



# **Agilent X-Series Wireless Communications Test Set**

This manual provides documentation  
for the following test sets:

EXT Test Set E6607A/B/C

**U9065A (Sequence  
Analyzer Mode): User's  
and Programmer's  
Reference**



# Notices

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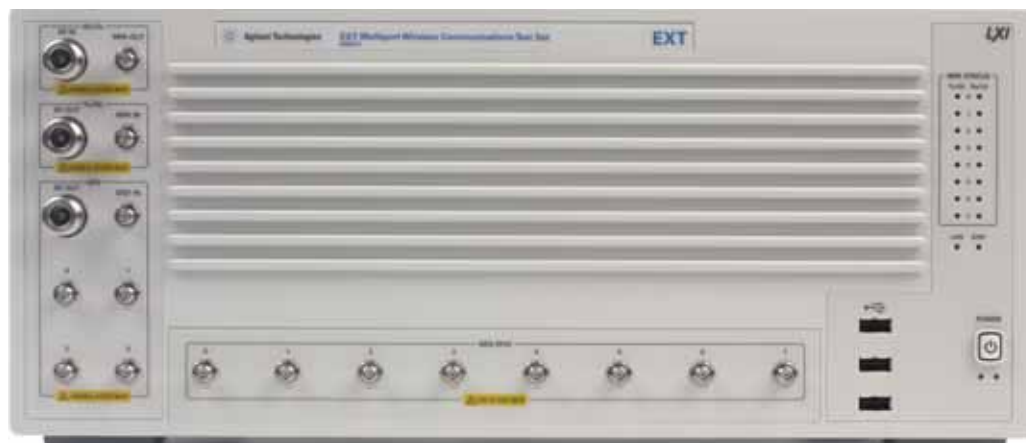
# 1 About the Test Set

The EXT Wireless Communication Test Set is a one-box tester, combining a vector signal analyzer with a vector signal source in a single instrument. The analyzer and source are each provided with a dedicated list sequencer, for rapid execution of a series of stimulus or measurement steps. The test set is optimized for production testing (including calibration and verification) of wireless mobile devices.

## E6607A/B



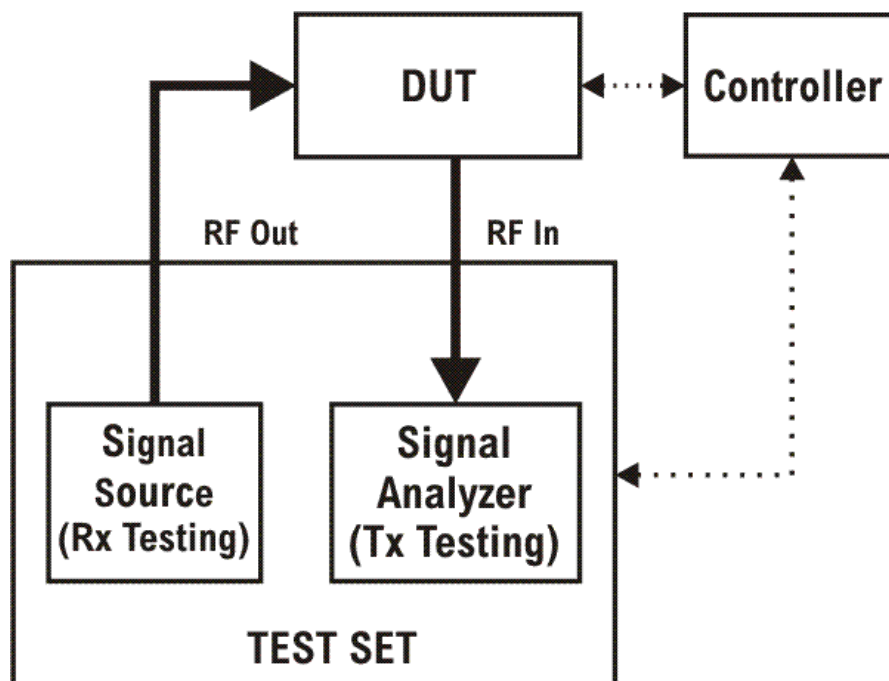
## E6607C



## How the Test Set Is Used

The E6607A/B/C Wireless Communication Test Set is typically used in a production test environment where mobile devices are being calibrated and verified in a “non-signalling” mode (that is, in a mode of operation which does not involve call processing, and which relies instead on test functions which are built into the device under test).

The test controller communicates with both the DUT and the test set to coordinate Rx and Tx test operations and to collect test results. However, both the DUT and the test set perform their own independent operations during the process (for example, internal test routines run by the DUT, and sequences run by the test set).



### Receiver Testing

The source within the test set can supply test signals to the DUT for the purpose of receiver testing. Typically the source plays a waveform which has been downloaded to the test set (for example, a .wfm file generated using Agilent Signal Studio or some other application). In receiver testing, the test set is providing the necessary stimulus for measurements which are performed by the DUT itself, using its built-in self-test capabilities. The test results (bit error rate, for example) come back to the controller from the DUT rather than from the test set.

### Transmitter Testing

The signal analyzer within the test set receives and measures signals from the DUT for the purpose of transmitter testing. Because the DUT is not being operated in a call-processing mode, the measurements

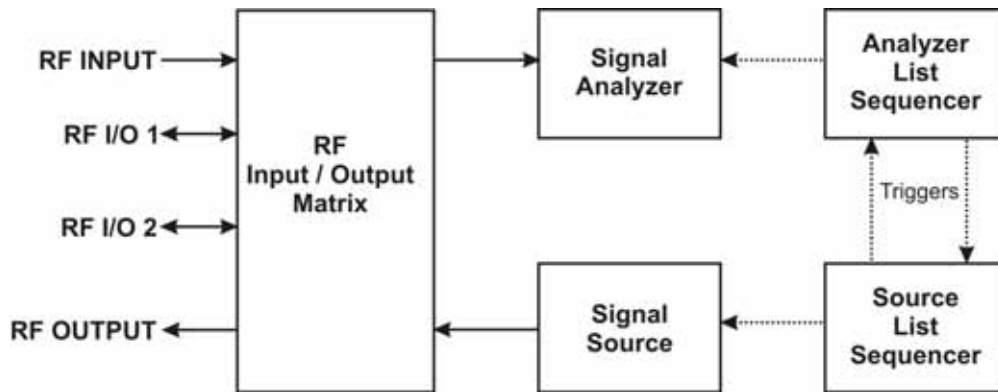
made by the analyzer pertain to signal quality (power, modulation accuracy, and so on) rather than to the data content of the transmitted signal. In transmitter testing, the measurement results come back to the controller from the test set rather than the DUT.

## Hardware Elements of the Test Set

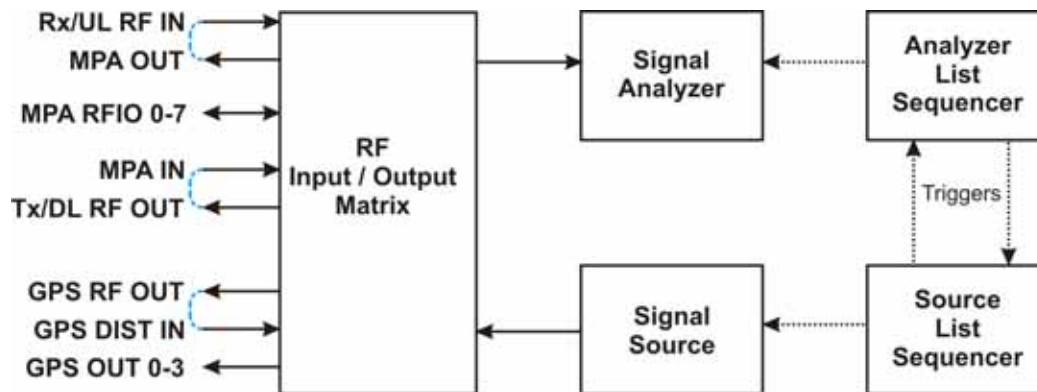
The test set includes a source and analyzer, which operate independently. You can control either of them directly (using front panel keys, the virtual front panel, or remote commands) or indirectly (by running a sequence, in which case the source and analyzer are operated by their list sequencers).

The source list sequencer and analyzer list sequencer function independently; however, you can coordinate their actions by setting them up to exchange trigger signals.

### E6607A/B

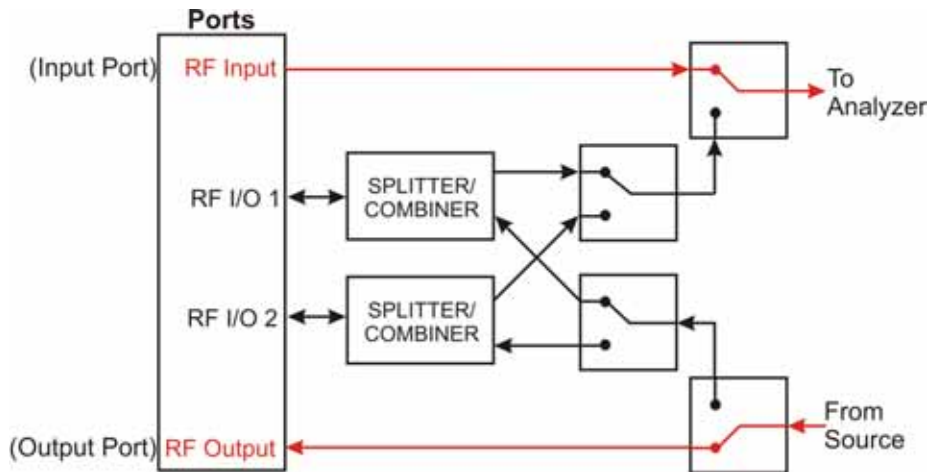


### E6607C



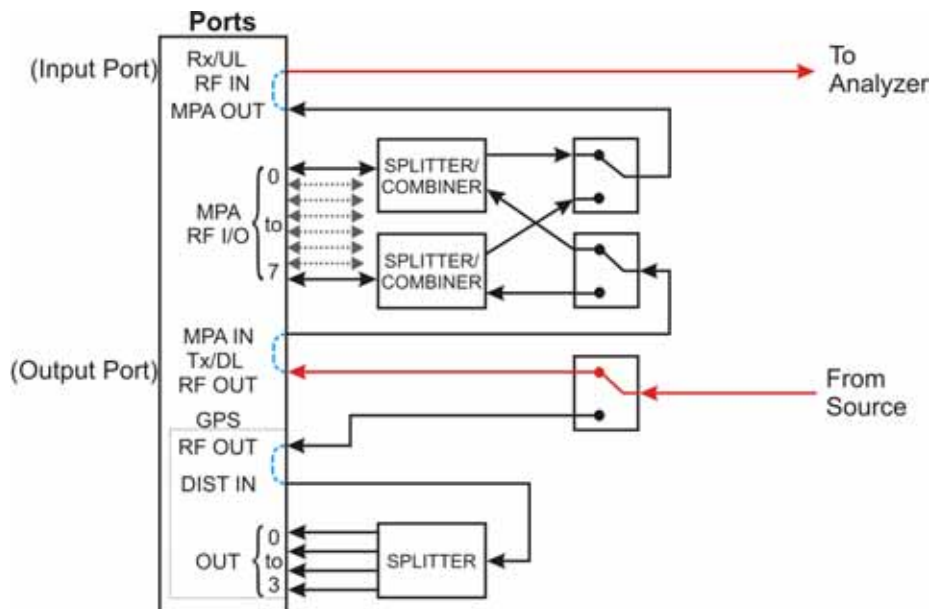
**E6607A/B**

The source and analyzer communicate with the device under test through an RF input/output matrix with four ports. Two of the ports have a fixed direction: an RF Output port which can be connected only to the source, and an RF Input port which can be connected only to the analyzer.



**E6607C**

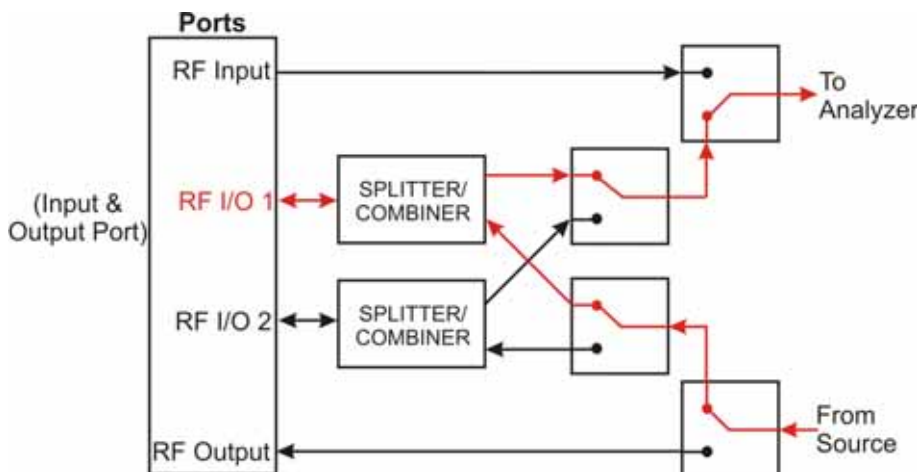
The source and analyzer communicate with the device under test through an RF input/output matrix with multiple ports. Two of the ports have a fixed direction: an Tx/DL RF Out port which can be connected only to the source, and an Rx/UL RF In port which can be connected only to the analyzer.





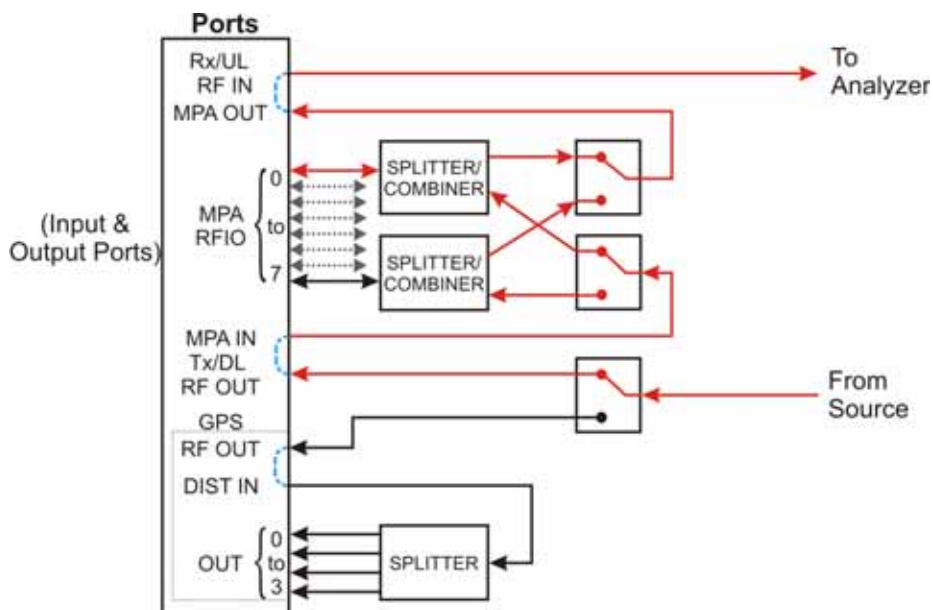
**E6607A/B**

The remaining two ports (the RF I/O ports) have bi-directional capability; they can be connected (through a splitter/combiner) to the source, to the analyzer, or to both at once. For example, in testing a mobile phone, both the source and the analyzer might be set up to interface with the device through the RF I/O 1 port, employing different frequencies for the transmit and receive signals.



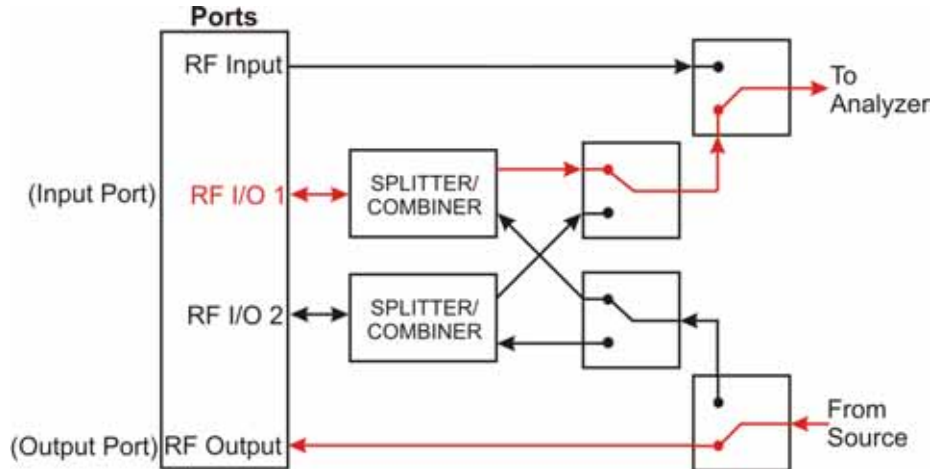
**E6607C**

The eight MPA RFIO ports have bi-directional capability; they can be connected (through internal splitter/combiners) to the source, to the analyzer, or to both at once. For example, in testing a mobile phone, both the source and the analyzer might be set up to interface with the device through the MPA RFIO 0 port, employing different frequencies for the transmit and receive signals.



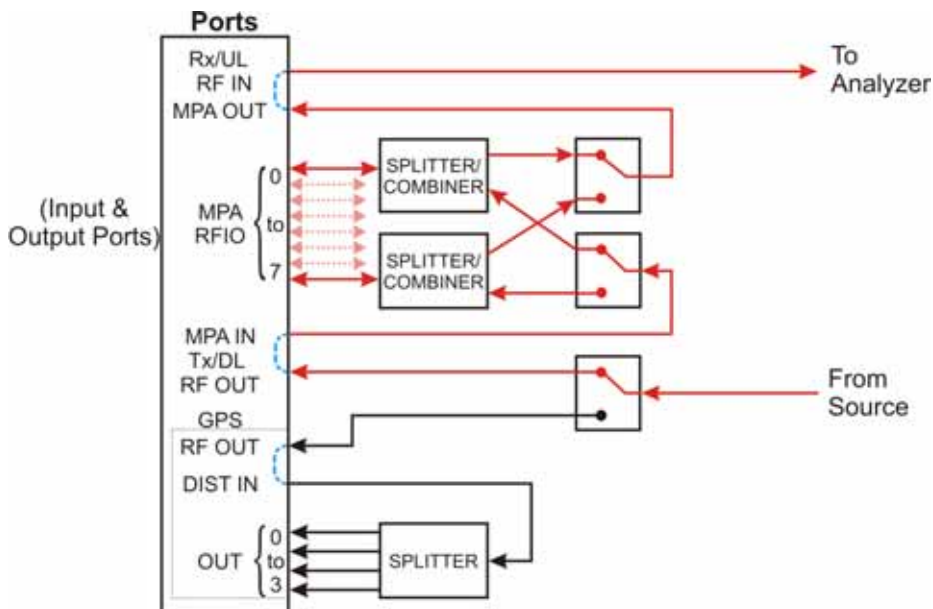
### E6607A/B

The RF I/O ports can also be used in a single direction, as in the case illustrated below, where RF I/O 1 serves as the input port, and RF Output serves as the output port.



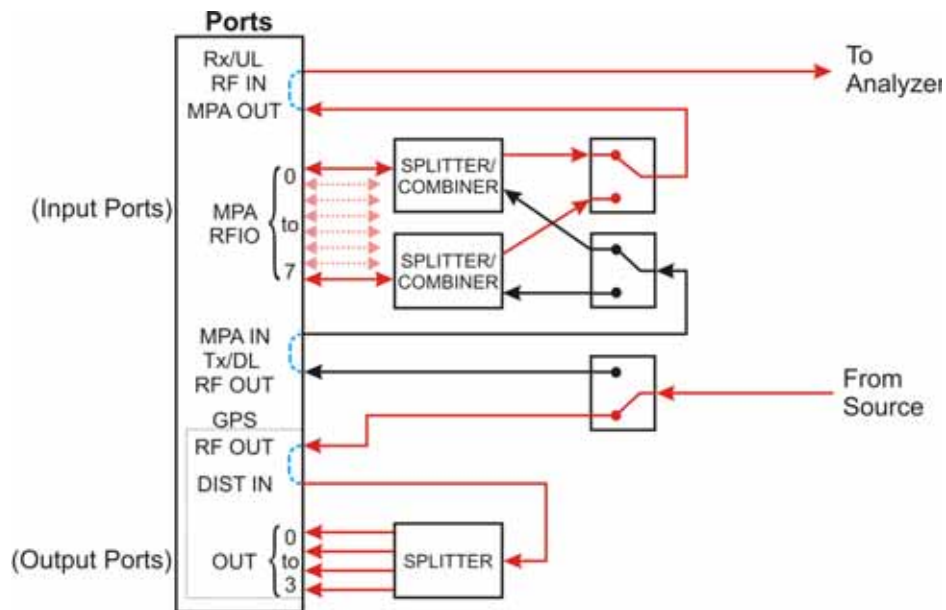
### E6607C

The MPA RFIO ports can also be used in a single direction, as in the case illustrated below. In this case, the MPA RFIO 0-7 ports are paired and each pair is connected to a single DUT. In each pair, one serves as the input port and the other serves as the output port. This provides for a total of 4 DUTs connected to a single test set at the same time.



### E6607C

When making GPS tests, the GPS OUT ports are fixed direction and are connected only to the source, as in the case illustrated below. In this case, four of the MPA RFIO 0-7 ports are paired with the four GPS OUT ports and each pair is connected to a single DUT. In each pair, the MPA RFIO port serves as the input port and the GPS OUT port serves as the output port. This provides for a total of 4 DUTs connected to a single test set at the same time.



### E6607A/B

For any sequence that the test set runs, a single port must be designated the input port, and a single port must be designated the output port. These port assignments cannot be changed during a sequence. The rules for port assignments are:

- Only one port at a time can be the input port, and it must be one of the following: RF Input, RF I/O 1, or RF I/O 2.
- Only one port at a time can be the output port, and it must be one of the following: RF Output, RF I/O 1, or RF I/O 2.
- RF I/O 1 can serve as both the input port and the output port simultaneously, but in that case it must be the only port in use.
- RF I/O 2 can serve as both the input port and the output port simultaneously, but in that case it must be the only port in use.

Although the two RF I/O ports cannot both be used bi-directionally at the same time, having two bi-directional ports offers practical advantages in reducing the impact of fixturing delays. For example, you can set up two sequences which are exactly alike, except that one of them designates RF I/O 1 as the input and output port, while the other sequence uses RF I/O 2 in the same way. During testing, the two sequences are run alternatively; a DUT is tested on one port while the next DUT is being fixtured on the other port.

## E6607C

For any sequence that the test set runs using the MPA RFIO or GPS OUT ports, a single MPA RFIO port must be designated the input port. For the output signal to the DUT, any of the MPA RFIO ports can be designated as output ports. Up to eight of the MPA RFIO ports can provide an output signal at one time. (However, if the MPA RFIO ports are used in input/output pairs, this will limit the number of available output ports to four.) These port assignments cannot be changed during a sequence. The rules for port assignments are:

- Only one port at a time can be the input port, and it must be one of the following: Rx/UL RF IN or any one of MPA RFIO 0-7.
- MPA RFIO 0-7 serve as both input ports or output ports when the MPA RF OUT is connected to the MPA IN.
- GPS 0-3 serve as output ports simultaneously when the GPS OUT is connected to the Dist .

## Software Elements of the Test Set

The test set firmware, which runs within the Windows XP Pro operating system, controls the source and analyzer, and provides access to a variety of licensed measurement applications which are available to be installed on the test set.

The basic test set includes licenses for two applications: the IQ Analyzer Mode (U9060A) and the Sequence Analyzer Mode (U9065A). Several other applications are available for installation. Many of the measurements which are included in these applications can be run from within the Sequence Analyzer mode, and not just in the native mode of the measurement. The table below shows all the available applications, and the measurements they include. Measurements which can be run from within the Sequence Analyzer mode are marked “available to sequencer” in the table.

**Table 1-1 Applications and Measurements in the Test Set**

Application	Measurement
IQ Analyzer Mode (U9060A)	<ul style="list-style-type: none"> <li>• IQ Waveform</li> <li>• Complex Spectrum</li> </ul>
Analog Demodulation Mode (U9063A)	<ul style="list-style-type: none"> <li>• Amplitude Modulation</li> <li>• Frequency Modulation</li> <li>• Phase Modulation</li> </ul>
Sequence Analyzer Mode (U9065A)	<ul style="list-style-type: none"> <li>• Basic measurements: Power, Phase &amp; Frequency, Discrete PAVT, IQ Data</li> <li>• List Sequencer</li> <li>• All application-specific measurements listed below that are marked “available to sequencer”.</li> </ul>

**Table 1-1 Applications and Measurements in the Test Set**

Application	Measurement
GSM/EDGE Mode (U9071A)	<ul style="list-style-type: none"> <li>• Transmit Power, also known as Burst Power</li> <li>• Power Vs. Time, GSM &amp; Edge versions (available to sequencer)</li> <li>• GMSK Phase &amp; Frequency (available to sequencer)</li> <li>• Output RF Spectrum, GMSK &amp; EDGE versions (available to sequencer)</li> <li>• EDGE Error Vector Magnitude (available to sequencer)</li> </ul>
cdma2000 Mode (U9072A)	<ul style="list-style-type: none"> <li>• Channel Power</li> <li>• Code Domain</li> <li>• ACP (available to sequencer)</li> <li>• Spectrum Emission Mask (available to sequencer)</li> <li>• Occupied Bandwidth (available to sequencer)</li> <li>• Modulation Accuracy (available to sequencer)</li> <li>• QPSK Error Vector Magnitude (available to sequencer)</li> </ul>
W-CDMA/HSPA Mode (U9073A)	<ul style="list-style-type: none"> <li>• Channel Power</li> <li>• Adjacent Channel Power (available to sequencer)</li> <li>• Spectrum Emission Mask (available to sequencer)</li> <li>• Occupied Bandwidth (available to sequencer)</li> <li>• Code Domain (available to sequencer)</li> <li>• Modulation Accuracy (available to sequencer)</li> <li>• QPSK Error Vector Magnitude (available to sequencer)</li> <li>• Power Control (available to sequencer)</li> </ul>
“WiMAX” Mode (802.16 OFDMA, U9075A)	<ul style="list-style-type: none"> <li>• Channel Power</li> <li>• Adjacent Channel Power</li> <li>• Spectrum Emission Mask</li> <li>• Modulation Analysis</li> </ul>
1xEVDO Mode (U9076A)	<ul style="list-style-type: none"> <li>• Channel Power</li> <li>• Reverse-Link Code Domain</li> <li>• Adjacent Channel Power (available to sequencer)</li> <li>• Spectrum Emission Mask (available to sequencer)</li> <li>• Occupied Bandwidth (available to sequencer)</li> <li>• Reverse-Link Modulation Accuracy (available to sequencer)</li> </ul>

**Table 1-1 Applications and Measurements in the Test Set**

Application	Measurement
TD-SCDMA with HSPA/8PSK (U9079A)	<ul style="list-style-type: none"> <li>• Burst Power (Transmit Power)</li> <li>• Power vs Time</li> <li>• ACP (available to sequencer)</li> <li>• Spectrum Emission Mask (available to sequencer)</li> <li>• Occupied Bandwidth (available to sequencer)</li> <li>• Code Domain Power (available to sequencer)</li> <li>• Conformance Error Vector Magnitude (available to sequencer)</li> </ul>
LTE Mode (U9080A)	<ul style="list-style-type: none"> <li>• Channel Power</li> <li>• Modulation Analysis (available to sequencer)</li> <li>• Occupied Bandwidth (available to sequencer)</li> <li>• ACP (available to sequencer)</li> <li>• Spectrum Emission Mask (available to sequencer)</li> <li>• Conformance Error Vector Magnitude (available to sequencer)</li> </ul>
Bluetooth (U9081A)	<ul style="list-style-type: none"> <li>• ACP</li> <li>• LE In-band Emissions</li> <li>• EDR In-band Spurious Emissions</li> <li>• Occupied Bandwidth</li> <li>• Transmit Analysis</li> </ul>
LTE TDD Mode (U9082A)	<ul style="list-style-type: none"> <li>• Channel Power</li> <li>• Occupied Bandwidth (available to sequencer)</li> <li>• ACP (available to sequencer)</li> <li>• Spectrum Emission Mask (available to sequencer)</li> <li>• Transmit On/Off Power (available to sequencer)</li> <li>• LTE Modulation Analysis (available to sequencer)</li> <li>• Conformance Error Vector Magnitude (available to sequencer)</li> </ul>

**NOTE**

Some measurements which are not marked “available to sequencer” can be replaced by a basic measurement function which is available in the Sequence Analyzer mode. For example, it is possible to use the basic Power measurement in Sequence Analyzer mode as a substitute for a Channel Power measurement from one of the other modes. Some measurements are not currently supported by the analyzer list sequencer, and therefore can be run only in the native mode of the measurement.

## Methods of Operating the Source

Regardless of which measurement mode is currently selected, the source can be operated using front panel keys, the virtual front panel, or remote commands, or by initiating the source list sequencer (which executes a predefined series of signal-generation steps).

The RF output of the source can be modulated by its internal arbitrary waveform generator, which runs waveform segment files that have been downloaded to the test set and loaded into ARB memory. (If a source sequence refers to a number of different waveform segments, all of these segments need to be loaded into ARB memory before the sequence can execute.)

In addition to playing back waveform segments in ARB memory, the source provides basic modulation functions (AM, FM, and PM).

## Waveform Segment Files

A waveform segment can be defined in a set of binary files (an I/Q data file with its supporting header and marker files) or in a .wfm file (a combined file format which is produced by Agilent Signal Studio). Playback of .wfm segments requires installation of a Signal Studio license on the test set.

Where the segment is represented by separate binary files, the files need to be placed in the same directory, and need to follow a naming convention which enables the test set to recognize them: if the I/Q data file is called "testWaveform.bin", then the header file needs to be called "testWaveform\_hdr.bin" and the marker file needs to be called "testWaveform\_mkr.bin". The I/Q data file is the one that is loaded to ARB memory and is referenced by name in source sequences.

## Methods of Operating the Analyzer

When a measurement mode other than Sequence Analyzer mode is selected, the analyzer can be operated using front panel keys, the virtual front panel, or remote commands. When the analyzer is used in this way, measurements are made in their native measurement mode (for example, GSM measurements in GSM/EDGE mode).

In Sequence Analyzer mode, initiating the analyzer list sequencer causes it to execute a predefined series of acquisitions and measurements. As described in [“Software Elements of the Test Set” on page 48](#) Sequence Analyzer mode incorporates many measurements from other modes; that is, measurements such as EDGE EVM in GSM/EDGE mode can also be included in a sequence, so that the measurements are made when the analyzer list sequencer is initiated. The Sequence Analyzer mode also includes four basic measurements (power, frequency, phase, and I/Q data).

## Creating Sequences

A sequence is a set of parameters which defines a series of signals to be generated, or acquisitions to be analyzed, or both. The parameters can be saved to a text file and later recalled. Initiating the sequencers causes the source and/or analyzer to execute all steps defined in the sequence. (A series of SCPI commands can also be used for the same purpose.)

Although it is possible to create and save a simple sequence using front panel keys, the complexity of the format makes it preferable to use a spreadsheet template or other tool to create a sequence (which is saved to a text file).

The easiest method is to use Agilent Sequence Studio, a PC application designed specifically to generate

sequences for the EXT Wireless Communication Test Set. Sequence Studio is able to load waveform traces directly from the test set, so that the analysis intervals in the sequence can be aligned with the waveform, using an interactive graph display; this method of creating sequences is much more efficient than typing in numerical values.

## Executing Sequences

Sequences are executed by initiating the source list sequencer, the analyzer list sequencer, or both.

The source list sequencer can be initiated (in any measurement mode) by using the **[Source], List Sequencer, Initiate Sequence** key, or by sending the `:SOURCE:LIST:TRIG` command.

The analyzer list sequencer can be initiated (in the Sequence Analyzer mode) by using the **[Restart]** key, or by sending the `:INIT` command.

When both list sequencers are used together, initiation of the sequencers must be carefully coordinated. It is not possible for both sequencers to be initiated absolutely simultaneously. When both are used, the source list sequencer should always be initiated first. There are two ways to coordinate the sequencers so that they are initiated in the proper order:

- Enable **Meas Setup, Include Source in Sequence**. When this selection is made, both of the list sequencers are initiated automatically, in the correct order, when you use a command or key to initiate the analyzer sequence (in this case, the source sequence cannot be initiated independently of the analyzer sequence).
- If “Include Source in Sequence” is disabled, then the source and analyzer must be initiated independently, and the source must be initiated first.

In addition to the initiating the sequencers, it is also necessary to trigger them. Output and input triggering for the two sequencers (as defined in the sequences they are executing) must be set up to coordinate the timing of their operations. Typically, the analyzer list sequencer generates a trigger input to the source list sequencer, so that the source begins generating a signal once the analyzer is ready to receive and analyze it.



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## Installing Application Software

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

When you purchase an application, you receive an entitlement certificate that is used to obtain a license key for that particular measurement application. Enter the license key that you obtain into the EXT test set to activate the new measurement application.

For the latest information on Agilent X-series measurement applications and upgrade kits, visit the following internet URL: <http://www.agilent.com/find/ext>

### Viewing a license key

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

Press **System, Show, System** to display which measurement applications are currently licensed in your test set.

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

C:\Programing Files\Agilent\Licensing

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

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### 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 test set. Follow the instructions that accompany the certificate to obtain your license key.

Installing a license key for the selected application can be done using a USB memory device. To do this, you put the license file on 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 license management application in the test set. It is found through the test set front panel keys at **System, Licensing...**, or internally at C:\Programming Files\Agilent\Licensing.

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

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## Missing and old Measurement application software

All the software applications were loaded at the time of original test set manufacture. It is a good idea to regularly update your software with the latest available version. This assures that you get any improvements and expanded functionality that is available.

Because the software was loaded at the initial purchase, there may be additional measurement applications that are now available. If the application you are interested in licensing is not available, you will need to do a software update. (Press **System, Show, System.**)

Check the Agilent internet website for the latest software versions available for downloading:

[http://www.agilent.com/find/ext\\_software](http://www.agilent.com/find/ext_software)

You must load the updated software package into the test set from a USB drive, or directly from the internet. An automatic loading program is included with the files.

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## X-Series options and accessories

“EXT Test Set Options” on page 55

“EXT X-series accessories” on page 55

“Advanced Measurement Application Software” on page 55

### EXT Test Set Options

Product	Description
<EXT model number>	Wireless communications test set
<EXT model number>-503	Frequency range from 10 MHz to 3.6 GHz
<EXT model number>-504	Frequency range from 10 MHz to 3.8 GHz
<EXT model number>-UK6	Commercial Calibration Certificate with Test Data

### EXT X-series accessories

Product	Description
<EXT model number>-EFM	USB storage device 4 GB blank
<EXT model number>-KYB	Keyboard, USB interface
<EXT model number>-HTC	Hard transit case
<EXT model number>-ICP	Rackmount kit with handles
<EXT model number>-1CN	Front handle kit
<EXT model number>-1CM	Rackmount kit
<EXT model number>-1CR	Rack slide kit

### Advanced Measurement Application Software

For a current list of application software, go to the following URLs.

<http://www.agilent.com/find/ext>

Select the **Options** tab on the top of the webpage.

## Front-Panel Features (E6607A/B)



Item		Description
#	Name	
1	Menu Keys	Key labels appear to the left of the menu keys to identify the current function of each key. The displayed functions are dependent on the currently selected Mode and Measurement, and are directly related to the most recent key press.
2	Measurement Keys	These keys select the Mode, and the Measurement within the mode. They also control the initiation and rate of recurrence of measurements.
3	Setup Keys	These keys set the parameters used for setting up the test set in the current Mode.
4	Marker Keys	Markers are often available for a measurement, to measure a very specific point/segment of data within the range of the current measurement data.
5	Utility Keys	These keys control system-wide functionality such as <ul style="list-style-type: none"> <li>• test set configuration information and I/O setup,</li> <li>• printer setup and printing,</li> <li>• file management, save and recall,</li> <li>• test set presets.</li> </ul>
6	Probe Power	Supplies power for external high frequency probes and accessories.
7	Headphones Output	Headphones can be used to hear any available audio output.
8	Back Space Key	Press this key to delete the previous character when entering alphanumeric information. It also works as the Back key in Help and Explorer windows.
9	USB Connectors	Standard USB 2.0 ports, Type A. Connect to external peripherals such as a mouse, keyboard, DVD drive or hard drive.

Item		Description
#	Name	
10	Delete Key	Press this key to delete files, or to perform other deletion tasks.
11	Local/Cancel/(Esc) Key	<p>If you are in remote operation the Local key</p> <ul style="list-style-type: none"> <li>returns test set control from remote back to local (the front panel).</li> <li>turns the display on (if it was turned off for remote operation).</li> <li>can be used to clear errors. (Press the key once to return to local control, and a second time to clear error message line.)</li> </ul> <p>If you have not already pressed the units or Enter key, Cancel exits the currently selected function without changing its value.</p> <p>Esc works the same as it does on a pc keyboard. It</p> <ul style="list-style-type: none"> <li>exits Windows dialogs</li> <li>clears errors</li> <li>aborts printing</li> <li>cancels operations.</li> </ul> <p>This key also exits the help system if it has been accessed.</p>
12	Numeric Keypad	Enters a specific numeric value for the current function. Entries appear on the upper left of the display, in the measurement information area.
13	Enter and Arrow Keys	<p>The Enter key terminates data entry when either no unit of measure is needed, or you want to use the default unit.</p> <p>The arrow keys</p> <ul style="list-style-type: none"> <li>Increment and decrement the value of the current measurement selection.</li> <li>Navigate help topics.</li> <li>Navigate, or make selections, within Windows dialogs.</li> <li>Navigate within forms used for setting up measurements.</li> <li>Navigate within tables.</li> </ul> <p><b>NOTE</b> The arrow keys cannot be used to move a mouse pointer around on the display.</p>
14	Menu/ (Alt) Key	Alt works the same as a pc keyboard. Use it to change control focus in Windows pull-down menus.
15	Ctrl Key	Ctrl works the same as a pc keyboard. Use it to navigate in Windows applications, or to select multiple items in lists.
16	Select / Space Key	Select is also the Space key and it has typical pc functionality. For example, in Windows dialogs, it selects files, checks and unchecks check boxes, and picks radio button choices. It opens a highlighted Help topic.
17	Tab Keys	Use these keys to move between fields in Windows dialogs.
18	Knob	Increments and decrements the value of the current active function.
19	Return Key	Exits the current menu and returns to the previous menu. Has typical pc functionality.
20	Full Screen Key	Pressing this key turns off the softkeys to maximize the graticule display area.

About the Test Set  
**Front-Panel Features (E6607A/B)**

Item		Description
#	Name	
21	Help Key	Initiates a context-sensitive help display for the current Mode. Once Help is accessed, pressing a front panel key brings up the help topic for that key function. Use the Local/Cancel/(Esc) key to exit help.
22	Speaker Control Keys	Enables you to increase or decrease the speaker volume, or mute it.
23	Window Control Keys	These keys select between single or multiple window displays. They zoom the current window to fill the data display, or change the currently selected window. They can be used to switch between the Help window navigation pane and the topic pane.
24	Power Standby/ On	Turns the test set on. A green light indicates power on. A yellow light indicates standby mode.  <div style="border: 1px solid gray; padding: 2px; display: inline-block; margin: 5px 0;"><b>NOTE</b></div> The front-panel switch is a standby switch, <b>not</b> a LINE switch (disconnecting device). The test set continues to draw power even when the line switch is in standby.  The main power cord can be used as the system disconnecting device. It disconnects the mains circuits from the mains supply.
25	RF I/O 1 Connector	RF Input/Output port #1 (communicates with both the source and the analyzer).
26	RF I/O 2 Connector	RF Input/Output port #2 (communicates with both the source and the analyzer).
27	RF Output	The test set's RF output port (communicates only with the source).
28	RF Input	The test set's RF input port (communicates only with the analyzer).

### Overview of key types

The keys labeled **FREQ Channel**, **System**, and **Marker Functions** are all examples of front-panel keys.



Most of the dark or light gray keys access menus of functions that are displayed along the right side of the display. These displayed key labels are next to a column of keys called menu keys.

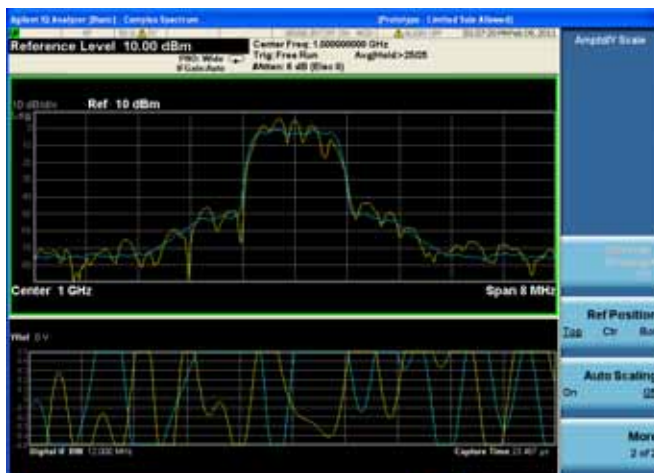
Menu keys list functions based on which front-panel key was pressed last. These functions are also dependant on the current selection of measurement application (**Mode**) and measurement (**Meas**).

If the numeric value of a menu key function can be changed, it is called an active function. The function label of the active function is highlighted after that key has been selected. For example, press **AMPTD Y Scale**. This calls up the menu of related amplitude functions. The function labeled **Ref Level** (the default selected key in the Amplitude menu) is highlighted. **Ref Level** also appears in the upper left of the display in the measurement information area. The displayed value indicates that the function is selected and its

value can now be changed using any of the data entry controls.



Some menu keys have multiple choices on their label, such as **On/Off** or **Top/Ctr/Bot** (as shown below). The different choices are selected by pressing the key multiple times. For example, the Auto/Man type of key. To select the function, press the menu key and notice that Auto is underlined and the key becomes highlighted. To change the function to manual, press the key again so that Man is underlined. If there are more than two settings on the key, keep pressing it until the desired selection is underlined.



When a menu first appears, one key label is highlighted to show which key is the default selection. If you

## About the Test Set

### Front-Panel Features (E6607A/B)

press **Marker Function**, the **Marker Function Off** key is the menu default key, and is highlighted.



Some of the menu keys are grouped together by a yellow bar running behind the keys near the left side or by a yellow border around the group of keys. When you press a key within the yellow region, such as **Marker Noise**, the highlight moves to that key to show it has been selected. The keys that are linked are related functions, and only one of them can be selected at any one time. For example, a marker can only have one marker function active on it. So if you select a different function it turns off the previous selection. If the current menu is two pages long, the yellow bar or border could include keys on the second page of keys.



In some key menus, a key label is highlighted to show which key has been selected from multiple available choices. And the menu is immediately exited when you press one of the other keys. For example, when you press the **Select Marker** key (in the **Marker** menu), it brings up its own menu of keys. The **Marker 1** key is highlighted. When you press the **marker 2** key, the highlight moves to that key and



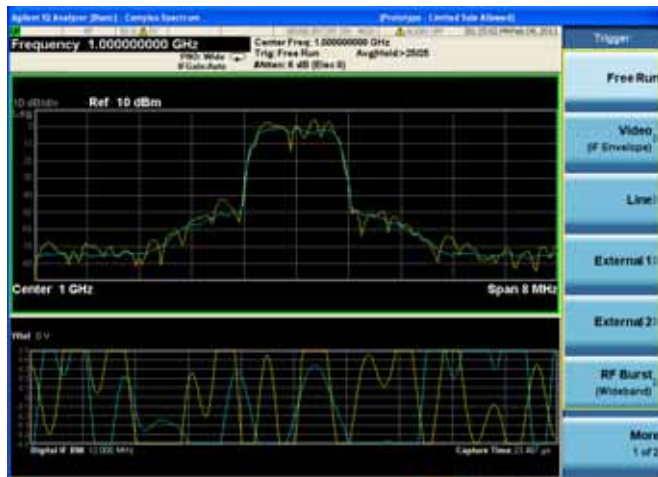
the screen returns to the **Marker** menu.



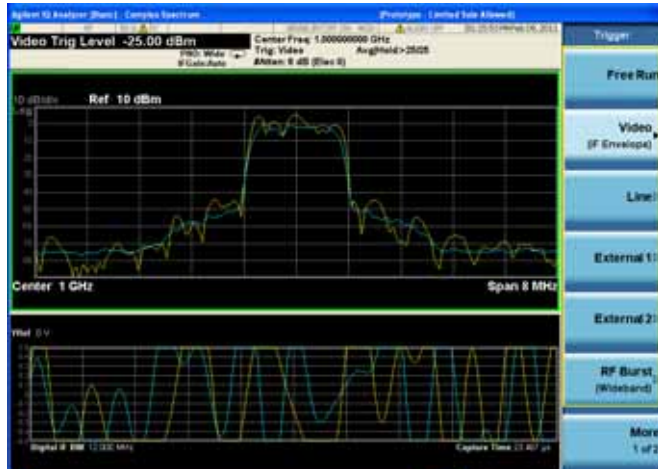
If a displayed key label shows a small solid-black arrow tip pointing to the right, it indicates that additional key menus are available. If the arrow tip is not filled in solid then pressing the key the first time selects that function. Now the arrow is solid and pressing it again brings up an additional menu of

# About the Test Set Front-Panel Features (E6607A/B)

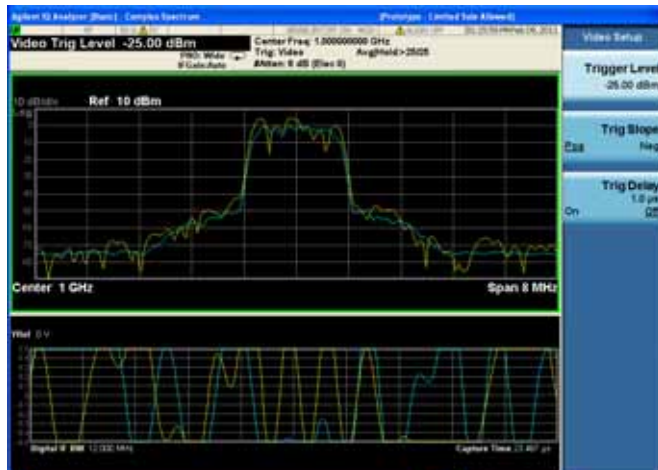
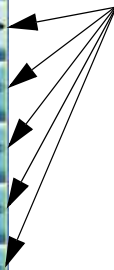
settings.



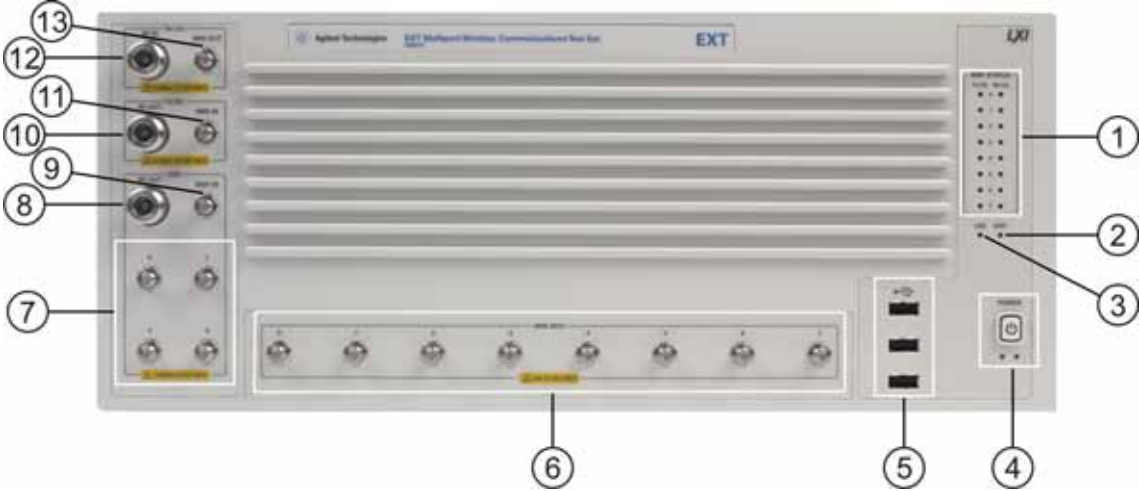
Open  
Arrow Tip



Solid  
Arrow Tip



**Front-Panel Features (E6607C)**



Item		Description
#	Name	
1	MPA Status	<p>MPA Status Indicator LEDs light indicating the status of the instrument:</p> <ul style="list-style-type: none"> <li>Tx/DL 0 - 7 (these light to indicate that the related RFIO ports are being used to transmit RF outputs to the connected DUTs).</li> <li>Rx/UL 0 - 7 (these light to indicate that the related RFIO ports are being used to receive RF inputs from the connected DUTs).</li> </ul> <p><b>NOTE</b> There are no indicators for the GPS ports, because the ports cannot be switched on or off. Whatever RF input is provided to the GPS DIST IN port is always split and delivered to the GPS 0 - 3 ports.</p>
2	Stat	<p>SCPI Status Indicator LED lights to indicate that the instrument is ready to receive a remote SCPI command.</p>
3	LAN	<p>LAN Status Indicator LED lights to indicate that the instrument has made an active LAN connection.</p>
4	Power	<p>Power Standby/On switch and indicator LEDs. A green light indicates power on. A yellow light indicates standby mode.</p> <p><b>NOTE</b> The front-panel switch is a standby switch, <b>not</b> a LINE switch (disconnecting device). The test set continues to draw power even when the line switch is in standby.</p> <p>The main power cord can be used as the system disconnecting device. It disconnects the mains circuits from the mains supply.</p>
5	USB Connectors	<p>Standard USB 2.0 ports, Type A. Connect to external peripherals such as a mouse, keyboard, DVD drive or hard drive.</p>

About the Test Set  
**Front-Panel Features (E6607C)**

Item		Description
#	Name	
6	MPA RFIO, Ports 0 - 7	RF input and output connections to the DUTs (SMA connectors). The maximum safe input level at any of these ports is 2 W (+33 dBm), $\pm 15$ Vdc.
7	GPS, Ports 0 - 3	RF input and output connections to the DUTs (SMA connectors). The maximum safe input level at any of these ports is 0.25 W (+24 dBm), 0 Vdc. Because GPS Ports 0 - 3 are the outputs of a four-way splitter, the maximum output power levels from these ports are lower than for RFIO Ports 0 - 7; see the E6607C data sheet for specifics.
8	RF OUT	GPS RF output port (communicates only with the source). The maximum safe input level at any of these ports is 0.25 W (+24 dBm), 0 Vdc.
9	DIST IN	GPS RF distribution input port (SMA connector). This port is connected to the four-way splitter that provides the signal to the 4 GPS output Ports 0 - 3. The maximum safe input level at any of these ports is 0.25 W (+24 dBm), 0 Vdc.
10	RF OUT	Tx/DL RF output port (communicates only with the source). The maximum safe input level at any of these ports is 0.25 W (+24 dBm), $\pm 15$ Vdc.
11	MPA IN	Tx/DL MPA RF input port (SMA connector). The maximum safe input level at any of these ports is 0.25 W (+24 dBm), $\pm 15$ Vdc.
12	RF IN	Rx/UL RF input port (communicates only with the analyzer). The maximum safe input level at any of these ports is 0.25 W (+24 dBm), $\pm 15$ Vdc.
13	MPA OUT	Rx/UL RF MPA output port (SMA connector). The maximum safe input level at any of these ports is 0.25 W (+24 dBm), $\pm 15$ Vdc.

## Overview of key types

The keys labeled **FREQ Channel**, **System**, and **Marker Function** are all examples of front-panel keys.



Most of the dark or light gray keys access menus of functions that are displayed along the right side of the display. These displayed key labels are next to a column of keys called menu keys.

Menu keys list functions based on which front-panel key was pressed last. These functions are also dependant on the current selection of measurement application (**Mode**) and measurement (**Meas**).

If the numeric value of a menu key function can be changed, it is called an active function. The function label of the active function is highlighted after that key has been selected. For example, press **AMPTD Y Scale**. This calls up the menu of related amplitude functions. The function labeled **Ref Level** (the default selected key in the Amplitude menu) is highlighted. **Ref Level** also appears in the upper left of the display in the measurement information area. The displayed value indicates that the function is selected and its value can now be changed using any of the data entry controls.

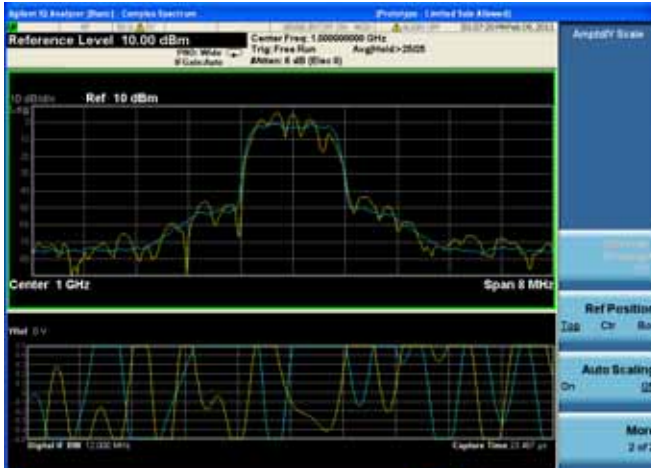


Some menu keys have multiple choices on their label, such as **On/Off** or **Top/Ctr/Bot** (as shown below). The different choices are selected by pressing the key multiple times. For example, the Auto/Man type of key. To select the function, press the menu key and notice that Auto is underlined and the key becomes highlighted. To change the function to manual, press the key again so that Man is underlined. If there are

## About the Test Set

### Overview of key types

more than two settings on the key, keep pressing it until the desired selection is underlined.



When a menu first appears, one key label is highlighted to show which key is the default selection. If you press **Marker Function**, the **Marker Function Off** key is the menu default key, and is highlighted.



Some of the menu keys are grouped together by a yellow bar running behind the keys near the left side or by a yellow border around the group of keys. When you press a key within the yellow region, such as **Marker Noise**, the highlight moves to that key to show it has been selected. The keys that are linked are related functions, and only one of them can be selected at any one time. For example, a marker can only have one marker function active on it. So if you select a different function it turns off the previous selection. If the current menu is two pages long, the yellow bar or border could include keys on the

second page of keys.



In some key menus, a key label is highlighted to show which key has been selected from multiple available choices. And the menu is immediately exited when you press one of the other keys. For example, when you press the **Select Marker** key (in the **Marker** menu), it brings up its own menu of keys. The **Marker 1** key is highlighted. When you press the **marker 2** key, the highlight moves to that key and the screen returns to the **Marker** menu.



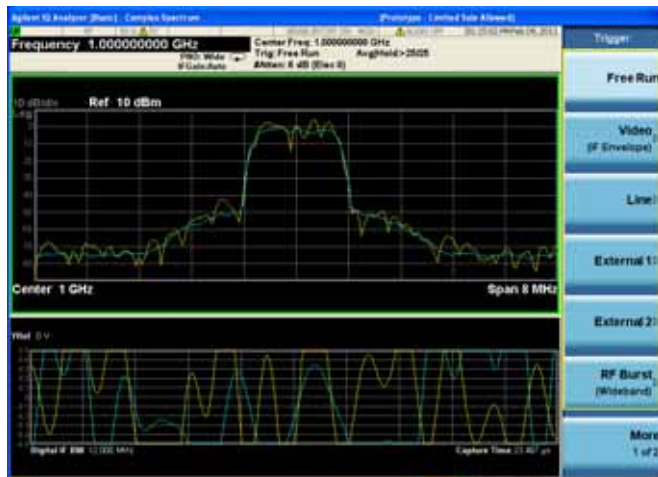
If a displayed key label shows a small solid-black arrow tip pointing to the right, it indicates that additional key menus are available. If the arrow tip is not filled in solid then pressing the key the first time selects that function. Now the arrow is solid and pressing it again brings up an additional menu of



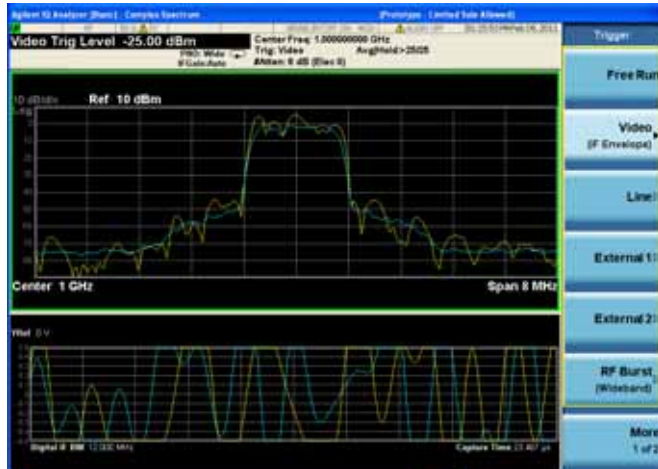
# About the Test Set

## Overview of key types

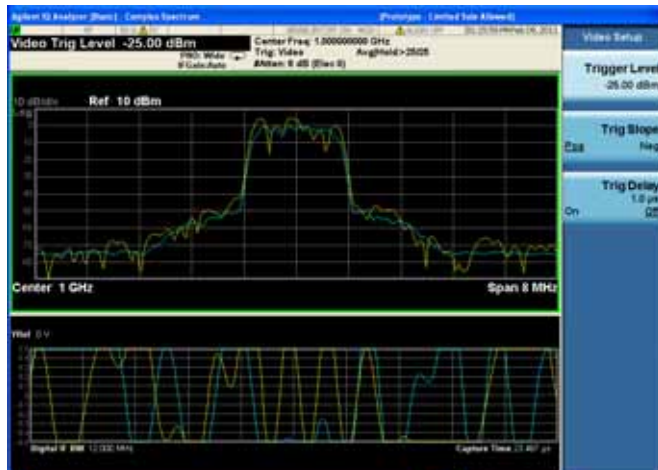
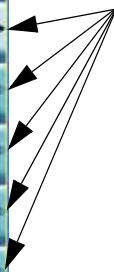
settings.



