of the measurement, except that two additional nodes are required in the Sequence Analyzer mode: one to identify the List Sequencer measurement and one to identify the mode from which the measurement comes. For example, [[:SENSe]:CDPower is replaced with

[[:SENSe]:LSEQuencer:WCDMa:CDPower:

[[:SENSe]:LSEQuencer:TDSCDMA:CDPower:

or

:CALCulate:LSEQuencer:WCDMa:CDPower:

:CALCulate:LSEQuencer:TDSCDMA:CDPower:

"WCDMa CDP" on page 342

"TDSCDMA CDP" on page 343

WCDMA CDP

Command	Description	Notes
:CALCulate:CDPower:TYPE	Meas Type	
:CALCulate:CDPower:SRate	Symbol rate	
:CALCulate:CDPower:SPRead	Code number	
:CALCulate:CDPower:AXIS[:MS]	I/Q Branch	
[:SENSe]:CDPower:SYNC:MS	Synch Type for MS	
[:SENSe]:CDPower:SFORmat:MS	Slot Format	
[:SENSe]:CDPower:PRACH:SIGNature	Preamble Signature	
[:SENSe]:CDPower:SYNC:SCRamble:MS	Scramble code	
:CALCulate:CDPower:DPCH:MS:CONFigure	DPCH/E-DPCH configuration	
[:SENSe]:CDPower:SBOundary:MS	Symbol boundary	
[:SENSe]:CDPower:SBOundary:LIST:MS:INIT	Initialise list	
[:SENSe]:CDPower:SBOundary:LIST:MS:APPend	Append list	
[:SENSe]:CDPower:SBOundary:LIST:MS:REPLace	Replace list	
[:SENSe]:CDPower:SBOundary:LIST:MS:CHANnel?	Query list	
[:SENSe]:CDPower:SBOundary:LIST:MS:NCHannels?	Num channels	
:CALCulate:CDPower:THSDpcch	Time offset tHS-DPCCH	
:CALCulate:CDPower:DTXBurst	DTX/Burst Detect	
:CALCulate:CDPower:IQPHase:ROTation	TX Diversity IQ Axis Rotation	
[:SENSe]:CDPower:SSLot:NUMBER	Synch Start Slot	
[:SENSe]:CDPower:SPECTrum	Spectral inversion	
:CALCulate:CDPower:ASET:THReshold	Active Set Threshold	
[:SENSe]:CDPower:FILTer[:RRC][:STATe]	RRC Filter control	
[:SENSe]:CDPower:FILTer:ALPHA	Filter alpha	
[:SENSe]:CDPower:CRATe	Chip Rate	

[SENSe]:CDPower:MCEstimator	Multi channel estimator
[SENSe]:CDPower:MCEstimator:TIMing	Timing Estimation
[SENSe]:CDPower:FERRor:TRANge	Frequency tolerance range
:CALCulate:CDPower:SEVM:FCOMpen	Frequency Compensation
:CALCulate:CDPower:SEVM:PCOMpen	Phase Compensation
:CALCulate:CDPower:SSUPpress[:STATe]	SCH Suppression

Key Path	Meas Setup
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TDSCDMA CDP

Command	Description	Notes
[SENSe]:CDPower:RINTerval	Result Length	Sets the result length in terms of sub-frames. It is the number of sub-frame user intends to analyze. For example, when it is necessary to estimate the S1/S2 phase on DwPTS, Result Length should be set to a number no less than 4.
[SENSe]:CDPower:ANALysis:SUBFrame	Analysis Subframe	Specifies which sub-frame, within the acquired result length, is used for analysis and trace data measurement results. The available selections should include the acquired sub-frames.
[SENSe]:CDPower:SCLength	Spread Code Length	Lets you set the Spread Code Length. The Spread Code Length is used along with the Code Channel to specify the active code layer and channel used for the measurement results
[SENSe]:CDPower:CDChannel	Code Channel	Lets you set the Code

Channel to be analyzed. The Code Channel is used along with the Spread Code Length to specify the active code channel and layer used for the measurement results

Key Path Meas Setup

Phase Discontinuity Meas Setup

The Slot Phase mode of UE Power Control measurement used in the W-CDMA modes is available in the sequencer, where it is called Phase Discontinuity measurement. The measurement parameters usable within the List Sequencer measurement are listed below. For complete details of each parameter, please see the online help associated with the measurement.

The SCPI that is used within the Sequence Analyzer mode is the same as in the original mode of the measurement, except that two additional nodes are required in the Sequence Analyzer mode: one to identify the List Sequencer measurement and one to identify the mode from which the measurement comes. For example, [:SENSE]:PCONTrol is replaced with

[:SENSE]:LSEQuencer:WCDMa: PCONtrol:

or

:CALCulate:LSEQuencer:WCDMa: PCONtrol:

Command	Description	Notes
[:SENSE]:PCONTrol:SLOT:FORMat	Slot Format	Auto SF0 SF1 SF2 SF3 SF4 SF5
[:SENSE]:PCONTrol:SSLot[:STATe] OFF ON 0 1	Sync Start Slot State	ON/OFF
[:SENSE]:PCONTrol:SSLot:NUMBer	Sync Start Slot	Range 0-14
[:SENSE]:PCONTrol:FILTer[:RRC][:STATe]	RRC Filter State ON/OFF	
[:SENSE]:PCONTrol:SYNC:SCRamble	Scrambling Code	
[:SENSE]:PCONTrol:FILTer[:RRC]:ALPHa	RRC Filter Alpha	RRC Filter Alpha value setting
[:SENSE]:PCONTrol:CRATe	Chip Rate	

All the slot power measeureme settings aren't supported.

All the PRACH Power measurement settings are unsupported.

All the PRACH Power measeureme settings are supported.

[:SENSe]:PCONtrol:SBOundary:MS	Slot Format	AUTO CUSTom
[:SENSe]:PCONtrol:SBOundary:LIST:MS:INIT	Symbol Boundary Custom Active Channel List (MS) Initialize	Only for setting <symbol_rate>, <code_num>, IPH QPH
[:SENSe]:PCONtrol:SBOundary:LIST:MS:APPend	Symbol Boundary Custom Active Channel List (MS) Append	Only for setting <symbol_rate>, <code_num>, IPH QPH
[:SENSe]:PCONtrol:SBOundary:LIST:MS:REPLace	Symbol Boundary Custom Active Channel List (MS) Replace	Only for setting <entry_id>, <symbol_rate>, <code_num>, IPH QPH
[:SENSe]:PCONtrol:SBOundary:LIST:MS:CHANnel? <entry_id>	Symbol Boundary Custom Active Channel List (MS) Query	Only for Query
[:SENSe]:PCONtrol:SBOundary:LIST:MS:NCHannels?	Symbol Boundary Custom Active Channel List (MS) Query number of entries	Only for Query
[:SENSe]:PCONtrol:MINterval	Measure Interval	Unit is a slot, 1 or 0.5
[:SENSe]:PCONtrol:SWEEp:TIME:TRANsient	Transient Interval	INCLude EXCLude, select EXclude means to remove 25us(96chips) each end of the slot (or half-slot)

Key Path	Meas Setup
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Loopback BER Meas Setup

The Loopback BER measurement in the Sequencer involved the following measurements for different radio standard:

- GMSK Phase & Frequency measurement used in the GSM mode for radio standard is GSM;
- EDGE EVM measurement used in the GSM mode for radio standard is EDGE;
- Code Domain Power measurement used in the W-CDMA mode for radio standard is W-CDMA;
- Code Domain Power measurement used in the TD-SCDMA mode for radio standard is TD-SCDMA .

The Meas parameters usable within the List Sequencer measurement are listed below. For complete details of each parameter, please see the online help associated with the measurement.

The SCPI that is used within the Sequence Analyzer mode is the same as in the original mode of the measurement, except that two additional nodes are required in the Sequence Analyzer mode: one to identify the List Sequencer measurement and one to identify the mode from which the measurement comes. For example,

- [:SENSe]:PFERror is replaced with [:SENSe]:LSEQuencer:EDGE:PFERror: or :CALCulate:LSEQuencer:EDGE:PFERror:
- [:SENSe]:EEVM is replaced with [:SENSe]:LSEQuencer:EDGE:EEVM: or :CALCulate:LSEQuencer:EDGE:EEVM:
- [:SENSe]:CDPower is replaced with [:SENSe]:LSEQuencer:WCDMa:CDPower: or :CALCulate:LSEQuencer:WCDMa:CDPower:

[:SENSe]:CDPower is replaced with [:SENSe]:LSEQuencer:TDSCdma:CDPower: or :CALCulate:LSEQuencer:TDSCdma:CDPower:

"GSM Loopback BER" on page 346

"EDGE Loopback BER" on page 347

"WCDMA Loopback BER" on page 347

"TD-SCDMA Loopback BER" on page 348

GSM Loopback BER

Command	Description	Notes
[:SENSe]:PFERror:BSYNc:SOURce	Burst Sync	

NOTE:

The parameters of Loopback BER measurement for GSM are the same as the parameters of GMSK Phase & Frequency (PFER) measurement.

EDGE Loopback BER

Command	Description	Notes
[SENSe]:EEVM:BSYNc:SOURce	Burst Sync	
[SENSe]:EEVM:DROop	Droop compensation	
[SENSe]:EEVM:FERRor:TRANge	Freq Err Tolerance	
[SENSe]:EEVM:BSYnc:PMODulation:ALIGNment	Polar Mod Align	

NOTE:

The parameters of Loopback BER measurement for EDGE are the same as the parameters of EDGE EVM measurement.

Key Path	Meas Setup
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WCDMA Loopback BER

Command	Description	Notes
:CALCulate:CDPower:TYPE	Meas Type	
:CALCulate:CDPower:SRATe	Symbol rate	
:CALCulate:CDPower:SPRead	Code number	
[SENSe]:CDPower:SYnc:MS	Synch Type for MS	
[SENSe]:CDPower:SFOrmat:MS	Slot Format	
[SENSe]:CDPower:PRACH:SIGNature	Preamble Signature	
[SENSe]:CDPower:SYnc:SCRamble:MS	Scramble code	
:CALCulate:CDPower:DPCH:MS:CONFigure	DPCH/E-DPCH configuration	
[SENSe]:CDPower:SBOundary:MS	Symbol boundary	
[SENSe]:CDPower:SBOundary:LIST:MS:INIT	Initialise list	
[SENSe]:CDPower:SBOundary:LIST:MS:APPend	Append list	
[SENSe]:CDPower:SBOundary:LIST:MS:REPLace	Replace list	
[SENSe]:CDPower:SBOundary:LIST:MS:CHANnel?	Query list	
[SENSe]:CDPower:SBOundary:LIST:MS:NCHannels?	Num channels	
:CALCulate:CDPower:THSDpcch	Time offset tHS-DPCCH	
:CALCulate:CDPower:DTXBurst	DTX/Burst	

	Detect
:CALCulate:CDPower:IQPhase:ROTation	TX Diversity IQ Axis Rotation
[:SENSe]:CDPower:SSLot:NUMBer	Synch Start Slot
[:SENSe]:CDPower:SPECTrum	Spectral inversion
:CALCulate:CDPower:ASET:THReshold	Active Set Threshold
[:SENSe]:CDPower:FILTer[:RRC][:STATe]	RRC Filter control
[:SENSe]:CDPower:FILTer:ALPHa	Filter alpha
[:SENSe]:CDPower:CRATe	Chip Rate
[:SENSe]:CDPower:MCEStimator	Multi channel estimator
[:SENSe]:CDPower:MCEStimator:TIMing	Timing Estimation
[:SENSe]:CDPower:FERRor:TRANge	Frequency tolerance range
:CALCulate:CDPower:SEVM:FCOMpen	Frequency Compensation
:CALCulate:CDPower:SEVM:PCOMpen	Phase Compensation
:CALCulate :CDPower:SSUPpress[:STATe]	SCH Suppression

NOTE:

The parameters of Loopback BER measurement for WCDMA are the same as the parameters of WCDMA's Code Domain Power measurement.

Key Path	Meas Setup
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TD-SCDMA Loopback BER

Command	Description	Notes
[:SENSe]:CDPower:RINTerval	Result Length	Sets the result length in terms of sub-frames. It is the number of sub-frame user intends to analyze. For example, when it is necessary to estimate the

		S1/S2 phase on DwPTS, Result Length should be set to a number no less than 4.
[SENSe]:CDPower:ANALysis:SUBFrame	Analysis Subframe	Specifies which sub-frame, within the acquired result length, is used for analysis and trace data measurement results. The available selections should include the acquired sub-frames.
[SENSe]:CDPower:SCLength	Spread Code Length	Lets you set the Spread Code Length. The Spread Code Length is used along with the Code Channel to specify the active code layer and channel used for the measurement results
[SENSe]:CDPower:CDChannel	Code Channel	Lets you set the Code Channel to be analyzed. The Code Channel is used along with the Spread Code Length to specify the active code channel and layer used for the measurement results

NOTE:

The parameters of Loopback BER measurement for TD-SCDMA are the same as the parameters of TD-SCDMA's Code Domain Power measurement.

Key Path	Meas Setup
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Mode Parameter Setup (for measurements from other modes)

These are mode parameters for a measurement mode other than Sequence Analyzer mode; when you use a measurement from another mode, the mode parameters for that mode can be set remotely using SCPI commands, without leaving Sequence Analyzer mode. These parameters are globally applied to all analysis steps over the entire Sequence..

GSM Timeslot

Time Slot setting for GSM mode. Provides an On/Off for each timeslot (0 to 7). Generally used only with periodic and ext frame triggers.

SCPI access only, from within Sequence Analyzer mode (front panel access through the GSM/EDGE mode). For more information, see the online help for GSM/EDGE mode.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:EDGE:CHANnel:SLOT <integer>
```

```
[[:SENSe]:LSEQuencer:EDGE:CHANnel:SLOT?
```

```
[[:SENSe]:LSEQuencer:EDGE:CHANnel:SLOT:AUTO OFF|ON|0|1
```

```
[[:SENSe]:LSEQuencer:EDGE:CHANnel:SLOT:AUTO?
```

GSM Burst Type

Burst Type setting for GSM mode. Sets the burst type that the test set searches for, and to which it synchronizes.

SCPI access only, from within Sequence Analyzer mode (front panel access through the GSM/EDGE mode). For more information, see the online help for GSM/EDGE mode.

The burst types available are:

- Sync (SCH)
- Access (RACH)
- Normal - NB (TCH & CCH)
- Higher Symbol Rate - HB (TCH & CCH)
- Mixed (NB/HB for TSC sync)

License required for the last two items: U9071A-3FPd.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:EDGE:CHANnel:BURSt NORMal|SYNC|ACCess|HSRate|MIXed
```

```
[[:SENSe]:LSEQuencer:EDGE:CHANnel:BURSt?
```

GSM TSC

TSC setting for GSM mode. Allows you to select the Training Sequence Code that determines which burst is to be measured. Applicable only when the selected GSM measurement requires a burst sync of type "Training Sequence".

SCPI access only, from within Sequence Analyzer mode (front panel access through the GSM/EDGE mode). For more information, see the online help for GSM/EDGE mode.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:EDGE:CHANnel:TSCode <integer>
```

```
[[:SENSe]:LSEQuencer:EDGE:CHANnel:TSCode?
```

GSM Mod Scheme

Modulation scheme setting for GSM mode. Selects the Modulation Scheme (modulation type) for Normal Burst that the test set searches for when Auto mode is selected.

SCPI access only, from within Sequence Analyzer mode (front panel access through the GSM/EDGE mode). For more information, see the online help for GSM/EDGE mode.

License required: U9071A–3FP license.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:EDGE:SYNc:NORMal:MODulation:AUTO ON|OFF]1|0
```

```
[[:SENSe]:LSEQuencer:EDGE:SYNc:NORMal:MODulation:AUTO?
```

GSM Burst Search Threshold

Burst Search Threshold setting for GSM mode. Sets the relative power threshold from the peak power, which is used by the burst alignment algorithm to determine the burst rising edge and falling edge.

SCPI access only, from within Sequence Analyzer mode (front panel access through the GSM/EDGE mode). For more information, see the online help for GSM/EDGE mode.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:EDGE:SYNc:BURSt:STHReshold <rel_ampl>
```

```
[[:SENSe]:LSEQuencer:EDGE:SYNc:BURSt:STHReshold?
```

GSM HSR Pulse Shape Filter

HSR Pulse Shaping Filter setting for GSM mode. Selects the pulse shaping filter for higher symbol rate (HSR) signals.

SCPI access only, from within Sequence Analyzer mode (front panel access through the GSM/EDGE mode). For more information, see the online help for GSM/EDGE mode.

This functionality applies only to the following measurements:

- EDGE EVM measurement
- EDGE Power vs. Time measurement
- GSMK/EDGE Output RF Spectrum measurement

License required: U9071A–3FP.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:EDGE:RADio:PSHape NARRow|WIDE
```

```
[[:SENSe]:LSEQuencer:EDGE:RADio:PSHape?
```

GSM Burst Align

Burst Align setting for GSM mode. Selects the sync alignment to be either to the GSM standard or the standard offset by a half bit behind.

SCPI access only, from within Sequence Analyzer mode (front panel access through the GSM/EDGE mode). For more information, see the online help for GSM/EDGE mode.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:EDGE:SYNC:ALIGnment GSM|HBIT
```

```
[[:SENSe]:LSEQuencer:EDGE:SYNC:ALIGnment?
```

GSM Carrier Bandpass Filter

Carrier Bandpass Filter setting for GSM mode. Select Multiple or Single to enable or disable the multi-carrier tolerance filter.

SCPI access only, from within Sequence Analyzer mode (front panel access through the GSM/EDGE mode). For more information, see the online help for GSM/EDGE mode.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:EDGE:RADio:CARRier:NUMBer SINGLE|MULTiple
```

```
[[:SENSe]:LSEQuencer:EDGE:RADio:CARRier:NUMBer?
```

GSM RF Sync Delay

RF Sync Delay setting for GSM mode. Adjusts the "T0" point that has been measured in each measurement. This adjustment does not apply if the Burst Sync key (in each measurement's Meas Setup menu) is set to None.

SCPI access only, from within Sequence Analyzer mode (front panel access through the GSM/EDGE mode). For more information, see the online help for GSM/EDGE mode.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:EDGE:SYNC:BURSt:RFAMplitude:DELay <time >
```

```
[[:SENSe]:LSEQuencer:EDGE:SYNC:BURSt:RFAMplitude:DELay ?
```

WCDMA HSDPA/HSUPA Enable

HSDPA/HSUPA Enable setting for WCDMA mode. Allows you to specify the HSDPA/HSUPA option enable On/Off. This selection is necessary because some of the auto detection functions which are expecting a

HSPA signal are less tolerant when the signal is noisy or distorted. So, you should turn it off when the HSPA signal is not expected.

SCPI access only, from within Sequence Analyzer mode (front panel access through the WCDMA mode). For more information, see the online help for WCDMA mode.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:WCDMa:RADio:CONFigure:HSDPa[:STATe] 0|1|OFF|ON
```

```
[[:SENSe]:LSEQuencer:WCDMa:RADio:CONFigure:HSDPa[:STATe]?
```

1xEV-DO Physical Layer SubType

Physical Layer Subtype setting for 1xEV-DO mode. Allows you to select the subtype used in measurement.

SCPI access only, from within Sequence Analyzer mode (front panel access through the 1xEV-DO mode). For more information, see the online help for 1xEV-DO mode.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer: EVDO:RADio:PLSubtype SUB0|SUB2|SUB3
```

```
[[:SENSe]:LSEQuencer: EVDO:RADio:PLSubtype?
```

1xEV-DO Pre-defined Offset/Interval

Pre-defined Offset/Interval setting for 1xEV-DO mode. Allows you to select a desired slot (the possibilities are Idle Slots 1 & 2, Half Slots 1 & 2, Pilot 1 & 2, MAC 1 thru 4, and Full Slot).

SCPI access only, from within Sequence Analyzer mode (front panel access through the 1xEV-DO mode). For more information, see the online help for 1xEV-DO mode.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer: EVDO:STYPe IS1|IS2|HS1|HS2|PIL1|PIL2|MAC1|MAC2|MAC3|MAC4|FS
```

```
[[:SENSe]:LSEQuencer:EVDO:STYPe?
```

TDSCDMA Analysis Timeslot

Analysis timeslot setting for TDSCDMA mode. It specifies which sub-frames timeslot, within the selected Sub-frame, is used for analysis and trace data measurement results. The available selections include timeslots 0 through 6, the DwPTS and UpPTS timeslots.

SCPI access only, from within Sequence Analyzer mode (front panel access through the TDSCDMA mode). For more information, see the online help for TDSCDMA mode.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:TDSCdma:SLOT TS0|TS1|TS2|TS3|TS4|TS5|TS6|UPTS|DPTS
```

```
[[:SENSe]:LSEQuencer:TDSCdma:SLOT?
```

TDSCDMA HSPA/8PSK Enable

HSPA/8PSK Enable setting for TDSCDMA mode. This key is active if the TD-SCDMA HSPA/8PSK option license is installed. If the license is not installed, this key will be unavailable.

SCPI access only, from within Sequence Analyzer mode (front panel access through the TDSCDMA mode). For more information, see the online help for TDSCDMA mode.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:TDSCdma:RADio:CONFIgure:HSDPa[:STATe] 0|1|OFF|ON
```

```
[[:SENSe]:LSEQuencer:TDSCdma:RADio:CONFIgure:HSDPa[:STATe]?
```

TDSCDMA Demod – Scramble Code

Scramble Code setting for TDSCDMA mode. The available range is 0 ~ 127.

SCPI access only, from within Sequence Analyzer mode (front panel access through the TDSCDMA mode). For more information, see the online help for TDSCDMA mode.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:SCODE <integer>
```

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:SCODE?
```

TDSCDMA Demod – Uplink Pilot

Uplink Pilot setting for TDSCDMA mode. It specifies the Uplink Pilot synchronization ID sequence (SYNC-UL). The available range is 0 ~ 255.

SCPI access only, from within Sequence Analyzer mode (front panel access through the TDSCDMA mode). For more information, see the online help for TDSCDMA mode.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:UPTS <integer>
```

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:UPTS?
```

TDSCDMA Demod – Sync Type

Sync Type setting for TDSCDMA mode. The available selections include Pilot, Midamble and Trigger.

- Pilot synchronization searches for either the Uplink Pilot or Downlink Pilot burst and then uses the location of that burst to position all of the rest of the time slots. Synchronization will fail if neither pilot burst is found or if the incorrect Uplink or Downlink Pilot Code ID is set for the Pilot burst present.

- Midamble synchronization searches for the first Uplink traffic burst, positioning it as timeslot TS1. Synchronization will fail if there are Pilot bursts present, if TS0 is present, if there are no traffic bursts present or if the incorrect Basic Midamble Code ID is set.
- Trigger synchronization deems the position of the trigger as the start of the frame of the TD-SCDMA signal.

SCPI access only, from within Sequence Analyzer mode (front panel access through the TDSCDMA mode). For more information, see the online help for TDSCDMA mode.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:SYNC PIlot|MIDamble|TRlgger
```

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:SYNC?
```

TDSCDMA Demod – Switching Point

Switching Point setting for TDSCDMA mode. Switching Point is the timeslot number of the last uplink traffic timeslot. Timeslots from the following (next higher numbered) traffic timeslot through the end of the sub-frame are treated as downlink timeslots.

SCPI access only, from within Sequence Analyzer mode (front panel access through the TDSCDMA mode). For more information, see the online help for TDSCDMA mode.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:ULSPoint <integer>
```

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:ULSPoint?
```

TDSCDMA Demod – Max Users for Traffic TS0

Max Users for Traffic TS0 setting for TDSCDMA mode. It specifies the number of Maximum Users that will be associated with the timeslots 0. The range is 2 ~ 16.

SCPI access only, from within Sequence Analyzer mode (front panel access through the TDSCDMA mode). For more information, see the online help for TDSCDMA mode.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:MXUSer:TS0 <integer>
```

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:MXUSer:TS0?
```

TDSCDMA Demod – Max Users for Traffic TS1

Max Users for Traffic TS1 setting for TDSCDMA mode. It specifies the number of Maximum Users that will be associated with the timeslots 1. The range is 2 ~ 16.

SCPI access only, from within Sequence Analyzer mode (front panel access through the TDSCDMA mode). For more information, see the online help for TDSCDMA mode.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:MXUSer:TS1 <integer>
```

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:MXUSer:TS1?
```

TDSCDMA Demod – Max Users for Traffic TS2

Max Users for Traffic TS2 setting for TDSCDMA mode. It specifies the number of Maximum Users that will be associated with the timeslots 2. The range is 2 ~ 16.

SCPI access only, from within Sequence Analyzer mode (front panel access through the TDSCDMA mode). For more information, see the online help for TDSCDMA mode.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:MXUSer:TS2 <integer>
```

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:MXUSer:TS2?
```

TDSCDMA Demod – Max Users for Traffic TS3

Max Users for Traffic TS3 setting for TDSCDMA mode. It specifies the number of Maximum Users that will be associated with the timeslots 3. The range is 2 ~ 16.

SCPI access only, from within Sequence Analyzer mode (front panel access through the TDSCDMA mode). For more information, see the online help for TDSCDMA mode.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:MXUSer:TS3 <integer>
```

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:MXUSer:TS3?
```

TDSCDMA Demod – Max Users for Traffic TS4

Max Users for Traffic TS4 setting for TDSCDMA mode. It specifies the number of Maximum Users that will be associated with the timeslots 4. The range is 2 ~ 16.

SCPI access only, from within Sequence Analyzer mode (front panel access through the TDSCDMA mode). For more information, see the online help for TDSCDMA mode.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:MXUSer:TS4 <integer>
```

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:MXUSer:TS4?
```

TDSCDMA Demod – Max Users for Traffic TS5

Max Users for Traffic TS5 setting for TDSCDMA mode. It specifies the number of Maximum Users that will be associated with the timeslots 5. The range is 2 ~ 16.

SCPI access only, from within Sequence Analyzer mode (front panel access through the TDSCDMA mode). For more information, see the online help for TDSCDMA mode.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:MXUSer:TS5 <integer>
```

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:MXUSer:TS5?
```

TDSCDMA Demod – Max Users for Traffic TS6

Max Users for Traffic TS6 setting for TDSCDMA mode. It specifies the number of Maximum Users that will be associated with the timeslots 6. The range is 2 ~ 16.

SCPI access only, from within Sequence Analyzer mode (front panel access through the TDSCDMA mode). For more information, see the online help for TDSCDMA mode.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:MXUSer:TS6 <integer>
```

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:MXUSer:TS6?
```

TDSCDMA Demod – Slot Frequency Reference

Slot Frequency Reference setting for TDSCDMA mode. It specifies whether the appropriate pilot timeslot or the midamble section of the timeslot will be used as the frequency and phase reference for an individual traffic timeslot.

SCPI access only, from within Sequence Analyzer mode (front panel access through the TDSCDMA mode). For more information, see the online help for TDSCDMA mode.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:SREFerence P|L|ot|M|I|D|a|mb|l|e
```

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:SREFerence?
```

TDSCDMA Demod – Code Channel Detection

Code Channel Detection setting for TDSCDMA mode. If the current timeslot is DwPTS or UpPTS, its value will be set to AUTO.

SCPI access only, from within Sequence Analyzer mode (front panel access through the TDSCDMA mode). For more information, see the online help for TDSCDMA mode.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:CDCHannel:DETection AUTO|MAN  
[:SENSe]:LSEQuencer:TDSCdma:TDEMod:CDCHannel:DETection?
```

TDSCDMA Demod – Mod Scheme

Modulation Scheme setting for TDSCDMA mode. This key is only available when HSPA/8PSK Option is installed and the Enable HSPA/8PSK key is set to ON. Otherwise, its value will be set to AUTO.

More Information about Mode Scheme

- If the Mod Scheme is MAN, it is you to specify the modulation format for each channel. If the Mod Scheme is Auto, the measurement will automatically detect the channel's modulation format.
- If the current timeslot is DwPTS or UpPTS, its value will be set to AUTO.
- The Auto mode is only applied to QPSK, 8PSK and 16QAM. For 64QAM, it only supports MAN mode.

SCPI access only, from within Sequence Analyzer mode (front panel access through the TDSCDMA mode). For more information, see the online help for TDSCDMA mode.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:MODScheme:AUTO 1|0|ON|OFF  
[:SENSe]:LSEQuencer:TDSCdma:TDEMod:MODScheme:AUTO?
```

TDSCDMA Demod – Channel Configuration

Allows you to specify the parameters for the channel. The below keys are unavailable when "Code Channel Detection" and "Mod Scheme" are both AUTO.

- Select Code Length
- Select All Code Channels
- Select Code Channel
- Code Channel Status
- Midamble Shift
- Modulation Format
- Phase Shift Detection
- Phase Shift

"Select Code Length" on page 359

"Select All Code Channels" on page 359

"Select Code Channel" on page 359

"Code Channel Status" on page 360

"Midamble Shift" on page 360

"Modulation Format" on page 360

"Phase Shift" on page 360

"Phase Shift Detection" on page 361

Select Code Length

Select Code Length in Channel Configuration setting for TDSCDMA mode. The available selections include 1, 2, 4, 8 and 16.

SCPI access only, from within Sequence Analyzer mode (front panel access through the TDSCDMA mode). For more information, see the online help for TDSCDMA mode.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:SCLength <integer>
```

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:SCLength?
```

Select All Code Channels

Select All Code Channels in Channel Configuration setting for TDSCDMA mode. If the Select All Code Channels is ON, by modifying the modulation format or the midamble shift, the user can change the values of all code channels which have the same code length and at the same time, the Select Code Channel key will be unavailable.

SCPI access only, from within Sequence Analyzer mode (front panel access through the TDSCDMA mode). For more information, see the online help for TDSCDMA mode.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:CDCHannel:SALL 1|0|ON|OFF
```

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:CDCHannel:SALL?
```

Select Code Channel

Select Code Channel in Channel Configuration setting for TDSCDMA mode. The max value for the code Channel should be (Select Code length – 1). The Dispread Channel Code Channel is used, along with the Dispread Channel Spread Code Length, to specify the active code channel and layer used for the channel trace data measurement results.

If the Select All Code Channel is ON, this key will be unavailable.

SCPI access only, from within Sequence Analyzer mode (front panel access through the TDSCDMA mode). For more information, see the online help for TDSCDMA mode.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:CDCHannel <integer>
```

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:CDCHannel?
```

Code Channel Status

Code Channel Status in Channel Configuration setting for TDSCDMA mode. This key is unavailable when “Code Channel Detection” is AUTO.

SCPI access only, from within Sequence Analyzer mode (front panel access through the TDSCDMA mode). For more information, see the online help for TDSCDMA mode.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:CDCHannel:ACTive <spread_code_length>,<code_channel>,<0|1|OFF|ON
```

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:CDCHannel:ACTive? <spread_code_length>,<code_channel>
```

Midamble Shift

Midamble Shift in Channel Configuration setting for TDSCDMA mode. The range is 1 ~ 16.

SCPI access only, from within Sequence Analyzer mode (front panel access through the TDSCDMA mode). For more information, see the online help for TDSCDMA mode.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:MSHift <spread_code_length>,<code_channel>,<integer>
```

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:MSHift? <spread_code_length>,<code_channel>
```

Modulation Format

Modulation Format in Channel Configuration setting for TDSCDMA mode. If Auto is assigned to a code channel with some spread code length, the modulation format on this code channel will be determined by the measurement.

SCPI access only, from within Sequence Analyzer mode (front panel access through the TDSCDMA mode). For more information, see the online help for TDSCDMA mode.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:MODFormat <integer>,<integer>,<AUTO|QPSK|PSK8|QAM16|QAM64
```

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:MODFormat? <integer>,<integer>
```

Phase Shift

Phase Shift in Channel Configuration setting for TDSCDMA mode. The range is -360.0 ~ 360.0 degree.

SCPI access only, from within Sequence Analyzer mode (front panel access through the TDSCDMA mode). For more information, see the online help for TDSCDMA mode.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:PHASe:SHIFt <integer>,<integer>,<real>
```

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:PHASe:SHIFt? <integer>,<integer>
```

Phase Shift Detection

Phase Shift Detection in Channel Configuration setting for TDSCDMA mode.

SCPI access only, from within Sequence Analyzer mode (front panel access through the TDSCDMA mode). For more information, see the online help for TDSCDMA mode.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:PHASe:SHIFt:DETection:AUTO ON|OFF|1|0
```

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:PHASe:SHIFt:DETection:AUTO?
```

TDSCDMA Demod – Timing Reference

Timing Reference setting for TDSCDMA mode. The available selections include DwPTS, UpPTS and Trigger.

SCPI access only, from within Sequence Analyzer mode (front panel access through the TDSCDMA mode). For more information, see the online help for TDSCDMA mode.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:TREFeRence DPTS|UPTS|TRIG
```

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:TREFeRence?
```

TDSCDMA Demod – Filter Alpha

Filter Alpha setting for TDSCDMA mode. It specifies the measurement filter (Root-raised Cosine) alpha.

SCPI access only, from within Sequence Analyzer mode (front panel access through the TDSCDMA mode). For more information, see the online help for TDSCDMA mode.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:ALPHa <real>
```

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:ALPHa?
```

TDSCDMA Demod – Active Slot Threshold

Active Slot Threshold setting for TDSCDMA mode. It specifies the Active Slot detection threshold. The unit is dBc (dB below the slot with the largest measured power).

SCPI access only, from within Sequence Analyzer mode (front panel access through the TDSCDMA mode). For more information, see the online help for TDSCDMA mode.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:THReshold:SLOT <real>
```

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:THReshold:SLOT?
```

TDSCDMA Demod – Active Channel Threshold

Active Channel Threshold setting for TDSCDMA mode. Active Channel Threshold lets you set the threshold above which a code channel is detected active and included in the Composite Reference waveform. The units are dBc (dB below the total power within the Analysis Timeslot).

SCPI access only, from within Sequence Analyzer mode (front panel access through the TDSCDMA mode). For more information, see the online help for TDSCDMA mode.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:THReshold:CHANnel <real>
```

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:THReshold:CHANnel?
```

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:THReshold:CHANnel:AUTO ON|OFF|0|1
```

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:THReshold:CHANnel:AUTO?
```

TDSCDMA Demod – EVM Result IQ Offset

EVM Result IQ Offset setting for TDSCDMA mode. The available selections include Standard and Exclude.

SCPI access only, from within Sequence Analyzer mode (front panel access through the TDSCDMA mode). For more information, see the online help for TDSCDMA mode.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:EVMResult:IQOffset STANdard|EXClude
```

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:EVMResult:IQOffset?
```

TDSCDMA Demod – Mirror Frequency Spectrum

Mirror Frequency Spectrum setting for TDSCDMA mode. The available selections include Normal and Invert.

SCPI access only, from within Sequence Analyzer mode (front panel access through the TDSCDMA mode). For more information, see the online help for TDSCDMA mode.

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:SPECTrum:MIRRor NORMAl|INVert
```

[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:SPECtrum:MIRRor?

TDSCDMA Demod – Limit Test

Limit Test setting for TDSCDMA mode.

SCPI access only, from within Sequence Analyzer mode (front panel access through the TDSCDMA mode). For more information, see the online help for TDSCDMA mode.

The SCPI commands in Sequence Analyzer mode are:

[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:NORMalize 1|0|ON|OFF

[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:NORMalize?

TDSCDMA Demod – Multi-Carrier Demod

Multi-Carrier Demod setting for TDSCDMA mode.

SCPI access only, from within Sequence Analyzer mode (front panel access through the TDSCDMA mode). For more information, see the online help for TDSCDMA mode.

The SCPI commands in Sequence Analyzer mode are:

[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:MCARrier 1|0|ON|OFF

[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:MCARrier?

BLUETOOTH Radio Standard

Bluetooth Radio Standard setting for Bluetooth mode.

SCPI access only, from within Sequence Analyzer mode (front panel access through the Bluetooth mode). For more information, see the online help for Bluetooth mode. Bluetooth

The SCPI commands in Sequence Analyzer mode are:

[[:SENSe]:LSEQuencer:BTtooth:RADio:STANdard GFSK|EDR|LEnergy

[[:SENSe]:LSEQuencer:BTtooth:RADio:STANdard?

BLUETOOTH Channel Number

Channel Number setting for Bluetooth mode.

SCPI access only, from within Sequence Analyzer mode (front panel access through the Bluetooth mode). For more information, see the online help for Bluetooth mode. Bluetooth

The SCPI commands in Sequence Analyzer mode are:

[[:SENSe]:LSEQuencer:BTtooth:CHANnel[:NUMBer]

[[:SENSe]:LSEQuencer:BT00th:CHANnel[:NUMBer]?

WLAN Radio Standard

Radio Standard setting for WLAN mode.

SCPI access only, from within Sequence Analyzer mode (front panel access through the WLAN mode).

The SCPI commands in Sequence Analyzer mode are:

[[:SENSe]:LSEQuencer:WLAN:RADio:STANdard AG|BG|GDO|N20|N40|AC20|AC40|AC80|ACT80|AC160

[[:SENSe]:LSEQuencer:WLAN:RADio:STANdard?

Modulation Format

Modulation Format for WLAN mode.

SCPI access only, from within Sequence Analyzer mode (front panel access through the WLAN mode).

The SCPI commands in Sequence Analyzer mode are:

For Radio Standard 802.11 a/g,

[[:SENSe]:LSEQuencer:WLAN:DEMod:AG:FORMat AUTO|BPSK|QPSK|QAM16|QAM64

[[:SENSe]:LSEQuencer:WLAN: DEMod:AG:FORMat?

For Radio Standard 802.11g DSSS-OFDM,

[[:SENSe]:LSEQuencer:WLAN:DEMod:GDO:FORMat AUTO|BPSK|QPSK|QAM16|QAM64

[[:SENSe]:LSEQuencer:WLAN: DEMod:GDO:FORMat?

For Radio Standard 802.11b/g,

[[:SENSe]:LSEQuencer:WLAN:DEMod:BG:FORMat
AUTO|DSSS1|DSSS2|CCK55|CCK11|PBCC55|PBCC11|PBCC22|PBCC33

[[:SENSe]:LSEQuencer:WLAN: DEMod:BG:FORMat?

For Radio Standard 802.11n 20MHz,

[[:SENSe]:LSEQuencer:WLAN:DEMod:N20:FORMat AUTO|BPSK|QPSK|QAM16|QAM64|SIG

[[:SENSe]:LSEQuencer:WLAN: DEMod:N20:FORMat?

For Radio Standard 802.11n 40MHz,

[[:SENSe]:LSEQuencer:WLAN:DEMod:N40:FORMat AUTO|BPSK|QPSK|QAM16|QAM64|SIG

[[:SENSe]:LSEQuencer:WLAN: DEMod:N40:FORMat?

For Radio Standard 802.11ac 20MHz,

[[:SENSe]:LSEQuencer:WLAN:DEMod:AC20:FORMat AUTO|BPSK|QPSK|QAM16|QAM64|QAM256|SIG

[[:SENSe]:LSEQuencer:WLAN: DEMod:AC20:FORMat?

For Radio Standard 802.11ac 40MHz,

[[:SENSe]:LSEQuencer:WLAN:DEMod:AC40:FORMat AUTO|BPSK|QPSK|QAM16|QAM64|QAM256|SIG

[[:SENSe]:LSEQuencer:WLAN: DEMod:AC40:FORMat?

For Radio Standard 802.11ac 80MHz,

[[:SENSe]:LSEQuencer:WLAN:DEMod:AC80:FORMat AUTO|BPSK|QPSK|QAM16|QAM64|QAM256|SIG

[[:SENSe]:LSEQuencer:WLAN: DEMod:AC80:FORMat?

For Radio Standard 802.11ac 80+80MHz,

[[:SENSe]:LSEQuencer:WLAN:DEMod:ACT80:FORMat AUTO|BPSK|QPSK|QAM16|QAM64|QAM256|SIG

[[:SENSe]:LSEQuencer:WLAN: DEMod:ACT80:FORMat?

For Radio Standard 802.11ac 160MHz,

[[:SENSe]:LSEQuencer:WLAN:DEMod:AC160:FORMat AUTO|BPSK|QPSK|QAM16|QAM64|QAM256|SIG

[[:SENSe]:LSEQuencer:WLAN: DEMod:AC160:FORMat?

Subcarrier Spacing

Subcarrier Spacing for WLAN mode.

SCPI access only, from within Sequence Analyzer mode (front panel access through the WLAN mode).

The SCPI commands in Sequence Analyzer mode are:

For Radio Standard 802.11a/g,

[[:SENSe]:LSEQuencer:WLAN:DEMod:AG:SUBCarrier:SPACing <freq>

[[:SENSe]:LSEQuencer:WLAN: DEMod:AG:SUBCarrier:SPACing?

For Radio Standard 802.11g DSSS-OFDM,

[[:SENSe]:LSEQuencer:WLAN:DEMod:GDO:SUBCarrier:SPACing <freq>

[[:SENSe]:LSEQuencer:WLAN: DEMod:GDO:SUBCarrier:SPACing?

For Radio Standard 802.11n 20MHz,

[[:SENSe]:LSEQuencer:WLAN:DEMod:N20:SUBCarrier:SPACing <freq>

[[:SENSe]:LSEQuencer:WLAN: DEMod:N20:SUBCarrier:SPACing?

For Radio Standard 802.11n 40MHz,

[[:SENSe]:LSEQuencer:WLAN:DEMod:N40:SUBCarrier:SPACing <freq>

[[:SENSe]:LSEQuencer:WLAN: DEMod:N40:SUBCarrier:SPACing?

For Radio Standard 802.11ac 20MHz,

[[:SENSe]:LSEQuencer:WLAN:DEMod:AC20:SUBCarrier:SPACing <freq>

[[:SENSe]:LSEQuencer:WLAN: DEMod:AC20:SUBCarrier:SPACing?

For Radio Standard 802.11ac 40MHz,

[[:SENSe]:LSEQuencer:WLAN:DEMod:AC40:SUBCarrier:SPACing <freq>

[[:SENSe]:LSEQuencer:WLAN: DEMod:AC40:SUBCarrier:SPACing?

For Radio Standard 802.11ac 80MHz,

[[:SENSe]:LSEQuencer:WLAN:DEMod:AC80:SUBCarrier:SPACing <freq>

[[:SENSe]:LSEQuencer:WLAN: DEMod:AC80:SUBCarrier:SPACing?

For Radio Standard 802.11ac 80+80MHz,

[[:SENSe]:LSEQuencer:WLAN:DEMod:ACT80:SUBCarrier:SPACing <freq>

[[:SENSe]:LSEQuencer:WLAN: DEMod:ACT80:SUBCarrier:SPACing?

For Radio Standard 802.11ac 160MHz,

[[:SENSe]:LSEQuencer:WLAN:DEMod:AC160:SUBCarrier:SPACing <freq>

[[:SENSe]:LSEQuencer:WLAN: DEMod:AC160:SUBCarrier:SPACing?

Guard Interval

Guard Interval for WLAN mode.

SCPI access only, from within Sequence Analyzer mode (front panel access through the WLAN mode).

The SCPI commands in Sequence Analyzer mode are:

For Radio Standard 802.11a/g,

[[:SENSe]:LSEQuencer:WLAN:DEMod:AG:GINTErval R1B4|R1B8|OTHer

[[:SENSe]:LSEQuencer:WLAN: DEMod:AG: GINTErval?

For Radio Standard 802.11g DSSS-OFDM,

[[:SENSe]:LSEQuencer:WLAN:DEMod:GDO:GINTErval R1B4|R1B8|OTHer

[[:SENSe]:LSEQuencer:WLAN: DEMod:GDO: GINTErval?

For Radio Standard 802.11n 20MHz,

[[:SENSe]:LSEQuencer:WLAN:DEMod:N20:GINTErval R1B4|R1B8|SIG|OTHer

[[:SENSe]:LSEQuencer:WLAN: DEMod:N20: GINTErval?

For Radio Standard 802.11n 40MHz,

[[:SENSe]:LSEQuencer:WLAN:DEMod:N40:GINTErval R1B4|R1B8|SIG|OTHer

[[:SENSe]:LSEQuencer:WLAN: DEMod:N40: GINTErval?

For Radio Standard 802.11ac 20MHz,

```
[:SENSe]:LSEQuencer:WLAN:DEMod:AC20:GINTerval R1B4|R1B8|SIG|OTHer
```

```
[:SENSe]:LSEQuencer:WLAN: DEMod:AC20: GINTerval?
```

For Radio Standard 802.11ac 40MHz,

```
[:SENSe]:LSEQuencer:WLAN:DEMod:AC40:GINTerval R1B4|R1B8|SIG|OTHer
```

```
[:SENSe]:LSEQuencer:WLAN: DEMod:AC40: GINTerval?
```

For Radio Standard 802.11ac 80MHz,

```
[:SENSe]:LSEQuencer:WLAN:DEMod:AC80:GINTerval R1B4|R1B8|SIG|OTHer
```

```
[:SENSe]:LSEQuencer:WLAN: DEMod:AC80: GINTerval?
```

For Radio Standard 802.11ac 80+80MHz,

```
[:SENSe]:LSEQuencer:WLAN:DEMod:ACT20:GINTerval R1B4|R1B8|SIG|OTHer
```

```
[:SENSe]:LSEQuencer:WLAN: DEMod:ACT20: GINTerval?
```

For Radio Standard 802.11ac 160MHz,

```
[:SENSe]:LSEQuencer:WLAN:DEMod:AC160:GINTerval R1B4|R1B8|SIG|OTHer
```

```
[:SENSe]:LSEQuencer:WLAN: DEMod:AC160: GINTerval?
```

Guard Interval Length

Guard Interval Length for WLAN mode.

SCPI access only, from within Sequence Analyzer mode (front panel access through the WLAN mode).

The SCPI commands in Sequence Analyzer mode are:

For Radio Standard 802.11a/g,

```
[:SENSe]:LSEQuencer:WLAN:DEMod:AG:GINTerval:LENGth <real>
```

```
[:SENSe]:LSEQuencer:WLAN: DEMod:AG: GINTerval:LENGth?
```

For Radio Standard 802.11g DSSS-OFDM,

```
[:SENSe]:LSEQuencer:WLAN:DEMod:GDO:GINTerval:LENGth <real>
```

```
[:SENSe]:LSEQuencer:WLAN: DEMod:GDO: GINTerval:LENGth?
```

For Radio Standard 802.11n 20MHz,

```
[:SENSe]:LSEQuencer:WLAN:DEMod:N20:GINTerval:LENGth <real>
```

```
[:SENSe]:LSEQuencer:WLAN: DEMod:N20: GINTerval:LENGth?
```

For Radio Standard 802.11n 40MHz,