Open Arrow Tip



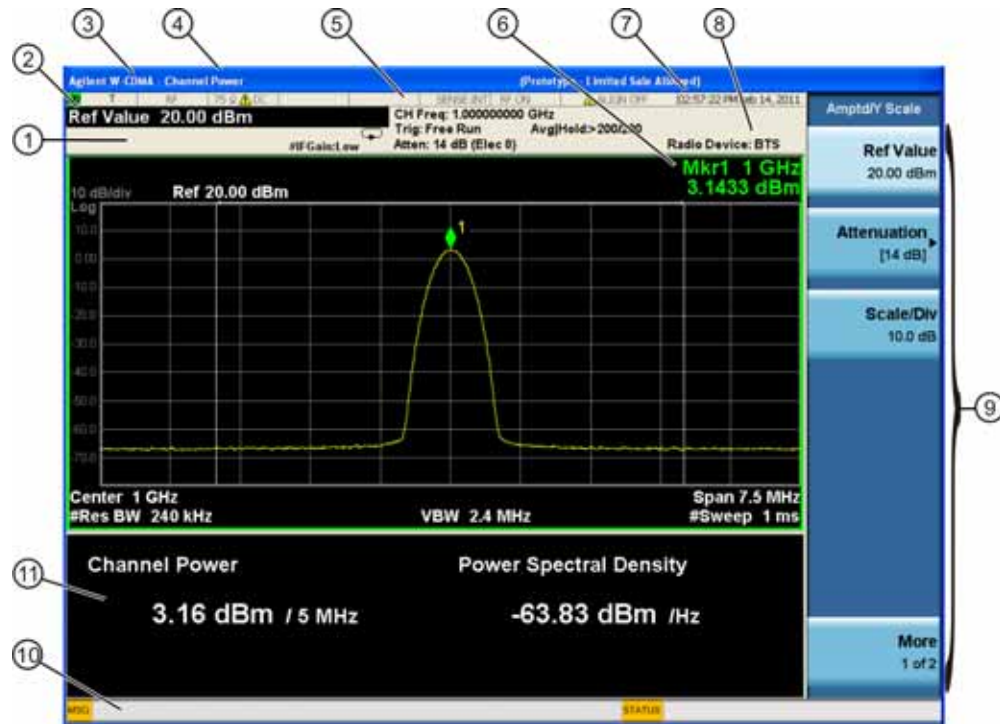
Solid Arrow Tip







## Display Annotations

This section describes the display annotation as it is on the Sequence Analyzer measurement application display. Other measurement application modes have some annotation differences.



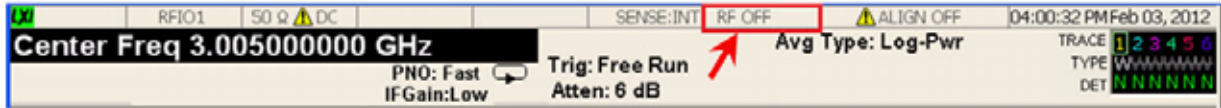
Item	Description	Function Keys
1	Measurement bar - Shows general measurement settings and information.   Indicates single/continuous measurement. Some measurements include limits that the data is tested against. A Pass/Fail indication may be shown in the lower left of the measurement bar.	All the keys in the test set Setup part of the front panel.
2	Active Function (measurement bar) - when the current active function has a settable numeric value, it is shown here.	Currently selected front panel key.
3	Banner - shows the name of the selected application that is currently running.	<b>Mode</b>

About the Test Set  
**Display Annotations**

Item	Description	Function Keys
4	Measurement title - shows title information for the current measurement, or a title that you created for the measurement.	<b>Meas</b> <b>View/Display, Display, Title</b>
5	Settings panel - displays system information that is not specific to any one application. <ul style="list-style-type: none"> <li>• Input/Output status - RLTS indicate Remote, Listen, Talk, SRQ</li> <li>• Input impedance and coupling</li> <li>• Selection of external frequency reference</li> <li>• Setting of automatic internal alignment routine</li> </ul>	<b>Local and System, I/O Config</b> <b>Input/Output, Amplitude, System</b> and others
6	Active marker frequency, amplitude or function value	<b>Marker</b>
7	Settings panel - time and date display.	<b>System, Control Panel</b>
8	Trace and detector information	<b>Trace/Detector,</b> <b>Clear Write (W) Trace Average (A) Max</b> <b>Hold (M) Min Hold (m)</b> <b>Trace/Detector,</b> <b>More,</b> <b>Detector,</b> <b>Average (A) Normal (N) Peak (P)</b> <b>Sample (S) Negative Peak (p)</b>
9	Key labels that change based on the most recent key press.	Softkeys
10	Displays information, warning and error messages. Message area - single events, Status area - conditions	
11	Measurement settings for the data currently being displayed in the graticule area. In the example above: center frequency, resolution bandwidth, video bandwidth, frequency span, sweep time and number of sweep points.	Keys in the test set Setup part of the front panel.

## Test Set Display Indicators

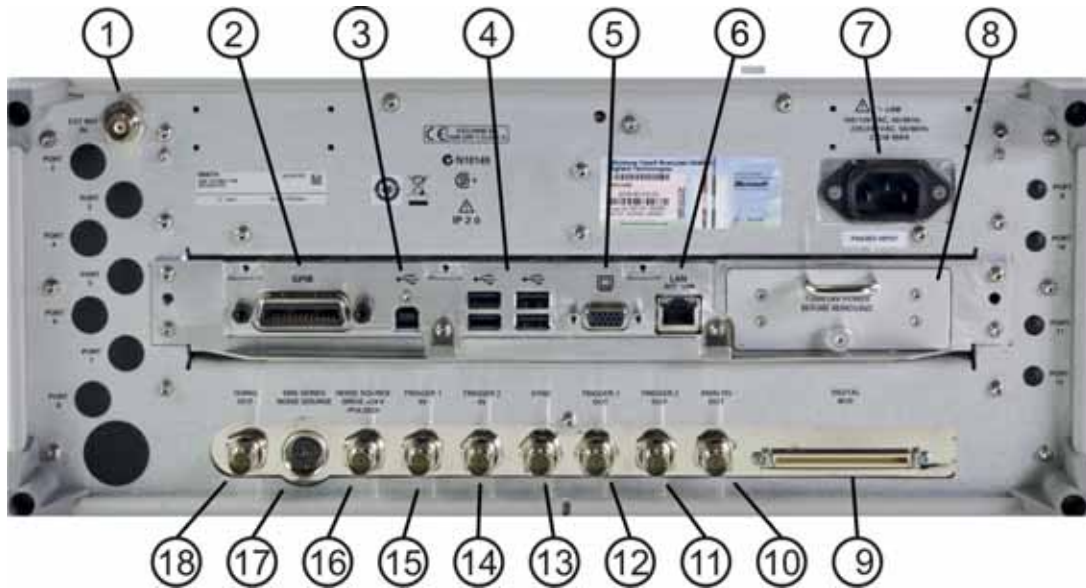
The display of the EXT Test Set includes, in the measurement bar, a field (highlighted in red below) which indicates the state of the internal source. When using the E6607A/B with the Multiport Adapter or when using the E6607C, this display is modified to indicate which output ports of the Multiport Adapter (if any) are supplying RF output power.



The table below illustrates the content of this field under different circumstances.

Multiport Adapter Usage	In Sequence Analyzer Mode	Not in Sequence Analyzer Mode, RF On	Not in Sequence Analyzer Mode, RF Off
Any or all of the 8 “RFIO” ports are in use.	SEQ MPA	RF ON MPA	RF OFF MPA
The 4 “GPS” ports are in use.	SEQ MPA-G	RF ON MPA-G	RF OFF MPA-G
Multiport Adapter is not in use.	SEQ	RF ON	RF OFF

## Rear-Panel Features



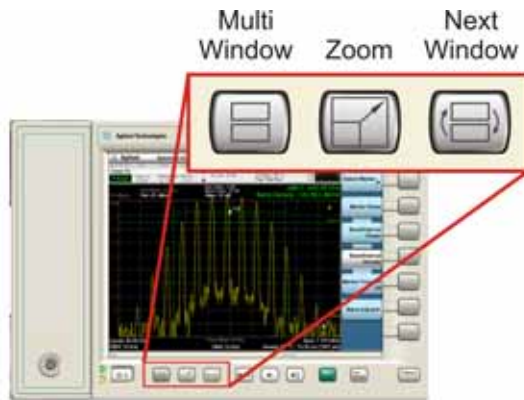
Item		Description
#	Name	
1	EXT REF IN	Input for an external frequency reference signal: 1 to 50 MHz
2	GPIB	A General Purpose Interface Bus (GPIB, IEEE 488.1) connection that can be used for remote test set operation.
3	USB Connector	USB 2.0 port, Type B. USB TMC (test and measurement class) connects to an external pc controller to control the test set and for data transfers over a 480 Mbps link.
4	USB Connectors	Standard USB 2.0 ports, Type A. Connect to external peripherals such as a mouse, keyboard, printer, DVD drive, or hard drive.
5	MONITOR	Allows connection of an external VGA monitor.
6	LAN	A TCP/IP Interface that is used for remote test set operation.
7	Line power input	The AC power connection. See the product specifications for more details.
8	Removable Hard Drive	Standard on E6607A.
9	DIGITAL BUS	Reserved for future use.
10	ANALOG OUT	Reserved for future use.
11	TRIGGER 2 OUT	A trigger output used to synchronize other test equipment with the test set. Configurable from the Input/Output keys.

Item		Description
#	Name	
12	TRIGGER 1 OUT	A trigger output used to synchronize other test equipment with the test set. Configurable from the Input/Output keys.
13	SYNC	Reserved for future use.
14	TRIGGER 2 IN	Allows external triggering of measurements.
15	TRIGGER 1 IN	Allows external triggering of measurements.
16	NOISE SOURCE DRIVE +28 V (PULSED)	Not functional in the EXT Test Set.
17	SNS SERIES NOISE SOURCE	Not functional in the EXT Test Set.
18	10 MHz OUT	An output of the test set internal 10 MHz frequency reference signal. It is used to lock the frequency reference of other test equipment to the test set.

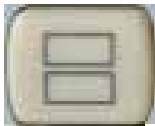
---

## Window Control Keys

The instrument provides three front-panel keys for controlling windows. They are Multi Window, Zoom, and Next Window. These are all “immediate action” keys.



### 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:	<b>Front-panel key</b>
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3496

### 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
Help Map ID:	3497

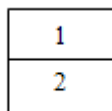
## Next Window

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

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
Help Map ID:	0

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,

About the Test Set  
**Window Control Keys**

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.

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## 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.

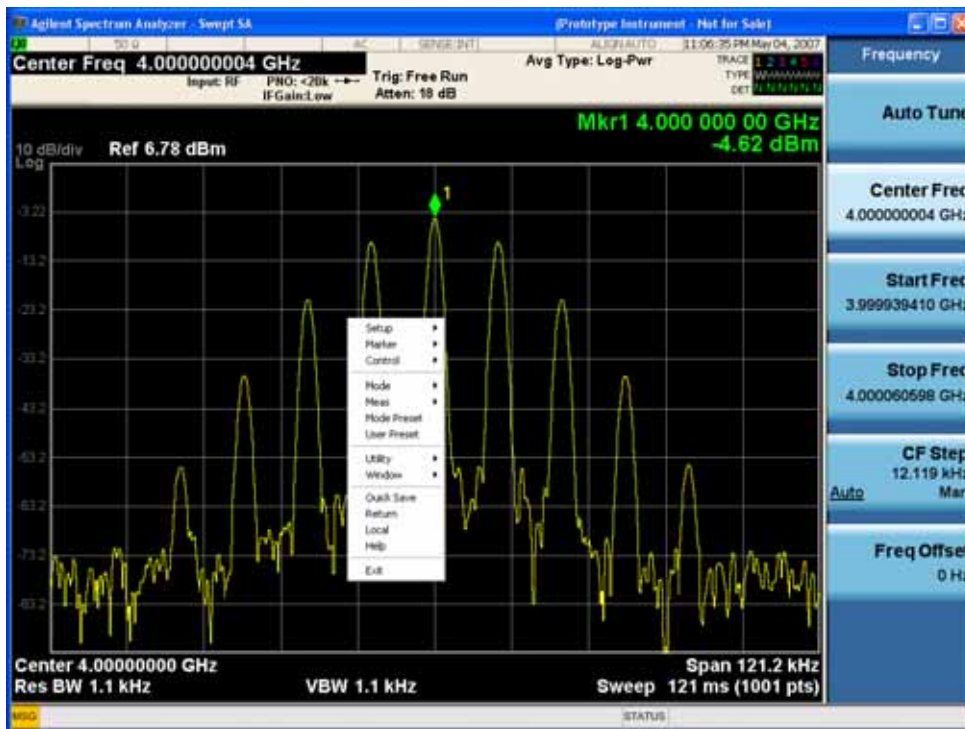
---

**NOTE**                    **E6607C:** When using the E6607C there is no instrument front-panel. Therefore, the PC mouse and monitor are required for instrument control through a virtual front panel (VFP). For ease in using the VFP, the PC keyboard is recommended.

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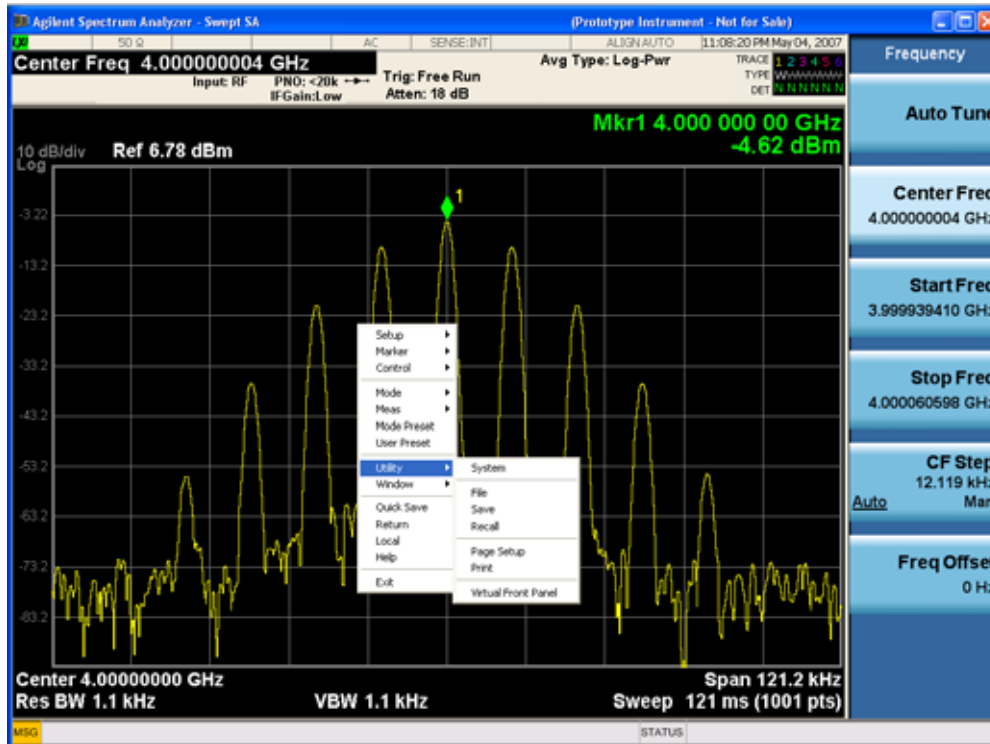
### Right-Click

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



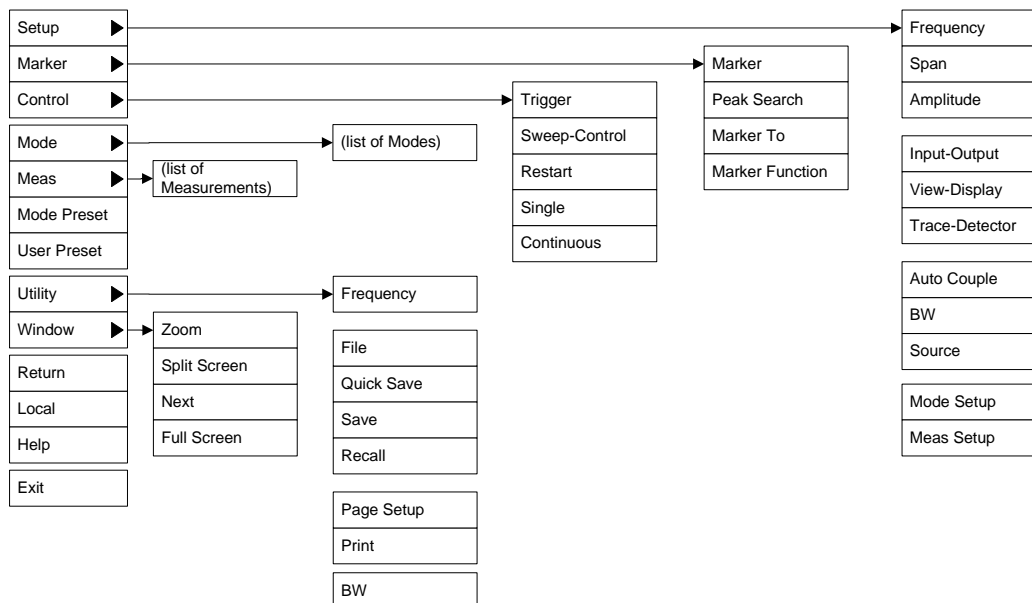
Placing the mouse on one of the rows marked with a right arrow symbol will cause that row to expand, as for example below where the mouse is hovered over the “Utility” row:

## 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:



## Virtual Front Panel

If you have a PC mouse, monitor, and keyboard plugged in (or through a Remote Desktop), you can navigate the front panel using the virtual front panel (VFP) shown below. Access the VFP as follows:

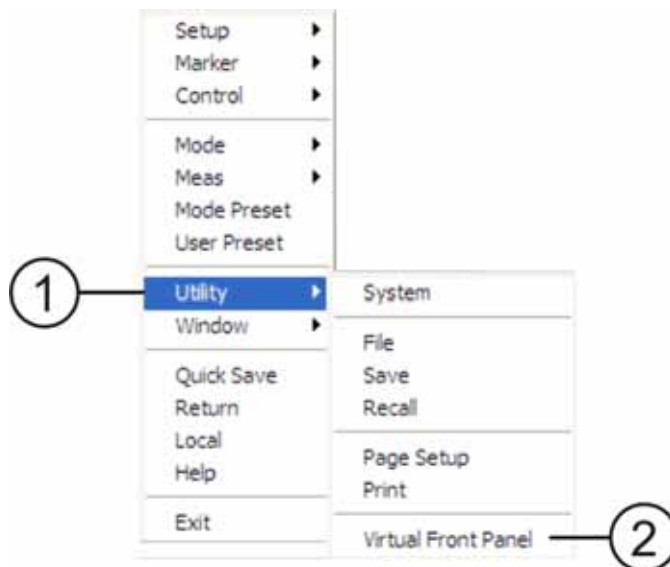
1. Right-click the mouse as described in [“Right-Click” on page 77](#).
2. Left-click Utility (1) in the menu, as shown below.
3. Left-click Virtual Front Panel (2) in the menu, as shown below.

---

**NOTE** The PC mouse and monitor are required when using the E6607C. For ease in using the VFP, the PC keyboard is recommended.

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When the VFP opens, the keys behave just as the front-panel and menu keys described in [“Front-Panel Features \(E6607A/B\)” on page 56](#) and [“Overview of key types” on page 65](#). On the VFP the keys labeled "Key 1" through "Key 7" function as the menu keys. Using the mouse to click on a combination of the VFP keys and the menu keys on the display screen, you can operate the instrument just as you would using the front-panel of the E6607A/B.

About the Test Set  
**Mouse and Keyboard Control**



## 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

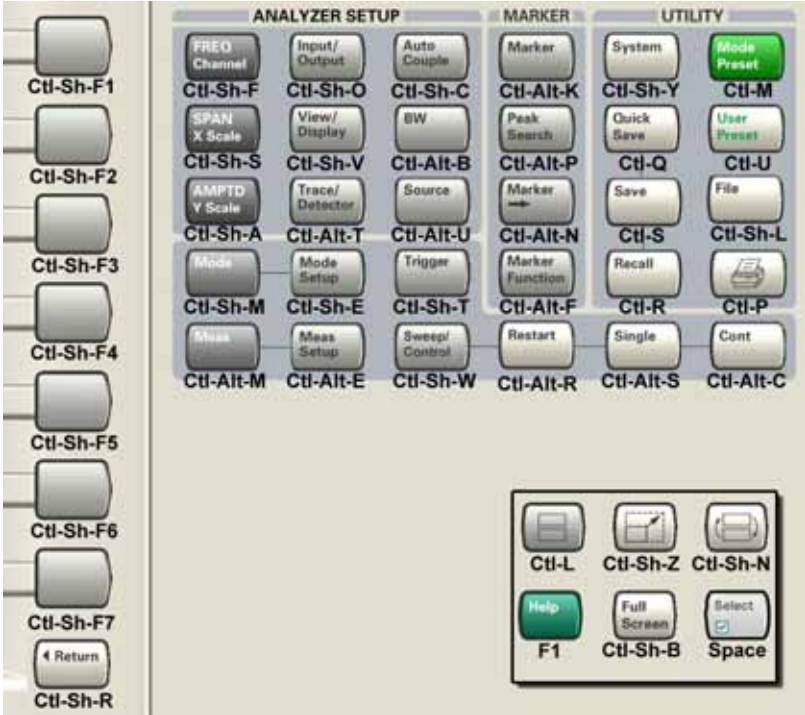
<b>Front-panel key</b>	<b>Key code</b>
Marker	CTRL+ALT+K
Peak Search	CTRL+ALT+P
Marker To	CTRL+ALT+N
Marker Function	CTRL+ALT+F
System	CTRL+SHIFT+Y
Quick Save	CTRL+Q
Save	CTRL+S
Recall	CTRL+R
Mode Preset	CTRL+M
User Preset	CTRL+U
Print	CTRL+P
File	CTRL+SHIFT+L
Mode	CTRL+SHIFT+M
Measure	CTRL+ALT+M
Mode 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
Full Screen	CTRL+SHIFT+B
Return	CTRL+SHIFT+R
Mute	Mute
Inc Audio	Volume Up
Dec Audio	Volume Down
Help	F1

About the Test Set  
**Mouse and Keyboard Control**

<b>Front-panel key</b>	<b>Key code</b>
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

Front-panel key	Key code
0	0

This is a pictorial view of the table:



## **Instrument Security & Memory Volatility**

If you are using the test set 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 the X Series test sets, this information is contained in the document "Security Features and Volatility". This document is **not** included in the test set's on-disk library, but it may be downloaded from Agilent's web site.

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

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

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



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## About the Sequence Analyzer Application

This section provides information about the Sequence Analyzer Mode.

### What Does Sequence Analyzer Mode 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.)

## Installing Application Software

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

So when you purchase an application, you will receive an entitlement certificate that is used to obtain a license key for that particular measurement application. Enter the license key that you obtain into the E6607A test set to activate the new measurement application. See below for more information.

For the latest information about Agilent Wireless Communications test set measurement applications and upgrade kits, visit the following internet URL.

<http://www.agilent.com/find/techsupport>.

### Viewing a License Key

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

Press **System, Show, System** to display which measurement applications are currently licensed in your test set.

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

C:\Programing Files\Agilent\Licensing

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<b>NOTE</b>	You may want to keep a copy of your license key in a secure location. You can print out a copy of the display showing the license numbers to do this. If you should lose your license key, call your nearest Agilent Technologies service or sales office for assistance.
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### 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 test set. Follow the instructions that accompany the certificate to obtain your license key.

Installing a license key for the selected application can be done automatically using a USB memory device. To do this, you would put the license file on 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 license management application in the test set. It is found through the test set front panel keys at **System, Licensing. . .**, or internally at C:\Programming Files\Agilent\Licensing.

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

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### **Missing and Old Measurement Application Software**

All the software applications were loaded at the time of original test set manufacture. It is a good idea to regularly update your software with the latest available version. This assures that you get any improvements and expanded functionality that is available.

Because the software was loaded at the initial purchase, there may be additional measurement applications that are now available. If the application you are interested in licensing is not available, you will need to do a software update. (Press **System, Show, System.**)

Check the Agilent internet website for the latest software versions available for downloading:

<http://www.agilent.com/find/techsupport>.

You must load the updated software package into the test set from a USB drive, or directly from the internet. An automatic loading program is included with the files.

About the Sequence Analyzer Application  
**Installing Application Software**

This chapter provides introductory information about the programming documentation included with your test set.

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## What Programming Information is Available?

The X-Series Documentation can be accessed through the Additional Documentation page in the instrument Help system and is included on the Documentation CD shipped with the instrument. It can also be found in the instrument at: C:\ProgramsFiles\Agilent\SignalAnalysis\Infrastructure\Help\otherdocs, or online at: [http://www.agilent.com/find/mxa\\_manuals](http://www.agilent.com/find/mxa_manuals).

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

Resource	Description
<b>X-Series Programmer's Guide</b>	<p>Provides general SCPI programming information on the following topics:</p> <ul style="list-style-type: none"> <li>• Programming the X-Series Applications</li> <li>• Programming fundamentals</li> <li>• Programming examples</li> </ul> <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>
<b>User's and Programmer's Reference manuals</b>	<p>Describes all front-panel keys and softkeys, including SCPI commands for a measurement application. Note that:</p> <ul style="list-style-type: none"> <li>• Each measurement application has its own User's and Programmer's Reference.</li> <li>• 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).</li> </ul>
<b>Embedded Help in your instrument</b>	<p>Describes all front-panel keys and softkeys, including SCPI commands, for a measurement application.</p> <p>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>
<b>X-Series Getting Started Guide</b>	<p>Provides valuable sections related to programming including:</p> <ul style="list-style-type: none"> <li>• Licensing New Measurement Application Software - After Initial Purchase</li> <li>• Configuring instrument LAN Hostname, IP Address, and Gateway Address</li> <li>• Using the Windows XP Remote Desktop to connect to the instrument remotely</li> <li>• Using the Embedded Web Server Telnet connection to communicate SCPI</li> </ul> <p>This printed document is shipped with the instrument.</p>
<b>Agilent Application Notes</b>	Printable PDF versions of pertinent application notes.
<b>Agilent VISA User's Guide</b>	Describes the Agilent Virtual Instrument Software Architecture (VISA) library and shows how to use it to develop I/O applications and instrument drivers on Windows PCs.

## IEEE Common GPIB Commands

Numeric values for bit patterns can be entered using decimal or hexi-decimal representations. (that is,. 0 to 32767 is equivalent to #H0 to #H7FFF).

### Calibration Query

\*CAL? Performs a full alignment and returns a number indicating the success of the alignment. A zero is returned if the alignment is successful. A one is returned if any part of the alignment fails. The equivalent SCPI command is CALibrate[:ALL]?

See “Alignments” on page 161 for details of \*CAL?.

### 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:	<b>No equivalent key. Related key System, Show Errors, Clear Error Queue</b>
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
Help Map ID:	0

### 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:	<b>No equivalent key. Related key System, Show Errors, Clear Error Queue</b>
-----------	--

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 <i>STATUS</i> subsystem and <i>SYSTEM:ERROR[:NEXT]?</i> 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
Help Map ID:	0

### 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 <i>STATUS</i> 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
Help Map ID:	0

### 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:	<b>No equivalent key. See related key System, Show System.</b>
Remote Command:	*IDN?
Example:	*IDN? Returns instrument identification information, such as: Agilent Technologies,N9020A,US01020004,A.01.02
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	0

### Instrument Model Number

ID? - Returns a string of the instrument identification. The string will contain the model number.

When in Remote Language compatibility mode the query will return the model number of the emulated instrument, when in any other mode the returned model number will be that of the actual hardware.

### 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:	<p>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.</p> <p>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.</p> <p>*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):</p> <p>Calibrating: monitored by PSA, ESA, VSA (E4406A)</p> <p>Sweeping: monitored by PSA, ESA, VSA (E4406A)</p> <p>Waiting for Trigger: monitored by PSA, ESA, VSA (E4406A)</p> <p>Measuring: monitored by PSA and ESA (but not in all Modes).</p> <p>Paused: monitored by VSA (E4406A).</p> <p>Printing: monitored by VSA (E4406A).</p> <p>Mass memory busy: monitored by VSA (E4406A).</p>
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	0

### 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?
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	0

### 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 #>
Example:	*RCL 7 Recalls the instrument state that is currently stored in register 7.
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
Help Map ID:	0

### 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
Help Map ID:	0

### 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
Help Map ID:	0

### 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
Help Map ID:	0

### Trigger

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

Key Path:	<b>No equivalent key. See related keys Single and Restart.</b>
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
Help Map ID:	0

### 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
Help Map ID:	0

### 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
Help Map ID:	0





## File

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

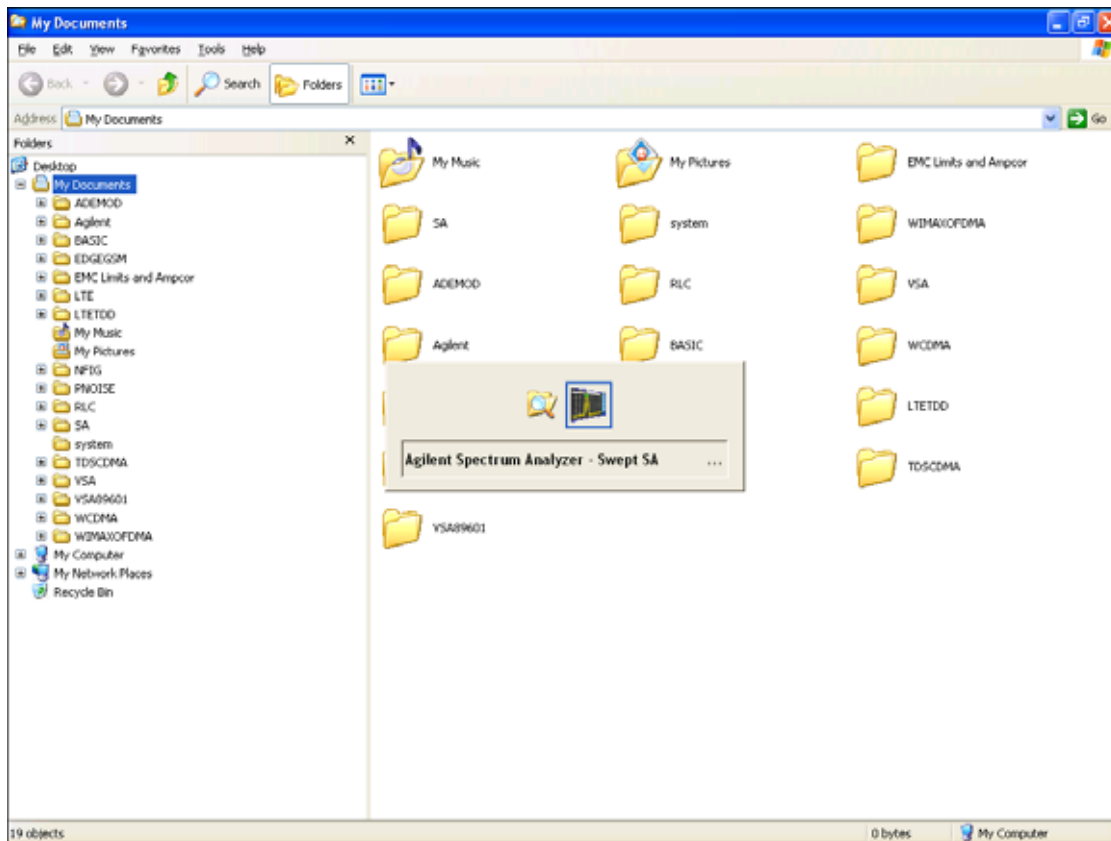
Key Path:	<b>Front-panel key</b>
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2200

## 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 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 shown above, then release the Alt key.

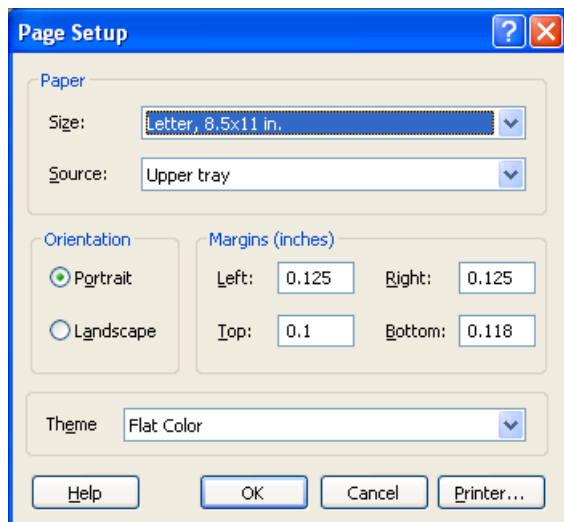
Key Path:	<b>File</b>
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2201

## 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:	<b>File</b>
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3513

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
Help Map ID:	0

## Print

The Print key opens a Print dialog for configured printing ( for example, to the printer of your choice). Refer to your Microsoft Windows Operating System manual for more information.

## Maximize/Restore Down

These keys allow the Instrument Application to be maximized and then restored to its prior state. Only one of the two keys is visible at a time. When not already maximized the Maximize Application key is visible, and when maximized, the Restore Down Application key is visible and replaces the Maximize Application key.

### Maximize

This key allows you to Maximize the Instrument Application, which causes the analyzer display to fill the screen. Once the application is maximized, this key is replaced by the Restore Down key.

Key Path:	<b>File</b>
Mode:	<b>All</b>
Notes:	No equivalent remote command for this key.
State Saved:	No
Initial S/W Revision:	A.05.01
Help Map ID:	3668

### 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:	<b>File</b>
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Mode:	All
Notes:	No equivalent remote command for this key.
State Saved:	No
Initial S/W Revision:	A.05.01
Help Map ID:	3669

## Minimize

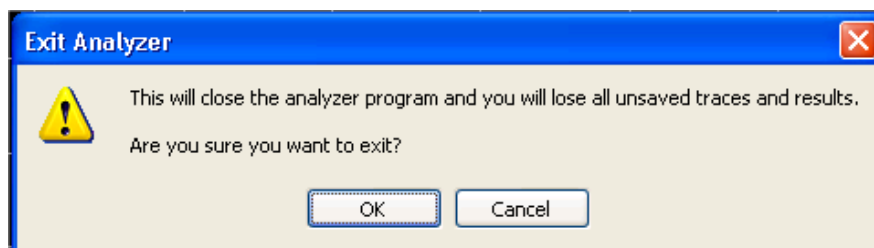
The Minimize key causes the analyzer display to disappear down into the task bar, allowing you to see

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
Help Map ID:	3670

## 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
Help Map ID:	2202

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## 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 105](#) for more information.

Key Path:	<b>Front-panel key</b>
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:	<p>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 in 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.</p> <p>There is also no “Preset Type” as there is on the PSA. There is a green Mode Preset front-panel key that does a <b>Mode Preset</b> 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.</p> <p>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.</p>
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2300

## 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

System Functions  
Mode Preset

Type Of Preset	SCPI Command	Front Panel Access
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

### 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:	<b>Mode Setup</b>
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

Help Map ID:	2307
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## Meas Preset

Resets the measurement local variables for the currently active measurement to their factory default values. The measurement settings that get reset are the same ones that are reset during a Mode Preset. This function keeps the instrument in the current measurement and the current mode and does not affect the settings for other measurements, but does abort the currently running measurement.

Key Path:	<b>Meas Setup</b>
Remote Command:	:CONFigure:<Measurement>
Example:	:CONF:ACP immediately does a Meas Preset to the ACP measurement.
Notes:	Clears the Measuring bit  :CONF:<Measurement> resets the specified measurement settings to default in ESA, VSA and PSA; in GPSA it allows the addition of the NDEFault node to the command to prevent a measurement preset from occurring after a measurement switch.  :MEASure:<Measurement> also restores the default values of the selected measurement, but it also initiates the specified measurement.
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2306

## 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
Help Map ID:	0

**\*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
Help Map ID:	2301



## 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:	<b>Front-panel key</b>
Remote Command:	:HCOPY[:IMMEDIATE]
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3495

Key Path:	<b>SCPI command only</b>
Remote Command:	:HCOPY:ABORT
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	0

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## 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.

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**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.

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**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.

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Key Path:	<b>Front-panel key</b>
Notes:	No remote command for this key specifically.
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2635

## 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).

The default paths for Recall are data type dependent and are the same as for the Save key.

Key Path:	<b>Front-panel key</b>
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 &lt;filename&gt;.</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. 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>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
Help Map ID:	2637

## 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 114](#).

Key Path:	<b>Recall</b>
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.

System Functions  
Recall

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> <p>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> <p>After recalling the state, the Recall State function does the following:</p> <p>Makes the saved measurement for the mode the active measurement.</p> <p>Clears the input and output buffers.</p> <p>Status Byte is set to 0.</p> <p>Executes a *CLS</p> <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:	<p>:MMEMory:LOAD:STATe 1,&lt;filename&gt;</p> <p>For backwards compatibility, the above syntax is supported. The "1" is simply ignored.</p>
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2638

**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:

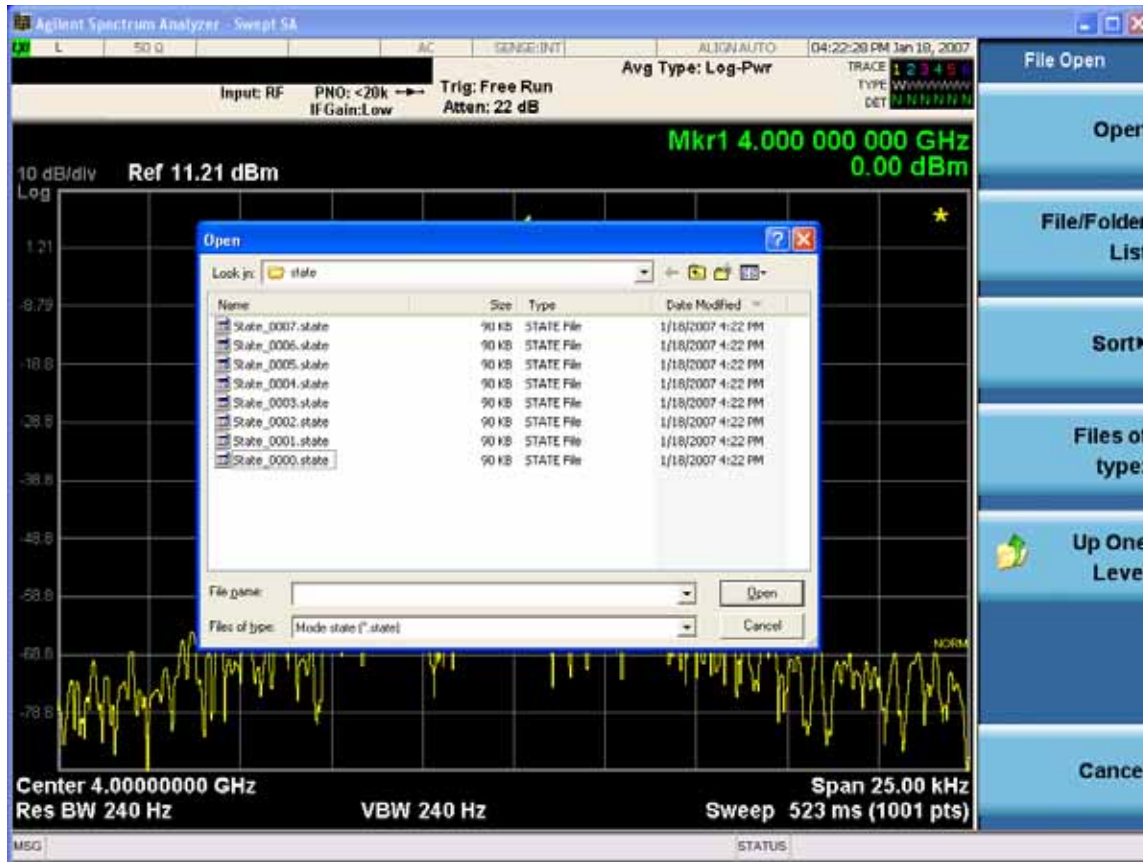
<p>You want to recall state and one trace's data, leaving other traces unaffected.</p>	<p>Save Trace+State from 1 trace. Make sure that no other traces are updating (they should all be in View or Blank mode) when the save is performed.</p>	<p>On Recall, specify the trace you want to load the one trace's 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.</p>
<p>You want to recall all traces</p>	<p>Save Trace+State from ALL traces.</p>	<p>On Recall, all traces will come back in View (or Blank if they were in Blank or Background when saved)</p>
<p>You want all traces to load exactly as they were when saved.</p>	<p>Save State</p>	<p>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.</p>

**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.

## System Functions

### Recall



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:	<b>Recall, State</b>
Notes:	Brings up the Open dialog for recalling a State Save Type
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2646

#### 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:	<b>Recall, State</b>
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
Help Map ID:	50008

#### Register 1 thru Register 16

Selecting any one of these register keys causes the State of the mode from the specified Register to be

## System Functions

### Recall

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.

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:	<b>Recall, State</b>
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 <b>Save, State, Edit Register Names</b> 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
Help Map ID:	2639

### Trace (+State)

The Recall Trace (+State) menu lets you choose a register or file from which to recall the Trace+State state file.

A saved state contains all of the settings and data required to return the analyzer as closely as possible to the exact setup it had when the save occurred. This includes the Input/Output settings, even though they are outside of the Mode’s state, because they are needed to restore the complete setup. A Trace+State file also includes trace data from one trace or all traces, which will load in View mode when the Trace+State file is recalled. Recall Trace (+State) will also cause a mode switch if the state being recalled is not for the current active mode.

After the recall completes, the message "File <filename> recalled" or “Recalled Trace Register <register number>” is displayed.

For rapid recalls, the Trace (+State) menu lists 5 registers to 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 including .trace 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:	Recall
Mode:	SA
Remote Command:	:MMEMory:LOAD:TRACe TRACE1   TRACE2   TRACE3   TRACE4   TRACE5   TRACE6 , <filename>  :MMEMory:LOAD:TRACe:REGister TRACE1   TRACE2   TRACE3   TRACE4   TRACE5   TRACE6 , <integer>
Example:	MMEM:LOAD:TRAC TRACE2,"MyTraceFile.trace"  This loads the trace file data (on the default file directory path) into the specified trace; if it is a "single trace" save file, that trace is loaded to trace 2, and is set to be not updating.  :MMEM:LOAD:TRAC:REG TRACE1,2  restores the trace data in register 2 to Trace 1
Notes:	When you perform the recall, the recalling Trace function must first verify the file is recallable in this instrument by checking instrument software version and model number, since it includes State. If everything matches, a full recall proceeds by aborting the currently running measurement, and loading the state from the saved state file to as close as possible to the context in which the save occurred. You can open .trace files from any mode that supports them, so recalling a Trace 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 and the saved measurement of the mode becomes the newly active measurement, and the data relevant to the measurement (if there is any) is recalled.  Once the state is loaded, the trace data must be loaded. The internal flags are consulted to see which trace to load and the "To Trace" setting to see where to load it. Trace data is always loaded with the specified trace set to View, so that the data is visible and not updating(so as not to erase the recalled data). If the file is an "all trace" file, all traces are loaded with the saved data(to the original trace the data was saved from) and set to View. Traces whose data is not loaded are restored to the update state that existed when they were saved.  After the Recall the analyzer exits the Recall menu and returns to the previous menu.  Some modes and measurements do not have available all 6 traces. Phase Noise mode command, for example, is: MMEMory:LOAD:TRACe TRACE1   TRACE2   TRACE3 , <filename>
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3491

System Functions  
Recall

**Register 1 thru Register 5**

Selecting any one of these register keys causes the Traces and State 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.

Trace registers are shared by all modes, so recalling from any one of the 5 registers may cause a mode switch to the mode that was active when the save to the Register occurred.

Key Path:	<b>Recall, Trace</b>
Range:	1-5
Readback:	Date and time with seconds resolution of the last Save is displayed on the key, or "(empty)" if no prior save operation performed to this register.
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3593

**To Trace**

These menu selections let you choose the Trace where the recalled saved trace will go. Not all modes have the full 6 traces available. The default is the currently selected trace, selected in this menu or in the Trace/Detector, Export Data, Import Data, or Save Trace menus, except if you have chosen All, then it remains chosen until you specifically change it to a single trace.

If the .trace file is an "all trace" file, "To Trace" is ignored and the traces each go back to the trace from which they were saved.

Once selected, the key returns back to the Recall Trace menu and the selected Trace number is annotated on the key. Now you have selected exactly where the trace needs to be recalled. To trigger a recall of the selected Trace, you must select the **Open** key in the Recall Trace menu.

When you select a trace, it makes that trace the current trace, so it displays on top of all of the other traces.

Key Path:	<b>Save, Data, Trace</b>
Mode:	SA
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3492

**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.

See "[From File...](#)" on page 115 under Save, State for a full description of this dialog and menu.

Key Path:	<b>Recall, Trace</b>
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Mode:	SA
Notes:	Brings up Open dialog for recalling a Trace Save Type
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3493

## Sequences

This menu and all of its submenus are only available in the EXT (E6607A).

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:	<b>Recall, Sequences</b>
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
Help Map ID:	3630

## 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:	<b>Recall, Sequences</b>
Example:	:MMEM:LOAD:SEQ:SLIS "MySequence.txt"
Dependencies:	Only available in XOBT
Initial S/W Revision:	A.05.00
Help Map ID:	3631

### 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:	<b>Recall,Sequences</b>
Example:	:MMEM:LOAD:SEQ:ALIS "MySequence.txt"
Dependencies:	Only available in XOBT, Sequence Analyzer mode
Initial S/W Revision:	A.05.00
Help Map ID:	3632

### 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:	<b>Recall,Sequences</b>
Example:	:MMEM:LOAD:SEQ:SAAL "MySequence.txt"
Dependencies:	Only available in XOBT, Sequence Analyzer mode
Initial S/W Revision:	A.05.00
Help Map ID:	3633

### Open...

Pressing **File Open** brings up the File Open standard Windows dialog and the File Open key menu. When the user navigates to this selection, they have already determined they are recalling a specific Data Type and now they want to specify which file to open.

When you first enter this dialog, the path is in the Look In: field in this File Open dialog depends on which import data type you navigated here from.

The only files that are visible are those specific to the file type being recalled.

Key Path:	<b>Recall, Sequence</b>
Notes:	The key location is mode-dependent and will vary.
Notes:	Brings up Open dialog for recalling a <sequence> Save Type
Initial S/W Revision:	A.05.00

Help Map ID:	3635
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## 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:	<b>Recall</b>
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
Help Map ID:	2648

## 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 115 in **Recall, State**, for a full description of this dialog and menu.

Key Path:	<b>Recall, Data</b>
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System Functions  
**Recall**

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
Help Map ID:	2654



## 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:	<b>Front-panel key</b>
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
Help Map ID:	2600

## State

The Save State menu lets you choose a register or file for saving 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, GPIB address) 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).

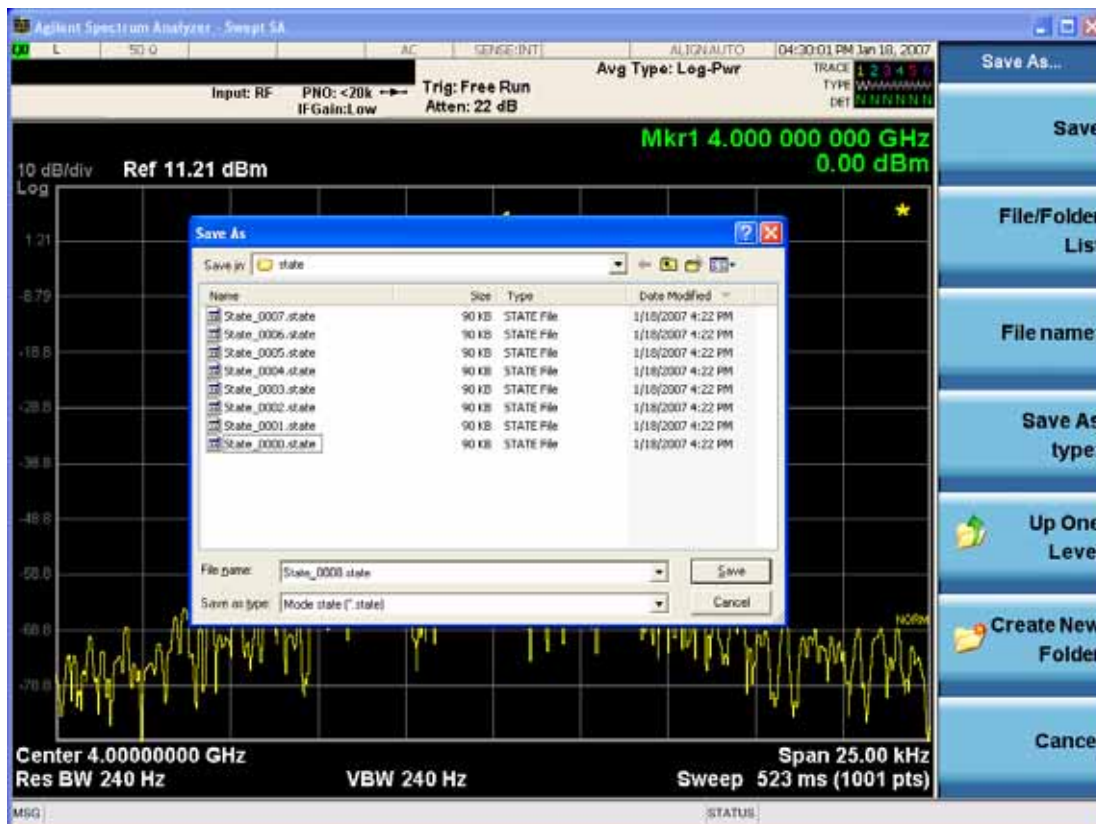
Key Path:	<b>Save</b>
Mode:	All
Remote Command:	:MMEMory:STORe:STATe <filename>

System Functions  
Save

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 <b>Save State</b> 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 Compatibility SCPI:	:MMEMory:STORe:STATe 1,<filename>  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
Help Map ID:	2601

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 110](#) 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

## System Functions

### Save

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:	<b>Save, State</b>
Mode:	All
Notes:	Brings up Save As dialog for saving a State Save Type
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2609

### 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 129](#)

Key Path:	<b>Save, State</b>
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
Help Map ID:	50009

### 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.

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:	<b>Save, State</b>
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 <b>Edit Register Names</b> 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
Help Map ID:	2602

### Trace (+State)

The **Save Trace (+State)** menu lets you choose a register or file specifying where to save the Trace+State state file.

A saved state contains all of the settings and data required to return the analyzer as closely as possible to the exact setup it had when the save occurred. This includes the Input/Output settings, even though they are outside of the Mode’s state, because they are needed to restore the complete setup. A Trace+State file also includes trace data from one trace or all traces, which will load in View mode when the Trace+State file is recalled.

After the save completes, the message "File <filename> saved" or "Trace Register <register number> saved" is displayed.

For rapid saves, the Trace (+State) menu lists 5 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 including .trace 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).

This key is grayed out for measurements that do not support trace saves. It is blanked for modes that do not support trace saves. Saving **Trace** is identical to saving State except a .trace extension is used on the file instead of .state, and internal flags are set in the file indicating which trace was saved. You may select to save one trace or ALL traces.

Key Path:	<b>Save</b>
Mode:	SA
Remote Command:	:MMEMory:STORe:TRACe TRACE1   TRACE2   TRACE3   TRACE4   TRACE5   TRACE6   ALL, <filename >  :MMEMory:STORe:TRACe:REGister TRACE1   TRACE2   TRACE3   TRACE4   TRACE5   TRACE6   ALL, <integer>

Example:	<p>:MMEM:STOR:TRAC TRACE1,“myState.trace” saves the file myState.trace on the default path and flags it as a “single trace” file with Trace 1 as the single trace (even though all of the traces are in fact stored).</p> <p>:MMEM:STOR:TRAC ALL,“myState.trace” saves the file myState.trace on the default path and flags it as an “all traces” file</p> <p>:MMEM:STOR:TRAC:REG TRACE1,2 stores trace 1 data in trace register 2</p>
Notes:	<p>This command actually performs a save state, which in the Swept SA measurement includes the trace data. However it flags it (in the file) as a “save trace” file of the specified trace (or all traces).</p> <p>Some modes and measurements do not have available all 6 traces. The Phase Noise mode command, for example, is: MMEMory:STORe:TRACe TRACE1 TRACE2 TRACE3 ALL,&lt;filename&gt;</p> <p>The range for the register parameter is 1–5</p> <p>When you initiate a save, if the file already exists, a dialog will appear that allows you to replace the existing file by selecting <b>OK</b> 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.</p> <p>Both single and double quotes are supported for any filename parameter over remote.</p> <p>After saving to a register, that register’s menu key is updated with the date and time of the save.</p> <p>After saving to a register, you remain in the <b>Save Trace</b> 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.</p>
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3486

### Register 1 thru Register 5

Selecting any one of these register menu keys causes the Trace(s) specified under From Trace, along with the state of the currently active mode, to be saved to the specified Trace 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.

Key Path:	<b>Save, Trace</b>
Mode:	SA
Range:	1–5
Readback:	Date and time with seconds resolution are displayed on the key, or "(empty)" if no prior save operation performed to this register.
Initial S/W Revision:	Prior to A.02.00

Help Map ID:	3598
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**From Trace**

Accesses a menu that enables you to select the trace to be saved. Once a trace is selected, the key returns to the Save Trace menu and the selected trace number is annotated on the key. The default is the currently selected trace, selected in this menu or in the Trace/Det, Export Data, Import Data or Recall Trace menus, except if you have chosen All then it remains chosen until you specifically change it to a single trace. To save the Trace you must select the **Save As** key in the Save Trace menu.

When you select a trace, it makes that trace the current trace, so it displays on top of all of the other traces.

Key Path:	<b>Save, Trace + State</b>
Mode:	SA
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3505

**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.

See “[To File . . .](#)” on page 126 in **Save, State** for a full description of this dialog and menu.

Key Path:	<b>Save, Trace (+State)</b>
Mode:	SA
Notes:	Brings up Save As dialog for saving a Trace+State Save Type
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3506

**Sequences**

This menu and all of its submenus are only available in the EXT (E6607A).

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:	<b>Save, Sequences</b>
Mode:	All
Remote Command:	:MMEM:STOR:SEquences:  SLIST  ALIST  SAAList  SSTep "MySequence.txt"



Example:	:MMEM:STOR:SEQ:SLIS "MySequence.txt"
Notes:	Available file types are: CSV (Comma delimited) (*.csv) Text (Tab delimited) (*.txt)
Initial S/W Revision:	A.05.00
Help Map ID:	3636

### 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:	<b>Save, Sequences</b>
Example:	:MMEM:STOR:SEQ:SLIS "MySequence.txt"
Dependencies:	Only available in XOBT
Initial S/W Revision:	A.05.00
Help Map ID:	3637

### 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:	<b>Save, Sequences</b>
Example:	:MMEM:STOR:SEQ:ALIS "MySequence.txt"
Dependencies:	Only available in XOBT, Sequence Analyzer mode
Initial S/W Revision:	A.05.00
Help Map ID:	3638

### 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

## System Functions

### Save

receiver's performance.

Key Path:	<b>Save, Sequences</b>
Example:	:MMEM:STOR:SEQ:SAAL "MySequence.txt"
Dependencies:	Only available in XOBT, Sequence Analyzer mode
Initial S/W Revision:	A.05.00
Help Map ID:	3639

### 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:	<b>Save, Sequences</b>
Mode:	All
Notes:	Brings up Save As dialog for saving a Sequence Save Type
Initial S/W Revision:	A.05.00
Help Map ID:	3641

### 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:	<b>Save</b>
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
Help Map ID:	2611

### 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 126 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

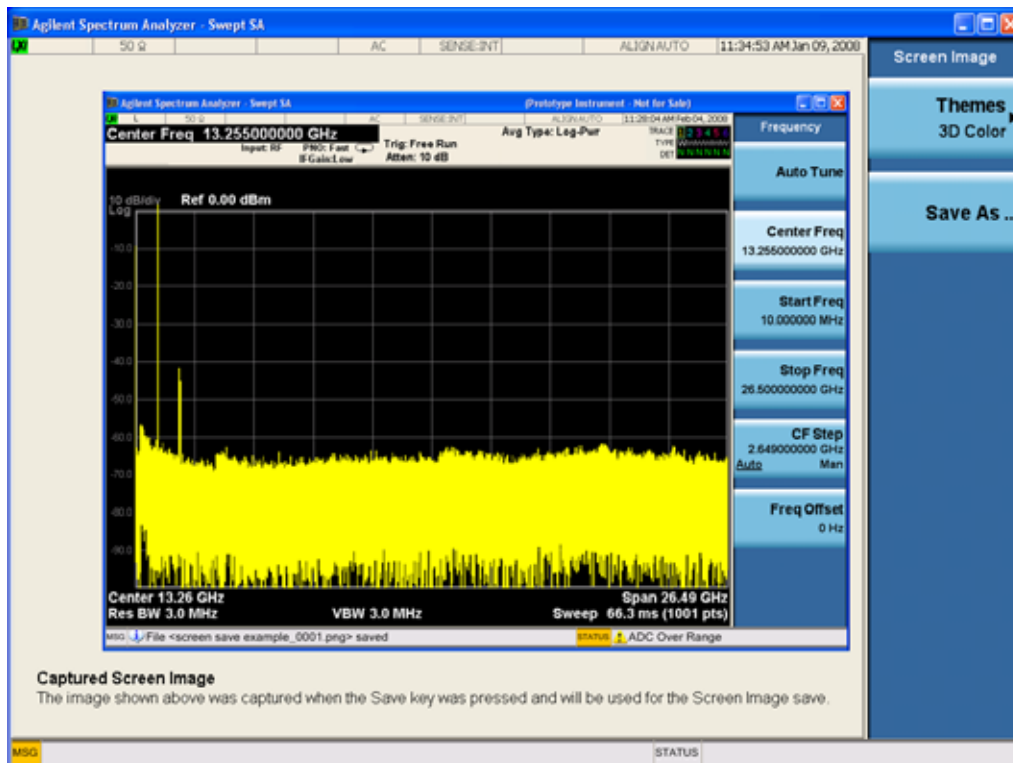
Key Path:	<b>Save, Data</b>
Mode:	All
Notes:	The key location is mode-dependent and will vary.  Brings up the Save As dialog for saving a <mode specific> Save Type. The save is performed immediately and does not wait until the measurement is complete.
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2617

## 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:	<b>Save</b>
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
Help Map ID:	2620

### 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:	<b>Save, Screen Image</b>
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 the user 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
Help Map ID:	2621

### 3D Color

Selects a standard color theme with each object filled, shaded and colored as designed.

Key Path:	<b>Save, Screen Image, Themes</b>
Example:	MMEM:STOR:SCR:THEM TDC

## System Functions

### Save

Readback:	3D Color
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2622

### 3D Monochrome

Selects a format that is like 3D color but shades of gray are used instead of colors.

Key Path:	<b>Save, Screen Image, Themes</b>
Example:	MMEM:STOR:SCR:THEM TDM
Readback:	3D Mono
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2623

### Flat Color

Selects a format that is best when the screen is to be printed on an ink printer.