```
[:SENSe]:LSEQuencer:WLAN:DEMod:N40:GINTerval:LENGth <real>
```

[[:SENSe]:LSEQuencer:WLAN: DEMod:N40: GINTerval:LENGth?

For Radio Standard 802.11ac 20MHz,

[[:SENSe]:LSEQuencer:WLAN:DEMod:AC20:GINTerval:LENGth <real

[[:SENSe]:LSEQuencer:WLAN: DEMod:AC20: GINTerval:LENGth?

For Radio Standard 802.11ac 40MHz,

[[:SENSe]:LSEQuencer:WLAN:DEMod:AC40:GINTerval:LENGth <real>

[[:SENSe]:LSEQuencer:WLAN: DEMod:AC40: GINTerval:LENGth?

For Radio Standard 802.11ac 80MHz,

[[:SENSe]:LSEQuencer:WLAN:DEMod:AC80:GINTerval:LENGth <real>

[[:SENSe]:LSEQuencer:WLAN: DEMod:AC80: GINTerval:LENGth?

For Radio Standard 802.11ac 80+80MHz,

[[:SENSe]:LSEQuencer:WLAN:DEMod:ACT20:GINTerval:LENGth <real>

[[:SENSe]:LSEQuencer:WLAN: DEMod:ACT20: GINTerval:LENGth?

For Radio Standard 802.11ac 160MHz,

[[:SENSe]:LSEQuencer:WLAN:DEMod:AC160:GINTerval:LENGth <real>

[[:SENSe]:LSEQuencer:WLAN: DEMod:AC160: GINTerval:LENGth?

Remote Setup

There are 3 ways of setting up the Sequence.

1. Using a TAB delimited file to input the Sequence setup in table format. The TAB delimited file also contains the source setup, to allow coordination of the source and analyzer sequencers in one entry format. Both modules have separate SCPI commands, so that they can each be set up separately. The loading in of the TAB delimited file in this mode is parsed and each of the modules are set up. Only the Sequence setup parameters can be loaded in via this method. The individual measurement setup parameters and other parameters associated with the entire Sequence different from the default values need to be sent via SCPI. A recall state can be used to reinstate all parameters.
2. Setting up the sequence directly, using SCPI.
3. Using U9066A Sequence Studio, a PC application that is used to build and download sequences for the test set. It can also be used to upload sequences from the test set for modification and read back and display results.

The number of analysis steps that are supported in a Sequence is 1000. There is a limit to 512 acquisitions (HW states/changes). Within those two limits, you can build up combinations of steps with and without change of acquisition. You are constrained by the capture depth of the test set's Analyzer and the sweep capability of the test set's Source list.

Tab Delimited File Setup

Importing a Sequence into the List Sequencer can be done using a TAB delimited file. This file type is used instead of a comma separated value (CSV) file, because the latter would be incompatible with some of the data that is included in the sequence.

The TAB delimited file can contain any of the following:

1. An analyzer sequence only. This would include the analyzer table.
2. A source sequence only. This would include the source table.
3. A dual sequence, including both the source table and the analyzer table.

Combining the two types of tables into one file makes it possible to define a complete sequence for the test set as a whole. The source and analyzer tables each represent a separate piece of hardware on the test set (its internal signal generator and its internal signal analyzer).

The 2 tables are all contained in the one file as 2 tables one below the other. The order is:

1. Analyzer table
2. Source table

A spreadsheet is used to aid the entry of the data, allowing drop down 1 of N parameters where appropriate, and allow the whole spreadsheet to be converted to a TAB separated list for importing into the Sequence Analyzer.

Templates and examples of the spreadsheet and TSV files are provided with the test set. An example of a spreadsheet can be seen below.

EXT Analyzer Table

The fields required for the acquisition (a "red bar") are shown below in the example spreadsheet below (the row is shown split into two parts here, to fit the illustration on the page).

#Acq Number	Radio Standard	Radio Band	Device	Freq (MHz) /Chan	Number of Averages	Peak Power (dBm)	Inst Gain (dB)	Transition Time (ms)	Acquisition Duration(ms)
### Analyzer									
###									
Version:1.4.0									
1	GSM	PCS1900	MS	512	1	0	ZERO	0.02	0.72
Input Trigger Type	Input Trigger Level	Input Trigger Delay (ms)	Output Trigger	Multiport Adptr Input Port	Multiport Adptr Preamp	Integration Type	Acquisition RF Input Port		

6 List Sequence Measurements
List Sequence Measurements

RFB	-10	0	INTernal	RFIO0	ON	PRIMARY	RFIO1
urst							

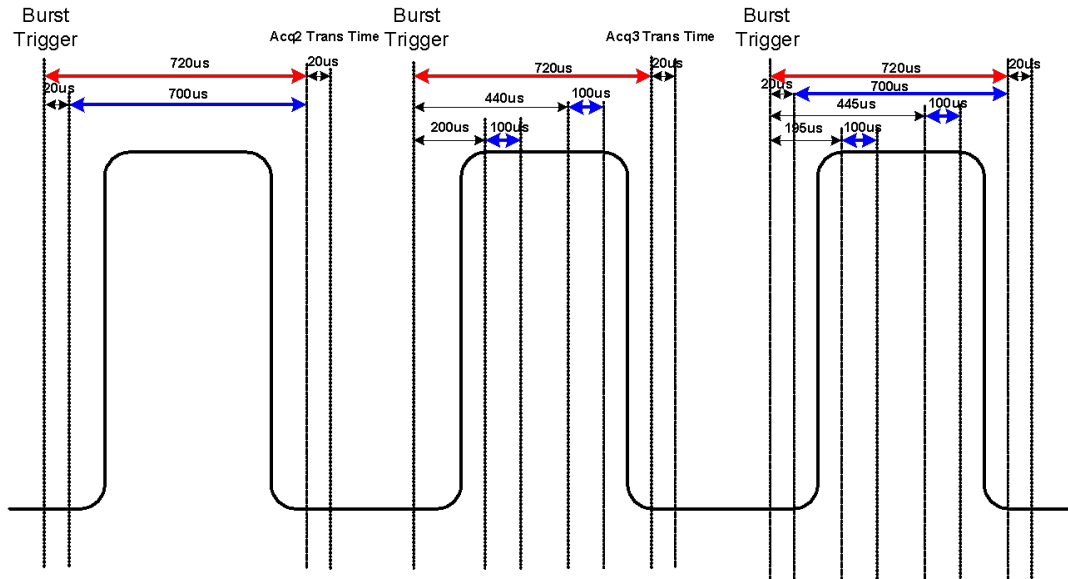
The fields required for the analysis interval (a “blue bar”) are shown in the example spreadsheet below.

Analysis Step Number	Analysis Step Offset (ms)	Analysis Step Interval (ms)	Measurement Bitmap	Exp Power at DUT Output (dBm)
1	0.02	0.7	111	-5

The full width of the spreadsheet is illustrated below.

Acq Number	Radio Standard	Radio Band	Device	Frq(MHz)(Cs)	Number of Average	Peak Power(dBm)	Int Gain Type	Transition Time(ms)	Acquisition Duration(ms)	Input Trigger Type	Input Trigger Level	Input Trigger Delay(ms)	Acquisition Output Trigger	Int Gain LOV rnk(dB)	MPA Input Port	MPA Preamp	Analysis Step Number	Analysis Step Offset(ms)	Analysis Step Interval (ms)	Measurement Elmsp	DUT Output (dBm)
Version 1.0																					
1	GSM	PCS1900	MS	512	1	0	ZERO	0.02	0.72	RFBurst	-10	0	INTernal	-20	RFIO3	ON	1	0.02	0.7	111	-5
2	WCDMA	BAND3	MS	513	5	0	LOW	0.02	0.72	RFBurst	-10	0	INTernal	-15	RFIO4	ON	1	0.02	0.1	1025	-5
																	2	0.44	0.1	11	-5
3	GSM	PGSM	MS	514	1	0	ZERO	0.02	0.72	RFBurst	-10	0	INTernal	-15	RFIO5	OFF	1	0.02	0.7	111	-5
																	2	0.195	0.1	11	-5
																	3	0.445	0.1	1111	-5

For a description of each column, look up the relevant parameter in "Meas Setup" on page 376.



Here is a use case

which contains 3 bursts. The three bursts, because they are all different acquisition states, are 3 separate Acquisitions. These are shown as red bars.

The first acquisition has one Analysis period within it shown by the red Bar. The second has 2 and the third has 3.

In the third burst the Analysis periods overlap. Many analysis periods can overlap on a single acquisition. See "[Analysis Step Setup](#)" on page 428 for more details on limits.

#Acq Number	Radio Standard	Radio Band	Device	Freq(MHz)Ch	in	Number of Averages	Peak Power(dBm)	Int Gain(dB)	Transition Time(us)	Acquisition Duration(us)	Input Trigger Type	Input Trigger Level	Input Trigger Delay(us)	Output Trigger	Multiport Adpt	Multiport Adpt Preset	Analysis Step Number	Analysis Step Offset(us)	Analysis Step Interval (us)	Measurement Setup	DUT Output (dBm)
Version 10.0																					
1	GSM	PCS1900	MS	512	1	0	ZERO	0.02	0.72	RFBurst	-10	0	Internal	RFIO0	ON		1	0.02	0.7	111	-5
2	WCDMA	BANDII	MS	513	5	0	ZERO	0.02	0.72	RFBurst	-10	0	Internal	RFIO1	ON		1	0.02	0.1	1025	-5
																	2	0.44	0.1	11	-5
3	GSM	PGSM	MS	514	1	0	ZERO	0.02	0.72	RFBurst	-10	0	Internal	RFIO2	ON		1	0.02	0.7	111	-5
																	2	0.195	0.1	11	-5
																	3	0.445	0.1	1111	-5

For a description of each column see the equivalent parameter in [Meas Setup Parameters](#).

The start of the analyzer sequence in the TSV file is indicated by the row:

Analyzer

EXT Source Table

The start of the source sequence in the TSV file is indicated by the row:

Source

Excel Spreadsheet

An excel spreadsheet is provided that makes it easier for you to configure your sequence setup and convert it to a .tsv file to be downloaded to the test set.

Drop down lists

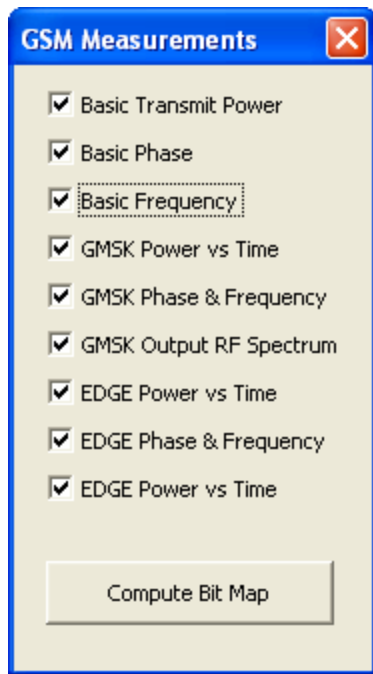
These provide valid selections for the following fields in the .tsv table;

- Analyzer Table
- Radio Standard
- Trigger Input
- Trigger Output
- Filter Type
- Radio Band
- Radio Device
- Inst Gain
- Source Table

Refer to the Source User's Guide for details.

Meas Bitmap

Configuring the Meas Bitmap is simplified by a Visual Basic macro which enables you to select the measurements you require from a form. The form displayed is dependent on the currently selected Radio Standard. For example, for GSM it would be:



Programming Acquisitions Via SCPI

The SCPI command used to configure the Acquisition and Analysis Meas Setup parameters is detailed in the tables in ["Acquisition Setup using SCPI" on page 378](#) and ["Analysis Step Setup" on page 428](#). The SCPI is defined so that you send one command per Acquisition or Analysis Step, with the Acquisition or Analysis Step number being specified as a sub op code of the SCPI command. Each command includes all the settings for the Acquisition or Analysis Step. As an analysis step is set up, the values entered are run

through several levels of validation. For details of these validation steps, see "[Validation and Setup dependencies](#)" on page 374.

Acquisition Setup using SCPI

Key Path	SCPI only
Remote Command	<pre>[:SENSe]:LSEQuencer:ACQuire[1] 2 ... 4..512:SETup NONE GSM EDGE WCDMA CDMA2K CDMA1XEV LTE LTETDD TDSCDMA BTooth WLAN,NONE PGSM EGSM RGSM DCS1800 PCS1900 TGSM810 GSM450 GSM480 GSM850 GSM700 BANDI BANDII BANDIII BANDIV BANDV BANDVI BANDVII BANDVIII BANDIX BANDX BANDXI BANDXII BANDXIII BANDXIV BANDXIX USCELL USPCS JAPAN KOREAN NMT IMT2K UPPER SECOND PAMR400 PAMR800 IMTEXT PCS1DOT9G AWS US2DOT5G PUBLIC LOWER BAND1 BAND2 BAND3 BAND4 BAND5 BAND6 BAND7 BAND8 BAND9 BAND10 BAND11 BAND12 BAND13 BAND14 BAND17 BAND18 BAND19 BAND20 BAND21 BAND24 BAND25 BAND26 BAND27 BAND28 BAND31 BAND33 BAND34 BAND35 BAND36 BAND37 BAND38 BAND39 BAND40 BAND41 BAND42 BAND43 BAND44 BANDA BANDB BANDC BANDD BANDE BANDF, BTS MS,<real>,<integer>,<ampl>,LOW ZERO HIGH,<time>,<time>, IMMEDIATE VIDeo Video2 INTernal EXT1 EXT2,<ampl>,<time>,NONE INT/,<relative ampl>,OFF RFIO0 RFIO1 RFIO2 RFIO3 RFIO4 RFIO5 RFIO6 RFIO7, ON OFF, NORMAl PRIMary LOWer UPPer RANGE SMIMo, RFIO1 RFIO2 RFIN RFIO3 RFIO4 [:SENSe]:LSEQuencer:ACQuire[1] 2 ... 4..512:SETup?</pre>
Example	<pre>:LSEQ:ACQ1 GSM, , PGSM, , MS, , 10, , 10, , 0dB, , LOW, , 5ms, , 50ms, , RFB, , -10dBm, , 0, , NONE, -20, , RFIO0, ON, , NORM, RFIO1 :LSEQ:ACQ1?</pre>
Notes	<p>The parameters are:</p> <ul style="list-style-type: none"> <enum> - specifies the Radio Standard for the Acquisition. <enum> - specifies the Radio Band for the Acquisition. <enum> - specifies the DeviceType for the Acquisition. <real> - specifies the Frequency or Channel Number for the Acquisition. The channel number and frequency are combined to one parameter. If the radio band is set to NONE, this value is interpreted as a frequency value in Hz. If the radio band is set to a valid band, this value is interpreted as a channel number. <integer> - specifies the Number of Averages for the Acquisition. <ampl> - specifies the peak expected power in dB for the Acquisition. <enum> - specifies the Instrument Gain for the Acquisition. <time> - specifies the Transition Time for the Acquisition. <time> - specifies the duration of the Acquisition. <enum> - specifies the Input Trigger Type for the Acquisition. <ampl> - specifies the Input Trigger Level for the Acquisition. <time> - specifies the Input Trigger Delay for the Acquisition. <enum> - specifies the Acquisition Output Trigger for the Acquisition. <relative ampl> - specifies the dB value of Instrument Gain when Instrument Gain is set to LOW. It is Electronic Attenuation in fact. If Instrument Gain is not set to LOW, this value is ignored. This value is optional. If it is not set, the default value is used.

	<p><enum> - specify the step Multiport Adapter Input path selection.</p> <p><enum> - specify the step Multiport Adapter Preamplify On/Off.</p> <p><enum> - specify the Integration type of current acquisition. this is for Span extension and Range extension.</p> <p><enum> - specify the acquisition step input path selection. "Acquisition RF Input Port " on page 447</p>
Dependencies	<p>The range of sub op code values is determined by the number of Acquisitions you have configured. If you attempt to remotely set or query a sub op code that is out of range, this results in an error message.</p>
Initial S/W Revision	A.05.00
Modified S/W Revision	A.14.00

Analysis Step Setup

Key Path	SCPI only
Remote Command	<code>[[:SENSE]:LSEQuencer:ACQuire[1] 2 ... 4..512:ASTep[1] 2 ... 4...1000:SETup <time>, <time>, <integer>, <ampl></code>
Example	<code>:LSEQ:ACQ1:ASTEP1:SETup 20,20,1, -10</code> <code>:LSEQ:ACQ1:ASTEP1:SETup?</code>
Notes	<p>The parameters are:</p> <p><time> - specifies the Analysis Offset for the Analysis Step.</p> <p><time> - specifies the Analysis Interval for the Analysis Step.</p> <p><integer> - specifies the Measurement Bitmap for the Analysis Step (this is the decimal equivalent of the bits selected).</p> <p><ampl> - specifies the Expected Power at DUT Output for the Analysis Step.</p>
Dependencies	<p>The range of sub op code values is determined by the Number of Acquisitions and the Number of Analysis Steps you have configured. If you attempt to remotely set or query a sub op code combination that is out of range, this results in an error message.</p>
Initial S/W Revision	A.05.00

Validation and Setup dependencies

When a Sequence is transferred into the test set using a TSV file an initial verification phase is carried out. If the file is found to be invalid, an error “-232, Invalid format, syntax error on line 0” is generated.

For all other setup methods, the validation checks prior to run time are listed below:

Validation Errors:

1. Range checking for all parameters.
2. Settings Conflict: Channel Number is not valid for the selected Band and link direction.

3. Settings Conflict: Radio Standard and Bitmap do not match (for example, a selected measurement is not available for the selected standard).
4. Step numbers are not sequential (for example, the numbers cannot be 1,2,3,4,7).
5. Settings Conflict: Acquisition duration is not long enough to accommodate the analysis step offset and analysis step interval.
6. Settings Conflict: Radio band not licensed.
7. For averaging, expected power must be the same for each “blue bar” (analysis interval).
8. Selected radio band not applicable to the selected radio standard.
9. Acquisition overlap pre-trigger error (acquisitions cannot overlap in time).
10. Analysis step number exceeded, due to the number of averages.
11. Trigger set to output Int trig, but the test set’s source or analyzer is not set up to accept it.
12. Settings Conflict: Freq for acquisition > 3.6 GHz, hence the electronic attenuator cannot be used.

Validation Warnings/Advisories:

1. Warning: Meas Bitmap and Expected Power settings are in conflict. For example, EVM accuracy is in question, due to the low power level. EVM accuracy is only guaranteed for power levels greater than –65 dBm for RFIO paths and –70 dBm for RF In path.
2. Expected Power is in conflict with Instrument Gain setting.
3. Transition Time is not long enough for the Acquisition change.

If the file passes this test, errors may be generated at run time for the Sequence. In this case, the error messages are sent to the error queue. The Sequence may or may not stop when an error is detected, depending on whether you have selected “Abort on error”. Additionally, the error message contains the Acquisition Number and Analysis Step Number (if applicable) where the error occurred.

Meas Setup

Meas Setup for the Sequence Analyzer mode includes some parameters which are specific to an acquisition (see [Acquisition Setup](#)) or specific to an analysis step (see [Analysis Step Setup](#)). The remaining Meas Setup parameters apply to the sequence as a whole.

Measurements available in Sequence Analyzer mode include:

- “Basic” measurements, which are native to the Sequence Analyzer mode. Measurement setup for these modes can be done either from the front panel or by means of remote SCPI commands.
- Measurements “borrowed” from other modes (for example, from GSM/EDGE mode), but executed within Sequence Analyzer mode. When the test set is in Sequence Analyzer mode, setting up these measurements is possible only by means of remote SCPI commands. To set up these measurements from the front panel, you must switch to the appropriate mode and make the setup changes; the changes are then retained when you switch back to Sequence Analyzer mode.

Key Path	Meas
Mode	Sequence Analyzer
Initial S/W Revision	A.05.00

Result Type

This parameter represents the format of the results to be calculated for the entire Sequence. The only selection currently supported is “Measurement Metrics”.

The parameters that apply to “Meas Metrics” are:

- All the Analysis Step Setup Parameters.
- Acquisition Parameter: Peak Power.
- Auto Set RF Levels = On.
- All parameters under ["Basic Meas Setup" on page 448](#)
- All parameters under [Error! Reference source not found.](#)
- All parameters under ["Mode Parameter Setup \(for measurements from other modes\)" on page 349](#)

Key Path	Meas Setup, Acquisition Setup
Remote Command	<code>[:SENSe] :LSEQuencer :RTYPe MMETric</code> <code>[:SENSe] :LSEQuencer : RTYPe?</code>
Example	<code>:LSEQ:RTYP MME</code>
Couplings	This parameter can NOT be set as a Delta Parameter. It is fixed for the entire Sequence.
Preset	Measurement Metric
State Saved	Saved in instrument state.
Range	Measurement Metric
Initial S/W Revision	A.05.00

Measurement Metrics

This parameter represents the Metrics format of the results to be calculated for the entire Sequence.

Key Path	Meas Setup, Acquisition Setup, Result Type
Example	:LSEQ:RTYP MMET
Couplings	MeasurementMetrics selected un-greys out the Analysis Step Setup key in the same menu.
State Saved	Saved in instrument state.
Initial S/W Revision	A.05.00

Display Results ON/OFF

The setting of this parameter determines whether or not the results are displayed on the test set's screen.

Key Path	Meas Setup, Acquisition Setup, Result Type
Remote Command	[:SENSe] :LSEQuencer:RESults:DISPlay ON OFF 1 0 [:SENSe] :LSEQuencer:RESults:DISPlay?
Example	:LSEQ:RES:DISP OFF
Couplings	This parameter can NOT be set as a Delta Parameter. It is fixed for the entire Sequence.
Preset	ON
State Saved	Saved in instrument state.
Range	ON OFF 0 1
Initial S/W Revision	A.05.00

Display Results ON/OFF

The setting of this parameter determines whether or not the results are displayed on the test set's screen.

Key Path	Meas Setup, Acquisition Setup, Result Type
Remote Command	[:SENSe] :LSEQuencer:RESults:DISPlay ON OFF 1 0 [:SENSe] :LSEQuencer:RESults:DISPlay?
Example	:LSEQ:RES:DISP OFF
Couplings	This parameter can NOT be set as a Delta Parameter. It is fixed for the entire Sequence.
Preset	ON
State Saved	Saved in instrument state.
Range	ON OFF 0 1
Initial S/W Revision	A.05.00

Acquisition Setup using SCPI

Key Path	SCPI only
Remote Command	<pre>[[:SENSE]:LSEQuencer:ACQuire[1] 2 ... 4..512:SETup NONE GSM EDGE WCDMA CDMA2K CDMA1XEV LTE LTE_TDD TDSCDMA BTooth WLAN,NONE PGSM EGSM RGSM DCS1800 PCS1900 TGSM810 GSM450 GSM480 GSM850 GSM700 BANDI BANDII BANDIII BANDIV BANDV BANDVI BANDVII BANDVIII BANDIX BANDX BANDXI BANDXII BANDXIII BANDXIV BANDXIX USCELL USPCS JAPAN KOREAN NMT IMT2K UPPER SECOND PAMR400 PAMR800 IMTEXT PCS1DOT9G AWS US2DOT5G PUBLIC LOWER BAND1 BAND2 BAND3 BAND4 BAND5 BAND6 BAND7 BAND8 BAND9 BAND10 BAND11 BAND12 BAND13 BAND14 BAND17 BAND18 BAND19 BAND20 BAND21 BAND24 BAND25 BAND26 BAND27 BAND28 BAND31 BAND33 BAND34 BAND35 BAND36 BAND37 BAND38 BAND39 BAND40 BAND41 BAND42 BAND43 BAND44 BANDA BANDB BANDC BANDD BANDE BANDE, BTS MS,<real>,<integer>,<ampl>,LOW ZERO HIGH,<time>,<time>, IMMEDIATE VIDEo Video2 INTernal EXT1 EXT2,<ampl>,<time>,NONE INT/,<relative ampl>,OFF RFIO0 RFIO1 RFIO2 RFIO3 RFIO4 RFIO5 RFIO6 RFIO7, ON OFF, NORMal PRIMary LOWer UPPer RANGE SMIMO, RFIO1 RFIO2 RFIN RFIO3 RFIO4 [:SENSE]:LSEQuencer:ACQuire[1] 2 ... 4..512:SETup?</pre>
Example	<pre>:LSEQ:ACQ1 GSM, , PGSM, , MS, , 10, , 10, , 0dB, , LOW, , 5ms, , 50ms, , RFB, , -10dBm, , 0, , NONE, -20, , RFIO0, ON, , NORM, RFIO1 :LSEQ:ACQ1?</pre>
Notes	<p>The parameters are:</p> <ul style="list-style-type: none"> <enum> - specifies the Radio Standard for the Acquisition. <enum> - specifies the Radio Band for the Acquisition. <enum> - specifies the DeviceType for the Acquisition. <real> - specifies the Frequency or Channel Number for the Acquisition. The channel number and frequency are combined to one parameter. If the radio band is set to NONE, this value is interpreted as a frequency value in Hz. If the radio band is set to a valid band, this value is interpreted as a channel number. <integer> - specifies the Number of Averages for the Acquisition. <ampl> - specifies the peak expected power in dB for the Acquisition. <enum> - specifies the Instrument Gain for the Acquisition. <time> - specifies the Transition Time for the Acquisition. <time> - specifies the duration of the Acquisition. <enum> - specifies the Input Trigger Type for the Acquisition. <ampl> - specifies the Input Trigger Level for the Acquisition. <time> - specifies the Input Trigger Delay for the Acquisition. <enum> - specifies the Acquisition Output Trigger for the Acquisition. <relative ampl> - specifies the dB value of Instrument Gain when Instrument Gain is set to LOW. It is Electronic Attenuation in fact. If Instrument Gain is not set to LOW, this value is ignored. This value is optional. If it is not set, the default value is used. <enum> - specify the step Multiport Adapter Input path selection. <enum> - specify the step Multiport Adapter Preampify On/Off.

<enum> - specify the Integration type of current acquisition. this is for Span extension and Range extension.
 <enum> - specify the acquisition step input path selection. "Acquisition RF Input Port " on page 447

Dependencies	The range of sub op code values is determined by the number of Acquisitions you have configured. If you attempt to remotely set or query a sub op code that is out of range, this results in an error message.
Initial S/W Revision	A.05.00
Modified S/W Revision	A.14.00

Number of Acquisitions

This parameter is used to define the number of current active Acquisitions.

Key Path	Meas Setup, Acquisition Setup
Remote Command	<code>[:SENSe] :LSEQuencer :NUMBer :ACQuire <integer></code> <code>[:SENSe] :LSEQuencer :NUMBer :ACQuire ?</code>
Example	<code>:LSEQ:NUMB:ACQ 25</code>
Notes	If the number is increased then any new acquisitions contain default values.
Couplings	Every acquisition must have at least one analysis step. Adding a new acquisition populates one analysis step with default parameters.
Preset	1
State Saved	Saved in instrument state.
Range	1 to 512
Min	1
Max	512
Initial S/W Revision	A.05.00

Current Acquisition

This parameter is used to define the current active Acquisition.

Key Path	Meas Setup, Acquisition Setup
Notes	No SCPI, front panel access only
Couplings	Updates UI Acquisition parameters to selected Acquisition
Preset	1
Range	1 to Number of Acquisitions
Min	1
Max	Number of Acquisitions
Initial S/W Revision	A.05.00

Insert Before Acquisition

This inserts a default Acquisition before the current Acquisition.

Key Path	Meas Setup, Acquisition Setup
Notes	No SCPI, front panel access only Maximum number of Acquisitions is 512. If exceeded an error (Data out of range: Table Full) occurs
Couplings	Increases Number of Acquisitions by 1
Initial S/W Revision	A.05.00

Delete Acquisition

This deletes the current Acquisition.

Key Path	Meas Setup, Acquisition Setup
Notes	No SCPI, front panel access only Cannot delete when Number of Acquisitions is equal to 1.
Couplings	Decreases Number of Acquisitions by 1
Initial S/W Revision	A.05.00

Avg Number

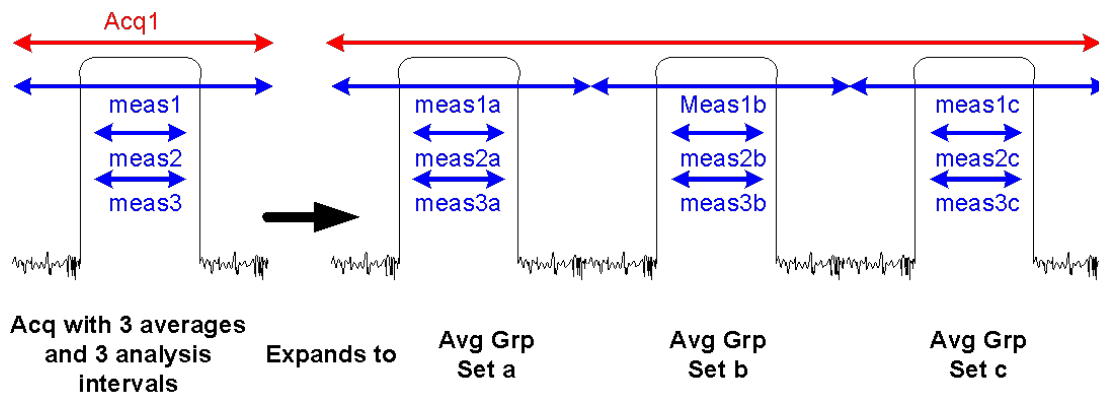
Sets the number of averages for the acquisition.

Key Path	Meas Setup, Acquisition Setup
Remote Command	<p>- To set average number individually, [:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:AVERage:NUMBer <integer> [:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:AVERage:NUMBer?</p> <p>-To set the average number as an array: [:SENSe]:LSEQuencer:LIST:SETup:AVERage:NUMBer <integer>,<integer>,<integer>,... [:SENSe]:LSEQuencer:LIST:SETup:AVERage:NUMBer?</p> <p>The array form of the command is used to make a different setting for each acquisition in the sequence (the number of array values must match the number of acquisitions; otherwise a "settings conflict" error will occur).</p>
Example	<pre>:LSEQ:ACQ2:SET:AVER:NUMB 3 :LSEQ:ACQ2:SET:AVER:NUMB?</pre>

	:LSEQ:LIST:SET:AVER:NUMB 2,3,4,5 :LSEQ:LIST:SET:AVER:NUMB?
Notes	For setting this parameter using SCPI, see " Programming Acquisitions Via SCPI " on page 372.
Preset	1
State Saved	Saved in instrument state.
Range	1 to 512
Min	1
Max	512
Initial S/W Revision	A.05.00

Averaging in the Sequence is supported with the following limitations.

1. Sequences cannot be averaged. Only individual **Analysis Steps** within a single Acquisition can be averaged.
2. The Acquisition is repeated for the **Number of Averages** and all **Analysis Steps** with that Acquisition are averaged.
3. All **Analysis Steps** are averaged individually and the result returned for each **Analysis Step** is the average result.
4. "Pass/Fail" results within the measurement return a "Fail" if any fails occur.
5. Any results that cannot be averaged return the last result.
6. For averaging within an acquisition, there must be a repeating element of the signal during that time. If the input signal is not repeating, the results are invalid and/or questionable.
7. The repeating elements of the signal within an acquisition must have the same duration. The Transition time only applies to the last acquisition capture in the average group.
8. The repeating elements of the signal are acquired as one contiguous capture (one acquisition).
9. As with non-averaged measurements, a single trigger event can be used to initiate the acquisition (the beginning of the first repeating element). Subsequent repeating elements within the acquisition need to be deterministically offset from this trigger



In the diagram above, if an Acquisition is specified to have 3 averages and 3 Analysis steps each having 1 measurement, then the List Sequence measurement expects the DUT to output 3 identical signals. The output metrics for measurement 1 returns one result for each index in the measurement. The average is set a, b, and c.

The table below describes the type of averaging used for each measurement result;

Measurement	Measurement Result	Avg Type/Algorithm
Basic Transmit Power	Transmit Power	"Logarithmic Averaging" on page 389
Basic Frequency and Phase Error	Frequency Error	"Linear Averaging" on page 389
	Phase Error	"Linear Averaging" on page 389
Basic IQ Data	IQ Pairs	N/A
	Average Power	"Logarithmic Averaging" on page 389
	Peak Power	"Logarithmic Averaging" on page 389
Power Vs Time*	Single Burst Power	"Last Value Averaging" on page 389
	Average Power	"Logarithmic Averaging" on page 389
	Start Data Point	"Last Value Averaging" on page 389
	Stop Data Point	"Last Value Averaging" on page 389
	T0	"Last Value Averaging" on page 389
	Burst Width	"Last Value Averaging" on page 389
	Max Point	"Max Hold Averaging" on page 389
	Min Point	"Min Hold Averaging" on page 389
	Burst Threshold	"Last Value Averaging" on page 389
	First Error Point	"Last Value Averaging" on page 389
	Detected TSC	"Last Value Averaging" on page 389
	Mod Scheme	"Last Value Averaging" on page 389
	Estimated Carrier Power	"Logarithmic Averaging" on page 389
ORFS (Front Panel)	Power Control Level	Not averaged but uses averaged Ref Power result to compute this result

Repeat for each offset	Modulation Ref Power	"Logarithmic Averaging" on page 389
	Modulation Neg Offset Abs Power	"Logarithmic Averaging" on page 389
	Modulation Neg Offset Rel Power	"Logarithmic Averaging" on page 389
	Modulation Neg Offset Limit Delta	Not averaged but uses averaged Modulation Neg Offset results to compute this result
	Modulation Pos Offset Abs Power	"Logarithmic Averaging" on page 389
	Modulation Pos Offset Rel Power	"Logarithmic Averaging" on page 389
	Modulation Pos Offset Limit Delta	Not averaged but uses averaged Modulation Pos Offset results to compute this result
	Switching Ref Power	"Logarithmic Averaging" on page 389
	Switching Neg Offset Abs Power	"Logarithmic Averaging" on page 389
	Switching Neg Offset Rel Power	"Logarithmic Averaging" on page 389
	Switching Neg Offset Limit Delta	Not averaged but uses averaged Switching Neg Offset results to compute this result
	Switching Pos Offset Abs Power	"Logarithmic Averaging" on page 389
	Switching Pos Offset Rel Power	"Logarithmic Averaging" on page 389
	Switching Pos Offset Limit Delta	Not averaged but uses averaged Switching Pos Offset results to compute this result
	Repeat for each offset	Modulation Neg Offset Rel Power
Modulation Neg Offset Abs Power		"Logarithmic Averaging" on page 389
Modulation Pos Offset Rel Power		"Logarithmic Averaging" on page 389
Modulation Pos Offset Abs Power		"Logarithmic Averaging" on page 389
Switching Neg Offset Rel Power		"Logarithmic Averaging" on page 389
Switching Neg Offset Abs Power		"Logarithmic Averaging" on page 389
Switching Pos Offset Rel Power		"Logarithmic Averaging" on page 389
GMSK Phase & Freq	Avg RMS Phase Error	"Linear Averaging" on page 389
	Max RMS Phase Error	"Linear Averaging" on page 389
	Avg Peak Phase Error	"Linear Averaging" on page 389
	Max Peak Phase Error	"Max Hold Averaging" on page 389
	Peak Phase Error Position	"Last Value Averaging" on page 389
	Max Peak Phase Error Position	Not averaged but uses averaged Max Peak Phase Error to compute this result
	Avg Freq Error	"Linear Averaging" on page 389
	Max Freq Error	"Radio Setup" on page 389
	Avg IQ Origin Offset	"Logarithmic Averaging" on page 389

	Max IQ Origin Offset	"Max Hold Averaging" on page 389
	Average T0 Offset	"Linear Averaging" on page 389
	Max T0 Offset	"Max Hold Averaging" on page 389
	Detected TSC	"Last Value Averaging" on page 389
EDGE EVM	95%ile EVM	"Linear Averaging" on page 389
	Avg RMS EVM	"Linear Averaging" on page 389
	MAX RMS EVM	"Max Hold Averaging" on page 389
	Avg Peak EVM	"Linear Averaging" on page 389
	Max Peak EVM	"Max Hold Averaging" on page 389
	Peak EVM Symbol Position	Not averaged but uses averaged Max Peak EVM to compute this result
	Avg Mag Error	"Linear Averaging" on page 389
	Max Mag Error	"Max Hold Averaging" on page 389
	Avg Phase Error	"Linear Averaging" on page 389
	Max Phase Error	"Max Hold Averaging" on page 389
	Avg Freq Error	"Linear Averaging" on page 389
	Max Freq Error	"Abs Max Hold Averaging" on page 389
	IQ Origin Offset	"Logarithmic Averaging" on page 389
	Amplitude Droop	"Logarithmic Averaging" on page 389
	T0 Offset	"Linear Averaging" on page 389
	Timing Offset	"Linear Averaging" on page 389
	Detected TSC	"Last Value Averaging" on page 389
	Detected Mod Scheme	"Last Value Averaging" on page 389
	Peak Phase Error	Linear Averaging
	Max Peak Phase Error	Max Hold Averaging
ACP	Total Carrier Power	"Logarithmic Averaging" on page 389
	Ref Carrier Power	"Logarithmic Averaging" on page 389
Repeat for each carrier	Carrier Rel Power	"Logarithmic Averaging" on page 389
	Carrier Abs Power	"Logarithmic Averaging" on page 389
Repeat for each offset	Lower Rel Power	"Logarithmic Averaging" on page 389
	Lower Abs Power	"Logarithmic Averaging" on page 389
	Upper Rel Power	"Logarithmic Averaging" on page 389
	Upper Abs Power	"Logarithmic Averaging" on page 389
SEM	Total Power Ref	"Logarithmic Averaging" on page 389
	Peak Freq Ref	"Max Hold Averaging" on page 389
Repeat for each offset	Lower Abs Integrated Power	"Logarithmic Averaging" on page 389

	Lower Rel Integrated Power	"Logarithmic Averaging" on page 389
	Lower Abs Peak Power	"Max Hold Averaging" on page 389
	Lower Rel Peak Power	"Max Hold Averaging" on page 389
	Lower Peak Freq	Not averaged but uses averaged Lower Abs Peak Power to compute this result
	Lower Limit Delta	"Logarithmic Averaging" on page 389
	Upper Abs Integrated Power	"Logarithmic Averaging" on page 389
	Upper Rel Integrated Power	"Logarithmic Averaging" on page 389
	Upper Abs Peak Power	"Max Hold Averaging" on page 389
	Upper Rel Peak Power	"Max Hold Averaging" on page 389
	Upper Peak Freq	Not averaged but uses averaged Upper Abs Peak Power to compute this result
	Upper Limit Delta	"Logarithmic Averaging" on page 389
Occupied BW	Occupied BW	"Linear Averaging" on page 389
	Transmit Freq Error	"Linear Averaging" on page 389
	x dB Bandwidth	"Linear Averaging" on page 389
Modulation Accuracy	RMS EVM	"Linear Averaging" on page 389
	Peak EVM	
	Mag Error	"Linear Averaging" on page 389
TDSCDMA only	Peak Mag Error	Max Hold Averaging
	Phase Error	"Linear Averaging" on page 389
TDSCDMA only	Peak Phase Error	Max Hold Averaging
	IQ Origin Offset	"Linear Averaging" on page 389
	Frequency Error	"Linear Averaging" on page 389
	Rho	"Linear Averaging" on page 389
	Peak Code Domain Error	"Max Hold Averaging" on page 389
	Peak Code Domain Error Channel Number	Not averaged but uses averaged Peak Code Domain Error to compute this result
TDSCDMA only	Peak Code Domain Error – Code Length	Not averaged but uses averaged Peak Code Domain Error to compute this result
TDSCDMA only	Peak Code Domain Error – Code Index	Not averaged but uses averaged Peak Code Domain Error to compute this result
	Number of Active Channels	"Linear Averaging" on page 389
TDSCDMA only	Peak Active Code Domain Error	"Max Hold Averaging" on page 389
TDSCDMA only	Peak Active Code Domain Error – Code Length	Not averaged but uses averaged Peak Active Code Domain Error to compute this result
TDSCDMA only	Peak Active Code Domain Error – Code Index	Not averaged but uses averaged Peak Active Code Domain Error to compute this result
(cdma2k, TDSCDMA	Time Offset	"Linear Averaging" on page 389

and WCDMA only)		
(WCDMA only)	Total Power over a Slot	"Linear Averaging" on page 389
	First Slot Number	"Last Value Averaging" on page 389
	DPCCH Slot Format	"Last Value Averaging" on page 389
	Preamble Signature	"Last Value Averaging" on page 389
(1xEVDO only)	Pilot Offset	"Linear Averaging" on page 389
	Max Inactive CDP	"Max Hold Averaging" on page 389
	Pilot Power	"Logarithmic Averaging" on page 389
	RRI Power	"Logarithmic Averaging" on page 389
	RRI Relative Power	"Logarithmic Averaging" on page 389
	DRC Power	"Logarithmic Averaging" on page 389
	DRC Relative Power	"Logarithmic Averaging" on page 389
	ACK Power	"Logarithmic Averaging" on page 389
	ACK Relative Power	"Logarithmic Averaging" on page 389
	Data Power	"Logarithmic Averaging" on page 389
	Data Channel Relative Power	"Logarithmic Averaging" on page 389
	Auxiliary Pilot Power	"Logarithmic Averaging" on page 389
	Auxiliary Pilot Channel Relative Power	"Logarithmic Averaging" on page 389
	Total Power	"Logarithmic Averaging" on page 389
	Pilot and RRI Power	"Logarithmic Averaging" on page 389
	DSC Channel Power	"Logarithmic Averaging" on page 389
	DSC Channel Relative Power	"Logarithmic Averaging" on page 389
	Half Slot RMS EVM	"Linear Averaging" on page 389
	Half Slot Peak EVM	"Max Hold Averaging" on page 389
	Half Slot Mag Error	"Linear Averaging" on page 389
	Half Slot Phase Error	"Linear Averaging" on page 389
	Half Slot IQ Origin Offset	"Linear Averaging" on page 389
	Half Slot Frequency Error	"Linear Averaging" on page 389
	Half Slot Rho	"Linear Averaging" on page 389
	Half Slot Peak Code Domain Error	"Max Hold Averaging" on page 389
	Half Slot Peak Code Domain Error Channel Number	Not averaged but uses averaged Half Slot Peak Code Domain Error to compute this result
	Half Slot Number of Active Channels	"Linear Averaging" on page 389
	Half Slot Pilot Offset	"Linear Averaging" on page 389
	Half Slot Total Power	"Logarithmic Averaging" on page 389

(LTE both FDD and TDD)	EVM	"Linear Averaging" on page 389
	ResSymTimeAdjust	"Linear Averaging" on page 389
	EVMPk	"Max Hold Averaging" on page 389
	EVMPkIdx	NAN when making average
	DataEVM	"Linear Averaging" on page 389
	TgppQpskEVM	"Linear Averaging" on page 389
	TgppQam16EVM	"Linear Averaging" on page 389
	TgppQam64EVM	"Linear Averaging" on page 389
	RSEVM	"Linear Averaging" on page 389
	RSTxPower	"Logarithmic Averaging" on page 389
	OSTxPower	"Logarithmic Averaging" on page 389
	FreqErr	"Linear Averaging" on page 389
	SyncCorr	"Linear Averaging" on page 389
	ResSyncType	NAN when making average
	CommonTrackingError	"Linear Averaging" on page 389
	SymClkErr	"Linear Averaging" on page 389
	TimeOffset	"Linear Averaging" on page 389
	IQOffset	"Linear Averaging" on page 389
	IQGainImbalance	"Linear Averaging" on page 389
	IQQuadError	"Linear Averaging" on page 389
	IQTimingSkew	"Linear Averaging" on page 389
	ResCpLengthMode	NAN when making average
	ResCellIdGroSec	NAN when making average
	ResCellId	NAN when making average
	ResPilotPRS	NAN when making average
	RefRxPower	NAN when making average
	RefRxQuality	"Linear Averaging" on page 389
	EcMax1 Normal	"Linear Averaging" on page 389
	EcMin1 Normal	"Linear Averaging" on page 389
	EcMax2Normal	"Linear Averaging" on page 389
	EcMin2Normal	"Linear Averaging" on page 389
	RP1 Normal	"Linear Averaging" on page 389
	RP2Normal	"Linear Averaging" on page 389
	RP12Normal	"Linear Averaging" on page 389
	RP21Normal	"Linear Averaging" on page 389
	EcMax1 Extreme	"Linear Averaging" on page 389

	EcMin1 Extreme	"Linear Averaging" on page 389
	EcMax2 Extreme	"Linear Averaging" on page 389
	EcMin2 Extreme	"Linear Averaging" on page 389
	RP1 Extreme	"Linear Averaging" on page 389
	RP2 Extreme	"Linear Averaging" on page 389
	RP12 Extreme	"Linear Averaging" on page 389
	RP21 Extreme	"Linear Averaging" on page 389
QPSK EVM	Avg RMS EVM	"Linear Averaging" on page 389
	Max RMS EVM	"Max Hold Averaging" on page 389
	Avg Peak EVM	"Linear Averaging" on page 389
	Max Peak EVM	"Max Hold Averaging" on page 389
	Avg Magnitude Error	"Linear Averaging" on page 389
	Max Magnitude Error	"Max Hold Averaging" on page 389
	Avg Phase Error	"Linear Averaging" on page 389
	Max Phase Error	"Max Hold Averaging" on page 389
	Avg Frequency Error	"Linear Averaging" on page 389
	Max Frequency Error	"Max Hold Averaging" on page 389
	IQ Origin Offset	"Linear Averaging" on page 389
(WCDMA only)	IQ Pairs	"Logarithmic Averaging" on page 389
(TDSCDMA only)	Code Domain Power	"Logarithmic Averaging" on page 389
	Code Domain Error	"Logarithmic Averaging" on page 389
Phase Discontinuity	Number of slots	Can't work with averaging, NAN will be returned if Average Count is set to greater than 1
Repeat for each slot	Phase	Can't work with averaging, NAN will be returned if Average Count is set to greater than 1
Repeat for each slot	Phase Discontinuity	Can't work with averaging, NAN will be returned if Average Count is set to greater than 1
Repeat for each slot	RMS EVM	Can't work with averaging, NAN will be returned if Average Count is set to greater than 1
Repeat for each slot	RMS Magnitude Error	Can't work with averaging, NAN will be returned if Average Count is set to greater than 1
Repeat for each slot	RMS Phase Error	Can't work with averaging, NAN will be returned if Average Count is set to greater than 1
Repeat for each slot	Frequency Error	Can't work with averaging, NAN will be returned if Average Count is set to greater than 1
Repeat for each slot	IQ Original offset	Can't work with averaging, NAN will be returned if Average Count is set to greater than 1
(GSM, EDGE, WCDMA, TD-SCDMA only)	BER	"Linear Averaging" on page 389

Total Bits	Accumulating
Failed Bits	Accumulating

* Power v. Time only averages the measurement results, not the underlying trace; therefore mask limit testing does not support averaging.

Logarithmic Averaging

Convert all the values to be averaged to linear.

Sum linear values and divide by number of averages.

Convert final value to log.

Linear Averaging

Sum all the values to be averaged and divide by number of averages.

Last Value Averaging

Use the last value of all the results to be averaged.

Min Hold Averaging

Use the min value of all the values to be averaged.

Max Hold Averaging

Use the max value of all the values to be averaged.

Abs Linear Averaging

Convert all values to be averaged to the absolute value.

Sum absolute values and divide by number of averages.

Abs Min Hold Averaging

Convert all values to be averaged to the absolute value.

Use the min value of all the absolute values.

Abs Max Hold Averaging

Convert all values to be averaged to the absolute value.

Use the max value of all the absolute values.

Radio Setup

This allows access to the **Radio Setup** sub menus.

Key Path	Meas Setup, Acquisition Setup
Notes	No SCPI : Front panel only
Initial S/W Revision	A.05.00

Radio Standard

This parameter sets the Radio Standard for the current **Acquisition** Number.

The measurements that are made on an acquisition are defined by the Meas Bitmap parameter for each Analysis Step of that acquisition, and the selected Radio Standard determines which measurements are available for that acquisition. For example, the ORFS measurement can be included in an analysis step if the Radio Standard for the acquisition is set to GSM, but not if the Radio Standard is set to WCDMA.

Supported Radio Standards are:

1. NONE
2. GSM
3. EDGE
4. WCDMA
5. CDMA2K
6. 1XEVD0
7. LTE
8. LTE TDD
9. TDSCDMA
10. BLUETOOTH
11. WLAN

All settings allow you to return any or all of these four measurement results Basic Tx Power, Basic Phase Error, Basic Freq Error, Basic IQ Data.

Key Path	Meas Setup, Acquisition Setup, Radio Setup
Remote Command	<p>-To set Radio Standard individually:</p> <pre>[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:RADio:STANdard < NONE GSM EDGE WCDMA CDMA2K CDMA1XEV LTE LTETDD TDSCDMA BTooth WLAN></pre> <pre>[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:RADio:STANdard?</pre> <p>-To set Radio Standard as an array:</p> <pre>[:SENSe]:LSEQuencer:LIST:SETup:RADio:STANdard <enum>, <enum>, <enum>, ...</pre> <pre>[:SENSe]:LSEQuencer:LIST:SETup:RADio:STANdard?</pre> <p>The array form of the command is used to make a different setting for each acquisition in the sequence (the number of array values must match the number of acquisitions; otherwise a "settings conflict" error will occur).</p>

Example

```
:LSEQ:ACQ2:SET:RAD:STAN CDMA2K
:LSEQ:ACQ2:SET:RAD:STAN?
:LSEQ:LIST:SET:RAD:STAN NONE, WCDMA, CDMA2K, CDMA1XEV
:LSEQ:LIST:SET:RAD:STAN?
```

Notes	For setting this parameter using SCPI, see " Programming Acquisitions Via SCPI " on page 372.
Couplings	Coupling to Meas Bitmap which restricts meas choices.
State Saved	Saved in instrument state.
Range	NONE GSM EDGE WCDMA CDMA2K CDMA1XEV LTE LTETDD TDSCDMA BTooth
Initial S/W Revision	A.05.00

None

Sets the Radio Standard for the current Acquisition to None.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard
----------	--

Remote Command

-To set Radio Band individually:

```
[ :SENSe ] :LSEQuencer:ACQuire{1:512} :SETup:RADio:BAND NONE
```

```
[ :SENSe ] :LSEQuencer:ACQuire{1:512} :SETup:RADio:BAND?
```

-To set Radio Band as an array:

```
[ :SENSe ] :LSEQuencer:LIST:SETup:RADio:BAND <enum>, <enum>, <enum>, ...
```

```
[ :SENSe ] :LSEQuencer:LIST:SETup:RADio:BAND?
```

The array form of the command is used to make a different setting for each acquisition in the sequence (the number of array values must match the number of acquisitions; otherwise a "settings conflict" error will occur).

Example

```
:LSEQ:ACQ2:SET:RAD:BAND NONE
:LSEQ:ACQ2:SET:RAD:BAND?
:LSEQ:LIST:SET:RAD:BAND NONE, NONE, NONE, NONE
:LSEQ:LIST:SET:RAD:BAND?
```

Initial S/W Revision	A.05.00
----------------------	---------

GSM

Selects GSM for the Radio Standard for the current Acquisition and allows selection of the GSM/EDGE band.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard
Remote Command	<p>-To set Radio Band individually:</p> <pre>[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:RADio:BAND NONE PGSM EGSM RGSM DCS1800 PCS1900 TGSM810 GSM450 GSM480 GSM700 GSM850 [:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:RADio:BAND?</pre> <p>-To set Radio Band as an array:</p> <pre>[:SENSe]:LSEQuencer:LIST:SETup:RADio:BAND <enum>, <enum>, <enum>, ... [:SENSe]:LSEQuencer:LIST:SETup:RADio:BAND?</pre> <p>The array form of the command is used to make a different setting for each acquisition in the sequence (the number of array values must match the number of acquisitions; otherwise a "settings conflict" error will occur).</p>
Example	<pre>:LSEQ:ACQ2:SET:RAD:BAND NONE :LSEQ:ACQ2:SET:RAD:BAND? :LSEQ:LIST:SET:RAD:BAND PGSM, NONE, GSM850, PGSM :LSEQ:LIST:SET:RAD:BAND?</pre>
Notes	For setting this parameter using SCPI, see "Programming Acquisitions Via SCPI" on page 372 .
State Saved	Saved in instrument state.
Range	NONE PGSM EGSM RGSM DCS1800 PCS1900 TGSM810 GSM450 GSM480 GSM700 GSM850
Initial S/W Revision	A.05.00

None

Selecting None for GSM means that in the Acquisition, the frequency of the GSM signal is determined by the Frequency parameter in the Acquisition setup.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, GSM
Initial S/W Revision	A.05.00

PGSM

Selects PGSM for the Band for GSM.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, GSM
Initial S/W Revision	A.05.00

EGSM

Selects EGSM for the Band for GSM.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, GSM
Initial S/W Revision	A.05.00

RGSM

Selects RGSM for the Band for GSM.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, GSM
Initial S/W Revision	A.05.00

DCS 1800

Selects DCS1800 for the Band for GSM.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, GSM
Initial S/W Revision	A.05.00

PCS 1900

Selects PCS1900 for the Band for GSM.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, GSM
Initial S/W Revision	A.05.00

GSM 450

Selects GSM 450 for the Band for GSM.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, GSM
Initial S/W Revision	A.05.00

GSM 480

Selects GSM 480 for the Band for GSM.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, GSM
Initial S/W Revision	A.05.00

GSM 850

Selects GSM 850 for the Band for GSM.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, GSM
Initial S/W Revision	A.05.00

GSM 700

Selects GSM 700 for the Band for GSM.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, GSM
Initial S/W Revision	A.05.00

T-GSM 810

Selects T-GSM 810 for the Band for GSM.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, GSM
Initial S/W Revision	A.05.00

EDGE

Selects EDGE for the Radio Standard for the current Acquisition and allows selection of the EDGE band.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard
----------	--

Remote Command

-To set Radio Band individually:

```
[ :SENSe ] :LSEQuencer:ACQuire{1:512}:SETup:RADio:BAND NONE | PGSM | EGSM  
| RGSM | DCS1800 | PCS1900 | TGSM810 | GSM450 | GSM480 | GSM700 |  
GSM850
```

```
[ :SENSe ] :LSEQuencer:ACQuire{1:512}:SETup:RADio:BAND?
```

-To set Radio Band as an array:

```
[ :SENSe ] :LSEQuencer:LIST:SETup:RADio:BAND <enum>, <enum>, <enum>, ...
```

```
[ :SENSe ] :LSEQuencer:LIST:SETup:RADio:BAND?
```

The array form of the command is used to make a different setting for each acquisition in the sequence (the number of array values must match the number of acquisitions; otherwise a "settings conflict" error will occur).

Example

```
:LSEQ:ACQ2:SET:RAD:BAND NONE  
:LSEQ:ACQ2:SET:RAD:BAND?  
:LSEQ:LIST:SET:RAD:BAND PGSM, NONE, GSM850, PGSM
```

: LSEQ:LIST:SET:RAD:BAND?

Notes	For setting this parameter using SCPI, see " Programming Acquisitions Via SCPI " on page 372.
State Saved	Saved in instrument state.
Range	NONE PGSM EGSM RGSM DCS1800 PCS1900 TGSM810 GSM450 GSM480 GSM750 GSM850
Initial S/W Revision	A.05.00

None

Selecting None for EDGE means that in the Acquisition, the frequency of the EDGE signal is determined by the Frequency parameter in the Acquisition setup.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, GSM
Initial S/W Revision	A.05.00

PGSM

Selects PGSM for the Band for EDGE.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, EDGE
Initial S/W Revision	A.05.00

EGSM

Selects EGSM for the Band for EDGE.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, EDGE
Initial S/W Revision	A.05.00

RGSM

Selects RGSM for the Band for EDGE.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, EDGE
Initial S/W Revision	A.05.00

DCS 1800

Selects DCS1800 for the Band for EDGE.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, EDGE
Initial S/W Revision	A.05.00

PCS 1900

Selects PCS1900 for the Band for EDGE.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, EDGE
Initial S/W Revision	A.05.00

GSM 450

Selects GSM 450 for the Band for EDGE.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, EDGE
Initial S/W Revision	A.05.00

GSM 480

Selects GSM 480 for the Band for EDGE.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, EDGE
Initial S/W Revision	A.05.00

GSM 850

Selects GSM 850 for the Band for EDGE.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, EDGE
Initial S/W Revision	A.05.00

GSM 700

Selects GSM 700 for the Band for EDGE.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, EDGE
Initial S/W Revision	A.05.00

T-GSM 810

Selects T-GSM 810 for the Band for EDGE.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, EDGE
Initial S/W Revision	A.05.00

WCDMA/HSPA

Selects WCDMA/HSPA for the Radio Standard for the current Acquisition and allows selection of the WCDMA/HSPA band.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard
Remote Command	<p>-To set Radio Band individually:</p> <pre>[:SENSe] :LSEQuencer:ACQuire{1:512}:SETup:RADio:BAND NONE BandI BandII BandIII BandIV BandV BandVI BandVII BandVIII BandIX BandX BandXI BandXII BandXIII BandXIV bandxix</pre> <pre>[:SENSe] :LSEQuencer:ACQuire{1:512}:SETup:RADio:BAND?</pre> <p>-To set Radio Band as an array:</p> <pre>[:SENSe] :LSEQuencer:LIST:SETup:RADio:BAND <enum>, <enum>, <enum>, ...</pre> <pre>[:SENSe] :LSEQuencer:LIST:SETup:RADio:BAND?</pre> <p>The array form of the command is used to make a different setting for each acquisition in the sequence (the number of array values must match the number of acquisitions; otherwise a "settings conflict" error will occur).</p>
Example	<pre>:LSEQ:ACQ2:SET:RAD:BAND NONE :LSEQ:ACQ2:SET:RAD:BAND? :LSEQ:LIST:SET:RAD:BAND BandII, NONE, BandIII, BandXII :LSEQ:LIST:SET:RAD:BAND?</pre>
Notes	For setting this parameter using SCPI, see "Programming Acquisitions Via SCPI" on page 372 .
State Saved	Saved in instrument state.
Range	NONE BANDI BANDII BANDIII BANDIV BANDV BANDVI BANDVII BANDVIII BANDIX BANDX BANDXI BANDXII BANDXIII BANDXIV BANDXIX
Initial S/W Revision	A.05.00

None

Selecting None for WCDMA/HSPA means that in the Acquisition, the frequency of the WCDMA/HSPA signal is determined by the Frequency parameter in the Acquisition setup.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, WCDMA/HSPA
Initial S/W Revision	A.05.00

Band I

Selects Band I for the Band for WCDMA/HSPA.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, WCDMA/HSPA
Initial S/W Revision	A.05.00

Band II

Selects Band II for the Band for WCDMA/HSPA.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, WCDMA/HSPA
Initial S/W Revision	A.05.00

Band III

Selects Band III for the Band for WCDMA/HSPA.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, WCDMA/HSPA
Initial S/W Revision	A.05.00

Band IV

Selects Band IV for the Band for WCDMA/HSPA.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, WCDMA/HSPA
Initial S/W Revision	A.05.00

Band V

Selects Band V for the Band for WCDMA/HSPA.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, WCDMA/HSPA
Initial S/W Revision	A.05.00

Band VI

Selects Band VI for the Band for WCDMA/HSPA.

Key Path	Meas Setup, Step Setup, Radio Band, Band
Initial S/W Revision	A.05.00

Band VII

Selects Band VII for the Band for WCDMA/HSPA.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, WCDMA/HSPA
Initial S/W Revision	A.05.00

Band VIII

Selects Band VIII for the Band for WCDMA/HSPA.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, WCDMA/HSPA
Initial S/W Revision	A.05.00

Band IX

Selects Band IX for the Band for WCDMA/HSPA.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, WCDMA/HSPA
Initial S/W Revision	A.05.00

Band X

Selects Band X for the Band for WCDMA/HSPA.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, WCDMA/HSPA
Initial S/W Revision	A.05.00

Band XI

Selects Band XI for the Band for WCDMA/HSPA.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, WCDMA/HSPA
Initial S/W Revision	A.05.00

Band XII

Selects Band XII for the Band for WCDMA/HSPA.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, WCDMA/HSPA
Initial S/W Revision	A.05.00

Band XIII

Selects Band XIII for the Band for WCDMA/HSPA.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, WCDMA/HSPA
Initial S/W Revision	A.05.00

Band XIV

Selects Band XIV for the Band for WCDMA/HSPA.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, WCDMA/HSPA
Initial S/W Revision	A.05.00

CDMA 2000

Selects CDMA 2000 for the Radio Standard for the current Acquisition and allows selection of the CDMA 2000 band.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard
----------	--

Remote Command

-To set Radio Band individually:

```
[ :SENSe]:LSEQuencer:ACQuire{1:512}:SETup:RADio:BAND NONE | USCELL | USPCS | JAPAN | KOREAN | NMT | IMT2K | UPPER | SECOND | PAMR400 | PAMR800 | IMTEXT | PCS1DOT9G | AWS | US2DOT5G | PUBLIC | LOWER
```

```
[ :SENSe]:LSEQuencer:ACQuire{1:512}:SETup:RADio:BAND?
```

-To set Radio Band as an array:

```
[ :SENSe]:LSEQuencer:LIST:SETup:RADio:BAND <enum>, <enum>, <enum>, ...
```

```
[ :SENSe]:LSEQuencer:LIST:SETup:RADio:BAND?
```

The array form of the command is used to make a different setting for each acquisition in the sequence (the number of array values must match the number of acquisitions; otherwise a "settings conflict" error will occur).

Example

```
:LSEQ:ACQ2:SET:RAD:BAND NONE
:LSEQ:ACQ2:SET:RAD:BAND?
:LSEQ:LIST:SET:RAD:BAND NMT, NONE, KOREAN, IMTEXT
:LSEQ:LIST:SET:RAD:BAND?
```

Notes	For setting this parameter using SCPI, see "Programming Acquisitions Via SCPI" on page 372 .
State Saved	Saved in instrument state.
Range	NONE USCELL USPCS JAPAN KOREAN NMT IMT2K UPPER SECOND PAMR400 PAMR800 IMTEXT PCS1DOT9G AWS US2DOT5G PUBLIC LOWER

Initial S/W Revision	A.05.00
----------------------	---------

None

Selecting None for CDMA 2000 means that in the Acquisition, the frequency of the CDMA 2000 signal is determined by the Frequency parameter in the Acquisition setup.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, CDMA 2000
Initial S/W Revision	A.05.00

US Cell

Selects US Cell for the Band for CDMA 2000.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, CDMA 2000
Initial S/W Revision	A.05.00

US PCS

Selects US PCS for the Band for CDMA 2000.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, CDMA 2000
Initial S/W Revision	A.05.00

Japan Cell

Selects Japan Cell for the Band for CDMA 2000.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, CDMA 2000
Initial S/W Revision	A.05.00

Korean PCS

Selects Korean Cell for the Band for CDMA 2000.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, CDMA 2000
Initial S/W Revision	A.05.00

NMT 450

Selects NMT 450 for the Band for CDMA 2000.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, CDMA 2000
Initial S/W Revision	A.05.00

IMT 2000

Selects IMT 2000 for the Band for CDMA 2000.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, CDMA 2000
Initial S/W Revision	A.05.00

Upper 700

Selects Upper 700 for the Band for CDMA 2000.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, CDMA 2000
Initial S/W Revision	A.05.00

Secondary 800

Selects Secondary 800 for the Band for CDMA 2000.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, CDMA 2000
Initial S/W Revision	A.05.00

400 Euro PAMR

Selects 400 Euro PAMR for the Band for CDMA 2000.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, CDMA 2000
Initial S/W Revision	A.05.00

800 PAMR

Selects 800 PAMR for the Band for CDMA 2000.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, CDMA 2000
Initial S/W Revision	A.05.00

2.5 GHz IMT EXT

Selects 2.5GHz IMT EXT for the Band for CDMA 2000.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, CDMA 2000
Initial S/W Revision	A.05.00

US PCS 1.9 GHz

Selects US PCS 1.9GHz for the Band for CDMA 2000.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, CDMA 2000
Initial S/W Revision	A.05.00

AWS

Selects AWS for the Band for CDMA 2000.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, CDMA 2000
Initial S/W Revision	A.05.00

US 2.5 GHz

Selects US 2.5GHz for the Band for CDMA 2000.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, CDMA 2000
Initial S/W Revision	A.05.00

700 Public Safety

Selects 700 Public Notice for the Band for CDMA 2000.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, CDMA 2000
Initial S/W Revision	A.05.00

C2K Lower 700

Selects C2K Lower 700 for the Band for CDMA 2000.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, CDMA 2000
Initial S/W Revision	A.05.00

1xEV-DO

Selects 1xEVDO for the Radio Standard for the current Acquisition and allows selection of the 1xEVDO band.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard
Remote Command	<p>-To set Radio Band individually:</p> <pre>[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:RADio:BAND NONE USCELL USPCS JAPAN KOREAN NMT IMT2K UPPER SECOND PAMR400 PAMR800 IMTEXT PCS1DOT9G AWS US2DOT5G PUBLIC LOWER</pre> <pre>[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:RADio:BAND?</pre> <p>-To set Radio Band as an array:</p> <pre>[:SENSe]:LSEQuencer:LIST:SETup:RADio:BAND <enum>, <enum>, <enum>, ...</pre> <pre>[:SENSe]:LSEQuencer:LIST:SETup:RADio:BAND?</pre> <p>The array form of the command is used to make a different setting for each acquisition in the sequence (the number of array values must match the number of acquisitions; otherwise a "settings conflict" error will occur).</p>
Example	<pre>:LSEQ:ACQ2:SET:RAD:BAND NONE :LSEQ:ACQ2:SET:RAD:BAND? :LSEQ:LIST:SET:RAD:BAND NMT, NONE, KOREAN, IMTEXT :LSEQ:LIST:SET:RAD:BAND?</pre>
Notes	For setting this parameter using SCPI, see "Programming Acquisitions Via SCPI" on page 372 .
State Saved	Saved in instrument state.
Range	NONE USCELL USPCS JAPAN KOREAN NMT IMT2K UPPER SECOND PAMR400 PAMR800 IMTEXT PCS1DOT9G AWS US2DOT5G PUBLIC LOWER
Initial S/W Revision	A.05.00

None

Selecting None for 1xEV-DO means that in the Acquisition, the frequency of the 1xEV-DO signal is determined by the Frequency parameter in the Acquisition setup.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, 1xEVDO
Initial S/W Revision	A.05.00

US Cell

Selects US Cell for the Band for 1xEVDO.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, 1xEVDO
Initial S/W Revision	A.05.00

US PCS

Selects US PCS for the Band for 1xEVDO.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, 1xEVDO
Initial S/W Revision	A.05.00

Japan Cell

Selects Japan Cell for the Band for 1xEVDO.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, 1xEVDO
Initial S/W Revision	A.05.00

Korean PCS

Selects Korean Cell for the Band for 1xEVDO.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, 1xEVDO
Initial S/W Revision	A.05.00

NMT 450

Selects NMT 450 for the Band for 1xEVDO.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, 1xEVDO
Initial S/W Revision	A.05.00

IMT 2000

Selects IMT 2000 for the Band for 1xEVDO.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, 1xEVDO
Initial S/W Revision	A.05.00

Upper 700

Selects Upper 700 for the Band for 1xEVDO.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, 1xEVDO
Initial S/W Revision	A.05.00

Secondary 800

Selects Secondary 800 for the Band for 1xEVDO.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, 1xEVDO
Initial S/W Revision	A.05.00

400 Euro PAMR

Selects 400 Euro PAMR for the Band for 1xEVDO.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, 1xEVDO
Initial S/W Revision	A.05.00

800 PAMR

Selects 800 PAMR for the Band for 1xEVDO.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, 1xEVDO
Initial S/W Revision	A.05.00

2.5 GHz IMT EXT

Selects 2.5GHz IMT EXT for the Band for 1xEVDO.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, 1xEVDO
Initial S/W Revision	A.05.00

US PCS 1.9 GHz

Selects US PCS 1.9GHz for the Band for 1xEVDO.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, 1xEVDO
Initial S/W Revision	A.05.00

AWS

Selects AWS for the Band for 1xEVDO.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, 1xEVDO
Initial S/W Revision	A.05.00

US 2.5 GHz

Selects US 2.5GHz for the Band for 1xEVDO.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, 1xEVDO
Initial S/W Revision	A.05.00

700 Public Safety

Selects 700 Public Notice for the Band for 1xEVDO.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, 1xEVDO
Initial S/W Revision	A.05.00

C2K Lower 700

Selects C2K Lower 700 for the Band for 1xEVDO.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, 1xEVDO
Initial S/W Revision	A.05.00

LTE FDD

Selects LTE FDD for the Radio Standard for the current Acquisition and allows selection of the LTE FDD band.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard
Remark	<p>-To set Radio Band individually:</p> <pre>[:SENSe] :LSEQuencer:ACQuire{1:512}:SETup:RADio:BAND NONE BAND1 BAND2 BAND3 BAND4 BAND5 BAND6 BAND7 BAND8 BAND9 BAND10 BAND11 BAND12 BAND13 BAND14 BAND17 BAND18 BAND19 BAND20 BAND21 BAND24 BAND25 BAND26 BAND27 BAND28 BAND31</pre> <p>[:SENSe] :LSEQuencer:ACQuire{1:512}:SETup:RADio:BAND?</p> <p>-To set Radio Band as an array:</p> <pre>[:SENSe] :LSEQuencer:LIST:SETup:RADio:BAND <enum>, <enum>, <enum>, ...</pre> <pre>[:SENSe] :LSEQuencer:LIST:SETup:RADio:BAND?</pre>

The array form of the command is used to make a different setting for each acquisition in the sequence (the number of array values must match the number of acquisitions; otherwise a "settings conflict" error will occur).

Example

```
:LSEQ:ACQ2:SET:RAD:BAND NONE
:LSEQ:ACQ2:SET:RAD:BAND?
:LSEQ:LIST:SET:RAD:BAND BAND1, NONE, BAND24, BAND21
:LSEQ:LIST:SET:RAD:BAND?
```

Notes For setting this parameter using SCPI, see ["Programming Acquisitions Via SCPI" on page 372](#).

State Saved Saved in instrument state.

Range NONE|BAND1|BAND2|BAND3|BAND4|BAND5|BAND6|BAND7|BAND8|BAND9|BAND10|BAND11|BAND12|BAND13|BAND14|BAND17|BAND18|BAND19|BAND20|BAND21|BAND24|BAND25|BAND26|BAND27|BAND28|BAND31

Initial S/W Revision A.09.50

None

Selecting None for LTE F means that in the Acquisition, the frequency of the LTE FDD signal is determined by the Frequency parameter in the Acquisition setup.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD
Initial S/W Revision	A.09.50

BAND1

Selects BAND1 for the Band for LTE FDD.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD
Initial S/W Revision	A.09.50

BAND2

Selects BAND2 for the Band for LTE FDD.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD
Initial S/W Revision	A.09.50

BAND3

Selects BAND3 for the Band for LTE FDD.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD
Initial S/W Revision	A.09.50

BAND4

Selects BAND4 for the Band for LTE FDD.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD
Initial S/W Revision	A.09.50

BAND5

Selects BAND5 for the Band for LTE FDD.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD
Initial S/W Revision	A.09.50

BAND6

Selects BAND6 for the Band for LTE FDD.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD
Initial S/W Revision	A.09.50

BAND7

Selects BAND7 for the Band for LTE FDD.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD
Initial S/W Revision	A.09.50

BAND8

Selects BAND8 for the Band for LTE FDD.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD
Initial S/W Revision	A.09.50

BAND9

Selects BAND9 for the Band for LTE FDD.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD
Initial S/W Revision	A.09.50

BAND10

Selects BAND10 for the Band for LTE FDD.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD
Initial S/W Revision	A.09.50

BAND11

Selects BAND11 for the Band for LTE FDD.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD
Initial S/W Revision	A.09.50

BAND12

Selects BAND12 for the Band for LTE FDD.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD
Initial S/W Revision	A.09.50

BAND13

Selects BAND13 for the Band for LTE FDD.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD
Initial S/W Revision	A.09.50

BAND14

Selects BAND14 for the Band for LTE FDD.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD
Initial S/W Revision	A.09.50

BAND17

Selects BAND17 for the Band for LTE FDD.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD
Initial S/W Revision	A.09.50

BAND18

Selects BAND18 for the Band for LTE FDD.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD
Initial S/W Revision	A.09.50

BAND19

Selects BAND19 for the Band for LTE FDD.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD
Initial S/W Revision	A.09.50

BAND20

Selects BAND20 for the Band for LTE FDD.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD
Initial S/W Revision	A.09.50

BAND21

Selects BAND21 for the Band for LTE FDD.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD
Initial S/W Revision	A.09.50

BAND24

Selects BAND24 for the Band for LTE FDD.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD
Initial S/W Revision	A.09.50

BAND25

Selects BAND25 for the Band for LTE FDD.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD
Initial S/W Revision	A.09.50

BAND26

Selects BAND26 for the Band for LTE FDD.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD
Initial S/W Revision	A.12.53

BAND27

Selects BAND27 for the Band for LTE FDD.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD
Initial S/W Revision	A.14.00

BAND28

Selects BAND28 for the Band for LTE FDD.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD
Initial S/W Revision	A.14.00

BAND31

Selects BAND31 for the Band for LTE FDD.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD
Initial S/W Revision	A.14.00

LTE TDD

Selects LTE TDD for the Radio Standard for the current Acquisition and allows selection of the LTE TDD band.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard
----------	--

Remote Command	<p>-To set Radio Band individually:</p> <pre>[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:RADio:BAND NONE BAND33 BAND34 BAND35 BAND36 BAND37 BAND38 BAND39 BAND40 BAND41 BAND42 BAND43 BAND44</pre> <pre>[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:RADio:BAND?</pre> <p>-To set Radio Band as an array:</p> <pre>[:SENSe]:LSEQuencer:LIST:SETup:RADio:BAND <enum>, <enum>, <enum>, ...</pre> <pre>[:SENSe]:LSEQuencer:LIST:SETup:RADio:BAND?</pre> <p>The array form of the command is used to make a different setting for each acquisition in the sequence (the number of array values must match the number of acquisitions; otherwise a "settings conflict" error will occur).</p>
Example	<pre>:LSEQ:ACQ2:SET:RAD:BAND NONE</pre> <pre>:LSEQ:ACQ2:SET:RAD:BAND?</pre> <pre>:LSEQ:LIST:SET:RAD:BAND BAND33, NONE, BAND34, BAND35</pre> <pre>:LSEQ:LIST:SET:RAD:BAND?</pre>
Notes	For setting this parameter using SCPI, see "Programming Acquisitions Via SCPI" on page 372 .
State Saved	Saved in instrument state.
Range	NONE BAND33 BAND34 BAND35 BAND36 BAND37 BAND38 BAND39 BAND40 BAND41 BAND42 BAND43 BAND44
Initial S/W Revision	A.12.00

None

Selecting None for LTE TDD means that in the Acquisition, the frequency of the LTE TDD signal is determined by the Frequency parameter in the Acquisition setup.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE TDD
Initial S/W Revision	A.12.00

BAND 33

Selects BAND 33 for the Band for LTE TDD.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE TDD
Initial S/W Revision	A.12.00

BAND 34

Selects BAND 34 for the Band for LTE TDD.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE TDD
Initial S/W Revision	A.12.00

BAND 35

Selects BAND 35 for the Band for LTE TDD.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE TDD
Initial S/W Revision	A.12.00

BAND 36

Selects BAND 36 for the Band for LTE TDD.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE TDD
Initial S/W Revision	A.12.00

BAND 37

Selects BAND 37 for the Band for LTE TDD.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE TDD
Initial S/W Revision	A.12.00

BAND 38

Selects BAND 38 for the Band for LTE TDD.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE TDD
Initial S/W Revision	A.12.00

BAND 39

Selects BAND 39 for the Band for LTE TDD.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE TDD
Initial S/W Revision	A.12.00

BAND 40

Selects BAND 40 for the Band for LTE TDD.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE TDD
Initial S/W Revision	A.12.00

BAND 41

Selects BAND 41 for the Band for LTE TDD.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE TDD
Initial S/W Revision	A.12.00

BAND 42

Selects BAND 42 for the Band for LTE TDD.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE TDD
Initial S/W Revision	A.12.00

BAND 43

Selects BAND 43 for the Band for LTE TDD.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE TDD
Initial S/W Revision	A.12.00

BAND 44

Selects BAND 44 for the Band for LTE TDD.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE TDD
Initial S/W Revision	A.14.00

TDSCDMA

Selects TDSCDMA for the Radio Standard for the current Acquisition and allows selection of the TDSCDMA band.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard
Remote Command	<p>-To set Radio Band individually:</p> <pre>[:SENSe] :LSEQuencer:ACQuire{1:512} :SETup:RADio:BAND NONE BANDA BANDB BANDC BANDD BANDE BANDF</pre>

```
[ :SENSe ] :LSEQuencer :ACQuire { 1 : 512 } :SETup :RADio :BAND ?
```

-To set Radio Band as an array:

```
[ :SENSe ] :LSEQuencer :LIST :SETup :RADio :BAND <enum> , <enum> , <enum> , ...
```

```
[ :SENSe ] :LSEQuencer :LIST :SETup :RADio :BAND ?
```

The array form of the command is used to make a different setting for each acquisition in the sequence (the number of array values must match the number of acquisitions; otherwise a "settings conflict" error will occur).

Example

```
:LSEQ:ACQ2:SET:RAD:BAND NONE
:LSEQ:ACQ2:SET:RAD:BAND?
:LSEQ:LIST:SET:RAD:BAND BANDA, NONE, BANDB, BANDF
:LSEQ:LIST:SET:RAD:BAND?
```

Notes	For setting this parameter using SCPI, see "Programming Acquisitions Via SCPI" on page 372 .
State Saved	Saved in instrument state.
Range	NONE BANDA BANDB BANDC BANDD BANDE BANDF
Initial S/W Revision	A.12.00

None

Selecting None for TDSCDMA means that in the Acquisition, the frequency of the TDSCDMA signal is determined by the Frequency parameter in the Acquisition setup.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, TDSCDMA
Initial S/W Revision	A.12.00

BAND A

Selects BAND A for the Band for TDSCDMA.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, TDSCDMA
Initial S/W Revision	A.12.00

BAND B

Selects BAND B for the Band for TDSCDMA.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, TDSCDMA
Initial S/W Revision	A.12.00

BAND C

Selects BAND C for the Band for TDSCDMA.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, TDSCDMA
Initial S/W Revision	A.12.00

BAND D

Selects BAND D for the Band for TDSCDMA.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, TDSCDMA
Initial S/W Revision	A.12.00

BAND E

Selects BAND E for the Band for TDSCDMA.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, TDSCDMA
Initial S/W Revision	A.12.00

BAND F

Selects BAND F for the Band for TDSCDMA.

Key Path	Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, TDSCDMA
Initial S/W Revision	A.12.00

Device (For Channel)

This parameter is used to determine the Channel Plan to be used when computing the Frequency/Channel values.

This spreadsheet Acquisition parameter "Device" relates only to the setting of the channel number in the sequencer. It should not be confused with the parameter Radio Device, which appears under the Mode Setup, Radio Setup menus for some other measurement modes. This similarly-named parameter is used in some cases to alter what limits are used for the measurements. To avoid confusion, a parenthetical note is added under the Device name of "For Channel".

Key Path	Meas Setup, Acquisition Setup, Radio Setup
Remote Command	<p>-To set Radio Device individually:</p> <pre>[:SENSe] :LSEQuencer:ACQuire{1:512} :SETup:RADio:DEvice < BTS MS ></pre> <pre>[:SENSe] :LSEQuencer:ACQuire{1:512} :SETup:RADio:DEvice?</pre>

-To set Radio Device as an array:

```
[ :SENSe ] :LSEQuencer :LIST :SETup :RADio :DEVice <enum>, <enum>, <enum>, ...
```

```
[ :SENSe ] :LSEQuencer :LIST :SETup :RADio :DEVice ?
```

The array form of the command is used to make a different setting for each acquisition in the sequence (the number of array values must match the number of acquisitions; otherwise a "settings conflict" error will occur).

Example

```
:LSEQ:ACQ2:SET:RAD:DEV MS
:LSEQ:ACQ2:SET:RAD:DEV?
:LSEQ:LIST:SET:RAD:DEV MS,MS,MS
:LSEQ:LIST:SET:RAD:DEV?
```

Notes For setting this parameter using SCPI, see ["Programming Acquisitions Via SCPI" on page 372](#). This parameter and the Band parameter are used to determine which Channel Plan is to be used.

Couplings Coupled to Channel number, Band and Radio Standard parameters

Preset
MS

State Saved Saved in instrument state.

Range BTS | MS

Initial S/W Revision A.05.00

Channel

This parameter sets the channel for the current acquisition. If a Radio Standard other than None is selected for the acquisition, this parameter and the Frequency parameter are coupled (changing either parameter changes the other as well). If the Radio Standard for the acquisition is None, this parameter is not applicable; in that case, set Frequency instead.

Key Path Meas Setup, Acquisition Setup

Remote Command

-To set channel number/ frequency individually:

```
[ :SENSe ] :LSEQuencer :ACQuire {1:512} :SETup :CNFRequency <real>
```

```
[ :SENSe ] :LSEQuencer :ACQuire {1:512} :SETup :CNFRequency ?
```

-To set the channel number/ frequency as an array:

```
[ :SENSe ] :LSEQuencer :LIST :SETup :CNFRequency <real>, <real>, <real>, ...
```

```
[ :SENSe ] :LSEQuencer :LIST :SETup :CNFRequency ?
```

The array form of the command is used to make a different setting for each acquisition in the sequence (the number of array values must match the number of acquisitions; otherwise a "settings conflict" error will occur).

NOTE: when the radio band is NONE, these SCPI commands are to configure Frequency, otherwise, these commands are to configure channel number.

Example