Key Path:	<b>Save, Screen Image, Themes</b>
Example:	MMEM:STOR:SCR:THEM FCOL
Readback:	Flat Color
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2624

### 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:	<b>Save, Screen Image, Themes</b>
Example:	MMEM:STOR:SCR:THEM FMON
Readback:	Flat Mono
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2625

### 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 126 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:	<b>Save, Screen Image</b>
Notes:	Brings up Save As dialog for saving a Screen Image Save Type
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2626

### Mass Storage Catalog (Remote Command Only)

Remote Command:	:MMEMory:CATalog? [<directory_name>]
Notes:	<p>The string must be a valid logical path.</p> <p>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:</p> <p>&lt;numeric_value&gt;,&lt;numeric_value&gt;,{&lt;file_entry&gt;}</p> <p>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 &lt;file_entry&gt; is a string. Each &lt;file_entry&gt; indicates the name, type, and size of one file in the directory list:</p> <p>&lt;file_name&gt;,&lt;file_type&gt;,&lt;file_size&gt;</p> <p>As the windows file system has an extension that indicates file type, &lt;file_type&gt; is always empty. &lt;file_size&gt; provides the size of the file in bytes. For directories, &lt;file_entry&gt; is surrounded by square brackets and both &lt;file_type&gt; and &lt;file_size&gt; are empty</p>
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	0

### Mass Storage Change Directory (Remote Command Only)

Remote Command:	:MMEMory:CDIRectory [<directory_name>] :MMEMory:CDIRectory?
Notes:	<p>The string must be a valid logical path.</p> <p>Changes the default directory for a mass memory file system. The &lt;directory_name&gt; parameter is a string. If no parameter is specified, the directory is set to the *RST value.</p> <p>At *RST, this value is set to the default user data storage area, that is defined as System.Environment.SpecialFolder.Personal.</p> <p>Query returns full path of the default directory.</p>
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	0

### Mass Storage Copy (Remote Command Only)

Remote Command:	:MMEMory:COPY <string>,<string> [, <string>,<string>]
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Notes:	<p>The string must be a valid logical path.</p> <p>Copies an existing file to a new file or an existing directory to a new directory.</p> <p>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.</p> <p>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.</p> <p>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.</p>
Help Map ID:	0

### Mass Storage Delete (Remote Command Only)

Remote Command:	:MMEMory:DELeTe <file_name> [, <directory_name>]
Notes:	<p>The string must be a valid logical path.</p> <p>Removes a file from the specified directory. The &lt;file_name&gt; 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.</p>
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	0

### Mass Storage Data (Remote Command Only)

Creates a file containing the specified data OR queries the data from an existing file.

Remote Command:	<p>:MMEMory:DATA &lt;file_name&gt;, &lt;data&gt;</p> <p>:MMEMory:DATA? &lt;file_name&gt;</p>
Notes:	<p>The string must be a valid logical path.</p> <p>The command form is MMEMory:DATA &lt;file_name&gt;,&lt;data&gt;. It loads &lt;data&gt; into the file &lt;file_name&gt;. &lt;data&gt; is in 488.2 block format. &lt;file_name&gt; is string data.</p> <p>The query form is MMEMory:DATA? &lt;file_name&gt; with the response being the associated &lt;data&gt; in block format.</p>
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	0

### Mass Storage Make Directory (Remote Command Only)

Remote Command:	:MMEMory:MDIRectory <directory_name>
Notes:	<p>The string must be a valid logical path.</p> <p>Creates a new directory. The &lt;directory_name&gt; parameter specifies the name to be created.</p> <p>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.</p>
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	0

### Mass Storage Move (Remote Command Only)

Remote Command:	:MMEMory:MOVE <string>, <string> [, <string>, <string>]
Notes:	<p>The string must be a valid logical path.</p> <p>Moves an existing file to a new file or an existing directory to a new directory.</p> <p>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.</p> <p>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.</p> <p>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.</p>
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	0

### Mass Storage Remove Directory (Remote Command Only)

Remote Command:	:MEMMory:RDIRectory <directory_name>
Notes:	<p>The string must be a valid logical path.</p> <p>Removes a directory. The &lt;directory_name&gt; 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
Help Map ID:	0

## System

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

Key Path:	<b>Front-panel key</b>
Notes:	No remote command for this key specifically.
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2400

## Show

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

Key Path:	<b>System</b>
Mode:	All
Remote Command:	:SYSTem:SHOW OFF ERRor SYSTem HARDware LXI HWSTatistics ALIGNment SOFTware CAPplication :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 CAPplication
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2403

## 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:	<b>System, Show</b>
Mode:	All
Remote Command:	:SYSTem:ERRor [:NEXT] ?
Example:	:SYST:ERR?
Notes:	<p>The return string has the format:  “&lt;Error Number&gt;,&lt;Error&gt;”  Where &lt;Error Number&gt; and &lt;Error&gt; are those shown on the Show Errors screen</p>

Backwards Compatibility Notes:	<p>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</p> <p>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).</p> <p>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.</p> <p>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.</p> <p>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.</p>
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3487

### 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:	<b>System, Show, Errors</b>
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2671

### Previous Page

See [“Next Page” on page 146.](#)

Key Path:	<b>System, Show, Errors</b>
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Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3629

### History

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

Key Path:	<b>System, Show, Errors</b>
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2672

### Status

See [“History” on page 147](#).

### 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:	<b>System, Show, Errors</b>
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
Help Map ID:	2673

### 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:	<b>SCPI only</b>
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
Help Map ID:	0

### Refresh

When pressed, refreshes the Show Errors display.

Key Path:	<b>System, Show, Errors</b>
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2674



### 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:	<b>System, Show, Errors</b>
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2675

### 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:	<b>System, Show</b>
Mode:	All
Example:	SYST:SHOW SYST

## System Functions

### System

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
Help Map ID:	2676

#### 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
Help Map ID:	0

#### 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:CSYSTem?
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
Help Map ID:	0

## 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:



## System Functions

### System

Defaults, User Preset and Last State.

Key Path:	<b>System</b>
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 <b>Preset Type</b> key in legacy analyzers has been removed, and the <b>Power On</b> toggle key has been replaced by this 1-of-N key in the <b>System</b> menu.
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2316

### 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:	<b>System, Power On</b>
Mode:	All
Example:	SYST: PON: TYPE MODE
Readback Text:	Defaults
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2317

### 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** An instrument could never power up for the first time in User Preset.

---

Key Path:	<b>System, Power On</b>
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
Help Map ID:	2318

### 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** 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:	<b>System, Power On</b>
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 <code>:SYSTem:PDOWn</code> 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
Help Map ID:	2319

### 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.

Key Path:	<b>System, Power On</b>
Mode:	All
Remote Command:	: SYSTem: PON: MODE SA   BASIC   ADEMOD   NFIGURE   PNOISE   CDMA2K   TDSCDMA   VSA   VSA89 601   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 SA.
State Saved:	No
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2320

### 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.

For more information, see the following topics:

[“Preloading Applications” on page 155](#)

[“Access to Configure Applications utility” on page 155](#)

[“Virtual memory usage” on page 155](#)

Key Path:	<b>System, Power On</b>
Example:	:SYST:SHOW CAPP Displays the Config Applications screen
Initial S/W Revision:	A.02.00
Help Map ID:	3616

## 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 Agilent. 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:

It will not let you preload more applications than will fit into memory at once.

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

## System Functions

### System

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:	<b>System, Power On, Configure Applications</b>
Initial S/W Revision:	A.02.00
Help Map ID:	3617

### 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:	<b>System, Power On, Configure Applications</b>
Initial S/W Revision:	A.02.00
Help Map ID:	3618

### 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:	<b>System, Power On, Configure Applications</b>
Initial S/W Revision:	A.02.00
Help Map ID:	3619



### 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:	<b>System, Power On, Configure Applications</b>
Initial S/W Revision:	A.02.00
Help Map ID:	3620

### Select/Deselect

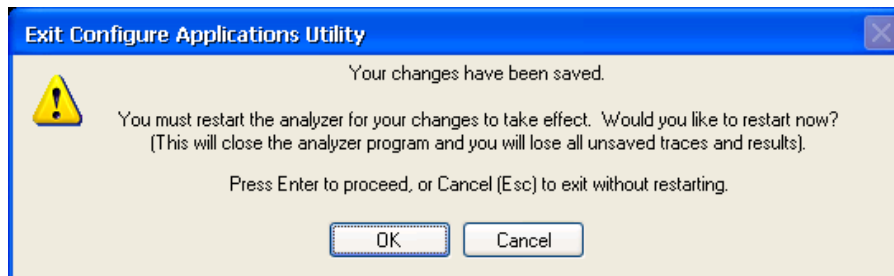
Toggles the currently highlighted application in the list.

Key Path:	<b>System, Power On, Configure Applications</b>
Initial S/W Revision:	A.02.00
Help Map ID:	3621

### 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 affect until the next time you shut down and restart the analyzer.



Key Path:	<b>System, Power On, Configure Applications</b>
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
Help Map ID:	3622

### Exit Without Saving

Pressing this key will exit the Configure Applications utility without saving your changes.

Key Path:	<b>System, Power On, Configure Applications</b>
Initial S/W Revision:	A.02.00
Modified at S/W Revision:	A.04.00
Help Map ID:	3623

### Configure Applications - Instrument boot-up

At start-up of the analyzer program a 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.

### 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 159](#)

[“Configuration Memory Available \(Remote Command Only\)” on page 159](#)

[“Configuration Memory Total \(Remote Command Only\)” on page 159](#)

[“Configuration Memory Used \(Remote Command Only\)” on page 160](#)

[“Configuration Application Memory \(Remote Command Only\)” on page 160](#)

### 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
Help Map ID:	0

### 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
Help Map ID:	0

### 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
Help Map ID:	0

### 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
Help Map ID:	0

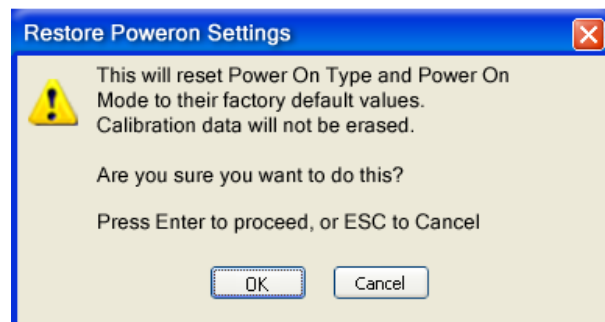
### Configuration Application Memory (Remote Command Only)

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
Help Map ID:	0

### 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:	<b>System, Power On</b>
Example:	:SYST:DEF PON
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2321

## 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:	<b>System</b>
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2000

## Auto Align

Configures the method for which the automatic background alignment is run.

Automatic background alignments are run periodically between measurement acquisitions. The instrument's software determines when alignments are to be performed to maintain warranted operation. The recommended setting for Auto Align is Normal.

An Auto Align execution cannot be aborted with the Cancel (ESC) key. To interrupt an Auto Align execution, select **Auto Align Off**.

Key Path:	<b>System, Alignments</b>
Mode:	All
Remote Command:	:CALibration:AUTO ON PARTial OFF :CALibration:AUTO?
Example:	:CAL:AUTO ON
Notes:	While Auto Align is executing, bit 0 of Status Operation register is set.
Couplings:	Auto Align is set to Off if Restore Align Data is invoked.
Preset:	This is unaffected by Preset but is set to ON upon a "Restore System Defaults->Align".
State Saved:	No

Status Bits/OPC dependencies:	When Auto Align is executing, bit 0 in the Status Operational register is set.
Backwards Compatibility SCPI:	:CALibration:AUTO ALERt Parameter ALERt is for backward compatibility only and is mapped to PARTial
Backwards Compatibility Notes:	ESA SCPI for Auto Align is :CALibration:AUTO <Boolean>. The command for X-Series is an enumeration. Thus the parameters of “0” and “1” are not possible in X-Series.  Similarly, the ESA SCPI for :CALibration:AUTO? returned the Boolean value 1 or 0, in X-Series it is an Enumeration (string). Thus, queries by customer applications into numeric variables will result in an error  In PSA Auto Align OFF was not completely off, it is equivalent to PARTial in X-Series. In X-Series, OFF will be fully OFF. This means users of PSA SCPI who choose OFF may see degraded performance and should migrate their software to use PARTial.
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2001

### Normal

Auto Align, Normal turns on the automatic alignment of all measurement systems. The Auto Align, Normal selection maintains the instrument in warranted operation across varying temperature and over time.

If the condition “Align Now, All required” is set, transition to Auto Align, Normal will perform the required alignments and clear the “Align Now, All required” condition and then continue with further alignments as required to maintain the instrument adequately aligned for warranted operation.

When **Auto Align, Normal** is selected the Auto Align Off time is set to zero.

When **Auto Align, Normal** is selected the Settings Panel indicates ALIGN AUTO.

Key Path:	<b>System, Alignments, Auto Align</b>
Mode:	All
Example:	:CAL:AUTO ON
Notes:	Alignment processing as a result of the transition to Normal will be executed sequentially. Thus, *OPC? or *WAI following CAL:AUTO ON will return when the alignment processing is complete.  The presence of an external signal may interfere with the RF portion of the alignment. If so, the Error Condition message “Align skipped: 50 MHz interference” or “Align skipped: 4.8 GHz interference” is reported, and bit 11 is set in the Status Questionable Calibration register. After the interfering signal is removed, subsequent alignment of the RF will clear the condition, and clear bit 11 in the Status Questionable Calibration register.
Readback Text:	Normal

Status Bits/OPC dependencies:	An interfering user signal may prevent automatic alignment of the RF subsystem. If this occurs, the Error Condition message “Align skipped: 50 MHz interference” or “Align skipped: 4.8 GHz interference” is reported, the Status Questionable Calibration bit 11 is set, and the alignment proceeds. When a subsequent alignment of the RF subsystem succeeds, either by the next cycle of automatic alignment or from an Align Now, RF, the Error Condition and Status Questionable Calibration bit 11 are cleared.
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2002

### Partial

Auto Align, Partial disables the full automatic alignment and the maintenance of warranted operation for the benefit of improved measurement throughput. Accuracy is retained for the Resolution Bandwidth filters and the IF Passband which is critical to FFT accuracy, demodulation, and many measurement applications. With Auto Align set to Partial, you are now responsible for maintaining warranted operation by updating the alignments when they expire. The Auto Align, Alert mechanism will notify you when alignments have expired. One solution to expired alignments is to perform the Align All, Now operation. Another is to return the Auto Align selection to Normal.

Auto Align, Partial is recommended for measurements where the throughput is so important that a few percent of improvement is more valued than an increase in the accuracy errors of a few tenths of a decibel. One good application of Auto Align, Partial would be an automated environment where the alignments can be called during overhead time when the device-under-test is exchanged.

When **Auto Align, Partial** is selected the elapsed time counter begins for Auto Align Off time.

When **Auto Align, Partial** is selected the Settings Panel indicates ALIGN PARTIAL with a warning icon. The warning icon is to inform the operator that they are responsible for maintaining the warranted operation of the instrument

Key Path:	<b>System, Alignments, Auto Align</b>
Mode:	All
Example:	:CAL:AUTO PART
Notes:	Auto Align Partial begins the elapsed time counter for Auto Align Off time.
Readback Text:	Partial
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2003

### Off

Auto Align, Off disables automatic alignment and the maintenance of warranted operation, for the benefit of maximum measurement throughput. With Auto Align set to Off, you are now responsible for maintaining warranted operation by updating the alignments when they expire. The Auto Align, Alert mechanism will notify you when alignments have expired. One solution to expired alignments is to perform the Align All, Now operation. Another is to return the Auto Align selection to Normal.

**System Functions**  
**System**

The Auto Align, Off setting is rarely the best choice, because Partial gives almost the same improvement in throughput while maintaining the warranted performance for a much longer time. The choice is intended for unusual circumstances such as the measurement of radar pulses where you might like the revisit time to be as consistent as possible.

When **Auto Align, Off** is selected the Auto Align Off time is initialized and the elapsed time counter begins.

When **Auto Align, Off** is selected the Settings Panel indicates ALIGN OFF with a warning icon. The warning icon is to inform the operator that they are responsible for maintaining the warranted operation of the instrument:

Key Path:	<b>System, Alignments, Auto Align</b>
Mode:	All
Example:	:CAL:AUTO OFF
Notes:	Auto Align Off begins the elapsed time counter for Auto Align Off time.
Couplings:	Auto Align is set to Off if Restore Align Data is invoked.
Readback Text:	Off
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2004

**All but RF**

Auto Align, All but RF, configures automatic alignment to include or exclude the RF subsystem. (Eliminating the automatic alignment of the RF subsystem prevents the input impedance from changing. The normal input impedance of 50 ohms can change to an open circuit when alignments are being used. Some devices under test do not behave acceptably under such circumstances, for example by showing instability.) When Auto Align, All but RF ON is selected, the operator is responsible for performing an Align Now, RF when RF-related alignments expire. The Auto Align, Alert mechanism will notify the operator to perform an Align Now, All when the combination of time and temperature variation is exceeded.

When Auto Align, All but RF ON is selected the Settings Panel indicates ALIGN AUTO/NO RF with a warning icon (warning icon is intended to inform the operator they are responsible for the maintaining the RF alignment of the instrument):

Key Path:	<b>System, Alignments, Auto Align</b>
Mode:	All
Remote Command:	:CALibration:AUTO:MODE ALL NRF :CALibration:AUTO:MODE?
Example:	:CAL:AUTO:MODE NRF
Preset:	This is unaffected by Preset but is set to ALL on a "Restore System Defaults->Align".



State Saved:	No
Readback Text:	RF or NRF
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2005

### Alert

The instrument will signal an Alert when conditions exist such that you will need to perform a full alignment (for example, Align Now, All). The Alert can be configured in one of four settings; Time & Temperature, 24 hours, 7 days, or None. A confirmation is required when a selection other than Time & Temperature is chosen. This prevents accidental deactivation of alerts.

With Auto Align set to Normal, the configuration of Alert is not relevant because the instrument's software maintains the instrument in warranted operation.

Key Path:	<b>System, Alignments, Auto Align</b>
Mode:	All
Remote Command:	:CALibration:AUTO:ALERT TTEMPerature   DAY   WEEK   NONE :CALibration:AUTO:ALERT?
Example:	:CAL:AUTO:ALER TTEM
Notes:	The alert that alignment is needed is the setting of bit 14 in the Status Questionable Calibration register.
Preset:	This is unaffected by Preset but is set to TTEMPerature on a "Restore System Defaults->Align".
State Saved:	No
Status Bits/OPC dependencies:	The alert is the Error Condition message "Align Now, All required" and bit 14 is set in the Status Questionable Calibration register.
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2006

### Time & Temperature

With Auto Align Alert set to Time & Temperature the instrument will signal an alert when alignments expire due to the combination of the passage of time and changes in temperature. The alert is the Error Condition message "Align Now, All required". If this choice for Alert is selected, the absence of an alert means that the analyzer alignment is sufficiently up-to-date to maintain warranted accuracy.

Key Path:	<b>System, Alignments, Auto Align, Alert</b>
Mode:	All
Example:	:CAL:AUTO:ALER TTEM
Readback Text:	Time & Temp

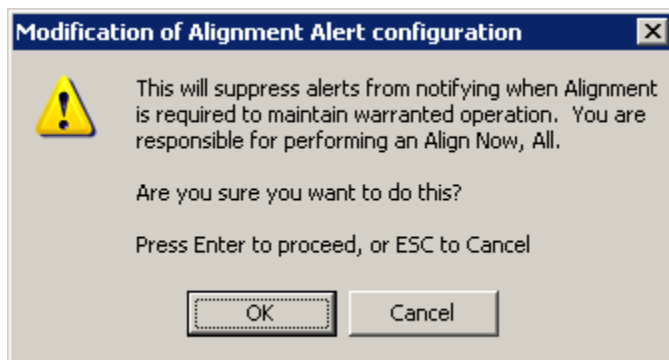
System Functions  
System

Status Bits/OPC dependencies:	Bit 14 is set in the Status Questionable Calibration register.
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2007

**24 hours**

With Auto Align Alert set to 24 Hours the instrument will signal an alert after a time span of 24 hours since the last successful full alignment (for example, Align Now, All or completion of a full Auto Align). You may choose this selection in an environment where the temperature is stable on a daily basis at a small risk of accuracy errors in excess of the warranted specifications. The alert is the Error Condition message “Align Now, All required”.

For front-panel operation , confirmation is required to transition into this setting of Alert. The confirmation dialog is:



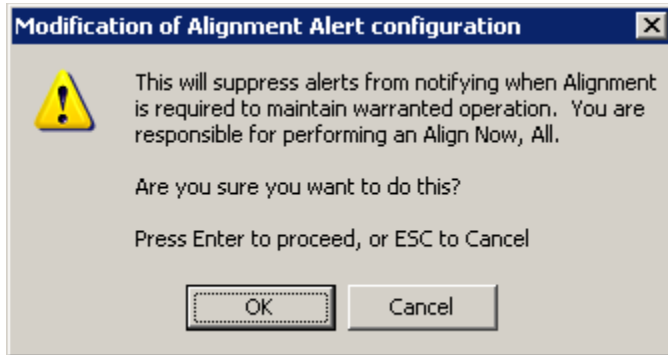
No confirmation is required when Alert is configured through a remote command.

Key Path:	<b>System, Alignments, Auto Align, Alert</b>
Mode:	All
Example:	:CAL:AUTO:ALER DAY
Readback Text:	24 hours
Status Bits/OPC dependencies:	Bit 14 is set in the Status Questionable Calibration register.
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2008

**7 days**

With Auto Align Alert is set to 7 days the instrument will signal an alert after a time span of 168 hours since the last successful full alignment (for example, Align Now, All or completion of a full Auto Align). You may choose this selection in an environment where the temperature is stable on a weekly basis, at a modest risk of accuracy degradations in excess of warranted performance. The alert is the Error Condition message “Align Now, All required”.

For front panel operation, confirmation is required for the customer to transition into this setting of Alert. The confirmation dialog is:



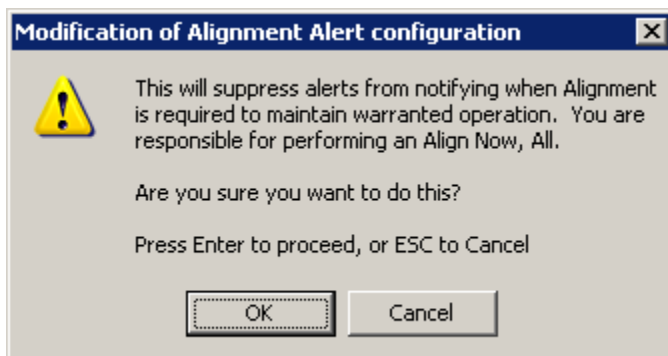
No confirmation is required when Alert is configured through a remote command.

Key Path:	<b>System, Alignments, Auto Align, Alert</b>
Mode:	All
Example:	:CAL:AUTO:ALER WEEK
Readback Text:	7 days
Status Bits/OPC dependencies:	Bit 14 is set in the Status Questionable Calibration register.
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2009

### None

With Auto Align Alert set to None the instrument will not signal an alert. This is provided for rare occasions where you are making a long measurement which cannot tolerate Auto Align interruptions, and must have the ability to capture a screen image at the end of the measurement without an alert posted to the display. Agilent does not recommend using this selection in any other circumstances, because of the risk of accuracy performance drifting well beyond expected levels without the operator being informed.

For front panel operation, confirmation is required to transition into this setting of Alert. The confirmation dialog is:



## System Functions System

No confirmation is required when Alert is configured through a remote command.

Key Path:	<b>System, Alignments, Auto Align, Alert</b>
Mode:	All
Example:	:CAL:AUTO:ALER NONE
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2010

### 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
Help Map ID:	0

### Align Now

Accesses alignment processes that are immediate action operations. They perform complete operations and run until they are complete.

Key Path:	<b>System, Alignments</b>
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2011

### All

Immediately executes an alignment of all subsystems. 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.

In models with the RF Preselector, such as the N9038A, the Align Now All alignment will immediately execute an alignment of all subsystems in the Spectrum Analyzer and partial subsystems of the RF Preselector. The additional alignments are the System Gain, Mechanical attenuator and Electronic attenuator alignments on the RF Preselector path. The purpose of these alignments is to improve the RF Preselector path amplitude variation compared to the bypass path.

Key Path:	<b>System, Alignments, Align Now</b>
Mode:	All
Remote Command:	:CALibration[:ALL] :CALibration[:ALL]?
Example:	:CAL

Notes:	<p>:CALibration[:ALL]? returns 0 if successful</p> <p>:CALibration[:ALL]? returns 1 if failed</p> <p>:CALibration[:ALL]? is the same as *CAL?</p> <p>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.</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> <p>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.</p> <p>An interfering user supplied signal will result in the instrument requiring an Align Now, RF with the interfering signal removed.</p>
Couplings:	<p>Initializes the time for the Last Align Now, All Time.</p> <p>Records the temperature for the Last Align Now, All Temperature.</p> <p>If Align RF component succeeded, initializes the time for the Last Align Now, RF Time.</p> <p>If Align RF component succeeded, records the temperature for the Last Align Now, RF Temperature.</p>
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
Help Map ID:	2012

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

### All but RF

Immediately executes an alignment of all subsystems except the RF subsystem. 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.

In models with the RF Preselector, such as the N9038A, the “All but RF” alignment will execute an alignment of all subsystems except the RF subsystem of the Spectrum Analyzer, as well as the system gain of the RF Preselector.

Key Path:	<b>System, Alignments, Align Now</b>
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.

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System

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
Help Map ID:	2013

**RF**

Immediately executes an alignment of the RF subsystem. The instrument stops any measurement currently underway, performs the alignment, then restarts the measurement from the beginning (similar to pressing the **Restart** key).

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.

In models with the RF Preselector, such as the N9038A, the RF alignment will execute an alignment of the RF subsystem of the Spectrum Analyzer, as well as the RF subsystem on RF Preselector path.

Key Path:	<b>System, Alignments, Align Now</b>
Mode:	All
Remote Command:	:CALibration:RF :CALibration:RF?
Example:	:CAL:RF



Notes:	<p>:CALibration:RF? returns 0 if successful</p> <p>:CALibration:RF? returns 1 if failed (including interfering user signal)</p> <p>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.</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 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.</p> <p>A failure encountered during alignment will generate the Error Condition message “Align RF failed” and set bit 3 in the Status Questionable Calibration register.</p> <p>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.</p> <p>An interfering user supplied signal will result in the instrument requiring an Align Now, RF with the interfering signal removed.</p>
Couplings:	<p>Initializes the time for the Last Align Now, RF Time.</p> <p>Records the temperature for the Last Align Now, RF Temperature.</p>
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
Help Map ID:	2014

### External Mixer

Immediately executes an alignment of the External Mixer that is plugged into the USB port. The instrument stops any measurement currently underway, performs the alignment, then restarts the measurement from the beginning (similar to pressing the Restart key). As this alignment calibrates the LO power to the mixer, this is considered an LO alignment; and failure is classified as an LO alignment failure.

The query form of the remote commands (:CALibration:EMIXer?) will invoke the alignment of the External Mixer and return a success or failure value.

Key Path:	<b>System, Alignments, Align Now</b>
Mode:	All
Remote Command:	:CALibration:EMIXer :CALibration:EMIXer?
Example:	:CAL:EMIX

System Functions  
System

Notes:	<p>:CAL:EMIX? returns 0 if successful</p> <p>:CAL:EMIX? returns 1 if failed</p> <p>While Align Now, Ext Mix 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.</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>A failure encountered during alignment will generate the Error Condition message “Align LO failed” and set bit 5 in the Status Questionable Calibration register. Successful completion will clear the “Align LO failed” message and bit 5 in the Status Questionable Calibration register.</p>
Dependencies:	This key does not appear unless option EXM is present and is grayed-out unless a USB mixer is plugged in to the USB.
Status Bits/OPC dependencies:	Bit3 may be set in the Status Questionable Calibration Extended Failure register.
Initial S/W Revision:	A.08.00
Help Map ID:	3672

**Source**

This menu is only available in the EXT (E6607A).

Accesses source alignment processes that are immediate action operations. They perform complete operations and run until they are complete.

Immediately executes an IQ alignment of the complete source. The instrument stops any sequence of the source, performs the alignment, then restarts the sequence from the beginning.

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 need to be executed.

Key Path:	<b>System, Alignments, Align Now</b>
Mode:	All
Remote Command:	:CALibration:INTernal:SOURce[:ALL] :CALibration:INTernal:SOURce[:ALL]?
Example:	:CAL:INT:SOUR
Notes:	<p>Only available in: XOBT</p> <p>:CAL:SOUR? Initiates an Alignment and returns 0 if successful</p> <p>:CAL:SOUR? Initiates an Alignment and returns 1 if failed</p>
Couplings:	<p>Initializes the time for the Last Align Source Now, All Time.</p> <p>Records the temperature for the Last Align Source Now, All Temperature.</p>

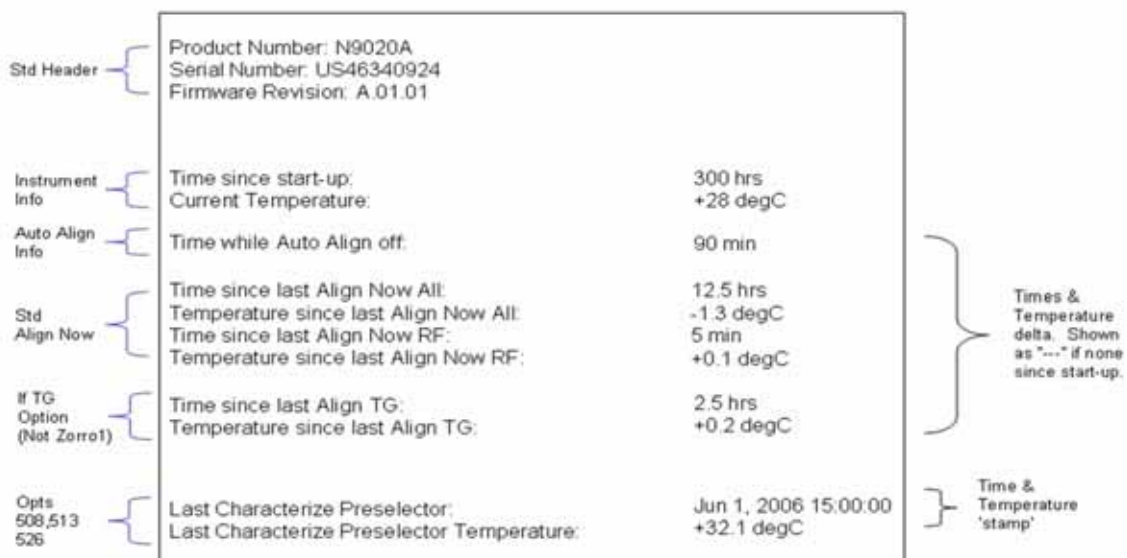
Status Bits/OPC dependencies:	Bits TODO may be set in the Status Questionable Calibration register
Initial S/W Revision:	A.05.00
Help Map ID:	3652

### 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:	<b>System, Alignments</b>
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
Help Map ID:	2018

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Key Path:	<b>Visual annotation in the Show Alignment Statistics screen</b>
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
Help Map ID:	0

Key Path:	<b>Visual annotation in the Show Alignment Statistics screen</b>
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
Help Map ID:	0

Key Path:	<b>Visual annotation in the Show Alignment Statistics screen</b>
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
Help Map ID:	0

Key Path:	<b>Visual annotation in the Show Alignment Statistics screen</b>
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
Help Map ID:	0

Key Path:	<b>Visual annotation in the Show Alignment Statistics screen</b>
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
Help Map ID:	0

Key Path:	<b>Visual annotation in the Show Alignment Statistics screen</b>
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
Help Map ID:	0

Key Path:	<b>Visual annotation in the Show Alignment Statistics screen</b>
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

System Functions  
System

Help Map ID:	0
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Key Path:	<b>Visual annotation in the Show Alignment Statistics screen</b>
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

Help Map ID:	0
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Key Path:	<b>Visual annotation in the Show Alignment Statistics screen</b>
Mode:	All
Remote Command:	:CALibration:TIME:LPreselector?
Example:	:CAL:TIME:LPR?
Notes:	Value is the date and time the last successful Characterize Preselector was executed. The date is separated from the time by a space character. Returns "" if no Characterize Preselector has ever been performed on the instrument.
Dependencies:	In models that do not include preselectors, this command is not enabled and any attempt to set or query will yield an error.
State Saved:	No
Initial S/W Revision:	Prior to A.02.00

Help Map ID:	0
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Key Path:	<b>Visual annotation in the Show Alignment Statistics screen</b>
Mode:	All
Remote Command:	:CALibration:TEMPerature:LPreselector?
Example:	:CAL:TEMP:LPR?
Notes:	Value is in degrees Centigrade at which the last successful Characterize Preselector was executed.
Dependencies:	In models that do not include preselectors, this command is not enabled and any attempt to set or query will yield an error.
State Saved:	No
Initial S/W Revision:	Prior to A.02.00

Help Map ID: 0

Key Path:	<b>Visual annotation in the Show Alignment Statistics screen</b>
Mode:	All
Remote Command:	:CALibration:AUTO:TIME:OFF?
Example:	:CAL:AUTO:TIME:OFF?
Notes:	Value is the elapsed time, in seconds, since Auto Align has been set to Off or Off with Alert. The value is 0 if Auto Align is ALL or NORF.
State Saved:	No
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	0

Key Path:	<b>Visual annotation in the Show Alignment Statistics screen</b>
Mode:	All
Remote Command:	:CALibration:TIME:RFPSselector:LCONducted?
Example:	:CAL:TIME:RFPS:LCON?
Notes:	Values are the date and time the last successful Align Now, 20 Hz – 30 MHz was executed. The date is separated from the time by a semi-colon character.
State Saved:	No
Help Map ID:	0

Key Path:	<b>Visual annotation in the Show Alignment Statistics screen</b>
Mode:	All
Remote Command:	:CALibration:TEMPerature:RFPSselector:LCONducted?
Example:	:CAL:TEMP:RFPS:LCON?
Notes:	Value is in degrees Centigrade at which the last successful Align Now, 20 Hz – 30 MHz was executed.
State Saved:	No
Help Map ID:	0

Key Path:	<b>Visual annotation in the Show Alignment Statistics screen</b>
Mode:	All
Remote Command:	:CALibration:TIME:RFPSselector:LRADiated?
Example:	:CAL:TIME:RFPS:LRAD?

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Notes:	Value is the date and time the last successful Align Now, 30 MHz – 3.6 GHz was executed. The date is separated from the time by a semi-colon character.
State Saved:	No
Help Map ID:	0

Key Path:	<b>Visual annotation in the Show Alignment Statistics screen</b>
Mode:	All
Remote Command:	:CALibration:TEMPerature:RFPSelector:LRADiated?
Example:	:CAL:TEMP:RFPS:LRAD?
Notes:	Value is in degrees Centigrade at which the last successful Align Now, 30 MHz – 3.6 GHz was executed.
State Saved:	No
Help Map ID:	0

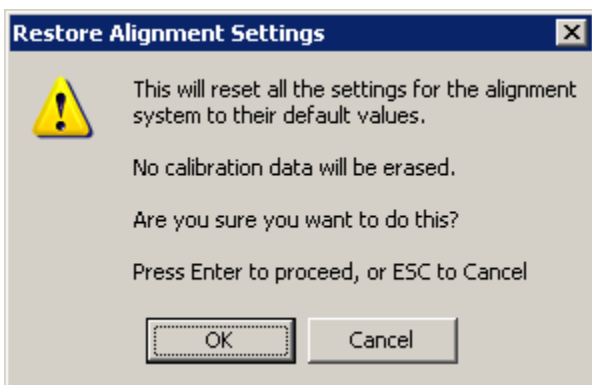
Key Path:	<b>Visual annotation in the Show Alignment Statistics screen</b>
Mode:	All
Remote Command:	:CALibration:RFPSelector:SCHeduler:TIME:NEXT? This query returns data using the following format “YYYY/MM/DD; HH:MM:SS”
Example:	:CAL:RFPS:SCH:TIME:NEXT?
Notes:	The next run time will be updated based on the start date/time and recurrence set by the users. “date” is representation of the date the task will run in the form of “YYYY/MM/DD” where: YYYY is the four digit representation of year. (for example, 2009) MM is the two digit representation of month. (for example, 01 to 12) DD is the two digit representation of the day. (for example, 01 to 28, 29, 30 or 31 depending on the month and year) “time” is a representation of the time of day the task will run in the form of “HH:MM:SS” where: HH is the two digit representation of the hour in 24 hour format MM is the two digit representation of minute SS is the two digit representation of seconds For model N9038A only.
State Saved:	No
Help Map ID:	0



### 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:	<b>System, Alignments</b>
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
Help Map ID:	2022

### Backup or Restore Align Data...

Opens the utility for backing-up or restoring the alignment data.

Alignment data for the instrument resides on the hard drive in a database. Agilent uses high quality hard drives; however it is highly recommended the alignment data be backed-up to storage outside of the

## System Functions

### System

instrument. Additionally, for customers who use multiple CPU Assemblies or multiple disk drives, the alignment that pertains to the instrument must be transferred to the resident hard drive after a CPU or hard drive is replaced. This utility facilitates backing-up and restoring the alignment data.

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**NOTE** This utility allows the operator to navigate to any location of the Windows file system. It is intended that the operator use a USB memory device or Mapped Network Drive to back up the alignment data to storage outside of the instrument.

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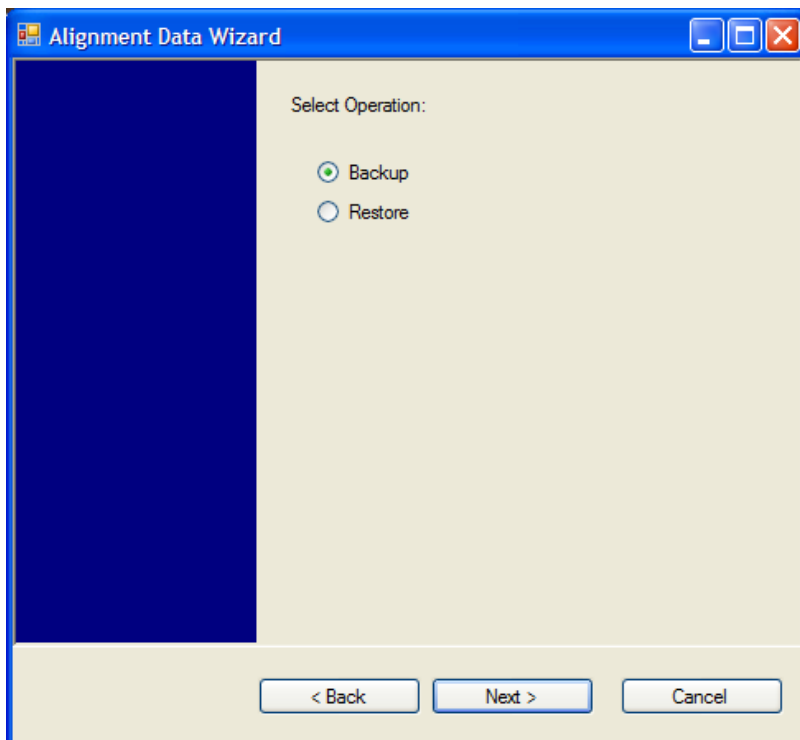
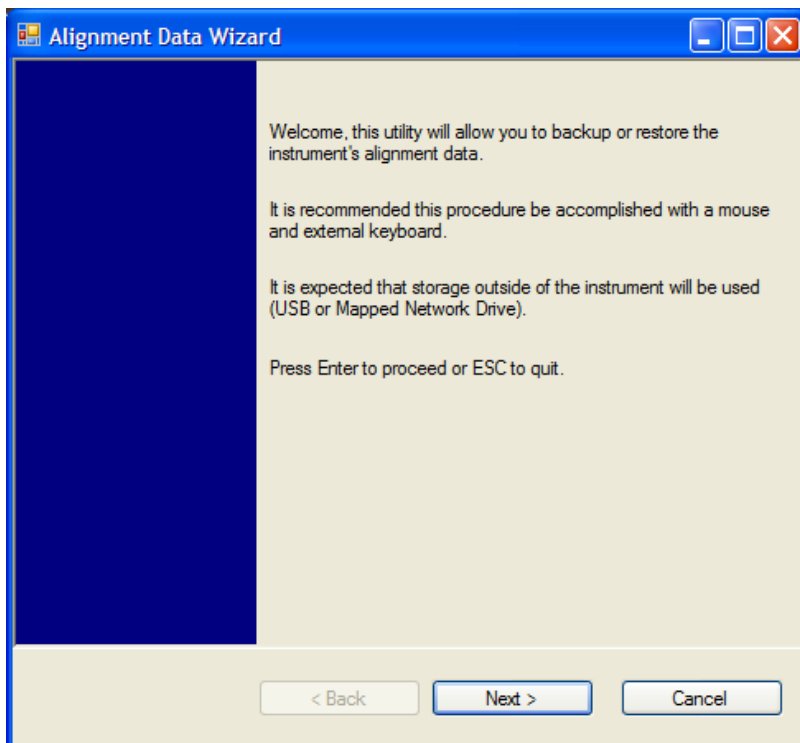
Key Path:	<b>System, Alignments</b>
Initial S/W Revision:	A.02.00
Help Map ID:	3624

Key Path:	<b>System, Alignments</b>
Mode:	All
Remote Command:	:CALibration:DATA:DEFault
Example:	:CAL:DATA:DEF
Couplings:	Sets Auto Align to Off. Sets bit 14 in the Status Questionable Calibration register. The Error Condition message "Align Now, All required" is generated.
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	0

### Alignment Data Wizard

The Backup or Restore Alignment Data wizard guides you through the operation of backing-up or restoring the alignment data.

The following dialogue boxes operates without a mouse or external keyboard when you use the default file names.



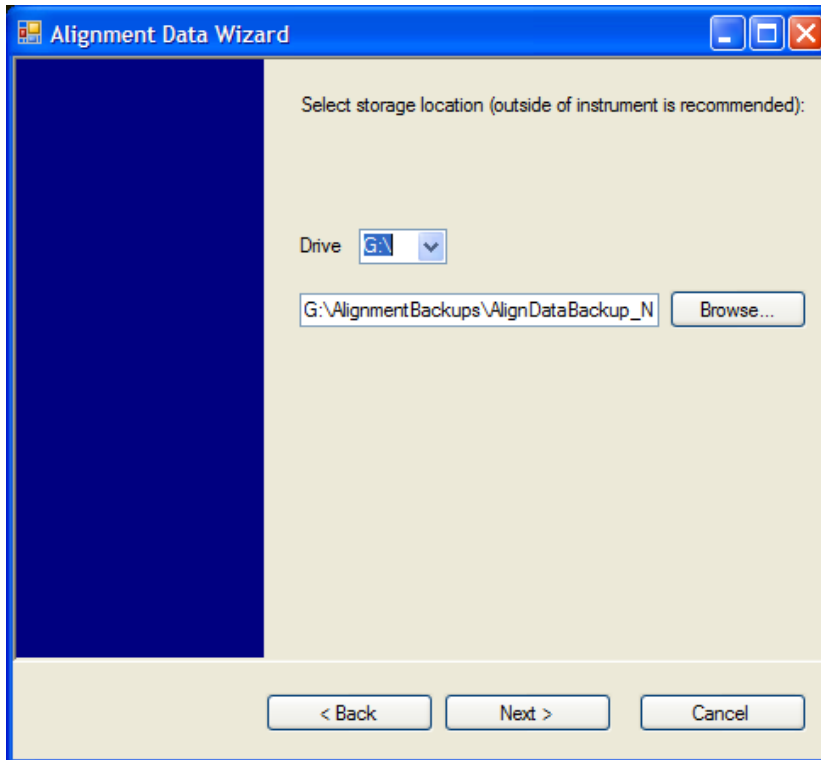
The backup screen indicates the approximate amount of space required to contain the backup file.

The default file name will be AlignDataBackup\_<model number>\_<serial number>\_<date in YYYYMMDDHHMMSS>.bak.

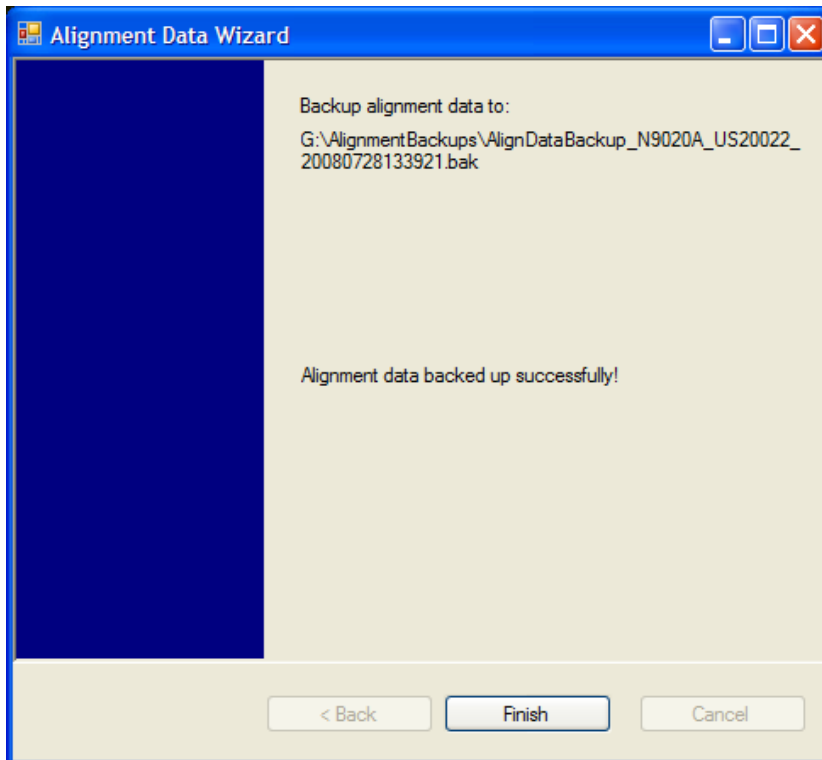
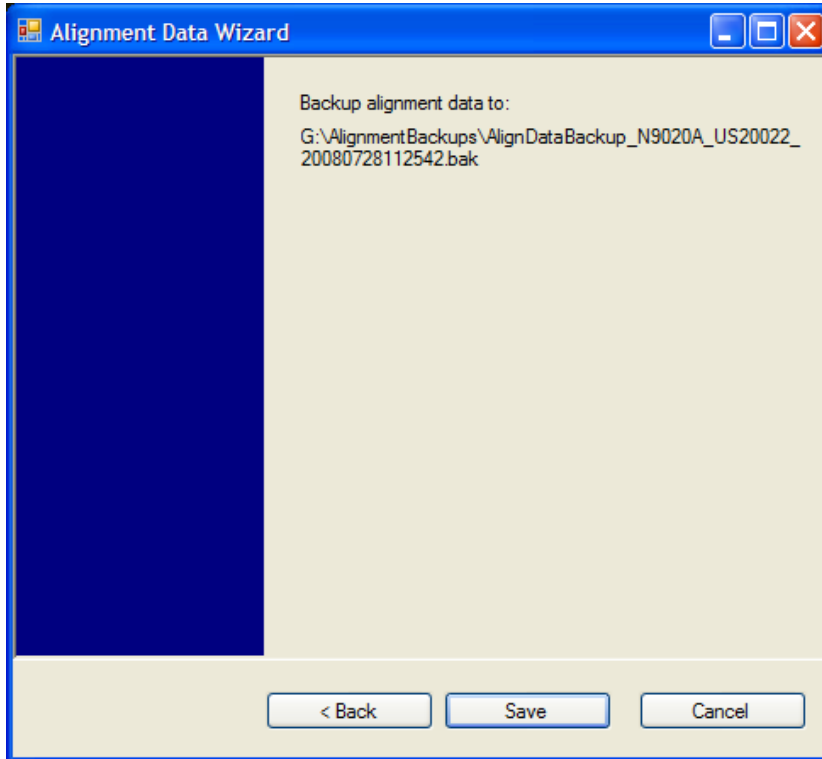
## System Functions

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For the N9030A the default backup location will be the internal F: drive which is a solid-state memory device located internally on the instrument.



Changing the drive letter will also modify the path displayed in the box below. When this step is first loaded, the drive drop-down menu is populated with connected drives, which provide the user with write access. If there are many unreachable network drives connected to the instrument, this step can take a few seconds. If a USB drive is present, it will be selected by default. The path defaults to the AlignmentBackups folder, and a filename is automatically created in the form of AlignDataBackup\_<model>\_<serial number>\_<date><time>. When the "Next >" button is pressed, you will be prompted to create a new folder if the chosen path does not yet exist.



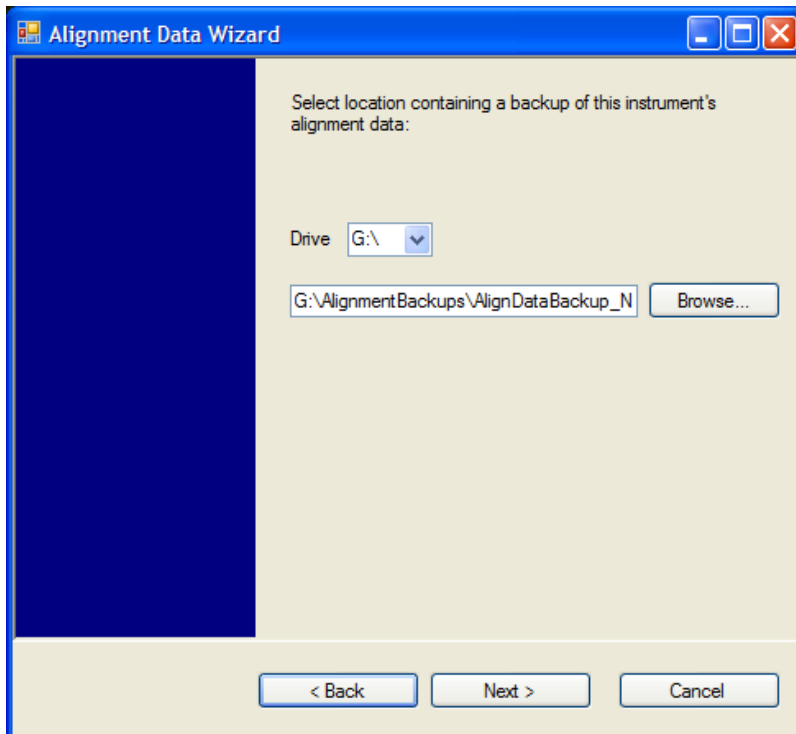
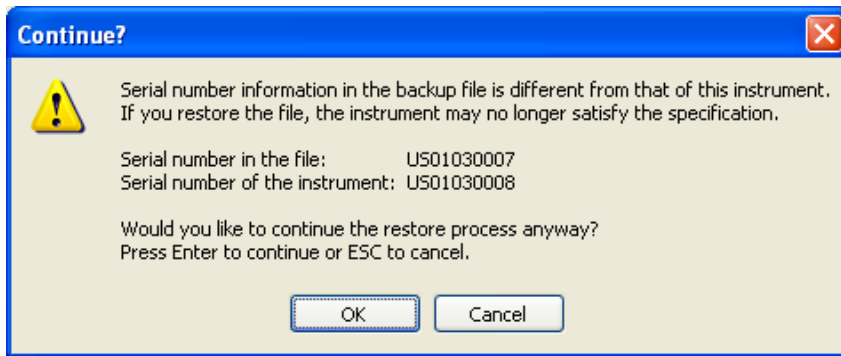
The restore operation checks the validity of the restore file using the database's built-in file validation. If the restore file is corrupt, the existing alignment data will remain in use.

If the serial number information in the backup file being restored is different from that of the instrument,

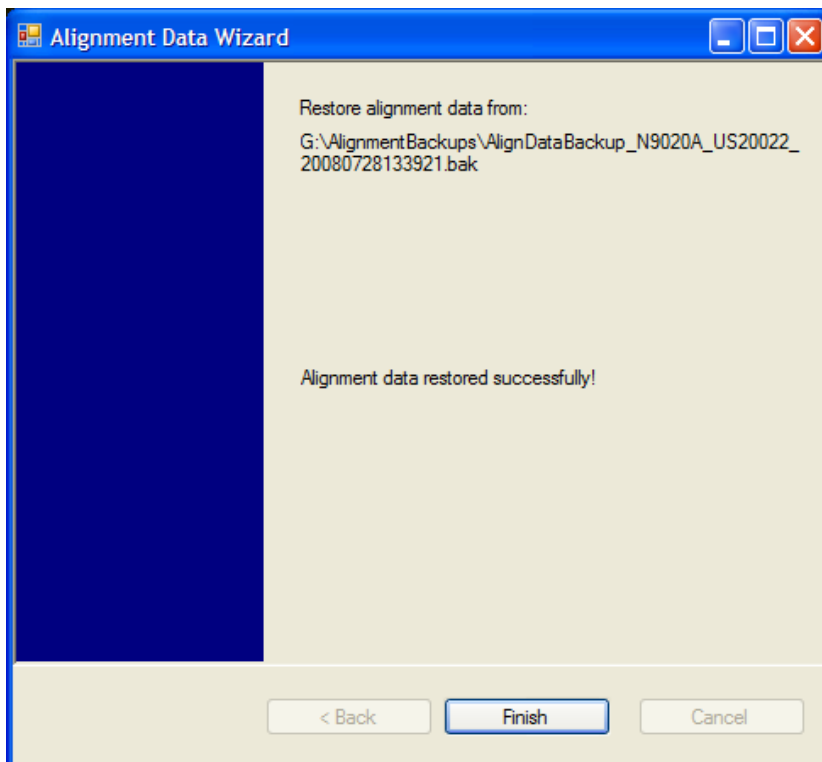
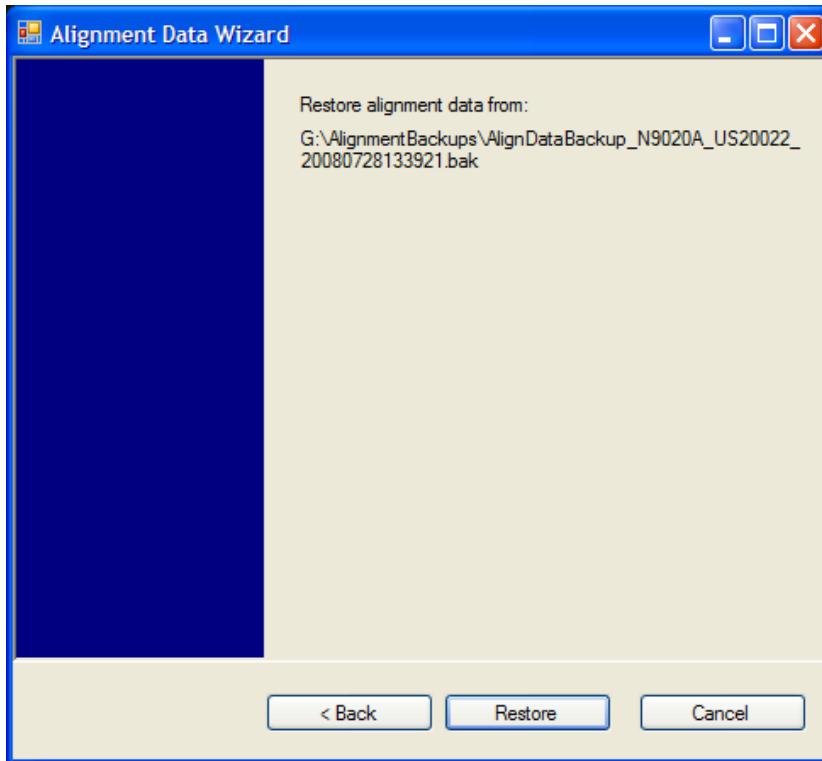
## System Functions

### System

the following message appears (the serial number shown are examples):



Changing the drive letter also modifies the path displayed in the box below. When this step is first loaded, the drive drop-down menu is populated with connected drives, which provide you with read access. The path defaults to the AlignBackups folder. The most recent \*.bak file in the folder will also be selected by default.



**Perform Backup (Remote Command Only)**

Invokes an alignment data backup operation to the provided Folder.

---

**NOTE** It is recommended that the Folder provided is outside of the instrument (USB or Mapped Network Drive).

---

Remote Command:	:CALibration:DATA:BACKup <filename>
Example:	:CAL:DATA:BACK "F:\AlignDataBackup_N9020A_US00000001_2008140100.bak"
Initial S/W Revision:	A.02.00
Help Map ID:	0

### Perform Restore (Remote Command Only)

Invokes an alignment data restore operation from the provided filename.

Remote Command:	:CALibration:DATA:RESTore <filename>
Example:	:CAL:DATA:REST "F:\ AlignDataBackup_N9020A_US00000001_2008140100.bak "
Initial S/W Revision:	A.02.00
Help Map ID:	0

### Advanced

Accesses alignment processes that are immediate action operations that perform operations that run until complete. Advanced alignments are performed on an irregular basis, or require additional operator interaction

Key Path:	<b>System, Alignments</b>
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2015

### Characterize Preselector

The Preselector tuning curve drifts over temperature and time. Recognize that the Amplitude, Presel Center function adjusts the preselector for accurate amplitude measurements at an individual frequency. Characterize Preselector improves the amplitude accuracy by ensuring the Preselector is approximately centered at all frequencies without the use of the Amplitude, Presel Center function. Characterize Preselector can be useful in situations where absolute amplitude accuracy is not of utmost importance, and the throughput savings or convenience of not performing a Presel Center is desired. Presel Center is required prior to any measurement for best (and warranted) amplitude accuracy.

Agilent recommends that the Characterize Preselector operation be performed yearly as part of any calibration, but performing this operation every three months can be worthwhile.

Characterize Preselector immediately executes a characterization of the Preselector, which is a



YIG-tuned filter (YTF). The instrument stops any measurement currently underway, performs the characterization, then restarts the measurement from the beginning (similar to pressing the Restart key).

The query form of the remote commands (:CALibration:YTF?) will invoke the alignment of the YTF subsystem and return a success or failure value.

A failure encountered during alignment will generate the Error Condition message “Characterize Preselector failure” and set bit 3 in the STATUS:QUESTIONable:CALibration:EXTended:FAILure status register. Successful completion of Characterize Preselector will clear this Condition. It will also begin the elapsed time counter for Last Characterize Preselector Time, and capture the Last Characterize Preselector Temperature.

The last Characterize Preselector Time and Temperature survives across the power cycle as this operation is performed infrequently.

---

**NOTE** The Characterize Preselector function can be interrupted by pressing the Cancel (ESC) front-panel key or remotely with Device Clear followed by the :ABORT SCPI command. None of the new characterization data is then used. However, since the old characterization data is purged at the beginning of the characterization, you now have an uncharacterized preselector. You should re-execute this function and allow it to finish before making any further preselected measurements.