```
:LSEQ:ACQ2:SET:CNFR 150
:LSEQ:ACQ2:SET:CNFR?
:LSEQ:LIST:SET:CNFR 1102,1e9,1.3e9,2300
:LSEQ:LIST:SET:CNFR?
```

Notes	For setting this parameter using SCPI, see " Programming Acquisitions Via SCPI " on page 372.
Dependencies	This parameter is disabled (grayed out) when Radio Setup is set to None
Couplings	The Channel parameter is coupled to the Radio Setup parameter, except when the Radio Setup parameter is set to None. When coupled, changes to either Channel or Frequency update the other parameter. If a frequency is entered that does not match a channel in the currently selected channel plan the closest channel value is displayed prefixed with a "<" or ">" depending on if the frequency entered is less than or greater than the channel's frequency value. Range Varies
Preset	1
State Saved	Saved in instrument state.
Range	1 to 10838
Min	1
Max	10838
Initial S/W Revision	A.05.00

Frequency

This parameter sets the frequency for the current Acquisition. If a Radio Standard other than None is selected for the acquisition, this parameter and the Channel parameter are coupled (changing either parameter changes the other as well).

Key Path	Meas Setup, Acquisition Setup
Remote Command	<p>-To set channel number/ frequency individually:</p> <pre>[:SENSe] :LSEQuencer:ACQuire{1:512}:SETup:CNFRrequency <real> [:SENSe] :LSEQuencer:ACQuire{1:512}:SETup:CNFRrequency?</pre> <p>-To set the channel number/ frequency as an array:</p> <pre>[:SENSe] :LSEQuencer:LIST:SETup:CNFRrequency <real>,<real>,<real>,... [:SENSe] :LSEQuencer:LIST:SETup:CNFRrequency?</pre> <p>The array form of the command is used to make a different setting for each acquisition in the</p>

sequence (the number of array values must match the number of acquisitions; otherwise a "settings conflict" error will occur).

NOTE: when the radio band is NONE, these SCPI commands are to configure Frequency, otherwise, these commands are to configure channel number.

Example

```
:LSEQ:ACQ2:SET:CNFR 150
:LSEQ:ACQ2:SET:CNFR?
:LSEQ:LIST:SET:CNFR 1102,1e9,1.3e9,2300
:LSEQ:LIST:SET:CNFR?
```

Notes	For setting this parameter using SCPI, see "Programming Acquisitions Via SCPI" on page 372 .
Couplings	The Frequency parameter is coupled to the "Channel" on page 418 parameter, except when the Band parameter is set to None. When coupled, changes to either Channel or Frequency update the other parameter.
Preset	1 GHz
State Saved	Saved in instrument state.
Range	-80 MHz to 3.7 GHz, 3.9GHz or 6.1GHz
Min	-80 MHz
Max	depends on the frequency license installed. For Option 503: the Max frequency is 3.7GHz For Option 504, the Max Frequency is 3.9GHz. (only for EXT to support LTE-TDD) For Option 506, the Max Frequency is 6.1GHz.
Initial S/W Revision	A.05.00

Peak Power

This parameter sets the peak power for the acquisition which is used for the Auto Set RF Level algorithm when Auto Set RF Level is set to ON. (Note: Auto Set RF Level is always ON for E6607C, E6630A, and E6640A). If OFF this peak power parameter is ignored.

Key Path	Meas Setup, Acquisition Setup
Remote Command	<p>-To set Peak Power individually:</p> <pre>[:SENSe] :LSEQuencer:ACQuire{1:512}:SETup:PPOWer <amp;gt; [:SENSe] :LSEQuencer:ACQuire{1:512}:SETup:PPOWer?</pre> <p>-To set Peak Power as an array:</p> <pre>[:SENSe] :LSEQuencer:LIST:SETup:PPOWer <amp;gt;,<amp;gt;,<amp;gt;,... [:SENSe] :LSEQuencer:LIST:SETup:PPOWer?</pre> <p>The array form of the command is used to make a different setting for each acquisition in the</p>

sequence (the number of array values must match the number of acquisitions; otherwise a "settings conflict" error will occur).

Example

```
:LSEQ:ACQ2:SET:PPOW 20 dBm
:LSEQ:ACQ2:SET:PPOW?
:LSEQ:LIST:SET:PPOW 0,10dBm,15dBm
:LSEQ:LIST:SET: PPOW?
```

Notes	For setting this parameter using SCPI, see "Programming Acquisitions Via SCPI" on page 372 .
Couplings	Coupled to Auto Set RF Level when set to On. If Off this parameter is ignored.
Preset	0 dBm
State Saved	Saved in instrument state.
Min	-100 dBm
Max	100 dBm
Initial S/W Revision	A.05.00

Transition Time

This parameter sets the amount of time that is required for any changes in Acquisition Parameters that occur between Acquisitions (this allows time for transition between Frequency and or Power range changes). This time applies to the acquisition after the Acquisition Duration.

Key Path	Meas Setup, Acquisition Setup
----------	-------------------------------

Remote Command

-To set Transition Time individually:
`[:SENSe] :LSEQuencer:ACQuire{1:512}:SETup:TIME:TRANSition <time>`
`[:SENSe] :LSEQuencer:ACQuire{1:512}:SETup:TIME:TRANSition?`

-To set the Transition Time as an array:
`[:SENSe] :LSEQuencer:LIST:SETup:TIME:TRANSition <time>,<time>,<time>,...`
`[:SENSe] :LSEQuencer:LIST:SETup:TIME:TRANSition?`

The array form of the command is used to make a different setting for each acquisition in the sequence (the number of array values must match the number of acquisitions; otherwise a "settings conflict" error will occur).

Example

```
:LSEQ:ACQ2:SET:TIME:TRAN 10ms
:LSEQ:ACQ2:SET:TIME:TRAN?
:LSEQ:LIST:SET:TIME:TRAN 500us,1ms,2ms
:LSEQ:LIST:SET:TIME:TRAN?
```

Notes	For setting this parameter using SCPI, see "Programming Acquisitions Via SCPI" on page 372 .
-------	--

The times set here are dependent on what Acquisition parameters are changing between acquisitions. For accurate measurements the following setup rules should apply.

Instrument Gain Changes : 20us

Frequency changes:

 Within same Frequency Band switching: 300us

 Different Frequency Band switching: 1ms

NOTE

 Frequency Band 1: -0.08GHz to 0.6075GHz

 Frequency Band 2: 0.5075GHz to 2.1775GHz

 Frequency Band 3: 2.0775GHz to 3.6GHz

Preset	20 us
State Saved	Saved in instrument state.
Range	1 us to 4 ks
Min	0 s
Max	4 ks
Initial S/W Revision	A.05.00

Acquisition Duration

This parameter sets the interval for when the test set is acquiring IQ samples. If a pre trigger is set then the acquisition duration includes the pre-trigger time. A pre-trigger is set by setting a negative Input Trigger Delay.

For no-measurement acquisitions (which are used only to coordinate the triggering of the test set's source and analyzer) the Duration could be set to minimum, and the Meas Bitmap for the single analysis step in the acquisition should be set to zero. The acquisition Transition Time should then be set to the remaining time that is required for the no-measurement acquisition.

Key Path Meas Setup, Acquisition Setup

Remote Command

-To set Duration Time individually:

```
[ :SENSE ] :LSEQuencer:ACQuire{1:512}:SETup:TIME:DURation <time>
```

```
[ :SENSE ] :LSEQuencer:ACQuire{1:512}:SETup:TIME:DURation?
```

-To set the Duration Time as an array:

```
[ :SENSE ] :LSEQuencer:LIST:SETup:TIME:DURation <time>,<time>,<time>,...
```

```
[ :SENSE ] :LSEQuencer:LIST:SETup:TIME:DURation?
```

The array form of the command is used to make a different setting for each acquisition in the sequence (the number of array values must match the number of acquisitions; otherwise a "settings conflict" error will occur).

Example

	:LSEQ:ACQ2:SET:TIME:DUR 10ms :LSEQ:ACQ2:SET:TIME: DUR? :LSEQ:LIST:SET:TIME: DUR 500us,1ms,2ms :LSEQ:LIST:SET:TIME: DUR?
Notes	For setting this parameter using SCPI, see " Programming Acquisitions Via SCPI " on page 372.
Preset	1 ms
State Saved	Saved in instrument state.
Range	0 to 1 s
Min	0
Max	1s
Initial S/W Revision	A.05.00

Input Trigger

This parameter sets the Trigger input for the current acquisition. Trigger slope for Video, RF Burst and External triggers, and level for External triggers, are set for the entire Sequence, and are detailed in the Global Meas parameter section.

Key Path	Meas Setup, Acq Setup
----------	-----------------------

Remote Command

-To set Input Trigger Type individually:

```
[ :SENSe ] :LSEQuencer:ACQuire{1:512}:SETup:TRIGger[:INPut] IMMEDIATE |  
VIDEO | INTERNAL | EXTERNAL1 | EXTERNAL2 | RFBURST
```

```
[ :SENSe ] :LSEQuencer:ACQuire{1:512}:SETup:TRIGger[:INPut] ?
```

-To set the Input Trigger Type as an array:

```
[ :SENSe ] :LSEQuencer:LIST:SETup:TRIGger[:INPut] <enum>,<enum>,<enum>,...
```

```
[ :SENSe ] :LSEQuencer:LIST:SETup:TRIGger[:INPut] ?
```

The array form of the command is used to make a different setting for each acquisition in the sequence (the number of array values must match the number of acquisitions; otherwise a "settings conflict" error will occur).

Example

```
:LSEQ:ACQ2:SET:TRIG:INP IMM  
:LSEQ:ACQ2:SET:TRIG:INP?  
:LSEQ:LIST:SET:TRIG:INP IMM,INT,VID  
:LSEQ:LIST:SET:TRIG:INP?
```

Notes	For setting this parameter using SCPI, see " Programming Acquisitions Via SCPI " on page 372. Video – IF Envelope, Level set by Input Trigger Level parameter
-------	--

	Internal - Internal from Sig Gen Ext1/2 - External Trig at Input port
Dependencies	RF Burst trigger is enabled on E6640A.
Preset	All Free Run
State Saved	Saved in instrument state.
Range	Free Run Video Internal Ext1 Ext2 RF Burst
Initial S/W Revision	A.05.00

Free Run

Selects Free Run for the Trigger for the current Acquisition.

Key Path	Meas Setup, Acquisition Setup, Input Trigger
Initial S/W Revision	A.05.00

Video

Selects Video (that is, IF envelope triggering) for the Trigger for the current Acquisition.

Key Path	Meas Setup, Acquisition Setup, Input Trigger
Initial S/W Revision	A.05.00

Internal

Selects Internal for the Trigger for the current Acquisition.

Key Path	Meas Setup, Acquisition Setup, Input Trigger
Initial S/W Revision	A.05.00

External 1

Selects External 1 for the Trigger for the current Acquisition.

Key Path	Meas Setup, Acquisition Setup, Input Trigger
Notes	On E6640A, trigger 1 is a bi-directional trigger port. So when trigger 1 has been configured as OUTPUT type, choosing External 1 as the input trigger for the current step will generate error.
Initial S/W Revision	A.05.00

External 2

Selects External 2 for the Trigger for the current Acquisition.

Key Path	Meas Setup, Acquisition Setup, Input Trigger
Notes	On E6640A, trigger 2 is a bi-directional trigger port. So when trigger 2 has been configured as OUTPUT type, choosing External 2 as the input trigger for the current step will generate error.
Initial S/W Revision	A.05.00

Input Trigger Level

This parameter sets the trigger level of RF Burst or Video trigger for the current Acquisition.

Key Path	Meas Setup, Acq Setup
Remote Command	<p>-To set Input Trigger Level individually:</p> <pre>[:SENSe] :LSEQuencer:ACQuire { 1 : 512 } :SETup:TRIGger [:INPut] :LEVel < amp ></pre> <pre>[:SENSe] :LSEQuencer:ACQuire { 1 : 512 } :SETup:TRIGger [:INPut] :LEVel ?</pre> <p>-To set the Input Trigger Level as an array:</p> <pre>[:SENSe] :LSEQuencer:LIST:SETup:TRIGger [:INPut] :LEVel</pre> <pre>< amp > , < amp > , < amp > , ...</pre> <pre>[:SENSe] :LSEQuencer:LIST:SETup:TRIGger [:INPut] :LEVel ?</pre> <p>The array form of the command is used to make a different setting for each acquisition in the sequence (the number of array values must match the number of acquisitions; otherwise a "settings conflict" error will occur).</p>
Example	<pre>:LSEQ:ACQ2:SET:TRIG:INP:LEV -10dBm</pre> <pre>:LSEQ:ACQ2:SET:TRIG:INP:LEV?</pre> <pre>:LSEQ:LIST:SET:TRIG:INP:LEV 0, -10dBm, -20dBm</pre> <pre>:LSEQ:LIST:SET:TRIG:INP:LEV?</pre>
Notes	For setting this parameter using SCPI, see "Programming Acquisitions Via SCPI" on page 372 .
Dependencies	This parameter is used for Video trigger only; otherwise it is disabled.
Preset	-20 dBm
State Saved	Saved in instrument state.
Min	-100 dBm
Max	100 dBm
Initial S/W Revision	A.05.00

Input Trigger Delay

This parameter allows you to set the trigger delay for the current Acquisition.

Key Path	Meas Setup, Acquisition Setup
Remote Command	<p>-To set Input Trigger Delay individually:</p> <pre>[:SENSe] :LSEQuencer :ACQuire { 1 : 512 } :SETup :TRIGger [:INPut] :DELay <time> [:SENSe] :LSEQuencer :ACQuire { 1 : 512 } :SETup :TRIGger [:INPut] :DELay?</pre> <p>-To set the Input Trigger Delay as an array:</p> <pre>[:SENSe] :LSEQuencer :LIST :SETup :TRIGger [:INPut] :DELay <time>, <time>, <time>, ... [:SENSe] :LSEQuencer :LIST :SETup :TRIGger [:INPut] :DELay?</pre> <p>The array form of the command is used to make a different setting for each acquisition in the sequence (the number of array values must match the number of acquisitions; otherwise a "settings conflict" error will occur).</p>
Example	<pre>:LSEQ:ACQ2:SET:TRIG:INP:DEL -200us :LSEQ:ACQ2:SET:TRIG:INP:DEL? :LSEQ:LIST:SET:TRIG:INP:DEL 0, -200us, -100us :LSEQ:LIST:SET:TRIG:INP:DEL?</pre>
Notes	<p>For setting this parameter using SCPI, see "Programming Acquisitions Via SCPI" on page 372.</p> <p>Positive values act as a trigger delay. A negative number acts as a pre-trigger. For example, if set to -200 us, the meas offset would start 200 us prior to the trigger event. Meas interval starts after meas offset ends, which in this case would be 200 us prior to the trigger event plus the Meas Offset value.</p> <p>GMSK ORFS switching and GMSK PVT (for example) need to see the full rising edge and all the overshoot/undershoot. A warning is displayed (see "Validation and Setup dependencies" on page 374) if selected measurement in the first analysis step requires a rising edge then acquisition may need a pre-trigger to catch the rising edge.</p>
Preset	0 s
State Saved	Saved in instrument state.
Range	-150 ms to 500 ms
Min	-150 ms
Max	500 ms
Initial S/W Revision	A.05.00

Acquisition Output Trigger

This parameter is used to set the output trigger of the current acquisition. It has two options now, NONE and Internal. NONE means no output trigger in the current acquisition. Internal means turn on the Internal Trigger to Source in the current acquisition.

NOTE

Acquisition Output Trigger can be generated once per acquisition, not on every analysis step (unless each analysis step is in a separate acquisition).

Now Acquisition Output Trigger only support the Internal Trigger from Analyzer to Source. It may be expanded in the future

Key Path	Meas Setup, Acquisition Setup
Remote Command	<p>-To set Ouput Trigger Type individually:</p> <pre>[:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:TRIGger:OUTPut NONE INTernal [:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:TRIGger:OUTPut?</pre> <p>-To set the Output Trigger Type as an array:</p> <pre>[:SENSe]:LSEQuencer:LIST:SETup:TRIGger:OUTPut <enum>,<enum>,<enum>,... [:SENSe]:LSEQuencer:LIST:SETup:TRIGger:OUTPut?</pre> <p>The array form of the command is used to make a different setting for each acquisition in the sequence (the number of array values must match the number of acquisitions; otherwise a "settings conflict" error will occur).</p>
Example	<pre>:LSEQ:ACQ2:SET:TRIG:OUTP NONE :LSEQ:ACQ2:SET:TRIG:OUTP? :LSEQ:LIST:SET:TRIG:OUTP NONE,INT,NONE :LSEQ:LIST:SET:TRIG:OUTP?</pre>
Notes	<p>For setting this parameter using SCPI, see "Programming Acquisitions Via SCPI" on page 372.</p> <p>All triggers are sent at the start of the Acquisition.</p> <p>NONE - no trigger fed out</p> <p>Internal - To internal source</p>
State Saved	Saved in instrument state.
Range	None Internal
Initial S/W Revision	A.05.00

NONE

Selects no output trigger for the current Acquisition.

Key Path	Meas Setup, Acquisition Setup, Acquisition Output Trigger
Initial S/W Revision	A.05.00

Internal

Select the Internal Trigger to Source for the current Acquisition.

Key Path	Meas Setup, Acquisition Setup, Acquisition Output Trigger
Initial S/W Revision	A.05.00

Analysis Step Setup

Key Path	SCPI only
Remote Command	<code>[[:SENSe]:LSEQuencer:ACQuire [1] 2 ... 4...512:ASTep [1] 2 ... 4...1000:SETup <time>, <time>, <integer>, <ampl></code>
Example	<code>:LSEQ:ACQ1:ASTEP1:SETup 20,20,1, -10</code> <code>:LSEQ:ACQ1:ASTEP1:SETup?</code>
Notes	The parameters are: <time> - specifies the Analysis Offset for the Analysis Step. <time> - specifies the Analysis Interval for the Analysis Step. <integer> - specifies the Measurement Bitmap for the Analysis Step (this is the decimal equivalent of the bits selected). <ampl> - specifies the Expected Power at DUT Output for the Analysis Step.
Dependencies	The range of sub op code values is determined by the Number of Acquisitions and the Number of Analysis Steps you have configured. If you attempt to remotely set or query a sub op code combination that is out of range, this results in an error message.
Initial S/W Revision	A.05.00

Number of Analysis Steps

This parameter is used to define the number of Analysis periods within the current Acquisition.

Key Path	Meas Setup, Acquisition Setup, Analysis Setup
Remote Command	<code>[[:SENSe]:LSEQuencer: ACQuire [1] 2 3 4...512:NUMBer:ASTeps <integer></code> <code>[[:SENSe]:LSEQuencer: ACQuire [1] 2 3 4...512:NUMBer:ASTeps?</code>
Example	<code>:LSEQ:ACQ1:NUMB:AST 25</code>
Notes	If number is increased, any new analysis steps will contain default values.
Dependencies	The Acquisition must already be enabled before Analysis steps can be added, queried or removed. The total number of Analysis Steps on the Acquisitions can be no more than 1000.

Couplings	When a new acquisition is added this parameter value defaults to 1.
Preset	1
State Saved	Saved in instrument state.
Range	1 to 1000
Min	1
Max	1000
Initial S/W Revision	A.05.00

Current Analysis Step

This parameter is used to define the current active Analysis Step with the current Acquisition period.

Key Path	Meas Setup, Acquisition Setup, Analysis Step Setup
Notes	For setting this parameter using SCPI, see " Programming Acquisitions Via SCPI " on page 372.
Couplings	Updates UI Analysis parameters to selected Analysis Step
Preset	1
Range	1 to Number of Steps
Min	1
Max	Number of Steps
Initial S/W Revision	A.05.00

Insert Before Analysis Step

This inserts a default Analysis Step before the current Analysis Step.

Key Path	Meas Setup, Acquisition Setup, Analysis Setup
Notes	No SCPI, front panel access only Maximum number of Acquisitions is 1000 if exceeded an error (Data out of range: Table Full) occurs
Couplings	Increases Number of Analysis Steps by 1
Initial S/W Revision	A.05.00

Delete Analysis Step

This deletes the current Analysis.

Key Path	Meas Setup, Acquisition Setup, Analysis Setup
Notes	No SCPI, front panel access only Cannot delete when Number of Analysis Steps is equal to 1.

Couplings	Decreases Number of Analysis Steps by 1
Initial S/W Revision	A.05.00

Analysis Offset

This parameter sets the amount of time between the start of the acquisition and the start of the analysis step. It is always referenced to the start of the acquisition.

Key Path	Meas Setup, Acquisition Setup, Analysis Setup
----------	---

Remote Command

-To set Analysis Offset individually:

```
[ :SENSe ] :LSEQuencer:ACQuire{1:512}:ASTep{1:1000}:SETup:TIME:OFFSet
<time>
```

```
[ :SENSe ] :LSEQuencer:ACQuire{1:512}:ASTep{1:1000}:SETup:TIME:OFFSet?
```

-To set the Analysis Offset as an array:

```
[ :SENSe ] :LSEQuencer:ACQuire{1:512}:LIST:SETup:TIME:OFFSet
<time>,<time>,<time>,...
```

```
[ :SENSe ] :LSEQuencer:ACQuire{1:512}:LIST:SETup:TIME:OFFSet?
```

The array form of the command is used to make a different setting for each acquisition in the sequence (the number of array values must match the number of acquisitions; otherwise a "settings conflict" error will occur).

-To set Analysis Offset for the whole sequence as an array:

```
[ :SENSe ] :LSEQuencer:LIST:SETup:TIME:OFFSet <time>,<time>,<time>,...
```

```
[ :SENSe ] :LSEQuencer:LIST:SETup:TIME:OFFSet?
```

The array form of the command is used to make a different setting for each analysis step in the sequence.

If the number of array values is greater than the total number of analysis steps, a "settings conflict" error will occur.

If the number of array values is less than the total number of analysis steps, the array will be auto repeated to fill in all the analysis steps.

Example

```
:LSEQ:ACQ2:AST3:SET:TIME:OFFS 10ms
:LSEQ:ACQ2:AST3:SET:TIME:OFFS?
:LSEQ:ACQ2:LIST:SET:TIME:OFFS 500us, 1ms, 2ms
:LSEQ:ACQ2:LIST:SET:TIME:OFFS?
:LSEQ:NUMB:ACQ 2
:LSEQ:ACQ1:NUMB:AST 5
:LSEQ:ACQ2:NUMB:AST 5
:LSEQ:LIST:SET:TIME:OFFS 0.1s,0.2s,0.3s
:LSEQ:LIST:SET:TIME:OFFS? => 0.1, 0.2, 0.3, 0.1, 0.2, 0.3, 0.1, 0.2, 0.3, 0.1
```

Notes	For setting this parameter using SCPI, see "Programming Acquisitions Via SCPI" on page 372.
Preset	0 s
State Saved	Saved in instrument state.
Range	0 s to 1 s
Min	0 s
Max	1 s
Initial S/W Revision	A.05.00

Analysis Interval

This parameter sets the period over which measurements are made.

Key Path	Meas Setup, Acquisition Setup, Analysis Setup
Remote Command	<p>-To set Analysis Interval individually:</p> <pre>[:SENSe] :LSEQuencer:ACQuire{1:512} :ASTep{1:1000} :SETup:TIME:INTERval <time></pre> <pre>[:SENSe] :LSEQuencer:ACQuire{1:512} :ASTep{1:1000} :SETup:TIME:INTERval?</pre> <p>-To set the Analysis Interval as an array:</p> <pre>[:SENSe] :LSEQuencer:ACQuire{1:512} :LIST:SETup:TIME:INTERval <time>, <time>, <time>, ...</pre> <pre>[:SENSe] :LSEQuencer:ACQuire{1:512} :LIST:SETup:TIME:INTERval?</pre> <p>The array form of the command is used to make a different setting for each acquisition in the sequence (the number of array values must match the number of acquisitions; otherwise a "settings conflict" error will occur).</p>

Example	<pre>:LSEQ:ACQ2:AST3:SET:TIME:INT 10ms :LSEQ:ACQ2:AST3:SET:TIME:INT? :LSEQ:ACQ2:LIST:SET:TIME:INT 500us, 1ms, 2ms :LSEQ:ACQ2:LIST:SET:TIME:INT? :LSEQ:NUMB:ACQ 2 :LSEQ:ACQ1:NUMB:AST 5 :LSEQ:ACQ2:NUMB:AST 5 :LSEQ:LIST:SET:TIME:INT 500us, 600us, 700us :LSEQ:LIST:SET:TIME:INT? => 5e-4, 6e-4, 7e-4, 5e-4, 6e-4, 7e-4, 5e-4, 6e-4, 7e-4, 5e-4</pre>
Notes	For setting this parameter using SCPI, see "Programming Acquisitions Via SCPI" on page 372.
Preset	500 us

State Saved	Saved in instrument state.
Range	0 to 1 s
Min	0
Max	1 s
Initial S/W Revision	A.05.00

Measurement Bitmap

Allows you to select which measurements are included in an analysis step. Measurement bitmap choice differs for each radio standard. See the table below for bitmapping. The measurements available to be selected vary, depending on the licenses installed (for example, if you do not have the U9071A GSM_EDGE measurement license, then the GSM and EDGE measurements are unavailable). The measurement bitmap determines what results are returned via SCPI and in the Result Metrics View.

Measurement	Bit	Radio Standards Supported
Basic Transmit Power	0	ALL: BASIC, GSM, EDGE, WCDMA, CDMA2000, 1xEV-DO, LTE-FDD, LTE-TDD, TDSCDMA, BLUETOOTH, WLAN
Basic Frequency and Phase Error	1	ALL: BASIC, GSM, EDGE, WCDMA, CDMA2000, 1xEV-DO, LTE-FDD, LTE-TDD, TDSCDMA, BLUETOOTH, WLAN
Basic Discrete PAVT	2	ALL: BASIC, GSM, EDGE, WCDMA, CDMA2000, 1xEV-DO, LTE-FDD, LTE-TDD, TDSCDMA, BLUETOOTH, WLAN
Basic IQ Data	3	ALL: BASIC, GSM, EDGE, WCDMA, CDMA2000, 1xEV-DO, LTE-FDD, LTE-TDD, TDSCDMA, BLUETOOTH, WLAN
PVT	4	GSM,EDGE, LTE-TDD, TDSCDMA
ORFS	5	GSM,EDGE
GMSK Phase&Freq	6	GSM, EDGE1
EDGE EVM	7	GSM1, EDGE
ACP	8	WCDMA, CDMA2000, 1xEV-DO, LTE-FDD, LTE-TDD, TDSCDMA, BLUETOOTH
SEM	9	WCDMA, CDMA2000, 1xEV-DO, LTE-FDD, LTE-TDD, TDSCDMA, WLAN
Occupied BW	10	WCDMA, CDMA2000, 1xEV-DO, LTE-FDD, LTE-TDD, TDSCDMA, BLUETOOTH, WLAN
Mod Accuracy	11	WCDMA, CDMA2000, 1xEV-DO, LTE-FDD, LTE-TDD, TDSCDMA, BLUETOOTH, WLAN
QPSK EVM	12	WCDMA, CDMA2000, TDSCDMA
Code Domain	13	WCDMA, TDSCDMA

Phase Discontinuity	14	WCDMA
Loopback BER	15	GSM, EDGE, WCDMA, TDSCDMA
EDR In-band Spurious Emission	16	BLUETOOTH
LE In-band Emission	17	BLUETOOTH
MIMO EVM	18	WLAN This measurement is available when license "V9065B-SFP" is present.

Note 1: The GSM and EDGE option used to be separated. There would be the case that customer only have one of them. But now the two options are combined. Strictly speaking, GMSK Phase&Freq is GSM measurement, EDGE EVM is EDGE measurement. Here we let GSM and EDGE share these measurements for convenient because these two formats are combined too close in customer use.

Key Path	Meas Setup, Acquisition Setup, Analysis Setup
Remote Command	<p>-To set Measurement BitMap individually:</p> <pre>[:SENSe] :LSEQuencer:ACQuire { 1 : 512 } :ASTep { 1 : 1000 } :SETup:MBITmap <Integer></pre> <pre>[:SENSe] :LSEQuencer:ACQuire { 1 : 512 } :ASTep { 1 : 1000 } :SETup:MBITmap?</pre> <p>-To set Measurement BitMap as an array:</p> <pre>[:SENSe] :LSEQuencer:ACQuire { 1 : 512 } :LIST:SETup:MBITmap <Integer>, <Integer>, <Integer>, ...</pre> <pre>[:SENSe] :LSEQuencer:ACQuire { 1 : 512 } :LIST:SETup:MBITmap?</pre> <p>The array form of the command is used to make a different setting for each acquisition in the sequence (the number of array values must match the number of acquisitions; otherwise a "settings conflict" error will occur).</p>
Example	<pre>:LSEQ:ACQ2:SET:MPA:MBIT 1 :LSEQ:ACQ2:SET:MPA:MBIT? :LSEQ:LIST:SET:MPA:MBIT 1,256,1032 :LSEQ:LIST:SET:MPA:MBIT? :LSEQ:NUMB:ACQ 2 :LSEQ:ACQ1:NUMB:AST 5 :LSEQ:ACQ2:NUMB:AST 5 :LSEQ:LIST:SET:MBIT 1,2,3 :LSEQ:LIST:SET:MBIT? => 1, 2, 3, 1, 2, 3, 1, 2, 3, 1</pre>
Notes	Each bit is associated with a measurement; as shown in the bitmap table above. The value of a bit is '0' if the corresponding measurement is not selected, and '1' if it is. (For example, to select EDGE

	EVM, set Bit 7 to '1'. The field requires a decimal entry. For example, if an analysis step requires the measurements Basic Transmit Power and EDGE EVM, the Bit Mask for this combination is 10000001, and the value of this parameter is the decimal number '129'.
Dependencies	When this parameter is set up using " Programming Acquisitions Via SCPI " on page 372, the value must be entered as the decimal equivalent of the bits. For example, Bit 7 (EDGE EVM) would be entered in the form of its decimal value (128).
Couplings	Coupled to Radio Standard, which limits the measurement choices. The results displayed vary depending on the setting of this parameter.
Preset	1
State Saved	Saved in instrument state.
Range	0 to 65535
Min	0
Max	65535
Initial S/W Revision	A.05.00

Basic Transmit Power

This parameter determines if the Basic Transmit Power measurement is computed on the selected analysis step.

Key Path	Meas Setup, Step Setup, Meas Bit Mask
Preset	On
State Saved	Saved in instrument state.
Range	On Off
Initial S/W Revision	A.05.00

Basic Frequency and Phase Error

This parameter determines if the Basic Frequency and Phase Error measurement is computed on the selected analysis step.

Key Path	Meas Setup, Step Setup, Meas Bit Mask
Preset	Off
State Saved	Saved in instrument state.
Range	On Off
Initial S/W Revision	A.05.00

Basic Discrete PAVT

This parameter determines if the Basic Discrete PAVT (Phase Amplitude versus Time) measurement is computed on the selected analysis step.

Key Path	Meas Setup, Step Setup, Meas Bit Mask
Preset	Off
State Saved	Saved in instrument state.
Range	On Off
Initial S/W Revision	A.05.00

Basic IQ Data

This parameter determines if the Basic IQ Data measurement is computed on the selected analysis step.

Key Path	Meas Setup, Step Setup, Meas Bit Mask
Preset	Off
State Saved	Saved in instrument state.
Range	On Off
Initial S/W Revision	A.05.00

Power vs Time

This parameter determines if the Power vs Time measurement is computed on the selected analysis step.

Key Path	Meas Setup, Step Setup, Meas Bit Mask
Dependencies	This parameter is only enabled when the Radio Standard parameter is set to GSM or EDGE.
Preset	Off
State Saved	Saved in instrument state.
Range	On Off
Initial S/W Revision	A.05.00

Output RF Spectrum

This parameter determines if the Output RF Spectrum measurement is computed on the selected analysis step.

Key Path	Meas Setup, Step Setup, Meas Bit Mask
Dependencies	This parameter is only enabled when the Radio Standard parameter is set to GSM or EDGE.
Preset	Off
State Saved	Saved in instrument state.

Range	On Off
Initial S/W Revision	A.05.00

GMSK Phase & Freq

This parameter determines if the GMSK Phase & Freq measurement is computed on the selected analysis step.

Key Path	Meas Setup, Step Setup, Meas Bit Mask
Dependencies	This parameter is only enabled when the Radio Standard parameter is set to GSM.
Preset	Off
State Saved	Saved in instrument state.
Range	On Off
Initial S/W Revision	A.05.00

EDGE EVM

This parameter determines if the EDGE EVM measurement is computed on the selected analysis step.

Key Path	Meas Setup, Step Setup, Meas Bit Mask
Dependencies	This parameter is only enabled when the Radio Standard parameter is set to EDGE.
Preset	Off
State Saved	Saved in instrument state.
Range	On Off
Initial S/W Revision	A.05.00

Adjacent Channel Power

This parameter determines if the Adjacent Channel Power measurement is computed on the selected analysis step.

Key Path	Meas Setup, Step Setup, Meas Bit Mask
Dependencies	This parameter is only enabled when the Radio Standard parameter is set to WCDMA, cdma2000, 1xEV-DO, LTE-FDD, LTE-TDD, TDSCDMA, or Bluetooth
Preset	Off
State Saved	Saved in instrument state.
Range	On Off
Initial S/W Revision	A.05.00

Spectrum Emission Mask

This parameter determines if the Spectrum Emission Mask measurement is computed on the selected analysis step.

Key Path	Meas Setup, Step Setup, Meas Bit Mask
Dependencies	This parameter is only enabled when the Radio Standard parameter is set to WCDMA, cdma2000, 1xEV-DO, LTE-FDD, LTE-TDD, TDSCDMA
Preset	Off
State Saved	Saved in instrument state.
Range	On Off
Initial S/W Revision	A.05.00

Occupied BW

This parameter determines if the Occupied BW measurement is computed on the selected analysis step.

Key Path	Meas Setup, Step Setup, Meas Bit Mask
Dependencies	This parameter is only enabled when the Radio Standard parameter is set to WCDMA, cdma2000, 1xEV-DO, LTE-FDD, LTE-TDD, TDSCDMA , or Bluetooth
Preset	Off
State Saved	Saved in instrument state.
Range	On Off
Initial S/W Revision	A.05.00

Modulation Accuracy

This parameter determines if the Modulation Accuracy measurement is computed on the selected analysis step.

Key Path	Meas Setup, Step Setup, Meas Bit Mask
Dependencies	This parameter is only enabled when the Radio Standard parameter is set to WCDMA, cdma2000, 1xEV-DO, LTE-FDD, LTE-TDD, TD-SCDMA , Bluetooth or WLAN
Preset	Off
State Saved	Saved in instrument state.
Range	On Off
Initial S/W Revision	A.05.00

QPSK EVM

This parameter determines if the QPSK EVM measurement is computed on the selected analysis step.

Key Path	Meas Setup, Step Setup, Meas Bit Mask
Dependencies	This parameter is only enabled when the Radio Standard parameter is set to WCDMA or cdma2000
Preset	Off
State Saved	Saved in instrument state.
Range	On Off
Initial S/W Revision	A.05.00

Code Domain

This parameter determines if the CDP measurement is computed on the selected analysis step.

Key Path	Meas Setup, Step Setup, Meas Bit Mask
Dependencies	This parameter is only enabled when the Radio Standard parameter is set to WCDMA or TDSCDMA.
Preset	Off
State Saved	Saved in instrument state.
Range	On Off
Initial S/W Revision	A.05.00

Phase Discontinuity

This parameter determines if the Phase Discontinuity measurement is computed on the selected analysis step.

Key Path	Meas Setup, Step Setup, Meas Bit Mask
Dependencies	This parameter is only enabled when the Radio Standard parameter is set to WCDMA and the average of the acquisition step is set to 1.
Preset	Off
State Saved	Saved in instrument state.
Range	On Off
Initial S/W Revision	A.05.00

Basic Discrete PAVT Setup

This measurement returns the amplitude, phase and frequency errors of each step. For the first step, frequency errors are reference to the frequency set for the acquisition and phase are taken as zero. The amplitude, frequency and phase errors of remained steps are reference to first step. Because Basic Discrete PAVT needs to set the channel filter, it is exclusive with other measurements. It means that only

Basic Discrete PAVT is allowed for all analyses of this acquisition once Basic Discrete PAVT measurement is selected for one analysis of this acquisition.

Key Path	Meas Setup, Basic Meas Setup
Mode	Sequence Analyzer
Initial S/W Revision	A.05.00

Interval Count

This allows you to specify the total number of steps to be measured.

Key Path	SCPI Only
Remote Command	<code>[:SENSE] :LSEQuencer:PCALibration::STEP:COUNT <integer></code> <code>[:SENSE] :LSEQuencer:PCALibration::STEP:COUNT?</code>
Example	<code>:LSEQ:PCAL:STEP:COUN 25</code>
Notes	If the number is greater than the number of interval center or the number of the interval width, then any new interval center and interval width will use the previous step interval center or interval width value.
Preset	1
State Saved	Saved in instrument state.
Range	1 to 512
Min	1
Max	512
Initial S/W Revision	A.05.00

Interval Centers

This parameter sets the center time of each step.

Key Path	SCPI Only
Remote Command	<code>[:SENSE] :LSEQuencer:PCALibration:STEP:CENTer <time>, ..., < time ></code> <code>[:SENSE] :LSEQuencer:PCALibration:STEP:CENTer?</code>
Example	<code>:LSEQ:PCAL:STEP:CENT 1ms,2ms,3ms</code>
Notes	If the number is less than the number of interval count then any new interval center will use the previous step interval center. The step center time subtract half of the step interval width is greater than or equal to zero and step center time plus half of the step interval width is less than or equal to analysis interval.
Preset	1ms
State Saved	Saved in instrument state.
Range	50us to 399.95ms
Min	50 us

Max	399.95 ms
Initial S/W Revision	A.05.00

Interval Widths

This parameter sets the interval width of each step to be measured.

Key Path	SCPI Only
Remote Command	[[:SENSe]:LSEQuencer:PCALibration:STEP:WIDTh <time>, ..., < time > [:SENSe] :LSEQuencer:PCALibration:STEP:WIDTh?
Example	:LSEQ:PCAL:STEP:WIDTh 1ms,1ms,1ms
Notes	If the number is less than the number of interval count then any new interval width will use the previous step interval width. The step center time subtract half of the step interval width is greater than or equal to zero and step center time plus half of the step interval width is less than or equal to analysis interval.
Preset	1ms
State Saved	Saved in instrument state.
Range	100us to 400ms
Min	100 us
Max	400 ms
Initial S/W Revision	A.05.00

LE In-band Emission

This parameter determines if the Bluetooth LE In-band Emission measurement is computed on the selected analysis step.

Key Path	Meas Setup, Step Setup, Meas Bit Mask
Dependencies	This parameter is only enabled when the Radio Standard parameter is set to Bluetooth
Preset	Off
State Saved	Saved in instrument state.
Range	On Off

EDR In-band Spurious Emission

This parameter determines if the Bluetooth EDR In-band Spurious Emission measurement is computed on the selected analysis step.

Key Path	Meas Setup, Step Setup, Meas Bit Mask
Dependencies	This parameter is only enabled when the Radio Standard parameter is set to Bluetooth
Preset	Off
State Saved	Saved in instrument state.
Range	On Off

MIMO EVM

This parameter determines if MIMO EVM measurement is computed on the selected analysis step.

Key Path	Meas Setup, Step Setup, Meas Bit Mask
Dependencies	This parameter is only enabled when the Radio Standard parameter is set to WLAN, and related license "V9065B-SFP" is present.
Preset	Off
State Saved	Saved in instrument state.
Range	On Off
Initial S/W Revision	A.14.00

Expected Power at DUT Output

This parameter sets the average expected power of the analysis step. The RF input range is controlled in the acquisition parameter "Instrument Gain". The acquisition's peak power is set in the acquisition setup parameters, which is used for the Auto Set RF Level algorithm, together with this Expected power value for the analysis step.

CAUTION:

CAUTION The "Instrument Gain" selection range (described under the acquisition setup parameters) should match the expected power values; otherwise, the internal circuitry of the test set could be damaged.

This parameter is coupled to the Basic Tx Power measurement limits if that measurement is selected for the analysis step. Basic Tx Power measurement limits are referenced to this parameter for the analysis step.

Key Path	Meas Setup, Step Setup
Remote Command	-To set Expected Power individually:

```
[ :SENSe]:LSEQuencer:ACQuire{1:512}:ASTep{1:1000}:SETup:EPower <amp>
```

```
[ :SENSe]:LSEQuencer:ACQuire{1:512}:ASTep{1:1000}:SETup:EPower?
```

-To set Expected Power as an array:

```
[ :SENSe]:LSEQuencer:ACQuire{1:512}:LIST:SETup:EPower <amp>,<br><amp>,<amp>, ...
```

```
[ :SENSe]:LSEQuencer:ACQuire{1:512}:LIST:SETup:EPower?
```

The array form of the command is used to make a different setting for each acquisition in the sequence (the number of array values must match the number of acquisitions; otherwise a "settings conflict" error will occur).

-To set Expected Power for the whole sequence as an array:

```
[ :SENSe]:LSEQuencer:LIST:SETup:EPower <amp>,<amp>,<amp>, ...
```

```
[ :SENSe]:LSEQuencer:LIST:SETup:EPower?
```

The array form of the command is used to make a different setting for each analysis step in the sequence.

If the number of array values is greater than the total number of analysis steps, a "settings conflict" error will occur.

If the number of array values is less than the total number of analysis steps, the array will be auto repeated to fill in all the analysis steps.

Example

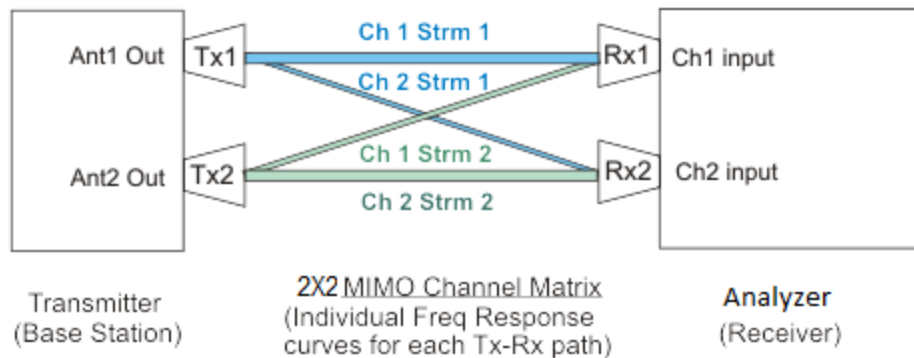
```
:LSEQ:ACQ2:SET:MPA:EPOW 20dBm
:LSEQ:ACQ2:SET:MPA:EPOW?
:LSEQ:LIST:SET:MPA:EPOW 0,20dBm,10dBm
:LSEQ:LIST:SET:MPA:EPOW?
EPOW0,-10dBm,-20dBm
EPOW
```

Notes	For setting this parameter using SCPI, see "Programming Acquisitions Via SCPI" on page 372 .
Couplings	Coupled to Basic Tx Power measurement limits if this meas is selected. Coupled to Auto Set RF Level when set to On.
Preset	0 dBm
State Saved	Saved in instrument state.
Min	-100 dBm
Max	100 dBm
Initial S/W Revision	A.05.00

Switch MIMO Extension

Multiple Input Multiple Output (MIMO) requires a transmitter to consist of multiple antennas with separate signals on each antenna, and similarly requires a receiver to have multiple antennas. A 2-Channel 2x2 MIMO measurement, for example, requires the analyzer to demodulate signals on two different input ports

for MIMO measurement. This method could be extended to 3x3 MIMO measurements, and accordingly requires 3 input ports on analyzer side.



2X2 MIMO Channel and Spatial Streams

If different channel signals are demodulated simultaneously, then it's a true MIMO measurement required by specifications. This kind of measurement usually requires several analyzers being synced up to work together to meet the "simultaneous" test requirement, and hence imposes high test cost on the manufacturing line.

Switch MIMO provides a cost-effective method for manufacturing test. It uses only one analyzer with several input ports to capture signal data on different input ports by switching ports in a time-division manner, and then combines the data from different ports together to do MIMO demodulation. This is called "Switch MIMO", in which ports are switched between acquisitions. For ports to be switched in a time-division manner, to meet MIMO measurement requirements, an uplink DUT signal with fixed pattern is required. For example, burst length is known, and the same burst repeats periodically in a fixed pattern. With this information known, test personnel can set the acquisition length on each port in the sequencer analyzer to simulate a true MIMO scenario.

Through Switch MIMO extension, multi-channel MIMO measurement can easily be reached. Below is the table of how many "Switch MIMO" acquisitions are required for different multi-channel MIMO measurement.

	Required Primary Acquisition	Required Switch MIMO Acquisition(s)
2x2 MIMO	1	1
3x3 MIMO	1	2

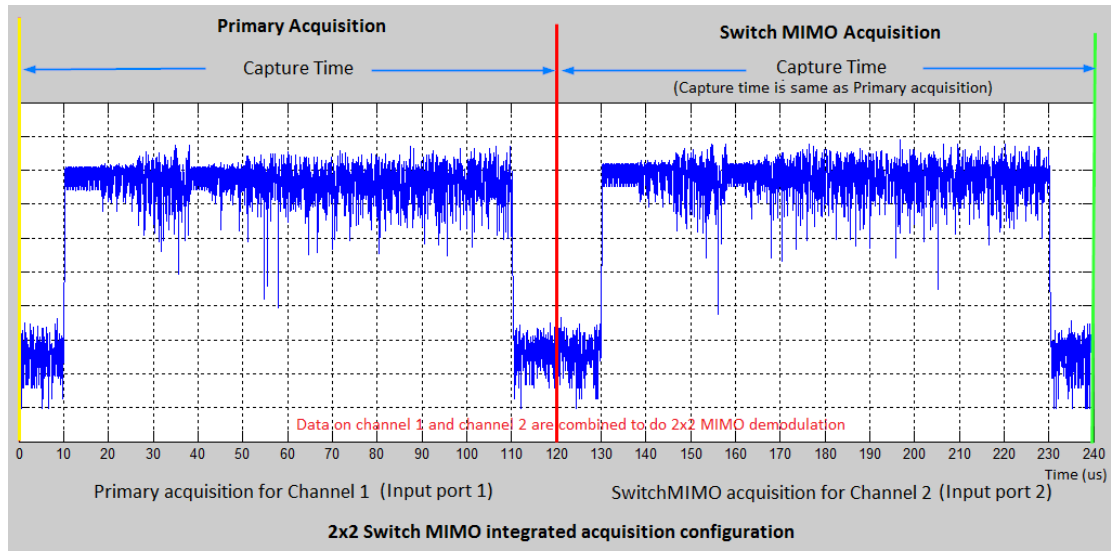
For 2x2 MIMO as example, we use two acquisitions to complete this measurement.

The first acquisition is Primary acquisition, and the second acquisition is Switch MIMO acquisition

- oPrimary acquisition captures input port 1 (channel 1).

- oSwitch MIMO acquisition captures input port 2 (channel 2), and acquisition length should be same as Primary acquisition.

oSignal data on channel 1 (port 1 on Primary acquisition) and channel 2 (port 2 on Switch MIMO acquisition) are combined together to do MIMO demodulation. For Switch MIMO acquisition lags behind Primary acquisition to capture data, so this requires signal from DUT on each channel has repeated burst pattern.



The measurements that support integration are listed below.

Measurement Name	Integration Purpose
SEM	Span Extension
ACP	Span Extension
OBW	Span Extension
TD-SCDMA PVT	Range Extension
TDD-LTE PVT	Range Extension
WLAN MIMO Mod Acc	Switch MIMO Extension

NOTE

The other measurement that does not support integration will only be performed on Primary or Normal acquisition.

Key Path	Meas Setup, Acquisition Setup
Remote Command	<p>-To set Integration Type individually:</p> <pre>[:SENSE] :LSEQuencer:ACQuire{1:512}:SETup:INTEgration NORMal PRIMary LOWer UPPer RANGE SMIMo</pre> <pre>[:SENSE] :LSEQuencer:ACQuire{1:512}:SETup:INTEgration?</pre> <p>-To set the Integration Type as an array:</p> <pre>[:SENSE] :LSEQuencer:LIST:SETup:INTEgration <enum>, <enum>, <enum>, ...</pre> <pre>[:SENSE] :LSEQuencer:LIST:SETup:INTEgration?</pre> <p>The array form of the command is used to make a different setting for each acquisition in the sequence (the number of array values must match the number of acquisitions; otherwise a "settings</p>

	conflict" error will occur).
Example	:LSEQ:ACQ2:SET:INT PRIM :LSEQ:ACQ2:SET:INT? :LSEQ:LIST:SET:INT PRIM,LOW,UPP,RANG :LSEQ:LIST:SET:INT?
Notes	<p>For setting this parameter using SCPI, see "Programming Acquisitions Via SCPI" on page 372.</p> <p>Normal - This acquisition is complete in itself; it is not integrated with other acquisitions..</p> <p>Primary – This acquisition is integrated with acquisitions which follow it, for purposes of extending its frequency span or dynamic range (or both).</p> <p>Lower – This acquisition is integrated with the last Primary acquisition which precedes it in the sequence, in order to add a lower extension to the frequency span of the primary. Parameter settings for this acquisition match those of the primary, except that the Center Frequency is equal to the Center Frequency of the Primary minus the IF Bandwidth of the Primary.</p> <p>Upper - This acquisition is integrated with the last Primary acquisition which precedes it in the sequence, in order to add an upper extension to the frequency span of the primary. Parameter settings for this acquisition match those of the primary, except that the Center Frequency is equal to the Center Frequency of the Primary plus the IF Bandwidth of the Primary.</p> <p>Range Extension - This acquisition is integrated with the last Primary acquisition which precedes it in the sequence, in order to extend the dynamic range of the primary. Parameter settings for this acquisition match those of the primary, except that Input Trigger is Free Run, Peak Power is –40 dBm, and Expected Power is –70 dBm.</p> <p>Switch MIMO Extension - This acquisition is integrated with the last Primary acquisition which precedes it in the sequence, in order to cooperate with the primary to acquire data on different port to achieve MIMO multi-channel measurement. Parameter settings for this acquisition match those of the primary, except that Input Trigger is settable. This extension is available when license "V9065B-SFP" is present, or error message "–221 Setting Conflict; Switch MIMO is not available" pops up.</p> <p>The matching process is performed automatically, and don't require the user to manually set any values.</p> <p>When integrating, the measurement results are stored in Primary acquisition, and the results in Lower, Upper or Range extension acquisition should be NAN.</p>
Couplings	If integration type is set to lower,upper or range extension, all paramteres of this acquisition are disabled. (except for integration type itself).
Preset	Normal
State Saved	Saved in instrument state.
Range	Normal Primary Lower Upper Range Extension Switch MIMO
Initial S/W Revision	A.11.50

Normal

Set the acquisition integration type to Normal, it is not integrated with other acquisitions.

Key Path	Meas Setup, Acquisition Setup, Acquisition Integration
Initial S/W Revision	A.11.50

Primary

Set the acquisition integration type to Primary. This acquisition will be integrated with acquisitions which follow it. For purpose of span extension, range extension or both.

Key Path	Meas Setup, Acquisition Setup, Acquisition Integration
Initial S/W Revision	A.11.00

Lower

Set the acquisition integration type to Lower, and it will be integrated with the last Primary acquisition which precedes it in the sequence

Key Path	Meas Setup, Acquisition Setup, Acquisition Integration
Initial S/W Revision	A.11.00

Upper

Set the acquisition integration type to upper, and it will be integrated with with the last Primary acquisition which precedes it in the sequence.

Key Path	Meas Setup, Acquisition Setup, Acquisition Integration
Initial S/W Revision	A.11.00

Range Ext

Set the acquisition integration type to Range Extension, and it will be integrated with the last Primary acquisition which precedes it in the sequence.

Key Path	Meas Setup, Acquisition Setup, Acquisition Integration
Initial S/W Revision	A.11.00

Switch MIMO

Set the acquisition integration type to Switch MIMO, and it will be integrated with the last Primary acquisition which precedes it in the sequence.

Key Path	Meas Setup, Acquisition Setup, Acquisition Integration
Notes	Limited by available ports on front panel, only up to two Switch MIMO extensions (for 3x3 MIMO) could be configured to cooperate with Primary. Available when license "V9065B-SFP" is present.
Initial S/W Revision	A.14.00

Acquisition RF Input Port

This parameter determines the path of the RF Input and the amplitude correction table to apply to the acquisition step.

Key Path	Meas Setup, Acquisition Setup
Notes	<p>For setting this parameter using SCPI, see "Programming Acquisitions Via SCPI" on page 372.</p> <p>For the E6640A with standard TRX hardware (M9430A), or the E6650A with standard TRX hardware (M9440A), the RF Input Path choices for the acquisition step of the sequence analyzer are:</p> <ul style="list-style-type: none"> • RFIO1 • RFIO2 • RF Input <p>For the E6640A with Option 4FD TRX hardware (M9431A), RF Input Path choice for the acquisition step of the sequence analyzer are :</p> <ul style="list-style-type: none"> • RFIO1 • RFIO2 • RFIO3 • RFIO4
Dependencies	This setting will be greyed out unless the Step Input Select(see Section "RF Input Port Mode " on page 467 RF Input Port Mode) is set to List.
Preset	RFIO1
State Saved	Saved in instrument state.
Range	RFIO1 RFIO2 RFIN RFIO3 RFIO4
Initial S/W Revision	A.14.00

RFIO1

Sets Acquisition RF Input port of the current acquisition to RFIO1

Key Path	Meas Setup, Acquisition Setup, Acquisition RF Input Port
Initial S/W Revision	A.14.00

RFIO2

Sets Acquisition RF Input port of the current acquisition to RFIO2

Key Path	Meas Setup, Acquisition Setup, Acquisition RF Input Port
Initial S/W Revision	A.14.00

RF Input

Sets Acquisition RF Input port of the current acquisition to RF Input

Key Path	Meas Setup, Acquisition Setup, Acquisition RF Input Port
Notes	For the E6640A with standard TRX hardware (M9430A), or the E6650A with the standard TRX hardware (M9430A) there are 2 half duplex ports, RF3 I/O and RF4 I/O. Users should choose RF Input as the acquisition RF Input port, and then select RF3 I/O or RF4 I/O under Input/Output > RF Output & Test Set Config > Half Duplex Config > RF Input Port. For E6640A with Option 4FD TRX hardware (M9431A), there are 4 full duplex ports and no RF Input port, so this choice is not available.
Initial S/W Revision	A.14.00

Basic Meas Setup

Provides access to setup menus for the four basic measurements included in Sequence Analyzer mode: Basic Transmit Power, Basic Frequency and Phase Error, Basic Discrete PAVT, and Basic IQ Data.

Key Path	Meas Setup
Mode	Sequence Analyzer
Initial S/W Revision	A.05.00

Basic Transmit Power Setup

The Basic Transmit Power measurement is available for all the radio standards that can be configured for an acquisition: None, GSM/EDGE, WCDMA/HSPA, CDMA2000, 1xEVDO, LTE-FDD, LTE-TDD, TDSCDMA and BLUETOOTH.

Key Path	Meas Setup, Basic Meas Setup
Mode	Sequence Analyzer
Initial S/W Revision	A.05.00

The settings defined in the subsection of "[Basic Transmit Power Setup](#)" on page 448 take effect only when the radio standard of the acquisition (please refer to "[Radio Standard](#)" on page 390) is set to None.

For selections other than None, the sample rate, channel filter shape and channel filter parameters are fixed to provide a measurement equivalent to the GSM mode's Transmit Power measurement, as well as the Channel Power measurement in WCDMA/HSPA, CDMA2000, 1xEVDO, LTE-FDD, LTE-TDD, TDSCDMA and BLUETOOTH modes:

Radio Standard	Digital IF BW(Hz)	Channel Filter BW(Hz)	Channel Filter Shape	Channel Filter Parameter
----------------	-------------------	-----------------------	----------------------	--------------------------

WCDMA/HSPA	7.68 *10e6 / 1.25	3.84*10e6	RRC	Alpha = 0.22
CDMA2000	2.4576*10e6 /1.25	1.23*10e6	Short Nyquist	Alpha = 0.1
1xEVDO	2.4576*10e6 / 1.25	1.23*10e6	Short Nyquist	Alpha = 0.1
GSM/EDGE	510*10e3	510*10e3	Flattop	
LTE(Both FDD and TDD)1	Bandwidth * 1.6	Bandwidth	Short Nyquist	Alpha = 0.1
TDSCDMA	1.5e6	1.5e6	RRC	Alpha = 0.22
BLUETOOTH	3e6	3e6	Flattop	

Note 1: The bandwidth of LTE could be changeable. The current bandwidth can be derived from Mode Setup→Demod→Bandwidth in LTE mode.

Upper Limit

This parameter sets the threshold level for the Basic Tx Power pass/fail result. When set to ON, the measurement checks each Analysis Step relative to the “Exp Power” level set for each Analysis Step. If it is above the “Exp Power” level plus this upper limit value, then the Pass/Fail result is “1”. If below, the Pass/Fail result is “0”. When set to OFF, the measurement populates the Pass/Fail result with “-1”, signifying it is untested.

For the “Input Overload”, integrity value is returned whether the Upper Limit is set to ON or OFF.

This parameter is also coupled with amplitude correction if it is enabled.

Key Path	Meas Setup, Basic Meas Setup, Basic Transmit Power Setup
Remote Command	[:SENSe] :LSEQuencer:BTXPower:LIMit:UPPer <rel_ampl> [:SENSe] :LSEQuencer:BTXPower:LIMit:UPPer? [:SENSe] :LSEQuencer:BTXPower:LIMit:UPPer:STATe OFF ON 0 1 [:SENSe] :LSEQuencer:BTXPower:LIMit:UPPer:STATe?
Example	LSEQ:BTXP:LIM:UPP 9dB LSEQ:BTXP:LIM:UPP? LSEQ:BTXP:LIM:UPP:STAT LSEQ:BTXP:LIM:UPP:STAT?
Couplings	This parameter is also coupled with amplitude correction if it is enabled.
Preset	9 ON
State Saved	Saved in instrument state.
Min	-100
Max	100
Initial S/W Revision	A.05.00

Lower Limit

This parameter sets the threshold level for the Basic Tx Power pass/fail result. When set to ON, the measurement checks each Analysis Step relative to the “Exp Power” level set for each Analysis Step. If it is below the “Exp Power” level plus this lower limit value, then the Pass/Fail result is “1”. If above, the Pass/Fail result is “0”. When set to OFF, the measurement populates the Pass/Fail result with “-1”, signifying it’s untested.

This parameter is also coupled with amplitude correction if it is enabled.

Key Path	Meas Setup, Basic Meas Setup, Basic Transmit Power Setup
Remote Command	[:SENSe] :LSEQuencer :BTXPower :LIMit :LOWer <rel_ampl> [:SENSe] :LSEQuencer :BTXPower :LIMit :LOWer? [:SENSe] :LSEQuencer :BTXPower :LIMit :LOWer :STATe OFF ON 0 1 [:SENSe] :LSEQuencer :BTXPower :LIMit :LOWer :STATe?
Example	LSEQ:BTXP:LIM:LOW 9dB LSEQ:BTXP:LIM:LOW? LSEQ:BTXP:LIM:LOW:STAT LSEQ:BTXP:LIM:LOW:STAT?
Couplings	This parameter is also coupled with amplitude correction it is enabled.
Preset	-10 ON
State Saved	Saved in instrument state.
Min	-100
Max	100
Initial S/W Revision	A.05.00

Radio Standard None

Setup parameters for Basic Transmit Power with “None” selected as the Radio Standard.

Key Path	Meas Setup, Basic Meas Setup, Basic Transmit Power
Mode	Sequence Analyzer
Initial S/W Revision	A.05.00

Digital IF BW

This parameter allows you to manually set the digital IF bandwidth of the receiver path for basic transmit power when the Radio Standard of the acquisition is set to None. This is used to set the hardware of the digital receiver.

Key Path	Meas Setup, Basic Meas Setup, Basic Transmit Power Setup, Radio Std None
Remote Command	[:SENSe] :LSEQuencer :BTXPower : [NONE] :DIF :BANDwidth BWIDth [:RESolution]

	<freq> [:SENSe]:LSEQuencer:BTXPower:[NONE]:DIF:BANDwidth BWIDth[:RESolution]?
Example	LSEQ:BTXP:DIF:BAND 1 kHz LSEQ:BTXP:DIF:BAND?
Couplings	This parameter only takes effect when the Radio Standard of acquisition is set to NONE.
Preset	25 MHz
State Saved	Saved in instrument state.
Min	1 kHz
Max	40 MHz

Filter Type

Selects the type of bandwidth filter that is used when the Radio Standard of the acquisition is set to None. The choices are Gaussian, Flat top, Short Nyquist or Root Raised Cosine (RRC).

Key Path	Meas Setup, Basic Meas Setup, Basic Transmit Power Setup, Radio Std None
Remote Command	[:SENSe]:LSEQuencer:BTXPower:[NONE]:DIF:FILTer:TYPE GAUSSian FLATtop RRC SNYQuist [:SENSe]:LSEQuencer:BTXPower:[NONE]:DIF:FILTer:TYPE?
Example	LSEQ:BTXP:DIF:FILT:TYPE GAUS LSEQ:BTXP: DIF:FILT:TYPE?
Couplings	This parameter only takes effect when the Radio Standard of the acquisition is set to NONE
Preset	FLATtop
State Saved	Saved in instrument state.
Range	Gaussian FlatTop RRC Short nyquist

Gaussian

Selects Gaussian for the filter type that is used when Radio Standard of the acquisition is set to None.

Key Path	Meas Setup, Basic Meas Setup, Basic Transmit Power Setup, Radio Std None, Filter Type
Initial S/W Revision	A.05.00

Flat Top

Selects Flat Top for the fir type that is used when Radio Standard of the acquisition is set to None.

Key Path	Meas Setup, Basic Meas Setup, Basic Transmit Power Setup, Radio Std None, Filter Type
Initial S/W Revision	A.05.00

RRC

Selects RRC for the filter type that is used when Radio Standard of the acquisition is set to None.

Key Path	Meas Setup, Basic Meas Setup, Basic Transmit Power Setup, Radio Std None, Filter Type
Initial S/W Revision	A.05.00

Short Nyquist

Selects short nyquist for the filter type that is used when Radio Standard of the acquisition is set to None.

Key Path	Meas Setup, Basic Meas Setup, Basic Transmit Power Setup, Radio Std None, Filter Type
Initial S/W Revision	A.05.00

Filter Bandwidth

This parameter allows you to manually set the channel filter bandwidth of the receiver path for basic transmit power when Radio Standard of the acquisition is set to None. This is used to set the hardware filter of the digital receiver.

Key Path	Meas Setup, Basic Meas Setup, Basic Transmit Power Setup, Radio Std None
Remote Command	[:SENSe] :LSEQuencer:BTXPower: [NONE] :DIF:FILTer:BANDwidth BWIDth [:RESolution] <freq> [:SENSe] :LSEQuencer:BTXPower: [NONE] :DIF:FILTer:BANDwidth BWIDth [:RESolution]?
Example	LSEQ:BTXP:DIF:FILT:BAND 1 kHz LSEQ:BTXP:DIF:FILT:BAND?
Dependencies	The maximum limitation of this setting is clipped to the current Digital IF BW value of basic transmitter power for None Radio Standard.
Couplings	This parameter is grayed out when the filter type for None Radio Standard is set to flattop.
Preset	Same value as Digital IF BW value of basic transmitter power for None Radio Standard.
State Saved	Saved in instrument state.
Min	1 kHz
Max	Clipped to the current Digital IF BW value of basic transmitter power for None Radio Standard.

Filter Alpha

This parameter specifies the width of the filter transition band.

Alpha is the ratio of the transition
bandwidth / 2 to the filter bandwidth.

Key Path	Meas Setup, Basic Meas Setup, Basic Transmit Power Setup, Radio Std None
Remote Command	[:SENSe] :LSEQuencer:BTXPower: [NONE] :DIF:FILTer:ALPha <real> [:SENSe] :LSEQuencer:BTXPower: [NONE] :DIF:FILTer:ALPha?
Example	LSEQ:BTXP:DIF:FILT:ALPH 0.22 LSEQ:BTXP:DIF:FILT:ALPH?
Dependencies	None.
Couplings	This parameter is grayed out when the filter type for None Radio Standard is set to flattop.
Preset	0.22
State Saved	Saved in instrument state.
Min	0.01
Max	1.0
Initial S/W Revision	A.05.00

Basic Frequency and Phase Error Setup

To allow the phase to be obtained, the freq offset is removed first. This then allows the phase to be returned. In the case of multiple samples, the result returned is the average. The result returned are Frequency Error and Phase Error with reference to the frequency set for the acquisition.

NOTE

Undetermined phase changes occur between acquisitions that change frequency or instrument gain. These cannot be calibrated out; therefore, phase error results need to be obtained from the same acquisition.

Key Path	Meas Setup, Basic Meas Setup
Mode	Sequence Analyzer
Initial S/W Revision	A.05.00

Digital IF BW

Activates the Digital IF BW function, which enables you to manually set the information bandwidth of the analyzer. This is used to set the digital IF filter of the EXT Analyzer.

Key Path	Meas Setup, Basic Meas Setup, Freq and Phase Error Setup
Remote Command	[:SENSe] :LSEQuencer:BFERor:DIF:BANDwidth[:RESolution] <freq> [:SENSe] :LSEQuencer:BFERor:DIF:BANDwidth[:RESolution]?
Example	LSEQ:BFER:DIF:BAND 25 MHz LSEQ:BFER:DIF:BAND?
Couplings	If Digital IF BW is set differently for different measurements in an acquisition, the test set's analyzer uses the highest value of those set. Basic Frequency and Phase Error makes the measurement on the captured samples, without re-sampling.

Preset	25 MHz
State Saved	Saved in instrument state.
Min	1 kHz
Max	40 MHz

Limit: Freq Error

This parameter sets the pass/fail limit for the frequency error result. Units are in parts per million (ppm).

Key Path	Meas Setup, Basic Meas Setup,
Remote Command	[:SENSe] :LSEQuencer :BFERor :LIMit :PPM <real> [:SENSe] :LSEQuencer :BFERor :LIMit :PPM? [:SENSe] :LSEQuencer :BFERor :LIMit :PPM OFF ON 0 1 [:SENSe] :LSEQuencer :BFERor :LIMit :PPM STATe?
Example	LSEQ:BFER:LIM:PPM 0.06 LSEQ:BFER:LIM:PPM? LSEQ:BFER:LIM:PPM:STAT LSEQ:BFER:LIM:PPM:STAT?
Couplings	If Abort on Limit Fail = On, and the freq error is more than the value set, the Sequence aborts, without completing the Sequence.
Preset	0.05 ON
State Saved	Saved in instrument state.
Min	0
Max	100
Initial S/W Revision	A.05.00

Basic Discrete PAVT Setup

This measurement returns the amplitude, phase and frequency errors of each step. For the first step, frequency errors are reference to the frequency set for the acquisition and phase are taken as zero. The amplitude, frequency and phase errors of remained steps are reference to first step. Because Basic Discrete PAVT needs to set the channel filter, it is exclusive with other measurements. It means that only Basic Discrete PAVT is allowed for all analyses of this acquisition once Basic Discrete PAVT measurement is selected for one analysis of this acquisition.

Key Path	Meas Setup, Basic Meas Setup
Mode	Sequence Analyzer
Initial S/W Revision	A.05.00

Filter Type

Activates the Filter Type function, which enables you to manually set the channel filter bandwidth of the analyzer by selecting different filter type. This is used to set the channel filter of the EXT Analyzer. When selecting Extremely Narrow filter, only measure and return the Amplitude results.

Key Path	Meas Setup, Basic Meas Setup, Basic Discrete PAVT Setup,
Remote Command	[:SENSe] :LSEQuencer:PCALibration:FILTer WIDE NARRow VNARrow ENARrow
Example	LSEQ:PCAL:FILT WIDE LSEQ:PCAL:FILT?
Preset	WIDE
State Saved	Saved in instrument state.
Range	Wide Narrow Very Narrow Extremely Narrow

Wide

Selects Wide for the filter type and its actual filter is short nyquist filter of filter alpha 0.5 and bandwidth 150KHz.

Key Path	Meas Setup, Basic Meas Setup, Basic Discrete PAVT Setup, Filter Type
Initial S/W Revision	A.05.00

Narrow

Selects Narrow for the filter type and its actual filter is short nyquist filter of filter alpha 0.5 and bandwidth 120KHz.

Key Path	Meas Setup, Basic Meas Setup, Basic Discrete PAVT Setup, Filter Type
Initial S/W Revision	A.05.00

Very Narrow

Selects Very Narrow for the filter type and its actual filter is short nyquist filter of filter alpha 0.5 and bandwidth 80KHz.

Key Path	Meas Setup, Basic Meas Setup, Basic Discrete PAVT Setup, Filter Type
Initial S/W Revision	A.05.00

Extremely Narrow

Selects Extremely Narrow for the filter type and its actual filter is short nyquist filter of filter alpha 0.5 and bandwidth 30KHz.

Key Path	Meas Setup, Basic Meas Setup, Basic Discrete PAVT Setup, Filter Type
Initial S/W Revision	A.05.00

Common(5MHz BW)

Selects Common(5MHz BW) for the filter type and its actual filter is Flat top filter of filter alpha 0.22 and bandwidth 5MHz.

Key Path	Meas Setup, Basic Meas Setup, Basic Discrete PAVT Setup, Filter Type
Initial S/W Revision	A.05.00

Basic IQ Data Setup

This allows you to return a limited amount of IQ data samples back as measurement results.

Averaging is not allowed when this measurement is selected in an Acquisition. If averaging is set, a "settings conflict" error is returned.

Basic IQ Data has two measurement parameters: "Digital IF BW" and "MeasType", which apply to the entire Sequence.

Key Path	Meas Setup, Basic Meas Setup
Mode	Sequence Analyzer
Initial S/W Revision	A.05.00

Digital IF BW

Activates the Digital IF BW function, which enables you to manually set the information bandwidth of the analyzer. This is used to set the digital IF filter of the EXT Analyzer.

Key Path	Meas Setup, Basic Meas Setup, Basic IQ Data Setup
Remote Command	<code>[:SENSe] :LSEQuencer:BIQData:DIF:BANDwidth[:RESolution] <freq></code> <code>[:SENSe] :LSEQuencer:BIQData:DIF:BANDwidth[:RESolution] ?</code>
Example	LSEQ:BIQD:DIF:BAND 25 MHz LSEQ:BIQD:DIF:BAND?
Couplings	If different Digital IF BW were set for several measurements in an acquisition (HW State) then the List Sequencer SW would have to choose the highest value and grab the acquisition. Basic IQ data returns the captured samples WITHOUT re-sampling.
Preset	25 MHz
State Saved	Saved in instrument state.

Min	1 kHz
Max	40 MHz

Measurement Type

This setting is used to set the Basic IQ measurement to return raw IQ samples or Amplitude/Phase pairs.

Key Path	Meas Setup, Basic Meas Setup, Basic IQ Data Setup
Remote Command	[:SENSe] :LSEQuencer:BIQData:TYPE RDATa APHase [:SENSe] :LSEQuencer:BIQData:TYPE?
Example	LSEQ:BIQD:TYPE RDAT LSEQ:BIQD:TYPE?
Preset	RData
State Saved	Saved in instrument state.
Range	RDATa APHase
Initial S/W Revision	A.05.00

Auto Set RF Levels

Allows you to set the mechanical attenuation for the whole Sequence and set the Instrument Gain for each acquisition automatically, based on the Sequence parameters which are being used by the test set.

For E6607C, it allows you to set the Multiport Adapter Preamp (if Multiport Adapter On/Off is On) and FrontEnd Gain for each acquisition automatically, based on the Sequence parameters which are being used by the test set.

For E6640A, it allows you to control the RF path Gain/Loss for each acquisition automatically, based on the Sequence parameters which being used on the test set.

Key Path	Meas Setup
Initial S/W Revision	A.05.00

Min Signal To Noise Ratio Margin

This parameter is fed into the auto set RF levels algorithm. It sets how far from the analyzer noise floor (DANL) the ranging will go. This is best described as a Signal to Noise Ratio (SNR) Margin. In communication systems this value is set to allow the data to be fully demodulated with minimum error. A default value of 15 dB is used. This assumes a capture length of 1 ms. The longer the capture, the more averaging is performed, which impacts the SNR required.

If the Auto Set RF Level is set to OFF, then these additional parameters are disabled.

Key Path	Meas setup, Auto Set RF Levels
Remote Command	[:SENSe] :LSEQuencer:ASRLevels:MSNRati <rel_amp1> [:SENSe] :LSEQuencer:ASRLevels:MSNRati?
Example	:LSEQ:ASRL:MSNR 10
Notes	Not available for E6607C,E6640A and E6650A.
Couplings	When “Auto Set RF Levels” parameter is set to Off, this parameter is disabled.
Preset	15
State Saved	Saved in instrument state.
Range	0 dB to 70 dB
Min	0 dB
Max	70 dB
Initial S/W Revision	A.05.00

Peak Power Margin

This parameter is fed into the auto set RF levels algorithm. It specifies a difference between expected peak power and full scale, after the ranging is done. This margin is intended to accommodate the output power uncertainty of the DUT. A default value of 5 dB is used. That means if the Auto RF level ranging is finished successfully, you won't get an overload warning if the actual power is less than (the Peak Power setting + 5 dB). Increasing the margin may cause the test set to increase its attenuation.

If the Auto Set RF Level is set to OFF, then these additional parameters are disabled.

Key Path	Meas setup, Auto Set RF Levels
Remote Command	[:SENSe] :LSEQuencer:ASRLevels:PPMargin <rel_amp1> [:SENSe] :LSEQuencer:ASRLevels:PPMargin?
Example	:LSEQ:ASRL:PPM 5
Couplings	When “Auto Set RF Levels” parameter is set to Off, this parameter is disabled.
Preset	5
State Saved	Saved in instrument state.
Range	0 dB to 10 dB
Min	0 dB
Max	10 dB
Initial S/W Revision	A.05.00

Trigger Timeout

This parameter sets the timeout for trigger events that occur throughout a sequence. It can effectively be used as a measurement timeout. If all acquisition triggers are set to Free Run, then this parameter is not active. It should be set to a value greater than the trigger arming period (that is, the time expected

between a previous acquisition completing and the trigger occurring). This value applies to all non-Free Run triggers in a sequence. When the STATE is set to ON and the trigger arming period is less than the trig timeout value, then the measurement continues and the trig timeout is activated on the next non-Free Run trigger in the sequence. No timeout error is thrown for that trigger event.

If the trigger arming period is greater than the trig timeout value then a trigger timeout error is thrown, and the integrity value for that acquisition is returned as “trigger error”. The measurement is only aborted if “Abort on Error” is enabled. Otherwise the measurement continues to wait for a trigger, and if a trigger event occurs, the measurement proceeds and trigger timeout is activated on the next non-Free Run trigger in the sequence.

When the STATE is set to OFF, then no trigger timeout error is thrown, and this parameter is disabled.

Key Path	Meas Setup
Remote Command	[:SENSe]:LSEQuencer:TIMEout:TRIGger <time> [:SENSe]:LSEQuencer:TIMEout:TRIGger? [:SENSe]:LSEQuencer:TIMEout:TRIGger:STATE OFF ON 0 1 [:SENSe]:LSEQuencer:TIMEout:TRIGger:STATE?
Example	LSEQ:TIM:TRIG 500ms
Couplings	The measurement is only aborted if “Abort on Error” is enabled. Coupled to the integrity indicator “Trigger Error”.
Preset	2 s Off
State Saved	Saved in instrument state.
Range	1 us to 4 ks
Min	1 us
Max	4 ks
Initial S/W Revision	A.05.00

Include Source in Sequence

This parameter determines if the internal source is incorporated into the analyzer sequence. When the source sequence is incorporated in this way, the source sequence is initiated automatically by the analyzer sequence, and cannot be initiated independently.

Key Path	Meas Setup
Remote Command	[:SENSe]:LSEQuencer:INCLude:SOURce YES NO 0 1 [:SENSe]:LSEQuencer:INCLude:SOURce?
Example	LSEQ:INCL:SOUR YES LSEQ:INCL:SOUR?
Dependencies	<ul style="list-style-type: none"> • If Source->List Sequencer->Sequencer is set OFF, “Include Source” will be disabled. • If Source->List Sequencer->Sequencer is set ON, “Include Source” will be enabled.

Couplings	If Source->List Sequencer->Sequencer is set OFF, "Include Source" will be set to NO.
Preset	On
State Saved	Saved in instrument state.
Range	YES NO 0 1
Initial S/W Revision	A.05.00

Abort on Limit Fail

This parameter is used to toggle abort on a limit failing while a sequence measurement is being made. When set to ON, if any of the selected measurements on an analysis step fails its pass/fail limits, the sequence aborts at the current point and fails to complete the full sequence if any more acquisitions or measurements have still to be made. When set to OFF, if any measurements fail their limits, then the sequence acquisitions and measurements carry on regardless. This only applies to measurements that have their respective limit test parameters enabled.

Key Path	Meas Setup, Abort On Limit Fail
Mode	SEQA
Remote Command	[:SENSe] :LSEQuencer:ABORt:LIMit:FAIL[:STATe] ON OFF 1 0 [:SENSe] :LSEQuencer:ABORt:LIMit:FAIL[:STATe] ?
Example	LSEQ:ABOR:LIM:FAIL ON LSEQ:ABOR:LIM:FAIL?
Dependencies	This only applies to limits that have their respective limit test parameters enabled. Measurements that this parameter does not apply to due to not having limits are: <ul style="list-style-type: none"> • Basic Discrete PAVT • Basic IQ Data • WCDMA Code Domain Power
Preset	OFF
State Saved	Saved in instrument state.
Range	ON OFF 1 0
Initial S/W Revision	A.05.00

Abort on Error

When this parameter is set to ON, if any of the integrity errors (see "[Integrity Indicator](#)" on page 285) occur, the sequence aborts at the current point, and fails to complete the full sequence if any more acquisitions or measurements have still to be made. When set to OFF, if any integrity errors occur, then the sequence acquisitions and measurements carry on regardless.

NOTE When set to ON, if any errors are in the error queue then the measurement aborts immediately. To avoid this, send *CLS or clear the error queue prior to starting the measurement.

Key Path	Meas Setup, Abort On Error
Mode	SEQA
Remote Command	[:SENSe] :LSEQuencer :ABORt :ERRor [:STATe] ON OFF 1 0 [:SENSe] :LSEQuencer :ABORt :ERRor [:STATe] ?
Example	LSEQ:ABOR:ERR ON LSEQ:ABOR:ERR?
Preset	OFF
State Saved	Saved in instrument state.
Range	ON OFF 1 0
Initial S/W Revision	A.05.00

Input Trigger Setup

This sets the input trigger parameters that cannot be set within the acquisition parameters. These are set for the entire Sequence.

NOTE The input trigger parameters detailed in this section are shared with the test set's source module.

Key Path	Meas Setup
Mode	Sequence Analyzer
Initial S/W Revision	A.05.00

Trigger Holdoff

Opens up a menu that lets you adjust Trigger Holdoff parameters.

Key Path	Meas Setup, Input Trigger Setup
Initial S/W Revision	A.11.50

Trig Holdoff

This parameter sets the trigger holdoff time and state. When the state is On, then the trigger only occurs after holdoff time expires (if the trigger condition is satisfied during the time span). The trigger condition is defined by "[Holdoff Type](#)" on page 462.

Key Path	Meas Setup, Input Trigger Setup, Trigger Holdoff
Remote Command	:TRIGger :LSEQuencer [:SEQuence] :HOLDoff <time> :TRIGger :LSEQuencer [:SEQuence] :HOLDoff? :TRIGger :LSEQuencer [:SEQuence] :HOLDoff :STATe OFF ON 0 1 :TRIGger :LSEQuencer [:SEQuence] :HOLDoff :STATe?

Example	:TRIG:LSEQ:HOLD 500ms :TRIG:LSEQ:HOLD?
Example	:TRIG:LSEQ:HOLD:STAT 1 :TRIG:LSEQ:HOLD:STAT?
Preset	0s Off
State Saved	Saved in instrument state.
Range	0s to 4s
Min	0 s
Max	4 s
Initial S/W Revision	A.11.50

Holdoff Type

Lets you set the Trigger Holdoff Type (Above or Below).

- **Above:** If the trigger slope is positive, a trigger event is generated only if the signal characteristic of interest crosses the trigger threshold (with positive slope) and then remains above the threshold for at least the holdoff time. For negative slope, the trigger event is generated if the signal characteristic crosses the threshold (with negative slope) after having been above the threshold for at least the holdoff time. In either case, the trigger event is associated with the time the level was crossed.
- **Below:** If the trigger slope is positive, a trigger event is generated only if the signal characteristic of interest crosses the trigger threshold (with positive slope) after having been below the threshold for at least the holdoff time. For negative slope, the trigger event is generated if the signal characteristic crosses the threshold (with negative slope) and then remains below the threshold for at least the holdoff time. In either case, the trigger event is associated with the time the level was crossed.

Key Path	Meas Setup, Input Trigger Setup, Trigger Holdoff
Remote Command	:TRIGger:LSEQuencer[:SEQuence]:HOLDoff:TYPE BELOW ABOVE :TRIGger:LSEQuencer[:SEQuence]:HOLDoff TYPE?
Example	TRIG:LSEQ:HOLD:TYPE BELOW TRIG:LSEQ:HOLD:TYPE?
Preset	Below
State Saved	Saved in instrument state.
Initial S/W Revision	A.11.50

RF Burst

Sets the trigger type to RF Burst (that is, RF magnitude triggering).

Key Path	Meas Setup, Input Trigger Setup
Mode	Sequence Analyzer
Initial S/W Revision	A.05.00

Trig Slope

This parameter controls the trigger polarity for the RF Burst trigger. It is set positive to trigger on a rising edge, and negative to trigger on a falling edge.

Key Path	Meas Setup, Input Trigger Setup
Remote Command	:TRIGger:LSEQuencer:RFBurst:SLOPe POSitive NEGative :TRIGger:LSEQuencer:RFBurst:SLOPe?
Example	TRIG:LSEQ:RFB:SLOP NEG TRIG:LSEQ:RFB:SLOP?
Preset	POSitive
State Saved	Saved in instrument state.
Initial S/W Revision	A.05.00

Video

Sets the trigger type to Video (that is, IF envelope triggering).

Key Path	Meas Setup, Input Trigger Setup
Mode	Sequence Analyzer
Initial S/W Revision	A.05.00

Trig Slope

This parameter controls the trigger polarity for the Video trigger. It is set positive to trigger on a rising edge, and negative to trigger on a falling edge.

Key Path	Meas Setup, Input Trigger Setup
Remote Command	:TRIGger:LSEQuencer:VIDeo:SLOPe POSitive NEGative :TRIGger:LSEQuencer:VIDeo:SLOPe?
Example	TRIG:LSEQ:VID:SLOP NEG TRIG:LSEQ:VID:SLOP?
Preset	POSitive
State Saved	Saved in instrument state.
Initial S/W Revision	A.05.00

External 1

Sets the trigger type to External 1 (uses a signal applied to TRIGGER 1 IN connector).

Key Path	Meas Setup, Input Trigger Setup
Mode	Sequence Analyzer
Initial S/W Revision	A.05.00

Trigger Level

Sets the voltage level for the External 1 trigger.

Key Path	Meas Setup, Input Trigger Setup
Remote Command	:TRIGger:LSEQuencer:EXTernal1:LEVel <level> :TRIGger:LSEQuencer:EXTernal1:LEVel?
Example	TRIG:LSEQ:EXT1:LEV 1.0 TRIG:LSEQ:EXT1:LEV?
Dependencies	This parameter is used for Ext1 trigger only. Disabled if anything else.
Preset	1.2 V
State Saved	Saved in instrument state.
Min	-5 V
Max	5 V
Initial S/W Revision	A.05.00

Trig Slope

This parameter controls the trigger polarity for the External 1 trigger. It is set positive to trigger on a rising edge, and negative to trigger on a falling edge.

Key Path	Meas Setup, Input Trigger Setup
Remote Command	:TRIGger:LSEQuencer:EXTernal1:SLOPe POSitive NEGative :TRIGger:LSEQuencer:EXTernal1:SLOPe?
Example	TRIG:LSEQ:EXT1:SLOP NEG TRIG:LSEQ:EXT1:SLOP?
Preset	POSitive
State Saved	Saved in instrument state.
Initial S/W Revision	A.05.00

External 2

Sets the trigger type to External 2 (uses a signal applied to TRIGGER 2 IN connector).

Key Path	Meas Setup, Input Trigger Setup
Mode	Sequence Analyzer
Initial S/W Revision	A.05.00

Trigger Level

Sets the voltage level for the External 2 trigger.

Key Path	Meas Setup, Input Trigger Setup
Remote Command	:TRIGger:LSEQuencer:EXTernal2:LEVel <level> :TRIGger:LSEQuencer:EXTernal2:LEVel?
Example	TRIG:LSEQ:EXT2:LEV 1.0 TRIG:LSEQ:EXT2:LEV?
Dependencies	This parameter is used for Ext2 trigger only. Disabled if anything else.
Preset	1.2 V
State Saved	Saved in instrument state.
Min	-5 V
Max	5 V
Initial S/W Revision	A.05.00

Trig Slope

This parameter controls the trigger polarity for the External 2 trigger. It is set positive to trigger on a rising edge, and negative to trigger on a falling edge.

Key Path	Meas Setup, Input Trigger Setup
Remote Command	:TRIGger:LSEQuencer:EXTernal2:SLOPe POSitive NEGative :TRIGger:LSEQuencer:EXTernal2:SLOPe?
Example	TRIG:LSEQ:EXT2:SLOP NEG TRIG:LSEQ:EXT2:SLOP?
Preset	POSitive
State Saved	Saved in instrument state.
Initial S/W Revision	A.05.00

IF Gain

In order to take full advantage of the RF dynamic range of the test set's analyzer, a switched IF amplifier with approximately 10 dB of gain can be toggled. If it can be turned on without an overload, the dynamic range is always better with it on than off. The IF Gain key can be used to set the IF Gain function to High (High Gain - the extra 10 dB) or Low (Low Gain). These settings affect sensitivity and IF overloads.

This setting is not displayed for E6607C

Key Path	Meas Setup, IF Gain
Remote Command	[:SENSe] :LSEQuencer :IF :GAIN [:STATe] LOW HIGH [:SENSe] :LSEQuencer :IF :GAIN [:STATe] ?
Example	LSEQ:IF:GAIN?
Notes	Not displayed for E6607C
Preset	LOW
State Saved	Saved in instrument state.
Readback Text	High Gain or Low Gain
Initial S/W Revision	A.05.00

Low Gain

Deactivates the FFT IF Gain.

Key Path	Meas setup, IF Gain
Example	LSEQ:IF:GAIN LOW
State Saved	Saved in instrument state.

High Gain

Activates the FFT IF Gain.

Key Path	Meas setup, IF Gain
Example	LSEQ:IF:GAIN HIGH
State Saved	Saved in instrument state.

Meas Preset

For more information, see the section under the Preset key in the Utility section.

Key Path	Meas Setup
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RF Input Port Mode

When this parameter is set to List, RF Input path of each acquisition can be set independently, (see Section "Acquisition RF Input Port " on page 447 Acquisition RF Input Port). Otherwise, all the acquisitions will use the same RF Input port setting under Input/Output menu.

Key Path	Meas Setup, RF Input Port Mode
Mode	SEQA
Remote Command	[:SENSe] :LSEQuencer :PORT :INPut :MODE FIXed LIST [:SENSe] :LSEQuencer :PORT :INPut :MODE ?
Example	LSEQ:PORT:INP:MODE LIST LSEQ:PORT:INP:MODE ?
Preset	Fixed
State Saved	Saved in instrument state.
Range	Fxied List
Initial S/W Revision	A.14.00

6 List Sequence Measurements
Mode

Mode

See ["Mode" on page 142](#)

Mode Preset

Returns the active mode to a known state.

Mode Preset does the following for the currently active mode:

- Aborts the currently running measurement.
- Brings up the default menu for the mode, with no active function.
- Sets measurement Global settings to their preset values for the active mode only.
- Activates the default measurement.
- Brings up the default menu for the mode.
- Clears the input and output buffers.
- Sets Status Byte to 0.

Mode Preset does not:

- Cause a mode switch
- Affect mode persistent settings
- Affect system settings
- See "[How-To Preset](#)" on page 470 for more information.

Key Path	Front-panel key
Remote Command	:SYSTem:PRESet
Example	:SYST:PRES
Notes	*RST is preferred over :SYST:PRES for remote operation. *RST does a Mode Preset, as done by the :SYST:PRES command, and it sets the measurement mode to Single measurement rather than Continuous for optimal remote control throughput. Clears all pending OPC bits. The Status Byte is set to 0.
Couplings	A Mode Preset aborts the currently running measurement, activates the default measurement, and gets the mode to a consistent state with all of the default couplings set.
Backwards Compatibility Notes	In the X-Series, the legacy "Factory Preset" has been replaced with Mode Preset, which only presets the currently active mode, not the entire instrument. In the X-Series, the way to preset the entire instrument is by using System, Restore System Defaults All, which behaves essentially the same way as restore System Defaults does on ESA and PSA. There is also no "Preset Type" as there is on the PSA. There is a green Mode Preset front-panel key that does a Mode Preset and a white-with-green-letters User Preset front-panel key that does a User Preset. The old PRESet:TYPE command is ignored (without generating an error), and SYST:PRES without a parameter does a Mode Preset, which should cover most backward code compatibility issues. The settings and correction data under the Input/Output front-panel key (examples: Input Z Corr, Ext Amp Gain, etc.) are no longer part of any Mode, so they will not be preset by a Mode Preset. They are preset using Restore Input/Output Defaults, Restore System Defaults All. Note that because User Preset does a Recall State, and all of these settings are saved in State, they ARE recalled when using

	User Preset.
Initial S/W Revision	Prior to A.02.00

How-To Preset

The table below shows all possible presets, their corresponding SCPI commands and front-panel access (key paths). Instrument settings depend on the current measurement context. Some settings are local to the current measurement, some are global (common) across all the measurements in the current mode, and some are global to all the available modes. In a similar way, restoring the settings to their preset state can be done within the different contexts.

Auto Couple - is a measurement local key. It sets all Auto/Man parameter couplings in the measurement to Auto. Any Auto/Man selection that is local to other measurements in the mode will not be affected.

Meas Preset - is a measurement local key. Meas Preset resets all the variables local to the current measurement except the persistent ones.

Mode Preset - resets all the current mode's measurement local and measurement global variables except the persistent ones.

Restore Mode Defaults - resets ALL the Mode variables (and all the Meas global and Meas local variables), including the persistent ones.

Type Of Preset	SCPI Command	Front Panel Access
Auto Couple	:COUPle ALL	Auto Couple front-panel key
Meas Preset	:CONFigure:<Measurement>	Meas Setup Menu
Mode Preset	:SYSTem:PRESet	Mode Preset (green key)
Restore Mode Defaults	:INSTrument:DEFault	Mode Setup Menu
Restore All Mode Defaults	:SYSTem:DEFault MODes	System Menu; Restore System Default Menu
*RST	*RST	not possible (Mode Preset with Single)
Restore Input/Output Defaults	:SYSTem:DEFault INPUt	System Menu; Restore System Default Menu
Restore Power On Defaults	:SYSTem:DEFault PON	System Menu; Restore System Default Menu
Restore Alignment Defaults	:SYSTem:DEFault ALIGn	System Menu; Restore System Default Menu
Restore Miscellaneous Defaults	:SYSTem:DEFault MISC	System Menu; Restore System Default Menu
Restore All System Defaults	:SYSTem:DEFault [ALL] :SYSTem:PRESet:PERsistent	System Menu; Restore System Default Menu
User Preset	:SYSTem:PRESet:USER	User Preset Menu
User Preset All Modes	:SYSTem:PRESet:USER:ALL	User Preset Menu

Power On Mode Preset	:SYSTem:PON:TYPE MODE	System Menu
Power On User Preset	:SYSTem:PON:TYPE USER	System Menu
Power On Last State	:SYSTem:PON:TYPE LAST	System Menu

Mode Setup

This key accesses a menu to allow you to select mode parameters. These settings apply to all measurements in the current mode. There are no Mode Parameters. All parameters are set in the List Sequencer Measurement.

Key Path	Front-panel key
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Restore Mode Defaults

Resets the state for the currently active mode by resetting the mode persistent settings to their factory default values, clearing mode data and by performing a Mode Preset. This function will never cause a mode switch. This function performs a full preset for the currently active mode; whereas, Mode Preset performs a partial preset. Restore Mode Defaults does not affect any system settings. System settings are reset by the Restore System Defaults function. This function does reset mode data; as well as settings.

Key Path	Mode Setup
Remote Command	:INSTRument:DEFault
Example	:INST:DEF
Notes	Clears all pending OPC bits. The Status Byte is set to 0. A message comes up saying: "If you are sure, press key again".
Couplings	A Restore Mode Defaults will cause the currently running measurement to be aborted and causes the default measurement to be active. It gets the mode to a consistent state with all of the default couplings set.
Initial S/W Revision	Prior to A.02.00

Preset Type (Remote Command Only)

As stated in the Backward Compatibility section, to be compatible with ESA/PSA the PRESet:TYPE command will be implemented as a no-op.

Mode	All
Remote Command	:SYSTem:PRESet:TYPE FACTory MODE USER :SYSTem:PRESet:TYPE?
Example	:SYST:PRESet:TYPE FACT
Notes	This command is supported for backward compatibility only. It is a no-op which does not change the behavior of any preset operation.
Preset	This is unaffected by Preset but is set to Mode on a "Restore System Defaults->All"
State Saved	No
Initial S/W Revision	Prior to A.02.00

Print

See ["Print" on page 166](#)

Quick Save

The Quick Save front-panel key repeats the most recent save that was performed from the Save menu, with the following exceptions:

- Register saves are not remembered as Saves for the purpose of the Quick Save function
- If the current measurement does not support the last non-register save that was performed, an informational message is generated, "File type not supported for this measurement"

Quick Save repeats the last type of qualified save (that is, a save qualified by the above criteria) in the last save directory by creating a unique filename using the Auto File Naming algorithm described below.

If Quick Save is pressed after startup and before any qualified Save has been performed, the Quick Save function performs a Screen Image save using the current settings for Screen Image saves (current theme, current directory), which then becomes the "last save" for the purpose of subsequent Quick Saves.

The Auto File Naming feature automatically generates a file name for use when saving a file. The filename consists of a prefix and suffix separated by a dot, as is standard for the Windows® file system. A default prefix exists for each of the available file types:

Type	Default Prefix	Menu
State	State_	(Save/Recall)
Trace + State	State_	(Save/Recall)
Screen	Screen_	(Save/Recall)
Amplitude Corrections	Ampcor_	(Import/Export)
Traces	Trace_	(Import/Export)
Limit Lines	LLine_	(Import/Export)
Measurement Result	MeasR_	(Import/Export)
Capture Buffer	CapBuf_	(Import/Export)

A four digit number is appended to the prefix to create a unique file name. The numbering sequence starts at 0000 within each Mode for each file type and updates incrementally to 9999, then wraps to 0000 again. It remembers where it was through a Mode Preset and when leaving and returning to the Mode. It is reset by Restore Misc Defaults and Restore System Defaults and subsequent running of the instrument application. So, for example, the first auto file name generated for State files is State_0000.state. The next is State_0001, and so forth.

One of the key features of Auto File Name is that we guarantee that the Auto File Name will never conflict with an existing file. The algorithm looks for the next available number. If it gets to 9999, then it looks for holes. If it find no holes, that is no more numbers are available, it gives an error.

For example, if when we get to State_0010.state there is already a State_0010.state file in the current directory, it advances the counter to State_0011.state to ensure that no conflict will exist (and then it verifies that State_0011.state also does not exist in the current directory and advances again if it does, and so forth).

If you enter a file name for a given file type, then the prefix becomes the filename you entered instead of the default prefix, followed by an underscore. The last four letters (the suffix) are the 4-digit number.

For example, if you save a measurement results file as "fred.csv", then the next auto file name chosen for a measurement results save will be fred_0000.csv.

NOTE

Although 0000 is used in the example above, the number that is used is actually the current number in the Meas Results sequence, that is, the number that would have been used if you had not entered your own file name.

NOTE

If the filename you entered ends with _dddd, where d=any number, making it look just like an auto file name, then the next auto file name picks up where you left off with the suffix being dddd + 1.

Key Path	Front-panel key
Notes	No remote command for this key specifically.
Initial S/W Revision	Prior to A.02.00

Recall

The Recall menu lets you choose what you want to recall, and where you want to recall it from. Among the types of files you can recall are **States and Traces**. In addition, an Import (Data) option lets you recall a number of data types stored in CSV files (as used by Excel and other spreadsheet programs).

NOTE

In products that run multiple instances of the X-Series Application, all instances share the same register and file location where you want to recall from.

The default paths for Recall are data type dependent and are the same as for the Save key.

Key Path	Front-panel key
Notes	<p>No remote command for this key specifically, but the :MMEM:LOAD command is available for specific file types. An example is :MMEM:LOAD:STATe <filename>.</p> <p>If you try to recall a State file for a mode that is not licensed or not available in the instrument, an error message will occur and the state will not change.</p>
Backwards Compatibility Notes	<p>In legacy analyzers, it was possible to load a state without affecting the trace data, limit lines or correction data. Similarly (since User Preset is actually loading a state), it was possible to do a User Preset without affecting the trace data, limit lines or correction data.</p> <p>In the X-Series, "state" always includes all of this data; so whenever state is loaded, all of the traces, limit lines and corrections are affected. Although this differs from previous behavior, it is desirable behavior, and should not cause adverse issues for users.</p>
Backwards Compatibility Notes	<p>Recall for the X-Series supports backward compatibility in the sense that you can recall a state file from any X-Series model number and any version of X-Series software. This is only possible if part of the recalling process goes through a limiting step after recalling the mode settings, at least for settings that may vary with version number, model number, option and license differences. If you try to recall a state file onto an instrument with less capability than what was available on the instrument during the save, the recall will ignore the state it doesn't support and it will limit the recalled setting to what it allows.</p> <p>Example: if the saved state includes preamp ON, but the recalling instrument does not have a preamp; the preamp is limited to OFF. Conversely, if you save a state without a preamp, the preamp is OFF in the state file. When this saved file is recalled on an instrument with a licensed preamp, the preamp is changed to OFF. Another example is if the saved state has center frequency set to 20 GHz, but the instrument recalling the saved state is a different model and only supports 13.5 GHz. In this case, the center frequency is limited along with any other frequency based settings. Since the center frequency can't be preserved in this case, the recall limiting tries to at least preserve span to keep the measurement setup as intact as possible.</p> <p>It may be appropriate to issue a warning if the state is limited on the recall; warnings do not go out to SCPI so this would only affect the manual user.</p> <p>Note that there is no state file compatibility outside of the X-Series. For example, you cannot recall a state file from ESA or PSA.</p>
Initial S/W Revision	Prior to A.02.00

State

The Recall State menu lets you choose a register or file from which to recall the state.

The content of a state file includes all of the settings and data required to return the analyzer as closely as possible to the Mode it was in, with the exact settings that were in place, when the save occurred. The Mode settings in each state file include the settings that are affected by Mode Preset, as well as the additional settings affected by Restore Mode Defaults; all of the Mode's settings. In addition, all of the settings of the Input/Output system are included, even though they are outside of the Mode's state, because they are needed to restore the complete setup. Persistent System settings (for example, GPIB address) are not affected by either a Mode Preset or Restore Mode Defaults, nor are they included in a saved State file.

Since each state file is only for one Mode, the settings for other Modes are unaffected when it is loaded. Recall State will cause a mode switch if the state being recalled is not from the current active mode.

After the recall completes, the message "File <filename> recalled" or "Recalled State Register <register number>" is displayed.

For rapid recalls, the State menu lists 16 registers that you can choose from to recall. Pressing a Register key initiates the recall. You can also select a file from which to recall.

The default path for all State Files is:

My Documents\<<mode name>\state

where <mode name> is the parameter used to select the mode with the INST:SEL command (for example, SA for the Spectrum Analyzer).

See ["More Information" on page 478](#).

Key Path	Recall
Mode	All
Remote Command	:MMEMory:LOAD:STATe <filename>
Example	:MMEM:LOAD:STAT "myState.state" This recalls the file myState.state on the default path
Example	MMEM:LOAD:STAT "MyStateFile.state" This loads the state file data (on the default file directory path) into the instrument state.
Notes	<p>When you pick a file to recall, the analyzer first verifies that the file is recallable in the current instrument by checking the software version and model number of the instrument. If everything matches, a full recall proceeds by aborting the currently running measurement, clearing any pending operations, and then loading the State from the saved state file. You can open state files from any mode, so recalling a State file switches to the mode that was active when the save occurred. After switching to the mode of the saved state file, mode settings and data (if any for the mode) are loaded with values from the saved file. The saved measurement of the mode becomes the newly active measurement and the data relevant to the measurement (if there is any) is recalled.</p> <ul style="list-style-type: none"> • If there is a mismatch between file version or model number or instrument version or model number, the recall function tries to recall as much as possible and returns a warning message. It may limit settings that differ based on model number, licensing or version number. <p>After recalling the state, the Recall State function does the following:</p> <ul style="list-style-type: none"> • Makes the saved measurement for the mode the active measurement. • Clears the input and output buffers. • Status Byte is set to 0.

	<ul style="list-style-type: none"> • Executes a *CLS <p>If the file specified is empty an error is generated. If the specified file does not exist, another error is generated. If there is a mismatch between the file and the proper file type, an error is generated. If there is a mismatch between file version or model number or instrument version or model number, a warning is displayed. Then it returns to the State menu and File Open dialog goes away.</p> <p>After the Recall, the analyzer exits the Recall menu and returns to the previous menu.</p>
Backwards Compatibility SCPI	:MMEMory:LOAD:STATe 1,<filename>
Initial S/W Revision	Prior to A.02.00

More Information

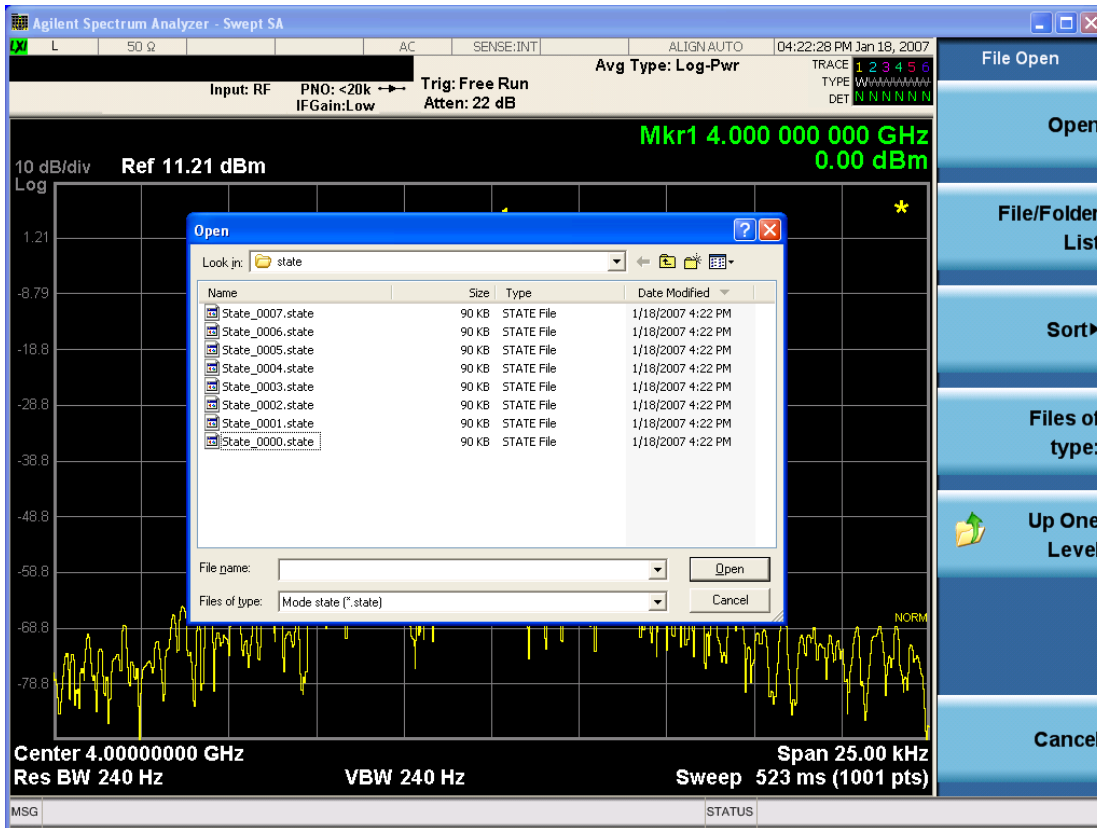
In measurements that support saving Traces, for example, Swept SA, the Trace data is saved along with the State in the State file. When recalling the State, the Trace data is recalled as well. Traces are recalled exactly as they were stored, including the writing mode and update and display modes. If a Trace was updating and visible when the State was saved, it will come back updating and visible, and its data will be rewritten right away. When you use State to save and recall traces, any trace whose data must be preserved should be placed in View or Blank mode before saving.

The following table describes the Trace Save and Recall possibilities:

You want to recall state and one trace's data, leaving other traces unaffected.	Save Trace+State from 1 trace. Make sure that no other traces are updating (they should all be in View or Blank mode) when the save is performed.	On Recall, specify the trace you want to load the one trace's data into. This trace will load in View. All other traces' data will be unaffected, although their trace mode will be as it was when the state save was performed.
You want to recall all traces	Save Trace+State from ALL traces.	On Recall, all traces will come back in View (or Blank if they were in Blank or Background when saved)
You want all traces to load exactly as they were when saved.	Save State	On recall, all traces' mode and data will be exactly as they were when saved. Any traces that were updating will have their data immediately overwritten.

From File...

When you press "From File", the analyzer brings up a Windows dialog and a menu entitled "File Open." This menu allows you to navigate to the various fields in the Windows dialog without using a keyboard or mouse. The Tab and Arrow keys can also be used for dialog navigation.



Listed below are the functions of the various fields in the dialog, and the corresponding softkeys:

Open

Performs the recall of the specified file. While the recall is being performed, the floppy icon appears briefly in the Meas bar.

File/Folder List

Enables you to navigate to the center of the dialog that contains the list of files and folders. Once here you can get information about the file and use the tab keys to navigate to the other fields in the dialog, such as Look In.

Look In

The Look In field shows the path from which the file will be recalled and allows you to change the path using the up and down arrow keys to navigate to other paths; the Enter key to open a directory; and the Backspace key to go back one directory. The **Look In field** first uses the last path from the Save As dialog **Save In**; path for that same file type. There is no softkey for directly navigating to the Look In field, but you can use the left tab to get here from the File/Folder List.

User specified paths are remembered when you leave and return to a Mode and are reset back to the default using Restore Mode Defaults.

Sort

Accesses a menu that enables you to sort the files within the File Open dialog. Only one sorting type can be selected at a time and the sorting happens immediately. The sorting types are By Date, By Name, By extension, and By Size.

Files of Type

This field shows the file suffix for the type of file you have selected to recall. For example, if you navigated here while recalling State, "Mode state (*.state)" is in the field. If you navigated here while recalling Trace, ""Mode state (*.trace)" is in the field. If you navigated here while importing a trace data file, "Trace Data (*.csv)" is in the field. For some file types, there is more than one choice in the dropdown menu, which you can select by using the up and down arrow keys and Enter.

Up One Level

This key corresponds to the icon of a folder with the up arrow that is in the tool bar of the dialog. When pressed, it causes the file and folder list to navigate up one level in the directory structure. The Backspace key does the same thing.

Cancel

This key corresponds to the Cancel selection in the dialog. It causes the current **Open** request to be cancelled. The ESC key does the same thing.

Key Path	Recall, State
Notes	Brings up the Open dialog for recalling a State Save Type
Initial S/W Revision	Prior to A.02.00

Edit Register Names

You may enter a custom name on any of the Register keys, to help you remember what you are using that state to save. To do this, press the Edit Register Names key, choose the register whose name you wish to edit, and then enter the desired label using the Alpha Editor or an external PC keyboard.

The maximum number of characters that can be added is 30. In most cases, 30 characters will fit on two lines of the key.

For more information and the SCPI command, see Edit Register Names under the Save, State function.

Key Path	Recall, State
Mode	All
Dependencies	N9060A-7FP or N9060B-2FP license required to edit the register names. When the feature is not licensed, sending the SCPI command generates an error, -221, "Settings conflict;Option not available"
Initial S/W Revision	A.11.00

Register 1 thru Register 16

Selecting any one of these register keys causes the State of the mode from the specified Register to be recalled. Each of the register keys annotates whether it is empty or at what date and time it was last

modified. In addition, you can use the Edit Register Names key under Save, State to enter custom names for each register.

NOTE

In products that run multiple instances of the X-Series Application, recalling the same register name on each instance is a way to share setups between the instances.

Registers are shared by all modes, so recalling from any one of the registers will cause a mode switch to the mode that was active when the save to the Register occurred.

Although these 16 registers are the only registers available from the front panel, there are 128 state registers available in the instrument. Registers 17–128 are only available from the SCPI interface, using the *RCL command.

After the recall completes, the message "Register <register number> recalled" appears in the message bar. If you are in the Spectrum Analyzer Mode, and you are recalling a register that was saved in the Spectrum Analyzer Mode, then after the recall, you will still be in the Recall Register menu. If the Recall causes you to switch modes, then after the Recall, you will be in the Frequency menu.

If a requested register is empty an error is generated.

Key Path	Recall, State
Example	*RCL 1
Range	1–16 from front panel, 1–128 from SCPI
Readback	Date and time with seconds resolution are displayed on the key OR A custom name of up to 30 characters entered using the Save, State, Edit Register Names key OR “(empty)” if no prior save operation has been performed to this register.
Initial S/W Revision	Prior to A.02.00
Modified at S/W Revision	Prior to A.11.00

Register 1 thru Register 16

Selecting any one of these register keys causes the State of the mode from the specified Register to be recalled. Each of the register keys annotates whether it is empty or at what date and time it was last modified. In addition, you can use the Edit Register Names key under Save, State to enter custom names for each register.

NOTE

In products that run multiple instances of the X-Series Application, recalling the same register name on each instance is a way to share setups between the instances.

Registers are shared by all modes, so recalling from any one of the registers will cause a mode switch to the mode that was active when the save to the Register occurred.

Although these 16 registers are the only registers available from the front panel, there are 128 state registers available in the instrument. Registers 17–128 are only available from the SCPI interface, using the *RCL command.

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If a requested register is empty an error is generated.

Key Path	Recall, State
Example	*RCL 1
Range	1-16 from front panel, 1-128 from SCPI
Readback	Date and time with seconds resolution are displayed on the key OR A custom name of up to 30 characters entered using the Save, State,Edit Register Names key OR “(empty)” if no prior save operation has been performed to this register.
Initial S/W Revision	Prior to A.02.00
Modified at S/W Revision	Prior to A.11.00

Sequences

These keys allow you to import a Tab separated or .txt file that will automatically setup all the parameters required for building a Sequence. The parameters will automatically be loaded into the Stated Sequencer.

Once selected, in order to import the selected Sequence Type you must select the Open key in the Source Sequence menu.

Key Path	Recall, Sequences
Mode	All
Remote Command	:MMEMory:LOAD:SEQuences: SLIS ALIS SAALIS "MySequence.txt"
Example	:MMEM:LOAD:SEQ:SLIS "MySequence.txt"
Notes	Available file types are: –CSV (Comma delimited) (*.csv) –Text (Tab delimited) (*.txt)
Initial S/W Revision	A.05.00

Source Sequence

The list of parameters, that configure steps, that makes up a sequence for the Source.

The Source sequence is a sequence of flexible configurable steps that can be set anywhere in the instruments frequency range.

Key Path	Recall,Sequences
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Example	:MMEM:LOAD:SEQ:SLIS "MySequence.txt"
Dependencies	Only available in XOBT
Initial S/W Revision	A.05.00

Analyzer Sequence

Only Available in: Sequence Analyzer Mode

The list of parameters, that configure steps, that makes up a sequence for the Analyzer.

The Analyzer sequence is a sequence of flexible configurable steps that can be set anywhere in the instruments frequency range for measuring the performance of a transmitters output

Key Path	Recall,Sequences
Example	:MMEM:LOAD:SEQ:ALIS "MySequence.txt"
Dependencies	Only available in XOBT, Sequence Analyzer mode
Initial S/W Revision	A.05.00

Source and Analyzer Sequence

Only Available in: Sequence Analyzer Mode

The list of parameters, that configure steps, that makes up sequences for the Analyzer and the Source.

The Source and Analyzer sequence is completely configurable and can have internal triggers between the source and the analyzer to orchestrate a sequence to completely test an external transmitter and receiver's performance.

Key Path	Recall,Sequences
Example	:MMEM:LOAD:SEQ:SAAL "MySequence.txt"
Dependencies	Only available in XOBT, Sequence Analyzer mode
Initial S/W Revision	A.05.00

Open...

When you press "Open", the analyzer brings up a Windows dialog and a menu entitled "File Open." This menu allows you to navigate to the various fields in the Windows dialog without using a keyboard or mouse. The Tab and Arrow keys can also be used for dialog navigation.

See "[From File...](#)" on page 478 in Recall, State, for a full description of this dialog and menu.

Key Path	Recall, Data
Notes	The key location is mode-dependent and will vary.

	Brings up Open dialog for recalling a <mode specific> Save Type
Initial S/W Revision	Prior to A.02.00

Data (Import)

Importing a data file loads data that was previously saved from the current measurement or from other measurements and/or modes that produce compatible data files. The Import Menu only contains Data Types that are supported by the current measurement.

Since the commonly exported data files are in .csv format, the data can be edited by the user prior to importing. This allows you to export a data file, manipulate the data in Excel (the most common PC Application for manipulating .csv files) and then import it.

Importing Data loads measurement data from the specified file into the specified or default destination, depending on the data type selected. Selecting an Import Data menu key will not actually cause the importing to occur, since the analyzer still needs to know from where to get the data. Pressing the Open key in this menu brings up the Open dialog and Open menu that provides you with the options from where to recall the data. Once a filename has been selected or entered in the Open menu, the recall occurs as soon as the Open button is pressed.

Key Path	Recall
Mode	All
Notes	The menu is built from whatever data types are available for the mode. Some keys will be missing completely, so the key locations in the sub-menu will vary. No SCPI command directly controls the Data Type that this key controls. The Data Type is included in the MMEM:LOAD commands.
Dependencies	If a file type is not used by a certain measurement, it is grayed out for that measurement. The key for a file type will not show at all if there are no measurements in the Mode that support it.
Preset	Is not affected by Preset or shutdown, but is reset during Restore Mode Defaults
Readback	The data type that is currently selected
Initial S/W Revision	Prior to A.02.00

Amplitude Correction

This key selects the Amplitude Corrections as the data type to be imported. When pressed a second time, it brings up the Select Menu, which lets you select the Correction into which the data will be imported.

Amplitude Corrections are fully discussed in the documentation of the Input/Output key, under the Corrections key.

A set of preloaded Corrections files can be found in the directory

/My Documents/ EMC Limits and Ampcor.

When the Amplitude Correction is an Antenna correction and the Antenna Unit in the file is not None, the Y Axis Unit setting will change to match the Antenna Unit in the file.

Key Path	Recall
Mode	SA EDGE GSM PN
Remote Command	:MMEMory:LOAD:CORRection 1 2 3 4 5 6 7 8, <filename>
Example	:MMEM:LOAD:CORR 2, "myAmpcor.csv" recalls the Amplitude Correction data from the file myAmpcor.csv in the current directory to the 2nd Amplitude Correction table, and turns on Correction 2. The default path is D:\User_My_Documents\Instrument\My Documents\amplitudeCorrections\