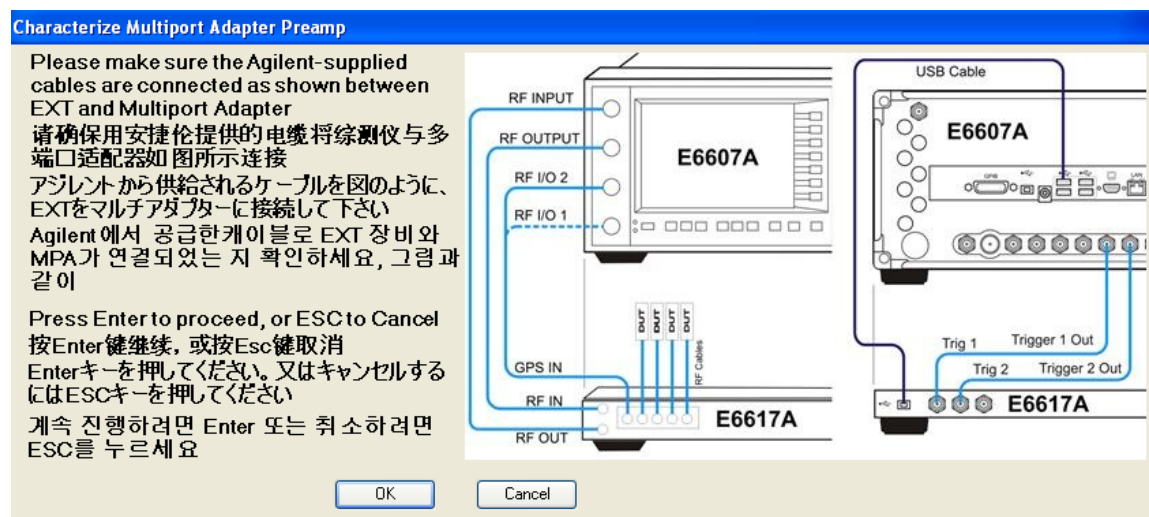
---

Key Path:	<b>System, Alignments, Advanced</b>
Mode:	All
Remote Command:	:CALibration:YTF :CALibration:YTF?
Example:	:CAL:YTF
Notes:	:CALibration:YTF? returns 0 if successful :CALibration:YTF? returns 1 if failed (including interfering user signal) While Advanced, Characterize Preselector 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 9 in the Status Questionable Calibration register. A failure encountered during alignment will generate the Error Condition message “Characterize Preselector failed” and set bit 9 in the Status Questionable Calibration register. For Options that support frequencies > 3.6 GHz only.

Dependencies:	This key does not appear in models that do not contain preselectors. In these models the SCPI command is accepted without error but no action is taken.
Couplings:	Initializes the time for the Last Characterize Preselector Time. Records the temperature for the Last Characterize Preselector Temperature.
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2016

### Characterize Multiport Adapter Preamp

A Multiport Adapter Preamp Characterization should be made when MPA and EXT are first paired, a message window is popped up as below to inform the user to take this action:



Correspondingly, bit 8 of the STATUS:QUESTIONable:CALibration:EXTended:NEEDED register (error 80) will be set for the “MPA Align required” message. Successful completion of Characterize Multiport Adapter Preamp will clear this Condition.

Users are expected to execute a characterization of the Preamp of Multiport Adapter when it is plugged into the USB port for the first time. The instrument stops any measurement currently underway, performs the characterization, then restarts the measurement from the beginning (similar to pressing the **Restart** key).

The query form of the remote command :CALibration:MPADapter:GAIN? will invoke the characterization of the Preamp of Multiport Adapter and return a success or failure value.

A failure encountered during characterization will generate the Error Condition message “MPA Align failed” and set bit 8 (error 83) in the STATUS:QUESTIONable:CALibration:EXTended:FAILure status register. Successful completion of Characterize Multiport Adapter Preamp will clear this Condition.

NOTE:

**NOTE** **Characterize Multiport Adapter Preamp** can be interrupted by pressing the Cancel (ESC) front-panel key or remotely with Device Clear followed by the

:ABORt SCPI command.

Key Path:	<b>System, Alignments, Advanced</b>
Mode:	All
Remote Command:	:CALibration:MPADapter:GAIN :CALibration:MPADapter:GAIN?
Example:	:CAL: MPAD:GAIN
Notes:	<p>:CALibration:MPADapter:GAIN? returns 0 if successful</p> <p>:CALibration:MPADapter:GAIN? returns 1 if failed</p> <p>While System, Alignments, Advanced, Characterize Multiport Adapter Preamp is performing the characterization, bit 0 in the Status Operation register is set. Completion, or termination, will clear bit 0 in the Status Operation register.</p> <p>This command is sequential, it must be completed 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 8 in the Status Questionable Calibration Extended Failure register.</p> <p>A failure encountered during alignment will generate the Error Condition message “MPAdapter Preamp Charact Failure” and set bit 8 in the Status Questionable Calibration Extended Failure register.</p>
Dependencies:	This key does not appear unless a multiport adapter is plugged in to the USB. Grayout error: -221.1400; Multiport Adapter Not Available
Status Bits/OPC dependencies:	Bit8 may be set in the Status Questionable Calibration Extended Failure register.
Initial S/W Revision:	A.10.00
Help Map ID:	50010

### Timebase DAC

Allows control of the internal 10 MHz reference oscillator timebase. This may be used to adjust for minor frequency alignment between the signal and the internal frequency reference. This adjustment has no effect if the instrument is operating with an External Frequency Reference.

If the value of the Timebase DAC changes (by switching to Calibrated from User with User set to a different value, or in User with a new value entered) an alignment may be necessary. The alignment system will take appropriate action; which will either invoke an alignment or cause an Alert.

Key Path:	<b>System, Alignments</b>
Mode:	All

System Functions  
System

Remote Command:	:CALibration:FREQuency:REFErence:MODE CALibrated USER :CALibration:FREQuency:REFErence:MODE?
Example:	:CAL:FREQ:REF:MODE CAL
Notes:	If the value of the timebase is changed the alignment system automatically performs an alignment or alerts that an alignment is due.  If the value of the timebase is changed the alignment system automatically performs an alignment or alerts that an alignment is due.
Preset:	This is unaffected by Preset but is set to CALibrated on a “Restore System Defaults->Align”.
State Saved:	No
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2019

**Calibrated**

Sets the Timebase DAC to the value established during factory or field calibration. The value displayed on the menu key is the calibrated value.

Key Path:	<b>System, Alignments, Timebase DAC</b>
Mode:	All
Example:	:CAL:FREQ:REF:MODE CAL
Readback Text:	[xxx] < where xxx is the calibrated value
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2020

**User**

Allows setting the Timebase DAC to a value other than the value established during the factory or field calibration. The value displayed on the menu key is the calibrated value.

Key Path:	<b>System, Alignments, Timebase DAC</b>
Mode:	All
Example:	:CAL:FREQ:REF:MODE USER
Readback Text:	xxx < where xxx is the Timebase DAC setting
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2021

Key Path:	<b>System, Alignments, Timebase DAC</b>
Mode:	All

Remote Command:	:CALibration:FREQuency:REFeRence:FINE <integer> :CALibration:FREQuency:REFeRence:FINE?
Example:	:CAL:FREQ:REF:FINE 8191
Notes:	If the value of the timebase is changed the alignment system automatically performs an alignment or alerts that an alignment is due.
Couplings:	Setting :CAL:FREQ:REF:FINE sets :CAL:FREQ:REF:MODE USER
Preset:	This is unaffected by Preset but is set to the factory setting on a “Restore System Defaults->Align”.
State Saved:	No
Min:	0
Max:	16383
Backwards Compatibility SCPI:	:CALibration:FREQuency:REFeRence:COARse  ESA hardware contained two DAC controls for the Timebase. In X-Series the command :CALibration:FREQuency:REFeRence:FINE is the method for adjusting the timebase. The :COARse command is provided as an alias to :FINE.
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	0

Remote Command:	:CALibration:FREQuency:REFeRence:COARse <integer> :CALibration:FREQuency:REFeRence:COARse?
Example:	:CAL:FREQ:REF:COAR 8191
Notes:	This is an alias for CAL:FREQ:REF:FINE any change to COARse is reflected in FINE and vice-versa. See CAL:FREQ:REF:FINE for description of functionality.
Couplings:	Setting :CAL:FREQ:REF:COAR sets :CAL:FREQ:REF:MODE USER
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	0

### RF Preselector

This menu and all of its submenus are only available in models with the RF Preselector, such as the N9038A.

See [“Align Now, 20 Hz to 30 MHz” on page 194](#)

See [“Align Now, 30 MHz to 3.6 GHz” on page 195](#)

See [“Align Now, 20 Hz to 3.6 GHz” on page 197](#)

See “Alert” on page 198

Key Path:	<b>System, Alignments</b>
Initial S/W Revision:	Prior to A.08..00
Help Map ID:	3694

### Align Now, 20 Hz to 30 MHz

Immediately executes an alignment of the receiver subsystem. The receiver will stop any measurement currently underway, perform the alignment, and then restart the measurement from the beginning (similar to pressing the Restart key).

The query form of the remote commands (:CALibration:RFPSelector:CONDUCTed?) will invoke the alignment of the RF Preselector on Conducted Band and return a success or failure value. Successful completion will clear the “Align 20 Hz to 30 MHz required” Error Condition, and clear the bit 1 in the Status Questionable Calibration Extended Needed register. The elapsed time counter will begin for Last Align Now, Conducted Time, and the temperature is captured for the Last Align Now, Conducted Temperature. The alignment 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 “Align 20 Hz to 30 MHz required” is set because new alignment data may be employed for an individual subsystem, but not a cohesive set of data for all subsystems.

The “Align 20 Hz to 30 MHz required” Error Condition will appear when this alignment has expired. User is now responsible to perform the Align Now, 20 Hz to 30 MHz in order to keep the receiver in warranted operation. This alignment can only be performed by user as it is not part of the Auto Align process.

Key Path:	<b>System, Alignments, RF Preselector, Align Now</b>
Mode:	All
Remote Command:	:CALibration:RFPSelector:CONDUCTed :CALibration:RFPSelector:CONDUCTed?
Example:	:CAL:RFPS:COND

Notes:	<p>:CALibration:RFPSelector:CONDUCTed? Return 0 if successful</p> <p>:CALibration:RFPSelector:CONDUCTed? Return 1 if failed</p> <p>When Align 20 Hz to 30 MHz 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.</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. Successful completion will clear bit 1 in the Status Questionable Calibration Extended Needed register and bit 0 in Status Questionable Calibration Extended Failure register.</p> <p>A failure encountered during alignment will set the Error Condition “20 Hz to 30 MHz Alignment Failure” and set both bit 1 in the Status Questionable Calibration Extended Needed register and bit 9 in Status Questionable Calibration register.</p> <p>For model N9038A only.</p>
Dependencies:	This key does not appear in other than N9038A models, setting or querying the SCPI will generate an error.
Couplings:	<p>Initializes the time for the Last Align Conducted Now, Conducted Time.</p> <p>Records the temperature for the Last Align Conducted Now, Conducted Temperature.</p>
Status Bits/OPC Dependencies:	<p>Bit 8 or 9 may be set in the Status Questionable Calibration register.</p> <p>Bit 1 may be set in the Status Questionable Calibration Extended Needed register.</p> <p>Bit 0 may be set in the Status Questionable Calibration Extended Failure register.</p>
Initial S/W Revision:	A.08.00
Help Map ID:	3673

### Align Now, 30 MHz to 3.6 GHz

Immediately executes an alignment of the receiver subsystem. The receiver will stop any measurement currently underway, perform the alignment, and then restart the measurement from the beginning (similar to pressing the Restart key).

The query form of the remote commands (:CALibration:RFPSelector:RADiated?) will invoke the alignment of the RF Preselector on Radiated Band and return a success or failure value. Successful completion will clear the “Align 30 MHz to 3.6 GHz required” Error Condition, and clear the bit 2 in the Status Questionable Calibration Extended Needed register. The elapsed time counter will begin for Last Align Now, Radiated Time, and the temperature is captured for the Last Align Now, Radiated Temperature. The alignment 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 “Align 30 MHz to 3.6 GHz required” is set because new alignment data may be employed for an individual subsystem, but not a cohesive set of data for all subsystems.

System Functions  
System

The “Align 30 MHz to 3.6 GHz required” Error Condition will appear when this alignment has expired. User is now responsible to perform the Align Now, 30 MHz to 3.6 GHz in order to keep the receiver in warranted operation. This alignment can only be performed by user as it is not part of the Auto Align process.

Key Path:	<b>System, Alignments, RF Preselector, Align Now</b>
Mode:	All
Remote Command:	:CALibration:RFPreselector:RADiated :CALibration:RFPreselector:RADiated?
Example:	:CAL:RFPS:RAD
Notes:	:CALibration:RFPreselector:RADiated? Return 0 if successful :CALibration:RFPreselector:RADiated? Return 1 if failed  When Align 30 MHz to 3.6 GHz 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 2 in the Status Questionable Calibration Extended Needed register and bit 1 in Status Questionable Calibration Extended Failure register.  A failure encountered during alignment will set the Error Condition “30 MHz to 3.6 GHz Alignment Failure” and set both bit 2 in the Status Questionable Calibration Extended Needed register and bit 9 in Status Questionable Calibration register.  For model N9038A only.
Dependencies:	This key does not appear in other than N9038A models, setting or querying the SCPI will generate an error.
Couplings:	Initializes the time for the Last Align Radiated Now, Radiated Time.  Records the temperature for the Last Align Radiated Now, Radiated Temperature.
Status Bits/OPC Dependencies:	Bit 8 or 9 may be set in the Status Questionable Calibration register.  Bit 2 may be set in the Status Questionable Calibration Extended Needed register.  Bit 1 may be set in the Status Questionable Calibration Extended Failure register.
Initial S/W Revision:	A.08.00
Help Map ID:	3674



### Align Now, 20 Hz to 3.6 GHz

Immediately executes an alignment of the receiver subsystem. The receiver will stop any measurement currently underway, perform the alignment, and then restart the measurement from the beginning (similar to pressing the Restart key).

The query form of the remote commands (:CALibration:RFPSelector:FULL?) will invoke the alignment of the RF Preselector on both Conducted and Radiated Band and return a success or failure value. Successful completion will clear the “Align 20 Hz to 3.6 GHz required” Error Condition, and clear the bit 1 and bit 2 in the Status Questionable Calibration Extended Needed register. The elapsed time counter will begin for Last Align Now, Conducted Time and Last Align Now Radiated Time and the temperature is captured for Last Align Now, Conducted Temperature and Last Align Now, Radiated Temperature. The alignment 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 “Align 20 Hz to 3.6 GHz required” is set because new alignment data may be employed for an individual subsystem, but not a cohesive set of data for all subsystems.

The “Align 20 Hz to 3.6 GHz required” Error Condition will appear when this alignment has expired. User is now responsible to perform the Align Now, 20 Hz to 3.6 GHz in order to keep the receiver in warranted operation. This alignment can only be performed by user as it is not part of the Auto Align process.

Key Path:	<b>System, Alignments, RF Preselector, Align Now</b>
Mode:	All
Remote Command:	:CALibration:RFPSelector:FULL :CALibration:RFPSelector:FULL?
Example:	:CAL:RFPS:FULL
Notes:	:CALibration:RFPSelector:FULL? Return 0 if successful :CALibration:RFPSelector:FULL? Return 1 if failed  When Align 20 Hz to 3.6 GHz 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 1, bit 2 in the Status Questionable Calibration Extended Needed register and bit 0, bit 1 in Status Questionable Calibration Extended Failure register.  A failure encountered during alignment will set the Error Condition “20 Hz to 3.6 GHz Alignment Failure” and set bit1, bit 2 in the Status Questionable Calibration Extended Needed register and bit 9 in Status Questionable Calibration register.  For model N9038A only.
Dependencies:	This key does not appear in other than N9038A models, setting or querying the SCPI will generate an error.

System Functions  
System

Couplings:	<p>Initializes the time for the Last Align Conducted Now, Conducted Time.</p> <p>Initializes the time for the Last Align Radiated Now, Radiated Time.</p> <p>Records the temperature for the Last Align Conducted Now, Conducted Temperature.</p> <p>Records the temperature for the Last Align Radiated Now, Radiated Temperature.</p>
Status Bits/OPC Dependencies:	<p>Bit 8 or 9 may be set in the Status Questionable Calibration register.</p> <p>Bit 1 and 2 may be set in the Status Questionable Calibration Extended Needed register.</p> <p>Bit 0 and 1 may be set in the Status Questionable Calibration Extended Failure register.</p>
Initial S/W Revision:	A.08.00
Help Map ID:	3675

**Alert**

Setting Alert to ON/OFF will enable/disable the display of RF Preselector alignment required message on the status line. The instrument will power up with Alert On mode.

Key Path:	<b>System, Alignments, RF Preselector</b>
Mode:	All
Remote Command:	:CALibration:RFPSelector:ALERT ON OFF 0 1 :CALibration:RFPSelector:ALERT?
Example:	:CAL:RFPS:ALER OFF
Notes:	<p>For model N9038A only.</p> <p>Error Condition will be generated when the alert is On and any of the RF Preselector alignments has expired.</p>
Preset:	This is unaffected by Preset, but is set to ON on a “Restore System Defaults->Align”.
State Saved:	No
Initial S/W Revision:	A.08.00
Help Map ID:	3676

**Schedule Setup**

Enables you to schedule a task to run automatically at the background based on the recurrence and time set in the scheduler. Make sure that the Instrument’s local time is accurate as the Scheduler relies on this information to execute the task.

Key Path:	<b>System, Alignments, RF Preselector</b>
-----------	---

Initial S/W Revision:	A.08.00
Help Map ID:	3677

### Task

There are 3 task that can be selected for the scheduler to run.

Task 1 is the 20 Hz to 30 MHz alignment

Task 2 is the 30 MHz to 3.6 GHz alignment

Task 3 is the 20 Hz to 3.6 GHz alignment.

Key Path:	<b>System, Alignments, RF Preselector, Schedule Setup</b>
Mode:	All
Remote Command:	:CALibration:RFPSselector:SCHeduler:TASK T1   T2   T3 :CALibration:RFPSselector:SCHeduler:TASK?
Example:	:CAL:RFPS:SCH:TASK T1
Notes:	Changing the task will not reset the Scheduler time and the alignment is based on the current scheduled configuration to occur.  For model N9038A only.
Preset:	This is unaffected by Preset but is set to T3 on a "Restore System Defaults->Align".
State Saved:	No
Range:	Task 1   Task 2   Task 3
Initial S/W Revision:	A.08.00
Help Map ID:	3678

### Date/Time

Enables you to configure the scheduler to run a task starting from this date and time. The date and time rely on the instrument's local time to execute a scheduled task. The date is based on the format "YYYY/MM/DD" and the time is based on a 24 hour clock.

Key Path:	<b>System, Alignments, RF Preselector, Schedule Setup</b>
Mode:	All
Remote Command:	:CALibration:RFPSselector:SCHeduler:TIME:START "date", "time"  :CALibration:RFPSselector:SCHeduler:TIME:START?  This query returns data using the following format "YYYY/MM/DD; HH:MM:SS"
Example:	:CAL:RFPS:SCH:TIME:STAR "2009/8/20","12:00:00"

System Functions  
System

Notes:	<p>“date” is representation of the date the task will run in the form of “YYYY/MM/DD” where:</p> <p>YYYY is the four digit representation of year. (for example, 2009)</p> <p>MM is the two digit representation of month. (for example, 01 to 12)</p> <p>DD is the two digit representation of the day. (for example, 01 to 28, 29, 30 or 31 depending on the month and year)</p> <p>“time” is a representation of the time of day the task will run in the form of “HH:MM:SS” where:</p> <p>HH is the two digit representation of the hour in 24 hour format</p> <p>MM is the two digit representation of minute</p> <p>SS is the two digit representation of seconds</p> <p>For model N9038A only.</p>
Preset:	This is unaffected by Preset but is set to Current date and 00:00:00 on a “Restore System Defaults->Align”.
State Saved:	No
Initial S/W Revision:	A.08.00
Help Map ID:	3679

**Date**

Enables you to configure the date of the scheduled task. The SCPI command to configure the date and time parameters of the scheduler is the same; however, they each have their own front-panel control.

Key Path:	<b>System, Alignments, RF Preselector, Schedule Setup, Date/Time</b>
Notes:	<p>See “Date/Time ” on page 199.</p> <p>For model N9038A only.</p>
Preset:	This is unaffected by Preset but is set to Current date and 00:00:00 on a “Restore System Defaults->Align”.
State Saved:	No
Initial S/W Revision:	A.08.00
Help Map ID:	3680

**Time**

Enables you to configure the time of the scheduled task. The SCPI command to configure the date and time parameters of the scheduler is the same; however, they each have their own front panel-control.

Key Path:	<b>System, Alignments, RF Preselector, Schedule Setup, Date/Time</b>
Notes:	<p>See “Date/Time ” on page 199 .</p> <p>For model N9038A only.</p>

Preset:	This is unaffected by Preset but is set to Current date and 00:00:00 on a “Restore System Defaults->Align”.
State Saved:	No
Initial S/W Revision:	A.08.00
Help Map ID:	3681

### Recurrence

Enables you to configure the scheduler to run the task recurrently on a scheduled date and time. You can schedule it to run daily, weekly or alternate weeks.

Key Path:	<b>System, Alignments, RF Preselector, Schedule Setup</b>
Mode:	All
Remote Command:	:CALibration:RFPSelector:SCHeduler:REcurrence DAY   WEEK   OFF :CALibration:RFPSelector:SCHeduler:REcurrence?
Example:	:CAL:RFPS:SCH:REC DAY
Notes:	For model N9038A only.
Preset:	This is unaffected by Preset but is set to OFF on a “Restore System Defaults->Align”.
State Saved:	No
Range:	DAY WEEK  OFF
Initial S/W Revision:	A.08.00
Help Map ID:	3682

### Every N Weeks

Enables you to configure the scheduler to run the task on a day in every number of week’s duration.

Key Path:	<b>System, Alignments, RF Preselector, Schedule Setup, Recurrence</b>
Initial S/W Revision:	A.08.00
Help Map ID:	3683

### N of Weeks

Enables you to set the number of weeks that the scheduler will wait to trigger a task.

Key Path:	<b>System, Alignments, RF Preselector, Schedule Setup, Recurrence, Every N Weeks</b>
Mode:	All

System Functions  
System

Remote Command:	:CALibration:RFPSelector:Scheduler:REcurrence:WEEK <integer> :CALibration:RFPSelector:Scheduler:REcurrence:WEEK?
Example:	:CAL:RFPS:SCH:REC:WEEK 2
Notes:	New scheduled date to run the alignment task will get updated when this parameter is changed. For model N9038A only.
Preset:	This is unaffected by Preset but is set to 1 on a “Restore System Defaults->Align”.
State Saved:	No
Range:	1–52
Initial S/W Revision:	A.08.00
Help Map ID:	3684

**Day**

Enables you to set the Day of the Week the scheduler will run a scheduled task.

Key Path:	<b>System, Alignments, RF Preselector, Schedule Setup, Recurrence, Every N Weeks</b>
Mode:	All
Remote Command:	:CALibration:RFPSelector:Scheduler:REcurrence:DAY SUN   MON   TUE   WED   THU   FRI   SAT :CALibration:RFPSelector:Scheduler:REcurrence:DAY?
Example:	:CAL:RFPS:SCH:REC:DAY SUN
Notes:	For model N9038A only.
Preset:	This is unaffected by Preset but is set to SUN on a “Restore System Defaults->Align”.
State Saved:	No
Range:	Sunday Monday Tuesday Wednesday Thursday Friday Saturday
Initial S/W Revision:	A.08.00
Help Map ID:	3685

**Scheduler**

Setting the Scheduler to ON will trigger the execution of the scheduled task based on the recurrence and time set in the scheduler since the last successful of the specific alignment. A warning condition of “RF Preselector alignment scheduler is ON” will be appeared when the scheduler is set to ON. OFF will turn off the Scheduler from running any scheduled task.

Key Path:	<b>System, Alignments, RF Preselector</b>
-----------	---

Mode:	All
Remote Command:	:CALibration:RFPSelector:SCHeduler:STATe ON OFF 0 1 :CALibration:RFPSelector:SCHeduler:STATe?
Example:	:CAL:RFPS:SCH:STAT OFF
Notes:	For model N9038A only.
Preset:	This is unaffected by Preset but is set to OFF on a “Restore System Defaults->Align”.
State Saved:	No
Initial S/W Revision:	A.08.00
Help Map ID:	3686

### I/O Config

Activates a menu for identifying and changing the I/O configuration for remote control.

Key Path:	<b>System</b>
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2100

### GPIB

Activates a menu for configuring the GPIB I/O port.

Key Path:	<b>System, I/O Config</b>
Initial S/W Revision:	A.02.00
Help Map ID:	3625

### GPIB Address

Select the GPIB remote address.

Key Path:	<b>System, I/O Config, GPIB</b>
Mode:	All
Remote Command:	:SYSTem:COMMunicate:GPIB [1] [:SELF] :ADDRess <integer> :SYSTem:COMMunicate:GPIB [1] [:SELF] :ADDRess?
Example:	:SYST:COMM:GPIB:ADDR 17
Notes:	Changing the Address on the GPIB port requires all further communication to use the new address.

Preset:	This is unaffected by Preset but is set to 18 on a “Restore System Defaults->Misc”
State Saved:	No
Range:	0 to 30
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2101

### GPIB Controller

Sets the GPIB port into controller or device mode. In the normal state, GPIB controller is disabled, which allows the analyzer to be controlled by a remote computer. When GPIB Controller is enabled, the instrument can run software applications that use the instrument's computer as a GPIB controller; controlling devices connected to the instrument's GPIB port.

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**NOTE** When GPIB Controller is enabled, the analyzer application itself cannot be controlled over GPIB. In this case it can easily be controlled via LAN or USB. The GPIB port cannot be a controller and device at the same time. Only one controller can be active on the GPIB bus at any given time. If the analyzer is the controller, an external PC cannot be a controller.

---

To control the instrument from the software that is performing GPIB controller operation, you can use an internal TCP/IP connection to the analyzer application. Use the address TCPIP0:localhost:inst0:INSTR to send SCPI commands to the analyzer application.

Key Path:	<b>System, I/O Config, GPIB</b>
Mode:	All
Scope:	Mode Global
Remote Command:	:SYSTem:COMMunicate:GPIB[1] [:SELF] :CONTroller[:ENABLE] ON OFF 0 1 :SYSTem:COMMunicate:GPIB[1] [:SELF] :CONTroller[:ENABLE]?
Example:	:SYST:COMM:GPIB:CONT ON Will set GPIB port to Controller
Notes:	When the instrument becomes the Controller bit 0 in the Standard Event Status Register is set (and when the instrument relinquishes Controller capability bit 0 is cleared in the Standard Event Status Register).
Preset:	This is unaffected by Preset but is set to OFF on a “Restore System Defaults->Misc”
State Saved:	No
Range:	Disabled Enabled
Initial S/W Revision:	A.02.00
Help Map ID:	3626



### Disabled

Disables the GPIB Controller capability, this is the default (or normal) setting.

Key Path:	<b>System, I/O Config, GPIB, GPIB Controller</b>
Example:	:SYST:COMM:GPIB:CONT OFF Will set GPIB port to Device
Initial S/W Revision:	A.02.00
Help Map ID:	3627

### Enabled

Enables the GPIB Controller capability.

Key Path:	<b>System, I/O Config, GPIB, GPIB Controller</b>
Example:	:SYST:COMM:GPIB:CONT ON Will set GPIB port to Controller
Initial S/W Revision:	A.02.00
Help Map ID:	3628

### 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.

Key Path:	<b>System, I/O Config</b>
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2102

### SCPI Telnet

Turns the SCPI LAN telnet capability On or Off allowing you to limit SCPI access over LAN through telnet.

Key Path:	<b>System, I/O Config, SCPI LAN</b>
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

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System

Range:	On   Off
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2103

### 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:	<b>System, I/O Config, SCPI LAN</b>
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
Help Map ID:	2104

### 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 when communicating with your analyzer	gpib7
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:	<b>System, I/O Config, SCPI LAN</b>
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
Help Map ID:	2106

### 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:	<b>System, I/O Config, SCPI LAN</b>
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
Help Map ID:	50007

### SCPI Socket Control Port (Remote Command Only)

Returns the TCP/IP port number of the control socket associated with the SCPI socket session. This

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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.

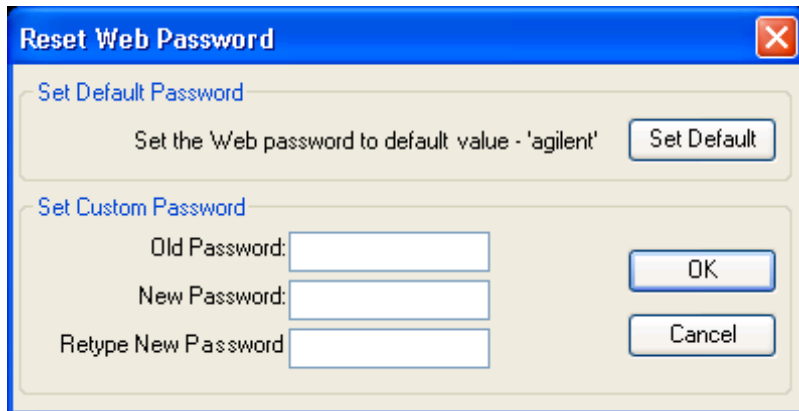
If this SCPI command is sent to a non SCPI Socket interface, then 0 is returned.

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
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	0

**Reset Web Password**

The embedded web server contains certain capability which are password protected; modifying the LAN configuration of the instrument, and access to web pages that can change the settings of the instrument. The default password from the factory is ‘agilent’ (without the quotes). The control provided here is the means to set the web password as the user desires, or to reset the password to the factory default.

Selecting Reset web password brings up a control for resetting the password as the user desires, or to the factory default. A keyboard is required to change the password from the factory default of ‘agilent’ or to set a new password that contains alphabetic characters. The control is:



If this control is entered without an external keyboard or mouse connected, you can cancel the control by pressing the Cancel (ESC) front-panel key.

Key Path:	<b>System, I/O Config</b>
Mode:	All

Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3600

## LXI

Opens a menu that allows you to access the various LXI configuration properties.

Key Path:	<b>System, I/O Config</b>
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3606

## LAN Reset

Resets the LAN connection.

Key Path:	<b>System, I/O Config, LXI</b>
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3500

## 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.

Key Path:	<b>System, I/O Config</b>
Mode:	All
Remote Command:	:SYSTem:IDN <string> :SYSTem:IDN?
Notes:	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  Null string as parameter restores the Factory setting
Preset:	This is unaffected by Preset but is set to the original factory setting on a "Restore System Defaults->Misc"
State Saved:	No
Initial S/W Revision:	A.06.00

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Help Map ID:	3667
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**Factory**

This key selects the factory setting, for example:

“Agilent Technologies,N9020A,MY00012345,A.05.01”

where the fields are manufacturer, model number, serial number, firmware revision.

Key Path:	<b>System, I/O Config, IDN Response</b>
Example:	:SYST:IDN "" null string, restores the factory setting
Initial S/W Revision:	A.06.0
Help Map ID:	3665

**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.

Key Path:	<b>System, I/O Config, IDN Response</b>
Example:	:SYST:IDN “XYZ Corp,Model 12,012345,A.01.01” user specified response
Initial S/W Revision:	A.06.00
Help Map ID:	3666

**Query USB Connection (Remote Command Only)**

Enables you to determine the speed of the USB connection.

Mode:	All
Remote Command:	:SYSTem:COMMunicate:USB:CONNectioN?
Example:	:SYST:COMM:USB:CONN?

Notes:	<p>NONE – Indicates no USB connection has been made.</p> <p>LSpeed – Indicates a USB low speed connection (1.5 Mbps).</p> <p>This is reserved for future use, the T+M488 protocol is not supported on low speed connections.</p> <p>HSPeed – Indicates that a USB high speed connection (480 Mbps) has been negotiated.</p> <p>FSPEED – Indicates that a USB full speed connection (12 Mbps) has been negotiated.</p>
State Saved:	No
Range:	NONE LSpeed HSPeed FSPEED
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	0

### USB Connection Status (Remote Command Only)

Enables you to determine the current status of the USB connection.

Mode:	All
Remote Command:	:SYSTem:COMMunicate:USB:STATus?
Example:	:SYST:COMM:USB:STAT?
Notes:	<p>SUSPended – Indicates that the USB bus is currently in its suspended state. The bus is in the suspended state when:</p> <p>The bus is not connected to any controller</p> <p>The controller is currently powered off</p> <p>The controller has explicitly placed the USB device into the suspended state.</p> <p>When in the suspended state, no USB activity, including start of frame packets are received.</p> <p>ACTive – Indicates that the USB device is in the active state. When the device is in the active state, it is receiving periodic start of frames but it isn't necessarily receiving or transmitting data.</p>
State Saved:	No
Range:	SUSPended ACTive
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	0

### USB Packet Count (Remote Command Only)

Enables you to determine the number of packets received and transmitted on the USB bus.

Mode:	All
Remote Command:	:SYSTem:COMMunicate:USB:PACKets?
Example:	:SYST:COMM:USB:PACK?
Notes:	Two integers are returned. The first is the number of packets received since application invocation, the second is the number of packets transmitted since application invocation. If no packets have been received or transmitted the response is 0,0.  The packet count is initialized to 0,0 when the instrument application is started.
State Saved:	No
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	0

### 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.

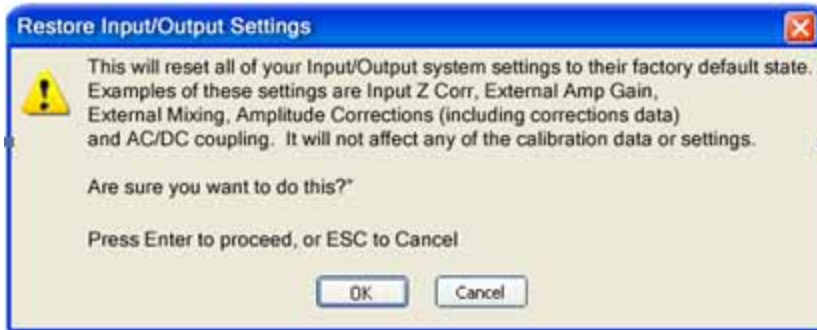
Key Path:	<b>System</b>
Mode:	All
Remote Command:	:SYSTem:DEFault [ALL]   ALIGn   INPut   MISC   MODes   PON
Example:	SYST:DEF
State Saved:	No
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2308

### 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:



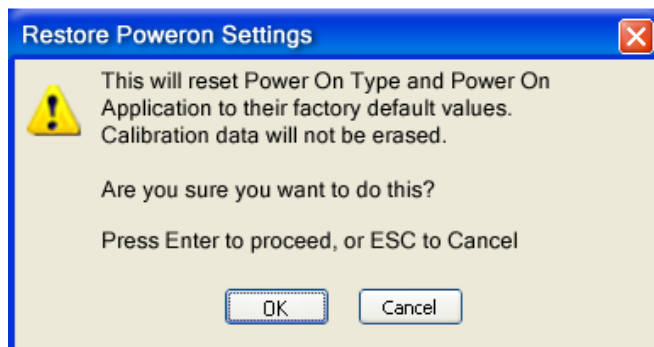


Key Path:	<b>System, Restore System Defaults</b>
Example:	:SYST:DEF INP
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2309

### 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:	<b>System, Restore System Defaults</b>
Example:	:SYST:DEF PON
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2310

### Restore Align Defaults

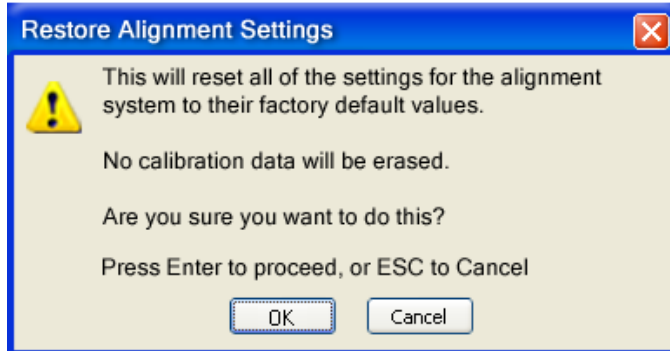
This selection causes the Alignment system settings to be a reset to their default values. This does not affect any Alignment data stored in the system. This level of Restore System Defaults does not affect any other system settings, mode settings and does not cause a mode switch.

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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:	<b>System, Restore System Defaults</b>
Example:	:SYST:DEF ALIG
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2311

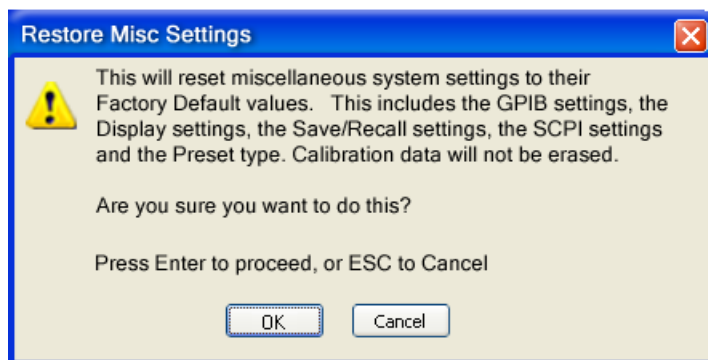
### Restore Misc Defaults

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
GPIB Address	18
Auto File Name Number	000
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

Miscellaneous Setting	Default Value
SICL Server	ON
Display Intensity	100
Display Backlight	ON
Display Theme	TDColor
System Annotation	ON
The SYST:PRES:TYPE	MODE

Confirmation is required to restore the factory default values. The confirmation dialog is:



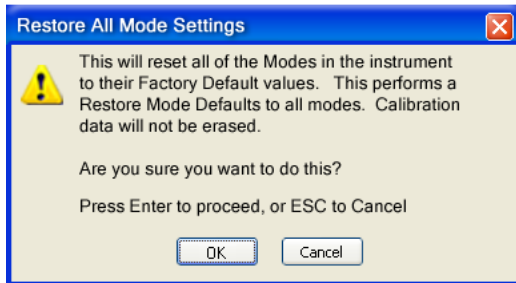
Key Path:	<b>System, Restore System Defaults</b>
Example:	:SYST:DEF MISC
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2312

### 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:

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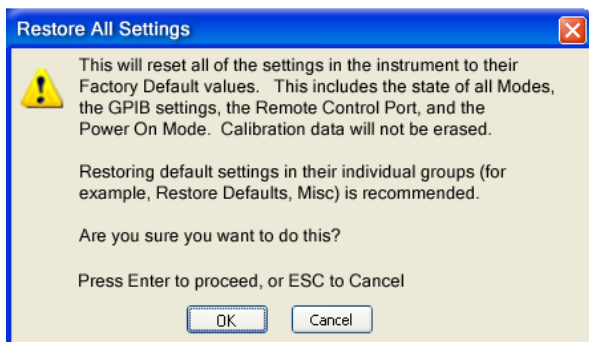


Key Path:	<b>System, Restore System Defaults</b>
Example:	:SYST:DEF MOD
Couplings:	An All Mode will cause the currently running measurement to be aborted, mode switch to the power-on mode and activate the default measurement for the power-on mode.. It gets the mode to a consistent state with all of the default couplings set.
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2313

**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:



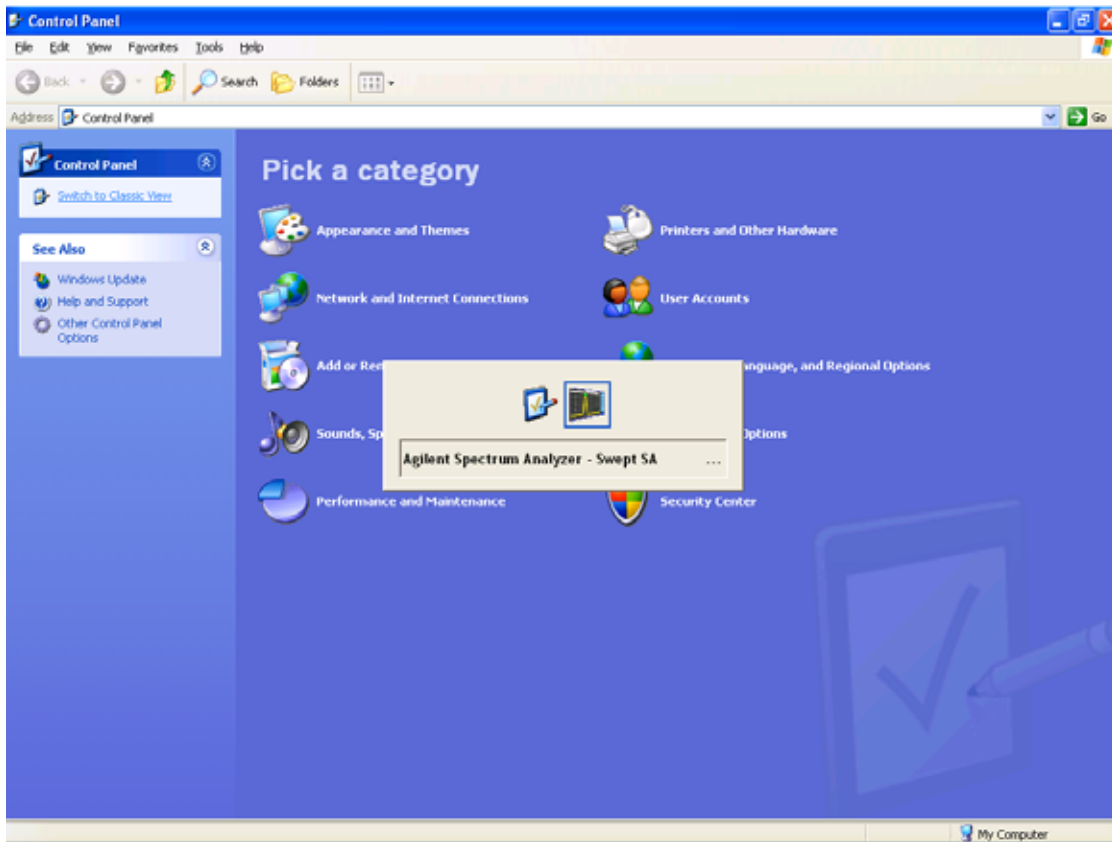
Key Path:	<b>System, Restore System Defaults</b>
Example:	:SYST:DEF ALL
Couplings:	An All will cause the currently running measurement to be aborted and get all modes to a consistent state, so it is unnecessary to couple any settings.
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2314


## 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.

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:	<b>System</b>
Notes:	No remote command for this key.
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2401

## Licensing...

Opens the license explorer.

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System

For Help on this key, select Help in the menu bar at the top of the license explorer window.

Key Path:	<b>System</b>
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
Help Map ID:	2402

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
Help Map ID:	0

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

Help Map ID:	0
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Remote Command:	:SYSTem:LKEY:LIST?
Notes:	<p>Return Value:</p> <p>An &lt;arbitrary block data&gt; of all the installed instrument licenses.</p> <p>The format of each license is as follows.</p> <p>&lt;Feature&gt;,&lt;Version&gt;,&lt;Signature&gt;,&lt;Expiration Date&gt;,&lt;Serial Number for Transport&gt;</p> <p>Return Value Example:</p> <p>#3136</p> <p>N9073A-1FP,1.000,B043920A51CA</p> <p>N9060A-2FP,1.000,4D1D1164BE64</p> <p>N9020A-508,1.000,389BC042F920</p> <p>N9073A-1F1,1.000,5D71E9BA814C,13-aug-2005</p> <p>&lt;arbitrary block data&gt; is:</p> <p>#NMMM&lt;data&gt;</p> <p>Where:</p> <p>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.</p> <p>MMM would be the ASCII representation of the number of bytes. In the previous example, N would be 55.</p> <p>&lt;data&gt; ASCII contents of the data</p>
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	0

Remote Command:	:SYSTem:LKEY? <"OptionInfo" >
Example:	SYST:LKEY? "N9073A-1FP"
Notes:	<p>The &lt;"OptionInfo"&gt; 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.</p> <p>Return Value:</p> <p>&lt;"LicenseInfo"&gt; if the license is valid, null otherwise.</p> <p>&lt;"LicenseInfo"&gt; contains the signature, the expiration date, and serial number if transportable.</p> <p>Return Value Example:</p> <p>"B043920A51CA"</p>
Initial S/W Revision:	Prior to A.02.00

## System Functions

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Help Map ID:	0
Remote Command:	:SYSTem:HID?
Notes:	Return value is the host ID as a string
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	0

## Security

Accesses capabilities for operating the instrument in a security controlled environment.

Key Path:	<b>System</b>
Initial S/W Revision:	A.04.00
Help Map ID:	3661

## USB

### Read-Write

Selection for allowing full read-write access to the USB ports.

Key Path:	<b>System, Security, USB</b>
Example:	:SYST:SEC:USB:WPR OFF      Will set USB ports to Read-Write
Initial S/W Revision:	A.04.00
Help Map ID:	3662

### Read only

Selection for disabling write access to the USB ports.

Key Path:	<b>System, Security, USB</b>
Example:	:SYST:SEC:USB:WPR ON      Will set USB ports to Read only
Initial S/W Revision:	A.04.00
Help Map ID:	3663

## Diagnostics

The Diagnostics key in the System menu gives you access to basic diagnostic capabilities of the instrument.

Key Path:	<b>System</b>
-----------	---------------



Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2445

### Show Hardware Statistics

Provides a display of various hardware statistics. The statistics include the following:

Mechanical relay cycles

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 which omit the mech atten fields are the N9000A–503/507 models.

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
Help Map ID:	2446

### SCPI for Show Hardware Statistics ( Remote Commands Only)

Each of the hardware statistic items can be queried via SCPI.

[“Query the Mechanical Relay Cycle Count” on page 222](#)

[“Query the Operating Temperature Extremes” on page 222](#)

[“Query the Elapsed Time since 1st power on” on page 223](#)

#### Query the Mechanical Relay Cycle Count

Return the count of mechanical relay cycles. For N9038A model, there are additional 2 Mechanical Relays which are <N9038A Input2>, <N9038A Bypass>.

Remote Command:	:SYSTem:MRELAy:COUNT?
Example:	:SYST:MREL:COUN?
Notes:	<p>Query Only</p> <p>The return value is a comma separated list of the individual counts for each mechanical relay.</p> <p>The position of the relays in the list is:</p> <p>“&lt;Cal Signal&gt;,&lt;AC/DC&gt;,&lt;2dB #1 Atten&gt;,&lt;2dB #2 Atten&gt;,&lt;6dB Atten&gt;,&lt;10dB Atten&gt;,&lt;20dB Atten&gt;,&lt;30dB Atten&gt;,&lt;Fixed Atten&gt;,&lt;Low Noise Path Switch&gt;,&lt;Presel Bypass&gt;,&lt;N9038A Input2&gt;, &lt;N9038A Bypass&gt;”</p> <p>Items in the list not pertaining to your particular hardware configuration will return as -999 for those items.</p>
Dependencies:	This SCPI command is NOT supported by the E6607C model.
Initial S/W Revision:	Prior to A.02.00
Modified at S/W Revision:	A.08.00
Help Map ID:	0

#### Query the Operating Temperature Extremes

Returns the low operating temperature extreme value. The value survives a power-cycle and is the temperature extreme encountered since the value was reset by the factory or service center.

Mode:	All
Remote Command:	:SYSTem:TEMPerature:LEXTreme?
Example:	:SYST:TEMP:LEXT?

Notes:	Value is in degrees Celsius at which the lowest operating temperature has been recorded since 1st power-up.
State Saved:	No
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	0

Mode:	All
Remote Command:	:SYSTem:TEMPerature:HEXTreme?
Example:	:SYST:TEMP:HEXT?
Notes:	Value is in degrees Celsius at which the highest operating temperature has been recorded since 1st power-up.
State Saved:	No
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	0

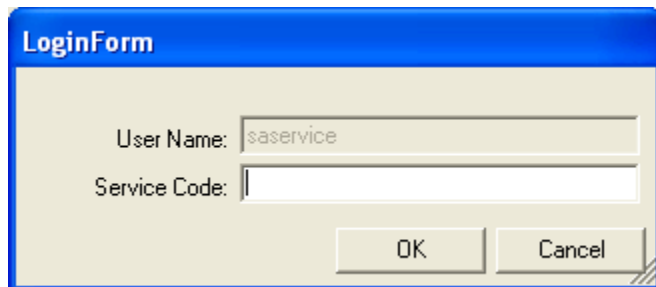
**Query the Elapsed Time since 1st power on**

Returns the elapsed on-time in minutes since 1<sup>st</sup> power-on.

Remote Command:	:SYSTem:PON:ETIMe?
Example:	:SYST:PON:ETIM?
Notes:	Query Only
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	0

**Advanced**

Accesses advanced diagnostic capabilities performed in the factory or under instructions from repair procedures. This menu key is only visible when the logged-in user is “saservice”. The first access to the Advanced Diagnostic Menu after invoking the instrument application will require an authentication, which is to enter the Service Code. Subsequent accesses to the Advanced Diagnostic Menu are unimpeded. The Authentication dialog looks like:



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“OK” is the default key thus the Enter key is used to complete the entry. If invalid Service Code is entered authentication is not granted and you are provided the following dialog:



Key Path:	<b>System, Diagnostics</b>
Notes:	Password is required to access this menu.
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3498

**Self test**

This key gives you access to diagnostic capabilities for self tests of the instrument.

Key Path:	<b>System, Diagnostics</b>
Initial S/W Revision:	Prior to A.10.00
Help Map ID:	50000

**All Self Test**

This key invokes all the self tests defined in the Diagnostics Self Test section.

Key Path:	<b>System, Diagnostics, Self Test</b>
Remote Command:	:SYSTem:TEST:WCTS:[ALL]
Example:	SYST:TEST:WCTS:[ALL]
Initial S/W Revision:	A.12.50
Help Map ID:	50011

**Source Self Test**

This key invokes the internal source self test. When operation is complete, the generated test summary file is: E:\Agilent\Instrument\CRFSSelfTestLog.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\ CRFSSelfTestLog.txt”

If the self test passes, an advisory message “Source self-test completed successfully” is generated.

Key Path:	<b>System, Diagnostics, Self Test</b>
Remote Command:	:SYSTem:TEST:WCTS:SOURce
Example:	SYST:TEST:WCTS:SOURce
Notes:	Access log with command : MMEM:DATA? "E:\Agilent\Instrument\CRFSSelfTestLog.txt"  Alias of source self test (:SOURce:SELF:TEST[:ALL])
Initial S/W Revision:	A.10.00
Help Map ID:	50001

### RFIO Self Test

This key invokes the RFIO ports self test for embedded MPA, which just are available on E6607C. When operation is completed, the generated test summary information is appended to log file E:\Agilent\Instrument\RFIOTestLog.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\RFIOTestLog.txt”

If the self test passes, an advisory message “RFIO self-test completed successfully” is generated.

Key Path:	<b>System, Diagnostics, Self Test</b>
Remote Command:	:SYSTem:TEST:WCTS:MPADapter
Example:	SYST:TEST:WCTS:MPAD
Notes:	Access log with command :  MMEM:DATA? "E:\ Agilent\Instrument\RFIOTestLog.txt"
Initial S/W Revision:	A.12.50
Help Map ID:	50012

---

**NOTE** This function is NOT available on EXT E6607A and E6607B models.

---

### FEC Self Test

This key invokes the EXT E6607C froned 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”

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If the self test passes, an advisory message “FEC self-test completed successfully” is generated.

Key Path:	<b>System, Diagnostics, Self Test</b>
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
Help Map ID:	50013

---

**NOTE** This function is NOT available on EXT E6607A and E6607B models.

---

**Show Result**

This key gives you access to show results of the following self tests:

“[Source Self Test Results](#)” on page 226

E6607C embedded MPA self-test results - “[RFIO Self Test REsults](#)” on page 228

E6607C FEC self-test results - “[FEC Self Test REsults](#)” on page 229

Key Path:	<b>System, Diagnostics, Self Test</b>
Initial S/W Revision:	A.12.50
Help Map ID:	50014

**Source Self Test Results**

Provides a display of last source 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 source test item, the tabular data should be directly printable.

Key Path:	<b>System, Diagnostics, Self Test, Show Results</b>
Remote Command:	: SYSTem: TEST: WCTS: SHOW: RESult SOURce
Example:	SYST:TEST:WCTS:SHOW:RES SOUR
Initial S/W Revision:	A.12.50
Help Map ID:	50015

The example of source self test result display is as follows:

Source Self Test Results					
Produce Number: E6607B					
Serial Number: MY51380425					
Instrument S/W: 11/15/2012 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
ModulatorTest					
Date	Time(GMT)	Name	MeasValue	ValidRange	Result
11/23/2012	16:13:57	LOLevel_vs_DET_LO	-1.108	-2.200 - 2.200	Pass
11/23/2012	16:13:57	LOLevel_vs_LEVEL_DET	1.010	-1.100 - 1.100	Pass
11/23/2012	16:13:57	LOLevel_vs_LEVEL_REF	1.995	0.500 - 2.500	Pass
11/23/2012	16:13:57	QUAD_vs_DET_LO	-0.879	-1.100 - 1.100	Pass
11/23/2012	16:13:57	QUAD_vs_LEVEL_DET	0.000	-1.100 - 1.100	Pass
11/23/2012	16:13:57	QUAD_vs_LEVEL_REF	0.000	-0.300 - 0.300	Pass
11/23/2012	16:13:57	QUAD_vs_QUAD_LOOP	0.885	0.350 - 1.100	Pass
IQModulatorTest					
Date	Time(GMT)	Name	MeasValue	ValidRange	Result
11/23/2012	16:13:57	VBLO_DAC	0.154	0.000 - 0.500	Pass
11/23/2012	16:13:57	AMP_BIAS1	145.154	132.000 - 185.000	Pass
11/23/2012	16:13:57	AMP_BIAS2	145.740	132.000 - 185.000	Pass
11/23/2012	16:13:57	OFFSET_QN	0.119	0.100 - 0.125	Pass
11/23/2012	16:13:57	OFFSET_QP	0.121	0.100 - 0.125	Pass

**Show Source Self Test Results contents (Remote Command Only)**

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

Remote Command:	:SYSTem:TEST:WCTS:SOURce:RESult?
Example:	SYST:TEST:WCTS:SOUR:RES?

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System

Notes:	The output is an IEEE Block format of the Show Source Self Test Results contents. Each line is separated with a new-line character.
Initial S/W Revision:	A.12.50
Help Map ID:	0

**RFIO Self Test Results**

Provides a display of last RFIO test results for embedded MPA of E6607C, 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 RFIO test item, the tabular data should be directly printable.

Key Path:	<b>System, Diagnostics, Self Test, Show Results</b>
Remote Command:	:SYSTem:TEST:WCTS:SHOW:RESult MPADapter
Example:	SYST:TEST:WCTS:SHOW:RES MPAD
Initial S/W Revision:	A.12.50
Help Map ID:	50016

---

**NOTE** This function is NOT available on EXT E6607A and E6607B models.

---

The example of RFIO self test result display is as following:

RFIO Self Test Results					
Produce Number: E6607C					
Serial Number: MY51380437					
Instrument S/W: 11/16/2012 2:51:19 PM					
CarrierClockTest	16:13:56				
Date	Time(GMT)	Name	MeasValue	ValidRange	Result
11/23/2012	16:13:57	Dig FPGA 100 MHz	1.000	1.000 - 1.000	Pass
11/23/2012	16:13:57	Feldspar CCLK	1.000	1.000 - 1.000	Pass
11/23/2012	16:13:57	Feldspar LVDS	1.000	1.000 - 1.000	Pass
11/23/2012	16:13:57	Dig FPGA LVDS	1.000	1.000 - 1.000	Pass
11/23/2012	16:13:57	Dig FPGA 200 MHz	1.000	1.000 - 1.000	Pass
DetectorTest					
Date	Time(GMT)	Name	MeasValue	ValidRange	Result
11/23/2012	16:13:57	ABUS_DET_SYNTH	29.879	14.400 - 100.000	Pass
11/23/2012	16:13:57	ABUS_DET_LO	18.136	9.000 - 100.000	Pass
11/23/2012	16:13:57	ABUS_DET_MOD	13.556	6.600 - 100.000	Pass



11/23/2012	16:13:57	ABUS_DET_MOD_FLT	18.000	7.800 - 100.000	Pass
FilterBankTest1					
Date	Time(GMT)	Name	MeasValue	ValidRange	Result
11/23/2012	16:13:57	Bank1_LPF_550MHz	30.357	>= 10.000	Pass
11/23/2012	16:13:57	Bank1_LPF_750MHz	29.358	>= 10.000	Pass
11/23/2012	16:13:57	Bank1_LPF_1020MHz	27.036	>= 10.000	Pass
11/23/2012	16:13:57	Bank1_LPF_1600MHz	27.594	>= 10.000	Pass
11/23/2012	16:13:57	Bank1_LPF_2400MHz	21.490	>= 10.000	Pass
11/23/2012	16:13:57	Bank1_LPF_3000MHz	18.476	>= 10.000	Pass
11/23/2012	16:13:57	OFFSET_QP	0.121	0.100 - 0.125	Pass

#### Show RFIO Self Test Results contents (Remote Command Only)

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

Remote Command:	:SYSTem:TEST:WCTS:MPADapter:RESult?
Example:	SYST:TEST:WCTS:MPAD:RES?
Notes:	The output is an IEEE Block format of the Show RFIO Self Test Results contents. Each line is separated with a new-line character.
Initial S/W Revision:	A.12.50
Help Map ID:	0

#### 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:	<b>System, Diagnostics, Self Test, Show Results</b>
Remote Command:	:SYSTem:TEST:WCTS:SHOW:RESult FEC
Example:	SYST:TEST:WCTS:SHOW:RES FEC
Initial S/W Revision:	A.12.50
Help Map ID:	50017

This function is NOT available on EXT E6607A and E6607B models.

**System Functions**  
**System**

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 - 0.200	Pass
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
Help Map ID:	0

### Multiport Adapter Cables Test

This key gives you access to diagnostic capabilities for the RF and trigger cable connections between EXT and Multiport Adapter with this instrument, which include:

EXT RF Input <-> Multiport Adapter RF OUT

EXT RF Output <-> Multiport Adapter RF IN

EXT RF IO2 <-> Multiport Adapter GPS IN

EXT Trigger 1<-> Multiport Adapter Trigger 1

EXT Trigger 2 <-> Multiport Adapter Trigger 2

Key Path:	<b>System, Diagnostics</b>
Remote Command:	:CALibration:MPADapter:CABLes:TEST
Example:	:CAL:MPAD:CABL:TEST
Notes:	If the Multiport Adapter cables are not connected correctly. It will report the proper error, for example: “-330, Self-test failed, MPA’S RF IN or RF OUT not properly connected”.
Dependencies:	This key does not appear unless a multiport adapter is plugged in to the USB. Grayout error: -221.1400; Multiport Adapter Not Available
Initial S/W Revision:	A.10.0
Help Map ID:	50018

### Quick Test ...

This key gives you access to launch a Windows program for conducting a confidence check of the Agilent EXT Wireless Communications Test Set and the E6617A Multiport Adapter connected to EXT. The operator must exit Quick Test to return to the instrument application.

Key Path:	<b>System, Diagnostics</b>
Notes:	Operator is responsible for exiting the Quick Test and returning focus to the Instrument Application.  The softkey in the menu is only displayed when the instrument is an EXT and the EXTQuickTest.exe file is present in the C:\Program Files\Agilent\EXTQuickTest folder.

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Initial S/W Revision:	A.09.49
Help Map ID:	50019

	Agilent 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?

### Service

Accesses capabilities performed in the factory or under instructions from repair procedures. This menu key is only visible when the logged-in user is “advanceduser” or “saservice”. The first access to the Service Menu after invoking the instrument application will require an authentication Service Code.

Key Path:	<b>System</b>
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	2500

### 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:	<b>System</b>
Mode:	<b>All</b>
Notes:	No equivalent remote command for this key.
Initial S/W Revision:	A.05.01
Help Map ID:	3671

### System Remote Commands (Remote Commands Only)

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

[“System Powerdown \(Remote Command Only\)” on page 233](#)

“List installed Options (Remote Command Only)” on page 233

“Lock the Front-panel keys (Remote Command Only)” on page 233

“List SCPI Commands (Remote Command Only)” on page 234

“SCPI Version Query (Remote Command Only)” on page 234

“Date (Remote Command Only)” on page 235

“Time (Remote Command Only)” on page 235

Initial S/W Revision:	Prior to A.02.00
Help Map ID:	0

### System Powerdown (Remote Command Only)

Remote Command:	:SYSTem:PDOWn [NORMal   FORCe]
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.
Help Map ID:	0

### List installed Options (Remote Command Only)

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

Mode:	All
Remote Command:	:SYSTem:OPTions?
Example:	:SYST:OPT?
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
Help Map ID:	0

### 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

**System Functions**  
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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:	:SYSTem:KLOCK OFF ON 0 1 :SYSTem:KLOCK?
Example:	:SYST:KLOC ON
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
Help Map ID:	0

**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
Help Map ID:	0

**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
Help Map ID:	0

### 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
Help Map ID:	0

### 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
Help Map ID:	0

## 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

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
Help Map ID:	2024

## 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:	<b>User Preset</b>
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
Help Map ID:	2302

## 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.

## System Functions

### User Preset

Sets the Status Byte to 0.

Key Path:	<b>User Preset</b>
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
Help Map ID:	2303

### 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:	<b>User Preset</b>
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
Help Map ID:	2304

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.

## 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 specific for n=1	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.		
		<table border="1"> <thead> <tr> <th>Step</th> <th>Result</th> </tr> </thead> </table>	Step	Result
		Step	Result	
		1	Total number of real values returned for the Sequence, including this one.	
		2	Reserved for Agilent 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			

Condition (ctd)	N (ctd)	Results Returned (ctd)
Mode = Sequence Analyzer	Not specified or n=1	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?
	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.
	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. 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 246.](#)

In addition, the results of a specific Acquisition can be queried 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 relating to the sequence as a whole are removed.

Step	Result
1	Total number of real values returned for this SCPI command, including this one.
2	Reserved for Agilent use.

Step	Result
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.

It is also possible to query the results for a specific analysis step within a specific acquisition:

```
: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 in the following table.

Step	Result
1	Total number of real values returned for this SCPI command, including this one.
2	Reserved for Agilent use.

Step	Result
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 results for the entire sequence can still be queried using the FETC:LSEQ1? detailed above.

To query the actual average count of a 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?
```

---

**NOTE** The returned actual average count should be equal to the Avg Number if Ignore Error In Average is OFF, and might be less than or equal to the user setting Avg Number when Ignore Error In Average is set to ON.

---

Asynchronous FETCh SCPI commands are used to get the results back as soon as possible once the queried results are available. Unlike the normal FETCh commands, the asynchronous FETCh commands do not require you to wait for completion of the entire sequence. For example, you can get the results of the 1st acquisition while the instrument is performing the 2nd or the 3rd acquisition, provided you are using asynchronous FETCh commands.

```
: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 for :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 for  
: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 a 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
Help Map ID	35012

---

**Example for two Acquisitions, each containing two**

## Analysis Steps

Condition	N	Results Returned																																																																					
Mode = Sequence Analyzer	Not specifi edor n=1	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 (only the result column is returned the other columns are for guidance only);																																																																					
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List Sequencer

Example for two Acquisitions, each containing two Analysis Steps

Condition (cnt)	N (cnt)	Results Returned																																							
Mode = Sequence Analyzer	Not specified n=1	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 (only the result column is returned the other columns are for guidance only);																																							
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		1	Analysis Interval 2 Measurement Bit Map - decimal representation	86																																					
		1	Integrity value for Transmit Power in Analysis Interval 2	87																																					
		1	Number of results in Transmit Power in Analysis Interval 2	88																																					
		4	Measurement results for Transmit Power in Analysis Interval 2	92																																					
		1	Integrity value for W-CDMA Mod Acc in Analysis Interval 2	93																																					
		1	Number of results in W-CDMA Mod Acc in Analysis Interval 2	94																																					
24	Measurement results for W-CDMA Mod Acc in Analysis Interval 2	118																																							

Key Path	<b>Meas</b>
Mode	Sequence Analyzer
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Help Map ID	0

## 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

Index	Result Details
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
Help Map ID	0

## 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
Help Map ID	0

## Basic Discrete PAVT Results

Basic Discrete PAVT (Phase Amplitude versus Time) measures the amplitude, phase and frequency errors of steps.

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
Help Map ID	0

## Basic IQ Data Results

Basic IQ Data returns IQ data for Phase Amplitude versus Time measurement.

Basic IQ Data 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.

List Sequencer  
Measurement Results

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 IQ Data results is 8. 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 IQ Data results is 4.

Metric Results returned are:

Index	Result Details
0	Number of IQ Pairs or Amplitude/Phase Pairs.
1	Info Bandwidth used to capture IQ Pairs.
2	Sample Interval used to capture IQ Pairs.
3	Sample Frequency used to capture IQ Pairs
4	Peak power of the measurement interval. Available since S/W Revision A.09.05. NAN will be returned if the measurement type is set to IQ samples pairs (see “Measurement Type” on page 502.)
5	Average power of the measurement interval. Available since S/W Revision A.09.05. NAN will be returned if the measurement type is set to IQ samples pairs (see “Measurement Type” on page 502.)

Key Path	Meas
Initial S/W Revision	A.05.00
Help Map ID	0

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**NOTE** Refer to “Basic IQ Data Setup” on page 501 and “Measurement Type” on page 502 to configure the result type of Basic IQ data. You can choose to return the basic IQ results as raw IQ sample pairs or Amplitude and Phase pairs. If you configure the Basic IQ to return Amplitude/Phase pairs, the phase of the 1st sample will always be returned as 0.

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In order to save transmission time, the IQ sample pairs, or amplitude and phase pairs, can only be retrieved by binary fetch commands:

- **:FETCH:LSEQuencer [1] :ACQuire [1] | 2 | ... | 512:ASTep [1] | 2 | ... | 1000 :BIQData:IAMPlitude?**  
The command should be used to get the I samples or Amplitude of specified Basic IQ data measurement in binary format. (IEE488 block)
- **:FETCH:LSEQuencer [1] :ACQuire [1] | 2 | ... | 512:ASTep [1] | 2 | ... | 1000 :BIQData:QPHase?**  
This command should be used to get the Q samples or Phase of specified Basic IQ data measurement



in binary format. (IEE488 block)

The two query commands return IQ samples, or Amplitude and Phase pairs, as an IEEE488 definite length arbitrary block. An IEEE488 arbitrary block comprises an ASCII header followed by a payload of arbitrary data, in this case data in binary form. The binary data is transmitted as 32 bit single precision floating point array (IEEE754 format).

This measurement returns a maximum of 20000 IQ pairs for the specified analysis interval. If there are more IQ pairs in the capture, they will not be returned.

## 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 last data acquired at the end of a set of averages. If averaging is on, the power is for the last 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

List Sequencer  
Measurement Results

Index	Result Details
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	<p>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).</p> <p>Note: The returned value in Sync (Synchronization Burst) is.</p> <p>10 if (BN42, BN43..BN105) = (1,0,1,1,1,0,0,1,0,1,1,0,0,0,1,0,0,0,0,0,1,0,0,0,0,0,1,1,1,0,0,1,0,1,1,0,1,0,1,0,0,0,1,1,0,1,1)</p> <p>11 if (BN42, BN43..BN105) = (1,1,1,0,1,1,1,0,0,1,1,0,1,0,1,1,0,0,1,0,1,0,0,0,0,0,1,1,1,1,1,0,1,1,1,0,1,0,0,0,1,1,1,1,1,0,1,1)</p> <p>12 if (BN42, BN43..BN105) = (1,1,1,0,1,1,0,0,0,0,1,1,0,1,1,1,0,1,0,1,0,0,0,1,0,1,0,0,0,1,0,1,0,1,1,0,1,0,0,0,1,0,1,0,1,1,0,1,0,0,0,0,0,1,0,0,0,0,0,1,0,0,0,0,1,1,0,1,0,0,1,1,0)</p> <p>The returned value in Access (Access Burst) is</p> <p>20 if (BN8, BN9..BN48) = (0,1,0,0,1,0,1,1,0,1,1,1,1,1,1,0,0,1,1,0,0,1,1,0,1,0,1,0,1,0,0,0,1,1,1,1,0,0,0)</p> <p>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)</p> <p>22 if (BN8, BN9..BN48) = (1,1,1,0,1,1,1,1,0,0,1,0,0,1,1,1,0,1,0,1,0,1,1,0,0,0,0,1,1,0,1,1,0,1,1,0,1,1,1)</p>
12	<p>Detected Mod scheme is the most recently detected modulation scheme. The returned value is as follows.</p> <p>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</p>
13	Estimated Carrier Power (ECP) in dBm
14	<p>Time Offset Power Results in dB</p> <p>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</p> <p>If averaged number N &gt; 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.</p> <p>12 Time Offsets can be set by SCPI commands, please see <a href="#">“PVT Time Offsets” on page 517</a> for details.</p>

Key Path	Meas
Initial S/W Revision	A.05.00

Help Map ID	0
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## 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

List Sequencer  
**Measurement Results**

Index	Result Details
1	<p>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:</p> <p>Negative offset(a) - power relative to carrier (dB)</p> <p>Negative offset(a) - absolute average power (dBm)</p> <p>Positive offset(a) - power relative to carrier (dB)</p> <p>Positive offset(a) - absolute average power (dBm)</p> <p>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 results/offset) *(15 offsets) *(2 measurement types: modulation &amp; switching)</p> <p>Carrier – modulation measurement values</p> <p>Offset 1 – modulation measurement values and so on</p> <p>~</p> <p>Offset 14 – modulation measurement values</p> <p>Carrier – switching transients measurement values</p> <p>Offset 1 – switching transients measurement values</p> <p>~</p> <p>Offset 14 – switching transients measurement values and so on</p>

Index	Result Details
2	<p>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:</p> <ol style="list-style-type: none"> <li>1. Relative level to the test limit (dB) at the negative offset frequency</li> <li>2. Relative level to the test limit (dB) at the positive offset frequency</li> <li>3. Relative test limit used (dB)</li> <li>4. Absolute test limit used (dBm)</li> </ol> <p>Values for all possible offsets are returned.</p> <p>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.</p> <p>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.</p> <p>The total number of values returned is:</p> $120 = (4 \text{ results / offset}) * (15 \text{ offset frequencies}) * (2 \text{ measurement types})$ <p>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</p>
3	<p>PCL is the Power Control Level that is determined by the Transmit Power and used to determine the limits</p>

Key Path	Meas
Initial S/W Revision	A.05.00
Help Map ID	0

### 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:

List Sequencer  
**Measurement Results**

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.

Index	Result Parameter
9	<p>Maximum of the Peak Phase Error Symbol Position</p> <p>A floating point number (in symbols) representing the symbol number at which the peak phase error occurred.</p>
10	<p>Average Frequency Error</p> <p>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.</p>
11	<p>Maximum Frequency Error</p> <p>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</p>
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

List Sequencer  
**Measurement Results**

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	<b>Meas</b>
Initial S/W Revision	A.05.00
Help Map ID	0

**EDGE EVM 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)



Index	Result Parameter
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

List Sequencer  
Measurement Results

Index	Result Parameter
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

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
Help Map ID	0

## 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> <p>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> <p>Lower Offset A – relative limit test result</p> <p>Lower Offset A – absolute limit test result</p> <p>Upper Offset A – relative limit test result</p> <p>Upper Offset A – absolute limit test result</p> <p>Lower Offset B – relative limit test result</p> <p>Lower Offset B – absolute limit test result</p> <p>Upper Offset B – relative limit test result</p> <p>Upper Offset B – absolute limit test result</p> <p>...</p> <p>Lower Offset F – relative limit test result</p> <p>Lower Offset F – absolute limit test result</p> <p>Upper Offset F – relative limit test result</p> <p>Upper Offset F – absolute limit test result</p>
1	<p>Carrier Powers</p> <p>Returns 3 scalar values representing overall pass/fail, carrier power, and reference carrier power</p> <p><b>Overall Pass/Fail</b></p> <p><b>Total Carrier Power</b></p> <p><b>Reference Carrier Power</b></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>

List Sequencer  
Measurement Results

Index	Result Details
2	Power Results Channel (1) – relative power Channel (1) – absolute power Channel (2) – relative power Channel (2) – absolute power ... Channel (12) – relative power Channel (12) – absolute power Lower offset A – relative power Lower offset A – absolute power Upper offset A – relative power Upper offset A – absolute power Lower offset B – relative power Lower offset B – absolute power Upper offset B – relative power Upper offset B – absolute power ... Lower offset F – relative power Lower offset F – absolute power Upper offset F – relative power Upper offset F – absolute power 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

Key Path	Meas
Initial S/W Revision	A.05.00
Help Map ID	0

### SEM 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

Index	Result Details
1	<p><b>Main results</b></p> <ol style="list-style-type: none"> <li>1. Absolute power at centre frequency (reference) area (dBm)</li> <li>2. Peak frequency in the centre frequency (reference) area (Hz)</li> <li>3. Relative integrated power on the negative offset A (dBc)</li> <li>4. Absolute integrated power on the negative offset A</li> <li>5. Relative peak power on the negative offset A (dBc)</li> <li>6. Absolute peak power on the negative offset A</li> <li>7. Peak power offset frequency from the centre frequency in the negative offset A (Hz)</li> <li>8. Relative integrated power on the positive offset A (dBc)</li> <li>9. Absolute integrated power on the positive offset A</li> <li>10. Relative peak power on the positive offset A (dBc)</li> <li>11. Absolute peak power on the positive offset A</li> <li>12. Peak power offset frequency from the centre frequency in the positive offset A (Hz)</li> <li>13. Relative integrated power on the negative offset B (dBc)</li> <li>...</li> <li>61. Absolute peak power on the positive offset F</li> <li>62. Peak power offset frequency from the centre frequency in the positive offset A (Hz)</li> <li>63. Minimum margin from the limit line on the negative offset A (db)</li> <li>64. Minimum margin from the limit line on the positive offset A (db)</li> <li>65. Minimum margin from the limit line on the negative offset B (db)</li> <li>66. Minimum margin from the limit line on the positive offset B (db)</li> <li>67. Minimum margin from the limit line on the negative offset C (db)</li> <li>68. Minimum margin from the limit line on the positive offset C (db)</li> <li>69. Minimum margin from the limit line on the negative offset D (db)</li> <li>70. Minimum margin from the limit line on the positive offset D (db)</li> <li>71. Minimum margin from the limit line on the negative offset E (db)</li> <li>72. Minimum margin from the limit line on the positive offset E (db)</li> <li>73. Minimum margin from the limit line on the negative offset F (db)</li> <li>74. Minimum margin from the limit line on the positive offset F (db)</li> </ol> <p>The unit for the absolute power results (listed in <i>italics</i>) 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</p>

Key Path	<b>Meas</b>
Initial S/W Revision	A.05.00
Help Map ID	0

## 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 1. Occupied Bandwidth (Hz) 2. Transmit Frequency Error (Hz) 3. x dB bandwidth (Hz)

Key Path	<b>Meas</b>
Initial S/W Revision	A.05.00
Help Map ID	0

## Modulation Accuracy Results

The Modulation Accuracy (Rho) measurement used in the WCDMA, CDMA2000, 1xEv-DO, TD-SCDMA, LTE-FDD, and LTE-TDD 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

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



Index	Result Parameter
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	<p>DPCCH Slot Format: (floating) If Sync Type is DPCCH, the DPCCH slot format value used for synchronization is returned.</p> <p>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</p> <p>- If Sync Type is PRACH, the value returned is -999.0. - In BTS mode, the value returned is -999.0</p>
20	<p>Preamble Signature: (floating)</p> <p>- BTS mode The returned value is always -999.0.</p> <p>- 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.</p>
21	Average Peak EVM (Average Peak) is a floating point number (in percent) of the average of Peak EVM readings on each slot over the entire measurement area.

### 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

List Sequencer  
**Measurement Results**

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

Index	Result Parameter
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
Help Map ID	0

### 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)

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Measurement Results

Index	Result Parameter
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

Index	Result Parameter
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)))

List Sequencer  
Measurement Results

Index	Result Parameter
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
Help Map ID	0

### LTE FDD Modulation Accuracy Results

#### General Results for LTE FDD Modulation Accuracy

LTE FDD Modulation Accuracy General 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 General 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 tested
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)

Index	Result Parameter
28	Reference Signal Rx Quality
29	Magnitude Error (%)
30	Phase Error (radians)

Key Path	Meas
Initial S/W Revision	A.09.50
Help Map ID	0

### Spectrum Flatness Equalizer Channel Frequency Results for LTE FDD Modulation Accuracy

LTE FDD Modulation Accuracy Spectrum Flatness Equalizer Channel Frequency 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[:ECFR equency?]` or by the asynchronous form of the command, `: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 equalizer channel frequency 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
Help Map ID	0

### Spectrum Flatness Ripple Results for LTE FDD Modulation Accuracy

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 by the asynchronous form of the command, `: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
Help Map ID	0

### Inband Emission Power Results for LTE FDD Modulation Accuracy

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 by the asynchronous form of the command,

List Sequencer  
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```
:FETCh:LSEQuencer:ASYNc:ACQuire{1:512}:ASTep{1:1000}:IEMission[:POWer]?/qonly/
```

These SCPI commands are 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
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
Help Map ID	0