Dependencies	<p>Only the first correction array (Correction 1) supports antenna units. This means that a correction file with an Antenna Unit can only be loaded into the Corrections 1 register. Consequently only for Correction 1 does the dropdown in the Recall dialog include.ant, and if an attempt is made to load a correction file into any other Correction register which DOES contain an antenna unit, a Mass Storage error is generated.</p> <p>Corrections are not supported by all Measurements. If in a Mode in which some Measurements support it, this key will be grayed out in measurements that do not. The key will not show at all if no measurements in the Mode support it.</p> <p>Errors are reported if the file is empty or missing, or if the file type does not match, or if there is a mismatch between the file type and the destination data type. If any of these occur during manual operation, the analyzer returns to the Import Data menu and the File Open dialog goes away.</p> <p>This key does not appear unless you have the proper option installed in your instrument.</p> <p>This command will generate an "Option not available" error unless you have the proper option installed in your instrument.</p>
Couplings	When a correction file is loaded from mass storage, it is automatically turned on (Correction ON) and ApplyCorrections is set to On. This allows you to see its effect, thus confirming the load.
Readback	selected Correction
Backwards Compatibility SCPI	:MMEMory:LOAD:CORRection ANTenna CABLe OTHer USER, <filename>
	For backwards compatibility, ANTenna maps to 1, CABLe maps to 2, OTHer maps to 3 and USER maps to 4
Initial S/W Revision	A.02.00

Amplitude Correction

These keys let you select which Correction to import the data into. Once selected, the key returns back to the Import Data menu and the selected Correction number is annotated on the key. The next step is to select the Open key in the Import Data menu.

Antenna corrections are a particular kind of Amplitude Corrections – they are distinguished in the corrections file by having the Antenna Unit set to a value other than None. Only Correction 1 supports Antenna Units.

Key Path	Recall, Data, Amplitude Correction
Notes	auto return
Dependencies	Only Correction 1 may be used to load a Correction that contains an Antenna Unit other than None

Preset	Not part of Preset, but is reset to Correction 1 by Restore Input/Output Defaults; survives shutdown.
State Saved	The current Correction number is saved in instrument state
Initial S/W Revision	A.02.00

Open...

When you press “Open”, the analyzer brings up a Windows dialog and a menu entitled “**File Open.**” This menu allows you to navigate to the various fields in the Windows dialog without using a keyboard or mouse. The Tab and Arrow keys can also be used for dialog navigation.

See "[From File...](#)" on page 478 in Recall, State, for a full description of this dialog and menu.

Key Path	Recall, Data
Notes	The key location is mode-dependent and will vary. Brings up Open dialog for recalling a <mode specific> Save Type
Initial S/W Revision	Prior to A.02.00

Restart

The Restart function restarts the current sweep, or measurement, or set of averaged/held sweeps or measurements. If you are Paused, pressing Restart does a Resume.

The Restart function is accessed in several ways:

- Pressing the Restart key
- Sending the remote command INIT:IMMEDIATE
- Sending the remote command INIT:RESTART

See "[More Information](#)" on page 487

Key Path	Front-panel key
Remote Command	:INITiate[:IMMEDIATE] :INITiate:RESTART
Example	:INIT:IMM :INIT:REST
Notes	:INITiate:RESTART and :INITiate:IMMEDIATE perform exactly the same function.
Couplings	Resets average/hold count k. For the first sweep overwrites all active (update=on) traces with new current data. For application modes, it resets other parameters as required by the measurement.
Status Bits/OPC dependencies	This is an Overlapped command. The STATUS:OPERation register bits 0 through 8 are cleared. The STATUS:QUESTIONable register bit 9 (INTEgrity sum) is cleared. The SWEEPING bit is set. The MEASURING bit is set.
Backwards Compatibility Notes	For Spectrum Analysis mode in ESA and PSA, the Restart hardkey and the INITiate:RESTART command restart trace averages (displayed average count reset to 1) for a trace in Clear Write, but did not restart Max Hold and Min Hold. In the X-Series, the Restart hardkey and the INITiate:RESTART command restart not only Trace Average, but MaxHold and MinHold traces as well. For wireless comms modes in ESA and PSA, the Restart hardkey and the INITiate:RESTART command restart every measurement, which includes all traces and numeric results. There is no change to this operation.
Initial S/W Revision	Prior to A.02.00

More Information

The **Restart** function first aborts the current sweep/measurement as quickly as possible. It then resets the sweep and trigger systems, sets up the measurement and initiates a new data measurement sequence with a new data acquisition (sweep) taken once the trigger condition is met.

If the analyzer is in the process of aligning when **Restart** is executed, the alignment finishes before the restart function is performed.

Even when set for Single operation, multiple sweeps may be taken when Restart is pressed (for example, when averaging/holding is on). Thus when we say that **Restart** "restarts a measurement," we may mean:

- It restarts the current sweep
- It restarts the current measurement
- It restarts the current set of sweeps if any trace is in Trace Average, Max Hold or Min Hold
- It restarts the current set of measurements if Averaging, or Max Hold, or Min Hold is on for the measurement
- depending on the current settings.

With **Average/Hold Number** (in **Meas Setup** menu) set to 1, or Averaging off, or no trace in Trace Average or Hold, a single sweep is equivalent to a single measurement. A single sweep is taken after the trigger condition is met; and the analyzer stops sweeping once that sweep has completed. However, with **Average/Hold Number** >1 and at least one trace set to **Trace Average, Max Hold, or Min Hold (SA Measurement)** or **Averaging on (most other measurements)**, multiple sweeps/data acquisitions are taken for a single measurement. The trigger condition must be met prior to each sweep. The sweep is stopped when the average count k equals the number N set for **Average/Hold Number**. A measurement average usually applies to all traces, marker results, and numeric results; but sometimes it only applies to the numeric results.

Once the full set of sweeps has been taken, the analyzer will go to idle state. To take one more sweep without resetting the average count, increment the average count by 1, by pressing the step up key while **Average/Hold Number** is the active function, or sending the remote command `CALC:AVER:TCON UP`.

Save

The Save menu lets you choose what you want to save and where you want to save it. Among the types of files you can save are **States**, **Traces**, and **Screen Images**. In addition, an Export (Data) option lets you save a number of data types as CSV files for easy import into Excel and other spreadsheet programs.

Key Path	Front-panel key
Mode	All
Notes	No remote command for this key specifically, but the :MMEM:STORe command is available for specific file types. An example is :MMEM:STOR:STATe <filename>.
Initial S/W Revision	Prior to A.02.00

State

The Save State menu lets you choose a register or file for saving the state.

NOTE

In products that run multiple instances of the X-Series Application, all instances share the same register and file location where you want to save the state.

The content of a state file includes all of the settings and data required to return the analyzer as closely as possible to the Mode it was in, with the exact settings which were in place, when the save occurred. The Mode settings in each state file include the settings that are affected by Mode Preset, as well as the additional settings affected by Restore Mode Defaults; all of the Mode's settings. In addition, all of the settings of the Input/Output system are included, even though they are outside of the Mode's state, because they are needed to restore the complete setup. Persistent System settings (for example, Verbose SCPI) are not affected by either Mode Preset or Restore Mode Defaults, nor are they included in a saved State file.

After the save completes, the message "File <filename> saved" or "State Register <register number> saved" is displayed.

For rapid saving, the State menu lists 16 registers to save to. Pressing a Register key initiates the save. You can also select a file to save to.

The default path for all State Files is:

My Documents\<<mode name>\state

where <mode name> is the parameter used to select the mode with the INST:SEL command (for example, SA for the Spectrum Analyzer).

Key Path	Save
Mode	All
Remote Command	:MMEMory:STORe:STATe <filename>
Example	MMEM:STOR:STATe "MyStateFile.state" This stores the current instrument state data in the file MyStateFile.state in the default directory.
Notes	Both single and double quotes are supported for any filename parameter over remote.

After saving to a register, that register's menu key is updated with the date the time, unless a custom label has been entered for that key.

After saving to a register, you remain in the Save State menu, so that you can see the Register key update. After saving to a file, the analyzer automatically returns to the previous menu and any Save As dialog goes away.

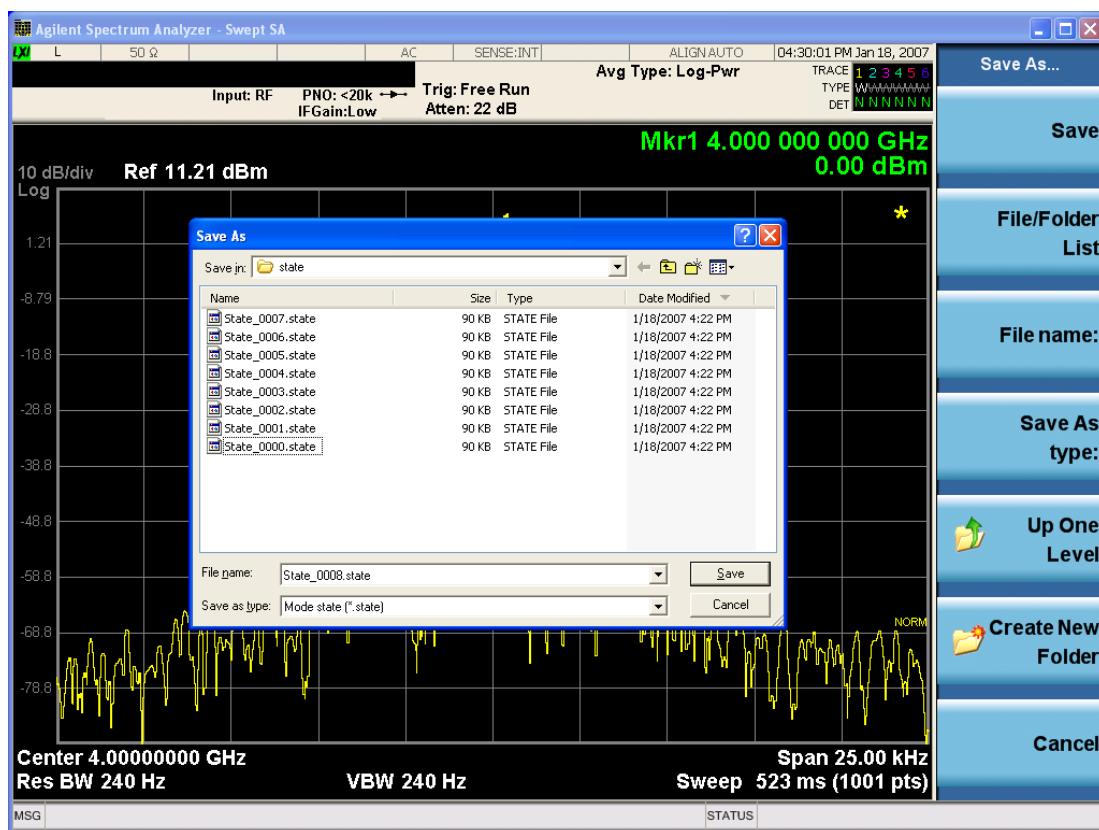
Backwards :MMEMory:STORE:STATe 1,<filename>

Compatibility SCPI For backwards compatibility, the above syntax is supported. The "1" is simply ignored. The command is sequential.

Initial S/W Revision Prior to A.02.00

To File . . .

When you press “To File”, the analyzer brings up a Windows dialog and a menu entitled “Save As.” This menu allows you to navigate to the various fields in the Windows dialog without using a keyboard or mouse. The Tab and Arrow keys can also be used for dialog navigation.



The Listed below

are the functions of the various fields in the dialog, and the corresponding softkeys:

Save

Performs the save to the specified file of the selected type. If the file already exists, a dialog will appear that allows you to replace the existing file by selecting OK, or you can Cancel the request. If you select OK,

the file will be overwritten. Using the C: drive is strongly discouraged, since it runs the risk of being overwritten during an instrument software upgrade.

While the save is being performed, the floppy icon appears briefly in the Meas bar.

File/Folder List

Enables you to navigate to the center of the dialog that contains the list of files and folders. Once here you can get information about the file and use the tab keys to navigate to the other fields in the dialog, such as Save In.

Save In

The Save In field shows the path to which the file will be saved and allows you to change the path using the up and down arrow keys to navigate to other paths; the Enter key to open a directory; and the Backspace key to go back one directory. The **Save In field** defaults to the default path for this type of file and remembers the last path you used to save this type of file. There is no softkey for directly navigating to the Save In field but you can use left tab to get here from the File/Folder List.

User specified paths are remembered when you leave and return to a Mode and are reset back to the default using Restore Mode Defaults.

File Name

The File Name field is initially loaded with an automatically generated filename specific to the appropriate Save Type. The automatically generated filename is guaranteed not to conflict with any filename currently in the directory. You may replace or modify this filename using the File Name key. See the ["Quick Save " on page 474](#) documentation for more on the automatic file naming algorithm.

When you press the File Name key the analyzer displays the Alpha Editor. Use the knob to choose the letter to add and the front-panel Enter key to add the letter to the file name. The BK character moves you back and the FW character moves you forward in the filename. The Select key on the front panel generates a space character. When you are done entering the filename press the Done softkey. This returns back to the **File Open** dialog and menu, but does not cause the save to occur.

Save As Type

This field shows the file suffix for the type of file you have selected to save. For example, if you navigated here while saving State, "Mode state (*.state)" is in the field. If you navigated here from saving Trace, ""Mode state (*.trace)" is in the field. If you navigated here while exporting a trace data file, "Trace Data (*.csv)" is in the field. For some file types, there is more than one choice in the dropdown, which you can select by using the up and down arrow keys and Enter.

Up One Level

This key corresponds to the icon of a folder with the up arrow that is in the tool bar of the dialog. When pressed, it causes the file and folder list to navigate up one level in the directory structure. The Backspace key does the same thing.

Create New Folder

This key corresponds to the icon of a folder with the "*" that is in the tool bar of the dialog. When pressed, a new folder is created in the current directory with the name **New Folder** and you can enter a new folder name using the Alpha Editor.

Cancel

This key corresponds to the Cancel selection in the dialog. It causes the current **Save As** request to be cancelled. The ESC key does the same thing.

Key Path	Save, State
Mode	All
Notes	Brings up Save As dialog for saving a State Save Type
Initial S/W Revision	Prior to A.02.00

Edit Register Names

You may enter a custom name on any of the Register keys, to help you remember what you are using that state to save. To do this, press the Edit Register Names key, choose the register whose name you wish to edit, and then enter the desired label using the Alpha Editor or an external PC keyboard.

The maximum number of characters that can be added is 30. In most cases, 30 characters will fit on two lines of the key.

See ["More Information" on page 492](#)

Key Path	Save, State
Mode	All
Remote Command	:MMEMory:REGister:STATe:LABel <reg number>,"label" :MMEMory:REGister:STATe:LABel? <reg number>
Example	:MMEM:REG:STAT:LAB 1,"my label"
Notes	<reg number> is an integer from 1 to 16. If the SCPI specifies an invalid register number an error message is generated, -222,"Data out of range;Invalid register label number" "label" is a string from 0 to 30 characters in length. If a label exceeds 30 characters, an error message is generated, -150,"String data error;Label clipped to 30 characters" "label" of length 0 erases the custom label and restores the default (time and date) label. E.g.: :MMEM:REG:STAT:LAB 1,""
Dependencies	N9060A-7FP or N9060B-2FP license required to edit the register names. When the feature is not licensed, sending this command generates an error, -221,"Settings conflict;Option not available"
Preset	The names are unaffected by Preset or power cycle but are set to the default label (time and date) on a "Restore System Defaults->Misc"
Initial S/W Revision	A.11.00

More Information

When you edit one of the register names, the time and date field will be replaced by the custom name.

If you delete all the characters in the custom name, it restores the default (time and date).

The register names are stored within the state files, but they are not part of the instrument state; that is, once you have edited a register name, loading a new state will not change that register name. Another

consequence of this is that the names will be persistent through a power cycle. Also, if a named state file is transferred to another analyzer, it will bring its custom name along with it.

If you try to edit the name of an empty register, the analyzer will first save the state to have a file to put the name in. If you load a named state file into an analyzer with older firmware it will ignore the metadata.

The *SAV and *RCL commands will not be affected by the custom register names, nor will the MMEM commands.

Register 1 thru Register 16

Selecting any one of these register menu keys causes the State of the currently active mode to be saved to the specified Register. The registers are provided for rapid saving and recalling, since you do not need to specify a filename or navigate to a file. Each of the register menu keys annotates whether it is empty or at what date and time it was last modified. In addition, you can use the Edit Register Names key to enter custom names for each register.

NOTE

In products that run multiple instances of the X-Series Application, save with different register name if you do not want to overwrite the register of another running instance.

Although these 16 registers are the only registers available from the front panel, there are 128 state registers available in the instrument. Registers 17–128 are only available from the SCPI interface, using the *SAV command.

There is one set of 128 state registers in the instrument, not one set for each Mode. When a state is saved, the Mode it was saved from is saved with it; then when it is recalled, the instrument switches to that Mode.

After the save completes, the corresponding register menu key annotation is updated with the date and time and the message "Register <register number> saved" is displayed.

Key Path	Save, State
Mode	All
Example	*SAV 1
Range	1–16 from front panel, 1–128 from SCPI
Readback	Date and time with seconds resolution are displayed on the key OR A custom name of up to 30 characters entered using the Edit Register Names key OR “(empty)” if no prior save operation has been performed to this register.
Initial S/W Revision	Prior to A.02.00
Modified at S/W Revision	A.11.00

Register 1 thru Register 16

Selecting any one of these register menu keys causes the State of the currently active mode to be saved to the specified Register. The registers are provided for rapid saving and recalling, since you do not need to specify a filename or navigate to a file. Each of the register menu keys annotates whether it is empty or at

what date and time it was last modified. In addition, you can use the Edit Register Names key to enter custom names for each register.

NOTE

In products that run multiple instances of the X-Series Application, save with different register name if you do not want to overwrite the register of another running instance.

Although these 16 registers are the only registers available from the front panel, there are 128 state registers available in the instrument. Registers 17–128 are only available from the SCPI interface, using the *SAV command.

There is one set of 128 state registers in the instrument, not one set for each Mode. When a state is saved, the Mode it was saved from is saved with it; then when it is recalled, the instrument switches to that Mode.

After the save completes, the corresponding register menu key annotation is updated with the date and time and the message "Register <register number> saved" is displayed.

Key Path	Save, State
Mode	All
Example	*SAV 1
Range	1–16 from front panel, 1–128 from SCPI
Readback	Date and time with seconds resolution are displayed on the key OR A custom name of up to 30 characters entered using the Edit Register Names key OR “(empty)” if no prior save operation has been performed to this register.
Initial S/W Revision	Prior to A.02.00
Modified at S/W Revision	A.11.00

Mass Storage Catalog (Remote Command Only)

Key path	SCPI Only
Remote Command	:MMEMory:CATalog? [<directory_name>]
Notes	The string must be a valid logical path. Queries disk usage information (drive capacity, free space available) and obtains a list of files and directories in a specified directory in the following format: <numeric_value>,<numeric_value>,{<file_entry>} It returns two numeric parameters and as many strings as there are files and directories. The first parameter indicates the total amount of storage currently used in bytes. The second parameter indicates the total amount of storage available, also in bytes. The <file_entry> is a string. Each <file_entry> indicates the name, type, and size of one file in the directory list: <file_name>,<file_type>,<file_size> As the windows file system has an extension that indicates file type, <file_type> is always empty. <file_size> provides the size of the file in bytes. For directories, <file_entry> is surrounded by square brackets and both <file_type> and <file_size> are empty
Initial S/W Revision	Prior to A.02.00

Mass Storage Change Directory (Remote Command Only)

Key path	SCPI Only
Remote Command	:MMEMory:CDIRectory [<directory_name>] :MMEMory:CDIRectory?
Notes	The string must be a valid logical path. Changes the default directory for a mass memory file system. The <directory_name> parameter is a string. If no parameter is specified, the directory is set to the *RST value. At *RST, this value is set to the default user data storage area, that is defined as System.Environment.SpecialFolder.Personal. Query returns full path of the default directory.
Initial S/W Revision	Prior to A.02.00

Mass Storage Copy (Remote Command Only)

Key path	SCPI Only
Remote Command	:MMEMory:COPY <string>,<string>[,<string>,<string>]
Notes	The string must be a valid logical path. Copies an existing file to a new file or an existing directory to a new directory. Two forms of parameters are allowed. The first form has two parameters. In this form, the first parameter specifies the source, and the second parameter specifies the destination. The second form has four parameters. In this form, the first and third parameters specify the source. The second and fourth parameters specify the directories. The first pair of parameters specifies the source. The second pair specifies the destination. An error is generated if the source doesn't exist or the destination file already exists. This command will generate an "access denied" error if the destination is a restricted folder (e.g., C:\Windows) and the current user does not have Power User or Administrator privileges.

Mass Storage Device Copy (Remote Command Only)

This command transfers data to/from a file and a peripheral device.

Key path	SCPI Only
Remote Command	:MMEMory:COPY:DEvice <source_string>,<dest_string>
Notes	The strings must be a valid logical path or a valid device keyword. If the dest_string is a device keyword, the data is copied from the source file to the device. If the source_string is a device keyword, the data is copied to the source file from the device. Valid device keywords are: SNS (smart noise source) An error is generated if the file or device is not found.

Mass Storage Delete (Remote Command Only)

Key path	SCPI Only
Remote Command	:MMEMory:DELeTe <file_name>[,<directory_name>]
Notes	The string must be a valid logical path. Removes a file from the specified directory. The <file_name> parameter specifies the file name to be removed. This command will generate an "access denied" error if the file is in a restricted folder (e.g., C:\Windows) and the current user does not have Power User or Administrator privileges.
Initial S/W Revision	Prior to A.02.00

Mass Storage Data (Remote Command Only)

Creates a file containing the specified data OR queries the data from an existing file.

Key path	SCPI Only
Remote Command	:MMEMory:DATA <file_name>, <data> :MMEMory:DATA? <file_name>
Notes	The string must be a valid logical path. The command form is MMEMory:DATA <file_name>,<data>. It loads <data> into the file <file_name>. <data> is in 488.2 block format. <file_name> is string data. The query form is MMEMory:DATA? <file_name> with the response being the associated <data> in block format.
Initial S/W Revision	Prior to A.02.00

Mass Storage Make Directory (Remote Command Only)

Key path	SCPI Only
Remote Command	:MMEMory:MDIRectory <directory_name>
Notes	The string must be a valid logical path. Creates a new directory. The <directory_name> parameter specifies the name to be created. This command will generate an "access denied" error if the new directory would be in a restricted folder (e.g., C:\Windows) and the current user does not have Power User or Administrator privileges.
Initial S/W Revision	Prior to A.02.00

Mass Storage Move (Remote Command Only)

Key path	SCPI Only
Remote Command	:MMEMory:MOVE <string>,<string>[,<string>,<string>]
Notes	The string must be a valid logical path. Moves an existing file to a new file or an existing directory to a new directory.

Two forms of parameters are allowed. The first form has two parameters. In this form, the first parameter specifies the source, and the second parameter specifies the destination.

The second form has four parameters. In this form, the first and third parameters specify the source. The second and fourth parameters specify the directories. The first pair of parameters specifies the source. The second pair specifies the destination. An error is generated if the source doesn't exist or the destination file already exists.

This command will generate an "access denied" error if the destination is a restricted folder (e.g., C:\Windows) and the current user does not have Power User or Administrator privileges.

Initial S/W Revision Prior to A.02.00

Mass Storage Remove Directory (Remote Command Only)

Key path	SCPI Only
Remote Command	:MMEMory:RDIRectory <directory_name>
Notes	<p>The string must be a valid logical path.</p> <p>Removes a directory. The <directory_name> parameter specifies the directory name to be removed. All files and directories under the specified directory shall also be removed.</p> <p>This command will generate an "access denied" error if the folder is a restricted folder (e.g., C:\Windows) or is in a restricted folder and the current user does not have Power User or Administrator privileges.</p>

Initial S/W Revision Prior to A.02.00

Sequences

These keys allow you to save a Tab separated or CSV file of the setup parameters required to build a Sequence.

In order to save you must select the Save As button and choose a destination folder.

Key Path	Save, Sequences
Mode	All
Remote Command	:MMEM:STOR:SEquences: SLIST ALIST SAAList SSTep "MySequence.txt"
Example	:MMEM:STOR:SEQ:SLIST "MySequence.txt"
Notes	<p>Available file types are:</p> <ul style="list-style-type: none"> -CSV (Comma delimited) (*.csv) -Text (Tab delimited) (*.txt)

Initial S/W Revision A.05.00

Source Sequence

The list of parameters, that configure steps, that makes up a sequence for the Source.

The Source sequence is a sequence of flexible configurable steps that can be set anywhere in the instruments frequency range.

Key Path	Save, Sequences
Example	:MMEM:STOR:SEQ:SLIS "MySequence.txt"
Dependencies	Only available in XOBT
Initial S/W Revision	A.05.00

Analyzer Sequence

Only Available in: Sequence Analyzer Mode

The list of parameters, that configure steps, that makes up a sequence for the Analyzer.

The Analyzer sequence is a sequence of flexible configurable steps that can be set anywhere in the instruments frequency range for measuring the performance of a transmitters output

Key Path	Save, Sequences
Example	:MMEM:STOR:SEQ:ALIS "MySequence.txt"
Dependencies	Only available in XOBT, Sequence Analyzer mode
Initial S/W Revision	A.05.00

Source and Analyzer Sequence

Available in: Sequence Analyzer Mode

The list of parameters, that configure steps, that makes up a sequence for the Analyzer and the Source.

The Source and Analyzer sequence is completely configurable and can have internal triggers between the source and the analyzer to orchestrate a sequence to completely test an external transmitter and receiver's performance.

Key Path	Save, Sequences
Example	:MMEM:STOR:SEQ:SAAL "MySequence.txt"
Dependencies	Only available in XOBT, Sequence Analyzer mode
Initial S/W Revision	A.05.00

Save As . . .

This menu lets you select the location where you can save the Sequence. This menu is a standard Windows® dialog with Save As menu keys. The "File Name" field in the Save As dialog is initially loaded

with an automatically generated filename specific to the appropriate Save Type. The automatically generated filename is guaranteed not to conflict with any filename currently in the directory. You may replace or modify this filename using the File Name softkey. See the Quick Save key documentation for more on the automatic file naming algorithm.

The default path for all Sequence Files is:

My Documents\Sequences

Key Path	Save, Sequences
Mode	All
Notes	Brings up Save As dialog for saving a Sequence Save Type
Initial S/W Revision	A.05.00

Data (Export)

Exporting a data file stores data from the current measurement to mass storage files. The Export Menu only contains data types that are supported by the current measurement.

Since the commonly exported data files are in .csv format, the data can be edited by you prior to importing. This allows you to export a data file, manipulate the data in Excel (the most common PC Application for manipulating .csv files) and then import it.

Selecting an Export Data menu key will not actually cause the exporting to occur, since the analyzer still needs to know where you wish to save the data. Pressing the Save As key in this menu brings up the Save As dialog and Save As menu that allows you to specify the destination file and directory. Once a filename has been selected or entered in the Open menu, the export will occur as soon as the Save key is pressed.

Key Path	Save
Mode	All
Notes	The menu is built from whatever data types are available for the mode. So the key locations in the sub menu will vary. No SCPI command directly controls the Data Type that this key controls. The Data Type is included in the MMEM:STORe commands.
Dependencies	If a file type is not used by a certain measurement, that type is grayed out for that measurement. The key for a file type will not show at all if there are no measurements in the Mode that support it.
Preset	Is not affected by a Preset or shutdown, but is reset during Restore Mode Defaults
Readback	The data type that is currently selected
Initial S/W Revision	Prior to A.02.00

Amplitude Correction

Pressing this key selects **Amplitude Corrections** as the data type to be exported. Pressing this key again brings up the Select Menu, which allows the user to select which **Amplitude Correction** to save.

Amplitude Corrections are fully discussed in the documentation of the Input/Output key, under the Corrections softkey.

See "[Correction Data File](#) " on page 500

Key Path	Save
Remote Command	:MMEMory:STORe:CORRection 1 2 3 4 5 6, <filename>
Example	:MMEM:STOR:CORR 2 "myAmpcor.csv" saves Correction 2 to the file myAmpcor.csv on the current path. The default path is My Documents\amplitudeCorrections.
Notes	If the save is initiated via SCPI, and the file already exists, the file will be overwritten. Using the C: drive is strongly discouraged, since it runs the risk of being overwritten during an instrument software upgrade. Both single and double quotes are supported for any filename parameter over SCPI.
Dependencies	Corrections are not supported by all Measurements. If in a Mode in which some Measurements support it, this key will be grayed out in measurements that do not. The key will not show at all if no measurements in the Mode support it. This key will not appear unless you have the proper option installed in your instrument.
Readback	Selected Correction
Backwards Compatibility SCPI	:MMEMory:STORe:CORRection ANTenna CABLe OTHer USER, <filename> For backwards compatibility, ANTenna maps to 1, CABLe maps to 2, OTHer maps to 3 and USER maps to 4
Initial S/W Revision	A.02.00

Correction Data File

A Corrections Data File contains a copy of one of the analyzer correction tables. Corrections provide a way to adjust the trace display for predetermined gain curves (such as for cable loss).

Corrections files are text files in .csv (comma separated values) form, to make them importable into Excel or other spreadsheet programs. The format for Corrections files is as follows.

Line #	Type of field	Example	Notes
1	File type, must be "Amplitude Correction"	Amplitude Correction	May not be omitted
2	File Description (in quotes)	"Correction Factors for 11966E"	60 characters max; may be empty but may not be omitted. If exceeds 60 characters, error -233 Too much data reported
3	Comment (in quotes)	"Class B Radiated"	60 characters max; may be empty but may not be omitted. . If exceeds 60 characters, error -233 Too much data reported

Line #	Type of field	Example	Notes
4	Instrument Version, Model #	A.02.06,N9020A	May be empty but may not be omitted
5	Option List, File Format Version	K03 LFE EXM ,01	May be empty but may not be omitted
6	Freq Unit to be used for all frequency values in the file	Frequency Unit,MHz	assumed to be Hz if omitted
7	Antenna Unit	Antenna Unit,None	If omitted leaves the Antenna unit unchanged. The amplitude unit in the Antenna Unit field is a conversion factor that is used to adjust the Y Axis Units of the current mode, if the mode supports Antenna Units. For more details on antenna correction data, refer to the Input/Output,Corrections key description. Allowable values: dBuV/m, dBuA/m, dBG, dBpT, None
8	Freq Interpolation	Frequency Interpolation,Linear	if omitted leaves the Freq Interpolation unchanged. Allowable values: Linear, Logarithmic
9	Bias value in mA	Bias,0.00	If omitted leaves the Bias value unchanged (added as of A.08.50)
10	Bias State	Bias State,On	If omitted leaves the Bias State unchanged. Allowable values: On, Off (added as of A.08.50)
11	Overlap, two values, Freq1 and Freq2, separated by commas.	Overlap,33500,40000	Uses Freq Unit from line 6. Thus, in this example Freq1=33.5 GHz, Freq2= 40.0 GHz (see note below). If omitted leaves the overlap unchanged (added as of A.08.50)
12	DATA marker	DATA	Corrections data begins in the next line

Lines 2 through 5 can be empty but must appear in the file. Lines 6 through 11 are optional, the lines can be left out of the file altogether.

The Overlap row and the two Bias rows apply only to external mixing. Both are read-only, they are never written by the analyzer. The only way to insert or modify these rows is to edit the file with a text editor or a spreadsheet editor. These rows are intended for use by mixer manufacturers, as they allow the manufacturer to insert data about how the mixer corrections were generated and how they should be applied. The Bias rows allow you to specify whether to turn Bias on or off when the Correction is turned on and to specify a Bias value (turning off the Correction does not change the Bias, but turning it back on again sets it to the value specified in the file). The Overlap row allows you to specify an overlap region in which two different corrections may be applied. It is expected that in the corrections data itself, there will be TWO corrections values exactly at Max Freq, otherwise Overlap is ignored. The way the overlap is processed is as follows: if at any given time the current analyzer Start Freq is greater than Freq 1 and lower than Freq 2,

and the current Stop Freq is greater than Freq 2, extend the first correction point at or above Freq 2 down to Freq 1, rather than using the correction data between Freq1 and Freq2.

The Antenna Unit row can only be used in Correction register 1, because there can only be one setting for Antenna Unit at any given time. If a Correction whose Antenna Unit is set to anything but None is loaded into any Correction register but 1, an error is generated (Mass storage error; Can only load an Antenna Unit into Correction 1). When a correction file is saved from any Correction register but 1, Antenna Unit is always written as None.

Similarly, the Bias rows can only be used in Correction register 1, because there can only be one setting for Bias at any given time. If a Correction file with a Bias or Bias State row is loaded into any Correction register but 1, an error is generated: Mass storage error; Can only load Bias Settings into Correction 1

The data follows the DATA row, as comma separated X, Y pairs; one pair per line.

For example, suppose you have an Antenna to correct for on an N9020A version A.02.06 and the correction data is:

- 0 dB at 200 MHz
- 17 dB at 210 MHz
- 14.8 dB at 225 MHz

Then the file will look like:

- Amplitude Correction
- "Correction Factors for 11966E"
- "Class B Radiated"
- A.02.06,N9020A
- P13 EA3 UK6,01
- Frequency Unit,MHz
- Antenna Unit,dBuV/m
- Frequency Interpolation,Linear
- DATA
- 200.000000,0.00
- 210.000000,17.00
- 225.000000,14.80

The choices for the 1 of N fields in the metadata are as follows:

- Frequency Unit: Hz, kHz, MHz, GHz
- Antenna Unit: dBuV/m, dBuA/m, dBG, dBpT, None
- Frequency Interpolation: Logarithmic, Linear

Amplitude Correction

These keys let you choose which Correction to save. Once selected, the key returns back to the Export Data menu and the selected Correction number is annotated on the key.

The next step in the Save process is to select the Save As key in the Export Data menu.

Key Path	Save, Data, Amplitude Correction
Preset	Not part of a Preset, but is reset to Correction 1 by Restore Input/Output Defaults. Survives a shutdown.
Readback	1
Initial S/W Revision	A.02.00

Save As . . .

When you press "Save As", the analyzer brings up a Windows dialog and a menu entitled "**Save As.**" This menu allows you to navigate to the various fields in the Windows dialog without using a keyboard or mouse. The Tab and Arrow keys can also be used for dialog navigation.

See "[To File . . .](#)" on page 490 in Save, State for a full description of this dialog and menu.

The default path for saving files is:

For all of the Trace Data Files:

My Documents\`<mode name>`\data\traces

For all of the Limit Data Files:

My Documents\`<mode name>`\data\limits

For all of the Measurement Results Data Files:

My Documents\`<mode name>`\data\`<measurement name>`\results

For all of the Capture Buffer Data Files:

My Documents\`<mode name>`\data\captureBuffer

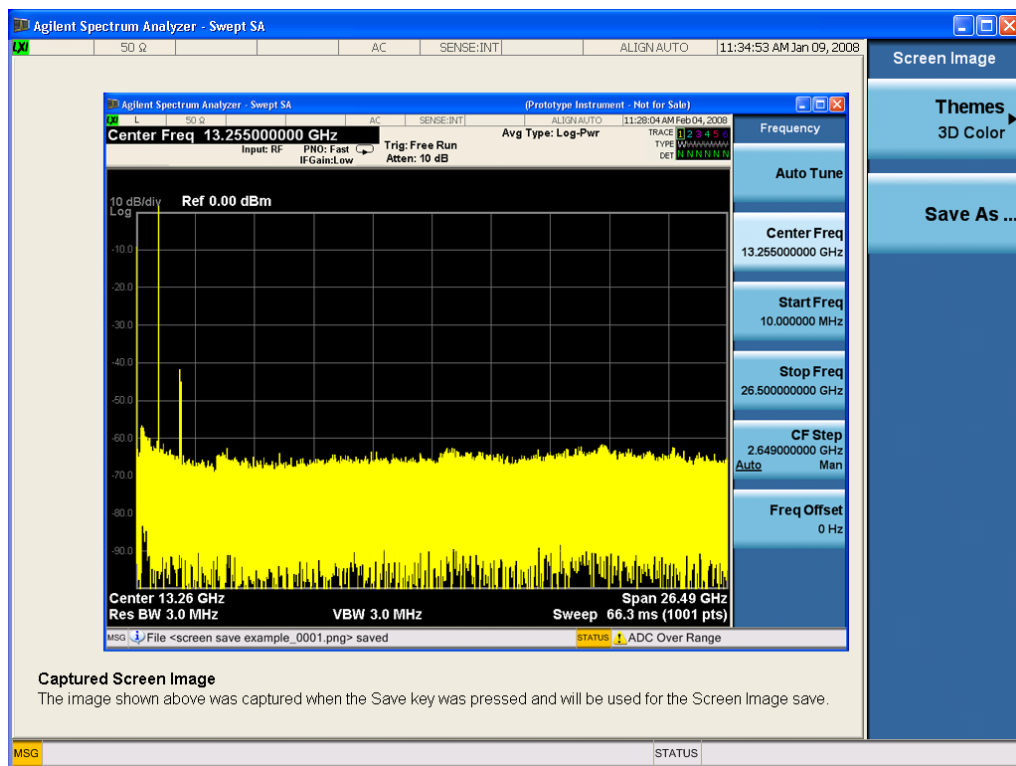
Key Path	Save, Data
Mode	All
Notes	The key location is mode-dependent and will vary. Brings up the Save As dialog for saving a <code><mode specific></code> Save Type. The save is performed immediately and does not wait until the measurement is complete.
Initial S/W Revision	Prior to A.02.00

Screen Image

Pressing Screen Image accesses a menu of functions that enable you to specify a format and location for the saved screen image. It brings up a menu that allows you to specify the color scheme of the Screen Image (Themes) or navigate to the Save As dialog to perform the actual save.

Screen Image files contain an exact representation of the analyzer display. They cannot be loaded back onto the analyzer, but they can be loaded into your PC for use in many popular applications.

The image to be saved is actually captured when the Save front panel key is pressed, and kept in temporary storage to be used if you ask for a Screen Image save. When the Screen Image key is pressed, a "thumbnail" of the captured image is displayed, as shown below:



When you continue on into the Save As menu and complete the Screen Image save, the image depicted in the thumbnail is the one that gets saved, showing the menus that were on the screen before going into the Save menus. The save is performed immediately and does not wait until the measurement is complete.

After you have completed the save, the Quick Save front-panel key lets you quickly repeat the last save performed, using an auto-named file, with the current screen data.

NOTE

For versions previous to A.01.55, if you initiate a screen image save by navigating through the Save menus, the image that is saved will contain the Save menu softkeys, not the menus and the active function that were on the screen when you first pressed the Save front panel key.

Key Path	Save
Mode	All

Remote Command	:MMEMory:STORe:SCReen <filename>
Example	:MMEM:STOR:SCR "myScreen.png" This stores the current screen image in the file MyScreenFile.png in the default directory.
Initial S/W Revision	Prior to A.02.00

Themes

Accesses a menu of functions that enable you to choose the theme to be used when saving the screen image.

The **Themes** option is the same as the **Themes** option under the **Display** and **Page Setup** dialogs. It allows you to choose between themes to be used when saving the screen image.

Key Path	Save, Screen Image
Remote Command	:MMEMory:STORe:SCReen:THEME TDColor TDMonochrome FCOLOR FMONochrome :MMEMory:STORe:SCReen:THEMe?
Example	:MMEM:STOR:SCR:THEM TDM
Preset	3D Color; Is not part of Preset, but is reset by Restore Misc Defaults or Restore System Defaults All and survives subsequent running of the modes.
Readback	3D Color 3D Mono Flat Color Flat Mono
Backwards Compatibility Notes	In ESA and PSA we offer the choice of "Reverse Bitmap" or "Reverse Metafile" when saving screen images. This is much like the "Flat Color" theme available in X-Series. Also, if you selected Reverse Bitmap AND a black & white screen image, that would be much like "Flat Monochrome". In other words, each of the X-Series themes has a similar screen image type in ESA/PSA. But they are not identical.
Initial S/W Revision	Prior to A.02.00

3D Color

Selects a standard color theme with each object filled, shaded and colored as designed.

Key Path	Save, Screen Image, Themes
Example	MMEM:STOR:SCR:THEM TDC
Readback	3D Color
Initial S/W Revision	Prior to A.02.00

3D Monochrome

Selects a format that is like 3D color but shades of gray are used instead of colors.

Key Path	Save, Screen Image, Themes
Example	MMEM:STOR:SCR:THEM TDM
Readback	3D Mono
Initial S/W Revision	Prior to A.02.00

Flat Color

Selects a format that is best when the screen is to be printed on an ink printer.

Key Path	Save, Screen Image, Themes
Example	MMEM:STOR:SCR:THEM FCOL
Readback	Flat Color
Initial S/W Revision	Prior to A.02.00

Flat Monochrome

Selects a format that is like Flat Color. But only black is used (no colors, not even gray), and no fill.

Key Path	Save, Screen Image, Themes
Example	MMEM:STOR:SCR:THEM FMON
Readback	Flat Mono
Initial S/W Revision	Prior to A.02.00

Save As...

When you press "Save As", the analyzer brings up a Windows dialog and a menu entitled "**Save As.**" This menu allows you to navigate to the various fields in the Windows dialog without using a keyboard or mouse. The Tab and Arrow keys can also be used for dialog navigation.

See "[To File . . .](#)" on page 490 in Save, State for a full description of this dialog and menu.

The default path for Screen Images is

My Documents\`<mode name>`\screen.

where `<mode name>` is the parameter used to select the mode with the INST:SEL command (for example, SA for the Spectrum Analyzer).

Key Path	Save, Screen Image
Notes	Brings up Save As dialog for saving a Screen Image Save Type
Initial S/W Revision	Prior to A.02.00

Single (Single Measurement/Sweep)

Sets the analyzer for Single measurement operation. The single/continuous state is Meas Global, so the setting will affect all the measurements. If you are Paused, pressing Single does a Resume.

See "[More Information](#)" on page 507

Key Path	Front-panel key
Example	:INIT:CONT OFF
Notes	See Cont key description.
Backwards Compatibility Notes	<p>For Spectrum Analysis mode in ESA and PSA, the Single hardkey and the INITiate:IMM switched from continuous measurement to single measurement and restarted sweeps and averages (displayed average count reset to 1), but did not restart Max Hold and Min Hold. In the X-Series, the Single hardkey and the INITiate:IMM command initiate a sweep/ measurement/ average sequence/hold sequence including MaxHold and MinHold.</p> <p>For Spectrum Analysis mode in ESA and PSA, the Single hardkey restarted the sweep regardless of whether or not you were in an active sweep or sweep sequence. In the X-Series, Restart does this but Single only restarts the sweep or sweep sequence if you are in the idle state.</p> <p>INIT[:IMM] in ESA & PSA Spectrum Analysis Mode does an implied ABORt. In some other PSA Modes, INIT[:IMM] is ignored if not in the idle state. . The X-Series follows the ESA/PSA SA Mode model, which may cause some Modes to have compatibility problems.</p>
Initial S/W Revision	Prior to A.02.00

More Information

See "[Restart](#)" on page 487 for details on the INIT:IMMEDIATE (Restart) function.

If you are already in single sweep, the INIT:CONT OFF command has no effect.

If you are already in Single Sweep, then pressing the Single key in the middle of a sweep does not restart the sweep or sequence. Similarly, pressing the Single key does not restart the sweep or sequence if the sweep is not in the idle state (for example, if you are taking a very slow sweep, or the analyzer is waiting for a trigger). Instead, it results in a message. "Already in Single, press Restart to initiate a new sweep or sequence". Even though pressing the Single key in the middle of a sweep does not restart the sweep, sending INIT:IMMEDIATE does reset it.

To take one more sweep without resetting the average count, increment the average count by 1, by pressing the step up key while **Average/Hold Number** is the active function, or sending the remote command CALC:AVER:TCON UP.

Source

Opens a menu of keys that access various source configuration menus and settings. In the test set, pressing this key also causes the central view area to change and display the Source Control Main view.

Key Path	Front-panel key
----------	-----------------

RF Output

This parameter sets the source RF power output state.

Key Path	Source
Remote Command	:OUTPut[:EXTernal][:STATe] ON OFF 1 0 :OUTPut[:EXTernal][:STATe]?
Example	OUTP OFF OUTP?
Notes	<p>The EXTernal node is shown in RD text so the SCPI remains the same between internal and external source control. However, for EXT we do not wish to document this node to the customer since we are controlling the internal source rather than the external source.</p> <p>This setting is for the independent mode and has no effect on the "List Sequencer" on page 587. If the "Sequencer" on page 588 is set to ON, the list sequencer controls the source output and this key will be grayed-out. And this setting will be none-forceful grey out on front panel to indicate out-of-scope. Non-forceful means user still can change this setting by SCPI but cannot change on front panel. When set to OFF will make source leave list sequencer and this setting will be black out and take effect immediately.</p> <p>When the RF Output is ON, an "RF" annunciator is displayed in the system settings panel. When the RF Output is turned Off, the RF annunciator is cleared. If the "Sequencer" on page 588 is set to ON, the "RF" annunciator will be replaced by "SEQ" in the system settings panel, indicating that the output is controlled by the list sequencer.</p>
Preset	Off
Range	On Off
Initial S/W Revision	A.05.00

Amplitude

Allows you to access the Amplitude sub-menu.

Key Path	Source
Notes	<p>The sub-menu under this button is for independent mode and has no effect on "List Sequencer" on page 587. If the "Sequencer" on page 588 is set to ON, the list sequencer controls the source output and this key will be grayed-out on front panel to indicate out-of-scope. When you set "Sequencer" on page 588 to Off will make source leave list sequencer and this button will be black out.</p>
Initial S/W Revision	A.05.00

RF Power

Allows you to adjust the power level of the source using the numeric keypad, step keys, or RPG. Pressing any digit, 0 through 9, on the numeric keypad brings up the unit terminator.

Please refer to the ["RF Power Range " on page 510](#) table below for the valid ranges.

Key Path	Source, Amplitude
Remote Command	:SOURce:POWer[:LEVel][:IMMediate][:AMPLitude] <ampl> :SOURce:POWer[:LEVel][:IMMediate][:AMPLitude]?
Example	:SOUR:POW -100 dBm
Notes	<p>Amplitude corrections can be specified for use with the source. In the event of amplitude corrections being applied, the valid ranges for the RF power do not change dependant on the current amplitude correction setting. If the combination of RF power + amplitude correction is higher or lower than the source output range, the Source Unleveled bit is set and the "Source Unleveled" indicator will appear on status panel to indicate that the source cannot maintain the output power that has been requested.</p> <p>When signal generator is unable to maintain the requested output level, the "Source Unleveled" indicator will appear on status panel. When the source output setting is restored to the normal range, the "Source Unleveled" is removed from status panel.</p> <p>Internal source has list sequence mode, which comprises of several steps which contain separate output power, frequency and waveform etc. When the source list sequence playing is complete, the last step keeps playing, and user can use this command to change the list sequence last step's output power.</p> <p>The multiport adapter RFIO TX ports and GPS ports cannot ensure power accuracy when power setting is lower than -130dBm, this power setting value is defined by the sum of RF Power setting and related amplitude correction value. But user settable value could be lower than this limit. When application detected there exists power setting lower than -130dBm on MPA RFIO TX ports, then popup warning message . When application detected there exists power setting lower than -130dBm on MPA GPS ports, then popup warning message . This is only warning message, and check is performed when RF is ON.</p>
Notes	The Min and Max value here defined UI settable amplitude range. This range is larger than actual amplitude range with level accuracy defined in spec.
Dependencies	The RF power is dependent on the RF output port and frequency, such that the current frequency and selected output port determine the valid range of power values.
Preset	-100 dBm
Min	The range of values depends on the current frequency and selected RF output port. Please refer to the "RF Power Range " on page 510 table below for the valid ranges.
Max	The range of values depends on the current frequency and selected RF output port. Please refer to the "RF Power Range " on page 510 table below for the valid ranges.
Initial S/W Revision	A.05.00

RF Power Range

RF Output Port	Frequency Range	Min Output Power	Max Output Power
High Power RF Out	10 MHz ≤ f ≤ 6 GHz	-150 dBm	20 dBm
RFIO 1 & RFIO 2	10 MHz ≤ f ≤ 6 GHz	-150 dBm	0 dBm
GPS (Note2)	10 MHz ≤ f ≤ 6 GHz	-150 dBm	0 dBm

Note: This is the UI power range, it's larger than actual spec.

Note2: GPS port is on the multiport adapter, or E6607C which has embedded MPA.

Set Reference Power

This key allows you to set the power reference. Pressing this key turns the power reference state to ON, sets the reference power value to the current RF output power, maintains this power at the RF output, and sets the displayed power to 0.00 dB. All subsequent RF power values entered under Source>Amplitude>RF Power are interpreted as being relative to this reference power.

When you use a power reference, the signal generator outputs an RF power that is set relative to the reference power by the value entered under Source>Amplitude>RF Power as follows:

$$\text{Output power} = \text{reference power} - \text{entered power}$$

Where:

reference power equals the original RF Power entered under Source>Amplitude>RF Power and set as the reference power

entered power equals a new value entered under Source>Amplitude>Amptd Offset

In addition, the displayed power value is the same as a new value entered under Source>Amplitude>RF Power.

NOTE

If Power Ref is set to ON with a reference value set, entering a value under Source>Amplitude>RF Power and pressing Set Reference Power will add that value to the existing Power Ref value.

If you wish to change the reference power value to a new value entered under Source>Amplitude>RF Power, first you must set Power Ref to OFF and then press Set Reference Power.

Key Path	Source, Amplitude
Dependencies	This key is unavailable, and is grayed out when the "List Sequencer" on page 587 is turned ON.
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Power Ref

This key allows you to toggle the state of the power reference.

When you use a power reference, the signal generator outputs an RF power that is set relative to the reference power by the value entered under Source>Amplitude>RF Power as follows:

$$\text{Output power} = \text{reference power} + \text{entered power}$$

Where:

reference power equals the original RF Power entered under Source>Amplitude>RF Power and set as the reference power

entered power equals a new value entered under Source>Amplitude>Amptd Offset

For more information on Reference Frequency refer to ["Set Reference Power" on page 510](#)

Key Path	Source, Amplitude
Remote Command	:SOURce:POWer:REFeRence <ampl> :SOURce:POWer:REFeRence? :SOURce:POWer:REFeRence:STATe OFF ON 0 1 :SOURce:POWer:REFeRence:STATe?
Example	:SOUR:POW:REF 0.00 dBm :SOUR:POW:REF:STATe ON
Dependencies	This setting is unavailable and is grayed out when the "List Sequencer" on page 587 is turned ON.
Couplings	This value is coupled to the "Set Reference Power" on page 510 key such that pressing the Set Reference Power key updates the reference power with the current output power.
Preset	0.00 dBm OFF
Min	-125.00 dBm
Max	10.00 dBm
Initial S/W Revision	A.05.00

Amptd Offset

Allows you to specify the RF output power offset value.

When the amplitude offset is set to zero (0) and you set a new offset value (positive or negative), the displayed amplitude value will change as follows and the RF output power will not change:

Displayed value = output power + offset value

Where:

output power equals the original RF Power entered under Source>Amplitude>RF Power

offset value equals the value entered under Source>Amplitude>Amptd Offset

When the amplitude offset is set to a value other than zero (0) and you enter a new RF power value under Source>Amplitude>RF Power, the displayed power will be the same as the value entered and the RF output power will be equal to the value entered minus the offset value as follows:

Output power = entered power – offset power

Displayed Power = output power + offset power

Displayed power = entered power

Where:

entered power equals the amplitude entered under Source>Amplitude>RF Power

offset power equals the value previously entered and set under Source>Amplitude>Amptd Offset

Key Path	Source, Amplitude
Remote Command	:SOURce:POWer[:LEVel][:IMMediate]:OFFSet <rel_ampl> :SOURce:POWer[:LEVel][:IMMediate]:OFFSet?
Example	:SOUR:POW:OFFS 0.00 dB
Dependencies	This setting is unavailable, and is grayed out when the List Sequencer is turned ON.
Preset	0.00 dB
Min	-200.00 dB
Max	200.00 dB
Initial S/W Revision	A.05.00

Modulation

Allows you to toggle the state of the modulation.

Key Path	Source
Remote Command	:OUTPut:MODulation[:STATe] ON OFF 1 0 :OUTPut:MODulation[:STATe]?
Example	:OUTP:MOD OFF
Notes	This setting is for independent mode and has no effect on "List Sequencer" on page 587 . If the "Sequencer" on page 588 is set to ON, the list sequencer controls the source output and this key will be grayed-out. And this setting will be none-forceful grey out on front panel to indicate out-of-scope. Non-forceful means user still can change this setting by SCPI but cannot change manually on front panel. When set to Off will make source leave list sequencer and this setting will be black out and take effect immediately. When the Modulation is ON, the "MOD" annunciator is displayed in the system settings panel. When the Modulation is turned Off, the "MOD" annunciator is cleared. If the "Sequencer" on page 588 is set to ON, the "MOD" annunciator will be replaced by "SEQ" in the system settings panel indicating that the output is controlled by list sequencer.
Preset	Off
Range	On Off
Initial S/W Revision	A.05.00

Frequency

Allows you to access the Frequency sub-menu.

Key Path	Source
Notes	The sub-menu under this button is for independent mode and has no effect on "List Sequencer" on

[page 587](#). If the "[Sequencer](#)" on [page 588](#) is set to ON, the list sequencer controls the source output and this key will be grayed-out. And this button will be grey out on front panel to indicate out-of-scope. When set to Off will make source leave list sequencer and this button will be black out.

Initial S/W Revision A.05.00

Frequency

Allows you to set the RF Output Frequency. You can adjust the frequency of the source using the numeric keypad, step keys, or RPG. Pressing any digit, 0 through 9, on the numeric keypad brings up the unit terminator.

Key Path	Source, Frequency
Remote Command	:SOURce:FREQuency[:CW] <freq> :SOURce:FREQuency[:CW] ?
Example	:SOUR:FREQ 1.00 GHz
Notes	Internal source has list sequence mode, which comprises of several steps which contain separate output power, frequency and waveform etc. When the source list sequence playing is complete, the last step keeps playing, and user can use this command to change the list sequence last step's output frequency.
Couplings	The frequency value is coupled to the current channel band and number, such that updates to the band and number will update the frequency value to the corresponding absolute frequency.
Preset	1.00 GHz If license F1A or 5WC is present, the default Center Frequency should be 2.412GHz.
Min	10.00 MHz
Max	Hardware Dependant: Option 503 = 3.6 GHz Option 504 = 3.8 GHz Option 506 = 6.00 GHz For E6640A, if license 5WC is present, the frequency range should be limited to: 1.1GHz-1.7GHz, 2.4GHz-2.5GHz, 4.8GHz-6.0GHz. If the user-defined frequency is outside of range, UI will report an error message called "Settings conflict; Frequency is outside available range".
Initial S/W Revision	A.05.00

Channel

The frequency of the source can be specified by a channel number of a given frequency band. This key allows you to specify the current channel number. For the appropriate range of channel numbers for a given frequency band, refer to the following tables: "[GSM/EDGE Channel Number Ranges](#)" on [page 514](#), "[W-CDMA Channel Number Ranges](#)" on [page 515](#), "[CDMA 2000 / 1xEVDO Channel Number Ranges](#)" on [page 516](#), and "[LTE FDD Channel Number Ranges](#)" on [page 518](#).

Key Path	Source, Frequency
Remote Command	:SOURCE:FREQUENCY:CHANNELS:NUMBER <int> :SOURCE:FREQUENCY:CHANNELS:NUMBER?
Example	:SOUR:FREQ:CHAN:NUMB 1
Notes	This key is grayed out when the "Radio Standard" on page 522 is set to NONE. This key is grayed out on E6630A.
Dependencies	This key is grayed out when the "Radio Standard" on page 522 is set to NONE. This key is grayed out on E6630A.
Couplings	The channel number is coupled to the frequency value when the "Radio Standard" on page 522 is not set to NONE. When the frequency value is changed, the channel number will increase or decrease to match the new frequency. If the frequency is not at an exact match for a channel number, the nearest channel number is displayed along with a greater than or less than sign to indicate the frequency is above or below the channel number.
Preset	1
Min	Please refer to the tables below for the valid ranges.
Max	Please refer to the tables below for the valid ranges.
Initial S/W Revision	A.05.00

GSM/EDGE Channel Number Ranges

Band	Link (Device)	Range	Frequency (MHz)
P-GSM	Uplink (MS)	$1 \leq n \leq 124$	$890.0 + 0.2*n$
	Downlink (BS)	$1 \leq n \leq 124$	$935.0 + 0.2*n$
E-GSM	Uplink (MS)	$0 \leq n \leq 124$	$890.0 + 0.2*n$
		$975 \leq n \leq 1023$	$890.0 + 0.2*(n-1024)$
	Downlink (BS)	$0 \leq n \leq 124$	$935.0 + 0.2*n$
		$975 \leq n \leq 1023$	$935.0 + 0.2*(n-1024)$
DCS 1800	Uplink (MS)	$512 \leq n \leq 885$	$1710.200 + 0.20*(n-512)$
	Downlink (BS)	$512 \leq n \leq 885$	$1805.200 + 0.20*(n-512)$
PCS 1900	Uplink (MS)	$512 \leq n \leq 810$	$1850.200 + 0.2*(n-512)$
	Downlink (BS)	$512 \leq n \leq 810$	$1930.200 + 0.2*(n-512)$
R-GSM	Uplink (MS)	$0 \leq n \leq 124$	$890.0 + 0.2*n$
		$955 \leq n \leq 1023$	$890.0 + 0.2*(n-1024)$
	Downlink (BS)	$0 \leq n \leq 124$	$935.0 + 0.2*n$
		$955 \leq n \leq 1023$	$935.0 + 0.2*(n-1024)$
GSM 450	Uplink (MS)	$256 \leq n \leq 293$	$450.6 + 0.2*(n-259)$
	Downlink (BS)	$256 \leq n \leq 293$	$460.6 + 0.2*(n-259)$
GSM 480	Uplink (MS)	$306 \leq n \leq 340$	$479.000 + 0.20*(n-306)$

Band	Link (Device)	Range	Frequency (MHz)
GSM 850	Downlink (BS)	$306 \leq n \leq 340$	$489.000 + 0.20*(n-306)$
	Uplink (MS)	$128 \leq n \leq 251$	$824.200 + 0.20*(n-128)$
GSM 700	Downlink (BS)	$128 \leq n \leq 251$	$869.200 + 0.20*(n-128)$
	Uplink (MS)	$438 \leq n \leq 516$	$777.200 + 0.20*(n-438)$
T-GSM810	Downlink (BS)	$438 \leq n \leq 516$	$747.200 + 0.20*(n-438)$
	Uplink (MS)	$350 \leq n \leq 425$	$806.0 + 0.20*(n-350)$
	Downlink (BS)	$350 \leq n \leq 425$	$851.0 + 0.20*(n-350)$

W-CDMA Channel Number Ranges

Band	Link (Device)	Range	Frequency (MHz)
Band I	Downlink	$10562 \leq n \leq 10838$	$n \div 5$
	Uplink	$9612 \leq n \leq 9888$	$n \div 5$
Band II	Downlink	$412 \leq n \leq 687$	$n \div 5 + 1850.1$
		$9662 \leq n \leq 9938$	$n \div 5$
	Uplink	$12 \leq n \leq 287$	$n \div 5 + 1850.1$
Band III	Downlink	$350 \leq n \leq 425$	$n \div 5$
	Downlink	$1162 \leq n \leq 1513$	$n \div 5 + 1575$
Band IV	Uplink	$937 \leq n \leq 1288$	$n \div 5 + 1525$
	Downlink	$537 \leq n \leq 1738$	$n \div 5 + 1805$
Band V	Downlink	$1887 \leq n \leq 2087$	$n \div 5 + 1735.1$
		Uplink	$1312 \leq n \leq 1513$
	Downlink	$1662 \leq n \leq 1862$	$n \div 5 + 1380.1$
Band VI	Downlink	$1007 \leq n \leq 1087$	$n \div 5 + 670.1$
		$4357 \leq n \leq 4458$	$n \div 5$
	Uplink	$782 \leq n \leq 862$	$n \div 5 + 670.1$
Band VII	Downlink	$4132 \leq n \leq 4233$	$n \div 5$
		Downlink	$1037 \leq n \leq 1062$
	Uplink	$4387 \leq n \leq 4413$	$n \div 5$
Band VIII	Downlink	$812 \leq n \leq 837$	$n \div 5 + 670.1$
		$4162 \leq n \leq 4188$	$n \div 5$
	Downlink	$2237 \leq n \leq 2563$	$n \div 5 + 2175$
Band IX	Downlink	$2587 \leq n \leq 2912$	$n \div 5 + 2105.1$
		Uplink	$2012 \leq n \leq 2338$
	Downlink	$2362 \leq n \leq 2687$	$n \div 5 + 2030.1$
Band X	Downlink	$2937 \leq n \leq 3088$	$n \div 5 + 340$
	Uplink	$2712 \leq n \leq 2863$	$n \div 5 + 340$

Band	Link (Device)	Range	Frequency (MHz)
Band IX	Downlink	$9237 \leq n \leq 9387$	$n \div 5$
	Uplink	$8762 \leq n \leq 8912$	$n \div 5$
Band X	Downlink	$3112 \leq n \leq 3388$	$n \div 5 + 1490$
		$3412 \leq n \leq 3687$	$n \div 5 + 1430.1$
	Uplink	$2887 \leq n \leq 3163$	$n \div 5 + 1135$
		$3187 \leq n \leq 3462$	$n \div 5 + 1075.1$
Band XI	Downlink	$3712 \leq n \leq 3812$	$n \div 5 + 736$
	Uplink	$3487 \leq n \leq 3587$	$n \div 5 + 733$
Band XII	Downlink	$3837 \leq n \leq 3903$	$n \div 5 - 37$
		$3927 \leq n \leq 3992$	$n \div 5 - 54.9$
	Uplink	$3612 \leq n \leq 3678$	$n \div 5 - 22$
		$3702 \leq n \leq 3767$	$n \div 5 - 39.9$
Band XIII	Downlink	$4017 \leq n \leq 4043$	$n \div 5 - 55$
		$4067 \leq n \leq 4092$	$n \div 5 - 64.9$
	Uplink	$3792 \leq n \leq 3818$	$n \div 5 + 21$
		$3702 \leq n \leq 3767$	$n \div 5 - 39.9$
Band XIV	Downlink	$4117 \leq n \leq 4143$	$n \div 5 - 63$
		$4167 \leq n \leq 4192$	$n \div 5 - 72.9$
	Uplink	$3892 \leq n \leq 3918$	$n \div 5 + 12$
		$3942 \leq n \leq 3967$	$n \div 5 + 2.1$
Band XIX	Downlink	$712 \leq n \leq 763$	$n \div 5 + 735$
		$787 \leq n \leq 837$	$n \div 5 + 720.1$
	Uplink	$312 \leq n \leq 363$	$n \div 5 + 770$
		$387 \leq n \leq 437$	$n \div 5 + 755.1$

CDMA 2000 / 1xEVDO Channel Number Ranges

Band	Link (Device)	Range	Frequency (MHz)
US Cellular	Uplink (MS, reverse link)	$1 \leq N \leq 799$	$0.030 \times N + 825.000$
		$991 \leq N \leq 1023$	$0.030 \times (N - 1023) + 825.000$
		$1024 \leq N \leq 1323$	$0.030 \times (N - 1024) + 815.040$
	Downlink (BS, forward link)	$1 \leq N \leq 799$	$0.030 \times N + 870.000$
		$991 \leq N \leq 1023$	$0.030 \times (N - 1023) + 870.000$
		$1024 \leq N \leq 1323$	$0.030 \times (N - 1024) + 860.040$
US PCS	Uplink (MS, reverse link)	$0 \leq N \leq 1199$	$1850.000 + 0.050 \times N$
	Downlink (BS, forward link)	$0 \leq N \leq 1199$	$1930.000 + 0.050 \times N$

Band	Link (Device)	Range	Frequency (MHz)
Japan Cellular Band	Uplink (MS, reverse link)	$1 \leq N \leq 799$	$0.0125 \times (N + 915.000)$
		$801 \leq N \leq 1039$	$0.0125 \times (N - 800) + 898.000$
		$1041 \leq N \leq 1199$	$0.0125 \times (N - 1040) + 887.000$
		$1201 \leq N \leq 1600$	$0.0125 \times (N - 1200) + 893.000$
	Downlink (BS, forward link)	$1 \leq N \leq 799$	$0.0125 \times (N + 860.000)$
		$801 \leq N \leq 1039$	$0.0125 \times (N - 800) + 843.000$
		$1041 \leq N \leq 1199$	$0.0125 \times (N - 1040) + 832.000$
		$1201 \leq N \leq 1600$	$0.0125 \times (N - 1200) + 838.000$
Korean PCS Band	Uplink (MS, reverse link)	$0 \leq N \leq 599$	$0.050 \times N + 1750.000$
	Downlink (BS, forward link)	$0 \leq N \leq 599$	$0.050 \times N + 1840.000$
NMT-450 Band	Uplink (MS, reverse link)	$1 \leq N \leq 400$	$0.025 \times (N - 1) + 450.000$
		$472 \leq N \leq 871$	$0.025 \times (N - 472) + 410.000$
		$1039 \leq N \leq 1473$	$0.020 \times (N - 1024) + 451.010$
		$1536 \leq N \leq 1715$	$0.025 \times (N - 1536) + 479.000$
	Downlink (BS, forward link)	$1 \leq N \leq 400$	$0.025 \times (N - 1) + 460.000$
		$472 \leq N \leq 871$	$0.025 \times (N - 472) + 420.000$
		$1039 \leq N \leq 1473$	$0.020 \times (N - 1024) + 461.010$
		$1536 \leq N \leq 1715$	$0.025 \times (N - 1536) + 489.000$
IMT-2000 Band	Uplink (MS, reverse link)	$0 \leq N \leq 1199$	$1920.000 + 0.050 \times N$
	Downlink (BS, forward link)	$0 \leq N \leq 1199$	$2100.000 + 0.050 \times N$
Upper 700 MHz Band	Uplink (MS, reverse link)	$0 \leq N \leq 240$	$776.000 + 0.050 \times N$
	Downlink (BS, forward link)	$0 \leq N \leq 240$	$746.000 + 0.050 \times N$
Secondary 800 MHz Band	Uplink (MS, reverse link)	$0 \leq N \leq 719$	$0.025 \times N + 806.000$
		$720 \leq N \leq 919$	$0.025 \times (N - 720) + 896.000$
	Downlink (BS, forward link)	$0 \leq N \leq 719$	$0.025 \times N + 851.000$
		$720 \leq N \leq 919$	$0.025 \times (N - 720) + 935.000$
2.5 GHz IMT Extension	Uplink (MS, reverse link)	$0 \leq N \leq 1399$	$2500.000 + 0.050 \times N$
	Downlink (BS, forward link)	$0 \leq N \leq 1399$	$2620.000 + 0.050 \times N$
US PCS 1.9 GHz	Uplink (MS, reverse link)	$0 \leq N \leq 1299$	$1850.000 + 0.050 \times N$

Band	Link (Device)	Range	Frequency (MHz)
AWS	Downlink (BS, forward link)	$0 \leq N \leq 1299$	$1930.000 + 0.050 \times N$
	Uplink (MS, reverse link)	$0 \leq N \leq 899$	$1710.000 + 0.050 \times N$
US 2.5 GHz	Downlink (BS, forward link)	$0 \leq N \leq 899$	$2100.000 + 0.050 \times N$
	Uplink (MS, reverse link)	$140 \leq N \leq 1459$	$2495.000 + 0.050 \times N$
700 Public Safety	Downlink (BS, forward link)	$140 \leq N \leq 1459$	$2617.000 + 0.050 \times N$
	Uplink (MS, reverse link)	$0 \leq N \leq 240$	$787.000 + 0.050 \times N$
C2K Lower 700	Downlink (BS, forward link)	$0 \leq N \leq 240$	$757.000 + 0.050 \times N$
	Uplink (MS, reverse link)	$0 \leq N \leq 360$	$698.000 + 0.050 \times N$
400 Euro PAMR	Downlink (BS, forward link)	$0 \leq N \leq 360$	$728.000 + 0.050 \times N$
	Uplink (MS, reverse link)	$1 \leq N \leq 400$	$0.025 \times (N-1) + 450.000$
	Uplink (MS, reverse link)	$472 \leq N \leq 871$	$0.025 \times (N-472) + 410.000$
	Uplink (MS, reverse link)	$1536 \leq N \leq 1715$	$0.025 \times (N-1536) + 479.000$
	Downlink (BS, forward link)	$1 \leq N \leq 400$	$0.025 \times (N-1) + 460.000$
	Downlink (BS, forward link)	$472 \leq N \leq 871$	$0.025 \times (N-472) + 420.000$
	Downlink (BS, forward link)	$1536 \leq N \leq 1715$	$0.025 \times (N-1536) + 489.000$
	Downlink (BS, forward link)		
800 PAMR	Uplink (MS, reverse link)	$0 \leq N \leq 239$	$870.0125 + 0.025 \times N$
	Downlink (BS, forward link)	$0 \leq N \leq 239$	$915.0125 + 0.025 \times N$

LTE FDD Channel Number Ranges

The carrier frequency in the uplink and downlink is designated by the E-UTRA Absolute Radio Frequency Channel Number (EARFCN) in the range 0 – 65535. The relation between EARFCN and the carrier frequency in MHz for the downlink is given by the following equation, where FDL_low and NOffs-DL are given in table 5.4.4–1 and ND L is the downlink EARFCN.

$$FDL = FDL_low + 0.1(NDL - NOffs-DL)$$

The relation between EARFCN and the carrier frequency in MHz for the uplink is given by the following equation where FUL_low and NOffs-UL are given in table 5.4.4-1 and NUL is the uplink EARFCN.

$$\text{FUL} = \text{FUL_low} + 0.1(\text{NUL} - \text{NOffs-UL})$$

Band	Downlink		Uplink			
	FDL_low (MHz)	NOffs-DL	Range of ND L	FUL_low (MHz)	NOffs-UL	Range of NUL
1		2110	0	0 - 599	1920	18000 - 18599
2		1930	600	600 - 1199	1850	18600 - 19199
3		1805	1200	1200 - 1949	1710	19200 - 19949
4		2110	1950	1950 - 2399	1710	19950 - 20399
5		869	2400	2400 - 2649	824	20400 - 20649
6		875	2650	2650 - 2749	830	20650 - 20749
7		2620	2750	2750 - 3449	2500	20750 - 20449
8		925	3450	3450 - 3799	880	21450 - 21799
9		1844.9	3800	3800 - 4149	1749.9	21800 - 22149
10		2110	4150	4150 - 4749	1710	22150 - 22749
11		1475.9	4750	4750 - 4949	1427.9	22750 - 22949
12		729	5010	5010 - 5179	699	23010 - 23179
13		746	5180	5180 - 5279	777	23180 - 23279
14		758	5280	5280 - 5379	788	23280 - 23379
...						
17		734	5730	5730 - 5849	704	23730 - 23849
18		860	5850	5850 - 5999	815	23850 - 23999
19		875	6000	6000 - 6149	830	24000 - 24149
20		791	6150	6150 - 6449	832	24150 - 24449
21		1495.9	6450	6450 - 6599	1447.9	24450 - 24599
...						
24		1525	7700	7700 - 8039	1626.5	25700 - 26039
25		1930	8040	8040 - 8689	1850	26040 - 26689
26		859	8690	8690 - 9039	814	26690 - 27039
...						

Note: The channel numbers that designate carrier frequencies so close to the operating band edges that the carrier extends beyond the operating band edge shall not be used. This implies that the first 7, 15, 25, 50, 75 and 100 channel numbers at the lower operating band edge and the last 6, 14, 24, 49, 74 and 99 channel numbers at the upper operating band edge shall not be used for channel bandwidths of 1.4, 3, 5, 10, 15 and 20 MHz respectively.

LTE TDD Channel Number Ranges

The carrier frequency in the uplink and downlink is designated by the E-UTRA Absolute Radio Frequency Channel Number (EARFCN) in the range 0 – 65535. The relation between EARFCN and the carrier frequency in MHz for the downlink is given by the following equation, where FDL_low and NOffs-DL are given in table 5.4.4–1 and NDL is the downlink EARFCN.

$$FDL = FDL_low + 0.1(NDL - NOffs-DL)$$

The relation between EARFCN and the carrier frequency in MHz for the uplink is given by the following equation where FUL_low and NOffs-UL are given in table 5.4.4–1 and NUL is the uplink EARFCN.

$$FUL = FUL_low + 0.1(NUL - NOffs-UL)$$

Band	Downlink		Uplink			
	FDL_low (MHz)	NOffs-DL	Range of NDL	FUL_low (MHz)	NOffs-UL	Range of NUL
33		1900	36000	36000 – 36199	1900	36000 – 36199
34		2010	36200	36200 – 36349	2010	36200 – 36349
35		1850	36350	36350 – 36949	1850	36350 – 36949
36		1930	36950	36950 – 37549	1930	36950 – 37549
37		1910	37550	37550 – 37749	1910	37550 – 37749
38		2570	37750	37750 – 38249	2570	37750 – 38249
39		1880	38250	38250 – 38649	1880	38250 – 38649
40		2300	38650	38650 – 39649	2300	38650 – 39649
41		2496	39650	39650 – 41589	2496	39650 – 41589
42		3400	41590	41590 – 43589	3400	41590 – 43589
43		3600	43590	43590 – 45589	3600	43590 – 45589

Note: The channel numbers that designate carrier frequencies so close to the operating band edges that the carrier extends beyond the operating band edge shall not be used. This implies that the first 7, 15, 25, 50, 75 and 100 channel numbers at the lower operating band edge and the last 6, 14, 24, 49, 74 and 99 channel numbers at the upper operating band edge shall not be used for channel bandwidths of 1.4, 3, 5, 10, 15 and 20 MHz respectively.

TDSCDMA Channel Number Ranges

1.28 Mcps TDD Option

No TX-RX frequency separation is required as Time Division Duplex (TDD) is employed. Each subframe consists of 7 main timeslots where all main timeslots (at least the first one) before the single switching point are allocated DL and all main timeslots (at least the last one) after the single switching point are allocated UL.

The nominal channel spacing is 1.6 MHz, but this can be adjusted to optimise performance in a particular deployment scenario.

The carrier frequency is designated by the UTRA absolute radio frequency channel number (UARFCN). The value of the UARFCN in the IMT2000 band is defined in the general case as follows:

$$N_t = 5 * F \quad 0.0 \text{ MHz} \leq F \leq 3276.6 \text{ MHz}$$

where F is the carrier frequency in MHz

Additional channels applicable to operation in the frequency band defined in sub-clause 5.2(d) are defined via the following UARFCN definition:

$$N_t = 5 * (F - 2150.1 \text{ MHz}) \quad 2572.5 \text{ MHz} \leq F \leq 2617.5 \text{ MHz}$$

UARFCN

1.28 Mcps TDD Option

The following UARFCN range shall be supported for each band:

Table: UTRA Absolute Radio Frequency Channel Number 1.28 Mcps TDD Option		
Frequency Band	Frequency Range	UARFCN Uplink and Downlink transmission
For operation in frequency band as defined in subclause 5.2 (a)	1900–1920 MHz	9504 to 9596
	2010–2025 MHz	10054 to 10121
For operation in frequency band as defined in subclause 5.2 (b)	1850–1910 MHz	9254 to 9546
	1930–1990 MHz	9654 to 9946
For operation in frequency band as defined in subclause 5.2 (c)	1910–1930 MHz	9554 to 9646
For operation in frequency band as defined in subclause 5.2 (d)	2570–2620 MHz	12854 to 13096
For operation in frequency band as defined in subclause 5.2 (e)	2300–2400 MHz	11504 to 11996
For operation in frequency band as defined in subclause 5.2 (f)	1880–1920 MHz	9404 to 9596

Radio Setup

Allows access to the sub-menus for selecting the radio standard and associated radio band. You can also set a frequency reference and offset.

This menu is greyed out when on E6630A. Radio band settings for GSM, cdma2000, and so on -- most of which are not actually supported in E6630A, which has three narrow frequency bands. So band settings are grayed out.

Key Path	Source, Frequency
Initial S/W Revision	A.05.00

Radio Standard

Allows access to the channel band sub-menus to select the desired radio standard. When you have selected the radio standard, you can then set an active channel band. The radio standard and the active channel band allow you to use channel numbers to set frequency automatically.

Key Path	Source, Frequency, Radio Setup
Remote Command	:SOURce:FREQuency:CHANnels:BAND NONE PGSM EGSM RGSM DCS1800 PCS1900 TGSM810 GSM450 GSM480 GSM700 GSM850 BANDI BANDII BANDIII BANDIV BANDV BANDVI BANDVII BANDVIII BANDIX BANDX BANDXI BANDXII BANDXIII BANDXIV BANDXIX USCELL USPCS JAPAN KOREAN NMT IMT2K UPPER SECOND PAMR400 PAMR800 IMTEXT PCS1DOT9G AWS US2DOT5G PUBLIC LOWER BAND1 BAND2 BAND3 BAND4 BAND5 BAND6 BAND7 BAND8 BAND10 BAND11 BAND12 BAND13 BAND14 BAND17 BAND18 BAND19 BAND20 BAND21 BAND24 BAND25 BAND26 BAND27 BAND28 BAND31 BAND33 BAND34 BAND35 BAND36 BAND37 BAND38 BAND39 BAND40 BAND41 BAND42 BAND43 BAND44 BANDA BANDB BANDC BANDD BANDE BANDF :SOURce:FREQuency:CHANnels:BAND?
Example	:SOUR:FREQ:CHAN:BAND PGSM
Notes	Set this setting to "NONE" will grey out "Channel" on page 513 Channel
Initial S/W Revision	A.05.00

None

Selects no radio standard for use. When you have selected the radio standard to NONE, you cannot use channel numbers to set frequency automatically. You will need to set the frequency manually.

Key Path	Source, Frequency, Radio Setup, Radio Standard
Initial S/W Revision	A.05.00

GSM/EDGE

Sets GSM/EDGE as the radio standard for use and accesses the GSM/EDGE specific channel band sub-menus.

Key Path	Source, Frequency, Radio Setup, Radio Standard
Initial S/W Revision	A.05.00

P-GSM

Selects P-GSM as the active channel band.

Key Path	Source, Frequency, Radio Setup, Radio Standard, GSM/EDGE
Example	:SOUR:FREQ:CHAN:BAND PGSM
Initial S/W Revision	A.05.00

E-GSM

Selects E-GSM as the active channel band.

Key Path	Source, Frequency, Radio Setup, Radio Standard, GSM/EDGE
Example	:SOUR:FREQ:CHAN:BAND EGSM
Initial S/W Revision	A.05.00

R-GSM

Selects R-GSM as the active channel band.

Key Path	Source, Frequency, Radio Setup, Radio Standard, GSM/EDGE
Example	:SOUR:FREQ:CHAN:BAND RGSM
Initial S/W Revision	A.05.00

DCS 1800

Selects DCS 1800 as the active channel band.

Key Path	Source, Frequency, Radio Setup, Radio Standard, GSM/EDGE
Example	:SOUR:FREQ:CHAN:BAND DCS1800
Initial S/W Revision	A.05.00

PCS 1900

Selects PCS 1900 as the active channel band.

Key Path	Source, Frequency, Radio Setup, Radio Standard, GSM/EDGE
Example	:SOUR:FREQ:CHAN:BAND PCS1900
Initial S/W Revision	A.05.00

GSM 450

Selects GSM 450 as the active channel band.

Key Path	Source, Frequency, Radio Setup, Radio Standard, GSM/EDGE
Example	:SOUR:FREQ:CHAN:BAND GSM450
Initial S/W Revision	A.05.00

GSM 480

Selects GSM 480 as the active channel band.

Key Path	Source, Frequency, Radio Setup, Radio Standard, GSM/EDGE
Example	:SOUR:FREQ:CHAN:BAND GSM480
Initial S/W Revision	A.05.00

GSM 850

Selects GSM 850 as the active channel band.

Key Path	Source, Frequency, Radio Setup, Radio Standard, GSM/EDGE
Example	:SOUR:FREQ:CHAN:BAND GSM850
Initial S/W Revision	A.05.00

GSM 700

Selects GSM 700 as the active channel band.

Key Path	Source, Frequency, Radio Setup, Radio Standard, GSM/EDGE
Example	:SOUR:FREQ:CHAN:BAND GSM700
Initial S/W Revision	A.05.00

T-GSM 810

Selects T-GSM 810 as the active channel band.

Key Path	Source, Frequency, Radio Setup, Radio Standard, GSM/EDGE
Example	:SOUR:FREQ:CHAN:BAND T-GSM810
Initial S/W Revision	A.05.00

WCDMA

Sets WCDMA as the radio standard for use and accesses the W-CDMA specific channel band sub-menus.

Key Path	Source, Frequency, Radio Setup, Radio Standard
Initial S/W Revision	A.05.00

Band I

Selects Band I as the active channel band.

Key Path	Source, Frequency, Radio Setup, Radio Standard, WCDMA
Example	:SOUR:FREQ:CHAN:BAND BANDI
Initial S/W Revision	A.05.00

Band II

Selects Band II as the active channel band.

Key Path	Source, Frequency, Radio Setup, Radio Standard, WCDMA
Example	:SOUR:FREQ:CHAN:BAND BANDII
Initial S/W Revision	A.05.00

Band III

Selects Band III as the active channel band.

Key Path	Source, Frequency, Radio Setup, Radio Standard, WCDMA
Example	:SOUR:FREQ:CHAN:BAND BANDIII
Initial S/W Revision	A.05.00

Band IV

Selects Band IV as the active channel band.

Key Path	Source, Frequency, Radio Setup, Radio Standard, WCDMA
Example	:SOUR:FREQ:CHAN:BAND BANDIV
Initial S/W Revision	A.05.00

Band V

Selects Band V as the active channel band.

Key Path	Source, Frequency, Radio Setup, Radio Standard, WCDMA
Example	:SOUR:FREQ:CHAN:BAND BANDV
Initial S/W Revision	A.05.00

Band VI

Selects Band VI as the active channel band.

Key Path	Source, Frequency, Radio Setup, Radio Standard, WCDMA
Example	:SOUR:FREQ:CHAN:BAND BANDVI
Initial S/W Revision	A.05.00

Band VII

Selects Band VII as the active channel band.

Key Path	Source, Frequency, Radio Setup, Radio Standard, WCDMA
Example	:SOUR:FREQ:CHAN:BAND BANDVII
Initial S/W Revision	A.05.00

Band VIII

Selects Band VIII as the active channel band.

Key Path	Source, Frequency, Radio Setup, Radio Standard, WCDMA
Example	:SOUR:FREQ:CHAN:BAND BANDVIII
Initial S/W Revision	A.05.00

Band IX

Selects Band IX as the active channel band.

Key Path	Source, Frequency, Radio Setup, Radio Standard, WCDMA
Example	:SOUR:FREQ:CHAN:BAND BANDIX
Initial S/W Revision	A.05.00

Band X

Selects Band X as the active channel band.

Key Path	Source, Frequency, Radio Setup, Radio Standard, WCDMA
Example	:SOUR:FREQ:CHAN:BAND BANDX
Initial S/W Revision	A.05.00

Band XI

Selects Band XI as the active channel band.

Key Path	Source, Frequency, Radio Setup, Radio Standard, WCDMA
Example	:SOUR:FREQ:CHAN:BAND BANDXI
Initial S/W Revision	A.05.00

Band XII

Selects Band XII as the active channel band.

Key Path	Source, Frequency, Radio Setup, Radio Standard, WCDMA
Example	:SOUR:FREQ:CHAN:BAND BANDXII
Initial S/W Revision	A.05.00

Band XIII

Selects band XIII as the active channel band.

Key Path	Source, Frequency, Radio Setup, Radio Standard, WCDMA
Example	:SOUR:FREQ:CHAN:BAND BANDXIII
Initial S/W Revision	A.05.00

Band XIV

Selects Band XIV as the active channel band.

Key Path	Source, Frequency, Radio Setup, Radio Standard, WCDMA
Example	:SOUR:FREQ:CHAN:BAND BANDXIV
Initial S/W Revision	A.05.00

CDMA 2000 / 1xEVDO

Sets CDMA 2000 / 1XEVDO as the radio standard for use and accesses the CDMA 2000/1xEVDO specific channel band sub-menus.

Key Path	Source, Frequency, Radio Setup, Radio Standard
Initial S/W Revision	A.05.00

US CELL

Selects US Cell as the active channel band.

6 List Sequence Measurements

Source

Key Path	Source, Frequency, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO
Example	:SOUR:FREQ:CHAN:BAND USCELL
Initial S/W Revision	A.05.00

US PCS

Selects US PCS as the active channel band.

Key Path	Source, Frequency, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO
Example	:SOUR:FREQ:CHAN:BAND PCS
Initial S/W Revision	A.05.00

Japan Cell

Selects Japan Cell as the active channel band.

Key Path	Source, Frequency, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO
Example	:SOUR:FREQ:CHAN:BAND JAPAN
Initial S/W Revision	A.05.00

Korean PCS

Selects Korean PCS as the active channel band.

Key Path	Source, Frequency, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO
Example	:SOUR:FREQ:CHAN:BAND KOREAN
Initial S/W Revision	A.05.00

NMT 450

Selects NMT 450 as the active channel band.

Key Path	Source, Frequency, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO
Example	:SOUR:FREQ:CHAN:BAND NMT
Initial S/W Revision	A.05.00

IMT 2000

Selects IMT 2000 as the active channel band.

Key Path	Source, Frequency, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO
Example	:SOUR:FREQ:CHAN:BAND IMT2K
Initial S/W Revision	A.05.00

Upper 700

Selects Upper 700 as the active channel band.

Key Path	Source, Frequency, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO
Example	:SOUR:FREQ:CHAN:BAND UPPER
Initial S/W Revision	A.05.00

Secondary 800

Selects Secondary 800 as the active channel band.

Key Path	Source, Frequency, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO
Example	:SOUR:FREQ:CHAN:BAND SECOND
Initial S/W Revision	A.05.00

400 Euro PAMR

Selects 400 Euro PAMR as the active channel band.

Key Path	Source, Frequency, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO
Example	:SOUR:FREQ:CHAN:BAND PAMR400
Initial S/W Revision	A.05.00

800 PAMR

Selects 800 PAMR as the active channel band.

Key Path	Source, Frequency, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO
Example	:SOUR:FREQ:CHAN:BAND PAMR800
Initial S/W Revision	A.05.00

2.5GHz IMT EXT

Selects 2.5 GHz IMT EXT as the active channel band.

6 List Sequence Measurements

Source

Key Path	Source, Frequency, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO
Example	:SOUR:FREQ:CHAN:BAND IMTEXT
Initial S/W Revision	A.05.00

US PCS 1.9GHz

Selects US PCS 1.9 GHz as the active channel band.

Key Path	Source, Frequency, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO
Example	:SOUR:FREQ:CHAN:BAND PCS1DOT9G
Initial S/W Revision	A.05.00

AWS

Selects AWS as the active channel band.

Key Path	Source, Frequency, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO
Example	:SOUR:FREQ:CHAN:BAND AWS
Initial S/W Revision	A.05.00

US 2.5GHz

Selects US 2.5 GHz as the active channel band.

Key Path	Source, Frequency, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO
Example	:SOUR:FREQ:CHAN:BAND US2DOT5G
Initial S/W Revision	A.05.00

700 Public Safety

Selects 700 Public Safety as the active channel band.

Key Path	Source, Frequency, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO
Example	:SOUR:FREQ:CHAN:BAND PUBLIC
Initial S/W Revision	A.05.00

C2K Lower 700

Selects C2K Lower 700 as the active channel band.

Key Path	Source, Frequency, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO
Example	:SOUR:FREQ:CHAN:BAND LOWER
Initial S/W Revision	A.05.00

LTE

Sets LTE FDD as the radio standard for use and accesses the LTE FDD specific channel band sub-menus..

Key Path	Source, Frequency, Radio Setup, Radio Standard
Initial S/W Revision	A.09.50

BAND 1

Selects BAND 1 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE
Example	:SOUR:FREQ:CHAN:BAND BAND1
Initial S/W Revision	A.09.50

BAND 2

Selects BAND 2 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE
Example	:SOUR:FREQ:CHAN:BAND BAND2
Initial S/W Revision	A.09.50

BAND 3

Selects BAND 3 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE
Example	:SOUR:FREQ:CHAN:BAND BAND3
Initial S/W Revision	A.09.50

BAND 4

Selects BAND 4 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE
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Example	:SOUR:FREQ:CHAN:BAND BAND4
Initial S/W Revision	A.09.50

BAND 5

Selects BAND 5 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE
Example	:SOUR:FREQ:CHAN:BAND BAND5
Initial S/W Revision	A.09.50

BAND 6

Selects BAND 6 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE
Example	:SOUR:FREQ:CHAN:BAND BAND6
Initial S/W Revision	A.09.50

BAND 7

Selects BAND 7 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE
Example	:SOUR:FREQ:CHAN:BAND BAND7
Initial S/W Revision	A.09.50

BAND 8

Selects BAND 8 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE
Example	:SOUR:FREQ:CHAN:BAND BAND8
Initial S/W Revision	A.09.50

BAND 9

Selects BAND 9 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE
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Example	:SOUR:FREQ:CHAN:BAND BAND9
Initial S/W Revision	A.09.50

BAND 10

Selects BAND 10 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE
Example	:SOUR:FREQ:CHAN:BAND BAND10
Initial S/W Revision	A.09.50

BAND 11

Selects BAND 11 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE
Example	:SOUR:FREQ:CHAN:BAND BAND11
Initial S/W Revision	A.09.50

BAND 12

Selects BAND 12 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE
Example	:SOUR:FREQ:CHAN:BAND BAND12
Initial S/W Revision	A.09.50

BAND 13

Selects BAND 13 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE
Example	:SOUR:FREQ:CHAN:BAND BAND13
Initial S/W Revision	A.09.50

BAND 14

Selects BAND 14 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE
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Example	:SOUR:FREQ:CHAN:BAND BAND14
Initial S/W Revision	A.09.50

BAND 17

Selects BAND 17 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE
Example	:SOUR:FREQ:CHAN:BAND BAND17
Initial S/W Revision	A.09.50

BAND 18

Selects BAND 18 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE
Example	:SOUR:FREQ:CHAN:BAND BAND18
Initial S/W Revision	A.09.50

BAND 19

Selects BAND 19 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE
Example	:SOUR:FREQ:CHAN:BAND BAND19
Initial S/W Revision	A.09.50

BAND 20

Selects BAND 20 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE
Example	:SOUR:FREQ:CHAN:BAND BAND20
Initial S/W Revision	A.09.50

BAND 21

Selects BAND 21 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE
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Example	:SOUR:FREQ:CHAN:BAND BAND21
Initial S/W Revision	A.09.50

BAND 24

Selects BAND 24 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE
Example	:SOUR:FREQ:CHAN:BAND BAND24
Initial S/W Revision	A.09.50

BAND 25

Selects BAND 25 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE
Example	:SOUR:FREQ:CHAN:BAND BAND25
Initial S/W Revision	A.09.50

BAND 26

Selects BAND 26 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE
Example	:SOUR:FREQ:CHAN:BAND BAND26
Initial S/W Revision	A.12.53

BAND 27

Selects BAND 27 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE
Example	:SOUR:FREQ:CHAN:BAND BAND27
Initial S/W Revision	A.14.00

BAND 28

Selects BAND 28 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE
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Example	:SOUR:FREQ:CHAN:BAND BAND28
Initial S/W Revision	A.14.00

BAND 31

Selects BAND 31 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE
Example	:SOUR:FREQ:CHAN:BAND BAND31
Initial S/W Revision	A.14.00

LTE TDD

Sets LTE TDD as the radio standard for use and accesses the LTE TDD specific channel band sub-menus..

Key Path	Source, Frequency, Radio Setup, Radio Standard
Initial S/W Revision	A.11.50

BAND 33

Selects BAND 33 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE TDD
Example	:SOUR:FREQ:CHAN:BAND BAND33
Initial S/W Revision	A.11.50

BAND 34

Selects BAND 34 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE TDD
Example	:SOUR:FREQ:CHAN:BAND BAND34
Initial S/W Revision	A.11.50

BAND 35

Selects BAND 35 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE TDD
Example	:SOUR:FREQ:CHAN:BAND BAND35
Initial S/W Revision	A.11.50

BAND 36

Selects BAND 36 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE TDD
Example	:SOUR:FREQ:CHAN:BAND BAND36
Initial S/W Revision	A.11.50

BAND 37

Selects BAND 37 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE TDD
Example	:SOUR:FREQ:CHAN:BAND BAND37
Initial S/W Revision	A.11.50

BAND 38

Selects BAND 38 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE TDD
Example	:SOUR:FREQ:CHAN:BAND BAND38
Initial S/W Revision	A.11.50

BAND 39

Selects BAND 39 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE TDD
Example	:SOUR:FREQ:CHAN:BAND BAND39
Initial S/W Revision	A.11.50

BAND 40

Selects BAND 40 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE TDD
Example	:SOUR:FREQ:CHAN:BAND BAND40
Initial S/W Revision	A.11.50

BAND 41

Selects BAND 41 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE TDD
Example	:SOUR:FREQ:CHAN:BAND BAND41
Initial S/W Revision	A.11.50

BAND 42

Selects BAND 42 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE TDD
Example	:SOUR:FREQ:CHAN:BAND BAND42
Initial S/W Revision	A.11.50

BAND 43

Selects BAND 43 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE TDD
Example	:SOUR:FREQ:CHAN:BAND BAND43
Initial S/W Revision	A.11.50

BAND 44

Selects BAND 44 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE TDD
Example	:SOUR:FREQ:CHAN:BAND BAND44
Initial S/W Revision	A.14.00

TDSCDMA

Sets TDSCDMA as the radio standard for use and accesses the TDSCDMA specific channel band sub-menus..

Key Path	Source, Frequency, Radio Setup, Radio Standard
Initial S/W Revision	A.11.50

BAND A

Selects BAND A as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, TDSCDMA
Example	:SOUR:FREQ:CHAN:BAND BANDA
Initial S/W Revision	A.11.50

BAND B

Selects BAND B as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, TDSCDMA
Example	:SOUR:FREQ:CHAN:BAND BANDB
Initial S/W Revision	A.11.50

BAND C

Selects BAND C as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, TDSCDMA
Example	:SOUR:FREQ:CHAN:BAND BANDC
Initial S/W Revision	A.11.50

BAND D

Selects BAND D as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, TDSCDMA
Example	:SOUR:FREQ:CHAN:BAND BANDD
Initial S/W Revision	A.11.50

BAND E

Selects BAND E as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, TDSCDMA
Example	:SOUR:FREQ:CHAN:BAND BANDE
Initial S/W Revision	A.11.50

BAND F

Selects BAND F as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, TDSCDMA
Example	:SOUR:FREQ:CHAN:BAND BANDF
Initial S/W Revision	A.11.50

Radio Band Link

Allows you to specify the channel band type as either uplink or downlink link direction. This value is used in conjunction with the channel band and channel number to determine the absolute frequency output by the source. When set to “Uplink”, the source will calculate the uplink frequency using an uplink formula together with the selected channel band and channel number . When set to “Downlink”, the source will calculate the downlink frequency using a downlink formula together with the selected channel band and channel number.

Key Path	Source, Frequency, Radio Setup
Remote Command	:SOURce:RADio:BAND:LINK DOWN UP :SOURce:RADio:BAND:LINK?
Example	:SOUR:RAD:BAND:LINK UP
Preset	DOWN
Range	DOWN UP
Backwards Compatibility SCPI	:SOURce:RADio:DEVIce BTS MS :SOURce:RADio:DEVIce?
Backwards Compatibility Notes	BTS maps to the Downlink frequency MS maps to the Uplink frequency
Initial S/W Revision	A.05.00

Set Reference Frequency

This key allows you to set the frequency reference. Pressing this key turns the frequency reference state to ON, sets the reference frequency value to the current frequency, maintains this frequency at the RF output, and sets the displayed frequency to 0.00 Hz. All subsequent frequencies entered under Source>Frequency>Frequency are interpreted as being relative to this reference frequency.

When you use a frequency reference, the signal generator outputs a frequency that is set relative to the reference frequency by the value entered under Source>Frequency>Frequency as follows:

$$\text{Output frequency} = \text{reference frequency} - \text{entered frequency}$$

Where:

reference frequency equals the original RF frequency entered under Source>Frequency>Frequency and set as the reference frequency

entered frequency equals a new value entered under Source>Frequency>Frequency

In addition, the displayed frequency value will be the same as the value entered under Source>Frequency>Frequency.

NOTE

If Freq Reference is set to ON with a reference value set, entering a value under Source>Frequency>Frequency and pressing Set Frequency Reference will add that value to the existing Freq Reference value.

If you wish to change the reference frequency value to the new value entered under Source>Frequency>Frequency, first you must set Freq Reference to OFF and then press Set Frequency Reference.

Key Path	Source, Frequency
Remote Command	:SOURce:FREQuency:REFerence:SET
Example	:SOUR:FREQ:REF:SET
Dependencies	This setting is unavailable, and is grayed out when the List Sequencer is turned ON.
Initial S/W Revision	A.05.00

Freq Reference

This key allows you to toggle the state of the frequency reference. When the frequency reference state is ON, an annunciator is displayed on the main source view to indicate this state to the user.

When you use a frequency reference, the signal generator outputs a frequency that is set relative to the reference frequency by the value entered under Source>Frequency>Frequency as follows:

Output frequency = reference frequency + entered frequency

Where:

reference frequency equals the original RF frequency entered under Source>Frequency>Frequency and set as the reference frequency

entered frequency equals a new value entered under Source>Frequency>Frequency

For more information on Reference Frequency refer to ["Set Reference Frequency" on page 540](#)

Key Path	Source, Frequency
Remote Command	:SOURce:FREQuency:REFerence <freq> :SOURce:FREQuency:REFerence? :SOURce:FREQuency:REFerence:STATe OFF ON 0 1 :SOURce:FREQuency:REFerence:STATe?
Example	:SOUR:FREQ:REF 0.00 Hz :SOUR:FREQ:REF:STATe ON
Dependencies	This setting is unavailable, and is grayed out when the List Sequencer is turned ON.
Couplings	The frequency reference state is coupled to the frequency reference set immediate action. When the reference set immediate action key is pressed, or the SCPI command issued, it turns the frequency reference state ON.

Preset	0.00 Hz OFF
Min	0.00 Hz
Max	Hardware Dependant: Option 503 = 3.6 GHz Option 504 = 3.8 GHz Option 506 = 6.00 GHz
Initial S/W Revision	A.05.00

Freq Offset

Allows you to specify the frequency offset value. When the frequency offset state is ON, an annunciator is displayed on the main source view to indicate this state to the user.

When the frequency offset is set to zero (0) and you set a new offset value, the displayed frequency value will change as follows and the RF output frequency will not change:

Displayed value = output frequency + offset value

Where:

output frequency equals the original frequency entered under Source>Frequency>Frequency

offset value equals the value entered under Source>Frequency>Freq Offset

When the frequency offset is set to a value other than zero (0) and you enter a new frequency value under Source>Frequency>Frequency, the displayed frequency will be the same as the value entered and the RF output frequency will be equal to the value entered minus the offset value as follows:

Output frequency = entered frequency – offset frequency

Displayed frequency = output frequency + offset frequency

Displayed frequency = entered frequency

Where:

entered frequency equals the frequency entered under Source>Frequency>Frequency

offset frequency equals the value previously entered and set under Source>Frequency>Freq Offset

Key Path	Source, Frequency
Remote Command	:SOURce:FREQuency:OFFSet <freq> :SOURce:FREQuency:OFFSet?
Example	:SOUR:FREQ:OFFS 0 Hz
Dependencies	This setting is unavailable, and is grayed out when the List Sequencer is turned ON.
Preset	0 Hz

Min	-100.00 GHz
Max	100.00 GHz
Initial S/W Revision	A.05.00

Modulation Setup

Allows access to the menus for setting up the available modulation types: "ARB" on page 543, "AM" on page 584, "FM" on page 585, and "PM" on page 586.

Key Path	Source
Initial S/W Revision	A.05.00

ARB

Allows you access to the ARB sub-menus.

Key Path	Source, Modulation Setup
Initial S/W Revision	A.05.00

ARB

Allows you to toggle the state of the ARB function. When the ARB is On, a "MOD" annunciator is displayed in the system settings panel. When the ARB is turned Off, the MOD annunciator is cleared

Key Path	Source, Modulation Setup, ARB
Remote Command	:SOURce:RADio:ARB[:STATe] ON OFF 1 0 :SOURce:RADio:ARB[:STATe]?
Example	:SOUR:RAD:ARB OFF :SOUR:RAD:ARB?
Notes	If the ARB is ON, a user then loads or deletes another file to ARB memory, the playing waveform segment may not keep phase continuity during the ARB memory operation. The waveform will be replayed after the ARB operation is finished.
Dependencies	This setting is for independent mode and has no effect on 3.3.8 list sequencer mode. Setting "Sequencer" on page 588 Sequencer to On will put source enter list sequencer mode, and even if ARB state is On, the ARB file will not be played. Setting "Sequencer" on page 588 Sequencer to Off will make source leave list sequencer mode, and this setting will take effect immediately. The ARB can only be turned on when there is a waveform file selected for playback. On the GUI If no waveform is selected, this key is grayed out. If you send the SCPI command to turn the ARB on with no waveform selected for playback, the ARB state remains OFF and an error is generated. "- When you try to recall a certain set of states in which the selected waveform is not in ARB memory and the ARB state is On, errors are reported

Preset	Off
Range	On Off
Initial S/W Revision	A.05.00

Select Waveform

Allows you to access to the waveform selection sub-menus.

Pressing this key changes the central view area to show the Waveform File Selection view.

Key Path	Source, Modulation Setup, ARB
Initial S/W Revision	A.05.00

Select Waveform

Allows you to select a waveform sequence or segment for the dual ARB to play.

NOTE: Selecting a waveform file does not result in automatic adjustments to burst timing (to compensate for the presence or absence of a Multiport Adapter); that adjustment occurs only when a waveform is loaded to ARB memory. See "Load Segment to ARB Memory" for more information about this adjustment.

Key Path	Source, Modulation Setup, ARB, Select Waveform
Remote Command	:SOURCE:RADio:ARB:WAVEform <string> :SOURCE:RADio:ARB:WAVEform?
Example	:SOUR:RAD:ARB:WAV "test_waveform.bin"
Notes	<p>If intended waveform is not in the memory yet, then issuing this command by SCPI will invoke ARB loading operation first, which involves a delay of unpredictable length. So this command should be followed by the query *OPC?, which holds off subsequent commands until the loading operating is complete.</p> <p><string> - specifies the name of the waveform segment or waveform sequence to be played by the ARB.</p> <p>When in Sequence Analyzer mode, and Include Source is Yes, if the you attempt to play a waveform sequence but not all the required waveform segments are in the ARB playback memory, the application will reject the loading operation with an error is generated .</p> <p>When Include Source is No, if you attempt to play a waveform sequence but not all the required waveform segments are contained in the ARB playback memory, the application will attempt to load the required segments from either the default directory of the current directory. If the ARB memory does not have enough space for all the waveform segments to be loaded, an error is generated and none of the waveform segments is loaded.</p> <p>If the ARB is ON, and you attemp to play a waveform sequence but not all the waveform segments within the sequence could be found to be loaded into ARB memory, an error is generated. The selected waveform keeps the previous value and ARB state remains On.</p> <p>If you specify a waveform segment over SCPI but the waveform segment is not present within ARB</p>

playback memory and cannot be found for auto loading within the current directory or the default directory, an error is generated and the file selection remains unchanged.

If you select a waveform for playback and the waveform requires a license that is not installed on the instrument, an error is generated.

If the ARB is ON and you load a file to ARB memory or delete a file from ARB memory, the playing waveform segment may not keep phase continuity during the ARB memory operation. The waveform will be replayed after the ARB operation is finished.

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Segments on Hard Disk

Allows you access to the sub-menus for loading waveform segments from the hard disk into ARB memory. The default directory is: D: varb.

Pressing this key changes the current view to the Waveform Management View.

Key Path	Source, Modulation Setup, ARB, Select Waveform
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Initial S/W Revision	A.05.00
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Load Segment To ARB Memory

Allows you to load the selected file into ARB memory. On the front panel you select the file for loading to the ARB memory by highlighting the desired file in the list. Using the SCPI command, you specify the file name on the HDD.

“NVWFM” (none-volatile storage) MSUS (Mass Storage Unit Specifier) is supported in the memory subsystem because the ARB memory cannot be accessed directly. Therefore, files must be downloaded to the instrument hard disk and then loaded into the ARB memory. “NVWFM” MSUS will be mapped to the default directory D: VARB. The SCPI command supports using either “NVWFM” MSUS or specifying a full path. For more information, see [Memory Subsystem \(Remote Command Only\)](#).

If a file of the same name already exists within ARB memory, it is overwritten. If you wish to load two segments of the same name, you must rename one of the segments before loading it into ARB memory. To rename a segment, you can either use Windows File Explorer, or the :MMEMory:CoPY command.

NOTE: When a waveform file is loaded to ARB memory, burst timing adjustments are made automatically, based on whether or not a Multiport Adapter is connected to the test set and powered on. If the connection/power status of the Multiport Adapter is changed after a waveform file has been loaded, it needs to be loaded again.

Key Path	Source, Modulation Setup, ARB, Select Waveform, Segments on Hard Disk
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Remote Command	:SOURce:RADio:ARB:LOAD <string>
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Example	:SOUR:RAD:ARB:LOAD "D: VARB\testwaveform.bin"
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or

	:SOUR:RAD:ARB:LOAD "NVWFM:testwaveform.bin"
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Notes	Because loading the file involves a delay of unpredictable length, this command should be followed by
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the query *OPC?, which holds off subsequent commands until the loading operating is complete.

<string> - specifies the path name of the file to load from the HDD into ARB memory. It could be a <full path + filename>, or <"NVWFM" MSUS + colon + filename>.

When in Sequence Analyzer mode, and Include Source is Yes, an attempt to load a file to ARB memory will be rejected with an error.

When Include Source is No and if there is insufficient free ARB memory to load the selected waveform, an error is generated. .

If you specify a file over SCPI, but the file is not at the specified location, an error is generated.

If you try to load a waveform file but the file contains less than 500 IQ samples, an error is generated.

If you try to load a Signal Studio waveform "*.wfm" which contains invalid waveform header, an error is generated.

If the ARB is ON when you load a file to ARB memory or delete a file from ARB memory, the playing waveform segment may not keep phase continuity during the ARB memory operation. The waveform will be replayed after the ARB operation is finished.

ARB can be loaded into ARB memory even required licenses do not present on the instrument. In this case, a GUI only warning message -800, "Operation complete; Loaded <filename> successfully, but no license <required licenses> installed". User can install required licenses according to <required licenses> string to license it, or multi-pack license it.

Initial S/W Revision	A.05.00
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Load All To ARB Memory

Allows you to load all the segment files within the currently selected directory into ARB memory. If a file of the same name already exists within ARB memory, it is overwritten. If you wish to load two segments of the same name, you must rename one of the segments before loading it into ARB memory. To rename a segment, you can either use Windows File Explorer, or the :MEMory:COpy command.

NOTE: When a waveform file is loaded to ARB memory, burst timing adjustments are made automatically, based on whether or not a Multiport Adapter is connected to the test set and powered on. If the connection/power status of the Multiport Adapter is changed after a waveform file has been loaded, it needs to be loaded again.

Key Path	Source, Modulation Setup, ARB, Select Waveform, Segments on Hard Disk
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Remote Command	:SOURce:RADio:ARB:LOAD:ALL <string>
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Example	:SOUR:RAD:ARB:LOAD:ALL "D: varb"
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Notes	<p><string> - specifies the directory on the HDD to load the files into ARB memory from.</p> <p>When in Sequence Analyzer mode, and Include Source is Yes, an attempt to load all files from a directory to ARB memory is rejected with an error.</p> <p>When Include Source is No and there is insufficient free ARB memory to load all the waveforms, when the ARB memory is full, the copy ceases, and an error is generated.</p> <p>If you specify a directory over SCPI, but the directory does not exist, an error is generated.</p> <p>If the ARB is ON, a user then loads or deletes file to ARB memory, the playing waveform segment may not keep phase continuity during the ARB memory operation. The waveform will be replayed after the ARB operation is finished.</p>
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Initial S/W Revision	A.05.00
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Change Directory...

Allows you to change the currently selected directory on the hard disk. Pressing this key opens a standard windows change directory dialog allowing you to select the new directory of interest.

The current directory is used for manually loading waveform segments into ARB memory for playback, and as a search location for waveform segments that are required to be loaded into ARB memory for playback of a waveform sequence or a list sequence.

Key Path	Source, Modulation Setup, ARB, Select Waveform, Segments on Hard Disk
Notes	No remote command, SCPI front panel only.
Initial S/W Revision	A.05.00

Default Directory...

Allows you to change the default directory. It is used as a search location for waveform segments that are required to be loaded into ARB memory for playback of a waveform sequence, and as a search location for selecting waveforms using SCPI.

Key Path	Source, Modulation Setup, ARB, Select Waveform, Segments on Hard Disk
Remote Command	:SOURce:RADio:ARB:DEFault:DIRectory <string> :SOURce:RADio:ARB: DEFault:DIRectory?
Example	:SOUR:RAD:ARB:DEF:DIR "D:\ArbFiles" :SOUR:RAD:ARB:DEF:DIR?
State Saved	Persistent, survives a power cycle and a preset but not saved in the instrument state
Initial S/W Revision	A.05.00

Segments in ARB Memory

Allows you access to the sub-menus for managing the files within ARB memory.

Key Path	Source, Modulation Setup, ARB, Select Waveform
Initial S/W Revision	A.05.00

Delete Segment From ARB Mem

Allows you to remove a segment from ARB playback memory.

Key Path	Source, Modulation Setup, ARB, Select Waveform, Segments in ARB Memory
Remote Command	:SOURce:RADio:ARB:DELete <string>
Example	:SOUR:RAD:ARB:DEL "testwaveform.bin"
Notes	<string> - specifies the waveform to be deleted from the ARB playback memory.

When in Sequence Analyzer mode and Include Source is Yes, an attempt to delete a file from ARB memory is rejected with an error.

When Include Source is No and you specify a file that does not exist within ARB memory, an error is generated.

It is possible to delete files from within the ARB memory when the ARB is ON. However, if you attempt to delete the file that is currently playing an error is generated.

It is possible to delete a file from within the ARB memory when the sequencer state is ON and the file is not being used by the List Sequencer. If you attempt to delete a file which is being used by the list sequencer, an error is generated.

When sequencer state is On, even if ARB state is On, the selected waveform will not be played. In this case, if the selected waveform is not used in List Sequence, it can be deleted and the ARB state is turned Off.

If the ARB is ON and you load a file to ARB memory or delete a file from ARB memory, the playing waveform segment may not keep phase continuity during the ARB memory operation. The waveform will be replayed after the ARB operation is finished.

Initial S/W Revision A.05.00

Delete All From ARB Memory

Allows you to remove all segments from ARB playback memory.

Key Path Source, Modulation Setup, ARB, Select Waveform, Segments in ARB Memory

Remote Command :SOURce:RADio:ARB:DELeTe:ALL

Example :SOUR:RAD:ARB:DELeTe:ALL

Notes When in Sequence Analyzer mode and Include Source is Yes, an attempt to delete all files from ARB memory is rejected with an error.

When Include Source is No and you attempt to delete all files from ARB memory when the ARB is currently playing a file, all files except the one playing are deleted and an error is generated.

If you attempt to delete all files from ARB memory when there are waveform files used in "[List Sequencer](#)" on page 587 and "[Sequencer](#)" on page 588 state is ON, all files except the files currently being used in list sequencer are deleted, and an error is generated.

If the ARB is ON and you load a file to ARB memory or delete a file from ARB memory, the playing waveform segment may not keep phase continuity during the ARB memory operation. The waveform will be replayed after the ARB operation is finished.

Initial S/W Revision A.05.00

Query ARB Memory File List (Remote Command Only)

Queries the test set for the list of waveform segments in the ARB memory.

NOTE

This command returns a string for waveform segment names in ARB memory. If you want a string list of waveform segments in the ARB memory, use "[Query ARB Memory Full File List \(Remote Command Only\)](#)" on page 549.

Remote Command	:SOURce:RADio:ARB:CATalog?
Example	:SOUR:RAD:ARB:CATalog?
Notes	The return data is in the following format: <integer> - memory used <integer> - memory free <string> ... - comma separated list of waveform segments within ARB memory
Initial S/W Revision	A.05.00

Query ARB Memory Full File List (Remote Command Only)

Queries the test set for the string list of waveform segments in the ARB memory. It returns a string list for waveform segment names in the ARB memory.

Remote Command	:SOURce:RADio:ARB:FCATalog?
Example	:SOUR:RAD:ARB:FCATalog?
Notes	The return data is in the following format: <integer> - memory used <integer> - memory free <integer> - file count in ARB memory <string>,<string>, ... <string> - comma separated string list of waveform segments within ARB memory Example: SOUR:RAD:ARB:FCAT? EXT returns: 27499,2069653,3,"c2k.wfm","gsm.wfm","wcdma.wfm"
Initial S/W Revision	A.09.00

ARB Setup

Allows access to the ARB setup sub-menus.

Key Path	Source, Modulation Setup, ARB
Initial S/W Revision	A.05.00

Sample Rate

Allows you to set the ARB waveform playback sample rate.

Key Path	Source, Modulation Setup, ARB, ARB Setup
Remote Command	:SOURce:RADio:ARB:SCLock:RATE <freq> :SOURce:RADio:ARB:SCLock:RATE?
Example	:SOUR:RAD:ARB:SCL:RATE 48.00 MHz

Notes	If there is a sample rate specified in the header of the waveform file, changing that sample rate is not recommended, as it may cause problems with burst timing.
Dependencies	When a new waveform is selected for playback the settings contained within the associated waveform header file are applied to the ARB. The sample rate is one of the values stored within the header file. If the newly selected waveform file has an associated header file, the sample rate is updated with the value from the header file. The sample rate will remain unchanged if the newly selected waveform does not have an associated header file.
Preset	125.00 MHz
Min	1.00 kHz
Max	125.00 MHz
Initial S/W Revision	A.05.00

Run-Time Scaling

Allows you to adjust the run-time scaling value. The run-time scaling value is applied in real-time while the waveform is playing.

Key Path	Source, Modulation Setup, ARB, ARB Setup
Remote Command	:SOURce:RADio:ARB:RSCaling <real> :SOURce:RADio:ARB:RSCaling?
Example	:SOUR:RAD:ARB:RSC 100.00
Notes	This setting cannot be set in E6640A. Grey out on menu and the value is fixed at 70.00%.
Dependencies	When a new waveform is selected for playback the settings contained within the associated waveform header file are applied to the ARB. The run-time scaling is one of the values stored within the header file. If the newly selected waveform file has an associated header file, the run-time scaling is updated with the value from the header file. The run-time scaling will remain unchanged if the newly selected waveform does not have an associated header file.
Preset	70.00 %
Min	1.00 %
Max	100.00 %
Initial S/W Revision	A.05.00

Baseband Freq Offset

Allows you to adjust the value by which the baseband frequency is offset relative to the carrier.

Key Path	Source, Modulation Setup, ARB, ARB Setup
Remote Command	:SOURce:RADio:ARB:BASEband:FREQuency:OFFSet <freq> :SOURce:RADio:ARB:BASEband:FREQuency:OFFSet?

Example	:SOUR:RAD:ARB:BAS:FREQ:OFFS 0.00 Hz
Dependencies	When a new waveform is selected for playback the settings contained within the associated waveform header file are applied to the ARB. The baseband frequency offset is one of the values stored within the header file. If the newly selected waveform file has an associated header file, the baseband frequency offset is updated with the value from the header file. The baseband frequency offset will remain unchanged if the newly selected waveform does not have an associated header file.
Preset	0.00 Hz
Min	-50.00 MHz
Max	50.00 MHz
Initial S/W Revision	A.05.00

Trigger Type

Allows access to the trigger type sub-menus. The setting for trigger type determines the behavior of the waveform when it plays.

Key Path	Source, Modulation Setup, ARB
Remote Command	:SOURce:RADio:ARB:TRIGger:TYPE CONTInuous SINGLE SADVance GATE :SOURce:RADio:ARB:TRIGger:TYPE?
Example	:SOUR:RAD:ARB:TRIG:TYPE CONT :SOUR:RAD:ARB:TRIG:TYPE?
Notes	Gated trigger type will be implemented at a later release
Preset	CONTInuous
Range	Continuous Single Seg Adv Gated
Initial S/W Revision	A.05.00

Continuous

Sets the active trigger type to Continuous. If Continuous is already selected as the active trigger type, pressing this key allows access to the continuous trigger type setup menu. In Continuous trigger mode, the waveform repeats continuously.

Key Path	Source, Modulation Setup, ARB, Trigger Type
Remote Command	:SOURce:RADio:ARB:TRIGger:TYPE:CONTInuous[:TYPE] FREE TRIGger RESet :SOURce:RADio:ARB:TRIGger:TYPE:CONTInuous[:TYPE]?
Example	:SOUR:RAD:ARB:TRIG:TYPE:CONT FREE
Preset	FREE
Range	Free Run Trigger + Run Reset + Run
Initial S/W Revision	A.05.00

Free Run

Selects Free Run as the trigger response for the continuous trigger type. Free Run sets the waveform generator to play a waveform sequence or segment continuously, without waiting for a trigger. In this mode, the waveform generator does not respond to triggers.

Key Path	Source, Modulation Setup, ARB, Trigger Type, Continuous
Example	:SOUR:RAD:ARB:TRIG:TYPE:CONT FREE
Initial S/W Revision	A.05.00

Trigger + Run

Sets Trigger and Run as the trigger response for the continuous trigger type. Trigger and Run sets the waveform generator to play a waveform sequence or segment continuously when the first trigger is received, and to ignore any subsequent triggers.

Key Path	Source, Modulation Setup, ARB, Trigger Type, Continuous
Example	:SOUR:RAD:ARB:TRIG:TYPE:CONT TRIG
Initial S/W Revision	A.05.00

Reset + Run

Sets Reset and Run as the trigger response for the continuous trigger type. Reset and Run sets the waveform generator to play a waveform sequence or segment continuously when the first trigger is received. Subsequent triggers reset the waveform sequence or segment to the start, and then play it continuously.

Key Path	Source, Modulation Setup, ARB, Trigger Type, Continuous
Example	:SOUR:RAD:ARB:TRIG:TYPE:CONT RES
Initial S/W Revision	A.05.00

Single

Sets the active trigger type to Single. If Single is already selected as the active trigger type, pressing this key allows access to the single trigger type setup menu. In Single trigger mode, the waveform plays once.

Key Path	Source, Modulation Setup, ARB, Trigger Type
Remote Command	:SOURce:RADio:ARB:RETRigger ON OFF IMMEDIATE :SOURce:RADio:ARB:RETRigger?
Example	:SOUR:RAD:ARB:RETR OFF
Notes	ON: Buffered Trigger OFF: No Retrigger Immediate: Restart on Trigger

	This is defined as an enumerated SCPI command, with ON OFF being considered as enumerated types rather than Boolean. This means the query will return OFF instead of 0, and ON instead of 1.
Preset	ON
Range	No Retrigger Buffered Trigger Restart on Trigger
Initial S/W Revision	A.05.00

No Retrigger

Selects No Retrigger as the trigger response for single trigger type. No Retrigger sets the waveform generator to play a waveform sequence or segment once when a trigger is received. Any triggers then received during playback are ignored.

Key Path	Source, Modulation Setup, ARB, Trigger Type, Single
Example	:SOUR:RAD:ARB:RETR OFF
Initial S/W Revision	A.05.00

Buffered Trigger

Selects Buffered Trigger as the trigger response for single trigger type. Buffered Trigger sets the waveform generator to play a waveform sequence or segment once when a trigger is received. If a trigger is received during playback, the waveform generator plays the sequence or segment to the end, then plays the sequence or segment once more.

Key Path	Source, Modulation Setup, ARB, Trigger Type, Single
Example	:SOUR:RAD:ARB:RETR ON
Initial S/W Revision	A.05.00

Restart on Trigger

Selects Restart on Trigger as the trigger response for single trigger type. Restart on Trigger sets the waveform generator to play a waveform sequence or segment once when a trigger is received. If a trigger is received during playback, the waveform generator resets and plays the sequence or segment from the start.

Key Path	Source, Modulation Setup, ARB, Trigger Type, Single
Example	:SOUR:RAD:ARB:RETR IMM
Initial S/W Revision	A.05.00

Segment Advance

Sets the active trigger type to Segment Advance. If Segment Advance is already selected as the active trigger type, pressing this key allows access to the segment advance trigger type setup menu.

Segment Advance triggering allows you to control the playback of waveform segments within a waveform sequence. When a trigger is received the ARB advances to the next waveform segment within the waveform sequence. This type of triggering ignores the repetition count for the waveform segment within the waveform sequence. For example, if a waveform segment has a repetition count of 10 and you select single segment advance triggering mode, the waveform segment will only play once.

Segment Advance triggering can also be used for waveform segments only. In this situation the same waveform segment is played again when a trigger is received.

Key Path	Source, Modulation Setup, ARB, Trigger Type
Remote Command	:SOURce:RADio:ARB:TRIGger:TYPE:SADVance[:TYPE] SINGle CONTInuous :SOURce:RADio:ARB:TRIGger:TYPE:SADVance[:TYPE]?
Example	:SOUR:RAD:ARB:TRIG:TYPE:SADV SING
Preset	CONTInuous
Range	Single Continuous
Initial S/W Revision	A.05.00

Single

Selects Single as the trigger response for Segment Advance trigger type. With single selected, once a trigger is received a segment is played once. If a trigger is received during playback of a segment, the segment plays to completion and the next segment is played once.

Key Path	Source, Modulation Setup, ARB, Trigger Type, Segment Advance
Example	:SOUR:RAD:ARB:TRIG:TYPE:SADV SING
Initial S/W Revision	A.05.00

Continuous

Selects Continuous as the trigger response for Segment Advance trigger type. With continuous selected, once a trigger is received a segment is played continuously. When subsequent triggers are received, the currently playing segment plays to completion and then the next segment is played continuously.

Key Path	Source, Modulation Setup, ARB, Trigger Type, Segment Advance
Example	:SOUR:RAD:ARB:TRIG:TYPE:SADV CONT
Initial S/W Revision	A.05.00

Trigger Source

Allows access to the trigger source sub-menus. The trigger source setting determines how the source receives the trigger that starts the waveform playing. Therefore, this key is grayed out if the trigger type is free run, since free run triggers immediately with no trigger source required.

Key Path	Source, Modulation Setup, ARB
Remote Command	:SOURce:RADio:ARB:TRIGger[:SOURce] KEY BUS EXTernal2 :SOURce:RADio:ARB:TRIGger[:SOURce]?
Example	:SOUR:RAD:ARB:TRIGger KEY
Dependencies	This key is grayed out if the current trigger type is Continuous, Free Run.
Preset	EXTernal2
Range	Trigger Key Bus External 2
Initial S/W Revision	A.05.00

Trigger Key

Sets the current trigger source to the front panel Trigger key. When Trigger Key is selected, the waveform is triggered when you press the front panel Trigger key.

Key Path	Source, Modulation Setup, ARB, Trigger Source
Example	:SOUR:RAD:ARB:TRIGger KEY
Initial S/W Revision	A.05.00

Bus

Sets the current trigger source to Bus. Selecting Bus trigger source enables triggering over GPIB, LAN, or USB using the :SOURce:RADio:ARB:TRIGger:INITiate command.

Key Path	Source, Modulation Setup, ARB, Trigger Source
Example	:SOUR:RAD:ARB:TRIGger BUS
Initial S/W Revision	A.05.00

External 2

Sets the current trigger source to External 2. Selecting External 2 enables triggering a waveform by an externally applied signal.

Key Path	Source, Modulation Setup, ARB, Trigger Source
Example	:SOUR:RAD:ARB:TRIGger EXT2
Notes	Note: When on E6640A, trigger 2 is a bi-directional trigger port. So when trigger 2 has been configured as OUTPUT type, choosing External 2 as the input trigger for the current step will generate error.
Initial S/W Revision	A.05.00

Trigger Initiate

Used to initiate an immediate trigger event if the trigger source is set to Trigger Key.

Key Path	Source, Modulation Setup, ARB
Notes	No remote command, SCPI front panel only.
Initial S/W Revision	A.05.00

Waveform Sequences

Allows access to the waveform sequence sub-menus. Pressing this key changes the central view area to display the Waveform Sequence List view.

Key Path	Source, Modulation Setup, ARB
Notes	No remote command, SCPI front panel only.
Initial S/W Revision	A.05.00

Build New Sequence

Allows access to the sub-menus for creating a new waveform sequence. Pressing this key changes the central view area to display the Waveform Sequence Creation and Editing view.

Key Path	Source, Modulation Setup, ARB, Waveform Sequences
Notes	No remote command, SCPI front panel only.
Initial S/W Revision	A.05.00

Current Segment

Specifies the selected sequence segment that will be affected by the menu functions.

Key Path	Source, Modulation Setup, ARB, Waveform Sequences, Build New Sequence
Notes	No remote command, SCPI front panel only. This key is grayed out and unavailable if the sequence is currently empty.
Initial S/W Revision	A.05.00

Insert New Waveform

Allows you access to the sub-menu for inserting a new waveform segment or sequence. Pressing this key also changes the central display to show the Waveform File Selection View.

Key Path	Source, Modulation Setup, ARB, Waveform Sequences, Build New Sequence
Notes	No remote command, SCPI front panel only.

Waveform segment name string length upper limit is 128 chars. Please do NOT insert waveform which name string exceeds 128 chars.

Initial S/W Revision A.05.00

Insert Waveform

Inserts the currently highlighted waveform to the end of the waveform sequence. Pressing this key also returns you to the menus for creating or editing a sequence, and returns the central view to the sequence creation view.

Key Path Source, Modulation Setup, ARB, Waveform Sequences, Build New Sequence, Insert New Waveform

Notes No remote command, SCPI front panel only.
Waveform segment name string length upper limit is 128 chars. Please do NOT insert waveform which name string exceeds 128 chars.

Initial S/W Revision A.05.00

Segments on Hard Disk

Allows you access to the sub-menus for loading waveform segments from the hard disk into ARB memory. The default directory is: D: varb.

Pressing this key changes the current view to the Waveform Management View.

Key Path Source, Modulation Setup, ARB, Select Waveform

Initial S/W Revision A.05.00

Load Segment To ARB Memory

Allows you to load the selected file into ARB memory. On the front panel you select the file for loading to the ARB memory by highlighting the desired file in the list. Using the SCPI command, you specify the file name on the HDD.

“NVWFM” (none-volatile storage) MSUS (Mass Storage Unit Specifier) is supported in the memory subsystem because the ARB memory cannot be accessed directly. Therefore, files must be downloaded to the instrument hard disk and then loaded into the ARB memory. “NVWFM” MSUS will be mapped to the default directory D: VARB. The SCPI command supports using either “NVWFM” MSUS or specifying a full path. For more information, see [Memory Subsystem \(Remote Command Only\)](#).

If a file of the same name already exists within ARB memory, it is overwritten. If you wish to load two segments of the same name, you must rename one of the segments before loading it into ARB memory. To rename a segment, you can either use Windows File Explorer, or the :MMEMory:COPY command.

NOTE: When a waveform file is loaded to ARB memory, burst timing adjustments are made automatically, based on whether or not a Multiport Adapter is connected to the test set and powered on. If the connection/power status of the Multiport Adapter is changed after a waveform file has been loaded, it needs to be loaded again.

Key Path	Source, Modulation Setup, ARB, Select Waveform, Segments on Hard Disk
Remote Command	:SOURce:RADio:ARB:LOAD <string>
Example	:SOUR:RAD:ARB:LOAD "D: VARB\testwaveform.bin" or :SOUR:RAD:ARB:LOAD "NVWFM:testwaveform.bin"
Notes	<p>Because loading the file involves a delay of unpredictable length, this command should be followed by the query *OPC?, which holds off subsequent commands until the loading operating is complete.</p> <p><string> – specifies the path name of the file to load from the HDD into ARB memory. It could be a <full path + filename>, or <"NVWFM" MSUS + colon + filename>.</p> <p>When in Sequence Analyzer mode, and Include Source is Yes, an attempt to load a file to ARB memory will be rejected with an error.</p> <p>When Include Source is No and if there is insufficient free ARB memory to load the selected waveform, an error is generated. .</p> <p>If you specify a file over SCPI, but the file is not at the specified location, an error is generated.</p> <p>If you try to load a waveform file but the file contains less than 500 IQ samples, an error is generated.</p> <p>If you try to load a Signal Studio waveform "*.wfm" which contains invalid waveform header, an error is generated.</p> <p>If the ARB is ON when you load a file to ARB memory or delete a file from ARB memory, the playing waveform segment may not keep phase continuity during the ARB memory operation. The waveform will be replayed after the ARB operation is finished.</p> <p>ARB can be loaded into ARB memory even required licenses do not present on the instrument. In this case, a GUI only warning message -800, "Operation complete; Loaded <filename> successfully, but no license <required licenses> installed". User can install required licenses according to <required licenses> string to license it, or multi-pack license it.</p>
Initial S/W Revision	A.05.00

Load All To ARB Memory

Allows you to load all the segment files within the currently selected directory into ARB memory. If a file of the same name already exists within ARB memory, it is overwritten. If you wish to load two segments of the same name, you must rename one of the segments before loading it into ARB memory. To rename a segment, you can either use Windows File Explorer, or the :MEMory:COpy command.

NOTE: When a waveform file is loaded to ARB memory, burst timing adjustments are made automatically, based on whether or not a Multiport Adapter is connected to the test set and powered on. If the connection/power status of the Multiport Adapter is changed after a waveform file has been loaded, it needs to be loaded again.

Key Path	Source, Modulation Setup, ARB, Select Waveform, Segments on Hard Disk
Remote Command	:SOURce:RADio:ARB:LOAD:ALL <string>
Example	:SOUR:RAD:ARB:LOAD:ALL "D: varb"
Notes	<p><string> - specifies the directory on the HDD to load the files into ARB memory from.</p> <p>When in Sequence Analyzer mode, and Include Source is Yes, an attempt to load all files from a directory to ARB memory is rejected with an error.</p>

When Include Source is No and there is insufficient free ARB memory to load all the waveforms, when the ARB memory is full, the copy ceases, and an error is generated.

If you specify a directory over SCPI, but the directory does not exist, an error is generated.

If the ARB is ON, a user then loads or deletes file to ARB memory, the playing waveform segment may not keep phase continuity during the ARB memory operation. The waveform will be replayed after the ARB operation is finished.

Initial S/W Revision	A.05.00
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Change Directory...

Allows you to change the currently selected directory on the hard disk. Pressing this key opens a standard windows change directory dialog allowing you to select the new directory of interest.

The current directory is used for manually loading waveform segments into ARB memory for playback, and as a search location for waveform segments that are required to be loaded into ARB memory for playback of a waveform sequence or a list sequence.

Key Path	Source, Modulation Setup, ARB, Select Waveform, Segments on Hard Disk
Notes	No remote command, SCPI front panel only.
Initial S/W Revision	A.05.00

Default Directory...

Allows you to change the default directory. It is used as a search location for waveform segments that are required to be loaded into ARB memory for playback of a waveform sequence, and as a search location for selecting waveforms using SCPI.

Key Path	Source, Modulation Setup, ARB, Select Waveform, Segments on Hard Disk
Remote Command	:SOURce:RADio:ARB:DEFault:DIRectory <string> :SOURce:RADio:ARB: DEFault:DIRectory?
Example	:SOUR:RAD:ARB:DEF:DIR "D:\ArbFiles" :SOUR:RAD:ARB:DEF:DIR?
State Saved	Persistent, survives a power cycle and a preset but not saved in the instrument state
Initial S/W Revision	A.05.00

Segments in ARB Memory

Allows you access to the sub-menus for managing the files within ARB memory.

Key Path	Source, Modulation Setup, ARB, Select Waveform
Initial S/W Revision	A.05.00

Delete Segment From ARB Mem

Allows you to remove a segment from ARB playback memory.

Key Path	Source, Modulation Setup, ARB, Select Waveform, Segments in ARB Memory
Remote Command	:SOURce:RADio:ARB:DELeTe <string>
Example	:SOUR:RAD:ARB:DEL "testwaveform.bin"
Notes	<p><string> - specifies the waveform to be deleted from the ARB playback memory.</p> <p>When in Sequence Analyzer mode and Include Source is Yes, an attempt to delete a file from ARB memory is rejected with an error.</p> <p>When Include Source is No and you specify a file that does not exist within ARB memory, an error is generated.</p> <p>It is possible to delete files from within the ARB memory when the ARB is ON. However, if you attempt to delete the file that is currently playing an error is generated.</p> <p>It is possible to delete a file from within the ARB memory when the sequencer state is ON and the file is not being used by the List Sequencer. If you attempt to delete a file which is being used by the list sequencer, an error is generated.</p> <p>When sequencer state is On, even if ARB state is On, the selected waveform will not be played. In this case, if the selected waveform is not used in List Sequence, it can be deleted and the ARB state is turned Off.</p> <p>If the ARB is ON and you load a file to ARB memory or delete a file from ARB memory, the playing waveform segment may not keep phase continuity during the ARB memory operation. The waveform will be replayed after the ARB operation is finished.</p>
Initial S/W Revision	A.05.00

Delete All From ARB Memory

Allows you to remove all segments from ARB playback memory.

Key Path	Source, Modulation Setup, ARB, Select Waveform, Segments in ARB Memory
Remote Command	:SOURce:RADio:ARB:DELeTe:ALL
Example	:SOUR:RAD:ARB:DELeTe:ALL
Notes	<p>When in Sequence Analyzer mode and Include Source is Yes, an attempt to delete all files from ARB memory is rejected with an error.</p> <p>When Include Source is No and you attempt to delete all files from ARB memory when the ARB is currently playing a file, all files except the one playing are deleted and an error is generated.</p> <p>If you attempt to delete all files from ARB memory when there are waveform files used in "List Sequencer" on page 587 and "Sequencer" on page 588 state is ON, all files except the files currently being used in list sequencer are deleted, and an error is generated.</p> <p>If the ARB is ON and you load a file to ARB memory or delete a file from ARB memory, the playing waveform segment may not keep phase continuity during the ARB memory operation. The waveform will be replayed after the ARB operation is finished.</p>
Initial S/W Revision	A.05.00

Segments on Hard Disk

This key functions the same as ["Segments on Hard Disk" on page 614](#).

Key Path	Source, Modulation Setup, ARB, Waveform Sequences, Build New Sequence, Insert New Waveform
Initial S/W Revision	Prior to A.09.00

Load Segment To ARB Memory

This key functions the same as ["Load Segment To ARB Memory" on page 614](#).

Key Path	Source, Modulation Setup, ARB, Waveform Sequences, Build New Sequence, Insert New Waveform, Segment on Hard Drive
Initial S/W Revision	Prior to A.09.00

Load All To ARB Memory

This key functions the same as ["Load All To ARB Memory" on page 615](#).

Key Path	Source, Modulation Setup, ARB, Waveform Sequences, Build New Sequence, Insert New Waveform, Segment on Hard Drive
Initial S/W Revision	Prior to A.09.00

Change Directory ...

This key functions the same as ["Change Directory..." on page 615](#).

Key Path	Source, Modulation Setup, ARB, Waveform Sequences, Build New Sequence, Insert New Waveform, Segment on Hard Drive
Initial S/W Revision	Prior to A.09.00

Default Directory ...

This key functions the same as ["Default Directory..." on page 616](#)

Key Path	Source, Modulation Setup, ARB, Waveform Sequences, Build New Sequence, Insert New Waveform, Segment on Hard Drive
Initial S/W Revision	Prior to A.09.00

Segments in ARB Memory

This key functions the same as ["Segments in ARB Memory" on page 616](#).

Key Path	Source, Modulation Setup, ARB, Waveform Sequences, Build New Sequence, Insert New Waveform
Initial S/W Revision	Prior to A.09.00

Delete Segment From ARB Memory

This key functions the same as ["Delete Segment From ARB Mem" on page 616](#).

Key Path	Source, Modulation Setup, ARB, Waveform Sequences, Build New Sequence, Insert New Waveform, Segment in ARB Memory
Initial S/W Revision	Prior to A.09.00

Delete All From ARB Memory

This key functions the same as ["Delete All From ARB Memory" on page 617](#).

Key Path	Source, Modulation Setup, ARB, Waveform Sequences, Build New Sequence, Insert New Waveform, Segment in ARB Memory
Initial S/W Revision	Prior to A.09.00

Query ARB Memory File List (Remote Command Only)

This command functions the same as ["Query ARB Memory File List \(Remote Command Only\)" on page 548](#).

Initial S/W Revision	Prior to A.09.00
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Edit Selected Waveform

Allows access to the sub-menus for editing the details of the currently selected waveform segment.

Key Path	Source, Modulation Setup, ARB, Waveform Sequences, Build New Sequence
Notes	No remote command, front panel only.
Initial S/W Revision	A.05.00

Repetitions

Allows you to specify the number of times the currently selected waveform is played within the sequence.

Key Path	Source, Modulation Setup, ARB, Waveform Sequences, Build New Sequence, Edit Selected Waveform
Notes	No remote command, SCPI front panel only.

Preset	1
Min	1
Max	65535
Initial S/W Revision	A.05.00

Marker 1

Allows you to enable or disable marker 1 for the currently selected waveform. For a waveform sequence, you can enable and disable markers on a per-segment basis, allowing you to output markers from some waveform segments within the sequence, but not for others.

Key Path	Source, Modulation Setup, ARB, Waveform Sequences, Build New Sequence, Edit Selected Waveform
Notes	No remote command, front panel only.
Preset	Enabled
Range	Enabled Disabled
Initial S/W Revision	A.05.00

Marker 2

Allows you to enable or disable marker 2 for the currently selected waveform. For a waveform sequence, you can enable and disable markers on a per-segment basis, allowing you to output markers from some waveform segments within the sequence, but not for others.

Key Path	Source, Modulation Setup, ARB, Waveform Sequences, Build New Sequence, Edit Selected Waveform
Notes	No remote command, front panel only.
Preset	Enabled
Range	Enabled Disabled
Initial S/W Revision	A.05.00

Marker 3

Allows you to enable or disable marker 3 for the currently selected waveform. For a waveform sequence, you can enable and disable markers on a per-segment basis, allowing you to output markers from some waveform segments within the sequence, but not for others.

Key Path	Source, Modulation Setup, ARB, Waveform Sequences, Build New Sequence, Edit Selected Waveform
Notes	No remote command, front panel only.

Preset	Enabled
Range	Enabled Disabled
Initial S/W Revision	A.05.00

Marker 4

Allows you to enable or disable marker 4 for the currently selected waveform. For a waveform sequence, you can enable and disable markers on a per-segment basis, allowing you to output markers from some waveform segments within the sequence, but not for others.

Key Path	Source, Modulation Setup, ARB, Waveform Sequences, Build New Sequence, Edit Selected Waveform
Notes	No remote command, front panel only.
Preset	Enabled
Range	Enabled Disabled
Initial S/W Revision	A.05.00

Delete Segment

Allows you to delete the selected segment from the waveform sequence.

Key Path	Source, Modulation Setup, ARB, Waveform Sequences, Build New Sequence
Notes	No remote command, front panel only.
Initial S/W Revision	A.05.00

Save Sequence...

Pressing this key displays the "Save As" dialog. The sequence name is passed to the save as dialog to use as the filename for saving, and the directory the save as dialog will open into is the default waveform directory.

Key Path	Source, Modulation Setup, ARB, Waveform Sequences, Build New Sequence
Initial S/W Revision	A.05.00

Build New Sequence (Remote Command Only)

This command is the SCPI equivalent of the waveform sequence creation features described in ["Build New Sequence" on page 556](#).

This command writes a waveform sequence file to the hard disk. You must specify the waveform sequence file path and filename which will be saved on the hard disk, and the waveform segment file path and name which will be nested into the waveform sequence file. You can utilize mass storage unit specifier (MSUS)

“NVWFM” or use a real full path representation. See the example below. MSUS “NVWFM” is mapped to D:VARB directory on test set hard disk.

Any number of segments, up to a segment count limit of 64, can be used to create a sequence. Repeated segments are included in the count limit.

Each waveform segment name string length upper limit is 128 chars. Please do NOT insert waveform which name string exceeds 128 chars.

The internal source does not support nesting one waveform sequence file into another waveform sequence file.

Remote Command :SOURce:RADio:ARB:SEQuence[:MWAVeform] <filename>, <waveform1>, <reps>, NONE | M1 | M2 | M3 | M4 | M1M2 | M1M3 | M1M4 | M2M3 | M2M4 | M3M4 | M1M2M3 | M1M2M4 | M1M3M4 | M2M3M4 | M1M2M3M4 | ALL, {<waveform2>, <reps>, NONE | M1 | M2 | M3 | M4 | M1M2 | M1M3 | M1M4 | M2M3 | M2M4 | M3M4 | M1M2M3 | M1M2M4 | M1M3M4 | M2M3M4 | M1M2M3M4 | ALL, } ...

(For additional description of each item, see Notes below "[For Setup SCPI](#)" on page 565 "For Setup SCPI".)

:SOURce:RADio:ARB:SEQuence[:MWAVeform]? <filename>

(For additional description of each item, see Notes "[For Query SCPI](#)" on page 566 below.)

Example For setup:

>:SOUR:RAD:ARB:SEQ "NVWFM:testSeq1.seq", "NVWFM:wfmSegment1.wfm", 10, M2M3M4, "NVWFM:wfmSegment2.wfm", 20, M1M3

Or

>:SOUR:RAD:ARB:SEQ "D: VARB\testSeq1.seq", " D: VARB\wfmSegment1.wfm", 10, M2M3M4, " D: VARB\wfmSegment2.wfm", 20, M1M3

For query, must specify which waveform sequence file to query.

>:SOUR:RAD:ARB:SEQ? "NVWFM:testSeq1.seq"

Or

>:SOUR:RAD:ARB:SEQ? "D: VARB\testSeq1.seq",

Notes

For Setup SCPI

For the Setup SCPI command, the parameters are:

<filename> - String Type

This variable specifies the path and name for the waveform sequence file. The path supports MSUS (NVWFM) or a real full path representation. See example.

<waveform1> - String Type

This variable specifies the path and name of the first existing waveform segment. The path supports MSUS (NVWFM) or a real full path representation. See example.

The segment file must reside within ARB playback memory before it can be played by the ARB player.

<reps> - Integer Type

This variable specifies the number of times a segment or sequence plays before moving on to the next segment or sequence.

<marker> - Enum Type

NONE – This choice disables all four markers for the waveform. Disabling markers means that the waveform sequence ignores the segments or sequence marker settings.

M1, M2, M3, M4 – these choices, either individually or a combination of them, enable the markers for the waveform segment or sequence. Markers not specified are ignored for that segment or sequence.

ALL – This choice enables all four markers in the waveform segment or sequence.

<waveform2> - String type.

This variable specifies the name of a second existing waveform segment. The path supports MSUS (NVWFM) and real full path representation both. See example.

The segment file must reside within ARB playback memory before it can be played by the ARB player.

<reps> same as above, for the 2nd waveform segment.

<marker> same as above, for the 2nd waveform segment.

You can insert several waveform segments into a waveform sequence file. Just repeat inserting waveform segments as described above.

Error Checks for Setup SCPI command:

If you do not specify a filename, or you use an unsupported MSUS (that is, not NVWFM), or have an error in the waveform sequence file path, an error is generated.

Notes

Error Checks for Query SCPI command: (Continued)

If the specified waveform sequence file name suffix is not “.seq”, error is generated.

If you use an unsupported MSUS (that is, not NVWFM), or have an error in the waveform segment file path, an error is generated.

If the first specified waveform file cannot be found, an error is generated.

If you nest one waveform sequence file into another waveform sequence file, an error is generated.

If the specified repetition value is larger than 65535 or smaller than 1, an error is generated.

If the specified marker type is unrecognized, an error is generated.

For Query SCPI

For the Query the parameters are:

<filename> - String type.

This variable specifies the path and name of the waveform sequence file being queried. The path supports MSUS (NVWFM) or a real full path representation. See example.

The return value is a <string>, which includes each waveform segment file name, repetitions, and marker type. For example:

```
>:SOUR:RAD:ARB:SEQ? "NVWFM:testSeq1.seq",  
<"wfmSegment1.wfm, 10, ALL, wfmSegment2.wfm, 20, M1M3",
```

Error Checks for Query SCPI command:

If you do not specify a filename, an error is generated.

If the waveform sequence file name is empty, an error is generated.

If the specified waveform sequence file cannot be found, an error is generated.

Initial S/W Revision

A.05.00

Edit Selected Sequence

Allows access to the sub-menus for editing the sequence currently selected within the Waveform Sequence List view. Pressing this key changes the central view area to display the Waveform Sequence Creation and Editing view.

Key Path	Source, Modulation Setup, ARB, Waveform Sequences
Notes	No remote command, front panel only.
Initial S/W Revision	A.05.00

Current Directory...

Allows you to change the currently selected directory on the hard disk. Pressing this key opens a standard windows change directory dialog and allows you to select the new directory of interest.

Key Path	Source, Modulation Setup, ARB, Waveform Sequences
Notes	No remote command, front panel only.
Initial S/W Revision	A.05.00

Waveform Utilities

Allows you access to the waveform utilities sub-menus.

Key Path	Source, Modulation Setup, ARB
Initial S/W Revision	A.05.00

Multi-Pack Licenses

Allows you access to the Multi - Pack License sub-menus. Pressing this key also changes the central view area to display the Multi -Pack License Management view.

On modular instrument like E6630A or E6640A, multi-pack license operations are only allowed on the default module, i.e. "Left" module for E6630A or "TRX1" module for E6640A.

Key Path	Source, Modulation Setup, ARB, Waveform Utilities
Notes	If access multi-pack license sub-menu from modules other than "TRX1", an advisory message like "Please goto "TRX1" to operate multi-pack license" will display.
Dependencies	This key is only available if there is at least one Multi-pack license installed on the instrument.
Initial S/W Revision	A.05.00

Add Waveform

Pressing this key accesses the Add Waveform sub-menu. It also changes the central display area to display the Multi-Pack License Waveform Add view.

Key Path	Source, Modulation Setup, ARB, Waveform Utilities, Multi-Pack Licenses
Dependencies	This key is only available if there is at least one slot available within at least one multi-pack license.
Initial S/W Revision	A.05.00

Add Waveform

Allows you to add the currently selected waveform segment to a multi-pack license. The new waveform is added to the next available slot regardless of which slot was selected on the Multi-Pack License Management view.

Key Path	Source, Modulation Setup, ARB, Waveform Utilities, Multi-Pack Licenses, Add Waveform
Remote Command	:SYSTem:LKEY:WAVeform:ADD <string> or :SYSTem:LIcense[:FPACK]:WAVeform:ADD <string>
Example	SYST:LKEY:WAV:ADD "mywaveform.wfm" or SYST:LIC:WAV:ADD "mywaveform.wfm"
Notes	The second SCPI :SYSTem:LIcense[:FPACK]:WAVeform:ADD is provided to be consistent with the style of Agilent signal sources. You can use either one of them. Since adding a waveform segment to a Multi-Pack license causes the license slot to enter the trial period of only 48 hours, pressing this key causes a confirmation dialog to be displayed to ensure you do want to add the waveform segment to the Multi-Pack. If you attempt to license a waveform that is already licensed using another slot an error is generated. . If current module is not "TRX1" module, the key will grey out, and error message is generated "-221 Setting conflict; Not allowed on current module. Goto "TRX1" to operate multi-pack license" when invoking SCPI.
Dependencies	This key is only available if the currently selected file is a secure waveform requiring a license, and there is at least one slot available within at least one multi-pack license. If the waveform highlighted is a secure waveform, but is already licensed, this key will be unavailable.
Initial S/W Revision	A.05.00

Segments on Hard Disk

Allows you access to the sub-menus for loading waveform segments from the hard disk into ARB memory. The default directory is: D: varb.

Pressing this key changes the current view to the Waveform Management View.

Key Path	Source, Modulation Setup, ARB, Select Waveform
Initial S/W Revision	A.05.00

Load Segment To ARB Memory

Allows you to load the selected file into ARB memory. On the front panel you select the file for loading to the ARB memory by highlighting the desired file in the list. Using the SCPI command, you specify the file name on the HDD.

“NVWFM” (none-volatile storage) MSUS (Mass Storage Unit Specifier) is supported in the memory subsystem because the ARB memory cannot be accessed directly. Therefore, files must be downloaded to the instrument hard disk and then loaded into the ARB memory. “NVWFM” MSUS will be mapped to the default directory D: VARB. The SCPI command supports using either “NVWFM” MSUS or specifying a full path. For more information, see [Memory Subsystem \(Remote Command Only\)](#).

If a file of the same name already exists within ARB memory, it is overwritten. If you wish to load two segments of the same name, you must rename one of the segments before loading it into ARB memory. To rename a segment, you can either use Windows File Explorer, or the :MMEMory:COPI command.

NOTE: When a waveform file is loaded to ARB memory, burst timing adjustments are made automatically, based on whether or not a Multiport Adapter is connected to the test set and powered on. If the connection/power status of the Multiport Adapter is changed after a waveform file has been loaded, it needs to be loaded again.

Key Path	Source, Modulation Setup, ARB, Select Waveform, Segments on Hard Disk
Remote Command	:SOURce:RADio:ARB:LOAD <string>
Example	:SOUR:RAD:ARB:LOAD "D: VARB\testwaveform.bin" or :SOUR:RAD:ARB:LOAD "NVWFM:testwaveform.bin"
Notes	<p>Because loading the file involves a delay of unpredictable length, this command should be followed by the query *OPC?, which holds off subsequent commands until the loading operating is complete.</p> <p><string> – specifies the path name of the file to load from the HDD into ARB memory. It could be a <full path + filename>, or <“NVWFM” MSUS + colon + filename>.</p> <p>When in Sequence Analyzer mode, and Include Source is Yes, an attempt to load a file to ARB memory will be rejected with an error.</p> <p>When Include Source is No and if there is insufficient free ARB memory to load the selected waveform, an error is generated. .</p> <p>If you specify a file over SCPI, but the file is not at the specified location, an error is generated.</p> <p>If you try to load a waveform file but the file contains less than 500 IQ samples, an error is generated.</p> <p>If you try to load a Signal Studio waveform “*.wfm” which contains invalid waveform header, an error is generated.</p> <p>If the ARB is ON when you load a file to ARB memory or delete a file from ARB memory, the playing waveform segment may not keep phase continuity during the ARB memory operation. The waveform will be replayed after the ARB operation is finished.</p> <p>ARB can be loaded into ARB memory even required licenses do not present on the instrument. In this</p>

	case, a GUI only warning message -800, "Operation complete; Loaded <filename> successfully, but no license <required licenses> installed". User can install required licenses according to <required licenses> string to license it, or multi-pack license it.
Initial S/W Revision	A.05.00

Load All To ARB Memory

Allows you to load all the segment files within the currently selected directory into ARB memory. If a file of the same name already exists within ARB memory, it is overwritten. If you wish to load two segments of the same name, you must rename one of the segments before loading it into ARB memory. To rename a segment, you can either use Windows File Explorer, or the :MEMory:COPY command.

NOTE: When a waveform file is loaded to ARB memory, burst timing adjustments are made automatically, based on whether or not a Multiport Adapter is connected to the test set and powered on. If the connection/power status of the Multiport Adapter is changed after a waveform file has been loaded, it needs to be loaded again.

Key Path	Source, Modulation Setup, ARB, Select Waveform, Segments on Hard Disk
Remote Command	:SOURce:RADio:ARB:LOAD:ALL <string>
Example	:SOUR:RAD:ARB:LOAD:ALL "D: varb"
Notes	<p><string> - specifies the directory on the HDD to load the files into ARB memory from.</p> <p>When in Sequence Analyzer mode, and Include Source is Yes, an attempt to load all files from a directory to ARB memory is rejected with an error.</p> <p>When Include Source is No and there is insufficient free ARB memory to load all the waveforms, when the ARB memory is full, the copy ceases, and an error is generated.</p> <p>If you specify a directory over SCPI, but the directory does not exist, an error is generated.</p> <p>If the ARB is ON, a user then loads or deletes file to ARB memory, the playing waveform segment may not keep phase continuity during the ARB memory operation. The waveform will be replayed after the ARB operation is finished.</p>
Initial S/W Revision	A.05.00

Change Directory...

Allows you to change the currently selected directory on the hard disk. Pressing this key opens a standard windows change directory dialog allowing you to select the new directory of interest.

The current directory is used for manually loading waveform segments into ARB memory for playback, and as a search location for waveform segments that are required to be loaded into ARB memory for playback of a waveform sequence or a list sequence.

Key Path	Source, Modulation Setup, ARB, Select Waveform, Segments on Hard Disk
Notes	No remote command, SCPIfront panel only.
Initial S/W Revision	A.05.00

Default Directory...

Allows you to change the default directory. It is used as a search location for waveform segments that are required to be loaded into ARB memory for playback of a waveform sequence, and as a search location for selecting waveforms using SCPI.

Key Path	Source, Modulation Setup, ARB, Select Waveform, Segments on Hard Disk
Remote Command	:SOURce:RADio:ARB:DEFault:DIRectory <string> :SOURce:RADio:ARB: DEFault:DIRectory?
Example	:SOUR:RAD:ARB:DEF:DIR "D:\ArbFiles" :SOUR:RAD:ARB:DEF:DIR?
State Saved	Persistent, survives a power cycle and a preset but not saved in the instrument state
Initial S/W Revision	A.05.00

Segments on Hard Disk

This key functions the same as ["Segments on Hard Disk" on page 614](#).

Key Path	Source, Modulation Setup, ARB, Waveform Utilities, Multi-Pack Licenses, Add Waveform
Initial S/W Revision	Prior to A.09.00

Load Segment To ARB Memory

This key functions the same as ["Load Segment To ARB Memory" on page 614](#).

Key Path	Source, Modulation Setup, ARB, Waveform Utilities, Multi-Pack Licenses, Add Waveform, Segment on Hard Drive
Initial S/W Revision	Prior to A.09.00

Load All To ARB Memory

This key functions the same as ["Load All To ARB Memory" on page 615](#).

Key Path	Source, Modulation Setup, ARB, Waveform Utilities, Multi-Pack Licenses, Add Waveform, Segment on Hard Drive
Initial S/W Revision	Prior to A.09.00

Change Directory ...

This key functions the same as ["Change Directory..." on page 615](#).

Key Path	Source, Modulation Setup, ARB, Waveform Utilities, Multi-Pack Licenses, Add Waveform, Segment on Hard Drive
Initial S/W Revision	Prior to A.09.00

Default Directory ...

This key functions the same as ["Default Directory..." on page 616](#)

Key Path	Source, Modulation Setup, ARB, Waveform Utilities, Multi-Pack Licenses, Add Waveform, Segment on Hard Drive
Initial S/W Revision	Prior to A.09.00

Replace Waveform

Pressing this key accesses the Replace Waveform submenu. It also changes the central display area to display the Multi-Pack License Waveform Add view.

Key Path	Source, Modulation Setup, ARB, Waveform Utilities, Multi-Pack Licenses
Dependencies	This key is only available if the currently selected slot is in the trial state.
Initial S/W Revision	A.05.00

Replace Waveform

Allows you to replace the waveform in the currently selected slot with the waveform currently selected in the Multi-Pack License Waveform Add view.

Key Path	Source, Modulation Setup, ARB, Waveform Utilities, Multi-Pack Licenses, Replace Waveform
Remote Command	:SYSTem:LKEY:WAVeform:REPLace <int>, <string> or :SYSTem:LICense[:FPACK]:WAVeform:REPLace <int>, <string>
Example	SYST:LKEY:WAV:REPL 1, "myotherwaveform.wfm" or :SYST:LIC:WAV:REPL 1, "myotherwaveform.wfm"
Notes	The second SCPI :SYSTem:LICense[:FPACK]:WAVeform:REPLace is provided to be consistent with the style of Agilent signal sources. You can use either one of them. If you attempt to license a waveform that is already licensed using another slot an error is generated. Waveform slot number <int> is positive. If you attempt to input a slot number less than or equals 0, an error is generated. If current module is not "TRX1" module, the key will grey out, and error message is generated "-221 Setting conflict; Not allowed on current module. Goto "TRX1" to operate multi-pack license" when invoking SCPI.
Initial S/W Revision	A.05.00

Segments on Hard Disk

This key functions the same as ["Segments on Hard Disk" on page 614](#).

Key Path	Source, Modulation Setup, ARB, Waveform Utilities, Multi-Pack Licenses, Replace Waveform
Initial S/W Revision	Prior to A.09.00

Load Segment To ARB Memory

This key functions the same as ["Load Segment To ARB Memory" on page 614](#).

Key Path	Source, Modulation Setup, ARB, Waveform Utilities, Multi-Pack Licenses, Replace Waveform, Segment on Hard Drive
Initial S/W Revision	Prior to A.09.00

Load All To ARB Memory

This key functions the same as ["Load All To ARB Memory" on page 615](#).

Key Path	Source, Modulation Setup, ARB, Waveform Utilities, Multi-Pack Licenses, Replace Waveform, Segment on Hard Drive
Initial S/W Revision	Prior to A.09.00

Change Directory ...

This key functions the same as ["Change Directory..." on page 615](#).

Key Path	Source, Modulation Setup, ARB, Waveform Utilities, Multi-Pack Licenses, Replace Waveform, Segment on Hard Drive
Initial S/W Revision	Prior to A.09.00

Default Directory ...

This key functions the same as ["Default Directory..." on page 616](#)

Key Path	Source, Modulation Setup, ARB, Waveform Utilities, Multi-Pack Licenses, Replace Waveform, Segment on Hard Drive
Initial S/W Revision	Prior to A.09.00

Clear Waveform from Slot

Allows you to clear the waveform from the selected slot.

Key Path	Source, Modulation Setup, ARB, Waveform Utilities, Multi-Pack Licenses
Remote Command	:SYSTem:LKEY:WAVeform:CLEar <int> or :SYSTem:LICense[:FPACK]:WAVeform:CLEar <int>
Example	SYST:LKEY:WAV:CLE 1 or :SYST:LIC:WAV:CLE 1
Notes	The second SCPI :SYSTem:LICense[:FPACK]:WAVeform:CLEar is provided to be consistent with the style of Agilent signal sources. You can use either one of them. Waveform slot number <int> is positive. If you attempt to input a slot number less than or equals 0, an error is generated. If current module is not "TRX1" module, the key will grey out, and error message is generated "-221 Setting conflict; Not allowed on current module. Goto "TRX1" to operate multi-pack license" when invoking SCPI.
Dependencies	This key is only available if the currently selected slot is in the trial state.
Initial S/W Revision	A.05.00

Lock Waveform in Slot

If the selected slot is in the trial state or the lock required state, the waveform that occupies the slot is locked and permanently licensed.

Key Path	Source, Modulation Setup, ARB, Waveform Utilities, Multi-Pack Licenses
Remote Command	:SYSTem:LKEY:WAVeform:LOCK <int> or :SYSTem:LICense[:FPACK]:WAVeform:LOCK <int>
Example	SYST:LKEY:WAV:LOCK 1 or SYST:LIC:WAV:LOCK 1
Notes	The second SCPI :SYSTem:LICense[:FPACK]:WAVeform:LOCK is provided to be consistent with the style of Agilent signal sources. You can use either one of them. Waveform slot number <int> is positive. If you attempt to input a slot number less than or equals 0, an error is generated. If current module is not "TRX1" module, the key will grey out, and error message is generated "-221 Setting conflict; Not allowed on current module. Goto "TRX1" to operate multi-pack license" when invoking SCPI.
Dependencies	This key is only available if the currently selected slot is in the trial state or the lock required state.
Initial S/W Revision	A.05.00

Slot Status Query (Remote Command Only)

Returns the status of the specified slot.

Remote Command	:SYSTem:LKEY:WAVeform:STATus? <int> or :SYSTem:LICense[:FPACK]:WAVeform:STATus? <int>
Example	:SYST:LKEY:WAV:STAT? 1 <"Locked" or :SYST:LIC:WAV:STAT? 1 <"Locked"
Notes	The second SCPI :SYSTem:LICense[:FPACK]:WAVeform:STATus is provided to be consistent with the style of Agilent signal sources. You can use either one of them. Waveform slot number <int> is positive. If you attempt to input a slot number less than or equals 0, an error is generated. Result type is string. If input slot number exceeds total available slot number, "Nonexistent" is returned.
Range	"Locked" "Available" "Trail" "LockRequired" "Nonexistent"
Initial S/W Revision	A.05.00

Slots Free Query (Remote Command Only)

Returns the number of license slots free.

Remote Command	:SYSTem:LKEY:WAVeform:FREE? or :SYSTem:LICense[:FPACK]:WAVeform:FREE?
Example	:SYST:LKEY:WAV:FREE? or :SYST:LIC:WAV:FREE?
Notes	The second SCPI :SYSTem:LICense[:FPACK]:WAVeform:FREE is provided to be consistent with the style of Agilent signal sources. You can use either one of them.
Initial S/W Revision	A.05.00

Slot Used Query (Remote Command Only)

Returns the number of license slots used.

Remote Command	:SYSTem:LKEY:WAVeform:USED? or :SYSTem:LICense[:FPACK]:WAVeform:USED?
Example	:SYST:LKEY:WAV:USED?

	or :SYST:LIC:WAV:USED?
Notes	The second SCPI :SYSTem:LIcense[:FPACK]:WAVeform:USED is provided to be consistent with the style of Agilent signal sources. You can use either one of them.
Initial S/W Revision	A.05.00

Slot Waveform Name Query (Remote Command Only)

Returns the waveform name of the specified slot

Remote Command	:SYSTem:LKEY:WAVeform:NAME? <int> or :SYSTem:LIcense[:FPACK]:WAVeform:NAME? <int>
Example	:SYST:LKEY:WAV:NAME? 1 <"CDMA2K_22.wfm" or :SYST:LIC:WAV:NAME? 1 <"CDMA2K_22.wfm"
Notes	Waveform slot number <int> is positive. If you attempt to input a slot number less than or equals 0, an error is generated. Result type is string. If input slot number exceeds total available slot number, "Nonexistent" is returned. If no waveform stored in the specified slot, then empty string is returned.
Initial S/W Revision	A.12.00

Slot Waveform Unique ID Query (Remote Command Only)

Returns the waveform unique ID of the specified slot

Remote Command	:SYSTem:LKEY:WAVeform:UID? <int> or :SYSTem:LIcense[:FPACK]:WAVeform:UID? <int>
Example	:SYST:LKEY:WAV:UID? 2 <"1346752140" or :SYST:LIC:WAV:UID? 2 <"1346752140"
Notes	Waveform slot number <int> is positive. If you attempt to input a slot number less than or equals 0, an error is generated. Result type is string. If input slot number exceeds total available slot number, "Nonexistent" is returned.

If no waveform stored in the specified slot, then "0" is returned

Initial S/W Revision A.12.00

Locked Waveform Name List Query (Remote Command Only)

Returns the waveform name list of locked.

Remote Command	:SOURce:RADio:ARB:MPLicensed:NAME:LOCKed?
Example	SOUR:RAD:ARB:MPL:NAME:LOCKed? <"CDMA2K_27.wfm", "GSM_MCS1.WFM", "c2kWfm.wfm"
Initial S/W Revision	A.11.00

Locked Waveform Unique ID List Query (Remote Command Only)

Returns the waveform unique id list of locked.

Remote Command	:SOURce:RADio:ARB:MPLicensed:UID:LOCKed?
Example	SOUR:RAD:ARB:MPL:UID:LOCKed? <"2996927136", "3812603511", "3710986266"
Notes	Each Signal Studio waveform has a unique id recorded in header. So if the unique ids are same, that means they are same one waveform. So besides SCPI to query locked waveform name list, also provide a SCPI to query locked waveform unique id list
Initial S/W Revision	A.11.00

Marker Utilities

Allows access to the marker utilities sub-menus.

Key Path	Source, Modulation Setup, ARB
Initial S/W Revision	A.05.00

Marker Polarity

Allows access to the marker polarity sub-menu, which allows you to specify the polarity for the four markers. For a positive polarity, the marker signal is high during the marker points. For a negative marker polarity, the marker signal is high during the period of no marker points.

Key Path	Source, Modulation Setup, ARB, Marker Utilities
Initial S/W Revision	A.05.00

Mkr 1 Polarity

Allows you to set the polarity of marker 1.

Key Path	Source, Modulation Setup, ARB, Marker Utilities, Marker Polarity
Remote Command	:SOURce:RADio:ARB:MPOLarity:MARKer1 POSitive NEGative :SOURce:RADio:ARB:MPOLarity:MARKer1?
Example	:SOUR:RAD:ARB:MPOL:MARK1 NEG
Dependencies	When a new waveform is selected for playback the settings contained within the associated waveform header file are applied to the ARB. The marker polarity is one of the values stored within the header file. If the newly selected waveform file has an associated header file, the marker polarity is updated with the value from the header file. The marker polarity will remain unchanged if the newly selected waveform does not have an associated header file.
Preset	Pos
Range	Neg Pos
Initial S/W Revision	A.05.00

Mkr 2 Polarity

Allows you to set the polarity of marker 2.

Key Path	Source, Modulation Setup, ARB, Marker Utilities, Marker Polarity
Remote Command	:SOURce:RADio:ARB:MPOLarity:MARKer2 POSitive NEGative :SOURce:RADio:ARB:MPOLarity:MARKer2?
Example	:SOUR:RAD:ARB:MPOL:MARK2 NEG
Dependencies	When a new waveform is selected for playback the settings contained within the associated waveform header file are applied to the ARB. The marker polarity is one of the values stored within the header file. If the newly selected waveform file has an associated header file, the marker polarity is updated with the value from the header file. The marker polarity will remain unchanged if the newly selected waveform does not have an associated header file.
Preset	Pos
Range	Neg Pos
Initial S/W Revision	A.05.00

Mkr 3 Polarity

Allows you to set the polarity of marker 3.

Key Path	Source, Modulation Setup, ARB, Marker Utilities, Marker Polarity
Remote Command	:SOURce:RADio:ARB:MPOLarity:MARKer3 POSitive NEGative :SOURce:RADio:ARB:MPOLarity:MARKer3?
Example	:SOUR:RAD:ARB:MPOL:MARK3 NEG
Dependencies	When a new waveform is selected for playback the settings contained within the associated

	waveform header file are applied to the ARB. The marker polarity is one of the values stored within the header file. If the newly selected waveform file has an associated header file, the marker polarity is updated with the value from the header file. The marker polarity will remain unchanged if the newly selected waveform does not have an associated header file.
Preset	Pos
Range	Neg Pos
Initial S/W Revision	A.05.00

Mkr 4 Polarity

Allows you to set the polarity of marker 4.

Key Path	Source, Modulation Setup, ARB, Marker Utilities, Marker Polarity
Remote Command	:SOURce:RADio:ARB:MPOLarity:MARKer4 POSitive NEGative :SOURce:RADio:ARB:MPOLarity:MARKer4?
Example	:SOUR:RAD:ARB:MPOL:MARK4 NEG
Dependencies	When a new waveform is selected for playback the settings contained within the associated waveform header file are applied to the ARB. The marker polarity is one of the values stored within the header file. If the newly selected waveform file has an associated header file, the marker polarity is updated with the value from the header file. The marker polarity will remain unchanged if the newly selected waveform does not have an associated header file.
Preset	Pos
Range	Neg Pos
Initial S/W Revision	A.05.00

Marker Routing

Allows access to the marker routing sub-menus, which allow you to specify where the marker events are routed. It should be noted that the markers can also be routed to Trigger 1 Out and Trigger 2 Out, however this must be set up using the menus accessed by pressing the "Trigger" hard key.

Key Path	Source, Modulation Setup, ARB, Marker Utilities
Initial S/W Revision	A.05.00

Pulse/RF Blank

Allows you to select which marker is used for the pulse/RF blanking function. The pulse/RF blanking function blanks the RF when the marker signal goes low. The marker polarity determines when the marker signal is high. For a positive polarity, this is during the marker points. For a negative polarity, this is when there are no marker points.

Marker points should be set before using this function. Enabling this function without setting maker points may create a continuous low or high signal, dependant on the marker polarity. This causes either no RF output, or a continuous RF output.

Key Path	Source, Modulation Setup, ARB, Marker Utilities, Marker Routing
Remote Command	:SOURce:RADio:ARB:MDEStination:PULSe NONE M1 M2 M3 M4 :SOURce:RADio:ARB:MDEStination:PULSe?
Example	:SOUR:RAD:ARB:MDES:PULS NONE
Dependencies	When a new waveform is selected for playback the settings contained within the associated waveform header file are applied to the ARB. The pulse/RF blanking setting is one of the values stored within the header file. If the newly selected waveform file has an associated header file, the pulse/RF blanking setting is updated with the value from the header file. The pulse/RF blanking setting will remain unchanged if the newly selected waveform does not have an associated header file.
Range	None M1 M2 M3 M4
Initial S/W Revision	A.05.00

None

Sets no marker to be used for the pulse/RF blanking function, essentially turning the RF blanking function off.

Key Path	Source, Modulation Setup, ARB, Marker Utilities, Marker Routing, Pulse/RF Blank
Example	:SOUR:RAD:ARB:MDES:PULS NONE
Initial S/W Revision	A.05.00

Marker 1

Sets marker 1 to be used for the pulse/RF blanking function.

Key Path	Source, Modulation Setup, ARB, Marker Utilities, Marker Routing, Pulse/RF Blank
Example	:SOUR:RAD:ARB:MDES:PULS M1
Initial S/W Revision	A.05.00

Marker 2

Sets marker 2 to be used for the pulse/RF blanking function.

Key Path	Source, Modulation Setup, ARB, Marker Utilities, Marker Routing, Pulse/RF Blank
Example	:SOUR:RAD:ARB:MDES:PULS M2
Initial S/W Revision	A.05.00

Marker 3

Sets marker 3 to be used for the pulse/RF blanking function.

Key Path	Source, Modulation Setup, ARB, Marker Utilities, Marker Routing, Pulse/RF Blank
Example	:SOUR:RAD:ARB:MDES:PULS M3
Initial S/W Revision	A.05.00

Marker 4

Sets marker 4 to be used for the pulse/RF blanking function.

Key Path	Source, Modulation Setup, ARB, Marker Utilities, Marker Routing, Pulse/RF Blank
Example	:SOUR:RAD:ARB:MDES:PULS M4
Initial S/W Revision	A.05.00

ALC Hold

Allows you to specify which marker is routed for use within the ALC hold function. The ALC hold marker function holds the ALC circuitry at the average value of the sample points set by the marker.

The ALC hold function operates during the low periods of the marker signal. The marker polarity determines when the marker signal is high. For positive polarity, this is during the marker points. For a negative polarity, this is when there are no marker points.

Key Path	Source, Modulation Setup, ARB, Marker Utilities, Marker Routing
Remote Command	:SOURce:RADio:ARB:MDEStination:ALCHold NONE M1 M2 M3 M4 :SOURce:RADio:ARB:MDEStination:ALCHold?
Example	:SOUR:RAD:ARB:MDES:ALCH NONE
Dependencies	When a new waveform is selected for playback the settings contained within the associated waveform header file are applied to the ARB. The ALC hold setting is one of the values stored within the header file. If the newly selected waveform file has an associated header file, the ALC hold setting is updated with the value from the header file. The ALC hold setting will remain unchanged if the newly selected waveform does not have an associated header file.
Range	None M1 M2 M3 M4
Initial S/W Revision	A.05.00

None

Sets no marker to be used for the ALC hold function, essentially turning the ALC hold function off.

Key Path	Source, Modulation Setup, ARB, Marker Utilities, Marker Routing, ALC Hold
Example	:SOUR:RAD:ARB:MDES:PULS NONE
Initial S/W Revision	A.05.00

Marker 1

Sets marker 1 to be used for the ALC hold function.

Key Path	Source, Modulation Setup, ARB, Marker Utilities, Marker Routing, ALC Hold
Example	:SOUR:RAD:ARB:MDES:PULS M1
Initial S/W Revision	A.05.00

Marker 2

Sets marker 2 to be used for the ALC hold function.

Key Path	Source, Modulation Setup, ARB, Marker Utilities, Marker Routing, ALC Hold
Example	:SOUR:RAD:ARB:MDES:PULS M2
Initial S/W Revision	A.05.00

Marker 3

Sets marker 3 to be used for the ALC hold function.

Key Path	Source, Modulation Setup, ARB, Marker Utilities, Marker Routing, ALC Hold
Example	:SOUR:RAD:ARB:MDES:PULS M3
Initial S/W Revision	A.05.00

Marker 4

Sets marker 4 to be used for the ALC hold function.

Key Path	Source, Modulation Setup, ARB, Marker Utilities, Marker Routing, ALC Hold
Example	:SOUR:RAD:ARB:MDES:PULS M4
Initial S/W Revision	A.05.00

Header Utilities

Allows access to the header utilities sub-menu. Pressing this key also causes the central display area to change to display the File Header Information view.

Key Path	Source, Modulation Setup, ARB
Dependencies	This key is only available if there is currently a waveform selected for playback. If no waveform is selected, the key is grayed out.
Initial S/W Revision	A.05.00

Clear Header

Allows you to clear the header information from the file header associated with the currently selected waveform.

Key Path	Source, Modulation Setup, ARB, Header Utilities
Remote Command	:SOURce:RADio:ARB:HEADer:CLEar
Example	:SOUR:RAD:ARB:HEAD:CLE
Notes	Attempting to clear the header details via SCPI when no waveform was selected for playback will generate an error.
Initial S/W Revision	A.05.00

Save Setup To Header

Allows you to save new file header information details to the file.

Key Path	Source, Modulation Setup, ARB, Header Utilities
Remote Command	:SOURce:RADio:ARB:HEADer:SAVE
Example	:SOUR:RAD:ARB:HEAD:SAVE
Notes	Attempting to save the header details via SCPI when no waveform was selected for playback will generate an error.
Initial S/W Revision	A.05.00

Query Waveform Unique ID (Remote Command Only)

Each Signal Studio waveform contains a unique waveform ID, which recorded in the header. This command allows you to query the unique waveform ID from the header. This is a SCPI only command. User can also check [Error! Reference source not found.](#) for waveform unique ID display.

Remote Command	:MMEMory:HEADer:ID? "<file name>"
Example	:MMEM:HEAD:ID? "test.wfm" (query the waveform already loaded into the ARB memory) :MMEM:HEAD:ID? "D: VARB\test.wfm" (query the waveform on the hard disk by absolute path) :MMEM:HEAD:ID? "NVWFM:test.wfm" (query the waveform on the hard disk by MSUS)
Notes	SCPI query only. The queried waveform file can be in ARB memory, or on hard disk. If want to query ARB in ARB memory, then give out the file name directly. If want to query ARB on the hard disk, then absolute file path or MSUS should be given along with the file name. The valid MSUS is "NVWFM" which is mapped to D: VARB on hard disk. If the file cannot be found in ARB memory or on hard disk, an error is generated and value -1 is returned
Initial S/W Revision	A.09.00

Bus Trigger Command (Remote Command Only)

Used to initiate an immediate trigger event if the trigger source is set to Bus.

Remote Command	:SOURce:RADio:ARB:TRIGger:INITiate
Example	:SOUR:RAD:ARB:TRIG:INIT
Initial S/W Revision	A.05.00

AM

Allows access to the menu for configuring the Amplitude Modulation.

Key Path	Source, Modulation Setup
Initial S/W Revision	A.05.00

AM

Enables or disables the amplitude modulation.

Turning AM on when another modulation format is already on results in the previous modulation format being turned off and the generation of an error.

Key Path	Source, Modulation Setup, AM
Remote Command	:SOURce:AM:STATe :SOURce:AM:STATe?
Example	:SOUR:AM:STAT OFF
Preset	Off
Range	On Off
Initial S/W Revision	A.05.00

AM Depth

Allows you to set the amplitude modulation depth in percent.

Key Path	Source, Modulation Setup, AM
Remote Command	:SOURce:AM[:DEPTh] [:LINear] :SOURce:AM[:DEPTh] [:LINear]?
Example	:SOUR:AM 0.1
Preset	0.1 %
Min	0.1 %
Max	95.0 %
Initial S/W Revision	A.05.00

AM Rate

Allows you to set the internal amplitude modulation rate.

Key Path	Source, Modulation Setup, AM
Remote Command	:SOURce:AM:INTernal:FREQuency :SOURce:AM:INTernal:FREQuency?
Example	:SOUR:AM:INT:FREQ 40.0 Hz
Preset	400.0 Hz
Min	10 Hz
Max	40 kHz
Initial S/W Revision	A.05.00

FM

Allows access to the menu for configuring the frequency modulation.

Key Path	Source, Modulation Setup
Initial S/W Revision	A.05.00

FM

Enables or disables the frequency modulation.

Turning FM on when another modulation format is already on results in the previous modulation format being turned off and the generation of an error.

Key Path	Source, Modulation Setup, FM
Remote Command	:SOURce:FM:STATe :SOURce:FM:STATe?
Example	:SOUR:FM:STAT OFF
Preset	Off
Range	On Off
Initial S/W Revision	A.05.00

FM Deviation

Allows you to set the frequency modulation deviation.

Key Path	Source, Modulation Setup, FM
----------	------------------------------

Remote Command	:SOURce:FM[:DEVIation] :SOURce:FM[:DEVIation]?
Example	:SOUR:FM 1.00 kHz
Preset	1.00 Hz
Min	1.00 Hz
Max	100.00 kHz
Initial S/W Revision	A.05.00

FM Rate

Allows you to set the internal frequency modulation rate.

Key Path	Source, Modulation Setup, FM
Remote Command	:SOURce:FM:INTernal:FREQuency :SOURce:FM:INTernal:FREQuency?
Example	:SOUR:FM:INT:FREQ 40.0 Hz
Preset	400.0 Hz
Min	10 Hz
Max	40 kHz
Initial S/W Revision	A.05.00

PM

Allows access to the menu for configuring the phase modulation.

Key Path	Source, Modulation Setup
Initial S/W Revision	A.05.00

PM

Enables or disables the phase modulation.

Turning PM on when another modulation format is already on results in the previous modulation format being turned off and the generation of an error.

Key Path	Source, Modulation Setup, PM
Remote Command	:SOURce:PM:STATe :SOURce:PM:STATe?
Example	:SOUR:PM:STAT OFF

Preset	Off
Range	On Off
Initial S/W Revision	A.05.00

PM Deviation

Allows you to set the phase modulation deviation.

Key Path	Source, Modulation Setup, PM
Remote Command	:SOURce:PM[:DEVIation] :SOURce:PM[:DEVIation]?
Example	:SOUR:PM 1.00 rad
Preset	0.1 rad
Min	0.1 rad
Max	20.0 rad
Initial S/W Revision	A.05.00

PM Rate

Allows you to set the internal phase modulation rate.

Key Path	Source, Modulation Setup, PM
Remote Command	:SOURce:PM:INTernal:FREQuency :SOURce:PM:INTernal:FREQuency?
Example	:SOUR:PM:INT:FREQ 40.0 Hz
Preset	400.0 Hz
Min	10 Hz
Max	40 kHz
Initial S/W Revision	A.05.00

List Sequencer

Allows you access to the sub-menus for configuring the list sequencer.

List sequences allows you to enter frequencies and amplitudes at unequal intervals in nonlinear ascending, descending or random order. Each step within the list can also include its own waveform file for playback, step duration, trigger event and trigger output.

The complexities involved in configuring the list sequencer do not lend itself to manual configuration; hence the manual configuration for this feature is limited. For easier configuration of the list sequencer, it is recommended that you use either SCPI or load a tab delimited file containing the setup parameters in a

tabular form. The details of the SCPI for configuring the list sequencer can be found in "[Step Configuration \(Remote Command Only\)](#)" on page 621.

Once the List Sequencer has been configured using the front panel, SCPI, or loading in a tab delimited file, the sequence must be initiated using the front panel Initiate Sequence key or the corresponding SCPI command.

Key Path	Source
Initial S/W Revision	A.05.00

Sequencer

Allows you to set the state of the list sequencer. When the list sequencer is on, the source is outputting the sequence defined by the sequencer. When the list sequencer is off, the source outputs a single waveform segment or sequence (independent mode) at a single frequency and amplitude.

Key Path	Source, List Sequencer
Remote Command	:SOURce:LIST[:STATe] ON OFF 1 0 :SOURce:LIST[:STATe] ?
Example	:SOUR:LIST OFF
Notes	When the sequencer is set to ON, the list sequencer controls the output of the source.
Couplings	When in Sequence Analyzer mode and the list sequencer state is Off, Include Source is forced to No, and the Include Source key is grayed out. When in Sequence Analyzer mode and the list sequencer state is On, Include Source is available to set. And, an ARB memory related operation, like load or delete will be rejected.
Preset	Off
Range	On Off
Initial S/W Revision	A.05.00

Initiate Sequence

Pressing this key arms the sequence for single execution. Once the sequence is armed the source begins the sequence as soon as the trigger is received. If the trigger is set to Free Run, the sequence starts immediately.

Key Path	Source, List Sequencer
Remote Command	:SOURce:LIST:TRIGger[:IMMediate]
Example	:SOUR:LIST:TRIG
Notes	When in Sequence Analyzer mode and Include Source is Yes, the Initiate list sequencer operation is rejected, and the key is grayed out, since source list sequence request is sent to physics via Parallel batch by sequence analyzer. If the file needed by the sequencer is not already in ARB memory, the sequence cannot be initiated

	and an error will be generated. There is a blocking SCPI query which can be used to query if source list sequence being initiated successfully or not. (see " Query List Sequence Initiation Armed Status (Remote Command Only) " on page 632 Query Source List Sequence Armed Status)
Dependencies	Under the Sequence Analyzer Mode, if Meas Setup->Include Source is set to YES, Source->List Sequencer->Initiate Sequence is disabled.
Initial S/W Revision	A.05.00

List Sequencer Setup

Allows you access to the list sequencer setup menus.

Key Path	Source, List Sequencer
----------	------------------------

Number of Steps

Allows you to specify the number of steps within the list sequence.

Key Path	Source, List Sequencer, List Sequencer Setup
Remote Command	:SOURce:LIST:NUMBer:STEPs <integer> :SOURce:LIST:NUMBer:STEPs?
Example	:SOUR:LIST:NUMB:STEP 1
Notes	Increasing the number of steps creates additional steps at the end of the list, with all the settings within the steps set to their default values. Decreasing the number of steps removes steps from the end of the list. The settings within the removed steps are not reset. This means that increasing the number of steps again would allow you to retrieve these steps.
Dependencies	The Step Count parameter is increased or decreased when you insert or delete a point from within the GUI interface to the sequencer.
Preset	1
Min	1
Max	1000
Initial S/W Revision	A.05.00

Current Step

Allows you to select the step number you wish to view or edit.

Key Path	Source, List Sequencer, List Sequencer Setup
----------	--

Notes	No remote command, front panel only.
Preset	1
Min	1
Max	Step Count
Initial S/W Revision	A.05.00

Insert Step Before

Allows you to insert a new step, containing default values, before the currently selected step. Inserting a step will automatically increase the Step Count parameter by 1. If sequence already reaches upper limit of 1000 steps, then insert more step will be rejected and popup error -221, "Setting Conflict; Cannot insert more steps, maximum number of steps reached"

Key Path	Source, List Sequencer, List Sequencer Setup
Notes	No remote command, front panel only. If the list already contains the maximum limit of 1000 steps, no operation will be made after pressing this key.
Initial S/W Revision	A.05.00

Delete Step

Allows you to delete the current step. Deleting a step will automatically decrease the Step Count parameter by 1. If sequence only has one step left, delete step will be rejected and popup error -221, "Setting conflict; Cannot delete current step, minimum number of steps reached"

Key Path	Source, List Sequencer, List Sequencer Setup
Notes	No remote command, Front Panel key only. If the list already contains the minimum limit of 1 step, no operation will be made after pressing this key
Initial S/W Revision	A.05.00

Clear List

Allows you to clear the list. Clearing the list sets the number of steps to the default value of 1 and sets the parameters for the only step to their default values.

Key Path	Source, List Sequencer, List Sequencer Setup
Initial S/W Revision	A.05.00

Step Trigger

Allows access to the sub-menu for selecting the trigger input for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup
Remote Command	:SOURce:LIST:STEP[1] 2 3...1000:SETup:INPut:TRIGger IMMEDIATE INTernal EXTernal2 KEY BUS EXTernal4 :SOURce:LIST:STEP[1] 2 3...1000:SETup:INPut:TRIGger?
Example	:SOUR:LIST:STEP2:SET:INP:TRIG BUS :SOUR:LIST:STEP2:SET:INP:TRIG?
Notes	SCPI is supported after A.09.40
Preset	Free Run
Range	Free Run Internal Manual (Trigger Key) Bus External 2 EXTernal4
Initial S/W Revision	A.05.00

Free Run

Sets the trigger input for the current step to Free Run.

Key Path	Source, List Sequencer, List Sequencer Setup, Step Trigger
Example	:SOUR:LIST:STEP2:SET:INP:TRIG IMM
Notes	SCPI is supported after A.09.40
Initial S/W Revision	A.05.00

Internal

Sets the trigger input for the current step to Internal.

Key Path	Source, List Sequencer, List Sequencer Setup, Step Trigger
Example	:SOUR:LIST:STEP2:SET:INP:TRIG INT
Notes	SCPI is supported after A.09.40
Initial S/W Revision	A.05.00

Manual (Trigger Key)

Sets the trigger input for the current step to Manual (Trigger Key). Any step in the sequence set to Manual will cause the sequence execution to stop until the manual trigger key is pressed. Sending the Bus Trigger SCPI command will have no effect. At any point in the sequence where the list sequencer is paused waiting for a software trigger, a pop up dialog is displayed until the trigger event occurs.

Key Path	Source, List Sequencer, List Sequencer Setup, Step Trigger
Example	:SOUR:LIST:STEP2:SET:INP:TRIG KEY
Notes	SCPI is supported after A.09.40
Initial S/W Revision	A.05.00

Bus

Sets the trigger input for the current step to Bus. Any step in the sequence set to Bus will cause the sequence execution to stop until the Bus Trigger SCPI command is sent. Pressing the manual trigger key has no effect. At any point in the sequence where the list sequencer is paused waiting for a software trigger, a pop up dialog is displayed until the trigger event occurs.

Key Path	Source, List Sequencer, List Sequencer Setup, Step Trigger
Example	:SOUR:LIST:STEP2:SET:INP:TRIG BUS
Notes	SCPI is supported after A.09.40
Initial S/W Revision	A.05.00

External 2

Sets the trigger input for the current step to External 2.

Key Path	Source, List Sequencer, List Sequencer Setup, Step Trigger
Example	:SOUR:LIST:STEP2:SET:INP:TRIG EXT2
Notes	SCPI is supported after A.09.40
Notes	Note: When on E6640A, trigger 2 is a bi-directional trigger port. So when trigger 2 has been configured as OUTPUT type, choosing External 2 as the input trigger for the current step will generate error.
Initial S/W Revision	A.05.00

Transition Time

Allows you to specify the transition time for the current step.

The transition time is the amount of time allowed for the source to settle at the current frequency or amplitude value.

Transition Time should not be taken as additional time before or inside the Step Duration. You can set a value for the settling time to allow the source output frequency or amplitude to become stable. Make sure that during this period of time, you do not use the source output signal.

The following table lists recommended values for appropriate settling times to allow for changes within the source.

Value Changed	Recommended Transition Time
Frequency	500 μ s
Amplitude	100 μ s to within 0.1 dB 20 μ s to within 1.0 dB

If the Transition Time value is shorter than the time necessary for the hardware to settle and a List Sequence is initiated, a **warning** is generated.

If the Transition Time value is longer than the Step Duration, an error is generated when initiating a source list sequence. For source list sequence, transition time is included in the step duration length. If the Transition Time value is longer than the Step Duration Time, the real step duration length is extended to equal the transition time and cause a timing shift.

Key Path	Source, List Sequencer, List Sequencer Setup
Remote Command	:SOURce:LIST:STEP[1] 2 3...1000:SETup:TRANsition:TIME <time> :SOURce:LIST:STEP[1] 2 3...1000:SETup:TRANsition:TIME?
Example	:SOUR:LIST:STEP2:SET:TRAN:TIME 1ms :SOUR:LIST:STEP2:SET:TRAN:TIME?
Notes	SCPI is supported after A.09.40
Preset	1.0 ms
Min	0.0 ms
Max	4.0 ks
Initial S/W Revision	A.05.00

Radio Setup

Allows you access to the sub-menus for setting up the radio standard, band, and radio band link direction for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup
Notes	No remote command, front panel only.
Initial S/W Revision	A.05.00

Radio Standard

Allows access to the sub-menus for selecting the radio standard and the associated radio band for use in the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup
Remote Command	:SOURce:LIST:STEP[1] 2 3...1000:SETup:RADio:BAND NONE PGSM EGSM RGSM DCS1800 PCS1900 TGSM810 GSM450 GSM480 GSM700 GSM850 BANDI BANDII BANDIII BANDIV BANDV BANDVI BANDVII BANDVIII BANDIX BANDX BANDXI BANDXII BANDXIII BANDXIV BANDXIX USCELL USPCS JAPAN KOREAN NMT IMT2K UPPER SECOND PAMR400 PAMR800 IMTEXT PCS1DOT9G AWS US2DOT5G PUBLIC LOWER NONE BAND1 BAND2 BAND3 BAND4 BAND5 BAND6 BAND7 BAND8 BAND10 BAND11 BAND12 BAND13 BAND14 BAND17 BAND18 BAND19 BAND20 BAND21 BAND24 BAND25 BAND26 BAND27 BAND28 BAND31 BAND33 BAND34 BAND35 BAND36 BAND37 BAND38

6 List Sequence Measurements

Source

	BAND39 BAND40 BAND41 BAND42 BAND43 BAND44 BANDA BANDB BANDC BANDD BANDE BANDF :SOURCE:LIST:STEP[1] 2 3...1000:SETup: RADio:BAND?
Example	:SOUR:LIST:STEP2:SET:RAD:BAND PGSM :SOUR:LIST:STEP2:SET:RAD:BAND?
Notes	SCPI is supported after A.09.40
Initial S/W Revision	A.05.00

None

Selects no radio standard for use on the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard
Example	:SOUR:LIST:STEP2:SET:RAD:BAND NONE
Notes	SCPI is supported after A.09.40
Initial S/W Revision	A.05.00

GSM/EDGE

Pressing this key once selects GSM/EDGE as the radio standard and the current GSM/EDGE band as the active channel band. Pressing this key again allows access to the sub-menus for selecting a different GSM/EDGE band.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard
Initial S/W Revision	A.05.00

P-GSM

Selects P-GSM as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, GSM/EDGE
Initial S/W Revision	A.05.00

E-GSM

Selects E-GSM as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, GSM/EDGE
Initial S/W Revision	A.05.00

R-GSM

Selects R-GSM as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, GSM/EDGE
Initial S/W Revision	A.05.00

DCS 1800

Selects DCS 1800 as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, GSM/EDGE
Initial S/W Revision	A.05.00

PCS 1900

Selects PCS 1900 as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, GSM/EDGE
Initial S/W Revision	A.05.00

GSM 450

Selects GSM 450 as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, GSM/EDGE
Initial S/W Revision	A.05.00

GSM 480

Selects GSM 480 as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, GSM/EDGE
Initial S/W Revision	A.05.00

GSM 850

Selects GSM 850 as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, GSM/EDGE
Initial S/W Revision	A.05.00

GSM 700

Selects GSM 700 as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, GSM/EDGE
Initial S/W Revision	A.05.00

T-GSM 810

Selects T-GSM 810 as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, GSM/EDGE
Initial S/W Revision	A.05.00

WCDMA

Pressing this key once selects WCDMA as the radio standard and the current WCDMA band as the active channel band. Pressing this key again allows access to the sub-menus for selecting a different WCDMA band.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard
Initial S/W Revision	A.05.00

Band I

Selects Band I as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, WCDMA
Initial S/W Revision	A.05.00

Band II

Selects Band II as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, WCDMA
Initial S/W Revision	A.05.00

Band III

Selects Band III as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, WCDMA
Initial S/W Revision	A.05.00

Band IV

Selects Band IV as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, WCDMA
Initial S/W Revision	A.05.00

Band V

Selects Band V as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, WCDMA
Initial S/W Revision	A.05.00

Band VI

Selects Band VI as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, WCDMA
Initial S/W Revision	A.05.00

Band VII

Selects Band VII as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, WCDMA
Initial S/W Revision	A.05.00

Band VIII

Selects Band VIII as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, WCDMA
Initial S/W Revision	A.05.00

Band IX

Selects Band IX as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, WCDMA
Initial S/W Revision	A.05.00

Band X

Selects Band X as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, WCDMA
Initial S/W Revision	A.05.00

Band XI

Selects Band XI as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, WCDMA
Initial S/W Revision	A.05.00

Band XII

Selects Band XII as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, WCDMA
Initial S/W Revision	A.05.00

Band XIII

Selects Band XIII as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, WCDMA
Initial S/W Revision	A.05.00

Band XIV

Selects Band XIV as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, WCDMA
Initial S/W Revision	A.05.00

CDMA 2000 / 1xEVDO

Pressing this key once selects CDMA 2000/1xEVDO as the radio standard and the current CDMA 2000/1xEVDO band as the active channel band. Pressing this key again allows access to the sub-menus for selecting a different CDMA 2000/1xEVDO band.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard
Initial S/W Revision	A.05.00

US CELL

Selects US Cell as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO
Initial S/W Revision	A.05.00

US PCS

Selects US PCS as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO
Initial S/W Revision	A.05.00

Japan Cell

Selects Japan Cell as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO
Initial S/W Revision	A.05.00

Korean PCS

Selects Korean PCS as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO
Initial S/W Revision	A.05.00

NMT 450

Selects NMT 450 as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO
Initial S/W Revision	A.05.00

IMT 2000

Selects IMT 2000 as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO
Initial S/W Revision	A.05.00

Upper 700

Selects Upper 700 as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO
Initial S/W Revision	A.05.00

Secondary 800

Selects Secondary 800 as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO
Initial S/W Revision	A.05.00

400 Euro PAMR

Selects 400 Euro PAMR as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO
Initial S/W Revision	A.05.00

800 PAMR

Selects 800 PAMR as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO
Initial S/W Revision	A.05.00

2.5GHz IMT EXT

Selects 2.5 GHz IMT EXT as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO
Initial S/W Revision	A.05.00

US PCS 1.9GHz

Selects US PCS 1.9 GHz as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO
Initial S/W Revision	A.05.00

AWS

Selects AWS as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO
Initial S/W Revision	A.05.00

US 2.5GHz

Selects US 2.5 GHz as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO
Initial S/W Revision	A.05.00

700 Public Safety

Selects 700 Public Safety as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO
Initial S/W Revision	A.05.00

C2K Lower 700

Selects C2K Lower 700 as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO
Initial S/W Revision	A.05.00

LTE

Pressing this key once selects LTE FDD as the radio standard and the current LTE FDD band as the active channel band. Pressing this key again allows access to the sub-menus for selecting a different LTE FDD band.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard
Initial S/W Revision	A.09.50

BAND 1

Selects BAND 1 as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE
Initial S/W Revision	A.09.50

BAND 2

Selects BAND 2 as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE
Initial S/W Revision	A.09.50

BAND 3

Selects BAND 3 as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE
Initial S/W Revision	A.09.50

BAND 4

Selects BAND 4 as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE
Initial S/W Revision	A.09.50

BAND 5

Selects BAND 5 as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE
Initial S/W Revision	A.09.50

BAND 6

Selects BAND 6 as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE
Initial S/W Revision	A.09.50

BAND 7

Selects BAND 7 as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE
Initial S/W Revision	A.09.50

BAND 8

Selects BAND 8 as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE
Initial S/W Revision	A.09.50

BAND 9

Selects BAND 9 as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE
Initial S/W Revision	A.09.50

BAND 10

Selects BAND 10 as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE
Initial S/W Revision	A.09.50

BAND 11

Selects BAND 11 as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE
Initial S/W Revision	A.09.50

BAND 12

Selects BAND 12 as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE
Initial S/W Revision	A.09.50

BAND 13

Selects BAND 13 as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE
Initial S/W Revision	A.09.50

BAND 14

Selects BAND 14 as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE
Initial S/W Revision	A.09.50

BAND 17

Selects BAND 17 as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE
Initial S/W Revision	A.09.50

BAND 18

Selects BAND 18 as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE
Initial S/W Revision	A.09.50

BAND 19

Selects BAND 19 as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE
Initial S/W Revision	A.09.50

BAND 20

Selects BAND 20 as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE
Initial S/W Revision	A.09.50

BAND 21

Selects BAND 21 as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE
Initial S/W Revision	A.09.50

BAND 24

Selects BAND 24 as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE
Initial S/W Revision	A.09.50

BAND 25

Selects BAND 25 as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE
Initial S/W Revision	A.09.50

BAND 26

Selects BAND 26 as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE
Initial S/W Revision	A.12.53

BAND 27

Selects BAND 27 as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE
Initial S/W Revision	A.14.00

BAND 28

Selects BAND 28 as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE
Initial S/W Revision	A.14.00

BAND 31

Selects BAND 31 as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE
Initial S/W Revision	A.14.00

LTE TDD

Sets LTE TDD as the radio standard for use and accesses the LTE TDD specific channel band sub-menus..

Key Path	Source, Frequency, Radio Setup, Radio Standard
Initial S/W Revision	A.11.50

BAND 33

Selects BAND 33 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE TDD
Example	:SOUR:FREQ:CHAN:BAND BAND33
Initial S/W Revision	A.11.50

BAND 34

Selects BAND 34 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE TDD
Example	:SOUR:FREQ:CHAN:BAND BAND34
Initial S/W Revision	A.11.50

BAND 35

Selects BAND 35 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE TDD
Example	:SOUR:FREQ:CHAN:BAND BAND35
Initial S/W Revision	A.11.50

BAND 36

Selects BAND 36 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE TDD
Example	:SOUR:FREQ:CHAN:BAND BAND36
Initial S/W Revision	A.11.50

BAND 37

Selects BAND 37 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE TDD
Example	:SOUR:FREQ:CHAN:BAND BAND37
Initial S/W Revision	A.11.50

BAND 38

Selects BAND 38 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE TDD
Example	:SOUR:FREQ:CHAN:BAND BAND38
Initial S/W Revision	A.11.50

BAND 39

Selects BAND 39 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE TDD
Example	:SOUR:FREQ:CHAN:BAND BAND39
Initial S/W Revision	A.11.50

BAND 40

Selects BAND 40 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE TDD
Example	:SOUR:FREQ:CHAN:BAND BAND40
Initial S/W Revision	A.11.50

BAND 41

Selects BAND 41 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE TDD
Example	:SOUR:FREQ:CHAN:BAND BAND41
Initial S/W Revision	A.11.50

BAND 42

Selects BAND 42 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE TDD
Example	:SOUR:FREQ:CHAN:BAND BAND42
Initial S/W Revision	A.11.50

BAND 43

Selects BAND 43 as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, LTE TDD
Example	:SOUR:FREQ:CHAN:BAND BAND43
Initial S/W Revision	A.11.50

BAND 44

Selects BAND 44 as the band for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE TDD
Initial S/W Revision	A.14.00

TDSCDMA

Sets TDSCDMA as the radio standard for use and accesses the TDSCDMA specific channel band sub-menus..

Key Path	Source, Frequency, Radio Setup, Radio Standard
Initial S/W Revision	A.11.50

BAND A

Selects BAND A as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, TDSCDMA
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Example	:SOUR:FREQ:CHAN:BAND BANDA
Initial S/W Revision	A.11.50

BAND B

Selects BAND B as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, TDSCDMA
Example	:SOUR:FREQ:CHAN:BAND BANDB
Initial S/W Revision	A.11.50

BAND C

Selects BAND C as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, TDSCDMA
Example	:SOUR:FREQ:CHAN:BAND BANDC
Initial S/W Revision	A.11.50

BAND D

Selects BAND D as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, TDSCDMA
Example	:SOUR:FREQ:CHAN:BAND BANDD
Initial S/W Revision	A.11.50

BAND E

Selects BAND E as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, TDSCDMA
Example	:SOUR:FREQ:CHAN:BAND BANDE
Initial S/W Revision	A.11.50

BAND F

Selects BAND F as the band for the current step.

Key Path	Source, Frequency, Radio Setup, Radio Standard, TDSCDMA
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Example	:SOUR:FREQ:CHAN:BAND BANDF
Initial S/W Revision	A.11.50

Radio Band Link

Allows you to specify the radio band link direction for the steps within the list sequence. The link is used in conjunction with the channel band and channel number to determine the output frequency.

When set to “Uplink”, the source will calculate the uplink frequency according to an uplink formula together with selected channel band and channel number. When set to “Downlink”, the source will calculate the downlink frequency according to a downlink formula together with selected channel band and channel number.

Key Path	Source, List Sequencer, List Sequencer Setup, Radio Setup
Remote Command	:SOURce:LIST:STEP [1] 2 3...1000:SETup:RADio:BAND:LINK DOWN UP :SOURce:LIST:STEP [1] 2 3...1000:SETup:RADio:BAND:LINK?
Example	:SOUR:LIST:STEP2:SET:RAD:BAND:LINK UP :SOUR:LIST:STEP2:SET:RAD:BAND:LINK?
Notes	SCPI is supported after A.09.40
Preset	DOWN
Range	DOWN UP
Initial S/W Revision	A.05.00

Channel

Allows you to specify the frequency of the current step via a channel number.

Key Path	Source, List Sequencer, List Sequencer Setup
Remote Command	:SOURce:LIST:STEP [1] 2 3...1000:SETup:CNFRrequency <double> :SOURce:LIST:STEP [1] 2 3...1000:SETup:CNFRrequency?
Example	:SOUR:LIST:STEP2:SET:CNFR 124 :SOUR:LIST:STEP2:SET:CNFR?
Notes	SCPI is supported after A.09.40. This SCPI is used to setup channel number or frequency setting, according to current Radio Band setting. If Radio Band is “NONE”, then it’s frequency. If Radio Band is not “NONE”, then it’s channel number.
Couplings	The channel number is coupled to the step frequency value. When the step frequency value is changed, the channel number will increase or decrease to match the new step frequency. If the step frequency is not at an exact match for a channel number, the nearest channel number is displayed, along with a greater than, or less than sign to indicate the frequency is above or below the channel number.

Preset	1
Min	0 (Please refer to for valid ranges.)
Max	10838 (Please refer to for valid ranges.)
Initial S/W Revision	A.05.00

Frequency

Allows you to specify a frequency value for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup
Remote Command	:SOURce:LIST:STEP[1] 2 3...1000:SETup:CNFRrequency <double> :SOURce:LIST:STEP[1] 2 3...1000:SETup:CNFRrequency?
Example	:SOUR:LIST:STEP2:SET:CNFR 1GHz :SOUR:LIST:STEP2:SET:CNFR?
Notes	SCPI is supported after A.09.40. This SCPI is used to setup channel number or frequency setting, according to current Radio Band setting. If Radio Band is "NONE", then it's frequency. If Radio Band is not "NONE", then it's channel number.
Couplings	The frequency value is coupled to the channel band and number for the step, such that updates to the radio band and channel number will update the frequency value to the corresponding absolute frequency. The reverse is also true, changing the frequency value causes the value of the channel number to be updated.
Preset	1.00 GHz
Min	10.00 MHz
Max	Hardware Dependant: Option 503 = 3.6 GHz Option 504 = 3.9 GHz Option 506 = 6.00 GHz
Initial S/W Revision	A.05.00

Power

Allows you to specify a power value for the current step.

Key Path	Source, List Sequencer, List Sequencer Setup
Remote Command	:SOURce:LIST:STEP[1] 2 3...1000:SETup:AMPLitude <double> :SOURce:LIST:STEP[1] 2 3...1000:SETup:AMPLitude?
Example	:SOUR:LIST:STEP2:SET:AMPL -50dBm :SOUR:LIST:STEP2:SET:AMPL?
Notes	SCPI is supported after A.09.40

Notes	<p>Amplitude corrections can be specified for use with the source. In the event of amplitude corrections being applied, the valid ranges for the RF power do not change dependant on the current amplitude correction setting. Instead, if the combination of RF power + amplitude correction is higher or lower than the source output range, the Source Unleveled bit is set and the “Source Unleveled” indicator will appear on status panel to indicate that the source cannot maintain the output power that has been requested.</p> <p>The multiport adapter RFIO TX ports and GPS ports cannot ensure power accuracy when power setting is lower than -130dBm, this power setting value is defined by the sum of RF Power setting and related amplitude correction value. But user settable value could be lower than this limit. When application detected there exists power setting lower than -130dBm on MPA RFIO TX ports, then popup warning message . When application detected there exists power setting lower than -130dBm on MPA GPS ports, then popup warning message . These are only warning messages, and check is performed when RF is ON.</p>
Notes	The Min and Max value here defined UI settable amplitude range. This range is larger than actual amplitude range with level accuracy defined in spec.
Dependencies	The RF power is dependent on the RF output port and frequency, such that the current frequency and selected output port determine the valid range of power values.
Preset	-100 dBm