### Inband Emission Margin Results for LTE FDD Modulation Accuracy

LTE FDD Modulation Accuracy 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 by the asynchronous form of the command, as :FETCh:LSEQuencer:ASYNc:ACQuire{1:512}:ASTep{1:1000}:IEMission:MARGin?/qonly/
```

These SCPI commands are 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. The margin = (Limit – Power ) in dB. A negative margin indicates that the power exceeds the limit.
2	Minimal Inband Margin Index – the RB index of minimal margin results (ZERO based)
3	Number of RBs - the number of RBs in current configuration

Index	Result Parameter
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
Help Map ID	0

### Detected Slot Number for LTE FDD Modulation Accuracy

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 by the asynchronous form of the command, as  
`: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
Help Map ID	0

### TD-SCDMA Modulation Accuracy (Rho) Results

LTE FDD Modulation Accuracy General 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:

List Sequencer  
**Measurement Results**

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 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.



## LTE TDD Modulation Accuracy Results

The modulation accuracy results for LTE TDD are the same as for LTE FDD (see “[LTE FDD Modulation Accuracy Results](#)” on page 274).

### Time Error Result

The Time Error is determined as a result of minimizing the error vector between the measured and ideal signals. It is a measure of the timing error of the UE's transmission relative to the frame clock. The Modulation Accuracy measurement doesn't provide Time Error Result directly, but it provides Time Offset (Pilot Offset for 1xeVdo) which can be used to get the Timing Error result under a special configuration.

The Time Offset result will be effective when Input Trigger Type is set to other than Free Run. When the trigger source is Frame Trigger, the Time Offset result stands by the Time Error result.

- **DUT can provide frame trigger:**

Connect the RF Output to the EXT, and the Trigger Output to EXT External Trigger In 1/2. Set Input Trigger Type to External 1/2. Set Input Trigger Delay to -50 us (see note below). Make the measurement; the Time Offset result is Time Error.

- **DUT can't provide frame trigger:**

Use the EXT source to play a wave with frame Marker. Set Trig 2 Out to the related Source Marker. Control DUT to generate Uplink/Reverse signal according to the Downlink/Forward signal played by the EXT source. Set Input Trigger Type to Internal and Input Trigger Delay to -50 us (see note below). Make the measurement. For CDMA2000, 1XEVD0, and LTE, the Time Offset result is Time Error. For WCDMA, because there is a 1024 chips fixed offset between Uplink and Downlink frame, the Time Offset = Time Error + 1024.

---

**NOTE** Input Trigger Delay must be set to -50 us. This is required for the EXT to capture an accurate frame boundary. The EXT will delete 50 us of data at the front side.

---

## 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	Peak EVM pass/fail result (1.0 = fail, 0.0 = pass) Returns the result of whether the Peak EVM passed the limit set in the measurement setup.
3	Magnitude Error pass/fail result (1.0 = fail, 0.0 = pass) Returns the result of whether the Magnitude Error passed the limit set in the measurement setup.
4	Phase Error pass/fail result (1.0 = fail, 0.0 = pass) Returns the result of whether the Phase Error passed the limit set in the measurement setup.
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	IQ Original Offset pass/fail result (1.0 = fail, 0.0 = pass) Returns the result of whether the IQ Original Offset passed the limit set in the measurement setup.
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

List Sequencer  
Measurement Results

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
Help Map ID	0

**QPSK EVM Result Selection**

This allows you to specify which of the possible result metrics from the QPSK EVM measurement are returned. The 1st (leftmost) value in the SCPI command represents Index 0.

The “Number of Results” value returned ahead of the measurement results is dependent on the selection made here. The result metrics that are selected by default are indexes 0-17 in the table of results for the measurement.

This selection is set for the entire Sequence. Should you want a specific result selection returned for one particular analysis step and not the rest, this can be achieved by using delta parameters.

Key Path	SCPI only
Remote Command	[:SENSe]:LSEQuencer::EVMQpsk:RESult:SELection ON OFF 0 1, ON OFF 0 1, ON OFF 0 1, ON OFF 0 1, ON OFF 0 1, ON OFF 0 1, ON OFF 0 1, ON OFF 0 1, ON OFF 0 1, ON OFF 0 1, ON OFF 0 1, ON OFF 0 1, ON OFF 0 1, ON OFF 0 1, ON OFF 0 1, ON OFF 0 1, ON OFF 0 1, ON OFF 0 1 [:SENSe]:LSEQuencer:EVMQpsk:RESult:SELection?
Example	LSEQ:EVMQ:RES:SEL 1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1
Preset	1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1
Initial S/W Revision	A.05.00
Help Map ID	35021

**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.

For more information on each result see the online help for the relevant radio standard measurement



mode.

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	Meas
Initial S/W Revision	A.05.00
Help Map ID	0

## Phase Discontinuity Measurement Results

The slot phase mode of the WCDMA Power Control measurement used in the WCDMA mode is available in the sequencer, where it is called 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

List Sequencer  
**Measurement Results**

returned for Phase Discontinuity results is 721 (that is, 1 float value for number of slots, and 8 phase discontinuity results per slot, times 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 25 us 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.
	...

Index	Result Details
630	IQ Original Offset of slot 90
631	Slot Power of Slot 1: In-channel power of slot 1
	...
720	Slot Power of Slot 1

Key Path	Meas
Initial S/W Revision	A.05.00
Help Map ID	0

### 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 and WCDMA radio standards. If the analysis step has requested this measurement, then the results returned for the analysis step within the List Sequencer Measurement are as 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.

Loopback 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
Help Map ID	0

## Integrity Indicator

The integrity indicator values are returned with the measurement results as indicated in “[Measurement Results](#)” on page 249. 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?`

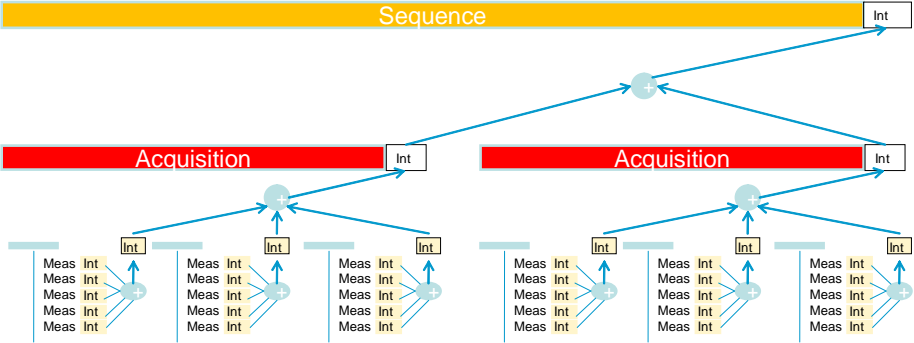
The integrity indicator values are coupled to the “Abort on Error” parameter if that parameter is On. In that case the Sequence aborts if any of the integrity values are set to 1, indicating a questionable value.

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	<b>Meas</b>
Initial S/W Revision	A.05.00
Help Map ID	0

List Sequencer  
**Integrity Indicator**

The key and command descriptions in this section describe functions that operate the same in multiple measurements and/or modes. This section is a library of functions that is referenced by many measurements and modes

To find the exact description and parameters for functions in a specific measurement, always look in the measurement section of this documentation. Pressing the front-panel key or key and then pressing the green Help key also provides the correct information.

---

**NOTE**

If you want to print the documentation, select this section and the measurement of interest to ensure that you have all the information you need. See [“Printing Acrobat Files” on page 52](#) for further instructions about printing.

---





## AMPTD (Amplitude) Y Scale

### Attenuation

**NOTE** Attenuation is available in models E6607A and E6607B, but not in E6607C.

The Attenuation menu is limited in Sequence Analyzer mode; only the Mechanical Attenuation needs to be set in this mode, as the electronic attenuator and preamp functionality are controlled by “Auto Set RF Levels” in combination with the sequence parameter “Instrument Gain”. See the selection table in the description for “Instrument Gain” on page 457.

Key Path	<b>AMPTD Y Scale</b>
Initial S/W Revision	A.05.00
Help Map ID	35267

### Mech Atten

**NOTE** The mechanical attenuator is included in models E6607A and E6607B, but not in E6607C.

This parameter is set for the entire Sequence. It cannot be changed from one acquisition to the next within the same sequence.

The Mech Atten value, range 0 – 70 dB in 2 dB steps, cannot be switched during a Sequence run; it must be set before the Sequence is initiated. There is no restriction to the Mechanical Atten value with either the Electronic Attenuation value or the preamp state. If “Auto Set RF Levels” on the Meas Setup menu is set to ON, the Mech Atten parameter is disabled and set automatically by the test set. See the “Auto Set RF Levels” description for details.

If the Auto Set RF Level is set to OFF, the Mech Atten parameter defaults to 0 dB but is enabled for you to change.

Key Path	<b>Amptd, Attenuation</b>
<b>Remote Command</b>	[ :SENSE ] :LSEQuencer:POWer [:RF]:ATTenuation <rel_ampl> [ :SENSE ] :LSEQuencer:POWer [:RF]:ATTenuation?
Example	:LSEQ:POW:ATT 4
Notes	Not available in E6607C.
Couplings	When “Auto Set RF Levels” parameter is set to On, this parameter is disabled and is auto set by the List Sequencer measurement.  When “Auto Set RF Levels” parameter is set to On and “Auto Rules” is set to “Best Abs Pwr Accuracy ” then the Mech Atten value is set to 6 dB.

## AMPTD (Amplitude) Y Scale

Preset	0
State Saved	Saved in instrument state.
Range	0 dB to 70 dB
Initial S/W Revision	A.05.00
Help Map ID	35010

## Ref Value

This specified the reference level (the amplitude represented by the topmost graticule line).

Key Path	AMPTD Y Scale
<b>Remote Command</b>	:DISPlay:LSEQuencer:VIEW[1]:WINDow[1]:TRACe:Y[:SCALe]:R LEVel <real>  :DISPlay:LSEQuencer:VIEW[1]:WINDow[1]:TRACe:Y[:SCALe]:R LEVel?
Example	DISP:LSEQ:VIEW:WIND:TRAC:Y:RLEV 20 DBM
Dependencies	When Y Auto Scaling is On, this value is automatically determined by the measurement result.  This setting is available only when “RF Envelope” is selected under View/Display.
Couplings	When you set this value manually, Y Auto Scaling automatically changes to Off.
Preset	10 dBm
State Saved	Saved in instrument state
Min	-250
Max	250
Initial S/W Revision	A.05.00
Help Map ID	35242

## Scale / Div

Sets the units per vertical graticule division on the display. This function is only available when Scale Type (Log) is selected and the vertical scale is power. When Scale Type (Lin) is selected, Scale/Div is grayed out.

Key Path	AMPTD Y Scale
----------	---------------

## AMPTD (Amplitude) Y Scale

<b>Remote Command</b>	:DISPlay:LSEQuencer:VIEW[1]:WINDow[1]:TRACe:Y[:SCALe]:P DIVision <rel_ampl>  :DISPlay:LSEQuencer:VIEW[1]:WINDow[1]:TRACe:Y[:SCALe]:P DIVision?
Example	DISP:LSEQ:VIEW:WIND:TRAC:Y:PDIV 5 DB
Dependencies	When Y Auto Scaling is On, this value is automatically determined by the measurement result.  This setting is available only when “RF Envelope” is selected under View/Display.
Couplings	When you set this value manually, Y Auto Scaling automatically changes to Off.
Preset	10.00 dB / Div
State Saved	Saved in instrument state
Min	0.10 dB
Max	20 dB
Initial S/W Revision	A.05.00
Help Map ID	35243

## Ref Position

Allows you to set the display reference position to Top, Center, or Bottom.

Key Path	AMPTD Y Scale
<b>Remote Command</b>	:DISPlay:LSEQuencer:VIEW[1]:WINDow[1]:TRACe:Y[:SCALe]:R POSition TOP CENTer BOTTom  :DISPlay:LSEQuencer:VIEW[1]:WINDow[1]:TRACe:Y[:SCALe]:R POSition?
Example	DISP:LSEQ:VIEW:WIND:TRAC:Y:RPOS TOP
Dependencies	This setting is available only when “RF Envelope” is selected under View/Display.
Preset	TOP
State Saved	Saved in instrument state
Range	TOP CENTer BOTTom
Initial S/W Revision	A.05.00
Help Map ID	35244

## AMPTD (Amplitude) Y Scale

### Auto Scaling

Allows you to toggle Y axis auto scaling function between On and Off.

Key Path	AMPTD Y Scale
<b>Remote Command</b>	:DISPlay:LSEQuencer:VIEW[1]:WINDow[1]:TRACe:Y[:SCALe]:COUPle 0 1 OFF ON :DISPlay:LSEQuencer:VIEW[1]:WINDow[1]:TRACe:Y[:SCALe]:COUPle?
Example	DISP:LSEQ:VIEW:WIND:TRAC:Y:COUP ON
Dependencies	This setting is available only when “RF Envelope” is selected under View/Display.
Preset	ON
State Saved	Saved in instrument state
Range	0 1 OFF ON
Initial S/W Revision	A.05.00
Help Map ID	35245

---

## Auto Couple

This function is not supported in the Sequence Analyzer mode.

## Auto Couple

---

**BW**

This function is not supported in the Sequence Analyzer mode.





---

**Cont**

This function is not supported in the Sequence Analyzer mode.

Cont

---

## FREQ Channel

The Frequency front-panel key has no functionality in the Sequence Analyzer mode. Frequency and channel are set on a sequence basis. See the Meas Setup section for details.



---

## 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 softkeys that control the Input/Output parameters of the instrument. In general, these are functions associated with external connections to the test set, 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 test set.

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 307](#)

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

Key Path:	<b>Front-panel key</b>
<b>Remote Command:</b>	[ :SENSe] :FEED RF   AIQ   EMIXer [ :SENSe] :FEED?
Example:	:FEED RF :FEED?
Couplings:	The [:SENSe]:FEED RF 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

## Input/Output

<p>Backwards Compatibility SCPI:</p>	<p><code>[:SENSe]:FEED AREFERENCE</code></p> <p>In the PSA the calibrator was one of the inputs and selected using the AREF parameter to the same :FEED 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.</p> <p>Note that after sending this, the query <code>[:SENSe]:FEED?</code> will NOT return "AREF" but instead the currently selected input.</p>
<p>Backwards Compatibility SCPI:</p>	<p><code>[:SENSe]:FEED IQ IONLy QONLy</code></p> <p><code>[:SENSe]:FEED?</code></p> <p>The parameters <code>IQ IONLy QONLy</code> are supported for backwards compatibility with the E44406A.</p> <p><code>[:SENSe]:FEED IQ</code> aliases to <code>[:SENSe]:FEED:IQ:TYPE IQ</code></p> <p><code>[:SENSe]:FEED IONLy</code> aliases to <code>[:SENSe]:FEED:IQ:TYPE IONLy</code></p> <p><code>[:SENSe]:FEED QONLy</code> aliases to <code>[:SENSe]:FEED:IQ:TYPE QONLy</code></p> <p>The query <code>[:SENSe]:FEED?</code> will always returns AIQ whatever the type of legacy parameters <code>IQ IONLy QONLy</code> has been used.</p>
<p>Backwards Compatibility Notes:</p>	<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-&gt;Restore System Defaults-&gt; In/Out Config key or through the System -&gt;Restore System Defaults -&gt; 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>
<p>Initial S/W Revision:</p>	<p>Prior to A.02.00</p>
<p>Help Map ID:</p>	<p>3065</p>
<p><b>Remote Command:</b></p>	<p><code>:INPut :MIXer EXTernal   INTernal</code></p> <p><code>:INPut :MIXer?</code></p>

Example:	INP:MIX INT INP:MIX?
Notes:	<p>1. 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 hence 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"> <li>1. When INPut:MIXer EXTernal is received, SENSe:FEED EMIXer is executed.</li> <li>2. When INPut:MIXer INTernal is received, SENSe:FEED RF is executed.</li> <li>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</li> </ol>
Preset:	INT
Backwards Compatibility Notes:	<p>1. PSA supports the following SCPI Command :</p> <pre>:INPut:MIXer:TYPE PRESelected UNPReselect</pre> <pre>:INPut:MIXer:TYPE?</pre> <p>PXA does not support the :INPut:MIXer:TYPE command.</p>
Initial S/W Revision:	A.08.01
Help Map ID:	0

### 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 test set signal input. If RF is already selected, pressing this key accesses the RF input setup functions.

Key Path:	<b>Input/Output</b>
Example:	[:SENSe]:FEED RF

## Input/Output

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 test sets with multiple RF inputs)  YY is AC or DC  ZZ is 50 or 75
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3068

### 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, dB $\mu$ V, dB $\mu$ A, 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 test set 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:	<b>Input/Output, RF Input</b>
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?
Couplings:	When the main RF Input is selected, the Input Z Correction will automatically change to 50 ohms. You may then change it to whatever is desired.
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 $\Omega$ or 75 $\Omega$ Current setting reads back to the RF key.
Initial S/W Revision:	Prior to A.02.00



Help Map ID:	3069
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### 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 which have them, changes the receiver performance of the instrument.

Key Path:	<b>Input/Output, RF Input</b>
Remote Command:	[ :SENSe] :FEED:RF:PORT [:INPut] RFIN   RFIN2   RFIO1   RFIO2 [ :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 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
Help Map ID:	29997

### RF Input

Specifies using the main RF port for the current measurement

Key Path:	<b>Input/Output, RF Input, RF Input Port</b>
Example:	:FEED:RF:PORT RFIN
ReadBack:	RF Input
Initial S/W Revision:	A.05.01
Help Map ID:	29998

## Input/Output

### RFIO1

Specifies using the RFIO 1 port, if supported, for the current measurement

Key Path:	<b>Input/Output, RF Input, RF Input Port</b>
Example:	:FEED:RF:PORT RFIO1
Dependencies:	Only available in EXT. 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
Help Map ID:	29999

### RFIO2

Specifies using the RFIO 2 port, if supported, for the current measurement

Key Path:	<b>Input/Output, RF Input, RF Input Port</b>
Example:	:FEED:RF:PORT RFIO2
Dependencies:	Only available in EXT. 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 2
Initial S/W Revision:	A.05.01
Help Map ID:	30000

### RF Calibrator

Lets you choose a calibrator signal to look at or turns the calibrator "off".

Key Path:	<b>Input/Output</b>
<b>Remote Command:</b>	[ :SENSE ] :FEED:AREFERENCE REF50   REF4800   OFF [ :SENSE ] :FEED:AREFERENCE?
Example:	FEED:AREF REF50 selects the 50 MHz amplitude reference as the signal input. FEED:AREF REF4800 selects the 4.8 GHz amplitude reference as the signal input FEED:AREF OFF turns the calibrator "off" (switches back to the selected input – RF or I/Q)

Dependencies:	<p>Selecting an input (RF or I/Q) turns the Calibrator OFF. This is true whether the input is selected by the keys or with the [:SENSe]:FEED command.</p> <p>The 4.8 GHz internal reference is only available in some models and frequency range options. If the 4.8 GHz reference is not present, the <b>4.8 GHz</b> softkey will be blanked, and if the REF4800 parameter is sent, the test set will generate an error.</p>
Couplings:	When one of the calibrator signals is selected, the test set routes that signal (an internal amplitude reference) to the test set, and changes the main input selection to RF so the calibrator signal can be seen. When you turn the calibrator off it does not switch back to the previously selected input.
Preset:	OFF
State Saved:	Saved in instrument state
Readback:	Off, 50 MHz, 4.8 GHz
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3086

<b>Remote Command:</b>	<pre>:CALibration:SOURce:STATe OFF ON 0 1 :CALibration:SOURce:STATe?</pre>
Notes:	<p>For ESA backwards compatibility.</p> <p>In the ESA the calibrator was a separate output which you connected to the input and switched on with this command.</p> <p>In the X-Series, the ON parameter is aliased to the [:SENSe]:FEED:AREF REF50 command and the OFF parameter is aliased to [:SENSe]:FEED:AREF OFF.</p> <p>When CALibration:SOURce:STATe? is received, 1 will be returned if any of the references is selected and 0 if the Calibrator is "Off"</p>
Preset:	OFF
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	0

### 50 MHz

Selects the 50 MHz internal reference as the input signal.

Key Path:	<b>Input/Output, RF Calibrator</b>
Example:	:FEED:AREF REF50
Readback:	50 MHz
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3087

## Input/Output

### Off

Switches the input back to the selected input (RF or I/Q)

Key Path:	<b>Input/Output, RF Calibrator</b>
Example:	:FEED:AREF OFF
Readback:	Off
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3085

### External Gain

Compensates for gain or loss in the measurement system outside the test set. The External Gain is subtracted from the amplitude readout (or the loss is added to the amplitude readout). So, the displayed signal level represents the signal level at the output of the device-under-test, which can be the input of an external device that provides gain or loss.

Entering an External Gain value does not affect the Reference Level, therefore the trace position on screen changes, as do all of values represented by the trace data. Thus, the values of exported trace data, queried trace data, marker amplitudes, trace data used in calculations such as N dB points, trace math, peak threshold, etc., are all affected by External Gain. Changing the External Gain, even on a trace which is not updating, will immediately change all of the above, without new data needing to be taken.

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**NOTE** Changing the External Gain causes the test set to immediately stop the current sweep and prepare to begin a new sweep. The data will not change until the trace data updates because the offset is applied to the data as it is taken. If a trace is exported with a nonzero External Gain, the exported data will contain the trace data with the offset applied.

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Key Path:	<b>Input/Output</b>
Couplings:	The Ext Preamp, MS, and BS keys may be grayed out depending on which measurement is currently selected. If any of the grayed out keys are pressed, or the equivalent SCPI command is sent, an advisory message is generated.
Readback:	1-of-N selection   [variable]
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3090

### Ext Preamp

This function is similar to the reference level offset function. Both affect the displayed signal level. Ref Lvl Offset is a mathematical offset only, no test set configuration is affected. Ext Preamp gain is used when determining the auto-coupled value of the Attenuator. The External Gain value and the Maximum Mixer Level settings are both part of the automatic setting equation for the RF attenuation setting. (10 dB of Attenuation is added for every 10 dB of External Gain.)

Note that the Ref Lvl Offset and Maximum Mixer Level are described in the Amplitude section. They are reset by the instrument Preset. The External Preamp Gain is reset by the "Restore Input/Output Defaults" or "Restore System Defaults->All functions. . The External Gain is subtracted from the amplitude readout so that the displayed signal level represents the signal level at the output of the device-under-test, which is the input of the external device that is providing gain or loss.

Key Path:	<b>Input/Output, External Gain</b>
<b>Remote Command:</b>	[ :SENSe] :CORRection:SA[:RF] :GAIN <rel_ampl> [ :SENSe] :CORRection:SA[:RF] :GAIN?
Example:	CORR:SA:GAIN 10 sets the Ext Gain value to 10 dB CORR:SA:GAIN -10 sets the Ext Gain value to -10 dB (that is, an attenuation of 10 dB)
Notes:	Does not auto return.
Dependencies:	The reference level limits are determined in part by the External Gain/Atten, Max Mixer Level, and RF Atten.  This key is grayed out in Modes that do not support External Gain
Preset:	This is unaffected by Preset but is set to 0 dB on a "Restore Input/Output Defaults" or "Restore System Defaults->All"
State Saved:	Saved in instrument state
Min:	-120 dB
Max:	120 dB
Readback:	Preamp Gain, <Ext Gain value> dB
Backwards Compatibility SCPI:	[ :SENSe]:CORRection:OFFSet[:MAGNitude]  The legacy "Ext Preamp Gain" key is now called "Ext Gain" and the sub-menu has choices of Ext Preamp   MS   BTS for backwards compatibility.
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3091

## MS

Sets an external gain/attenuation value for MS (Mobile Station) tests.

Key Path:	<b>Input/Output, External Gain</b>
<b>Remote Command:</b>	[ :SENSe] :CORRection:MS[:RF] :GAIN <rel_ampl> [ :SENSe] :CORRection:MS[:RF] :GAIN?

## Input/Output

Example:	CORR:MS:GAIN 10 sets the Ext Gain value to 10 dB CORR:MS:GAIN -10 sets the Ext Gain value to -10 dB (that is, a loss of 10 dB.)
Notes:	Does not auto return.
Dependencies:	The reference level limits are determined in part by the External Gain, Max Mixer Level, RF Atten  This key is grayed out in modes that do not support MS.
Preset:	This is unaffected by a Preset but is set to 0 dB on a "Restore Input/Output Defaults" or "Restore System Defaults->All"
State Saved:	Saved in instrument state.
Min:	-100 dB
Max:	100 dB
Readback:	MS, <Ext Gain value> dB
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3092

<b>Remote Command:</b>	[ :SENSE ] :CORRection:MS [ :RF ] :LOSS <rel_ampl> [ :SENSE ] :CORRection:MS [ :RF ] :LOSS?
Example:	CORR:MS:LOSS 10 sets the Ext Gain value to -10 dB, and subsequently querying :LOSS will give 10 dB CORR:MS:LOSS -10 sets the Ext Gain value to 10 dB, and subsequently querying :LOSS will give -10 dB
Notes:	A positive value of <rel_ampl> in the above command means a loss and a negative value indicates a gain.  Anytime :LOSS is set it sets :GAIN to the negative value of the parameter sent.  Anytime :LOSS is queried it gives the negative of :GAIN
Preset:	This is unaffected by a Preset but is set to 0 dB on a "Restore Input/Output Defaults" or "Restore System Defaults->All"
Min:	100 dB
Max:	-100 dB
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	0

**BTS**

Sets an external attenuation value for BTS (Base Transceiver Station) tests.

Key Path:	<b>Input/Output, External Gain</b>
<b>Remote Command:</b>	[ :SENSe] :CORRection:BTS [:RF] :GAIN <rel_ampl> [ :SENSe] :CORRection:BTS [:RF] :GAIN?
Example:	CORR:BTS:GAIN 10 sets the Ext Gain value to 10 dB CORR:BTS:GAIN -10 sets the Ext Gain value to -10 dB (that is, a loss of 10 dB.)
Notes:	Does not auto return.
Dependencies:	The reference level limits are determined in part by the External Gain, Max Mixer Level, RF Atten This key is grayed out in modes that do not support BTS.
Preset:	This is unaffected by a Preset but is set to 0 dB on a "Restore Input/Output Defaults" or "Restore System Defaults->All"
State Saved:	Saved in instrument state.
Min:	-100 dB
Max:	100 dB
Readback:	BTS, <Ext Gain value> dB
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3093

<b>Remote Command:</b>	[ :SENSe] :CORRection:BTS [:RF] :LOSS <rel_ampl> [ :SENSe] :CORRection:BTS [:RF] :LOSS?
Example:	CORR:BTS:LOSS 10 sets the Ext Gain value to -10 dB, and subsequently querying :LOSS will give 10 dB CORR:BTS:LOSS -10 sets the Ext Gain value to 10 dB, and subsequently querying :LOSS will give -10 dB
Notes:	A positive value of <rel_ampl> in the above command means a loss and a negative value indicates a gain. Anytime :LOSS is set it sets :GAIN to the negative value of the parameter sent. Anytime :LOSS is queried it gives the negative of :GAIN
Preset:	This is unaffected by a Preset but is set to 0 dB on a "Restore Input/Output Defaults" or "Restore System Defaults->All"
Min:	100 dB

## Input/Output

Max:	-100 dB
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	0

### 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:	<b>Input/Output</b>
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
Help Map ID:	3094

### Data Source

Gives you the choice of either using a hardware input signal as the input or raw data stored in a data storage buffer from an earlier acquisition. You can also share raw data across certain measurements that support this feature. The measurements must be capable of storing raw data. There are three choices under this menu. You can select "Inputs" which is the same as selecting one of the inputs from the input port, for example RF, AREF, I/Q, or IFALign. Selecting "Capture Buffer" allows you to use data that has been stored earlier in the same measurement or from a previous measurement using the "Current Meas -> Capture Buffer" feature. Selecting "Recorded Data" allows you to playback long data capture records stored in the record buffer.

Key Path:	<b>Input/Output</b>
<b>Remote Command:</b>	[ :SENSe ] :FEED:DATA INPut   STORed [ :SENSe ] :FEED:DATA?
Example:	FEED:DATA STOR FEED:DATA?
Notes:	INPutS = Inputs STORed = Capture Buffer



Dependencies:	Not all inputs are available in all modes. Unavailable keys are grayed out.
Preset:	This is unaffected by Preset but is set to INPut on a "Restore Input/Output Defaults" or "Restore System Defaults->All"
State Saved:	Saved in instrument state
Readback:	Variable
Backwards Compatibility SCPI:	[:SENSe]:FEED:SOURce INPut STORed [:SENSe]:FEED:SOURce?
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3095

### Inputs

Sets the measurement to use the input selections (RF, AREF, I/Q)

Key Path:	<b>Input/Output, Data Source</b>
Example:	FEED:DATA INP causes the measurement to look at the input selection
Notes:	Does not auto return.
Readback:	Inputs
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3096

### Capture Buffer

Some WCDMA and demod measurements support this feature. This allows sharing of the raw data across certain measurements. If you want to make another measurement on the same signal, you would store that raw data using the "Current Meas -> Capture Buffer" key. Then the data is available for the next measurement to use. You must have raw data stored in the instrument memory before the Capture Buffer choice is available for use.

Key Path:	<b>Input/Output, Data Source</b>
Example:	FEED:DATA STOR causes stored measurement data to be used with a different measurement that supports this.
Notes:	Does not auto return. This key is grayed out when you switch to a measurement that does not support this feature.
Dependencies:	If you switch to a measurement that does not support this feature, then the instrument switches to use "Inputs" and grays out this key. If the grayed out key is pressed, it generates a message.
Readback:	Stored Data
Initial S/W Revision:	Prior to A.02.00

## Input/Output

Help Map ID:	3097
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### Current Meas -> Capture Buffer

Pressing this key stores the raw data of one measurement in the internal memory of the instrument where it can then be used by a different measurement by pressing "Stored Data". When raw data is stored, then the data source selection switch automatically changes to "Stored Data". Stored raw data cannot be directly accessed by a user. There is no save/recall function to save the raw data in an external media. However if you want to get the stored raw data, you must first perform a measurement using the stored raw data. Now you can access the used raw data, which is the same as stored raw data, using the FETCh or READ commands.

Key Path:	<b>Input/Output, Data Source</b>
<b>Remote Command:</b>	[ :SENSE ] :FEED:DATA:STORE
Example:	FEED:DATA:STOR stores recorded data
Notes:	This is command only, there is no query
Backwards Compatibility SCPI:	[ :SENSE ] :FEED:SOURce:STORE
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3099

## 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 test set 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 to be 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 test set, 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**.

Instruments that have multiple Input/Output RF ports can have different corrections applied to the different ports. There are 4 sets of corrections 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:	<b>Input/Output, Corrections</b>
Mode:	SEQAN, TDSCDMA
Dependencies:	<p>This key will only appear if you have the proper option installed in your instrument.</p> <p>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.</p> <p>This menu selection does not have any effect when <b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Multiport Adapter</b> is set to the <b>On</b> state and <b>Input/Output, RF Output &amp; Test Set Config, RF Output</b> is <b>RF Output</b>.</p>
Preset:	Corrections arrays are reset (deleted) by Restore Input/Output Defaults. They survive shutdown and restarting of the test set application, which means they will survive a power cycle.
Initial S/W Revision:	A.02.00
Help Map ID:	3101

### Correction On/Off

Turning the Selected Correction on allows the values in it to be applied to the data. This 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:	<b>Input/Output, Corrections</b>
<b>Remote Command:</b>	<pre>[ :SENSE] :CORRection:CSET [1]   2   3   4   5   6 [ :STATe] ON   OFF   1   0  [ :SENSe] :CORRection:CSET [1]   2   3   4   5   6 [ :STATe] ?</pre>
Example:	SENS:CORR:CSET1 ON

## Input/Output

Dependencies:	<p>Turning this on 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 test set 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 <b>Restore Input/Output Defaults</b>
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
Help Map ID:	3104

### Properties

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

Key Path:	<b>Input/Output, Corrections</b>
Initial S/W Revision:	A.02.00
Help Map ID:	3105

### 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:	<b>Input/Output, Corrections, Properties</b>
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
Initial S/W Revision:	A.02.00
Help Map ID:	Use 3557

## 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 321](#)

Key Path:	<b>Input/Output, Corrections, Properties</b>
<b>Remote Command:</b>	[ :SENSE ] :CORRection:CSET [1]   2   3   4   5   6 :X:SPACing LINear   LOGarithmic  [ :SENSE ] :CORRection:CSET [1]   2   3   4   5   6 :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
Help Map ID:	3108

## Interpolation

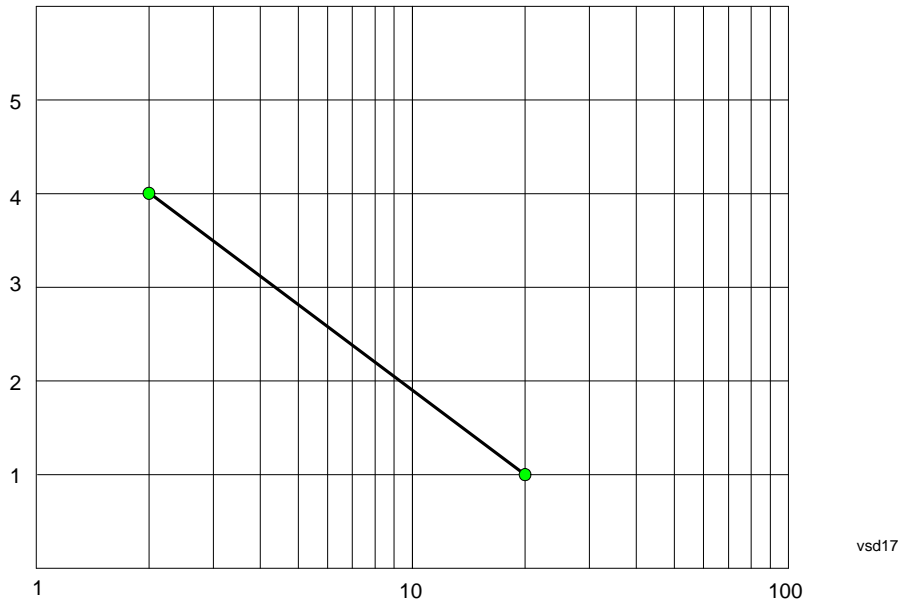
For each bucket processed by the application, all of the correction factors at the frequency of interest (center frequency of each bucket) are summed and added to the amplitude. All trace operations and post processing treat this post-summation value as the true signal to use.

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.

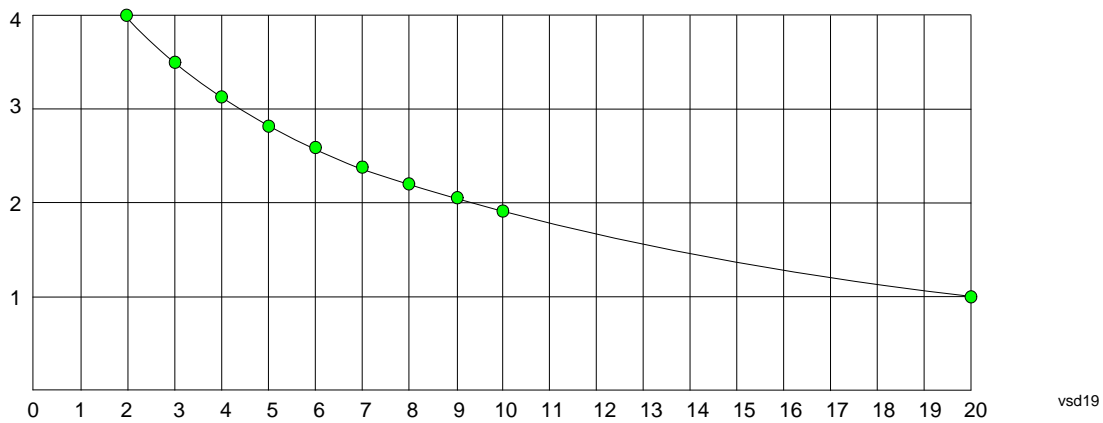
For amplitudes that lie between two user specified frequency points, we interpolate to determine the amplitude value. You may select either linear or logarithmic interpolation between the frequencies.

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:

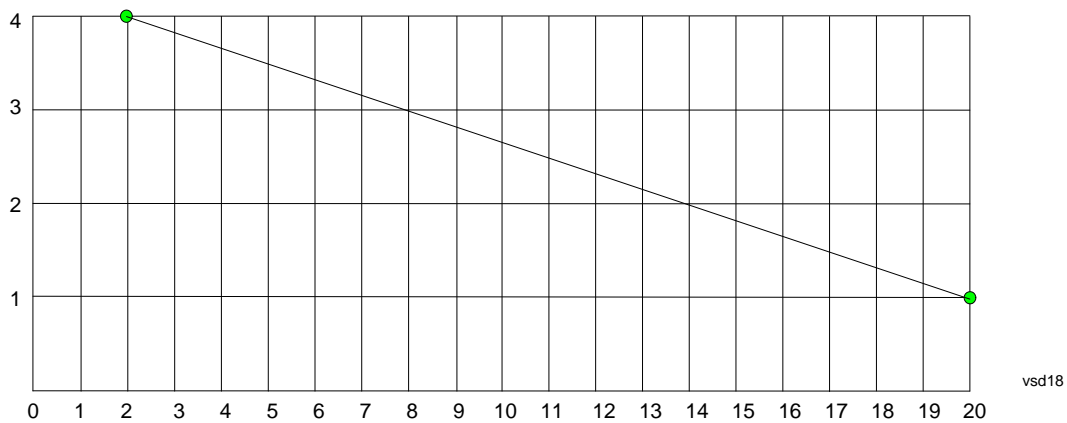
## Input/Output



On a linear scale (like that of the test set), 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 be in a screen dump.

Key Path:	<b>Input/Output, Corrections, Properties</b>
<b>Remote Command:</b>	[ :SENSE ] :CORRection:CSET [1]   2   3   4   5   6 :DESCription "text" [ :SENSE ] :CORRection:CSET [1]   2   3   4   5   6 :DESCription?
Example:	:CORR:CSET1:DESC "11941A Antenna correction"
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
Help Map ID:	3106

### 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 be in a screen dump.

Key Path:	<b>Input/Output, Corrections, Properties</b>
<b>Remote Command:</b>	[ :SENSE ] :CORRection:CSET [1]   2   3   4   5   6 :COMMent "text" [ :SENSE ] :CORRection:CSET [1]   2   3   4   5   6 :COMMent?
Example:	:CORR:CSET1:COMM "this is a comment"
Notes:	60 chars max; may not fit on display if max chars used
Preset:	Unaffected by Preset. Set to empty by <b>Restore Input/Output Defaults</b>
State Saved:	Saved in instrument state
Initial S/W Revision:	A.02.00
Help Map ID:	3107

### RF Port

This menu and all of its submenus are only available in the EXT.

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

Key Path:	<b>Input/Output, Corrections, Properties</b>
-----------	--

## Input/Output

Mode:	SEQAN
<b>Remote Command:</b>	[ :SENSe ] :CORRection:CSET [ 1 ]   2   3   4   5   6 :RF:PORT RFIN   RFIO1   RFIO2   RFOut  [ :SENSe ] :CORRection:CSET [ 1 ]   2   3   4   5   6 :RF:PORT?
Example:	:CORR:CSET:RF:PORT RFIN
Remote Command Notes:	
Dependencies:	Only available in EXT
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
Help Map ID:	30001

### RF Input

The port that the current corrections will be applied to.

Key Path:	<b>Input/Output, Corrections, Properties, RF Port</b>
Example:	:CORR:CSET:RF:PORT RFIN
Dependencies:	Only available in EXT
ReadBack:	RF IN
Initial S/W Revision:	A.05.01
Help Map ID:	30002

### RFOut

The port that the current corrections will be applied to.

Key Path:	<b>Input/Output, Corrections, Properties, RF Port</b>
Example:	:CORR:CSET:RF:PORT RFO
Dependencies:	Only available in EXT
ReadBack:	RFOut
Initial S/W Revision:	A.05.01
Help Map ID:	30003

### 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:	<b>Input/Output, Corrections, Properties, RF Port</b>
<b>Remote Command:</b>	[ :SENSe ] :CORRection:CSET [1]   2   3   4   5   6 :RF:PORT:RFIO1 SOURce   ANALyzer   BOTH  [ :SENSe ] :CORRection:CSET [1]   2   3   4   5   6 :RF:PORT:RFIO1?
Example:	:CORR:CSET:RF:PORT:RFIO1 BOTH
Preset:	Both
State Saved:	Saved in State
Help Map ID:	30004

### Correct Source

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

Key Path:	<b>Input/Output, Corrections, Properties, RF Port</b>
Example:	:CORR:CSET:RF:PORT:RFIO1 SOUR
Readback:	"Correct Source"
Help Map ID:	30005

### Correct Analyzer

Sets the corrections for the RFIO1 port to be applied to the test set.

Key Path:	<b>Input/Output, Corrections, Properties, RF Port</b>
Example:	:CORR:CSET:RF:PORT:RFIO1 ANAL
Readback:	"Correct Analyzer"
Help Map ID:	30006

### Correct Source and Analyzer

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

Key Path:	<b>Input/Output, Corrections, Properties, RF Port</b>
Example:	:CORR:CSET:RF:PORT:RFIO1 BOTH
Readback:	"Correct Source and Analyzer"
Help Map ID:	30007

## Input/Output

### 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:	<b>Input/Output, Corrections, Properties, RF Port</b>
Remote Command:	[ :SENSe ] :CORRection:CSET [ 1 ]   2   3   4   5   6 :RF:PORT:RFIO2 SOURce   ANALyzer   BOTH [ :SENSe ] :CORRection:CSET [ 1 ]   2   3   4   5   6 :RF:PORT:RFIO2?
Example:	:CORR:CSET:RF:PORT:RFIO2 BOTH
Preset:	Both
State Saved:	Saved in State
Help Map ID:	30008

### Correct Source

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

Key Path:	<b>Input/Output, Corrections, Properties, RF Port</b>
Example:	:CORR:CSET:RF:PORT:RFIO2 SOUR
Readback:	"Correct Source"
Help Map ID:	30009

### Correct Analyzer

Sets the corrections for the RFIO2 port to be applied to the test set.

Key Path:	<b>Input/Output, Corrections, Properties, RF Port</b>
Example:	:CORR:CSET:RF:PORT:RFIO2 ANAL
Readback:	"Correct Analyzer"
Help Map ID:	30010

### Correct Source and Analyzer

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

Key Path:	<b>Input/Output, Corrections, Properties, RF Port</b>
Example:	:CORR:CSET:RF:PORT:RFIO2 BOTH
Readback:	"Correct Source and Analyzer"
Help Map ID:	30011

## Edit

Invokes the integrated editing facility for this correction set.

When entering the menu, the editor window turns on, the selected correction is turned **On**, **Apply Corrections** is set to **On**, the amplitude scale is set to **Log**, and the Amplitude Correction (“Ampcor”) trace is displayed. The actual, interpolated correction trace is shown in green for the selected correction. Note that since the actual interpolated correction is shown, the correction trace may have some curvature to it. This trace represents only the correction currently being edited, rather than the total, accumulated amplitude correction for all amplitude corrections which are currently on, although the total, accumulated correction for all corrections which are turned on is still applied to the data traces.

Because corrections data is always in dB, but the Y-axis of the test set is in absolute units, it is necessary to establish a reference line for display of the Corrections data. 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 to be 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. By definition all points are connected. If a gap is desired for corrections data, enter 0 dB.

Note that a well-designed Corrections array should start at 0 dB and end at 0 dB. This is because whatever the high end point is will be extended to the top frequency of the instrument, and whatever the low end point is will be extended down to 0 Hz. So for a Corrections array to have no effect outside its range, you should start and end the array at 0 dB.

---

**NOTE** The table editor will only operate properly if the test set is sweeping, because its updates are tied to the sweep system. Thus, you should not try to use the editor in single sweep, and it will be sluggish during compute-intensive operations like narrow-span FFT sweeps.

---

When exiting the edit menu (by using the **Return** key or by pressing an instrument front-panel key), the editor window turns off and the Ampcor trace is no longer displayed; however, **Apply Corrections** remains **On**, any correction that was on while in the editor remains on, and the amplitude scale returns to its previous setting.

Corrections arrays are not affected by a Preset, because they are in the Input/Output system. They also survive shutdown and restarting of the test set application, which means they will survive a power cycle.

Key Path:	<b>Input/Output, Corrections</b>
Initial S/W Revision:	A.02.00
Help Map ID:	29983

## Navigate

Lets you move through the table to edit the desired point.

Key Path:	<b>Input/Output, Corrections, Edit</b>
Notes:	There is no value readback on the key

## Input/Output

Min:	1
Max:	2000
Initial S/W Revision:	A.02.00
Help Map ID:	3545

## Frequency

Lets you edit the frequency of the current row.

Key Path:	<b>Input/Output, Corrections, Edit</b>
Notes:	There is no value readback on the key.
Min:	0
Max:	1 THz
Initial S/W Revision:	A.02.00
Help Map ID:	3572

## Amplitude

Lets you edit the Amplitude of the current row.

Key Path:	<b>Input/Output, Corrections, Edit</b>
Notes:	There is no value readback on the key.
Min:	-1000 dB
Max:	1000 dB
Initial S/W Revision:	A.02.00
Help Map ID:	3574

## Insert Point Below

Inserts a point below the current point. The new point is a copy of the current point and becomes the current point. The new point is not yet entered into the underlying table, and the data in the row is displayed in light gray.

Key Path:	<b>Input/Output, Corrections, Edit</b>
Initial S/W Revision:	A.02.00
Help Map ID:	3576

## Delete Point

Deletes the currently-selected point, whether or not that point is being edited, and selects the Navigate functionality. The point following the currently-selected point (or the point preceding if there is none)

will be selected.

Key Path:	<b>Input/Output, Corrections, Edit</b>
Initial S/W Revision:	A.02.00
Help Map ID:	3581

### 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:	<b>Input/Output, Corrections</b>
<b>Remote Command:</b>	[ :SENSE] :CORRection:CSET [1]   2   3   4   5   6 :DELete
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
Help Map ID:	3115

### 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 319) are used.

Key Path:	<b>Input/Output, Corrections</b>
<b>Remote Command:</b>	[ :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
Help Map ID:	3102

### Delete All Corrections

Erases all correction values for all 4 Amplitude Correction sets.

## Input/Output

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:	<b>Input/Output, Corrections</b>
Remote Command:	<code>[ :SENSe ] :CORRection:CSET:ALL:DELeTe</code>
Example:	<code>CORR:CSET:ALL:DEL</code>
Initial S/W Revision:	A.02.00
Help Map ID:	3119

### Remote Correction Data Set Commands

#### 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   3   4   5   6 :DATA &lt;freq&gt;, &lt;ampl&gt;, . . .</code> <code>[ :SENSe ] :CORRection:CSET[1]   2   3   4   5   6 :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 test set 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
Help Map ID:	0

#### 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.

<b>Remote Command:</b>	[ :SENSe ] :CORRection:CSET [ 1   2   3   4   5   6 :DATA:MERGe <freq>, <ampl>, ...
Example:	CORR:CSET1:DATA:MERGE 15000000,-5.0,25000000,5.0 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 test set 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
Help Map ID:	0

## Freq Ref In

Specifies the frequency reference as being the internal reference, external reference or sensing the presence of an external reference.

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.

If Sense is selected, the instrument checks whether a signal is present at the external reference connector and will automatically switch to the external reference when a signal is detected. When no signal is present, it automatically switches to the internal reference. No message is generated as the reference switches between 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 2 in the Questionable Frequency register will be true and a condition error message is generated. When lock is regained, Status bit 2 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.

Key Path:	Input/Output
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## Input/Output

<b>Remote Command:</b>	<code>[ :SENSe ] :ROSCillator :SOURce :TYPE INTernal   EXTernal   SENSe  [ :SENSe ] :ROSCillator :SOURce :TYPE?</code>
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 2 set if unlocked.
Backwards Compatibility Notes:	1. 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
Help Map ID:	3124

<b>Remote Command:</b>	<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"> <li>1. If it was set to SENSe but there is no external reference so the instrument is actually using the internal reference, then this query returns INTernal and not SENSe.</li> <li>2. If it was set to SENSe and there is an external reference present, the query returns EXTernal and not SENSe.</li> <li>3. If it was set to EXTernal, then the query returns "EXTernal"</li> <li>4. If it was set to INTernal, then the query returns "INTernal"</li> </ol>
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
Help Map ID:	0

<b>Remote Command:</b>	<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>
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	0



**Sense**

The external reference is used if a valid signal is sensed at the Ext Ref input. Otherwise the internal reference is used.

Key Path:	<b>Input/Output, Freq Ref In</b>
Example:	:ROSC:SOUR:TYPE SENS
Readback:	Sense
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3127

**Internal**

The internal reference is used.

Key Path:	<b>Input/Output, Freq Ref In</b>
Example:	:ROSC:SOUR:TYPE INT
Readback:	Internal
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3128

**External**

The external reference is used.

Key Path:	<b>Input/Output, Freq Ref In</b>
Example:	:ROSC:SOUR:TYPE EXT
Readback:	External
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3129

**Ext Ref Freq**

This key tells the test set 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 test set 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

## Input/Output

frequency values.

Key Path:	<b>Input/Output, Freq Ref In</b>
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.
Notes:	Still available with Internal selected, to allow setup for when External is in use.
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:	CXA: 10 MHz EXA: 10 MHz or 13 MHz, depending on whether N9010A-R13 is licensed MXA: 1 MHz PXA: 1 MHz 1 MHz
Max:	CXA: 10 MHz EXA: 10 MHz MXA: 50 MHz PXA: 50 MHz 50 MHz
Default Unit:	Hz
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3130

## RF Output & Test Set Config

This menu and all of its submenus are only available in the EXT (E6607A/B/C).

Access the menu to select the front-panel RF output port to be the test set signal output. If RF is already selected, pressing this key accesses the RF output setup functions.

### EXT (E6607A/B)

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

**EXT (E6607C)**

The RF Output & Test Set Config key allows you to set the RF Output Port and MPA settings.

Key Path:	<b>Input/Output</b>
Dependencies:	Only available in EXT
Preset:	All settings under this key are returned to their default state when <b>Restore Input/Output Defaults</b> is pressed.
State Saved:	Saved in State
Initial S/W Revision:	A.10.00
Help Map ID:	30017

**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:	<b>Input/Output, RF Output &amp; Test Set Config</b>
<b>Remote Command:</b>	[ :SENSE] :FEED:RF:PORT:OUTPut RFOut   RFIO1   RFIO2 [ :SENSE] :FEED:RF:PORT:OUTPut?
Example:	:FEED:RF:PORT:OUTP RFIO1
Dependencies:	Only available in EXT
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 Text:	The current RF Output Port selected is read back to this key
Initial S/W Revision:	A.05.01
Help Map ID:	30013

**RF Out**

The RF port that will be used for the current output

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, RF Output</b>
Example:	:FEED:RF:PORT:OUTP RFO
Dependencies:	Only available in EXT
ReadBack:	RF Output
Initial S/W Revision:	A.05.01

## Input/Output

Help Map ID:	30014
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### RFIO1

The RF port that will be used for the current output

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, RF Output</b>
Example:	:FEED:RF:PORT:OUTP RFIO1
Dependencies:	Only available in EXT.
ReadBack:	RFIO1
Initial S/W Revision:	A.05.01
Help Map ID:	30015

### RFIO2

The RF port that will be used for the current output

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, RF Output</b>
Example:	:FEED:RF:PORT:OUTP RFIO2
Dependencies:	Only available in EXT.
ReadBack:	RFIO2
Initial S/W Revision:	A.05.01
Help Map ID:	30016

### Multiport Adapter

The Multiport Adapter key allows you to set the multiport adapter unit which is connected to the EXT by USB for download of calibration data and additional control.

Multiport Adapter is only available in the EXT (E6607A/B/C), and is blanked for other models.

#### EXT (E6607A/B)

The Multiport Adapter key will not be displayed if the multiport adapter unit is not connected to the EXT by USB.

#### EXT (E6607C)

The MPA is integrated into the instrument; therefore, the Multiport Adapter key is always displayed.

See [“More Information” on page 337](#)

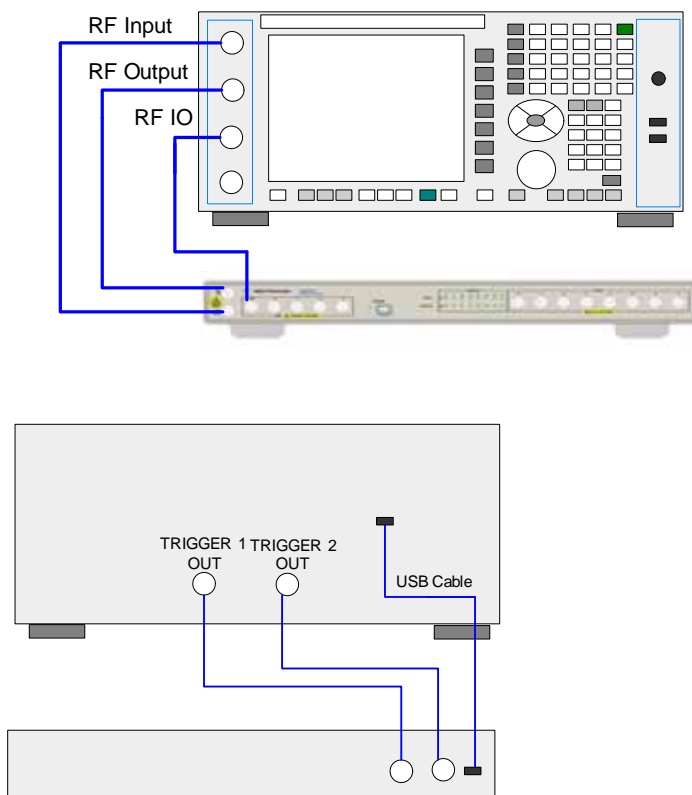
Key Path:	<b>Input/Output, RF Output &amp; Test Set Config</b>
-----------	--

Dependencies:	Multiport adapter is only available for EXT (E6607A/B) model, and is blanked for other models.  Multiport adapter unit is connected to EXT by USB for download of calibration data and additional control.
Preset:	All settings under this key are returned to their default state when <b>Restore Input/Output Defaults</b> is pressed.
State Saved:	All settings under this key, are remembered when you unplugged the multiport adapter unit USB connection, so that when multiport adapter unit USB is connected again, all the multiport adapter functions will retain their previous settings, with the exception of <b>Multiport Adapter</b> which is set to OFF.
Initial S/W Revision:	A.10.00
Help Map ID:	0

More Information

Multiport adapter in the EXT (E6607A/B) supports the Agilent E6617A, which provides a USB connection for download of calibration data and additional control.

The connection diagram for Agilent E6617A switch unit is:



**Multiport Adapter On/Off**

Turning the Multiport Adapter On means that the multiport adapter unit is connected and it will be used for the measurements or source.

## Input/Output

Turning the Multiport Adapter Off means that the multiport adapter unit will not be used for the analyzer or source.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter</b>
Remote Command:	[ :SENSE ] :MPADapter [ :STATE ] ON   OFF   1   0 [ :SENSE ] :MPADapter [ :STATE ] ?
Example:	:MPAD ON
Dependencies:	Only when the multiport adapter unit is connected to the EXT by USB, it is appeared. Otherwise, it will not be displayed and set to OFF.  If the current RF Input port is not RF Input, turn Multiport Adapter to On , an error message is generated: “-221, Settings conflict; RFIO1 or RFIO2 Port unavailable when Multiport Adapter is ON”.
Preset:	This is unaffected by Mode Preset but is set to OFF on a "Restore Input/Output Defaults" or "Restore System Defaults -> All"
Initial S/W Revision:	A.10.00
Help Map ID:	0

## Input Port

Specifies the multiport adapter unit input port used.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter</b>
Remote Command:	[ :SENSE ] :MPADapter :PORT :INPut OFF   RFIO0   RFIO1   RFIO2   RFIO3   RFIO4   RFIO5   RFIO6   RFIO7 [ :SENSE ] :MPADapter :PORT :INPut ?
Example:	:MPAD :PORT :INP RFIO1
Dependencies:	This menu selection does not have any effect unless Input/Output, More, RF Output & Test Set Config, Multiport Adapter is set to the On state.
Preset:	This is unaffected by Mode Preset but is set to RFIO0 on a "Restore Input/Output Defaults" or "Restore System Defaults -> All"
State Saved:	Saved in State
Readback Text:	The current Multiport Adapter Input Port selected is read back to this key
Backwards Compatibility SCPI Notes:	The commands above are included for ESU compatibility
Initial S/W Revision:	A.10.00
Help Map ID:	0

**OFF**

Specifies using the multiport adapter input port OFF.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Input Port</b>
Example:	[ :SENSe] :MPADapter:PORT:INPut OFF
ReadBack:	OFF
Initial S/W Revision:	A.10.00
Help Map ID:	0

**RFIO0**

Specifies using the multiport adapter input port RFIO 0.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Input Port</b>
Example:	[ :SENSe] :MPADapter:PORT:INPut RFIO0
ReadBack:	RFIO 0
Initial S/W Revision:	A.10.00
Help Map ID:	0

**RFIO1**

Specifies using the multiport adapter input port RFIO 1.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Input Port</b>
Example:	[ :SENSe]:MPADapter:PORT:INPut RFIO1
ReadBack:	RFIO 1
Initial S/W Revision:	A.10.00
Help Map ID:	0

**RFIO2**

Specifies using the multiport adapter Input port RFIO 2.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Input Port</b>
Example:	[ :SENSe]:MPADapter:PORT:INPut RFIO2
ReadBack:	RFIO 2
Initial S/W Revision:	A.10.00
Help Map ID:	0

## Input/Output

### RFIO3

Specifies using the multiport adapter input port RFIO 3.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Input Port</b>
Example:	[:SENSe]:MPADapter:PORT:INPut RFIO3
ReadBack:	RFIO 3
Initial S/W Revision:	A.10.00
Help Map ID:	0

### RFIO4

Specifies using the multiport adapter input port RFIO 4.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Input Port</b>
Example:	[:SENSe]:MPADapter:PORT:INPut RFIO4
ReadBack:	RFIO 4
Initial S/W Revision:	A.10.00
Help Map ID:	0

### RFIO5

Specifies using the multiport adapter input port RFIO 5.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Input Port, Page 2</b>
Example:	[:SENSe]:MPADapter:PORT:INPut RFIO5
ReadBack:	RFIO 5
Initial S/W Revision:	A.10.00
Help Map ID:	0

### RFIO6

Specifies using the multiport adapter input port RFIO 6.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Input Port, Page 2</b>
Example:	[:SENSe]:MPADapter:PORT:INPut RFIO6
ReadBack:	RFIO 6
Initial S/W Revision:	A.10.00
Help Map ID:	0



**RFIO7**

Specifies using the multiport adapter input port RFIO 7.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Input Port, Page 2</b>
Example:	[ :SENSe ] :MPADapter :PORT :INPut RFIO7
ReadBack:	RFIO 7
Initial S/W Revision:	A.10.00
Help Map ID:	0

**Output Port**

Specifies the multiport adapter unit output ports used. The Output Port key lets you set eight outputs ON/OFF. See the table below for bitmapping.

Multiport Adapter Output Port	Bit
RFIO0	0
RFIO1	1
RFIO2	2
RFIO3	3
RFIO4	4
RFIO5	5
RFIO6	6
RFIO7	7

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter</b>
<b>Remote Command:</b>	[ :SENSe ] :MPADapter :PORT :OUTPut :BITMap <integer> [ :SENSe ] :MPADapter :PORT :OUTPut :BITMap?
Example:	:MPAD:PORT:OUTPut:BITMap 1
Notes:	Each bit is associated with a multiport adapter output port; as shown in the bitmap table above. The value of a bit is '0' if the corresponding multiport adapter output port is not selected, and '1' if it is. (For example, to select multiport adapter RFIO7 output port , set Bit 7 to '1'.)  The field requires a decimal entry. For example, if multiport adapter selects the RFIO 7 output port and RFIO 0 output port, the Bit Mask for this combination is 10000001, and the value of this parameter is the decimal number '129'.

## Input/Output

Dependencies:	This menu selection does not have any effect unless Input/Output, RF Output & Test Set Config, Multiport Adapter, Multiport Adapter is set to the On state and Input/Output, RF Output & Test Set Config, RF Output is RF Output port.  When Input/Output, RF Output & Test Set Config, Multiport Adapter, Multiport Adapter is set to the On state and Input/Output, RF Output & Test Set Config, RF Output is set to RFIO1 or RFIO2 port, the Multiport Adapter GPS Output Port will be used.
Preset:	This is unaffected by Mode Preset but is set to "1" on a "Restore Input/Output Defaults" or "Restore System Defaults -> All"
State Saved:	Saved in State
Backwards Compatibility SCPI Notes:	The commands above are included for ESU compatibility
Initial S/W Revision:	A.10.00
Help Map ID:	0

### RFIO0

Turn on or off the multiport adapter RFIO0 output port.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Output Port</b>
Preset:	Not affected by a Preset. Set to ON pressing System > Restore Defaults > Input/Output Settings or System > Restore Defaults > All.
State Saved:	Saved in instrument state.
Initial S/W Revision:	A.10.0
Help Map ID:	0

### RFIO1

Turn on or off the multiport adapter RFIO1 output port.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Output Port</b>
Preset:	Not affected by a Preset. Set to OFF by pressing System > Restore Defaults > Input/Output Settings or System > Restore Defaults > All.
State Saved:	Saved in instrument state.
Initial S/W Revision:	A.10.0
Help Map ID:	0

### RFIO2

Turn on or off the multiport adapter RFIO2 output port.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Output Port</b>
-----------	--

Preset:	Not affected by a Preset. Set to OFF by pressing System > Restore Defaults > Input/Output Settings or System > Restore Defaults > All.
State Saved:	Saved in instrument state.
Initial S/W Revision:	A.10.0
Help Map ID:	0

**RFIO3**

Turn on or off the multiport adapter RFIO3 output port.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Output Port</b>
Preset:	Not affected by a Preset. Set to OFF by pressing System > Restore Defaults > Input/Output Settings or System > Restore Defaults > All.
State Saved:	Saved in instrument state.
Initial S/W Revision:	A.10.0
Help Map ID:	0

**RFIO4**

Turn on or off the multiport adapter RFIO4 output port.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Output Port</b>
Preset:	Not affected by a Preset. Set to OFF by pressing System > Restore Defaults > Input/Output Settings or System > Restore Defaults > All.
State Saved:	Saved in instrument state.
Initial S/W Revision:	A.10.0
Help Map ID:	0

**RFIO5**

Turn on or off the multiport adapter RFIO5 output port.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Output Port</b>
Preset:	Not affected by a Preset. Set to OFF by pressing System > Restore Defaults > Input/Output Settings or System > Restore Defaults > All.
State Saved:	Saved in instrument state.
Initial S/W Revision:	A.10.0
Help Map ID:	0

## Input/Output

### RFIO6

Turn on or off the multiport adapter RFIO6 output port.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Output Port, Page 2</b>
Preset:	Not affected by a Preset. Set to OFF by pressing System > Restore Defaults > Input/Output Settings or System > Restore Defaults > All.
State Saved:	Saved in instrument state.
Initial S/W Revision:	A.10.0
Help Map ID:	0

### RFIO7

Turn on or off the multiport adapter RFIO7 output port.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Output Port, Page 2</b>
Preset:	Not affected by a Preset. Set to OFF by pressing System > Restore Defaults > Input/Output Settings or System > Restore Defaults > All.
State Saved:	Saved in instrument state.
Initial S/W Revision:	A.10.0
Help Map ID:	0

### Preamp On/Off

Turn on or off the preamplifier of the multiport adapter input path. It will provide one fix gain for the multiport adapter input path.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter</b>
Remote Command:	[ :SENSE ] :MPADapter:GAIN [ :STATE ] ON OFF 1 0 [ :SENSe ] :MPADapter:GAIN [ :STATE ] ?
Example:	:MPAD:GAIN ON
Dependencies:	This menu selection does not have any effect unless Input/Output, More, RF Output & Test Set Config, Multiport Adapter, Multiport Adapter is set to the On state.
Preset:	This is unaffected by Mode Preset but is set to OFF on a "Restore Input/Output Defaults" or "Restore System Defaults -> All"
State Saved:	Saved in instrument state.
Initial S/W Revision:	A.10.0
Help Map ID:	0

## Amplitude Corrections

### Corrections

Multiport Adapter Amplitude Corrections arrays can be entered by the user, sent over SCPI, or loaded from a file. The Multiport Adapter correction supports 16 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. Multiport Adapter has multiple Input/Output RF ports can have different corrections applied to the different ports. 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.

See section “[Amplitude Corrections](#)” on page 345 for more information on Corrections.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter</b>
Mode:	Sequence Analyzer, I/Q Analyzer
Dependencies:	<p>This key will only appear if you have the proper option installed in your instrument.</p> <p>Multiport Adapter Amplitude correction may not be available in all modes; if a mode does not support amplitude correction, the Correction On/Off and Apply Corrections On/Off keys should be grayed and un-accessible.</p> <p>This menu selection does not have any effect unless Input/Output, More, RF Output &amp; Test Set Config, Multiport Adapter, Multiport Adapter is set to the On state.</p>
Preset:	Multiport Adapter 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.10.00
Help Map ID:	0

### 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:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport adapter, Corrections</b>
Mode:	Sequence Analyzer, I/Q Analyzer
Notes:	The selected correction is remembered even when not in the correction menu
Dependencies:	This menu selection does not have any effect unless Input/Output, More, RF Output & Test Set Config, Multiport Adapter, Multiport Adapter is set to the On state.
Preset:	Set to Correction 1 by Restore Input/Output Defaults

## Input/Output

Readback:	Correction 1 Correction 2 Correction 3 Correction 4 Correction 5 Correction 6 Correction 7  Correction 9 Correction 9 Correction 10 Correction 11 Correction 12
Initial S/W Revision:	A.10.00
Help Map ID:	0

### Correction On/Off

Turning the Selected Correction on allows the values in it to be applied to the data. This 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:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections</b>
Remote Command:	[ :SENSe ] :MPADapter:CORRection:CSET [1]   2   3   4   5   6   7   8   9   10   11   12   13   14   15   16 [ :STATe ] ON   OFF   1   0 [ :SENSe ] :MPADapter:CORRection:CSET [1]   2   3   4   5   6   7   8   9   10   11   12   13   14   15   16 [ :STATe ] ?
Example:	SENS:MPAD:CORR:CSET ON
Dependencies:	<p>This menu selection does not have any effect unless Input/Output, More, RF Output &amp; Test Set Config, Multiport Adapter, Multiport Adapter is set to the On state. This menu selection is hidden if the currently active measurement or mode does not support amplitude correction.</p> <p>Turning this on 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 <b>Restore Input/Output Defaults</b>
State Saved:	Saved in instrument state.
Initial S/W Revision:	A.10.00
Help Map ID:	0

## Properties

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

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections</b>
Dependencies:	This menu selection does not have any effect unless Input/Output, RF Output & Test Set Config, Multiport Adapter, Multiport Adapter is set to the On state. This menu selection is hidden if the currently active measurement or mode does not support amplitude correction.
Initial S/W Revision:	A.10.00
Help Map ID:	0

## 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:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties</b>
Notes:	The selected correction is remembered even when not in the correction menu
Dependencies:	This menu selection does not have any effect unless Input/Output, RF Output & Test Set Config, Multiport Adapter, Multiport Adapter is set to the On state
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 9 Correction 9 Correction 10 Correction 11 Correction 12 Correction 13 Correction 14 Correction 15 Correction 16
Initial S/W Revision:	A.10.00
Help Map ID:	0

## Antenna Unit

For devices (like antennae) which make measurements of field strength or flux density, the correction array should contain within its values the appropriate conversion factors such that, when the data on the analyzer is presented in dB $\mu$ V, the display is calibrated in the appropriate units. The "Antenna Unit" used for the conversion is contained within the corrections array database. It may be specified by the user or loaded in from an external file or SCPI.

When an array with an Antenna Unit other than "None" is turned on, the Y Axis Unit of the analyzer is forced to that unit. 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., and all other Y Axis Unit choices are grayed out.

Antenna Unit does not appear in all Modes that support Corrections. Only the modes listed in the Mode row of the table below support Antenna Units.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties</b>
Mode:	SA

## Input/Output

<b>Remote Command:</b>	[ :SENSe] :MPADapter:CORRection:CSET [1]   2   3   4   5   6   7   8   9   10   11   12   13   14   15   16 :ANTenna [:UNIT] GAUSS   PTESLa   UVM   UAM   NOConversion  [ :SENSe] :MPADapter:CORRection:CSET [1]   2   3   4   5   6   7   8   9   10   11   12   13   14   15   16 :ANTenna [:UNIT] ?
Example:	:MPAD:CORR:CSET:ANT GAUS
Dependencies:	Only the first correction array (Correction 1) supports antenna units.  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. Forceful message -250.3004
Preset:	Unaffected by Preset. Set to NOC by Restore Input/Output Defaults
State Saved:	Saved in State
Initial S/W Revision:	A.10.00
Help Map ID:	0

### dB $\mu$ V/m

Sets the antenna unit to dB $\mu$ V/m. If this correction is turned on, and Apply Corrections is on, the Y Axis Unit will then be forced to dB $\mu$ V/m and all other Y Axis Unit selections will be grayed out.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties, Antenna Unit</b>
Example:	:MPAD:CORR:CSET2:ANT UVM
Readback:	"dB $\mu$ V/m"