Min	The range of values depends on the current frequency and selected RF output port. Please refer to "RF Power" on page 509 and the table RF Power Range for the valid ranges.
Max	The range of values depends on the current frequency and selected RF output port. Please refer to "RF Power" on page 509 and the table RF Power Range for the valid ranges.
Initial S/W Revision	A.05.00

Waveform

Allows you access to the sub-menus for selecting the waveform to be played back during the current step. Pressing this key also changes the central display area to show the Waveform File Selection view.

Key Path	Source, List Sequencer, List Sequencer Setup
Remote Command	:SOURCE:LIST:STEP[1] 2 3...1000:SETup:WAVeform <string> :SOURCE:LIST:STEP[1] 2 3...1000:SETup:WAVeform?
Example	:SOUR:LIST:STEP2:SET:WAV "CW" :SOUR:LIST:STEP2:SET:WAV?
Notes	SCPI is supported after A.09.40
Remote Command Notes	String type, takes "Off" "CW" "Cont" "waveform name"
Preset	CW
Range	Waveform Continue Previous CW Off
Initial S/W Revision	A.05.00

CW

Sets the current step to output a CW tone.

Key Path	Source, List Sequencer, List Sequencer Setup, Waveform
Example	:SOUR:LIST:STEP2:SET:WAV "CW"
Notes	SCPI is supported after A.09.40
Initial S/W Revision	A.05.00

Selected Waveform

Inserts the currently selected waveform in the waveform selection view as the waveform for playback during the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Waveform
Example	:SOUR:LIST:STEP2:SET:WAV "waveform name"
Notes	SCPI is supported after A.09.40 If the selected waveform contains header (which contains ARB play parameters), source list sequence will automatically apply header settings of the selected waveform in that step.
Initial S/W Revision	A.05.00

Continue Previous

Sets the current step to continue with playback of the waveform from the previous step. When continuing the previous waveform, the ARB playback will not pause while the source retunes to the new frequency or amplitude that may be defined for the new step.

Key Path	Source, List Sequencer, List Sequencer Setup, Waveform
Example	:SOUR:LIST:STEP2:SET:WAV "Cont"
Notes	SCPI is supported after A.09.40
Initial S/W Revision	A.05.00

Off

Disable RF output of the current step.

Key Path	Source, List Sequencer, List Sequencer Setup, Waveform
Example	:SOUR:LIST:STEP2:SET:WAV "Off"
Notes	SCPI is supported after A.09.40
Initial S/W Revision	A.05.00

Segments on Hard Disk

Allows you access to the sub-menus for loading waveform segments from the hard disk into ARB memory. The default directory is: D: varb.

Pressing this key changes the current view to the Waveform Management View.

Key Path	Source, Modulation Setup, ARB, Select Waveform
Initial S/W Revision	A.05.00

Load Segment To ARB Memory

Allows you to load the selected file into ARB memory. On the front panel you select the file for loading to the ARB memory by highlighting the desired file in the list. Using the SCPI command, you specify the file name on the HDD.

“NVWFM” (none-volatile storage) MSUS (Mass Storage Unit Specifier) is supported in the memory subsystem because the ARB memory cannot be accessed directly. Therefore, files must be downloaded to the instrument hard disk and then loaded into the ARB memory. “NVWFM” MSUS will be mapped to the default directory D: VARB. The SCPI command supports using either “NVWFM” MSUS or specifying a full path. For more information, see [Memory Subsystem \(Remote Command Only\)](#).

If a file of the same name already exists within ARB memory, it is overwritten. If you wish to load two segments of the same name, you must rename one of the segments before loading it into ARB memory. To rename a segment, you can either use Windows File Explorer, or the :MMEMory:COPI command.

NOTE: When a waveform file is loaded to ARB memory, burst timing adjustments are made automatically, based on whether or not a Multiport Adapter is connected to the test set and powered on. If the connection/power status of the Multiport Adapter is changed after a waveform file has been loaded, it needs to be loaded again.

Key Path	Source, Modulation Setup, ARB, Select Waveform, Segments on Hard Disk
Remote Command	:SOURce:RADio:ARB:LOAD <string>
Example	:SOUR:RAD:ARB:LOAD "D: VARB\testwaveform.bin" or :SOUR:RAD:ARB:LOAD "NVWFM:testwaveform.bin"
Notes	<p>Because loading the file involves a delay of unpredictable length, this command should be followed by the query *OPC?, which holds off subsequent commands until the loading operating is complete.</p> <p><string> – specifies the path name of the file to load from the HDD into ARB memory. It could be a <full path + filename>, or <"NVWFM" MSUS + colon + filename>.</p> <p>When in Sequence Analyzer mode, and Include Source is Yes, an attempt to load a file to ARB memory will be rejected with an error.</p> <p>When Include Source is No and if there is insufficient free ARB memory to load the selected waveform, an error is generated. .</p> <p>If you specify a file over SCPI, but the file is not at the specified location, an error is generated.</p> <p>If you try to load a waveform file but the file contains less than 500 IQ samples, an error is generated.</p> <p>If you try to load a Signal Studio waveform "*.wfm" which contains invalid waveform header, an error is generated.</p>

If the ARB is ON when you load a file to ARB memory or delete a file from ARB memory, the playing waveform segment may not keep phase continuity during the ARB memory operation. The waveform will be replayed after the ARB operation is finished.

ARB can be loaded into ARB memory even if required licenses do not present on the instrument. In this case, a GUI only warning message -800, "Operation complete; Loaded <filename> successfully, but no license <required licenses> installed". User can install required licenses according to <required licenses> string to license it, or multi-pack license it.

Initial S/W Revision	A.05.00
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Load All To ARB Memory

Allows you to load all the segment files within the currently selected directory into ARB memory. If a file of the same name already exists within ARB memory, it is overwritten. If you wish to load two segments of the same name, you must rename one of the segments before loading it into ARB memory. To rename a segment, you can either use Windows File Explorer, or the :MEMORY:COPY command.

NOTE: When a waveform file is loaded to ARB memory, burst timing adjustments are made automatically, based on whether or not a Multiport Adapter is connected to the test set and powered on. If the connection/power status of the Multiport Adapter is changed after a waveform file has been loaded, it needs to be loaded again.

Key Path	Source, Modulation Setup, ARB, Select Waveform, Segments on Hard Disk
Remote Command	:SOURce:RADio:ARB:LOAD:ALL <string>
Example	:SOUR:RAD:ARB:LOAD:ALL "D: varb"
Notes	<p><string> - specifies the directory on the HDD to load the files into ARB memory from.</p> <p>When in Sequence Analyzer mode, and Include Source is Yes, an attempt to load all files from a directory to ARB memory is rejected with an error.</p> <p>When Include Source is No and there is insufficient free ARB memory to load all the waveforms, when the ARB memory is full, the copy ceases, and an error is generated.</p> <p>If you specify a directory over SCPI, but the directory does not exist, an error is generated.</p> <p>If the ARB is ON, a user then loads or deletes file to ARB memory, the playing waveform segment may not keep phase continuity during the ARB memory operation. The waveform will be replayed after the ARB operation is finished.</p>
Initial S/W Revision	A.05.00

Change Directory...

Allows you to change the currently selected directory on the hard disk. Pressing this key opens a standard windows change directory dialog allowing you to select the new directory of interest.

The current directory is used for manually loading waveform segments into ARB memory for playback, and as a search location for waveform segments that are required to be loaded into ARB memory for playback of a waveform sequence or a list sequence.

Key Path	Source, Modulation Setup, ARB, Select Waveform, Segments on Hard Disk
Notes	No remote command, SCPI front panel only.
Initial S/W Revision	A.05.00

Default Directory...

Allows you to change the default directory. It is used as a search location for waveform segments that are required to be loaded into ARB memory for playback of a waveform sequence, and as a search location for selecting waveforms using SCPI.

Key Path	Source, Modulation Setup, ARB, Select Waveform, Segments on Hard Disk
Remote Command	:SOURce:RADio:ARB:DEFault:DIRectory <string> :SOURce:RADio:ARB: DEFault:DIRectory?
Example	:SOUR:RAD:ARB:DEF:DIR "D:\ArbFiles" :SOUR:RAD:ARB:DEF:DIR?
State Saved	Persistent, survives a power cycle and a preset but not saved in the instrument state
Initial S/W Revision	A.05.00

Segments in ARB Memory

Allows you access to the sub-menus for managing the files within ARB memory.

Key Path	Source, Modulation Setup, ARB, Select Waveform
Initial S/W Revision	A.05.00

Delete Segment From ARB Mem

Allows you to remove a segment from ARB playback memory.

Key Path	Source, Modulation Setup, ARB, Select Waveform, Segments in ARB Memory
Remote Command	:SOURce:RADio:ARB:DELete <string>
Example	:SOUR:RAD:ARB:DEL "testwaveform.bin"
Notes	<string> - specifies the waveform to be deleted from the ARB playback memory. When in Sequence Analyzer mode and Include Source is Yes, an attempt to delete a file from ARB memory is rejected with an error. When Include Source is No and you specify a file that does not exist within ARB memory, an error is generated. It is possible to delete files from within the ARB memory when the ARB is ON. However, if you attempt to delete the file that is currently playing an error is generated. It is possible to delete a file from within the ARB memory when the sequencer state is ON and the file is not being used by the List Sequencer. If you attempt to delete a file which is being used by the list

sequencer, an error is generated.

When sequencer state is On, even if ARB state is On, the selected waveform will not be played. In this case, if the selected waveform is not used in List Sequence, it can be deleted and the ARB state is turned Off.

If the ARB is ON and you load a file to ARB memory or delete a file from ARB memory, the playing waveform segment may not keep phase continuity during the ARB memory operation. The waveform will be replayed after the ARB operation is finished.

Initial S/W Revision A.05.00

Delete All From ARB Memory

Allows you to remove all segments from ARB playback memory.

Key Path	Source, Modulation Setup, ARB, Select Waveform, Segments in ARB Memory
Remote Command	:SOURce:RADio:ARB:DELeTe:ALL
Example	:SOUR:RAD:ARB:DELeTe:ALL
Notes	<p>When in Sequence Analyzer mode and Include Source is Yes, an attempt to delete all files from ARB memory is rejected with an error.</p> <p>When Include Source is No and you attempt to delete all files from ARB memory when the ARB is currently playing a file, all files except the one playing are deleted and an error is generated.</p> <p>If you attempt to delete all files from ARB memory when there are waveform files used in "List Sequencer" on page 587 and "Sequencer" on page 588 state is ON, all files except the files currently being used in list sequencer are deleted, and an error is generated.</p> <p>If the ARB is ON and you load a file to ARB memory or delete a file from ARB memory, the playing waveform segment may not keep phase continuity during the ARB memory operation. The waveform will be replayed after the ARB operation is finished.</p>
Initial S/W Revision	A.05.00

Segments on Hard Disk

This key functions the same as ["Segments on Hard Disk" on page 614](#).

Key Path	Source, List Sequencer, List Sequencer Setup, Waveform
Initial S/W Revision	Prior to A.09.00

Load Segment To ARB Memory

This key functions the same as ["Load Segment To ARB Memory" on page 614](#).

Key Path	Source, List Sequencer, List Sequencer Setup, Waveform, Segment on Hard Drive
Initial S/W Revision	Prior to A.09.00

Load All To ARB Memory

This key functions the same as ["Load All To ARB Memory" on page 615](#).

Key Path	Source, List Sequencer, List Sequencer Setup, Waveform, Segment on Hard Drive
Initial S/W Revision	Prior to A.09.00

Change Directory ...

This key functions the same as ["Change Directory..." on page 615](#).

Key Path	Source, List Sequencer, List Sequencer Setup, Waveform, Segment on Hard Drive
Initial S/W Revision	Prior to A.09.00

Default Directory ...

This key functions the same as ["Default Directory..." on page 616](#)

Key Path	Source, List Sequencer, List Sequencer Setup, Waveform, Segment on Hard Drive
Initial S/W Revision	Prior to A.09.00

Segments in ARB Memory

This key functions the same as ["Segments in ARB Memory" on page 616](#).

Key Path	Source, List Sequencer, List Sequencer Setup, Waveform, Segments in ARB Memory
Initial S/W Revision	Prior to A.09.00

Delete Segment From ARB Memory

This key functions the same as ["Delete Segment From ARB Mem" on page 616](#).

Key Path	Source, List Sequencer, List Sequencer Setup, Waveform, Segments in ARB Memory, Segment in ARB Memory
Initial S/W Revision	Prior to A.09.00

Delete All From ARB Memory

This key functions the same as ["Delete All From ARB Memory" on page 617](#).

Key Path	Source, List Sequencer, List Sequencer Setup, Waveform, Segments in ARB Memory, Segment in ARB Memory
Initial S/W Revision	Prior to A.09.00

Step Duration

Allows access to the sub-menus for setting up the duration of play for the current step.

The duration can be set to be either the number of times for the ARB file associated with the sequence to play, or a specific time value, or continuous. If the step is set to play a CW tone, the step duration cannot be set to a play count.

Key Path	Source, List Sequencer, List Sequencer Setup
Remote Command	:SOURce:LIST:STEP[1] 2 3...1000:SETup:DURation:TYPE TIME COUNT CONTInuous CABort :SOURce:LIST:STEP[1] 2 3...1000:SETup:DURation:TYPE?
Example	:SOUR:LIST:STEP2:SET:DUR:TYPE TIME :SOUR:LIST:STEP2:SET:DUR:TYPE?
Notes	SCPI is supported after A.09.40
Notes	If "Step Duration" is set to "Time" or "Play Count" for the last step, the last step of ARB keeps playing as if set to "Continuous", until the set "Time" has expired or until the "Play Count" setting is reached. However, you can query Error! Reference source not found. Source Sweeping Condition Message to find out if the current list sequence is complete or not.
Range	Time Play Count Continuous Continuous Abort
Initial S/W Revision	A.05.00

Time

Sets the duration of the current step to be a time value for the length of time the step will play. Pressing this key again opens another menu which allows you to set the time value for the step duration.

Key Path	Source, List Sequencer, List Sequencer Setup, Step Duration
Example	:SOUR:LIST:STEP2:SET:DUR:TYPE TIME
Notes	SCPI is supported after A.09.40
Initial S/W Revision	A.05.00

Duration Time

Allows you to specify the length of time the current step will play.

When Step Duration is **Continuous Abort** this parameter specifies the maximum duration that the waveform will continue to play after a step trigger is received before the transition to the next waveform will occur. Duration is limited to a maximum of 20 seconds.

If the Transition Time value is longer than the Step Duration Time, an error is generated when initiating a source list sequence. For source list sequence, transition time is included in the step duration length (not occupy additional time). If the Transition Time value is longer than the Step Duration Time, the real step

duration length is extended to equal the transition time and cause a timing shift. This check is also described in section [Error! Reference source not found.](#) List Sequence Step Validation.

Key Path	Source, List Sequencer, List Sequencer Setup, Step Duration, Time
Remote Command	:SOURce:LIST:STEP [1] 2 3...1000:SETup:DURation:TCOut <double> :SOURce:LIST:STEP [1] 2 3...1000:SETup:DURation:TCOut?
Example	:SOUR:LIST:STEP2:SET:DUR:TCO 1s :SOUR:LIST:STEP2:SET:DUR:TCO?
Notes	SCPI is supported after A.09.40 This SCPI is reused by "Play Count", "Duration Time" and "Continuous Abort" according to current Duration Type setting is "Play Count" or "Duration Time" or "Continuous Abort". If current "Duration Type" is "Continuous", then popup error -221, "Settings conflict; Cannot accept time or count input when step duration type is Continuous on step #"
Notes	If "Duration Time" is set for the last step, the last step of ARB keeps playing as if set to "Continuous" after set time expires. However, you can query Source Sweeping Condition Message (:STAT:OPER:COND?) to find out if the current list sequence is complete or not.
Preset	1.00 ms
Min	100 µs
Max	1800 s
Initial S/W Revision	A.05.00

Play Count

Sets the duration of the current step to be an integer value for the number of times (play count) the ARB file is selected for playback during this step. For example, a 5 second ARB will be set to play 5 times during the step.

Key Path	Source, List Sequencer, List Sequencer Setup, Step Duration
Example	:SOUR:LIST:STEP2:SET:DUR:TYPE COUN
Notes	SCPI is supported after A.09.40 This key is unavailable and is grayed out if the current step is configured to CW tone rather than an ARB waveform.
Initial S/W Revision	A.05.00

Header Utilities

Allows access to the header utilities sub-menu. Pressing this key also causes the central display area to change to display the File Header Information view.

Key Path	Source, Modulation Setup, ARB
Dependencies	This key is only available if there is currently a waveform selected for playback. If no waveform is selected, the key is grayed out.
Initial S/W Revision	A.05.00

Continuous

Sets the current step to be played continuously until the next step starts. The waveform will always play completely before transitioning to the next step.

Key Path	Source, List Sequencer, List Sequencer Setup, Step Duration
Example	:SOUR:LIST:STEP2:SET:DUR:TYPE CONT
Notes	SCPI is supported after A.09.40
Initial S/W Revision	A.05.00

Output Trigger

Allows you to specify the trigger output for the current step. The trigger output signal is sent at the start of the step.

When select “On”, trigger event will occur on both Internal and External2 paths. Select “Off” will turn off trigger output.

Key Path	Source, List Sequencer, List Sequencer Setup
Remote Command	:SOURce:LIST:STEP[1] 2 3...1000:SETup:OUTPut:TRIGger ON OFF 1 0 :SOURce:LIST:STEP[1] 2 3...1000:SETup:OUTPut:TRIGger
Example	:SOUR:LIST:STEP2:SET:OUTP:TRIG ON :SOUR:LIST:STEP2:SET:OUTP:TRIG?
Notes	SCPI is supported after A.09.40
Preset	Off
Range	On Off
Initial S/W Revision	A.05.00

Step Configuration (Remote Command Only)

This SCPI command is used to configure the List Sequencer and is detailed in the table below. The command is defined such that you send one command per step, with the step number being specified as a subopcode of the SCPI command. Each command includes all the parameter settings for the step. As a step is setup, the values entered are run through several levels of validation.

Remote Command	:SOURce:LIST:STEP[1] 2 ... 4..1000:SETup IMMEDIATE INTERNAL KEY BUS EXTERNAL2, <time>, NONE PGSM EGSM RGSM DCS1800 PCS1900 TGSM810 GSM450 GSM480 GSM700 GSM850 BANDI BANDII BANDIII BANDIV BANDV BANDVI BANDVII BANDVIII BANDIX BANDX BANDXI BANDXII BANDXIII BANDXIV BANDXIX USCELL USPCS JAPAN KOREAN NMT IMT2K UPPER SECOND PAMR400 PAMR800 IMTEXT PCS1DOT9G AWS US2DOT5G PUBLIC LOWER NONE BAND1 BAND2 BAND3 BAND4 BAND5 BAND6 BAND7 BAND8 BAND10 BAND11 BAND12 BAND13 BAND14 BAND17 BAND18 BAND19 BAND20 BAND21 BAND24 BAND25 BAND26 BAND33 BAND34 BAND35 BAND36 BAND37 BAND38 BAND39 BAND40 BAND41 BAND42 BAND43 BANDA BANDB
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	<p>BANDC BANDD BANDE BANDF, DOWN UP, <freq>, <ampl>, <string>, TIME COUNT CONTInuous, <time>, ON OFF 1 0, [<int>],</p> <p>:SOURCE:LIST:STEP[1] 2 ... 4..1000:SETup?</p>
Example	:SOUR:LIST:STEP1:SET INT, 1ms, PGSM, DOWN, 10, -25 dBm, "GSM_Test1.bin", TIME, 10ms, OFF, 255
Notes	<p>The parameters are:</p> <p>(There is a total of 11 items in each step, the following is a list of the items in the order they must appear in the remote command.)</p> <ol style="list-style-type: none"> 1. Step Trigger <enum> – specifies the input trigger for the step. For details of the valid types of step trigger see "Step Trigger" on page 590. 2. Transition Time <time> – specifies the transition time for the step in seconds. For details of the valid ranges for the transition time see "Transition Time" on page 592. 3. Radio Band <enum> – specifies the radio band for the step. For details of the valid radio bands see "Radio Setup" on page 593. 4. Radio Band Link <enum> – specifies the radio band link direction for the step. For details of the valid link types, see "Radio Band Link" on page 610. 5. Frequency/Channel Number <freq>/<chan num> – specifies the frequency in Hz or the channel number for the step. The channel number and frequency are combined as one parameter that represents the frequency or channel number depending on the radio band setting. If the radio band is set to NONE, this value is interpreted as a frequency value in Hz. If the radio band is set to a valid band, this value is interpreted as a channel number. For details of the valid ranges for frequency and channel numbers, see "Channel" on page 610 and "Frequency" on page 611. 6. Power <ampl> – specifies the output power for the step in dBm. For details of the valid ranges see "Power" on page 611. 7. Waveform <string> – specifies the waveform for playback during the step. The step can output either a new ARB waveform, continue playback of the previous waveform, or output a CW tone. The options for specifying these are: <ul style="list-style-type: none"> <filename> – plays the specified waveform from the start. The filename value is the name of the file within ARB playback memory, it does not include the windows path to the file on the HDD. If you enter a filename for a waveform that does not reside within ARB playback memory, an error is generated. CONT – continues playback of the ARB file from the previous step CW – outputs a CW tone OFF – disable RF output 8. Step Duration <enum> – specifies the duration of the step. The duration can be specified to be either time, or play count of the ARB file associated with the step, or continuous. If Waveform is set to "CW", this value cannot be set to Play Count and an error will be generated. If continuous is selected, the following Time or Count value is ignored. For further details of this setting, see "Step Duration" on page 619. 9. Time or Count <time/int> – specifies time duration in seconds or play count of the ARB file associated with the step. For further details of this setting, including the valid ranges for the time or play count setting, "Time" on page 619 and "Play Count" on page 620. 10. Output Trigger <Boolean> – specifies the output trigger for the step. For details of the ranges for this setting see "Output Trigger" on page 621.

Dependencies	The range of subopcode values is 1 to 1000 and the value you enter is determined by the number of steps you have configured. For details see "Number of Steps" on page 589 . If you attempt to remotely set or query a subopcode that is out of range, an error is generated.
Initial S/W Revision	A.05.00

Step Configuration of Step Trigger parameter list (Remote Command Only)

This SCPI command is to configure "Step Trigger" parameter array of the whole List Sequencer at one time. The number of array is same as step number defined in ["Number of Steps" on page 589](#) Number of Steps. As a step is setup, the value entered run through several levels of validation.

Remote Command	:SOURce:LIST:SETup:INPut:TRIGger <enum>, <enum>, <enum>, ... :SOURce:LIST:SETup:INPut:TRIGger?
Example	:SOUR:LIST:SET:INP:TRIG IMM,INT,EXT2 :SOUR:LIST:SET:INP:TRIG?
Notes	The command is to setup below parameter array of whole list sequence. Step Trigger <enum> – specifies the input trigger for the step. For details of the valid types of step trigger see "Step Trigger" on page 590 . If input parameter number exceeds the step number defined by "Number of Steps" on page 589 Number of Steps then generate error ", and only those parametes whose index number falls in number of steps will be updated.
Remote Command Notes	IMMediate INTernal KEY BUS EXTernal2
Dependencies	The range is 1 to 1000 which is determined by the number of steps you have configured. For details see "Number of Steps" on page 589 .
Initial S/W Revision	A.09.40

Step Configuration of Transition Time parameter list (Remote Command Only)

This SCPI command is to configure "Transition Time" parameter array of the whole List Sequencer at one time. The number of array is same as step number defined in ["Number of Steps" on page 589](#) Number of Steps. As a step is setup, the value entered run through several levels of validation.

Remote Command	:SOURce:LIST:SETup:TRANsition:TIME <time>, <time>, <time>, ... :SOURce:LIST:SETup:TRANsition:TIME?
Example	:SOUR:LIST:SET:TRAN:TIME 1ms,1ms,1ms :SOUR:LIST:SET:TRAN:TIME?
Notes	The command is to setup below parameter array of whole list sequence. Transition Time <time> – specifies the transition time for the stepin seconds. For details of the valid ranges for the transition time see "Transition Time" on page 592 If input parameter number exceeds the step number defined by "Number of Steps" on page 589 Number of Steps then generate error ", and only those parametes whose index number falls in number of steps will be updated.

Dependencies	The range is 1 to 1000 which is determined by the number of steps you have configured. For details see "Number of Steps" on page 589 .
Initial S/W Revision	A.09.40

Step Configuration of Radio Band parameter list (Remote Command Only)

This SCPI command is to configure "Radio Band" parameter array of the whole List Sequencer at one time. The number of array is same as step number defined in ["Number of Steps" on page 589](#) Number of Steps. As a step is setup, the value entered run through several levels of validation.

R :SOURce:LIST:SETup:RADio:BAND <enum>, <enum>, <enum>, ...

e :SOURce:LIST:SETup:RADio:BAND?

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E :SOUR:LIST:SET:RAD:BAND PGSM, EGSM, RGSM

x :SOUR:LIST:SET:RAD:BAND?

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N The command is to setup below parameter array of whole list sequence.

0 Radio Band <enum> – specifies the radio band for the step. For details of the valid radio bands see ["Radio Setup" on page 593](#).

t If input parameter number exceeds the step number defined by ["Number of Steps" on page 589](#) Number of Steps then generate error ", and only those parametes whose index number falls in number of steps will be updated.

R NONE|PGSM|EGSM|RGSM|DCS1800|PCS1900|TGSM810|GSM450|GSM480|GSM700|GSM850|BANDI|BANDII|BANDIII|BANDIV|BANDV|BANDVI|BANDVII|BANDVIII|BANDIX|BANDX|BANDXI|BANDXII|BANDXIII|BANDXIV|BANDXIX|USCELL|USPCS|JAPAN|KOREAN|NMT|IMT2K|UPPER|SECOND|PAMR400|PAMR800|IMTEXT|PCS1 DOT9G|AWS|US2DOT5G|PUBLIC|LOWER|NONE|BAND1|BAND2|BAND3|BAND4|BAND5|BAND6|BAND7|BAND8|BAND10|BAND11|BAND12|BAND13|BAND14|BAND17|BAND18|BAND19|BAND20|BAND21|BAND24|BAND25|BAND26|BAND33|BAND34|BAND35|BAND36|BAND37|BAND38|BAND39|BAND40|BAND41|BAND42|BAND43|BANDA|BANDB|BANDC|BANDD|BANDE|BANDF

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D The range is 1 to 1000 which is determined by the number of steps you have configured. For details see "[Number of Steps](#)" on [page 589](#).

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Step Configuration of Radio Band Link parameter list (Remote Command Only)

This SCPI command is to configure “Radio Band Link” parameter array of the whole List Sequencer at one time. The number of array is same as step number defined in "[Number of Steps](#)" on [page 589](#) Number of Steps. As a step is setup, the value entered run through several levels of validation.

Remote Command :SOURce:LIST:SETup:RADio:BAND:LINK <enum>, <enum>, <enum>, ...

	:SOURce:LIST:SETup:RADio:BAND:LINK?
Example	:SOUR:LIST:SET:RAD:BAND:LINK DOWN,UP,UP :SOUR:LIST:SET:RAD:BAND:LINK?
Notes	The command is to setup below parameter array of whole list sequence. Radio Band Link <enum> – specifies the radio band link direction for the step. For details of the valid link types, see "Radio Band Link" on page 610. If input parameter number exceeds the step number defined by "Number of Steps" on page 589 Number of Steps then generate error ", and only those parametes whose index number falls in number of steps will be updated.
Remote Command Notes	DOWN UP
Dependencies	The range is 1 to 1000 which is determined by the number of steps you have configured. For details see "Number of Steps" on page 589.
Initial S/W Revision	A.09.40

Step Configuration of Frequency/Channel Number parameter list (Remote Command Only)

This SCPI command is to configure “Frequency” or “Channel Number” parameter array of the whole List Sequencer at one time. The number of array is same as step number defined in "Number of Steps" on page 589 Number of Steps. As a step is setup, the value entered run through several levels of validation.

Remote Command	:SOURce:LIST:SETup:CNFRrequency <double>, <double>, <double>, ... :SOURce:LIST:SETup:CNFRrequency?
Example	:SOUR:LIST:SET:CNFR 1GHz,100MHz,100MHz :SOUR:LIST:SET:CNFR? SOUR:LIST:SET:CNFR 124,124,124 :SOUR:LIST:SET:CNFR?
Notes	The command is to setup below parameter array of whole list sequence. Frequency/Channel Number <freq>/<chan num> – specifies the frequency in Hz or the channel number for the step. The channel number and frequency are combined as one parameter that represents the frequency or channel number depending on the radio band setting. If the radio band is set to NONE, this value is interpreted as a frequency value in Hz. If the radio band is set to a valid band, this value is interpreted as a channel number. For details of the valid ranges for frequency and channel numbers, see "Channel" on page 610 and "Frequency" on page 611 This SCPI is used to setup/query channel number or frequency setting, according to current Radio Band setting of that step. If Radio Band is “NONE”, then it’s frequency. If Radio Band is not “NONE”, then it’s channel number If input parameter number exceeds the step number defined by "Number of Steps" on page 589 Number of Steps then generate error ", and only those parametes whose index number falls in legal step number will be updated.
Dependencies	The range is 1 to 1000 which is determined by the number of steps you have configured. For details see "Number of Steps" on page 589.
Initial S/W Revision	A.09.40

Step Configuration of Power parameter list (Remote Command Only)

This SCPI command is to configure “Power” parameter array of the whole List Sequencer at one time. The number of array is same as step number defined in ["Number of Steps" on page 589](#) Number of Steps. As a step is setup, the value entered run through several levels of validation.

Remote Command	:SOURce:LIST:SETup:AMPLitude <ampl>, <ampl>, <ampl>, ... :SOURce:LIST:SETup:AMPLitude?
Example	:SOUR:LIST:SET:AMPL -50dBm,-40dBm,-30dBm :SOUR:LIST:SET:AMPL?
Notes	The command is to setup below parameter array of whole list sequence. Power <ampl> – specifies the output power for the step in dBm. For details of the valid ranges see "Power" on page 611 . If input parameter number exceeds the step number defined by "Number of Steps" on page 589 Number of Steps then generate error ", and only those parametes whose index number falls in legal step number will be updated.
Dependencies	The range is 1 to 1000 which is determined by the number of steps you have configured. For details see "Number of Steps" on page 589 .
Initial S/W Revision	A.09.40

Step Configuration of Waveform parameter list (Remote Command Only)

This SCPI command is to configure “Waveform” parameter array of the whole List Sequencer at one time. The number of array is same as step number defined in ["Number of Steps" on page 589](#) Number of Steps. As a step is setup, the value entered run through several levels of validation.

Remote Command	:SOURce:LIST:SETup:WAVEform <string>, <string>, <string>, ... :SOURce:LIST:SETup:WAVEform?
Example	:SOUR:LIST:SET:WAV "CW","Off","CONT" :SOUR:LIST:SET:WAV?
Notes	The command is to setup below parameter array of whole list sequence. Waveform <string> – specifies the waveform for playback during the step. The step can output either a new ARB waveform, continue playback of the previous waveform, or output a CW tone. The options for specifying these are: <filename> - plays the specified waveform from the start. The filename value is the name of the file within ARB playback memory, it is does not include the windows path to the file on the HDD. If you enter a filename for a waveform that does not reside within ARB playback memory, an error is generated. CONT – continues playback of the ARB file from the previous step CW – outputs a CW tone OFF – disable RF output If input parameter number exceeds the step number defined by "Number of Steps" on page 589 Number of Steps then generate error ", and only those parametes whose index number falls in number of steps will be updated.
Dependencies	The range is 1 to 1000 which is determined by the number of steps you have configured. For details

	see "Number of Steps" on page 589 .
Range	"filename" "CW" "Off" "CONT"
Initial S/W Revision	A.09.40

Step Configuration of Step Duration parameter list (Remote Command Only)

This SCPI command is to configure "Step Duration" parameter array of the whole List Sequencer at one time. The number of array is same as step number defined in ["Number of Steps" on page 589](#) Number of Steps. As a step is setup, the value entered run through several levels of validation.

Remote Command	:SOURce:LIST:SETup:DURation:TYPE <enum>, <enum>, <enum>, ... :SOURce:LIST:SETup:DURation:TYPE?
Example	:SOUR:LIST:SET:DUR:TYPE COUN,TIME,CONT :SOUR:LIST:SET:DUR:TYPE?
Notes	The command is to setup below parameter array of whole list sequence. Step Duration <enum> – specifies the duration of the step. The duration can be specified to be either time, or play count of the ARB file associated with the step, or continuous. If Waveform is set to "CW", this value cannot be set to Play Count and an error will be generated. If continuous is selected, the following Time or Count value is ignored. For further details of this setting, see "Step Duration" on page 619 . If input parameter number exceeds the step number defined by "Number of Steps" on page 589 Number of Steps then generate error ", and only those parametes whose index number falls in number of steps will be updated.
Remote Command Notes	TIME COUNT CONTInuous
Dependencies	The range is 1 to 1000 which is determined by the number of steps you have configured. For details see "Number of Steps" on page 589 .
Initial S/W Revision	A.09.40

Step Configuration of Duration Time or Play Count parameter list (Remote Command Only)

This SCPI command is to configure "Duration Time" or "Play Count" parameter array of the whole List Sequencer at one time. The number of array is same as step number defined in ["Number of Steps" on page 589](#) Number of Steps. As a step is setup, the value entered run through several levels of validation.

Remote Command	:SOURce:LIST:SETup:TOCount <time/int>, <time/int>, <time/int>, ... :SOURce:LIST:SETup:TOCount?
Example	:SOUR:LIST:SET:TOC 1s,2s,3s :SOUR:LIST:SET:TOC? :SOUR:LIST:SET:TOC 5,6,7 :SOUR:LIST:SET:TOC?
Notes	The command is to setup below parameter array of whole list sequence. Time or Count <time/int> – specifies time duration in seconds or play count of the ARB file

	<p>associated with the step. For further details of this setting, including the valid ranges for the time or play count setting, "Time" on page 619 and "Play Count" on page 620.</p> <p>If input parameter number exceeds the step number defined by "Number of Steps" on page 589 Number of Steps then generate error ", and only those parametes whose index number falls in number of steps will be updated.</p> <p>If current "Step Duration" on page 619 is "Continuous", then generate error -221, "Settings conflict; Cannot accept time or count input when step duration type is Continuous on step #"</p>
Dependencies	The range is 1 to 1000 which is determined by the number of steps you have configured. For details see " Number of Steps " on page 589.
Initial S/W Revision	A.09.40

Step Configuration of Output Trigger parameter list (Remote Command Only)

This SCPI command is to configure "Output Trigger" parameter array of the whole List Sequencer at one time. The number of array is same as step number defined in "[Number of Steps](#)" on page 589 Number of Steps. As a step is setup, the value entered run through several levels of validation.

Remote Command	<pre>:SOURce:LIST:SETup:OUTPut:TRIGger <bool>, <bool>, <bool>, ... :SOURce:LIST:SETup:OUTPut:TRIGger ?</pre>
Example	<pre>:SOUR:LIST:SET:OUTP:TRIG ON,OFF,ON :SOUR:LIST:SET:OUTP:TRIG?</pre>
Notes	<p>The command is to setup below parameter array of whole list sequence.</p> <p>Output Trigger <Boolean> – specifies the output trigger for the step. For details of the ranges for this setting see "Output Trigger" on page 621.</p> <p>If input parameter number exceeds the step number defined by "Number of Steps" on page 589 Number of Steps then generate error ", and only those parametes whose index number falls in legal step number will be updated.</p>
Remote Command Notes	ON OFF 1 0
Dependencies	The range is 1 to 1000 which is determined by the number of steps you have configured. For details see " Number of Steps " on page 589.
Initial S/W Revision	A.09.40

Clear List (Remote Command Only)

This command is the SCPI equivalent of the Clear List UI featuredescribed in.

Remote Command	:SOURce:LIST:SETup:CLEar
Example	:SOUR:LIST:SETup:CLE
Initial S/W Revision	A.05.00

Trigger Type

Allows access to the sub-menu for selecting the output trigger type for the list sequencer globally. It cannot be changed between different sequence steps.

Key Path	Source, List Sequencer
Remote Command	:SOURce:LIST:TRIGgerout:TYPe BEGinningofstep DATamarker
Example	:SOUR:LIST:TRIG:TYP BEG :SOUR:LIST:TRIG:TYP?
Notes	SCPI is supported after A.14.00
Preset	BEGinningofstep
Range	BEGinningofstep DATamarker
Initial S/W Revision	A.14.00

BeginningOfStep

Sets the output trigger type as BeginningOfStep for the whole source sequence.

Key Path	Source, List Sequencer, Trigger Type
Example	:SOUR:LIST:TRIG:TYP BEG
Notes	SCPI is supported after A.14.00
Initial S/W Revision	A.14.00

DataMarker

Sets the output trigger type as DataMarker for the whole source sequence. When DataMarker is selected, which marker to route is also needed to be set.

Key Path	Source, List Sequencer, Trigger Type
Example	:SOUR:LIST:TRIG:TYP DAT
Notes	SCPI is supported after A.14.00
Initial S/W Revision	A.14.00

Marker 1

Sets the output trigger maker routing to Marker 1 for DataMarker in the whole source sequence.

Key Path	Source, List Sequencer, Trigger Type, DataMarker
Example	:SOUR:LIST:TRIG:TYPE:MARK M1
Notes	SCPI is supported after A.14.00
Initial S/W Revision	A.14.00

Marker 2

Sets the output trigger maker routing to Marker 2 for DataMarker in the whole source sequence.

Key Path	Source, List Sequencer, Trigger Type, DataMarker
Example	:SOUR:LIST:TRIG:TYPE:MARK M2
Notes	SCPI is supported after A.14.00
Initial S/W Revision	A.14.00

Marker 3

Sets the output trigger maker routing to Marker 3 for DataMarker in the whole source sequence.

Key Path	Source, List Sequencer, Trigger Type, DataMarker
Example	:SOUR:LIST:TRIG:TYPE:MARK M3
Notes	SCPI is supported after A.14.00
Initial S/W Revision	A.14.00

Marker 4

Sets the output trigger maker routing to Marker 4 for DataMarker in the whole source sequence.

Key Path	Source, List Sequencer, Trigger Type, DataMarker
Example	:SOUR:LIST:TRIG:TYPE:MARK M4
Notes	SCPI is supported after A.14.00
Initial S/W Revision	A.14.00

Manual Trigger Now

Pressing this key provides a software trigger event to the list sequencer. During execution of sequence, if the sequencer is halted on any step that has been configured with a “Manual” step trigger, then this key press will cause the sequencer to continue and execute the step.

Key Path	Source, List Sequencer
Remote Command	No remote command, front panel only.
Initial S/W Revision	A.05.00

Remote Software Trigger (Remote command Only)

During execution of a list sequence, the sequence will halt and wait at any step that has Step Trigger set to "Bus". Sending this command will trigger the step and continue the sequence.

Remote Command	:SOURce:LIST:TRIGger:INITiate[:IMMediate]
Example	:SOUR:LIST:TRIG:INIT
Initial S/W Revision	A.05.00

Query List Sequence Initiation Armed Status (Remote Command Only)

This is a blocking SCPI query to determine if source list sequence being initiated successfully or not.

Remote Command	:SOURce:LIST:INITiation:ARMed?
Example	:SOUR:LIST:INIT:ARMed?
Notes	The return data is in the following format: Integer
Notes	Query only SCPI. Returning "1" if list sequence has been initiated successfully, returning "0" if not. Once get "0", you can use :SYST:ERR? to query what error happened. Just like "*OPC?", this command can be blocked until event/status "IsSourceSweeping" happens, and then returns. Doing so can help user's script query armed status only once during the time interval of the initiation. As an ancillary SCPI of existing SCPI ":SOUR:LIST:TRIGger[:IMMediate]" (see "Initiate Sequence" on page 588 Initiate Sequence), the right usage of this command is to use it after ":SOUR:LIST:TRIG". If not, this command will return "1" immediately.
Notes	There is an alias SCPI ":SOURce:LIST:TRIGger:INITiation:ARMed?".
Initial S/W Revision	A.09.40

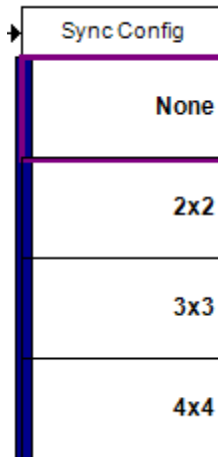
Source Sync Control

Opens a menu that allows you to set sync parameters.

Key Path	Source
Initial S/W Revision	A.14.00

Sync Config

This setting is used to config MIMO type based on the fixed setting. No matter from which module to choose the Sync Config type, the config result is as the same as defined. 2x2 means using the two consecutive modules on the left or the two consecutive modules on the Right. 3x3 means using the three consecutive modules on the left. 4x4 means using the four consecutive modules on the left.



Key Path	Source, Source Sync Control
Remote Command	:SOURce:SYNC: CONFig NONE TWO THRee FOUR :SOURce:SYNC: CONFig?
Example	:SOURce:SYNC: CONF TWO
Notes	The SCPI is available after A.14.00
Dependencies	2x2 MIMO is supported with license E6640A-M22 2x2, 3x3 MIMO is supported with license E6640A-M33 2x2, 3x3, 4x4 MIMO is supported with license E6640A-M44
Range	NONE TWO THRee FOUR
Initial S/W Revision	A.14.00
Modified at S/W Revision	A.14.50

None

Allows access to specify MIMO Config type as None.

Key Path	Source, Source Sync Control, Sync Config
Example	:SOURce:SYNC: CONF NON
Notes	The SCPI is available after A.14.00
Initial S/W Revision	A.14.00

2x2

Allows access to specify MIMO Config type as the fixed set 2x2.

Key Path	Source, Source Sync Control, Sync Config
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Example	:SOURce:SYNC:CONF TWO
Notes	The SCPI is available after A.14.00
Initial S/W Revision	A.14.00

3x3

Allows access to specify MIMO Config type as the fixed set 3x3.

Key Path	Source, Source Sync Control, Sync Config
Example	:SOURce:SYNC:CONF THRee
Notes	The SCPI is available after A.14.00
Initial S/W Revision	A.14.00

Sync Start

Allows you to start the slaves and masters , and ensure that immediate function can make all the master and slaves play arb synchronously.

Key Path	Source, Source Sync Control
Remote Command	:SOURce:SYNC:STARt
Example	:SOURce:SYNC:STAR
Notes	The SCPI is available after A.14.00 Once Sync Start is pressed, no source settings can be changed both in Master and Slave side, and this changes will effect until the sync is stopped.
Initial S/W Revision	A.14.00

Sync Stop

Allows you to stop the relationship between master and slaves. This immediate function will make the slaves in work change state from active to idle.

Key Path	Source, Source Sync Control
Remote Command	:SOURce:SYNC:STOP
Example	:SOURce:SYNC:STOP
Notes	The SCPI is available after A.14.00 When Master and Slave is in sync state, Press this menu can stop the sync and change source settings.
Initial S/W Revision	A.14.00

Source Preset

Allows you to preset the source settings to their default values.

Key Path	Source
Remote Command	:SOURce:PRESet
Example	:SOUR:PRES

6 List Sequence Measurements
System

System

See "[System](#)" on page 167

Trace/Detector

This key provides access to the Max Hold and Min Hold functions.

Key Path	Front-Panel
Initial S/W Revision	A.05.00

Max Hold

This key enables you to select visible/invisible Max Hold Trace.

Key Path	Trace/Dectector
Mode	SEQAN
Remote Command	:DISPlay:LSEQuencer:VIEW[1]:WINDow[1]:TRACe:MAXHold[:STATe] ON OFF 1 0 :DISPlay: LSEQuencer:VIEW[1]:WINDow[1]:TRACe:MAXHold[:STATe]?
Example	DISP:LSEQ:VIEW:WIND:TRAC:MAXH ON DISP:LSEQ:VIEW:WIND:TRAC:MAXH?
Notes	You must be in the Sequenece Analyzser mode to use this command. Use INSTRument:SElect to set the mode.
Preset	OFF
State Saved	Saved in instrument state.
Range	ON OFF 1 0
Initial S/W Revision	A.05.00

Min Hold

This key enables you to select visible/invisible Min Hold Trace.

Key Path	Trace/Dectector
Mode	SEQAN
Remote Command	:DISPlay:LSEQuencer:VIEW[1]:WINDow[1]:TRACe:MINHold[:STATe] ON OFF 1 0 :DISPlay: LSEQuencer:VIEW[1]:WINDow[1]:TRACe:MINHold[:STATe]?
Example	DISP:LSEQ:VIEW:WIND:TRAC:MINH ON DISP:LSEQ:VIEW:WIND:TRAC:MINH?
Notes	You must be in the Sequenece Analyzser mode to use this command. Use INSTRument:SElect to set the mode.
Preset	OFF
State Saved	Saved in instrument state.
Range	ON OFF 1 0
Initial S/W Revision	A.05.00

User Preset

Accesses a menu that gives you the following three choices:

- User Preset – recalls a state previously saved using the Save User Preset function.
- User Preset All Modes – presets all of the modes in the analyzer
- Save User Preset– saves the current state for the current mode

NOTE

In products that run multiple instances of the X-Series Application, all instances use the same location to save User Preset state. So Save User Preset of one instance will overwrite the Save User Preset of another instance.

Key Path	Front-panel key
Backwards Compatibility Notes	<p>User Preset is actually loading a state, and in legacy analyzers, it was possible to load a state without affecting the trace data, limit lines or correction data. Similarly it was possible to do a User Preset without affecting the trace data, limit lines or correction data.</p> <p>In the X-Series, “state” always includes all of this data; so whenever state is loaded, or User Preset is executed, all of the traces, limit lines and corrections are affected. Although this differs from previous behavior, it is desirable behavior, and should not cause adverse issues for users.</p> <p>On ESA and PSA, User Preset affected the entire instrument’s state. In the X-Series, User Preset only recalls the state for the active mode. There is a User Preset file for each mode. User Preset can never cause a mode switch as it can in legacy analyzers. If you want to recall all modes to their user preset file state, you will need to do a User Preset after mode switching into each mode.</p> <p>User Preset recalls mode state which can now include data like traces; whereas on ESA and PSA, User Preset did not affect data.</p>
Initial S/W Revision	Prior to A.02.00

User Preset

User Preset sets the state of the currently active mode back to the state that was previously saved for this mode using the Save User Preset menu key or the SCPI command, SYST:PRES:USER:SAV. It not only recalls the Mode Preset settings, but it also recalls all of the mode persistent settings, and the Input/Output system setting that existed at the time Save User Preset was executed.

If a Save User Preset has not been done at any time, User Preset recalls the default user preset file for the currently active mode. The default user preset files are created if, at power-on, a mode detects there is no user preset file. There will never be a scenario when there is no user preset file to restore. For each mode, the default user preset state is the same state that would be saved if a Save User Preset is performed in each mode right after doing a Restore Mode Default and after a Restore Input/Output Defaults.

The User Preset function does the following:

- Aborts the currently running measurement.
- Sets the mode State to the values defined by Save User Preset.
- Makes the saved measurement for the currently running mode the active measurement.
- Brings up the saved menu for the power-on mode.

- Clears the input and output buffers.
- Sets the Status Byte to 0.

Key Path	User Preset
Remote Command	:SYSTem:PRESet:USER
Example	:SYST:PRES:USER:SAVE:SYST:PRES:USER
Notes	:SYST:PRES:USER:SAVE is used to save the current state as the user preset state. Clears all pending OPC bits. The Status Byte is set to 0. Pressing the User Preset front-panel key while already in the User Preset menu will cause the User Preset to get executed
Couplings	A user preset will cause the currently running measurement to be aborted and cause the saved measurement to be active. Recalling a User Preset file has the same issues that recalling a Save State file has. Some settings may need to be limited and therefore re-coupled, since the capabilities of the mode may have changes when the User Preset file was last saved.
Initial S/W Revision	Prior to A.02.00

User Preset All Modes

Recalls all of the User Preset files for each mode, switches to the power-on mode, and activates the saved measurement from the power-on mode User Preset file.

NOTE

When the instrument is secured, all of the user preset files are converted back to their default user preset files.

The User Preset function does the following:

- Aborts the currently running measurement.
- Switches the Mode to the power-on mode.
- Restores the User Preset files for each mode.
- Makes the saved measurement for the power-on mode the active measurement.
- Brings up the saved menu for the power-on mode.
- Clears the input and output buffers.
- Sets the Status Byte to 0.

Key Path	User Preset
Remote Command	:SYSTem:PRESet:USER:ALL
Example	:SYST:PRES:USER:SAVE:SYST:PRES:USER:ALL
Notes	Clears all pending OPC bits. The Status Byte is set to 0. :SYST:PRES:USER:SAVE is used to save the current state as the user preset state.
Couplings	A user preset will cause the currently running measurement to be aborted, cause a mode switch to the power-on mode, and cause the saved measurement to be active in the power-on mode.

Recalling a User Preset file has the same issues that recalling a Save State file has. Some settings may need to be limited and therefore re-coupled, since the capabilities of the mode may have changes when the User Preset file was last saved.

Initial S/W Revision Prior to A.02.00

Save User Preset

Saves the currently active mode and its State. You can recall this User Preset file by pressing the User Preset menu key or sending the SYST:PRES:USER remote command. This same state is also saved by the Save State function.

Key Path	User Preset
Remote Command	:SYSTem:PRESet:USER:SAVE
Example	:SYST:PRES:USER:SAVE
Notes	:SYST:PRES:SAVE creates the same file as if the user requested a *SAV or a MMEM:STOR:STAT, except User Preset Save does not allow the user to specify the filename or the location of the file.
Initial S/W Revision	Prior to A.02.00

View/Display

The View/Display key opens the Display Menu (common to most measurements) and the View menu for the current measurement.

Only two views are available for the List Sequencer measurement: the Results Metric View, and the RF envelope view. The RF envelope view is only available when basic IQ data is captured in Sequence Analyzer mode.

Key Path	Front-panel key
Initial S/W Revision	A.05.00

Display

The Display menu is common to most measurements, and is used for configuring items on the display. Some Display menu settings apply to all the measurements in a mode, and some only to the current measurement. Those under the System Display Settings key apply to all measurements in all modes.

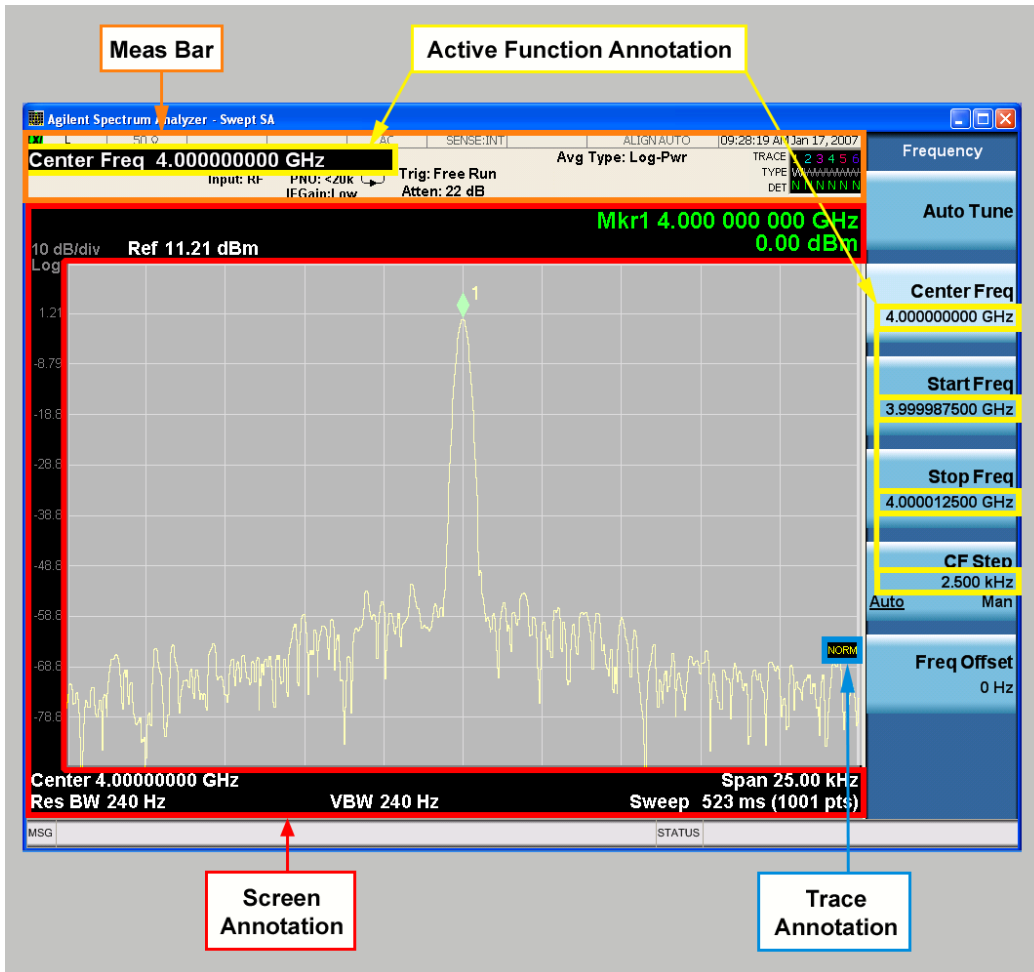
Key Path	Display
Key Path	View/Display
Initial S/W Revision	Prior to A.02.00

Annotation

Turns on and off various parts of the display annotation. The annotation is divided up into four categories:

1. Meas Bar: This is the measurement bar at the top of the screen. It does not include the settings panel or the Active Function. Turning off the Meas Bar turns off the settings panel and the Active Function. When the Meas Bar is off, the graticule area expands to fill the area formerly occupied by the Meas Bar.
2. Screen Annotation: this is the annotation and annunciation around the graticule, including any annotation on lines (such as the display line, the threshold line, etc.) This does NOT include the marker number or the N dB result. When off, the graticule expands to fill the entire graticule area.
3. Trace annotation: these are the labels on the traces, showing their detector (or their math mode).
4. Active Function annotation: this is the active function display in the meas bar, and all of the active function values displayed on softkeys.

See the figure below. Each type of annotation can be turned on and off individually.



Key Path	View/Display, Display
Initial S/W Revision	Prior to A.02.00

Meas Bar On/Off

This function turns the Measurement Bar on and off, including the settings panel. When off, the graticule area expands to fill the area formerly occupied by the Measurement Bar.

Key Path	View/Display, Display, Annotation
Remote Command	:DISPlay:ANNotation:MBAR[:STATE] OFF ON 0 1 :DISPlay:ANNotation:MBAR[:STATE]?
Example	DISP:ANN:MBAR OFF
Dependencies	Grayed out and forced to OFF when System Display Settings, Annotation is set to Off.
Preset	On This should remain Off through a Preset when System DisplaySettings, Annotation is set to Off.
State Saved	Saved in instrument state.
Initial S/W Revision	Prior to A.02.00

Screen

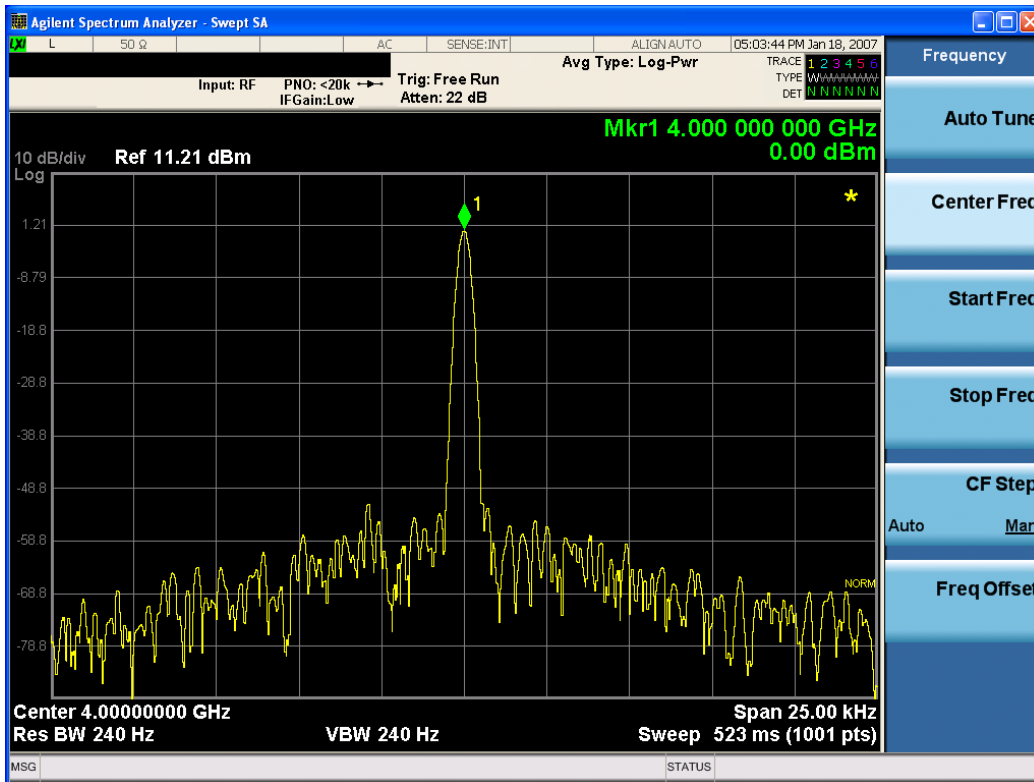
This controls the display of the annunciation and annotation around the graticule, including any annotation on lines (such as the display line, the threshold line, etc.) and the y-axis annotation. This does NOT include marker annotation (or the N dB result). When off, the graticule expands to fill the entire graticule area, leaving only the 1.5% gap above the graticule as described in the Trace/Detector chapter.

Key Path	View/Display, Display, Annotation
Remote Command	:DISPlay:ANNotation:SCReen[:STATe] OFF ON 0 1 :DISPlay:ANNotation:SCReen[:STATe]?
Example	DISP:ANN:SCR OFF
Dependencies	Grayed-out and forced to OFF when System Display Settings, Annotation is set to Off.
Preset	On This should remain Off through a Preset when System DisplaySettings, Annotation is set to Off
State Saved	Saved in instrument state.
Initial S/W Revision	Prior to A.02.00

Active Function Values On/Off

Turns on and off the active function display in the Meas Bar, and all of the active function values displayed on the softkeys.

Note that all of the softkeys that have active functions have these numeric values blanked when this function is on. This is a security feature..



Key Path	View/Display, Display, Annotation
Remote Command	:DISPlay:ACTivefunc[:STATE] ON OFF 1 0 :DISPlay:ACTivefunc[:STATE]?
Example	DISP:ACT OFF
Dependencies	Grayed out and forced to OFF when System Display Settings, Annotation is set to Off.
Preset	On This should remain Off through a Preset when System DisplaySettings, Annotation is set to Off
State Saved	Saved in instrument state.
Initial S/W Revision	Prior to A.02.00

Title

Displays menu keys that enable you to change or clear a title on your display.

Key Path	View/Display, Display
Initial S/W Revision	Prior to A.02.00

Change Title

Writes a title into the "measurement name" field in the banner, for example, "Swept SA".

Press Change Title to enter a new title through the alpha editor. Press Enter or Return to complete the entry. Press ESC to cancel the entry and preserve your existing title.

The display title will replace the measurement name. It remains for this measurement until you press Change Title again, or you recall a state, or a Preset is performed. A title can also be cleared by pressing Title, Clear Title.

NOTE

Notice the inclusion of the <measurement> parameter in the command below. Because each measurement remembers the Display Title, the command must be qualified with the measurement name. For the Swept SA measurement this is not the case; no <measurement> parameter is used when changing the Display Title for the Swept SA measurement.

Key Path	View/Display, Display, Title
Mode	All
Remote Command	:DISPlay:<measurement>:ANNotation:TITLe:DATA <string> :DISPlay:<measurement>:ANNotation:TITLe:DATA?
Example	DISP:ANN:TITL:DATA "This Is My Title" This example is for the Swept SA measurement in the Spectrum Analyzer mode. The SANalyzer <measurement> name is not used. DISP:ACP:ANN:TITL:DATA "This Is My Title" This example is for Measurements other than Swept SA. Both set the title to: This Is My Title
Notes	Pressing this key cancels any active function. When a title is edited the previous title remains intact (it is not cleared) and the cursor goes at the end so that characters can be added or BKSP can be used to go back over previous characters.
Preset	No title (measurement name instead)
State Saved	Saved in instrument state.
Initial S/W Revision	Prior to A.02.00

Clear Title

Clears a title from the front-panel display. Once cleared, the title cannot be retrieved. After the title is cleared, the current Measurement Name replaces it in the title bar.

Key Path	View/Display, Display, Title
Example	The following commands clear the title and restore the measurement's original title: DISP:ANN:TITL:DATA "" This example is for the Swept SA measurement in the Spectrum Analyzer mode. The SANalyzer <measurement> name is not used. DISP:ACP:ANN:TITL:DATA "" This example is for ACP; in measurements other than Swept SA the measurement name is required.
Notes	Uses the :DISPlay:<measurement>:ANNotation:TITLe:DATA <string> command with an empty string (in the Swept SA, the <measurement> is omitted).
Preset	Performed on Preset.
Initial S/W Revision	Prior to A.02.00

Graticule

Pressing Graticule turns the display graticule On or Off. It also turns the graticule y-axis annotation on and off.

Key Path	View/Display, Display
Remote Command	:DISPlay:WINDow[1]:TRACe:GRATicule:GRID[:STATe] OFF ON 0 1 :DISPlay:WINDow[1]:TRACe:GRATicule:GRID[:STATe]?
Example	DISP:WIND:TRAC:GRAT:GRID OFF
Notes	The graticule is the set of horizontal and vertical lines that make up the grid/divisions for the x-axis and y-axis.
Preset	On
State Saved	Saved in instrument state
Initial S/W Revision	Prior to A.02.00

System Display Settings

These settings are "Mode Global" – they affect all modes and measurements and are reset only by Restore Misc Defaults or Restore System Defaults under System.

Key Path	View/Display, Display
Initial S/W Revision	Prior to A.02.00

Annotation Local Settings

This is a Mode Global override of the meas local annotation settings. When it is All Off, it forces ScreenAnnotation, Meas Bar, Trace, and Active Function Values settings to be OFF for all measurements in all modes. This provides the security based "annotation off" function of previous analyzers; hence it uses the legacy SCPI command.

When it is All Off, the Screen, Meas Bar, Trace, and Active Function Values keys under the Display, Annotation menu are grayed out and forced to Off. When Local Settings is selected, you are able to set the local annotation settings on a measurement by measurement basis.

Key Path	View/Display, Display, System Display Settings
Remote Command	:DISPlay:WINDow[1]:ANNotation[:ALL] OFF ON 0 1 :DISPlay:WINDow[1]:ANNotation[:ALL]?
Example	:DISP:WIND:ANN OFF
Preset	On (Set by Restore Misc Defaults)
State Saved	Not saved in instrument state.
Backwards Compatibility Notes	The WINDow parameter and optional subopcode is included for backwards compatibility but ignored – all windows are equally affected.
Initial S/W Revision	Prior to A.02.00

Themes

Accesses a menu of functions that enable you to choose the theme to be used when saving the screen image.

The **Themes** option is the same as the **Themes** option under the **Display** and **Page Setup** dialogs. It allows you to choose between themes to be used when saving the screen image.

Key Path	Save, Screen Image
Remote Command	:MMEMory:STORe:SCReen:THEMe TDColor TDMonochrome FCOLor FMONochrome :MMEMory:STORe:SCReen:THEMe?
Example	:MMEM:STOR:SCR:THEM TDM
Preset	3D Color; Is not part of Preset, but is reset by Restore Misc Defaults or Restore System Defaults All and survives subsequent running of the modes.
Readback	3D Color 3D Mono Flat Color Flat Mono
Backwards Compatibility Notes	In ESA and PSA we offer the choice of "Reverse Bitmap" or "Reverse Metafile" when saving screen images. This is much like the "Flat Color" theme available in X-Series. Also, if you selected Reverse Bitmap AND a black & white screen image, that would be much like "Flat Monochrome". In other words, each of the X-Series themes has a similar screen image type in ESA/PSA. But they are not identical.
Initial S/W Revision	Prior to A.02.00

3D Color

Selects a standard color theme with each object filled, shaded and colored as designed.

Key Path	Save, Screen Image, Themes
Example	MMEM:STOR:SCR:THEM TDC
Readback	3D Color
Initial S/W Revision	Prior to A.02.00

3D Monochrome

Selects a format that is like 3D color but shades of gray are used instead of colors.

Key Path	Save, Screen Image, Themes
Example	MMEM:STOR:SCR:THEM TDM
Readback	3D Mono
Initial S/W Revision	Prior to A.02.00

Flat Color

Selects a format that is best when the screen is to be printed on an ink printer.

Key Path	Save, Screen Image, Themes
Example	MMEM:STOR:SCR:THEM FCOL
Readback	Flat Color
Initial S/W Revision	Prior to A.02.00

Flat Monochrome

Selects a format that is like Flat Color. But only black is used (no colors, not even gray), and no fill.

Key Path	Save, Screen Image, Themes
Example	MMEM:STOR:SCR:THEM FMON
Readback	Flat Mono
Initial S/W Revision	Prior to A.02.00

View Selection

Accesses a menu that allows you to select the desired view of the measurement. The following view selections are available:

- Result Metrics (SCPI: RESult)
- RF Envelope (SCPI:RFENvelope)

Key Path	View/Display
Mode	SEQAN
Remote Command	:DISPlay:LSEQuencer:VIEW[1][:SElect] RESult RFENvelope :DISPlay:LSEQuencer:VIEW[1][:SElect]?
Example	DISP:LSEQ:VIEW RES DISP:LSEQ:VIEW?
Preset	RESult
State Saved	Saved in instrument state.
Range	RESult RFENvelope
Initial S/W Revision	A.05.00