Initial S/W Revision:	A.10.00
Help Map ID:	0

### dB $\mu$ A/m

Sets the antenna unit to dB $\mu$ A/m. If this correction is turned on, and Apply Corrections is on, the Y Axis Unit will then be forced to dB $\mu$ A/m and all other Y Axis Unit selections will be grayed out.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties, Antenna Unit</b>
Example:	:MPAD:CORR:CSET2:ANT UVA
Readback:	" dB $\mu$ A/m"
Initial S/W Revision:	A.10.00
Help Map ID:	0



**dBpT**

Sets the antenna unit to dBpT. If this correction is turned on, and Apply Corrections is on, the Y Axis Unit will then be forced to dBpT and all other Y Axis Unit selections will be grayed out.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties, Antenna Unit</b>
Example:	:MPAD:CORR:CSET3:ANT PTES
Readback:	"dBpT"
Initial S/W Revision:	A.10.00
Help Map ID:	0

**dBG**

Sets the antenna unit to dBG. If this correction is turned on, and Apply Corrections is on, the Y Axis Unit will then be forced to dBG and all other Y Axis Unit selections will be grayed out.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties, Antenna Unit</b>
Example:	:MPAD:CORR:CSET:ANT GAUS
Readback:	" dBG"
Initial S/W Revision:	A.10.00
Help Map ID:	0

**None**

Selects no antenna unit for this Correction set. Thus no Y Axis unit will be forced.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties, Antenna Unit</b>
Example:	:MPAD:CORR:CSET4:ANT NOC
Readback:	"None"
Initial S/W Revision:	A.10.00
Help Map ID:	0

**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 350](#)

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties</b>
-----------	--

## Input/Output

<b>Remote Command:</b>	[:SENSe]:MPADapter:CORRection:CSET[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:X:SPACing LINear LOGarithmic [:SENSe]:MPADapter:CORRection:CSET[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:X:SPACing?
Example:	:MPAD:CORR:CSET:X:SPAC LIN
Dependencies:	This menu selection does not have any effect unless Input/Output, More, RF Output & Test Set Config, Multiport Adapter, Multiport Adapter is set to the On state.
Preset:	Unaffected by a Preset. Set to Linear by Restore Input/Output Defaults.
State Saved:	Saved in instrument state.
Initial S/W Revision:	A.10.00
Help Map ID:	0

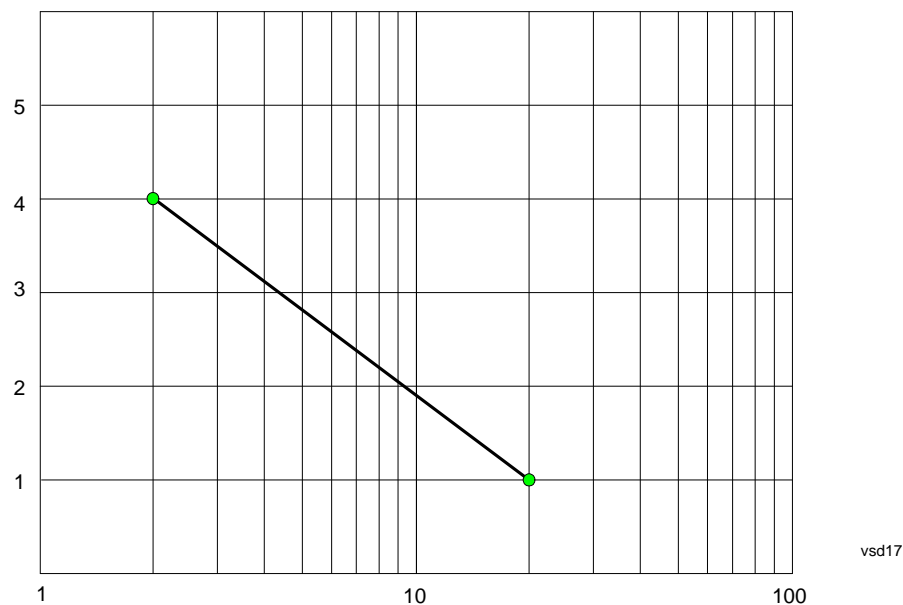
## Interpolation

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.

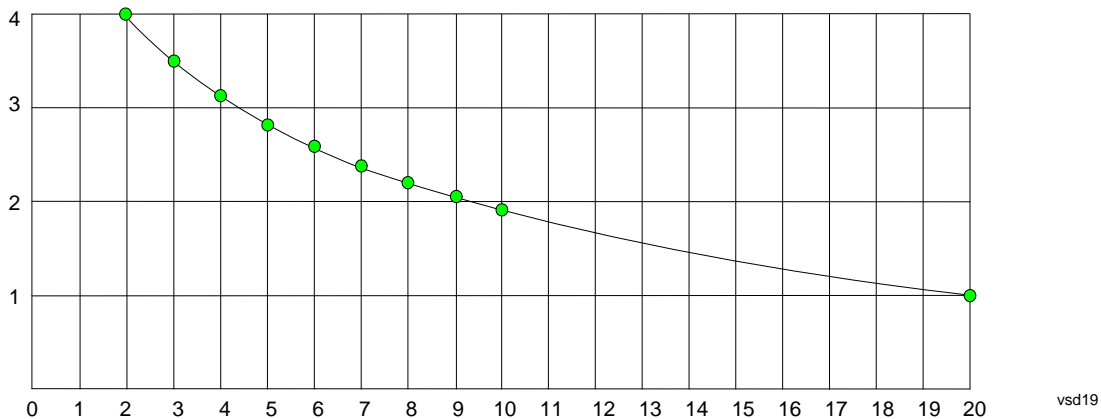
To effect this correction, the goal, for any particular start and stop frequency, is to build a correction trace, whose number of points matches the current Sweep Points setting of the instrument, which will be used to apply corrections on a bucket by bucket basis to the data traces.

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.

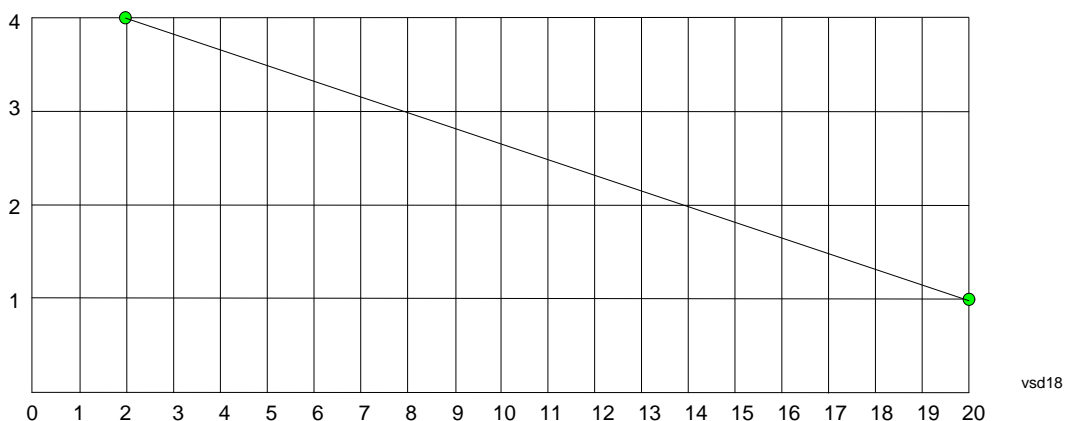
If we interpolate on a log scale, we assume that the line between the two points is a straight line on the log scale. For example, let's say the two points are (2,4) and (20,1). A straight line between them on a log scale looks like:



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



On the other hand, 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 be in a screen dump.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties</b>
Remote Command:	[:SENSe]:MPADapter:CORRection:CSET[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:DESCRiption "text" [:SENSe]:MPADapter:CORRection:CSET[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:DESCRiption?
Example:	:MPAD:CORR:CSET:DESC "11941A Antenna correction"
Notes:	45 chars max; may not fit on display if max chars used
Dependencies:	This menu selection does not have any effect unless Input/Output, More, RF Output & Test Set Config, Multiport Adapter, Multiport Adapter is set to the On state.

## Input/Output

Preset:	Unaffected by a Preset. Set to empty by <b>Restore Input/Output Defaults</b>
State Saved:	Saved in instrument state.
Initial S/W Revision:	A.10.00
Help Map ID:	0

### 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 be in a screen dump.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties</b>
Remote Command:	[ :SENSe ] :MPADapter:CORRection:CSET [1]   2   3   4   5   6   7   8   9   10   11   12   13   14   15   16 :COMMENT "text" [ :SENSe ] :MPADapter:CORRection:CSET [1]   2   3   4   5   6   7   8   9   10   11   12   13   14   15   16 :COMMENT?
Example:	:MPAD:CORR:CSET:COMM "this is a comment"
Notes:	45 chars max; may not fit on display if max chars used
Preset:	Unaffected by Preset. Set to empty by <b>Restore Input/Output Defaults</b>
State Saved:	Saved in instrument state
Initial S/W Revision:	A.10.00
Help Map ID:	0

### RF Port

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

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties</b>
Mode:	SEQAN
Remote Command:	[ :SENSe ] :MPADapter:CORRection:CSET [1]   2   3   4   5   6   7   8   9   10   11   12   13   14   15   16 :RF:PORT RFIO   RFIO1   RFIO2   RFIO3   RFIO4   RFIO5   RFIO6   RFIO7 [ :SENSe ] :MPADapter:CORRection:CSET [1]   2   3   4   5   6   7   8   9   10   11   12   13   14   15   16 :RF:PORT?
Example:	:MPAD:CORR:CSET:RF:PORT RFIO0
Notes:	
Dependencies:	Only available in EXT
Couplings:	
Preset:	Unaffected by Preset. Set to RF by Restore Input/Output Defaults

State Saved:	Saved in State
Backwards Compatibility SCPI:	
Initial S/W Revision:	A.10.00
Help Map ID:	0

**RFIO0**

The port to which the current corrections are applied. Pressing this key again allows the user access to the menu for specifying to which internal device and multiport adapter RF path the corrections for multiport adapter RFIO 0 are applied.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties, RF Port</b>
Remote Command:	[ :SENSE ] :MPADapter:CORRection:CSET [1]   2   3   4   5   6   7   8   9   10   11   12   13   14   15   16 :RF:PORT:RFIO0 SOURce   ANALyzer   BOTH [ :SENSE ] :MPADapter:CORRection:CSET [1]   2   3   4   5   6   7   8   9   10   11   12   13   14   15   16 :RF:PORT:RFIO0?
Example:	:MPAD:CORR:CSET:RF:PORT:RFIO0 BOTH
Preset:	Both
State Saved:	Saved in State
Initial S/W Revision:	A.10.0
Help Map ID:	0

**Correct Source**

Sets the corrections for the multiport adapter RFIO 0 port to be applied to the source.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties, RF Port, RFIO 0</b>
Example:	:MPAD:CORR:CSET[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:RF:PORT:RFIO0 SOUR
Readback:	"Correct Source"
Initial S/W Revision:	A.10.0
Help Map ID:	0

**Correct Analyzer**

Sets the corrections for the multiport adapter RFIO 0 port to be applied to the analyzer.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties, RF Port, RFIO 0</b>
Example:	:MPAD:CORR:CSET[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:RF:PORT:RFIO0 ANAL

## Input/Output

Readback:	"Correct Analyzer"
Initial S/W Revision:	A.10.0
Help Map ID:	0

### Correct Source and Analyzer

Sets the corrections for the multiport adapter RFIO 0 port to be applied to both the source and the analyzer.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties, RF Port, RFIO 0</b>
Example:	:MPAD:CORR:CSET[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:RF:PORT:RFIO0 BOTH
Readback:	"Correct Source and Analyzer"
Initial S/W Revision:	A.10.0
Help Map ID:	0

### RFIO1

The port to which the current corrections will be applied. Pressing this key again allows the user access to the menu for specifying to which internal device and multiport adapter RF path the corrections for multiport adapter RFIO 1 are applied.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties, RF Port</b>
<b>Remote Command:</b>	[ :SENSe ] :MPADapter :CORRection :CSET [ 1 ]   2   3   4   5   6   7   8   9   10   11   12   13   14   15   16 :RF :PORT :RFIO1 SOURce   ANALyzer   BOTH [ :SENSe ] :MPADapter :CORRection :CSET [ 1 ]   2   3   4   5   6   7   8   9   10   11   12   13   14   15   16 :RF :PORT :RFIO1?
Example:	:MPAD:CORR:CSET:RF:PORT:RFIO1 BOTH
Preset:	Both
State Saved:	Saved in State
Initial S/W Revision:	A.10.0
Help Map ID:	0

### Correct Source

Sets the corrections for the multiport adapter RFIO 1 port to be applied to the source.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties, RF Port, RFIO 1</b>
Example:	:MPAD:CORR:CSET[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:RF:PORT:RFIO1 SOUR
Readback:	"Correct Source"

Initial S/W Revision:	A.10.0
Help Map ID:	0

### Correct Analyzer

Sets the corrections for the multiport adapter RFIO 1 port to be applied to the analyzer.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties, RF Port, RFIO 1</b>
Example:	:MPAD:CORR:CSET[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:RF:PORT:RFIO1 ANAL
Readback:	"Correct Analyzer"
Initial S/W Revision:	A.10.0
Help Map ID:	0

### Correct Source and Analyzer

Sets the corrections for the multiport adapter RFIO 1 port to be applied to both the source and the analyzer.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties, RF Port, RFIO 1</b>
Example:	:MPAD:CORR:CSET[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:RF:PORT:RFIO1 BOTH
Readback:	"Correct Source and Analyzer"
Initial S/W Revision:	A.10.0
Help Map ID:	0

### RFIO2

The port to which the current corrections are applied. Pressing this key again allows the user access to the menu for specifying to which internal device and multiport adapter RF path the corrections for multiport adapter RFIO 2 are applied.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties, RF Port</b>
<b>Remote Command:</b>	[ :SENSE ] :MPADapter:CORRection:CSET [1]   2   3   4   5   6   7   8   9   10   11   12   13   14   15   16 :RF:PORT:RFIO2 SOURCE   ANALyzer   BOTH [ :SENSE ] :MPADapter:CORRection:CSET [1]   2   3   4   5   6   7   8   9   10   11   12   13   14   15   16 :RF:PORT:RFIO2?
Example:	:MPAD:CORR:CSET:RF:PORT:RFIO2 BOTH
Preset:	Both
State Saved:	Saved in State
Initial S/W Revision:	A.10.0

## Input/Output

Help Map ID:	0
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### Correct Source

Sets the corrections for the multiport adapter RFIO 2 port to be applied to the source.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties, RF Port, RFIO 2</b>
Example:	:MPAD:CORR:CSET[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:RF:PORT:RFIO2 SOUR
Readback:	"Correct Source"
Initial S/W Revision:	A.10.0
Help Map ID:	0

### Correct Analyzer

Sets the corrections for the multiport adapter RFIO 2 port to be applied to the analyzer.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties, RF Port, RFIO 2</b>
Example:	:MPAD:CORR:CSET[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:RF:PORT:RFIO2 ANAL
Readback:	"Correct Analyzer"
Initial S/W Revision:	A.10.0
Help Map ID:	0

### Correct Source and Analyzer

Sets the corrections for the multiport adapter RFIO 2 port to be applied to both the source and the analyzer.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties, RF Port, RFIO 2</b>
Example:	:MPAD:CORR:CSET[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:RF:PORT:RFIO2 BOTH
Readback:	"Correct Source and Analyzer"
Initial S/W Revision:	A.10.0
Help Map ID:	0

## RFIO3

The port to which the current corrections will be applied. Pressing this key again allows the user access to the menu for specifying to which internal device and multiport adapter RF path the corrections for multiport adapter



RFIO 3 are applied.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties, RF Port</b>
Remote Command:	[ :SENSE ] :MPADapter:CORRection:CSET [1]   2   3   4   5   6   7   8   9   10   11   12   13   14   15   16 :RF:PORT:RFIO3 SOURce   ANALyzer   BOTH [ :SENSe ] :MPADapter:CORRection:CSET [1]   2   3   4   5   6   7   8   9   10   11   12   13   14   15   16 :RF:PORT:RFIO3?
Example:	:MPAD:CORR:CSET:RF:PORT:RFIO3 BOTH
Preset:	Both
State Saved:	Saved in State
Initial S/W Revision:	A.10.0
Help Map ID:	0

**Correct Source**

Sets the corrections for the multiport adapter RFIO 3 port to be applied to the source.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties, RF Port, RFIO 3</b>
Example:	:MPAD:CORR:CSET[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:RF:PORT:RFIO3 SOUR
Readback:	"Correct Source"
Initial S/W Revision:	A.10.0
Help Map ID:	0

**Correct Analyzer**

Sets the corrections for the multiport adapter RFIO 3 port to be applied to the analyzer.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties, RF Port, RFIO 3</b>
Example:	:MPAD:CORR:CSET[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:RF:PORT:RFIO3 ANAL
Readback:	"Correct Analyzer"
Initial S/W Revision:	A.10.0
Help Map ID:	0

## Input/Output

### Correct Source and Analyzer

Sets the corrections for the multiport adapter RFIO 3 port to be applied to both the source and the analyzer.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties, RF Port, RFIO 3</b>
Example:	:MPAD:CORR:CSET[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:RF:PORT:RFIO3 BOTH
Readback:	"Correct Source and Analyzer"
Initial S/W Revision:	A.10.0
Help Map ID:	0

### RFIO4

The port to which the current corrections are applied. Pressing this key again allows the user access to the menu for specifying to which internal device and multiport adapter RF path the corrections for multiport adapter RFIO 4 are applied.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties, RF Port</b>
Remote Command:	[ :SENSe ] :MPADapter:CORRection:CSET [ 1 ]   2   3   4   5   6   7   8   9   10   11   12   13   14   15   16 :RF:PORT:RFIO4 SOURce   ANALyzer   BOTH [ :SENSe ] :MPADapter:CORRection:CSET [ 1 ]   2   3   4   5   6   7   8   9   10   11   12   13   14   15   16 :RF:PORT:RFIO4?
Example:	:MPAD:CORR:CSET:RF:PORT:RFIO4 BOTH
Preset:	Both
State Saved:	Saved in State
Initial S/W Revision:	A.10.0
Help Map ID:	0

### Correct Source

Sets the corrections for the multiport adapter RFIO 4 port to be applied to the source.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties, RF Port, RFIO 4</b>
Example:	:MPAD:CORR:CSET[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:RF:PORT:RFIO4 SOUR
Readback:	"Correct Source"
Initial S/W Revision:	A.10.0
Help Map ID:	0

**Correct Analyzer**

Sets the corrections for the multiport adapter RFIO 4 port to be applied to the analyzer.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties, RF Port, RFIO 4</b>
Example:	:MPAD:CORR:CSET[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:RF:PORT:RFIO4 ANAL
Readback:	"Correct Analyzer"
Initial S/W Revision:	A.10.0
Help Map ID:	0

**Correct Source and Analyzer**

Sets the corrections for the multiport adapter RFIO 4 port to be applied to both the source and the analyzer.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties, RF Port, RFIO 4</b>
Example:	:MPAD:CORR:CSET[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:RF:PORT:RFIO4 BOTH
Readback:	"Correct Source and Analyzer"
Initial S/W Revision:	A.10.0
Help Map ID:	0

**RFIO5**

The port to which the current corrections are applied. Pressing this key again allows the user access to the menu for specifying to which internal device and multiport adapter RF path the corrections for multiport adapter RFIO 5 are applied.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties, RF Port</b>
<b>Remote Command:</b>	[ :SENSE ] :MPADapter:CORRection:CSET [1]   2   3   4   5   6   7   8   9   10   11   12   13   14   15   16 :RF:PORT:RFIO5 SOURCE   ANALyzer   BOTH [ :SENSE ] :MPADapter:CORRection:CSET [1]   2   3   4   5   6   7   8   9   10   11   12   13   14   15   16 :RF:PORT:RFIO5?
Example:	:MPAD:CORR:CSET:RF:PORT:RFIO5 BOTH
Preset:	Both
State Saved:	Saved in State
Initial S/W Revision:	A.10.0
Help Map ID:	0

## Input/Output

### Correct Source

Sets the corrections for the multiport adapter RFIO 5 port to be applied to the source.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties, RF Port, RFIO 5</b>
Example:	:MPAD:CORR:CSET[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:RF:PORT:RFIO5 SOUR
Readback:	"Correct Source"
Initial S/W Revision:	A.10.0
Help Map ID:	0

### Correct Analyzer

Sets the corrections for the multiport adapter RFIO 5 port to be applied to the analyzer.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties, RF Port, RFIO 5</b>
Example:	:MPAD:CORR:CSET[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:RF:PORT:RFIO5 ANAL
Readback:	"Correct Analyzer"
Initial S/W Revision:	A.10.0
Help Map ID:	0

### Correct Source and Analyzer

Sets the corrections for the multiport adapter RFIO 5 port to be applied to both the source and the analyzer.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties, RF Port, RFIO 5</b>
Example:	:MPAD:CORR:CSET[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:RF:PORT:RFIO5 BOTH
Readback:	"Correct Source and Analyzer"
Initial S/W Revision:	A.10.0
Help Map ID:	0

### RFIO6

The port to which the current corrections are applied. Pressing this key again allows the user access to the menu for specifying to which internal device and multiport adapter RF path the corrections for multiport adapter RFIO 6 are applied.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties, RF Port, Page 2</b>
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<b>Remote Command:</b>	[ :SENSE] :MPADapter:CORRection:CSET [1]   2   3   4   5   6   7   8   9   10   11   12   13   14   15   16 :RF:PORT:RFIO6 SOURce   ANALyzer   BOTH  [ :SENSe] :MPADapter:CORRection:CSET [1]   2   3   4   5   6   7   8   9   10   11   12   13   14   15   16 :RF:PORT:RFIO6?
Example:	:MPAD:CORR:CSET:RF:PORT:RFIO6 BOTH
Preset:	Both
State Saved:	Saved in State
Initial S/W Revision:	A.10.0
Help Map ID:	0

**Correct Source**

Sets the corrections for the multiport adapter RFIO 6 port to be applied to the source.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties, RF Port, RFIO 6</b>
Example:	:MPAD:CORR:CSET[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:RF:PORT:RFIO6 SOUR
Readback:	"Correct Source"
Initial S/W Revision:	A.10.0
Help Map ID:	0

**Correct Analyzer**

Sets the corrections for the multiport adapter RFIO 6 port to be applied to the analyzer.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties, RF Port, RFIO 6</b>
Example:	:MPAD:CORR:CSET[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:RF:PORT:RFIO6 ANAL
Readback:	"Correct Analyzer"
Initial S/W Revision:	A.10.0
Help Map ID:	0

**Correct Source and Analyzer**

Sets the corrections for the multiport adapter RFIO 6 port to be applied to both the source and the analyzer.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties, RF Port, RFIO 6</b>
Example:	:MPAD:CORR:CSET[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:RF:PORT:RFIO6 BOTH

## Input/Output

Readback:	"Correct Source and Analyzer"
Initial S/W Revision:	A.10.0
Help Map ID:	0

### RFIO7

The port to which the current corrections are applied. Pressing this key again allows the user access to the menu for specifying to which internal device and multiport adapter RF path the corrections for multiport adapter RFIO 7 are applied.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties, RF Port, Page 2</b>
Remote Command:	[[:SENSe]:MPADapter:CORRection:CSET[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:RF:PORT:RFIO7 SOURce  ANALyzer  BOTH [:SENSe]:MPADapter:CORRection:CSET[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:RF:PORT:RFIO7?
Example:	:MPAD:CORR:CSET:RF:PORT:RFIO7 BOTH
Preset:	Both
State Saved:	Saved in State
Initial S/W Revision:	A.10.0
Help Map ID:	0

### Correct Source

Sets the corrections for the multiport adapter RFIO 7 port to be applied to the source.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties, RF Port, RFIO 7</b>
Example:	:MPAD:CORR:CSET[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:RF:PORT:RFIO7 SOUR
Readback:	"Correct Source"
Initial S/W Revision:	A.10.0
Help Map ID:	0

### Correct Analyzer

Sets the corrections for the multiport adapter RFIO 7 port to be applied to the analyzer.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties, RF Port, RFIO 7</b>
Example:	:MPAD:CORR:CSET[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:RF:PORT:RFIO7 ANAL
Readback:	"Correct Analyzer"

Initial S/W Revision:	A.10.0
Help Map ID:	0

**Correct Source and Analyzer**

Sets the corrections for the multiport adapter RFIO 7 port to be applied to both the source and the analyzer.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Properties, RF Port, RFIO 7</b>
Example:	:MPAD:CORR:CSET[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:RF:PORT:RFIO7 BOTH
Readback:	"Correct Source and Analyzer"
Initial S/W Revision:	A.10.0
Help Map ID:	0

**Table Editor**

**Edit**

Invokes the integrated editing facility for this correction set. See description in section [“Table Editor” on page 363](#).

When entering the menu, the editor window turns on, the selected correction is turned **On**, **Apply Corrections** is set to **On**, the amplitude scale is set to **Log**, and the Amplitude Correction (“Ampcor”) trace is displayed. The actual, interpolated correction trace is shown in green for the selected correction. Note that since the actual interpolated correction is shown, the correction trace may have some curvature to it. This trace represents only the correction currently being edited, rather than the total, accumulated amplitude correction for all amplitude corrections which are currently on, although the total, accumulated correction for all corrections which are turned on is still applied to the data traces.

Because corrections data is always in dB, but the Y-axis of the analyzer is in absolute units, it is necessary to establish a reference line for display of the Corrections data. 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. (0,0,255) and is three pixels high. The green correction trace is drawn after all other traces and this reference blue line, so it sits “on top” of them.

Corrections data is always in dB. Whatever dB value appears in the correction table represents the correction to be 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. By definition all points are connected. If a gap is desired for corrections data, enter 0 dB.

Note that a well-designed Corrections array should start at 0 dB and end at 0 dB. This is because whatever the high end point is will be extended to the top frequency of the instrument, and whatever the low end point is will be extended down to 0 Hz. So for a Corrections array to have no effect outside its range, you should start and end the array at 0 dB.

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**NOTE** The table editor will only operate properly if the analyzer is sweeping, because its updates are tied to the sweep system. Thus, you should not try to use the editor in single sweep, and it will be sluggish during compute-intensive operations like narrow-span FFT sweeps.

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When exiting the edit menu (by using the **Return** key or by pressing an instrument front-panel key), the editor

## Input/Output

window turns off and the Ampcor trace is no longer displayed; however, **Apply Corrections** remains **On**, any correction that was on while in the editor remains on, and the amplitude scale returns to its previous setting.

Corrections arrays are not affected by a Preset, because they are in the Input/Output system. They also survive shutdown and restarting of the analyzer application, which means they will survive a power cycle.

When editing a correction, the editor remembers which correction and which element in the correction array you were editing, and returns you to that correction and that element when you return to the editor after leaving it.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections</b>
Initial S/W Revision:	A.10.00
Help Map ID:	0

## Navigate

Lets you move through the table to edit the desired point.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Edit</b>
Notes:	There is no value readback on the key
Min:	1
Max:	2000
Initial S/W Revision:	A.10.00
Help Map ID:	0

## Frequency

Lets you edit the frequency of the current row.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Edit</b>
Notes:	There is no value readback on the key.
Min:	0
Max:	1 THz
Initial S/W Revision:	A.10.00
Help Map ID:	0

## Amplitude

Lets you edit the Amplitude of the current row.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Edit</b>
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Notes:	There is no value readback on the key.
Min:	-1000 dB
Max:	1000 dB
Initial S/W Revision:	A.10.00
Help Map ID:	0

**Insert Point Below**

Inserts a point below the current point. The new point is a copy of the current point and becomes the current point. The new point is not yet entered into the underlying table, and the data in the row is displayed in light gray.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Edit</b>
Initial S/W Revision:	A.10.00
Help Map ID:	0

**Delete Point**

Deletes the currently-selected point, whether or not that point is being edited, and selects the Navigate functionality. The point following the currently-selected point (or the point preceding if there is none) will be selected.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Edit</b>
Initial S/W Revision:	A.10.00
Help Map ID:	0

**Scale X Axis**

Matches the X Axis to the selected Correction, as well as possible. Sets the Start and Stop Frequency to contain the minimum and maximum Frequency of the selected Correction. The range between Start Frequency and Stop Frequency is 12.5% above the range between the minimum and maximum Frequency, so that span exceeds this range by one graticule division on either side. If in zero-span, or there is no data in the Ampcor table, or the frequency range represented by the table is zero, no action is taken. Standard clipping rules apply if the value in the table is outside the allowable range for the X axis.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections, Edit</b>
Dependencies:	If either the first or last point in the array is outside the frequency range of the current input, an error message is generated:  “-221. Settings conflict; Start or Stop Freq out of range for current input settings”
Initial S/W Revision:	A.10.00
Help Map ID:	0

## Input/Output

### 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:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections</b>
Remote Command:	[ :SENSe ] :MPADapter:CORRection:CSET [1   2   3   4   5   6   7   8   9   10   11   12   13   14   15   16 :DELete
Example:	MPAD:CORR:CSET:DEL MPAD:CORR:CSET1:DEL MPAD:CORR:CSET4:DEL
Notes:	Pressing this key when no corrections are present is accepted without error.
Initial S/W Revision:	A.10.00
Help Map ID:	0

### Correction On/Off

#### 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 346) are used.

Key Path:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections</b>
Remote Command:	[ :SENSe ] :MPADapter:CORRection:CSET:ALL [ :STATe ] ON   OFF   1   0  [ :SENSe ] :MPADapter:CORRection:CSET:ALL [ :STATe ] ?
Example:	SENS:MPAD: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.10.00
Help Map ID:	0

#### Delete All Corrections

Erases all correction values for all 16 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:	<b>Input/Output, RF Output &amp; Test Set Config, Multiport Adapter, Corrections</b>
<b>Remote Command:</b>	[ :SENSE ] :MPADapter:CORRection:CSET:ALL:DELeTe
Example:	MPAD:CORR:CSET:ALL:DEL
Initial S/W Revision:	A.10.00
Help Map ID:	0

#### 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.

<b>Remote Command:</b>	[ :SENSE ] :MPADapter:CORRection:CSET [1]   2   3   4   5   6   7   8   9   10   11   12   13   14   15   16 :DATA <freq>, <ampl>, . . . [ :SENSE ] :MPADapter:CORRection:CSET [1]   2   3   4   5   6   7   8   9   10   11   12   13   14   15   16 :DATA?
Example:	MPAD:CORR:CSET[1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:DATA 10000000,-1.0,20000000,1.0  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.10.00
Help Map ID:	0

#### 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.

## Input/Output

An Ampcor array can contain 2000 total points, maximum.

<b>Remote Command:</b>	[ :SENSE ] :MPADapter:CORRection:CSET [1]   2   3   4   5   6   7   8   9   10   11   12   13   14   15   16 :DATA:MERGE <freq>, <ampl>, ...
Example:	MPAD:CORR:CSET[1]2 3 4 5 6 7 8 9 10 11 12 13 14 15 16:DATA:MERGE 15000000,-5.0,25000000,5.0  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.10.00
Help Map ID:	0

## Output Config

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

Key Path:	<b>Input/Output</b>
Backwards Compatibility Notes:	1. 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
Help Map ID:	3133

## Trig Out (1 and 2)

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

Key Path:	<b>Input/Output, Output Config</b>
<b>Remote Command:</b>	:TRIGger   TRIGger1   TRIGger2 [ :SEQuence ] :OUTPut HSWP   MEASuring   MAIN   GATE   GTRigger   OEVEN   SPOINT   SSweep   SETtled   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.
Dependencies:	SSWeep SSETtled S1Marker S2Marker S3Marker S4Marker are only available for the source in the EXT.
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
Help Map ID:	3135

**Off**

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

Key Path:	<b>Input/Output, Output Config, Trig 1/2 Output</b>
Example:	TRIG1:OUTP OFF
Readback:	Off
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3141

**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:	<b>Input/Output, Output Config, Trig 1/2 Output</b>
<b>Remote Command:</b>	: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"

## Input/Output

State Saved:	Saved in instrument state
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3142

### 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:	<b>Input/Output, Output Config, Trig 1/2 Output</b>
Example:	TRIG1:OUTP HSWP
Readback:	Sweeping
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3136

### 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:	<b>Input/Output, Output Config, Trig 1/2 Output</b>
Example:	TRIG1:OUTP MEAS
Readback:	Measuring
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3137

### Main Trigger

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

Key Path:	<b>Input/Output, Output Config, Trig 1/2 Output</b>
Example:	TRIG1:OUTP MAIN
Readback:	Main Trigger
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3200

### 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:	<b>Input/Output, Output Config, Trig 1/2 Output</b>
Example:	TRIG1:OUTP GTR
Readback:	Gate Trigger
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3138

### 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:	<b>Input/Output, Output Config, Trig 1/2 Output</b>
Example:	TRIG1:OUTP GATE
Readback:	Gate
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3139

### 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 test set 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:	<b>Input/Output, Output Config, Trig 1/2 Output</b>
Example:	TRIG1:OUTP OEV
Readback:	Odd/Even
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3140

### Source Point Trigger

Selects the gate signal to be output to the Trig 1 Out or Trig 2 Out connector for use as the Point Trigger when operating an external source in Tracking mode. When Ext Trigger 1 is selected as the Point Trigger under Source, the Source Point Trigger under Trig1 Out automatically gets selected. Similarly, when Ext Trigger 2 is selected as the Point Trigger under Source, the Source Point Trigger key under Trig2 Out automatically gets selected

Key Path:	<b>Input/Output, Output Config, Trig 1/2 Output</b>
-----------	---

## Input/Output

Example:	TRIG1:OUTP SPO
Readback:	Source Point
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3178

### Source Marker 1

This key is only available in the EXT.

Trigger output at marker 1 in current playing Waveform file.

Key Path:	<b>Input/Output, Output Config, Trig 1/2 Output</b>
Example:	:TRIG1:OUTP S1M
ReadBack:	Marker 1
Initial S/W Revision:	A.05.01
Help Map ID:	30019

### Source Marker 2

This key is only available in the EXT.

Trigger output at marker 2 in current playing Waveform file.

Key Path:	<b>Input/Output, Output Config, Trig 1/2 Output</b>
Example:	:TRIG1:OUTP S2M
ReadBack:	Marker 2
Initial S/W Revision:	A.05.01
Help Map ID:	30020

### Source Marker 3

This key is only available in the EXT.

Trigger output at marker 3 in current playing Waveform file.

Key Path:	<b>Input/Output, Output Config, Trig 1/2 Output</b>
Example:	:TRIG1:OUTP S3M
ReadBack:	Marker 3
Initial S/W Revision:	A.05.01
Help Map ID:	30021



**Source Marker 4**

This key is only available in the EXT.

Trigger output at marker 4 in current playing Waveform file.

Key Path:	<b>Input/Output, Output Config, Trig 1/2 Output</b>
Example:	:TRIG1:OUTP S4M
ReadBack:	Marker 4
Initial S/W Revision:	A.05.01
Help Map ID:	30022

**Analog Out**

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

See [“More Information” on page 374](#)

Key Path:	<b>Input/Output, Output Config</b>
<b>Remote Command:</b>	:OUTPut :ANALog OFF   SVIDeo   LOGVidEo   LINVidEo   DAUDio :OUTPut :ANALog?
Example:	OUTP:ANAL SVIDeo ! causes the analog output type to be Screen Video
Preset:	OFF
Preset:	This is unaffected by Preset but is set to DAUDio on a "Restore Input/Output Defaults" or "Restore System Defaults->All
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
Help Map ID:	3143

## Input/Output

### 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 test set 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:	<b>Input/Output, Output Config, Analog Out</b>
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
Help Map ID:	29995

### Off

Turns off the analog output.

Key Path:	<b>Input/Output, Output Config, Analog Out</b>
Example:	OUTP:ANAL OFF ! causes the analog output to be off
Readback Text:	Off
Initial S/W Revision:	A.04.00
Help Map ID:	3144

**Log Video (RF Envelope, Ref=Mixer Level)**

Selects the analog output to be the log of the video signal. In this mode, the pre-detector data is output to the Analog Out connector with a Log scaling. The output is referenced to the current level at the mixer, does not depend on display settings like Reference Level or dB per division, and it is not influenced by the selected detector or any digital flatness corrections or trace post-processing (like Trace Averaging), but does change with input attenuation.

The output is designed so that full scale (1 V) corresponds to  $-10$  dBm at the mixer. The full range (0–1 V) covers 192.66 dB ; thus, 0 V corresponds to  $-202.66$  dBm at the mixer.

Key Path:	<b>Input/Output, Output Config, Analog Out</b>
Example:	OUTP:ANAL LOGV
Dependencies:	<p>Because the Log Video output uses one of the two IF processing channels, only one detector is available while Screen Video is selected. All active traces will change to use the same detector as the selected trace when Log Video is activated.</p> <p>Log Video output is not available while any EMI Detector is selected (Quasi Peak, RMS Average or EMI Average), because these detectors use both IF processing channels. Consequently, if the user chooses an EMI Detector, there will be no Log Video output.</p> <p>The output holds at its last value during an alignment, during a marker count, and during retrace (after a sweep and before the next sweep starts).</p> <p>This function depends on optional capability. The key will be blanked and the command will generate an “Option not available” error unless you have Option YAV licensed in your instrument.</p>
Couplings:	Log Video output changes while in FFT Sweeps, so for measurements that use exclusively FFT Sweeps, or if the user manually chooses FFT Sweeps, the Log Video output will look different than it does in swept mode.
Readback Text:	Log Video
Initial S/W Revision:	A.04.00
Help Map ID:	3146

**Linear Video (RF Envelope, Ref=Ref Level)**

Selects the analog output to be the envelope signal on a linear (voltage) scale. In this mode, the pre-detector data is output to the Analog Out connector with a Linear scaling. The output is based on the current Reference Level, and is not influenced by the selected detector or any digital flatness corrections or trace post-processing (like Trace Averaging).

The scaling is set so that 1 V output occurs with an instantaneous video level equal to the reference level, and 0 V occurs at the bottom of the graticule. This scaling gives you the ability to control the gain without having another setup control for the key. But it requires you to control the look of the display (the reference level) in order to control the analog output.

This mode is ideal for looking at Amplitude Modulated signals, as the linear envelope effectively

## Input/Output

demodulates the signal.

Key Path:	<b>Input/Output, Output Config, Analog Out</b>
Example:	OUTP:ANAL LINV
Dependencies:	<p>Because the Linear Video output uses one of the two IF processing channels, only one detector is available while Linear Video is selected. All active traces will change to use the same detector as the selected trace when Log Video is activated.</p> <p>Linear Video output is not available while any EMI Detector is selected (Quasi Peak, RMS Average or EMI Average), because these detectors use both IF processing channels. Consequently, if the user chooses an EMI Detector, there will be no Linear Video output.</p> <p>The output holds at its last value during an alignment and during a marker count and during retrace (after a sweep and before the next sweep starts).</p> <p>This function depends on optional capability; the key will be blanked and the command will generate an "Option not available" error unless you have Option YAV licensed in your instrument.</p>
Couplings:	Linear Video output changes while in FFT Sweeps, so for measurements that use exclusively FFT Sweeps, or if the user manually chooses FFT Sweeps, the Linear Video output will look different than it does in swept mode.
Readback Text:	Linear Video
Initial S/W Revision:	A.04.00
Help Map ID:	3147

### Demod Audio

Selects the analog output to be the demodulation of the video signal.

When Demod Audio is selected, the demodulated audio signal appears at this output whenever the Analog Demod application is demodulating a signal.

When Analog Out is in the Auto state, this output is auto-selected when in the Analog Demod mode.

If any other Analog Output is manually selected when in the Analog Demod mode, a condition warning message appears.

Key Path:	<b>Input/Output, Output Config, Analog Out</b>
Example:	OUTP:ANAL DAUD

Dependencies:	<p>This key only appears if the Analog Demod application (N9063A), the N6141A or W6141A application, or Option EMC is installed and licensed, otherwise the key will be blanked and the command will generate an “Option not available” error.</p> <p>The output holds at its last value during an alignment and during a marker count. It is not held between sweeps, in order for Tune and Listen to work properly.</p> <p>When Demod Audio is the selected Analog Output:</p> <ul style="list-style-type: none"> <li>• all active traces are forced to use the same detector.</li> <li>• CISPR detectors (QPD, EMI Avg, RMS Avg) are unavailable</li> </ul>
Readback Text:	Demod Audio
Initial S/W Revision:	Prior to A.02.00 (this was the default functionality, and there was no selection)
Modified at S/W Revision:	A.04.00
Help Map ID:	3148

### Digital Bus

This menu allows you to configure the LVDS connector located on the rear panel of the instrument. It is a unidirectional link of real time data at a 90 MSa/s rate. The ADC is sampling a 22.5 MHz IF.

The data that appears on this port is raw, uncorrected ADC samples, unless you have option RTL. With option RTL, you get fully corrected I/Q data.

This connector will only be active when the Narrowband IF Path is currently in use.

Key Path:	<b>Input/Output, Output Config, Digital Out</b>
Initial S/W Revision:	A.04.00
Help Map ID:	3559



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## Marker

### 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	<b>Front-Panel</b>
Initial S/W Revision	A.05.00
Help Map ID	35265

### Marker Select

Specifies the selected marker. The term “selected marker” is used specify which marker is affected by the functions.

Key Path	<b>Marker</b>
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
Help Map ID	35246

### 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.

**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

## Marker

enforced when the remote command is sent.

<b>Remote Command</b>	:CALCulate:LSEQuencer:MARKer [1]   2   3   4   5   6   7   8   9   10   11   12 :MODE POSition   DELTa   OFF  :CALCulate: LSEQuencer:MARKer [1]   2   3   4   5   6   7   8   9   10   11   12 :MODE?
Preset	OFF (all markers)
State Saved	The marker control mode is saved in instrument state
Initial S/W Revision	A.05.00
Help Map ID	0

## 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.

<b>Key Path</b>	<b>Marker</b>
Example	:CALC:LSEQ:MARK:MODE POS
Notes	See the description under the “ Marker” key.
Couplings	<ul style="list-style-type: none"><li>The marker addressed by this command becomes the selected marker on the front panel.</li></ul>
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
Help Map ID	35247

## 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.

<b>Key Path</b>	<b>Marker</b>
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
Help Map ID	35248

**Off**

Turns off the selected marker and any of its marker function settings. However, Off does not affect which marker is selected.

Key Path	<b>Marker</b>
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
Help Map ID	35249

**Properties**

Opens a menu used to set certain properties of the selected marker.

Key Path	<b>Marker</b>
Initial S/W Revision	A.05.00
Help Map ID	35250

**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	<b>Marker, Properties</b>
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## Marker

<b>Remote Command</b>	:CALCulate:LSEQuencer:MARKer [1]   2   3   4   5   6   7   8   9   10   11   12 :REFerence <integer>  :CALCulate:LSEQuencer:MARKer [1]   2   3   4   5   6   7   8   9   10   11   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
Help Map ID	35251

## Marker Trace

Assigns the specified marker to the designated trace.

Key Path	Marker, Properties
<b>Remote Command</b>	:CALCulate:LSEQuencer:MARKer [1]   2   3   4   5   6   7   8   9   10   11   12 :TRACe RFENvelope MAXRfenvelop MINRfenvelop  :CALCulate:LSEQuencer:MARKer [1]   2   3   4   5   6   7   8   9   10   11   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
Help Map ID	35252

### 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	<b>Remote Only</b>
<b>Remote Command</b>	:CALCulate:LSEQuencer:MARKer [1]   2   3   4   5   6   7   8   9   10   11   12 :X <real>  :CALCulate:LSEQuencer:MARKer [1]   2   3   4   5   6   7   8   9   10   11   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
Help Map ID	35253

### 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

## Marker

setting the value of the marker

Key Path	Remote Only
<b>Remote Command</b>	:CALCulate:LSEQuencer:MARKer[1] 2 3 4 5 6 7 8 9 10 11 12:X:POSition <real> :CALCulate:LSEQuencer:MARKer[1] 2 3 4 5 6 7 8 9 10 11 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
Help Map ID	35254

### 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
<b>Remote Command</b>	:CALCulate:LSEQuencer:MARKer[1] 2 3 4 5 6 7 8 9 10 11 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
Help Map ID	35255

### Select Marker

Specifies the selected marker. The term “selected marker” is used to specify which marker is affected by the functions.

Key Path	Marker
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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
Help Map ID	3153

### 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
<b>Remote Command</b>	: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
Help Map ID	35256

### All Markers Off

Turns off all markers.

Key Path	Marker
<b>Remote Command</b>	: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
Help Map ID	35257

### 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

## Marker

value for that marker's trace

<b>Remote Command</b>	:CALCulate:LSEQuencer:MARKer[1] 2 3 4 5 6 7 8 9 10 11 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
Help Map ID	35258

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## Marker Fctn (Function)

This function is not supported in the Sequence Analyzer mode.

## Marker Fctn (Function)



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## Marker > (Marker To)

This function is not supported in the Sequence Analyzer mode.

Marker > (Marker To)

---

## Meas

The information in this section is common to all measurements. For key and remote command information for a specific measurement, refer to the section that describes the measurement of interest.

Measurements available under the Meas key are specific to the current Mode.

When viewing Help for measurements, note the following:

---

**NOTE** Operation for some keys differs between measurements. The information displayed in Help pertains to the current measurement. To see how a key operates in a different measurement, exit Help (press the Cancel Esc key), select the measurement, then reenter Help (press the Help key) and press that key.

---

Key Path:	<b>Front-panel key</b>
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	4008

### Remote Measurement Functions

This section contains the following topics:

[“Measurement Group of Commands” on page 392](#)

[“Current Measurement Query \(Remote Command Only\) ” on page 396](#)

[“Limit Test Current Results \(Remote Command Only\)” on page 396](#)

[“Data Query \(Remote Command Only\)” on page 396](#)

[“Calculate/Compress Trace Data Query \(Remote Command Only\)” on page 396](#)

[“Calculate Peaks of Trace Data \(Remote Command Only\)” on page 401](#)

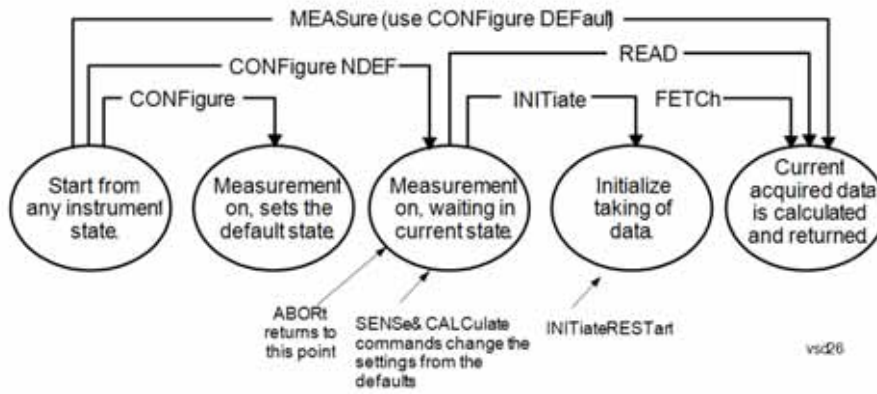
[“Format Data: Numeric Data \(Remote Command Only\)” on page 403](#)

[“Format Data: Byte Order \(Remote Command Only\)” on page 405](#)

Initial S/W Revision:	Prior to A.02.00
Help Map ID:	29978

## Meas

### 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.

**:CONFigure:NDEFault<measurement>** 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)

Initial S/W Revision:

Prior to A.02.00

Help Map ID:

0

## Meas

### Current Measurement Query (Remote Command Only)

This command returns the name of the measurement that is currently running.

<b>Remote Command:</b>	:CONFIgure?
Example:	CONF?
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	0

### 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.

<b>Remote Command:</b>	:CALCulate:CLIMits:FAIL?
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.
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	0

### 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.)

<b>Remote Command:</b>	: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.
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	0

### 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 test set. The command is used with a sub-opcode <n> (default=1) to specify the trace. With trace queries, it is best if the test set 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.

<b>Remote Command:</b>	: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.
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	0

- **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

## Meas

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)

$$\text{MEAN} = \frac{1}{n} \sum_{X_i \in \text{region}(s)} X_i \quad \text{vsd27-1}$$

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)

$$\text{MEAN} = \frac{1}{n} \sum_{X_i \in \text{region}(s)} |X_i| \quad \text{vsd27-2}$$

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)

$$\text{DME} = 10 \times \log_{10} \left( \frac{1}{n} \sum_{X_i \in \text{region}(s)} 10^{\frac{X_i}{10}} \right) \quad \text{vsd27-3}$$

- **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)**

$$\text{RMS} = \sqrt{\frac{1}{n} \sum_{X_i \in \text{region}(s)} X_i^2} \quad \text{vsd27-4}$$

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)**

$$\text{RMS} = \sqrt{\frac{1}{n} \sum_{X_i \in \text{region}(s)} X_i X_i^*} \quad \text{vsd27-5}$$

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)**

$$\text{SDEV} = \sqrt{\frac{1}{n} \sum_{X_i \in \text{region}(s)} (X_i - \bar{X})^2} \quad \text{vsd27-7}$$

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).

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## Meas

$$\text{SDEV} = \sqrt{\frac{1}{n} \sum_{X_i \in \text{region}(s)} (|X_i| - \bar{X})^2}$$

vsd27-8

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:

$$\sqrt{\frac{1}{n} \sum_{X_i \in \text{region}} X_i X_i^*}$$

vsd27-9

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:

$$\frac{1}{n} \sum_{Y_i \in \text{region}} Y_i$$

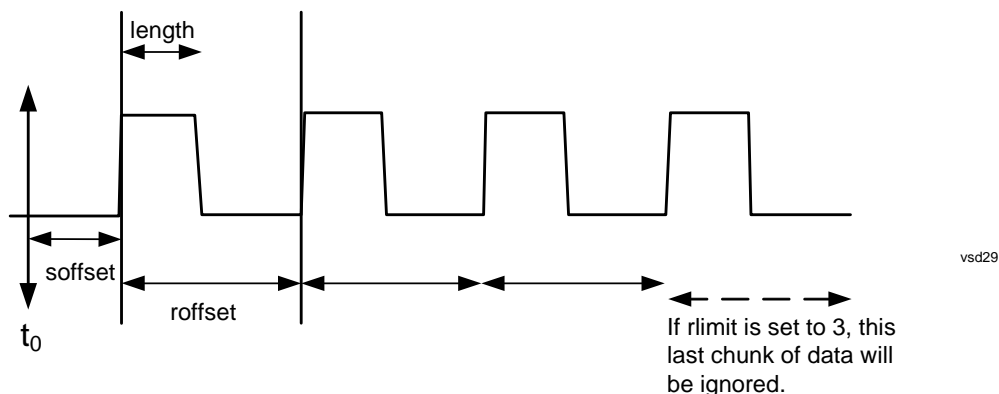
vsd27-10

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.

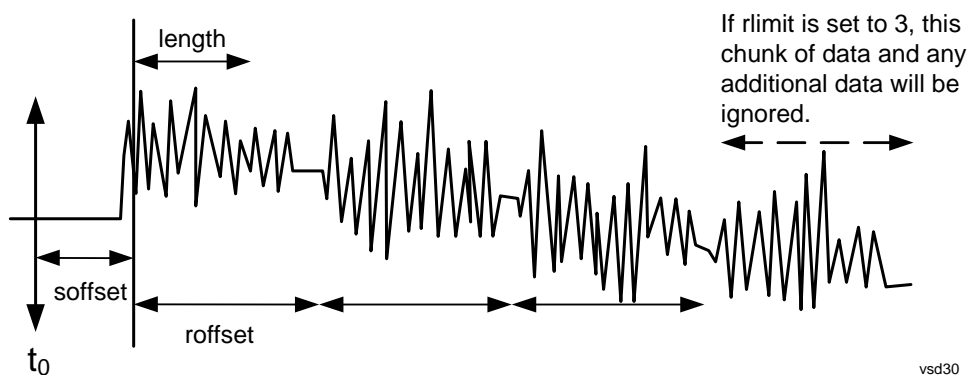
### Sample Trace Data - Constant Envelope

(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  $N_{\text{points}} - 1$ , 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  $N_{\text{points}} - 1$ , 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  $N_{\text{points}} - 1$ , 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

## Meas

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)

<b>Remote Command:</b>	:CALCulate:DATA[1]   2   3   4   5   6 :PEAKs? <threshold>, <excursion> [, AMPLitude   FREQuency   TIME]
Example:	<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>

<p>Notes:</p>	<p>&lt;n&gt; - is the trace that will be used</p> <p>&lt;threshold&gt; - 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>&lt;excursion&gt; - 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 excursion value stored under the Peak Criteria menu.</p> <p>Values must be provided for threshold and excursion. The sorting and display line parameters are optional (defaults are AMPLitude and ALL).</p> <p>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</p> <p>Sorting order:</p> <p>AMPLitude - lists the peaks in order of descending amplitude, with the highest peak first (default if optional parameter not sent)</p> <p>FREQuency - lists the peaks in order of occurrence, left to right across the x-axis.</p> <p>TIME - lists the peaks in order of occurrence, left to right across the x-axis.</p> <p>Peaks vs. Display Line:</p> <p>ALL - lists all of the peaks found (default if optional parameter not sent).</p> <p>GTDLine (greater than display line) - lists all of the peaks found above the display line.</p> <p>LTDLine (less than display line) - lists all of the peaks found below the display line.</p>
<p>Initial S/W Revision:</p>	<p>Prior to A.02.00</p>
<p>Help Map ID:</p>	<p>0</p>

**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.

<p><b>Remote Command:</b></p>	<p>:FORMat [:TRACe] [:DATA] ASCii   INTEger, 32   REAL, 32   REAL, 64</p> <p>:FORMat [:TRACe] [:DATA] ?</p>
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## Meas

Notes:	<p>The query response is:</p> <p>ASCii: ASC,8</p> <p>REAL,32: REAL,32</p> <p>REAL,64: REAL,64</p> <p>INTeger,32: INT,32</p> <p>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).</p> <p>The INT,32 format returns binary 32-bit integer values in internal units (m dBm), in a definite length block.</p>
Dependencies:	<p>Sending a data format spec with an invalid number (for example, INT,48) generates no error. The test set simply uses the default (8 for ASCii, 32 for INTeger, 32 for REAL).</p> <p>Sending data to the test set 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".</p>
Preset:	ASCii
Backwards Compatibility Notes:	Note that the INT,32 format is only applicable to the command, TRACe:DATA. 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
Help Map ID:	0

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.

<b>Remote Command:</b>	:FORMat:BORDER NORMAL   SWAPped :FORMat:BORDER?
Preset:	NORMal
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	0

Meas

## Meas Setup

Meas Setup for the Sequence Analyzer mode includes some parameters which are specific to an acquisition (see “[Acquisition Setup](#)” on page 408) or specific to an analysis step (see “[Analysis Step Setup](#)” on page 619). 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	<b>Meas</b>
Mode	Sequence Analyzer
Initial S/W Revision	A.05.00
Help Map ID	35022

## Meas Setup Parameters

### 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	<b>Meas Setup, Acquisition Setup, Result Type</b>
<b>Remote Command</b>	[ :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
Help Map ID	35259

## Meas Setup

### Acquisition Setup

Allows access to the Acquisition menu.

Key Path	<b>Meas Setup</b>
Initial S/W Revision	A.05.00
Help Map ID	35026

### Number of Acquisitions

This parameter is used to define the number of current active Acquisitions.

Key Path	<b>Meas Setup, Acquisition Setup</b>
<b>Remote Command</b>	<code>[ :SENSE ] :LSEQuencer :NUMBer :ACQuire &lt;integer&gt;</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
Initial S/W Revision	A.05.00
Help Map ID	35027

### Current Acquisition

This parameter is used to define the current active Acquisition.

Key Path	<b>Meas Setup, Acquisition Setup</b>
Notes	No SCPI, front panel access only
Couplings	Updates UI Acquisition parameters to selected Acquisition
Preset	1
Range	1 to Number of Acquisitions
Initial S/W Revision	A.05.00
Help Map ID	35028

### 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 <b>Number of Acquisitions</b> by 1
Initial S/W Revision	A.05.00
Help Map ID	35029

### Delete Acquisition

This deletes the current Acquisition.

Key Path	Meas Setup, Acquisition Setup
Notes	No SCPI, front panel access only Cannot delete when <b>Number of Acquisitions</b> is equal to 1.
Couplings	Decreases <b>Number of Acquisitions</b> by 1
Initial S/W Revision	A.05.00
Help Map ID	35030

### Avg Number

Sets the number of averages for the acquisition.

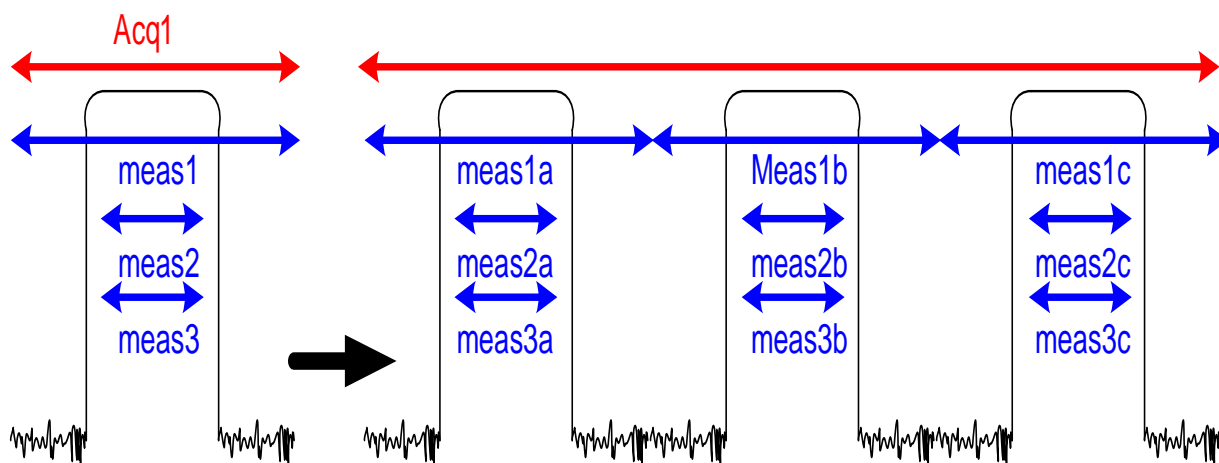
Key Path	Meas Setup, Acquisition Setup
SCPI Command	<p>To set the average number as an individual value:</p> <pre>[ :SENSe ] :LSEQuencer:ACQuire{ 1 : 512 } :SETup:AVERAge:NUMBer &lt;integer&gt;</pre> <pre>[ :SENSe ] :LSEQuencer:ACQuire{ 1 : 512 } :SETup:AVERAge:NUMBer ?</pre> <p>To set the average number as an array:</p> <pre>[ :SENSe ] :LSEQuencer:LIST:SETup:AVERAge:NUMBer &lt;integer&gt;, &lt;integer&gt;, &lt;integer&gt;, ...</pre> <pre>[ :SENSe ] :LSEQuencer:LIST:SETup:AVERAge:NUMBer ?</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>

## Meas Setup

SCPI Examples	:LSEQ:ACQ2:SET:AVER:NUMB 3 :LSEQ:ACQ2:SET:AVER:NUMB? :LSEQ:LIST:SET:AVER:NUMB 2,3,4,5 :LSEQ:LIST:SET:AVER:NUMB?
Notes	For setting all the analyzer sequence parameters at once using SCPI, see <a href="#">“Programming Acquisitions Via SCPI”</a> on page 617.
Preset	1
State Saved	Saved in instrument state.
Range	1 to 512
Initial S/W Revision	A.05.00
Help Map ID	35031

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



Acq with 3 averages  
and 3 analysis  
intervals

Expands to

Avg Grp  
Set a

Avg Grp  
Set b

Avg Grp  
Set c

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
<b>Basic Transmit Power</b>	Transmit Power	Logarithmic Averaging
<b>Basic Frequency and Phase Error</b>	Frequency Error	Linear Averaging
	Phase Error	Linear Averaging
<b>Basic IQ Data</b>	IQ Pairs	N/A
	Average Power	Logarithmic Averaging
	Peak Power	Logarithmic Averaging
<b>Power Vs Time*</b>	Single Burst Power	Last Value Averaging
	Average Power	Logarithmic Averaging
	Start Data Point	Last Value Averaging
	Stop Data Point	Last Value Averaging
	T0	Last Value Averaging
	Burst Width	Last Value Averaging

## Meas Setup

	Max Point	Max Hold Averaging
	Min Point	Min Hold Averaging
	Burst Threshold	Last Value Averaging
	First Error Point	Last Value Averaging
	Detected TSC	Last Value Averaging
	Mod Scheme	Last Value Averaging
	Estimated Carrier Power	Logarithmic Averaging
<b>ORFS (Front Panel)</b>	Power Control Level	Not averaged but uses averaged Ref Power result to compute this result
Repeat for each offset	Modulation Ref Power	Logarithmic Averaging
	Modulation Neg Offset Abs Power	Logarithmic Averaging
	Modulation Neg Offset Rel Power	Logarithmic Averaging
	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
	Modulation Pos Offset Rel Power	Logarithmic Averaging
	Modulation Pos Offset Limit Delta	Not averaged but uses averaged Modulation Pos Offset results to compute this result
	Switching Ref Power	Logarithmic Averaging
	Switching Neg Offset Abs Power	Logarithmic Averaging
	Switching Neg Offset Rel Power	Logarithmic Averaging
	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
	Switching Pos Offset Rel Power	Logarithmic Averaging
	Switching Pos Offset Limit Delta	Not averaged but uses averaged Switching Pos Offset results to compute this result
<b>ORFS (Remote)</b>		



Repeat for each offset	Modulation Neg Offset Rel Power	Logarithmic Averaging
	Modulation Neg Offset Abs Power	Logarithmic Averaging
	Modulation Pos Offset Rel Power	Logarithmic Averaging
	Modulation Pos Offset Abs Power	Logarithmic Averaging
	Switching Neg Offset Rel Power	Logarithmic Averaging
	Switching Neg Offset Abs Power	Logarithmic Averaging
	Switching Pos Offset Rel Power	Logarithmic Averaging
	Switching Pos Offset Abs Power	Logarithmic Averaging
<b>GMSK Phase &amp; Freq</b>	Avg RMS Phase Error	Linear Averaging
	Max RMS Phase Error	Linear Averaging
	Avg Peak Phase Error	Linear Averaging
	Max Peak Phase Error	Max Hold Averaging
	Peak Phase Error Position	Last Value Averaging
	Max Peak Phase Error Position	Not averaged but uses averaged Max Peak Phase Error to compute this result
	Avg Freq Error	Linear Averaging
	Max Freq Error	Convert all values to be averaged to the absolute value. Use the min value of all the absolute values.
	Avg IQ Origin Offset	Logarithmic Averaging
	Max IQ Origin Offset	Max Hold Averaging
	Average T0 Offset	Linear Averaging
	Max T0 Offset	Max Hold Averaging
	Detected TSC	Last Value Averaging
<b>EDGE EVM</b>	95%ile EVM	Linear Averaging
	Avg RMS EVM	Linear Averaging
	MAX RMS EVM	Max Hold Averaging
	Avg Peak EVM	Linear Averaging
	Max Peak EVM	Max Hold Averaging
	Peak EVM Symbol Position	Not averaged but uses averaged Max Peak EVM to compute this result

## Meas Setup

	Avg Mag Error	Linear Averaging
	Max Mag Error	Max Hold Averaging
	Avg Phase Error	Linear Averaging
	Max Phase Error	Max Hold Averaging
	Avg Freq Error	Linear Averaging
	Max Freq Error	Abs Max Hold Averaging
	IQ Origin Offset	Logarithmic Averaging
	Amplitude Droop	Logarithmic Averaging
	T0 Offset	Linear Averaging
	Timing Offset	Linear Averaging
	Detected TSC	Last Value Averaging
	Detected Mod Scheme	Last Value Averaging
<b>ACP</b>	Total Carrier Power	Logarithmic Averaging
	Ref Carrier Power	Logarithmic Averaging
Repeat for each carrier	Carrier Rel Power	Logarithmic Averaging
	Carrier Abs Power	Logarithmic Averaging
Repeat for each offset	Lower Rel Power	Logarithmic Averaging
	Lower Abs Power	Logarithmic Averaging
	Upper Rel Power	Logarithmic Averaging
	Upper Abs Power	Logarithmic Averaging
<b>SEM</b>	Total Power Ref	Logarithmic Averaging
	Peak Freq Ref	Max Hold Averaging
Repeat for each offset	Lower Abs Integrated Power	Logarithmic Averaging
	Lower Rel Integrated Power	Logarithmic Averaging
	Lower Abs Peak Power	Max Hold Averaging
	Lower Rel Peak Power	Max Hold Averaging
	Lower Peak Freq	Not averaged but uses averaged Lower Abs Peak Power to compute this result
	Lower Limit Delta	Logarithmic Averaging
	Upper Abs Integrated Power	Logarithmic Averaging
	Upper Rel Integrated Power	Logarithmic Averaging

	Upper Abs Peak Power	Max Hold Averaging
	Upper Rel Peak Power	Max Hold Averaging
	Upper Peak Freq	Not averaged but uses averaged Upper Abs Peak Power to compute this result
	Upper Limit Delta	Logarithmic Averaging
<b>Occupied BW</b>	Occupied BW	Linear Averaging
	Transmit Freq Error	Linear Averaging
	x dB Bandwidth	Linear Averaging
<b>Modulation Accuracy</b>	RMS EVM	Linear Averaging
	Peak EVM	
	Mag Error	Linear Averaging
(TDSCDMA ony)	Peak Mag Error	Max Hold Averaging
	Phase Error	Linear Averaging
(TDSCDMA ony)	Peak Phase Error	Max Hold Averaging
	IQ Origin Offset	Linear Averaging
	Frequency Error	Linear Averaging
	Rho	Linear Averaging
	Peak Code Domain Error	Max Hold Averaging
	Peak Code Domain Error Channel Number	Not averaged, but uses averaged Peak Code Domain Error to compute this result
(TDSCDMA ony)	Peak Code Domain Error -- Code Length	Not averaged, but uses averaged Peak Code Domain Error to compute this result
(TDSCDMA ony)	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
(TDSCDMA ony)	Peak Active Code Domain Error	Max Hold Averaging
(TDSCDMA ony)	Peak Active Code Domain Error -- Code Length	Not averaged, but uses averaged Peak Actvie Code Domain Error to compute this result

## Meas Setup

(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, and WCDMA only)	Time Offset	Linear Averaging
(WCDMA only)	Total Power over a Slot	Linear Averaging
	First Slot Number	Last Value Averaging
	DPCCH Slot Format	Last Value Averaging
(TDSCDMA only)	Preamble Signature	Last Value Averaging
(1xEVDO only)	Pilot Offset	Linear Averaging
	Max Inactive CDP	Max Hold Averaging
	Pilot Power	Logarithmic Averaging
	RRI Power	Logarithmic Averaging
	RRI Relative Power	Logarithmic Averaging
	DRC Power	Logarithmic Averaging
	DRC Relative Power	Logarithmic Averaging
	ACK Power	Logarithmic Averaging
	ACK Relative Power	Logarithmic Averaging
	Data Power	Logarithmic Averaging
	Data Channel Relative Power	Logarithmic Averaging
	Auxiliary Pilot Power	Logarithmic Averaging
	Auxiliary Pilot Channel Relative Power	Logarithmic Averaging
	Total Power	Logarithmic Averaging
	Pilot and RRI Power	Logarithmic Averaging
	DSC Channel Power	Logarithmic Averaging
	DSC Channel Relative Power	Logarithmic Averaging
	Half Slot RMS EVM	Linear Averaging
	Half Slot Peak EVM	Max Hold Averaging
	Half Slot Mag Error	Linear Averaging
	Half Slot Phase Error	Linear Averaging
	Half Slot IQ Origin Offset	Linear Averaging
	Half Slot Frequency Error	Linear Averaging

	Half Slot Rho	Linear Averaging
	Half Slot Peak Code Domain Error	Max Hold Averaging
	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
	Half Slot Pilot Offset	Linear Averaging
	Half Slot Total Power	Logarithmic Averaging
(LTE FDD and LTE TDD Only)	EVM	Linear Averaging
	ResSymTimeAdjust	Linear Averaging
	EVMPk	Max Hold Averaging
	EVMPkIdx	NAN when making average
	DataEVM	Linear Averaging
	TgppQpskEVM	Linear Averaging
	TgppQam16EVM	Linear Averaging
	TgppQam64EVM	Linear Averaging
	RSEVM	Linear Averaging
	RSTxPower	Logarithmic Averaging
	OSTxPower	Logarithmic Averaging
	FreqErr	Linear Averaging
	SyncCorr	Linear Averaging
	ResSyncType	NAN when making average
	CommonTrackingError	Linear Averaging
	SymClkErr	Linear Averaging
	TimeOffset	Linear Averaging
	IQOffset	Linear Averaging
	IQGainImbalance	Linear Averaging
	IQQuadError	Linear Averaging
	IQTimingSkew	Linear Averaging
	ResCpLengthMode	NAN when making average
	ResCellIdGroSec	NAN when making average

## Meas Setup

	ResCellId	NAN when making average
	ResPilotPRS	NAN when making average
	RefRxPower	NAN when making average
	RefRxQuality	Linear Averaging
	EcMax1Normal	Linear Averaging
	EcMin1Normal	Linear Averaging
	EcMax2Normal	Linear Averaging
	EcMin2Normal	Linear Averaging
	RP1Normal	Linear Averaging
	RP2Normal	Linear Averaging
	RP12Normal	Linear Averaging
	RP21Normal	Linear Averaging
	EcMax1Extreme	Linear Averaging
	EcMin1Extreme	Linear Averaging
	EcMax2Extreme	Linear Averaging
	EcMin2Extreme	Linear Averaging
	RP1Extreme	Linear Averaging
	RP2Extreme	Linear Averaging
	RP12Extreme	Linear Averaging
	RP21Extreme	Linear Averaging
<b>QPSK EVM</b>	Avg RMS EVM	Linear Averaging
	Max RMS EVM	Max Hold Averaging
	Avg Peak EVM	Linear Averaging
	Max Peak EVM	Max Hold Averaging
	Avg Magnitude Error	Linear Averaging
	Max Magnitude Error	Max Hold Averaging
	Avg Phase Error	Linear Averaging
	Max Phase Error	Max Hold Averaging
	Avg Frequency Error	Linear Averaging
	Max Frequency Error	Max Hold Averaging
	IQ Origin Offset	Linear Averaging

<b>Code Domain Power</b>		
(WCDMA only)	IQ Pairs	Logarithmic Averaging
(TDSCDMA only)	Code Domain Power	Logarithmic Averaging
(TDSCDMA only)	Code Domain Error	Logarithmic Averaging
<b>Phase Discontinuity</b>	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
<b>Loopback BER (for GSM, EDGE, WCDMA, and TD-SCDMA only)</b>	BER	Linear Averaging
	Total Bits	Accumulating
	Failed Bits	Accumulating

\* Power v. Time only averages the measurement results, not the underlying trace; therefore mask limit

## Meas Setup

testing does not support averaging.

### Logarithmic Averaging

1. Convert all the values to be averaged to linear.
2. Sum linear values and divide by number of averages.
3. Convert final value to log.

### Linear Averaging

1. 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	<b>Meas Setup, Acquisition Setup</b>
Notes	No SCPI : Front panel only
Initial S/W Revision	A.05.00
Help Map ID	35032



## 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

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
SCPI Command	<p>To set the radio standard as an individual value:</p> <pre>[ :SENSe] :LSEQuencer:ACQuire{1:512} :SETup:RADio:STANdard NONE   GSM   EDGE   WCDMA   CDMA2K   CDMA1XEV   LTE   LTETDD   TDSCDMA</pre> <pre>[ :SENSe] :LSEQuencer:ACQuire{1:512} :SETup:RADio:STANdard ?</pre> <p>To set the radio standard as an array:</p> <pre>[ :SENSe] :LSEQuencer:LIST:SETup:RADio:STANdard &lt;enum&gt;, &lt;enum&gt;, &lt;enum&gt;, ...</pre> <pre>[ :SENSe] :LSEQuencer:LIST:SETup:RADio:STANdard?</pre> <p>The array form of the co 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>
SCPI Examples	<pre>:LSEQ:ACQ2:SET:RAD:STAN CDMA2K</pre> <pre>:LSEQ:ACQ2:SET:RAD:STAN?</pre> <pre>:LSEQ:LIST:SET:RAD:STAN NONE,WCDMA,CDMA2K,CDMA1XEV</pre> <pre>:LSEQ:LIST:SET:RAD:STAN?</pre>

## Meas Setup

Notes	For setting all the analyzer sequence parameters at once using SCPI, see <a href="#">“Programming Acquisitions Via SCPI” on page 617</a> .
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
Initial S/W Revision	A.05.00. LTE is available after A.09.20. LTETDD and TDSCDMA are available in A.12.00.
Help Map ID	35033

### None

Sets the Radio Standard and Band for the current Acquisition to None.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard</b>
SCPI Command	<p>To set the radio band as an individual value:</p> <pre>[ :SENSe ] :LSEQuencer:ACQuire {1:512} :SETup:RADio: BAND NONE</pre> <pre>[ :SENSe ] :LSEQuencer:ACQuire {1:512} :SETup:RADio: BAND?</pre> <p>To set the radio band as an array:</p> <pre>[ :SENSe ] :LSEQuencer:LIST:SETup:RADio: BAND &lt;enum&gt;, &lt;enum&gt;, &lt;enum&gt;, ...</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>
SCPI Examples	<pre>:LSEQ:ACQ2:SET:RAD: BAND NONE</pre> <pre>:LSEQ:ACQ2:SET:RAD: BAND?</pre> <pre>:LSEQ:LIST:SET:RAD: BAND NONE,NONE,NONE,NONE</pre> <pre>:LSEQ:LIST:SET:RAD: BAND?</pre>
Notes	For setting all the analyzer sequence parameters at once using SCPI, see <a href="#">“Programming Acquisitions Via SCPI” on page 617</a> .
Initial S/W Revision	A.05.00
Help Map ID	35034

### GSM

Selects GSM for the Radio Standard for the current Acquisition and allows selection of the GSM/EDGE band.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard</b>
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SCPI Command (for specifying a GSM radio band)	<p>To set the radio band as an individual value:</p> <pre>[ :SENSE ] :LSEQuencer:ACQuire { 1 : 512 } :SETup:RADio: BAND NONE   PGSM   EGSM   RGSM   DCS1800   PCS1900   TGSM810   GSM450   GSM480   GSM700   GSM850</pre> <p>[ :SENSE ] :LSEQuencer:ACQuire { 1 : 512 } :SETup:RADio: BAND?</p> <p>To set the radio band as an array:</p> <pre>[ :SENSE ] :LSEQuencer:LIST:SETup:RADio: BAND &lt;enum&gt; , &lt;enum&gt; , &lt;enum&gt; , ...</pre> <p>[ :SENSE ] :LSEQuencer:LIST:SETup:RADio: BAND?</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>
SCPI Examples (for specifying a GSM radio band)	<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 all the analyzer sequence parameters at once using SCPI, see <a href="#">“Programming Acquisitions Via SCPI” on page 617</a> .
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
Help Map ID	35035

### 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	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, GSM</b>
Notes	See <a href="#">“GSM” on page 422</a> .
Initial S/W Revision	A.05.00
Help Map ID	35011

### PGSM

Selects PGSM for the Band for GSM.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, GSM</b>
Notes	See <a href="#">“GSM” on page 422</a> .

## Meas Setup

Initial S/W Revision	A.05.00
Help Map ID	35036

### EGSM

Selects EGSM for the Band for GSM.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, GSM</b>
Notes	See <a href="#">“GSM” on page 422.</a>
Initial S/W Revision	A.05.00
Help Map ID	35037

### RGSM

Selects RGSM for the Band for GSM.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, GSM</b>
Notes	See <a href="#">“GSM” on page 422.</a>
Initial S/W Revision	A.05.00
Help Map ID	35038

### DCS 1800

Selects DCS1800 for the Band for GSM.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, GSM</b>
Notes	See <a href="#">“GSM” on page 422.</a>
Initial S/W Revision	A.05.00
Help Map ID	35039

### PCS 1900

Selects PCS1900 for the Band for GSM.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, GSM</b>
Notes	See <a href="#">“GSM” on page 422.</a>
Initial S/W Revision	A.05.00
Help Map ID	35040

**T-GSM 810**

Selects T-GSM 810 for the Band for GSM.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, GSM</b>
Notes	See <a href="#">“GSM” on page 422.</a>
Initial S/W Revision	A.05.00
Help Map ID	35041

**GSM 450**

Selects GSM 450 for the Band for GSM.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, GSM</b>
Notes	See <a href="#">“GSM” on page 422.</a>
Initial S/W Revision	A.05.00
Help Map ID	35042

**GSM 480**

Selects GSM 480 for the Band for GSM.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, GSM</b>
Notes	See <a href="#">“GSM” on page 422.</a>
Initial S/W Revision	A.05.00
Help Map ID	35043

**GSM 850**

Selects GSM 850 for the Band for GSM.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, GSM</b>
Notes	See <a href="#">“GSM” on page 422.</a>
Initial S/W Revision	A.05.00
Help Map ID	35045

**GSM 700**

Selects GSM 700 for the Band for GSM.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, GSM</b>
Notes	See <a href="#">“GSM” on page 422.</a>
Initial S/W Revision	A.05.00

## Meas Setup

Help Map ID	35044
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### 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
SCPI Command (for specifying an EDGE radio band)	<p>To set the radio band as an individual value:</p> <pre>[ :SENSe ] :LSEQuencer :ACQuire { 1 : 512 } :SETup :RADio :BAND NONE   PGSM   EGSM   RGSM   DCS1800   PCS1900   TGSM810   GSM450   GSM480   GSM700   GSM850</pre> <pre>[ :SENSe ] :LSEQuencer :ACQuire { 1 : 512 } :SETup :RADio : BAND?</pre> <p>To set the radio band as an array:</p> <pre>[ :SENSe ] :LSEQuencer :LIST :SETup :RADio :BAND &lt;enum&gt; , &lt;enum&gt; , &lt;enum&gt; , ...</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>
SCPI Examples (for specifying an EDGE radio band)	<pre>:LSEQ:ACQ2:SET:RAD:BAND NONE</pre> <pre>:LSEQ:ACQ2:SET:RAD:BAND?</pre> <pre>:LSEQ:LIST:SET:RAD:BAND PGSM,NONE,GSM850,PGSM</pre> <pre>:LSEQ:LIST:SET:RAD:BAND?</pre>
Notes	For setting all the analyzer sequence parameters at once using SCPI, see <a href="#">“Programming Acquisitions Via SCPI” on page 617</a> .
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
Help Map ID	35046

### 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
Notes	See <a href="#">“EDGE” on page 426</a> .
Initial S/W Revision	A.05.00
Help Map ID	35233

**PGSM**

Selects PGSM for the Band for EDGE.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, EDGE</b>
Notes	See <a href="#">“EDGE” on page 426.</a>
Initial S/W Revision	A.05.00
Help Map ID	35047

**EGSM**

Selects EGSM for the Band for EDGE.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, EDGE</b>
Notes	See <a href="#">“EDGE” on page 426.</a>
Initial S/W Revision	A.05.00
Help Map ID	35048

**RGSM**

Selects RGSM for the Band for EDGE.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, EDGE</b>
Notes	See <a href="#">“EDGE” on page 426.</a>
Initial S/W Revision	A.05.00
Help Map ID	35049

**DCS 1800**

Selects DCS1800 for the Band for EDGE.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, EDGE</b>
Notes	See <a href="#">“EDGE” on page 426.</a>
Initial S/W Revision	A.05.00
Help Map ID	35050

**PCS 1900**

Selects PCS1900 for the Band for EDGE.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, EDGE</b>
Notes	See <a href="#">“EDGE” on page 426.</a>
Initial S/W Revision	A.05.00

## Meas Setup

Help Map ID	35051
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### T-GSM 810

Selects T-GSM 810 for the Band for EDGE.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, EDGE</b>
Notes	See <a href="#">“EDGE” on page 426</a> .
Initial S/W Revision	A.05.00
Help Map ID	35052

### GSM 450

Selects GSM 450 for the Band for EDGE.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, EDGE</b>
Notes	See <a href="#">“EDGE” on page 426</a> .
Initial S/W Revision	A.05.00
Help Map ID	35053

### GSM 480

Selects GSM 480 for the Band for EDGE.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, EDGE</b>
Notes	See <a href="#">“EDGE” on page 426</a> .
Initial S/W Revision	A.05.00
Help Map ID	35054

### GSM 850

Selects GSM 850 for the Band for EDGE.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, EDGE</b>
Notes	See <a href="#">“EDGE” on page 426</a> .
Initial S/W Revision	A.05.00
Help Map ID	35056

### GSM 700

Selects GSM 700 for the Band for EDGE.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, EDGE</b>
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Notes	See “EDGE” on page 426.
Initial S/W Revision	A.05.00
Help Map ID	35055

**WCDMA/HSPA**

Selects WCDMA/HSPA for the Radio Standard for the current Acquisition and allows selection of the WCDMA/HSPA band.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard</b>
SCPI Command (for specifying a WCDMA/HSPA radio band)	<p>To set the radio band as an individual value:</p> <pre>[ :SENSE ] :LSEQuencer:ACQuire{ 1 : 512 } :SETup:RADio: BAND NONE   BANDI   BANDII   BANDIII   BANDIV   BANDV   BANDVI   BANDVII   B ANDVIII   BANDIX   BANDX   BANDXI   BANDXII   BANDXIII   BANDXIV</pre> <pre>[ :SENSE ] :LSEQuencer:ACQuire{ 1 : 512 } :SETup:RADio: BAND?</pre> <p>To set the radio band as an array:</p> <pre>[ :SENSE ] :LSEQuencer:LIST:SETup:RADio: BAND &lt;enum&gt;, &lt;enum&gt;, &lt;enum&gt;, ...</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>
SCPI Examples (for specifying a WCDMA/HSPA radio band)	<pre>:LSEQ:ACQ2:SET:RAD:BAND NONE</pre> <pre>:LSEQ:ACQ2:SET:RAD:BAND?</pre> <pre>:LSEQ:LIST:SET:RAD:BAND BANDII, NONE, BANDIII, BANDXII</pre> <pre>:LSEQ:LIST:SET:RAD:BAND?</pre>
Notes	For setting all the analyzer sequence parameters at once using SCPI, see “Programming Acquisitions Via SCPI” on page 617.
State Saved	Saved in instrument state.
Range	NONE BANDI BANDII BANDIII BANDIV BANDV BANDVI BANDVII BANDVIII BANDIX BANDX BANDXI BANDXII BANDXIII BANDXIV
Initial S/W Revision	A.05.00
Help Map ID	35057

**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	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, WCDMA/HSPA</b>
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## Meas Setup

Notes	See “WCDMA/HSPA” on page 429.
Initial S/W Revision	A.05.00
Help Map ID	35234

### Band I

Selects Band I for the Band for WCDMA/HSPA.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, WCDMA/HSPA</b>
Notes	See “WCDMA/HSPA” on page 429.
Initial S/W Revision	A.05.00
Help Map ID	35058

### Band II

Selects Band II for the Band for WCDMA/HSPA.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, WCDMA/HSPA</b>
Notes	See “WCDMA/HSPA” on page 429.
Initial S/W Revision	A.05.00
Help Map ID	35059

### Band III

Selects Band III for the Band for WCDMA/HSPA.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, WCDMA/HSPA</b>
Notes	See “WCDMA/HSPA” on page 429.
Initial S/W Revision	A.05.00
Help Map ID	35060

### Band IV

Selects Band IV for the Band for WCDMA/HSPA.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, WCDMA/HSPA</b>
Notes	See “WCDMA/HSPA” on page 429.
Initial S/W Revision	A.05.00
Help Map ID	35061

**Band V**

Selects Band V for the Band for WCDMA/HSPA.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, WCDMA/HSPA</b>
Notes	See <a href="#">“WCDMA/HSPA” on page 429</a> .
Initial S/W Revision	A.05.00
Help Map ID	35062

**Band VI**

Selects Band VI for the Band for WCDMA/HSPA.

Key Path	<b>Meas Setup, Step Setup, Radio Band, Band</b>
Notes	See <a href="#">“WCDMA/HSPA” on page 429</a> .
Initial S/W Revision	A.05.00
Help Map ID	35063

**Band VII**

Selects Band VII for the Band for WCDMA/HSPA.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, WCDMA/HSPA</b>
Notes	See <a href="#">“WCDMA/HSPA” on page 429</a> .
Initial S/W Revision	A.05.00
Help Map ID	35064

**Band VIII**

Selects Band VIII for the Band for WCDMA/HSPA.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, WCDMA/HSPA</b>
Notes	See <a href="#">“WCDMA/HSPA” on page 429</a> .
Initial S/W Revision	A.05.00
Help Map ID	35065

**Band IX**

Selects Band IX for the Band for WCDMA/HSPA.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, WCDMA/HSPA</b>
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## Meas Setup

Notes	See “WCDMA/HSPA” on page 429.
Initial S/W Revision	A.05.00
Help Map ID	35066

### Band X

Selects Band X for the Band for WCDMA/HSPA.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, WCDMA/HSPA</b>
Notes	See “WCDMA/HSPA” on page 429.
Initial S/W Revision	A.05.00
Help Map ID	35067

### Band XI

Selects Band XI for the Band for WCDMA/HSPA.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, WCDMA/HSPA</b>
Notes	See “WCDMA/HSPA” on page 429.
Initial S/W Revision	A.05.00
Help Map ID	35068

### Band XII

Selects Band XII for the Band for WCDMA/HSPA.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, WCDMA/HSPA</b>
Notes	See “WCDMA/HSPA” on page 429.
Initial S/W Revision	A.05.00
Help Map ID	35069

### Band XIII

Selects Band XIII for the Band for WCDMA/HSPA.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, WCDMA/HSPA</b>
Notes	See “WCDMA/HSPA” on page 429.
Initial S/W Revision	A.05.00
Help Map ID	35070

**Band XIV**

Selects Band XIV for the Band for WCDMA/HSPA.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, WCDMA/HSPA</b>
Notes	See <a href="#">“WCDMA/HSPA” on page 429.</a>
Initial S/W Revision	A.05.00
Help Map ID	35071

**CDMA 2000**

Selects CDMA 2000 for the Radio Standard for the current Acquisition and allows selection of the CDMA 2000 band.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard</b>
SCPI Command (for specifying a CDMA 2000 radio band)	<p>To set the radio band as an individual value:</p> <pre>[ :SENSe] :LSEQuencer:ACQuire{1:512} :SETup:RADio:BAND NONE USCELL USPCS JAPAN KOREAN NMT IMT2K UPPER SECOND P AMR400 PAMR800 IMTEXT PCS1DOT9G AWS US2DOT5G PUBLIC LOW ER</pre> <p>[ :SENSe] :LSEQuencer:ACQuire{1:512} :SETup:RADio:BAND?</p> <p>To set the radio band as an array:</p> <pre>[ :SENSe] :LSEQuencer:LIST:SETup:RADio:BAND &lt;enum&gt;, &lt;enum&gt;, &lt;enum&gt;, ...</pre> <p>[ :SENSe] :LSEQuencer:LIST:SETup:RADio:BAND?</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>
SCPI Examples (for specifying a CDMA 2000 radio band)	<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 all the analyzer sequence parameters at once using SCPI, see <a href="#">“Programming Acquisitions Via SCPI” on page 617.</a>
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
Help Map ID	35072

## Meas Setup

### 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	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, CDMA 2000</b>
Notes	See <a href="#">“CDMA 2000” on page 433</a> .
Initial S/W Revision	A.05.00
Help Map ID	35235

### US Cell

Selects US Cell for the Band for CDMA 2000.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, CDMA 2000</b>
Notes	See <a href="#">“CDMA 2000” on page 433</a> .
Initial S/W Revision	A.05.00
Help Map ID	35073

### US PCS

Selects US PCS for the Band for CDMA 2000.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, CDMA 2000</b>
Notes	See <a href="#">“CDMA 2000” on page 433</a> .
Initial S/W Revision	A.05.00
Help Map ID	35074

### Japan Cell

Selects Japan Cell for the Band for CDMA 2000.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, CDMA 2000</b>
Notes	See <a href="#">“CDMA 2000” on page 433</a> .
Initial S/W Revision	A.05.00
Help Map ID	35075

### Korean PCS

Selects Korean Cell for the Band for CDMA 2000.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, CDMA 2000</b>
Notes	See <a href="#">“CDMA 2000” on page 433</a> .

Initial S/W Revision	A.05.00
Help Map ID	35076

**NMT 450**

Selects NMT 450 for the Band for CDMA 2000.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, CDMA 2000</b>
Notes	See <a href="#">“CDMA 2000” on page 433.</a>
Initial S/W Revision	A.05.00
Help Map ID	35077

**IMT 2000**

Selects IMT 2000 for the Band for CDMA 2000.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, CDMA 2000</b>
Notes	See <a href="#">“CDMA 2000” on page 433.</a>
Initial S/W Revision	A.05.00
Help Map ID	35078

**Upper 700**

Selects Upper 700 for the Band for CDMA 2000.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, CDMA 2000</b>
Notes	See <a href="#">“CDMA 2000” on page 433.</a>
Initial S/W Revision	A.05.00
Help Map ID	35079

**Secondary 800**

Selects Secondary 800 for the Band for CDMA 2000.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, CDMA 2000</b>
Notes	See <a href="#">“CDMA 2000” on page 433.</a>
Initial S/W Revision	A.05.00
Help Map ID	35080

## Meas Setup

### 400 Euro PAMR

Selects 400 Euro PAMR for the Band for CDMA 2000.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, CDMA 2000</b>
Notes	See <a href="#">“CDMA 2000” on page 433</a> .
Initial S/W Revision	A.05.00
Help Map ID	35081

### 800 PAMR

Selects 800 PAMR for the Band for CDMA 2000.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, CDMA 2000</b>
Notes	See <a href="#">“CDMA 2000” on page 433</a> .
Initial S/W Revision	A.05.00
Help Map ID	35082

### 2.5 GHz IMT EXT

Selects 2.5GHz IMT EXT for the Band for CDMA 2000.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, CDMA 2000</b>
Notes	See <a href="#">“CDMA 2000” on page 433</a> .
Initial S/W Revision	A.05.00
Help Map ID	35083

### US PCS 1.9 GHz

Selects US PCS 1.9GHz for the Band for CDMA 2000.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, CDMA 2000</b>
Notes	See <a href="#">“CDMA 2000” on page 433</a> .
Initial S/W Revision	A.05.00
Help Map ID	35084

### AWS

Selects AWS for the Band for CDMA 2000.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, CDMA 2000</b>
Notes	See <a href="#">“CDMA 2000” on page 433</a> .
Initial S/W Revision	A.05.00



Help Map ID	35085
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**US 2.5 GHz**

Selects US 2.5GHz for the Band for CDMA 2000.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, CDMA 2000</b>
Notes	See <a href="#">“CDMA 2000” on page 433.</a>
Initial S/W Revision	A.05.00
Help Map ID	35086

**700 Public Safety**

Selects 700 Public Notice for the Band for CDMA 2000.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, CDMA 2000</b>
Notes	See <a href="#">“CDMA 2000” on page 433.</a>
Initial S/W Revision	A.05.00
Help Map ID	35087

**C2K Lower 700**

Selects C2K Lower 700 for the Band for CDMA 2000.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, CDMA 2000</b>
Notes	See <a href="#">“CDMA 2000” on page 433.</a>
Initial S/W Revision	A.05.00
Help Map ID	35088

**1xEVDO**

Selects 1xEVDO for the Radio Standard for the current Acquisition and allows selection of the 1xEVDO band.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, 1xEVDO</b>
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## Meas Setup

SCPI Command (for specifying a 1xEVDO radio band)	<p>To set the radio band as an individual value:</p> <pre>[ :SENSe] :LSEQuencer:ACQuire {1:512} :SETup:RADio:BAND NONE   USCELL   USPCS   JAPAN   KOREAN   NMT   IMT2K   UPPER   SECOND   P AMR400   PAMR800   IMTEXT   PCS1DOT9G   AWS   US2DOT5G   PUBLIC   LOW ER</pre> <pre>[ :SENSe] :LSEQuencer:ACQuire {1:512} :SETup:RADio:BAND?</pre> <p>To set the radio band as an array:</p> <pre>[ :SENSe] :LSEQuencer:LIST:SETup:RADio:BAND &lt;enum&gt;, &lt;enum&gt;, &lt;enum&gt;, ...</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>
SCPI Examples (for specifying a 1xEVDO radio band)	<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 all the analyzer sequence parameters at once using SCPI, see <a href="#">“Programming Acquisitions Via SCPI” on page 617</a> .
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
Help Map ID	35089

### 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	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, 1xEVDO</b>
Notes	See <a href="#">“1xEVDO” on page 437</a> .
Initial S/W Revision	A.05.00
Help Map ID	35236

### US Cell

Selects US Cell for the Band for 1xEVDO.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, 1xEVDO</b>
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Notes	See “1xEVDO” on page 437.
Initial S/W Revision	A.05.00
Help Map ID	35090

**US PCS**

Selects US PCS for the Band for 1xEVDO.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, 1xEVDO</b>
Notes	See “1xEVDO” on page 437.
Initial S/W Revision	A.05.00
Help Map ID	35091

**Japan Cell**

Selects Japan Cell for the Band for 1xEVDO.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, 1xEVDO</b>
Notes	See “1xEVDO” on page 437.
Initial S/W Revision	A.05.00
Help Map ID	35092

**Korean PCS**

Selects Korean Cell for the Band for 1xEVDO.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, 1xEVDO</b>
Notes	See “1xEVDO” on page 437.
Initial S/W Revision	A.05.00
Help Map ID	35093

**NMT 450**

Selects NMT 450 for the Band for 1xEVDO.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, 1xEVDO</b>
Notes	See “1xEVDO” on page 437.
Initial S/W Revision	A.05.00
Help Map ID	35094

## Meas Setup

### IMT 2000

Selects IMT 2000 for the Band for 1xEVDO.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, 1xEVDO</b>
Notes	See <a href="#">“1xEVDO” on page 437.</a>
Initial S/W Revision	A.05.00
Help Map ID	35095

### Upper 700

Selects Upper 700 for the Band for 1xEVDO.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, 1xEVDO</b>
Notes	See <a href="#">“1xEVDO” on page 437.</a>
Initial S/W Revision	A.05.00
Help Map ID	35096

### Secondary 800

Selects Secondary 800 for the Band for 1xEVDO.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, 1xEVDO</b>
Notes	See <a href="#">“1xEVDO” on page 437.</a>
Initial S/W Revision	A.05.00
Help Map ID	35097

### 400 Euro PAMR

Selects 400 Euro PAMR for the Band for 1xEVDO.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, 1xEVDO</b>
Notes	See <a href="#">“1xEVDO” on page 437.</a>
Initial S/W Revision	A.05.00
Help Map ID	35098

### 800 PAMR

Selects 800 PAMR for the Band for 1xEVDO.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, 1xEVDO</b>
Notes	See <a href="#">“1xEVDO” on page 437.</a>
Initial S/W Revision	A.05.00

Help Map ID	35099
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**2.5 GHz IMT EXT**

Selects 2.5GHz IMT EXT for the Band for 1xEVDO.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, 1xEVDO</b>
Notes	See <a href="#">“1xEVDO” on page 437.</a>
Initial S/W Revision	A.05.00
Help Map ID	35100

**US PCS 1.9 GHz**

Selects US PCS 1.9GHz for the Band for 1xEVDO.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, 1xEVDO</b>
Notes	See <a href="#">“1xEVDO” on page 437.</a>
Initial S/W Revision	A.05.00
Help Map ID	35101

**AWS**

Selects AWS for the Band for 1xEVDO.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, 1xEVDO</b>
Notes	See <a href="#">“1xEVDO” on page 437.</a>
Initial S/W Revision	A.05.00
Help Map ID	35102

**US 2.5 GHz**

Selects US 2.5GHz for the Band for 1xEVDO.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, 1xEVDO</b>
Notes	See <a href="#">“1xEVDO” on page 437.</a>
Initial S/W Revision	A.05.00
Help Map ID	35103

**700 Public Safety**

Selects 700 Public Notice for the Band for 1xEVDO.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, 1xEVDO</b>
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## Meas Setup

Notes	See <a href="#">“1xEVDO” on page 437</a> .
Initial S/W Revision	A.05.00
Help Map ID	35104

### C2K Lower 700

Selects C2K Lower 700 for the Band for 1xEVDO.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, 1xEVDO</b>
Notes	See <a href="#">“1xEVDO” on page 437</a> .
Initial S/W Revision	A.05.00
Help Map ID	35105

### LTE FDD

Selects LTE FDD for the Radio Standard for the current Acquisition and allows selection of the LTE FDD band.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard</b>
SCPI Command (for specifying an LTE FDD radio band)	<p>To set the radio band as an individual value:</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</pre> <pre>[ :SENSe ] :LSEQuencer:ACQuire { 1:512 } :SETup:RADio: BAND?</pre> <p>To set the radio band as an array:</p> <pre>[ :SENSe ] :LSEQuencer:LIST:SETup:RADio: BAND &lt;enum&gt;, &lt;enum&gt;, &lt;enum&gt;, ...</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>
SCPI Examples (for specifying an LTE FDD radio band)	<pre>:LSEQ:ACQ2:SET:RAD:BAND NONE</pre> <pre>:LSEQ:ACQ2:SET:RAD:BAND?</pre> <pre>:LSEQ:LIST:SET:RAD:BAND BAND1, NONE, BAND24, BAND21</pre> <pre>:LSEQ:LIST:SET:RAD:BAND?</pre>
Notes	For setting all the analyzer sequence parameters at once using SCPI, see <a href="#">“Programming Acquisitions Via SCPI” on page 617</a> .
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

Initial S/W Revision	A.09.50
Help Map ID	35291

**None**

Selecting None for LTE FDD means that in the Acquisition, the frequency of the LTE FDD signal is determined by the Frequency parameter in the Acquisition setup.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD</b>
Notes	See <a href="#">“LTE FDD” on page 442.</a>
Initial S/W Revision	A.09.50
Help Map ID	35292

**BAND1**

Selects BAND1 for the Band for LTE FDD.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD</b>
Notes	See <a href="#">“LTE FDD” on page 442.</a>
Initial S/W Revision	A.09.50
Help Map ID	35293

**BAND2**

Selects BAND2 for the Band for LTE FDD.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD</b>
Notes	See <a href="#">“LTE FDD” on page 442.</a>
Initial S/W Revision	A.09.50
Help Map ID	35294

**BAND3**

Selects BAND3 for the Band for LTE FDD.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD</b>
Notes	See <a href="#">“LTE FDD” on page 442.</a>
Initial S/W Revision	A.09.50
Help Map ID	35295

## Meas Setup

### BAND4

Selects BAND4 for the Band for LTE FDD.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD</b>
Notes	See <a href="#">“LTE FDD” on page 442.</a>
Initial S/W Revision	A.09.50
Help Map ID	35296

### BAND5

Selects BAND5 for the Band for LTE FDD.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD</b>
Notes	See <a href="#">“LTE FDD” on page 442.</a>
Initial S/W Revision	A.09.50
Help Map ID	35297

### BAND6

Selects BAND6 for the Band for LTE FDD.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD</b>
Notes	See <a href="#">“LTE FDD” on page 442.</a>
Initial S/W Revision	A.09.50
Help Map ID	35298

### BAND7

Selects BAND7 for the Band for LTE FDD.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD</b>
Notes	See <a href="#">“LTE FDD” on page 442.</a>
Initial S/W Revision	A.09.50
Help Map ID	35299

### BAND8

Selects BAND8 for the Band for LTE FDD.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD</b>
Notes	See <a href="#">“LTE FDD” on page 442.</a>
Initial S/W Revision	A.09.50



Help Map ID	35300
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**BAND9**

Selects BAND9 for the Band for LTE FDD.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD</b>
Notes	See <a href="#">“LTE FDD” on page 442.</a>
Initial S/W Revision	A.09.50
Help Map ID	35301

**BAND10**

Selects BAND10 for the Band for LTE FDD.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD</b>
Notes	See <a href="#">“LTE FDD” on page 442.</a>
Initial S/W Revision	A.09.50
Help Map ID	35302

**BAND11**

Selects BAND11 for the Band for LTE FDD.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD</b>
Notes	See <a href="#">“LTE FDD” on page 442.</a>
Initial S/W Revision	A.09.50
Help Map ID	35303

**BAND12**

Selects BAND12 for the Band for LTE FDD.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD</b>
Notes	See <a href="#">“LTE FDD” on page 442.</a>
Initial S/W Revision	A.09.50
Help Map ID	35304

**BAND13**

Selects BAND13 for the Band for LTE FDD.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD</b>
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## Meas Setup

Notes	See “LTE FDD” on page 442.
Initial S/W Revision	A.09.50
Help Map ID	35305

### BAND14

Selects BAND14 for the Band for LTE FDD.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD</b>
Notes	See “LTE FDD” on page 442.
Initial S/W Revision	A.09.50
Help Map ID	35306

### BAND17

Selects BAND17 for the Band for LTE FDD.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD</b>
Notes	See “LTE FDD” on page 442.
Initial S/W Revision	A.09.50
Help Map ID	35307

### BAND18

Selects BAND18 for the Band for LTE FDD.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD</b>
Notes	See “LTE FDD” on page 442.
Initial S/W Revision	A.09.50
Help Map ID	35308

### BAND19

Selects BAND19 for the Band for LTE FDD.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD</b>
Notes	See “LTE FDD” on page 442.
Initial S/W Revision	A.09.50
Help Map ID	35309

**BAND20**

Selects BAND20 for the Band for LTE FDD.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD</b>
Notes	See <a href="#">“LTE FDD” on page 442.</a>
Initial S/W Revision	A.09.50
Help Map ID	35310

**BAND21**

Selects BAND21 for the Band for LTE FDD.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD</b>
Notes	See <a href="#">“LTE FDD” on page 442.</a>
Initial S/W Revision	A.09.50
Help Map ID	35311

**BAND24**

Selects BAND24 for the Band for LTE FDD.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD</b>
Notes	See <a href="#">“LTE FDD” on page 442.</a>
Initial S/W Revision	A.09.50
Help Map ID	35325

**BAND25**

Selects BAND25 for the Band for LTE FDD.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD</b>
Notes	See <a href="#">“LTE FDD” on page 442.</a>
Initial S/W Revision	A.09.50
Help Map ID	35326

**BAND26**

Selects BAND26 for the Band for LTE FDD.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE FDD</b>
Notes	See <a href="#">“LTE FDD” on page 442.</a>
Initial S/W Revision	A.09.50

## Meas Setup

Help Map ID	37024
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### 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
SCPI Command (for specifying an LTE TDD radio band)	<p>To set the radio band as an individual value:</p> <pre>[ :SENSE ] :LSEQuencer :ACQuire { 1 : 512 } :SETup :RADio :BAND NONE   BAND33   BAND34   BAND35   BAND36   BAND37   BAND38   BAND39   B AND40   BAND41   BAND42   BAND43</pre> <pre>[ :SENSE ] :LSEQuencer :ACQuire { 1 : 512 } :SETup :RADio :BAND?</pre> <p>To set the radio band as an array:</p> <pre>[ :SENSE ] :LSEQuencer :LIST :SETup :RADio :BAND &lt;enum&gt; , &lt;enum&gt; , &lt;enum&gt; , ...</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>
SCPI Examples (for specifying an LTE TDD radio band)	<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 all the analyzer sequence parameters at once using SCPI, see <a href="#">“Programming Acquisitions Via SCPI” on page 617</a> .
State Saved	Saved in instrument state.
Range	NONE BAND33 BAND34 BAND35 BAND36 BAND37 BAND38 BAND39 BAND40 BAND41 BAND42 BAND43
Initial S/W Revision	A.12.00
Help Map ID	37001

### 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
Notes	See <a href="#">“LTE TDD” on page 448</a> .
Initial S/W Revision	A.12.00
Help Map ID	37002

**BAND33**

Selects BAND 33 for the Band for LTE TDD.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE TDD</b>
Notes	See <a href="#">“LTE TDD” on page 448.</a>
Initial S/W Revision	A.12.00
Help Map ID	37003

**BAND34**

Selects BAND 34 for the Band for LTE TDD.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE TDD</b>
Notes	See <a href="#">“LTE TDD” on page 448.</a>
Initial S/W Revision	A.12.00
Help Map ID	37004

**BAND35**

Selects BAND 35 for the Band for LTE TDD.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE TDD</b>
Notes	See <a href="#">“LTE TDD” on page 448.</a>
Initial S/W Revision	A.12.00
Help Map ID	37005

**BAND36**

Selects BAND 36 for the Band for LTE TDD.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE TDD</b>
Notes	See <a href="#">“LTE TDD” on page 448.</a>
Initial S/W Revision	A.12.00
Help Map ID	37006

**BAND37**

Selects BAND 37 for the Band for LTE TDD.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE TDD</b>
Notes	See <a href="#">“LTE TDD” on page 448.</a>
Initial S/W Revision	A.12.00

## Meas Setup

Help Map ID	37007
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### BAND38

Selects BAND 38 for the Band for LTE TDD.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE TDD</b>
Notes	See <a href="#">“LTE TDD” on page 448.</a>
Initial S/W Revision	A.12.00
Help Map ID	37008

### BAND39

Selects BAND 39 for the Band for LTE TDD.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE TDD</b>
Notes	See <a href="#">“LTE TDD” on page 448.</a>
Initial S/W Revision	A.12.00
Help Map ID	37009

### BAND40

Selects BAND 40 for the Band for LTE TDD.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE TDD</b>
Notes	See <a href="#">“LTE TDD” on page 448.</a>
Initial S/W Revision	A.12.00
Help Map ID	37010

### BAND41

Selects BAND 41 for the Band for LTE TDD.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE TDD</b>
Notes	See <a href="#">“LTE TDD” on page 448.</a>
Initial S/W Revision	A.12.00
Help Map ID	37011

### BAND42

Selects BAND 42 for the Band for LTE TDD.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE TDD</b>
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Notes	See <a href="#">“LTE TDD” on page 448</a> .
Initial S/W Revision	A.12.00
Help Map ID	37012

**BAND43**

Selects BAND 43 for the Band for LTE TDD.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, LTE TDD</b>
Notes	See <a href="#">“LTE TDD” on page 448</a> .
Initial S/W Revision	A.12.00
Help Map ID	37013

**TDSCDMA**

Selects TDSCDMA for the Radio Standard for the current Acquisition and allows selection of the TDSCDMA band.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard</b>
SCPI Command (for specifying a TDSCDMA radio band)	<p>To set the radio band as an individual value:</p> <pre>[ :SENSe] :LSEQuencer:ACQuire{1:512} :SETup:RADio: BAND NONE   BANDA   BANDB   BANDC   BANDD   BANDE   BANDF</pre> <pre>[ :SENSe] :LSEQuencer:ACQuire{1:512} :SETup:RADio: BAND?</pre> <p>To set the radio band as an array:</p> <pre>[ :SENSe] :LSEQuencer:LIST:SETup:RADio: BAND &lt;enum&gt;, &lt;enum&gt;, &lt;enum&gt;, ...</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>
SCPI Examples (for specifying a TDSCDMA radio band)	<pre>:LSEQ:ACQ2:SET:RAD:BAND NONE</pre> <pre>:LSEQ:ACQ2:SET:RAD:BAND?</pre> <pre>LSEQ:LIST:SET:RAD:BAND BANDA,NONE,BANDB,BANDF</pre> <pre>:LSEQ:LIST:SET:RAD:BAND?</pre>
Notes	For setting all the analyzer sequence parameters at once using SCPI, see <a href="#">“Programming Acquisitions Via SCPI” on page 617</a> .
State Saved	Saved in instrument state.
Range	NONE BANDA BANDB BANDC BANDD BANDE BANDF
Initial S/W Revision	A.12.00
Help Map ID	37014

## Meas Setup

### 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	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, TDSCDMA</b>
Notes	See <a href="#">“TDSCDMA” on page 451</a> .
Initial S/W Revision	A.12.00
Help Map ID	37015

### BANDA

Selects BAND A for the Band for TDSCDMA.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, TDSCDMA</b>
Notes	See <a href="#">“TDSCDMA” on page 451</a> .
Initial S/W Revision	A.12.00
Help Map ID	37016

### BANDB

Selects BAND B for the Band for TDSCDMA.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, TDSCDMA</b>
Notes	See <a href="#">“TDSCDMA” on page 451</a> .
Initial S/W Revision	A.12.00
Help Map ID	37017

### BANDC

Selects BAND C for the Band for TDSCDMA.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, TDSCDMA</b>
Notes	See <a href="#">“TDSCDMA” on page 451</a> .
Initial S/W Revision	A.12.00
Help Map ID	37018

### BANDD

Selects BAND 3D for the Band for TDSCDMA.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, TDSCDMA</b>
Notes	See <a href="#">“TDSCDMA” on page 451</a> .



Initial S/W Revision	A.12.00
Help Map ID	37019

**BANDE**

Selects BAND E for the Band for TDSCDMA.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, TDSCDMA</b>
Notes	See <a href="#">“TDSCDMA” on page 451.</a>
Initial S/W Revision	A.12.00
Help Map ID	37020

**BANDE**

Selects BAND F for the Band for TDSCDMA.

Key Path	<b>Meas Setup, Acquisition Setup, Radio Setup, Radio Standard, TDSCDMA</b>
Notes	See <a href="#">“TDSCDMA” on page 451.</a>
Initial S/W Revision	A.12.00
Help Map ID	37021

**Device (For Channel)**

This parameter is used to determine the Channel Plan to be used when computing the Frequency/Channel values. Currently, Mobile Station is the only supported choice.

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	<b>Meas Setup, Acquisition Setup, Radio Setup</b>
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## Meas Setup

SCPI Command	<p>To set the device as an individual value:</p> <pre>[ :SENSe ] :LSEQuencer:ACQuire {1:512} :SETup:RADio:DEVIce BTS   MS</pre> <pre>[ :SENSe ] :LSEQuencer:ACQuire {1:512} :SETup:RADio:DEVIce?</pre> <p>To set the device as an array:</p> <pre>[ :SENSe ] :LSEQuencer:LIST:SETup:RADio:DEVIce &lt;enum&gt;, &lt;enum&gt;, &lt;enum&gt;, ...</pre> <pre>[ :SENSe ] :LSEQuencer:LIST:SETup:RADio:DEVIce?</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>
SCPI Examples	<pre>:LSEQ:ACQ2:SET:RAD:DEV MS</pre> <pre>:LSEQ:ACQ2:SET:RAD:DEV?</pre> <pre>:LSEQ:LIST:SET:RAD:DEV MS, MS, MS</pre> <pre>:LSEQ:LIST:SET: RAD:DEV?</pre>
Notes	<p>For setting all the analyzer sequence parameters at once using SCPI, see <a href="#">“Programming Acquisitions Via SCPI” on page 617</a>.</p> <p>This parameter and the Band parameter are used to determine which Channel Plan is to be used.</p>
Dependencies	Choice of BTS is disabled. MS only.
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
Help Map ID	35106

### 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	<b>Meas Setup, Acquisition Setup</b>
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SCPI Command	<p>To set the channel number/frequency as an individual value:</p> <pre>[ :SENSe] :LSEQuencer:ACQuire{1:512} :SETup:CNFRrequency &lt;real&gt;</pre> <pre>[ :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 &lt;real&gt;, &lt;real&gt;, &lt;real&gt;, ...</pre> <pre>[ :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 sequence (the number of array values must match the number of acquisitions; otherwise a "settings conflict" error will occur).</p>
SCPI Examples	<pre>:LSEQ:ACQ2:SET:CNFR 150</pre> <pre>:LSEQ:ACQ2:SET:CNFR?</pre> <pre>:LSEQ:LIST:SET:CNFR 1102,1e9,1.3e9,2300</pre> <pre>:LSEQ:LIST:SET:CNFR?</pre>
Notes	<p>When Radio Band is set to NONE, these SCPI commands are for setting the Frequency; otherwise, they are for setting the Channel Number.</p> <p>For setting all the analyzer sequence parameters at once using SCPI, see <a href="#">“Programming Acquisitions Via SCPI” on page 617</a>.</p>
Dependencies	This parameter is disabled (grayed out) when Radio Setup is set to None
Couplings	<p>The Channel parameter is coupled to the Radio Setup parameter, except when the Radio Setup parameter is set to None.</p> <p>When coupled, changes to either Channel or Frequency update the other parameter.</p> <p>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 “&lt;” or “&gt;” depending on if the frequency entered is less than or greater than the channel’s frequency value.</p> <p>Range Varies</p>
Preset	1
State Saved	Saved in instrument state.
Range	1 to 10838
Initial S/W Revision	A.05.00
Help Map ID	35107

### 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

## Meas Setup

parameter changes the other as well).

Key Path	Meas Setup, Acquisition Setup
SCPI Command	<p>To set the channel number/frequency as an individual value:</p> <pre>[ :SENSe ] :LSEQuencer :ACQuire { 1 : 512 } :SETup :CNFRrequency &lt;real&gt;</pre> <pre>[ :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 &lt;real&gt;, &lt;real&gt;, &lt;real&gt;, ...</pre> <pre>[ :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 sequence (the number of array values must match the number of acquisitions; otherwise a "settings conflict" error will occur).</p>
SCPI Examples	<pre>:LSEQ:ACQ2:SET:CNFR 150</pre> <pre>:LSEQ:ACQ2:SET:CNFR?</pre> <pre>:LSEQ:LIST:SET:CNFR 1102,1e9,1.3e9,2300</pre> <pre>:LSEQ:LIST:SET:CNFR?</pre>
Notes	<p>When Radio Band is set to NONE, these SCPI commands are for setting the Frequency; otherwise, they are for setting the Channel Number.</p> <p>For setting all the analyzer sequence parameters at once using SCPI, see <a href="#">“Programming Acquisitions Via SCPI” on page 617</a>.</p>
Couplings	<p>The Frequency parameter is coupled to the Channel parameter (see <a href="#">“Channel” on page 454</a>) except when the Band parameter is set to None.</p> <p>When coupled, changes to either Channel or Frequency update the other parameter.</p>
Preset	1 GHz
State Saved	Saved in instrument state.
Min	–80 MHz
Max	<p>For Option 503: the Max frequency is 3.7GHz</p> <p>For Option 504, the Max Frequency is 3.9GHz.</p> <p>For Option 506, the Max Frequency is 6.1GHz.</p>
Initial S/W Revision	A.05.00
Help Map ID	35108

## 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. If OFF this peak power parameter is ignored.

Key Path	Meas Setup, Acquisition Setup
SCPI Command	<p>To set the peak power as an individual value:</p> <pre>[ :SENSe] :LSEQuencer:ACQuire{1:512} :SETup:PPOWer &lt;amp;&gt; [ :SENSe] :LSEQuencer:ACQuire{1:512} :SETup:PPOWer?</pre> <p>To set the peak power as an array:</p> <pre>[ :SENSe] :LSEQuencer:LIST:SETup:PPOWer &lt;amp&gt;, &lt;amp&gt;, &lt;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 sequence (the number of array values must match the number of acquisitions; otherwise a "settings conflict" error will occur).</p>
SCPI Examples	<pre>:LSEQ:ACQ2:SET:PPOW 20 dBm :LSEQ:ACQ2:SET:PPOW? :LSEQ:LIST:SET:PPOW 0,10dBm,15dBm :LSEQ:LIST:SET:PPOW?</pre>
Notes	For setting all the analyzer sequence parameters at once using SCPI, see <a href="#">“Programming Acquisitions Via SCPI” on page 617</a> .
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
Help Map ID	35109

## Instrument Gain

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**NOTE** This parameter is set for models E6607A and E6607B, but cannot be set for E6607C, which does not include a mechanical attenuator. For E6607C, Auto Set RF Levels is always on.

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This parameter is for control of the test set's input gain.

The gain setting is for setting the path gain of the test set during an acquisition. A different value can be set for each acquisition. In fact, Instrument Gain includes two settings, Electronic Attenuation and PreAmplify. When Instrument Gain is set to LOW, Electronic Attenuator is turned on and PreAmplifier is turned off. The default value of Electronic Attenuation is -20 dB. When Instrument Gain is set to

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ZERO, both Electronic Attenuator and PreAmplifier are turned off. Signal is bypassed. When Instrument Gain is set to HIGH, Electronic Attenuator is turned off and PreAmplifier is turned on.

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**NOTE** The “Instrument Gain” selection range detailed here should match the expected power values. If not, the internal circuitry on the test set could be damaged.

If frequency Option 504 is installed, the maximum frequency of the electronic attenuator is 3.9 GHz, otherwise the max frequency of the electronic attenuator is 3.6 GHz. If acquisition frequencies are above the max frequency of the electronic attenuator, then the Electronic Attenuator is disabled, hence the acquisition parameter “Instrument Gain” selection is limited to HIGH or ZERO.

If both frequency Option 504 and Preamplifier Option P04 are available, the preamp Low band max frequency is 3.9 GHz, otherwise the Low band max frequency is 3.6 GHz. Preamp gain is 20 dB in Low band and 35 dB in High band.

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Instrument Gain setting will affect the power range coverage of the test set. When “Auto Set RF Levels” is set to ON, this setting is controlled by the test set. The test set will choose an appropriate value according to the Peak Power and the Minimum Expected Power in the red bar. Please see [“Auto Set RF Levels” on page 502](#). When “Auto Set RF Levels” is set to OFF, this setting should be set manually. The following table describes the sequencer step switching threshold levels for the acquisition parameter “Instrument Gain”. The mechanical attenuator value is 0 dB. Use the mechanical attenuator value to adjust the ranges in the table. Note that the mechanical attenuator value is fixed for the entire Sequence.

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**NOTE** The table below is only intended as a reference. Actual measurements may involve situations more complex than this table covers. Use of Auto Set RF Levels is strongly recommended as an alternative to setting the gain in this way.

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Acquisition Freq	Instrument Gain	RF Path	Expected DUT Tx Power in Acquisition (dBm) <sup>1</sup>	E-Atten Value (dB)	Preamp State
Low Band	Low	RFIO1/2 (20 dB loss)	>29 <sup>2</sup>	24	OFF
Low Band	Low	RFIO1/2 (20 dB loss)	+29 to +5	24 to 0	OFF
Low Band	Zero	RFIO1/2 (20 dB loss)	+5 to -15	0	OFF
Low Band	High (+20)	RFIO1/2 (20 dB loss)	<-15 <sup>3</sup>	0	ON
Low Band	Low	RFInput (6 dB loss)	>15 <sup>2</sup>	24	OFF
Low Band	Low	RFInput (6 dB loss)	+15 to -9	24 to 0	OFF
Low Band	Zero	RFInput (6 dB loss)	-9 to -29	0	OFF
Low Band	High (+20)	RFInput (6 dB loss)	<29 <sup>3</sup>	0	ON
High Band	Zero	RFIO1/2 (20dB Loss)	>5 <sup>2</sup>	NAN	OFF

Acquisition Freq	Instrument Gain	RF Path	Expected DUT Tx Power in Acquisition (dBm) <sup>1</sup>	E-Atten Value (dB)	Preamp State
High Band	Zero	RFIO1/2 (20dB Loss)	+5 to -30	NAN	OFF
High Band	High (+35)	RFIO1/2 (20dB Loss)	<-30 <sup>3</sup>	NAN	ON
High Band	Zero	RFInput (6 dB Loss)	>-9 <sup>2</sup>	NAN	OFF
High Band	Zero	RFInput (5 dB Loss)	-9 to -44	NAN	OFF
High Band	High (+35)	RFInput (5 dB Loss)	<-44 <sup>3</sup>	NAN	ON

1. This is the power level at the input port of the EXT (taking into account any fixture loss between the DUT and the test set).
2. Instrument Gain cannot provide enough attenuation. Mech-Atten can be used for additional attenuation; however, Mech-Atten applies to the entire sequence.
3. Instrument Gain can not provide enough gain. IF Gain may be used for additional gain; however, IF Gain applies to the entire sequence.

Key Path	Meas Setup, Acquisition Setup
SCPI Command	<p>To set the instrument gain as an individual value:</p> <pre>[ :SENSE ] :LSEQuencer:ACQuire{ 1 : 512 } :SETup:GAIN Low   Zero   High</pre> <pre>[ :SENSE ] :LSEQuencer:ACQuire{ 1 : 512 } :SETup:GAIN?</pre> <p>To set the instrument gain as an array:</p> <pre>[ :SENSE ] :LSEQuencer:LIST:SETup:GAIN&lt;enum&gt;, &lt;enum&gt;, &lt;enum&gt; ' ... [ :SENSE ] :LSEQuencer:LIST:SETup:GAIN?</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>
SCPI Examples	<pre>:LSEQ:ACQ2:SET:GAIN ZERO :LSEQ:ACQ2:SET:GAIN? :LSEQ:LIST:SET:GAIN ZERO,LOW,HIGH :LSEQ:LIST:SET:GAIN?</pre>
Notes	<p>This parameter is not available for E6607C.</p> <p>For setting all the analyzer sequence parameters at once using SCPI, see <a href="#">“Programming Acquisitions Via SCPI” on page 617.</a></p>

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Couplings	<p>When “Auto Set RF Levels” parameter is set to On, this parameter is disabled and is auto set by the List Sequencer measurement.</p> <p>For acquisition frequencies &gt;3.6 GHz, the LOW setting cannot be used.</p> <p>The value of HIGH is dependent on the acquisition frequency: 35 dB gain for frequencies above 3.6 GHz, 20 dB gain for all lower frequencies.</p>
Preset	0 dB (ZERO) and should be disabled.
State Saved	Yes
Range	Low   Zero   High
Initial S/W Revision	A.05.00
Help Map ID	35110

### Low

Turns on the Electronic Attenuation and Sets the true value of electronic attenuation. The preamplifier is set to OFF.

Key Path	<b>Meas Setup, Acquisition Setup, Instrument Gain</b>
SCPI Command	<p>To set the value of electronic attenuation as an individual value:</p> <pre>[ :SENSE ] :LSEQuencer:ACQuire { 1 : 512 } :SETup:EATTenuation &lt;rel amp&gt;</pre> <pre>[ :SENSE ] :LSEQuencer:ACQuire { 1 : 512 } :SETup:EATTenuation?</pre> <p>To set the value of electronic attenuation as an array:</p> <pre>[ :SENSE ] :LSEQuencer:LIST:SETup:EATTenuation &lt;rel amp&gt;, &lt;rel amp&gt;, &lt;rel amp&gt;, ...</pre> <pre>[ :SENSE ] :LSEQuencer:LIST:SETup:EATTenuation?</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>
SCPI Examples	<pre>:LSEQ:ACQ2:SET:EATT -10dB</pre> <pre>:LSEQ:ACQ2:SET:EATT?</pre> <pre>:LSEQ:LIST:SET:EATT -5,10dB,0</pre> <pre>:LSEQ:LIST:SET:EATT?</pre>
Notes	<p>This parameter is not available for E6607C.</p> <p>For setting all the analyzer sequence parameters at once using SCPI, see <a href="#">“Programming Acquisitions Via SCPI” on page 617</a>. The value of this key is at the end of the command. It is optional. If it is not set, use the default value (-20dB). If Instrument Gain is not set to LOW, this value is ignored.</p>
Couplings	Coupled to Auto Set RF Level when set to Off. If On this parameter is ignored.



Preset	-20 dB electronic attenuation, preamplifier off.
State saved	Saved in instrument state.
Min	-24 dB
Max	0 dB
Resolution	1 dB
Knob Increment	1 dB
Step Increment	0.1 dB
Unit Terminator Key	dB
Initial S/W Revision	A.05.00
Help Map ID	35183

**Zero**

Sets the electronic attenuator and the preamp to OFF.

Key Path	<b>Meas Setup, Acquisition Setup, Instrument Gain</b>
Notes	This parameter is not available for E6607C. See <a href="#">“Instrument Gain” on page 457.</a>
Initial S/W Revision	A.05.00
Help Map ID	35184

**High**

Sets the electronic attenuator to OFF and the preamp to ON.

Key Path	<b>Meas Setup, Acquisition Setup, Instrument Gain</b>
Notes	This parameter is not available for E6607C. See <a href="#">“Instrument Gain” on page 457.</a>
Initial S/W Revision	A.05.00
Help Map ID	35185

**Actual Instrument Gain (Remote Command Only)**

This parameter is used to query the actual value of Instrument Gain when Auto Set RF Levels is set to ON. In that case, the actual value of Instrument Gain is determined by Auto Set RF Levels. This is a query only parameter and can be accessed only by remote command.

This parameter is not available for Model E6607C, which uses a different parameter for the purpose (see

## Meas Setup

“Actual FrontEnd Gain (Remote Command Only)” on page 462).

<b>Remote Command</b>	:SERVice:LSEQuencer:ACQuire:INSTrument:GAIN:ACTual?
Example	SERV:LSEQ:ACQ:INST:GAIN:ACT?
Notes	Not available for E6607C.
Preset	0 dB (ZERO)
State Saved	Saved in instrument state.
Range	-24 ~ 0, 20
Initial S/W Revision	Prior to A.05.00
Help Map ID	0

### Actual FrontEnd Gain (Remote Command Only)

This parameter is used to query the actual value of FrontEnd Gain in the E6607C test set (which is set automatically). This is a query only parameter and can be accessed only by remote command.

This parameter pertains to the E6607C test set. It is not available for E6607A or E6607B, which use a different query (see “Actual Instrument Gain (Remote Command Only)” on page 461).

<b>Remote Command</b>	:SERVice:LSEQuencer:ACQuire:FEND:GAIN:ACTual?
Example	SERV:LSEQ:ACQ:FEND:GAIN:ACT?
Notes	Not available for E6607A or E6607B.
Preset	0 dB (ZERO)
State Saved	Saved in instrument state.
Range	-14 ~ 40
Initial S/W Revision	A.12.00
Help Map ID	0

### Actual Multiport Adapter Preamp (Remote Command Only)

This parameter is used to query the actual on/off state of the Multiport Adapter Preamp in the E6607C test set (which is set automatically). In that case, the actual preamp state is determined by Auto Set RF Levels. This is a query only parameter and can be accessed only by remote command.

This parameter is not available for Model E6607A or Model E6607B.

<b>Remote Command</b>	:SERVice:LSEQuencer:ACQuire:MPAdapTer:GAIN:ACTual?
Example	SERV:LSEQ:ACQ:MPA:GAIN:ACT?
Notes	Not available for E6607A or E6607B.
Preset	On

State Saved	Saved in instrument state.
Range	On Off
Initial S/W Revision	A.12.00
Help Map ID	0

### 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
SCPI Command	<p>To set the transition time as an individual value:</p> <pre>[ :SENSE ] :LSEQuencer:ACQuire{1:512}:SETup:TIME:TRANSition &lt;time&gt;</pre> <pre>:SENSe]:LSEQuencer:ACQuire{1:512}:SETup:TIME:TRANSition?</pre> <p>To set the transition time as an array:</p> <pre>[ :SENSE ] :LSEQuencer:LIST:SETup:TIME:TRANSition &lt;time&gt;,&lt;time&gt;,&lt;time&gt;,...</pre> <pre>[ :SENSe ] :LSEQuencer:LIST:SETup:TIME:TRANSition?</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>
SCPI Examples	<pre>:LSEQ:ACQ2:SET:TIME:TRAN 10ms</pre> <pre>:LSEQ:ACQ2:SET:TIME:TRAN?</pre> <pre>:LSEQ:LIST:SET:TIME:TRAN 500us,1ms,2ms</pre> <pre>:LSEQ:LIST:SET:TIME:TRAN?</pre>

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Notes	<p>For setting all the analyzer sequence parameters at once using SCPI, see <a href="#">“Programming Acquisitions Via SCPI”</a> on page 617.</p> <p>The transition time needed depends on which acquisition parameters are changing between acquisitions, and how large the change is. In most situations, the following suggested values provide adequate transition time:</p> <p>Source Gain Changes: 500 us</p> <p>Analyzer Electronic Attenuator Gain Changes: 350 us</p> <p>Source &amp; Analyzer Frequency changes:</p> <p style="padding-left: 20px;">Switching within same Frequency Band: 300 us</p> <p style="padding-left: 20px;">Switching across Frequency Bands: 1 ms</p> <p>Note:</p> <p style="padding-left: 20px;">Frequency Band 1: -0.08 GHz to 0.6075 GHz</p> <p style="padding-left: 20px;">Frequency Band 2: 0.5075 GHz to 2.1775 GHz</p> <p style="padding-left: 20px;">Frequency Band 3: 2.0775 GHz to 3.6 GHz</p>
Preset	20 us
State Saved	Saved in instrument state.
Range	1 us to 4 ks
Initial S/W Revision	A.05.00
Help Map ID	35111

### 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 should 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
SCPI Command	<p>To set the acquisition duration as an individual value:</p> <pre>[ :SENSe ] :LSEQuencer :ACQuire { 1 : 512 } :SETup :TIME :DURation &lt;time&gt;</pre> <pre>[ :SENSe ] :LSEQuencer :ACQuire { 1 : 512 } :SETup :TIME :DURation?</pre> <p>To set the acquisition duration as an array:</p> <pre>[ :SENSe ] :LSEQuencer :LIST :SETup :TIME :DURation &lt;time&gt;, &lt;time&gt;, &lt;time&gt;, ...</pre> <pre>[ :SENSe ] :LSEQuencer :LIST :SETup :TIME :DURation?</pre>

SCPI Examples	: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 all the analyzer sequence parameters at once using SCPI, see <a href="#">“Programming Acquisitions Via SCPI”</a> on page 617.
Preset	1 ms
State Saved	Saved in instrument state.
Range	0 to 10 s
Initial S/W Revision	A.05.00
Help Map ID	35112

### Input Trigger

This parameter sets the Trigger input for the current acquisition. Trigger slope for Video 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
SCPI Command	<p>To set the input trigger as an individual value:</p> <pre>[ :SENSe] :LSEQuencer :ACQuire { 1 : 512 } :SETup :TRIGger [ : INPut ] IMMEDIATE   VIDEo   INTernal   EXTernal1   EXTernal2</pre> <pre>[ :SENSe] :LSEQuencer :ACQuire { 1 : 512 } :SETup :TRIGger [ : INPut ] ?</pre> <p>To set the input trigger as an array:</p> <pre>[ :SENSe] :LSEQuencer :LIST :SETup :TRIGger [ : INPut ] &lt;enum&gt; , &lt;enum&gt; , &lt;enum&gt; , ...</pre> <pre>[ :SENSe] :LSEQuencer :LIST :SETup :TRIGger [ : INPut ] ?</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>
SCPI Examples	:LSEQ:ACQ2:SET:TRIG:INP IMM :LSEQ:ACQ2:SET:TRIG:INP? :LSEQ:LIST:SET:TRIG:INP IMM,INT,VID :LSEQ:LIST:SET:TRIG:INP?

## Meas Setup

Notes	For setting all the analyzer sequence parameters at once using SCPI, see <a href="#">“Programming Acquisitions Via SCPI” on page 617</a> . IMMediate: free run. VIDeo: IF Envelope (level set by Input Trigger Level parameter). INTernal: from internal signal generator. EXTernal1/2: from external trigger input ports.
Preset	All Free Run
State Saved	Saved in instrument state.
Range	Free Run   Video   Internal   Ext1   Ext2
Initial S/W Revision	A.05.00
Help Map ID	35113

### Free Run

Selects Free Run for the Trigger for the current Acquisition.

Key Path	<b>Meas Setup, Acquisition Setup, Input Trigger</b>
Notes	See <a href="#">“Input Trigger” on page 465</a> .
Initial S/W Revision	A.05.00
Help Map ID	35114

### Video

Selects Video (that is, IF envelope triggering) for the Trigger for the current Acquisition.

Key Path	<b>Meas Setup, Acquisition Setup, Input Trigger</b>
Notes	See <a href="#">“Input Trigger” on page 465</a> .
Initial S/W Revision	A.05.00
Help Map ID	35237

### Internal

Selects Internal for the Trigger for the current Acquisition.

Key Path	<b>Meas Setup, Acquisition Setup, Input Trigger</b>
Notes	See <a href="#">“Input Trigger” on page 465</a> .
Initial S/W Revision	A.05.00
Help Map ID	35116

**External 1**

Selects External 1 for the Trigger for the current Acquisition.

Key Path	<b>Meas Setup, Acquisition Setup, Input Trigger</b>
Notes	See <a href="#">“Input Trigger” on page 465</a> .
Initial S/W Revision	A.05.00
Help Map ID	35117

**External 2**

Selects External 2 for the Trigger for the current Acquisition.

Key Path	<b>Meas Setup, Acquisition Setup, Input Trigger</b>
Notes	See <a href="#">“Input Trigger” on page 465</a> .
Initial S/W Revision	A.05.00
Help Map ID	35118

**Input Trigger Level**

This parameter sets the trigger level of the Video trigger for the current Acquisition.

Key Path	<b>Meas Setup, Acq Setup</b>
SCPI Command	<p>To set the input trigger level as an individual value:</p> <pre>[ :SENSE ] :LSEQuencer:ACQuire{ 1:512 } :SETup:TRIGger [ :INPut ] :LEVel &lt; amp &gt;</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 &lt; amp &gt; , &lt; amp &gt; , &lt; amp &gt; , ...</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>
SCPI Examples	<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 all the analyzer sequence parameters at once using SCPI, see <a href="#">“Programming Acquisitions Via SCPI” on page 617</a> .

## Meas Setup

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
Help Map ID	35119

### Input Trigger Delay

This parameter allows you to set the trigger delay for the current Acquisition.

Key Path	<b>Meas Setup, Acquisition Setup</b>
SCPI Command	<p>To set the input trigger delay as an individual value:</p> <pre>[ :SENSe ] :LSEQuencer :ACQuire { 1 : 512 } :SETUp :TRIGger [ : INPut ] :DELay &lt;time&gt;</pre> <pre>[ :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 &lt;time&gt;, &lt;time&gt;, &lt;time&gt;, ...</pre> <pre>[ :SENSe ] :LSEQuencer :LIST :SETUp :TRIGger [ : INPut ] :DELay?</pre>
SCPI Examples	<pre>:LSEQ:ACQ2:SET:TRIG:INP:DEL -200us</pre> <pre>:LSEQ:ACQ2:SET:TRIG:INP:DEL?</pre> <pre>:LSEQ:LIST:SET:TRIG:INP:DEL 0,-200us,-100us</pre> <pre>:LSEQ:LIST:SET:TRIG:INP:DEL?</pre>
Notes	<p>For setting all the analyzer sequence parameters at once using SCPI, see <a href="#">“Programming Acquisitions Via SCPI” on page 617</a>.</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 <a href="#">“Validation and Setup dependencies” on page 619</a>) if the selected measurement in the first analysis step requires a rising edge; then the 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
Initial S/W Revision	A.05.00
Help Map ID	35120

### Output Trigger

This parameter is used to set the type of trigger output generated by the test set's Analyzer when the acquisition starts.

---

**NOTE** A trigger out can be generated once per acquisition, not on every analysis step (unless each analysis step is in a separate acquisition).

---

Key Path	Meas Setup, Acquisition Setup
SCPI Command	<p>To set the output trigger type as an individual value:</p> <pre>[ :SENSE] :LSEQuencer:ACQuire{1:512} :SETup:TRIGger:OUTPut NONE   INTernal</pre> <pre>[ :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 &lt;enum&gt;, &lt;enum&gt;, &lt;enum&gt;, ...</pre> <pre>[ :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>
SCPI Examples	<pre>:LSEQ:ACQ2:SET:TRIG:OUTP NONE</pre> <pre>:LSEQ:ACQ2:SET:TRIG:OUTP?</pre> <pre>:LSEQ:LIST:SET:TRIG:OUTP NONE,INT,NONE</pre> <pre>:LSEQ:LIST:SET:TRIG:OUTP?</pre>
Notes	<ol style="list-style-type: none"> <li>1. For setting all the analyzer sequence parameters at once using SCPI, see <a href="#">“Programming Acquisitions Via SCPI” on page 617</a>.</li> <li>2. All triggers are sent at the start of the Acquisition.</li> <li>3. NONE: no trigger is issued.</li> <li>4. INTernal: trigger is sent to internal source.</li> </ol>
State Saved	Saved in instrument state.
Range	None   Internal
Initial S/W Revision	A.05.00
Help Map ID	35121

## Meas Setup

### None

Selects no output trigger for the current Acquisition.

Key Path	<b>Meas Setup, Acquisition Setup, Input Trigger</b>
Notes	See “Output Trigger” on page 469.
Initial S/W Revision	A.05.00
Help Map ID	35122

### Internal

Selects Internal for the Ext Trigger for the current Acquisition.

Key Path	<b>Meas Setup, Acquisition Setup, Input Trigger</b>
Notes	See “Output Trigger” on page 469.
Initial S/W Revision	A.05.00
Help Map ID	35123

### Multiport Adptr Input

This allows access to the Multiport Adapter Input Setup menus. The Multiport Adapter is a separate instrument (E6617A) in the case of the E6607A and E6607B test sets; it is embedded in the E6607C.

Key Path	<b>Meas Setup, Acquisition Setup</b>
Notes	No SCPI : Front panel only.
Dependencies	This setting is grayed out unless the Multiport Adptr Input Mode is set to List. In E6607A and E6607B, this setting is displayed only when the Multiport Adapter (E6617A) is connected by way of the USB interface. Otherwise, the setting is hidden and is set to OFF. In E6607C, the Multiport Adapter is embedded in the test set; it requires Option E6607C-MPA for use.
Initial S/W Revision	A.12.00
Help Map ID	35312

### Input Port

This parameter sets the Multiport Adapter RF input Port for the current acquisition.

Key Path	<b>Meas Setup, Acquisition Setup, Multiport Adaptr Input</b>
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<b>Remote Command</b>	<p>To set the Multiport Adapter Input Port as an individual value:</p> <pre>[ :SENSe] :LSEQuencer:ACQuire{1:512}:SETup:MPAdapTer:INPut RFIO0  RFIO1  RFIO2  RFIO3  RFIO4  RFIO5  RFIO6  RFIO7</pre> <p>[ :SENSe] :LSEQuencer:ACQuire{1:512}:SETup:MPAdapTer:INPut?</p> <p>To set the Multiport Adapter Input Port as an array:</p> <pre>[ :SENSe] :LSEQuencer:LIST:SETup:MPAdapTer:INPut &lt;enum&gt;, &lt;enum&gt;, &lt;enum&gt;, ...</pre> <p>[ :SENSe] :LSEQuencer:LIST:SETup:MPAdapTer:INPut?</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:MPA:INP RFIO0 :LSEQ:ACQ2:SET:MPA:INP? :LSEQ:LIST:SET:MPA:INP RFIO0,RFIO1,RFIO2 :LSEQ:LIST:SET:MPA:INP?</pre>
Notes	<ol style="list-style-type: none"> <li>1. For setting all the analyzer sequence parameters at once using SCPI, see <a href="#">“Programming Acquisitions Via SCPI” on page 617</a>.</li> <li>2. RF Input Path choices for the acquisition step: OFF, RFIO0, RFIO1, RFIO2, RFIO3, RFIO4, RFIO5, RFIO6, RFIO7.</li> </ol>
Dependencies	This setting is disabled (grayed out) when Multiport Adaptr Input Mode is set to Fixed.
Couplings	None.
Preset	RFIO0
State Saved	Saved in instrument state.
Range	RFIO0  RFIO1  RFIO2  RFIO3  RFIO4  RFIO5  RFIO6  RFIO7
Initial S/W Revision	A.10.00
Help Map ID	35313

**Off**

Sets the Multiport Adapter RF Input path of the current acquisition to Off.

Key Path	<b>Meas Setup, Acquisition Setup, Multiport Adptr Input, Input Port</b>
Initial S/W Revision	A.10.00
Help Map ID	35327

## Meas Setup

### RFIO0

Sets the Multiport Adapter RF Input path of the current acquisition to port RFIO0.

Key Path	<b>Meas Setup, Acquisition Setup, Multiport Adptr Input, Input Port</b>
Initial S/W Revision	A.10.00
Help Map ID	35314

### RFIO1

Sets the Multiport Adapter RF Input path of the current acquisition to port RFIO1.

Key Path	<b>Meas Setup, Acquisition Setup, Multiport Adptr Input, Input Port</b>
Initial S/W Revision	A.10.00
Help Map ID	35328

### RFIO2

Sets the Multiport Adapter RF Input path of the current acquisition to port RFIO2.

Key Path	<b>Meas Setup, Acquisition Setup, Multiport Adptr Input, Input Port</b>
Initial S/W Revision	A.10.00
Help Map ID	35315

### RFIO3

Sets the Multiport Adapter RF Input path of the current acquisition to port RFIO3.

Key Path	<b>Meas Setup, Acquisition Setup, Multiport Adptr Input, Input Port</b>
Initial S/W Revision	A.10.00
Help Map ID	35316

### RFIO4

Sets the Multiport Adapter RF Input path of the current acquisition to port RFIO4.

Key Path	<b>Meas Setup, Acquisition Setup, Multiport Adptr Input, Input Port</b>
Initial S/W Revision	A.10.00
Help Map ID	35317

### RFIO5

Sets the Multiport Adapter RF Input path of the current acquisition to port RFIO5.

Key Path	<b>Meas Setup, Acquisition Setup, Multiport Adptr Input, Input Port</b>
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Initial S/W Revision	A.10.00
Help Map ID	35318

### RFIO6

Sets the Multiport Adapter RF Input path of the current acquisition to port RFIO6.

Key Path	<b>Meas Setup, Acquisition Setup, Multiport Adptr Input, Input Port</b>
Initial S/W Revision	A.10.00
Help Map ID	35319

### RFIO7

Sets the Multiport Adapter RF Input path of the current acquisition to port RFIO7.

Key Path	<b>Meas Setup, Acquisition Setup, Multiport Adptr Input, Input Port</b>
Initial S/W Revision	A.10.00
Help Map ID	35320

### Preamp

This parameter determines if the Multiport Adapter Preamp is enabled on the current acquisition.

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**NOTE** This setting is available only in E6607A and E6607B test sets. In E6607C, the preamp in the embedded Multiport Adapter is not user-settable.

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Key Path	<b>Meas Setup, Acquisition Setup, Multiport Adptr Input</b>
<b>Remote Command</b>	<p>To set the Multiport Adapter Preamp as an individual value:</p> <pre>[ :SENSe] :LSEQuencer:ACQuire{1:512}:SETup:MPAdpTter:GAIN ON OFF</pre> <pre>[ :SENSe] :LSEQuencer:ACQuire{1:512}:SETup:MPAdpTter:GAIN?</pre> <p>To set the Multiport Adapter Preamp as an array:</p> <pre>[ :SENSe] :LSEQuencer:LIST:SETup:MPAdpTter:GAIN &lt;boolean&gt;, &lt;boolean&gt;, &lt;boolean&gt;, ...</pre> <pre>[ :SENSe] :LSEQuencer:LIST:SETup:MPAdpTter:GAIN?</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:GAIN 1</pre> <pre>:LSEQ:ACQ2:SET:MPA:GAIN?</pre> <pre>:LSEQ:LIST:SET:MPA:GAIN ON,OFF,0</pre> <pre>:LSEQ:LIST:SET:MPA:GAIN?</pre>

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Notes	For setting all the analyzer sequence parameters at once using SCPI, see <a href="#">“Programming Acquisitions Via SCPI” on page 617</a> . This setting is not available for the E6607C test set.
Dependencies	When “Auto Set RF Levels” is set to ON, this setting is controlled by the test set and it is grayed out.
Couplings	None
Preset	On
Range	On Off
Initial S/W Revision	A.10.00
Help Map ID	35322

## Acquisition Integration

This parameter is used to extend the frequency span and dynamic range capabilities of the sequence analyzer. There is an IF bandwidth limitation of 40 MHz per acquisition, but it is possible to divide a measurement across multiple acquisitions in order to capture a larger total bandwidth. The Acquisition Integration parameter specifies how a given acquisition is to be integrated into a set of acquisitions.

Measurements which support integration of acquisitions for the purpose of frequency span extension are: SEM, ACP, and OBW.

Measurements which support integration of acquisitions for the purpose of dynamic range extension are: TD-SCDMA PvT and TDD-LTE PvT.

Other measurements are performed only on a Normal or Primary acquisition type.

Key Path	Meas Setup, Acquisition Setup
<b>Remote Command</b>	<p>To set the Acquisition Integration as an individual value:</p> <pre>[ :SENSe ] :LSEQuencer:ACQuire{1:512}:SETup:INTEgration NORMal   PRIMary   LOWer   UPPer   RANGe</pre> <pre>[ :SENSe ] :LSEQuencer:ACQuire{1:512}:SETup:INTEgration?</pre> <p>To set the Acquisition Integration as an array:</p> <pre>[ :SENSe ] :LSEQuencer:LIST:SETup:INTEgration &lt;enum&gt; , &lt;enum&gt; , &lt;enum&gt; , ...</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 conflict" error will occur).</p>
<b>Example</b>	<pre>:LSEQ:ACQ2:SET:INT PRIM :LSEQ:ACQ2:SET:INT? :LSEQ:LIST:SET:INT PRIM,LOW,UPP,RANG :LSEQ:LIST:SET:INT?</pre>

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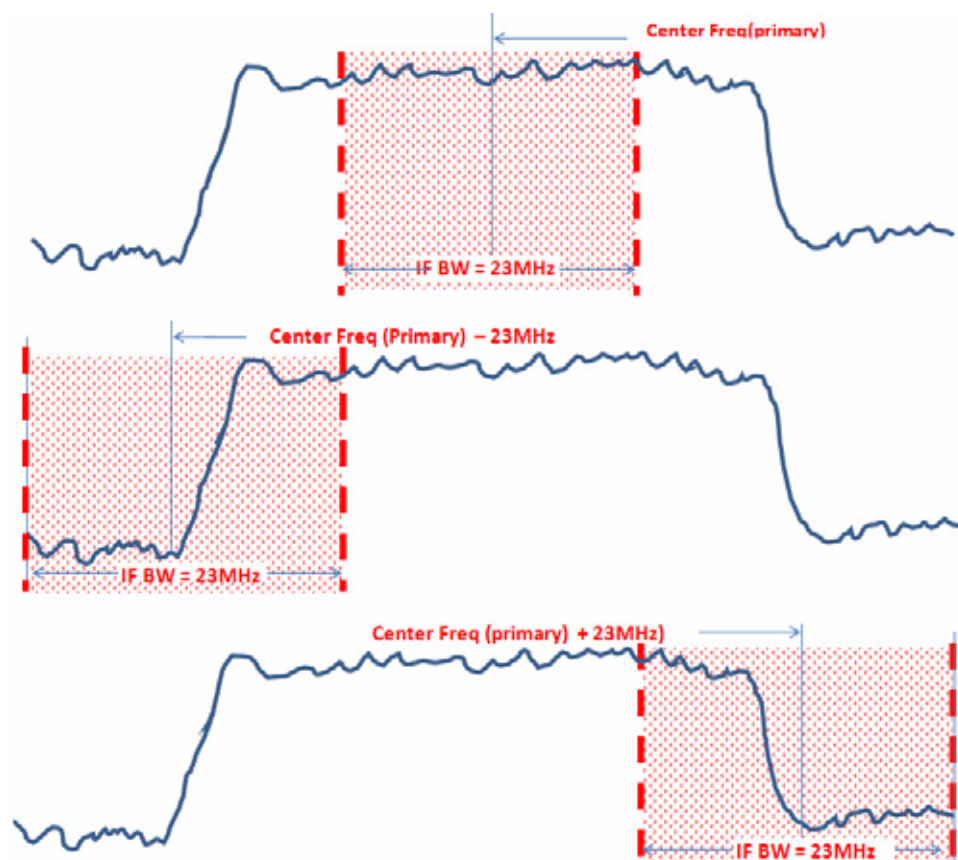
Notes	<ul style="list-style-type: none"> <li>• For setting all the analyzer sequence parameters at once using SCPI, see <a href="#">“Programming Acquisitions Via SCPI” on page 617</a>.</li> <li>• Normal: This acquisition is complete in itself; it is not integrated with other acquisitions.</li> <li>• Primary: This acquisition is integrated with acquisitions which follow it, for purposes of extending its frequency span or dynamic range.</li> <li>• 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.</li> <li>• 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.</li> <li>• Range Extension: This acquisition is integrated with the last Primary acquisition which precedes it in the sequence, in order to add a lower extension to 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.</li> <li>• The purpose of integration is described in more detail in <a href="#">“Span Extension in Frequency Domain” on page 476</a> and <a href="#">“Range Extension” on page 477</a>.</li> <li>• The matching process is performed automatically, and does not require the user to manually set any values.</li> <li>• When integrating, the measurement results are stored in Primary acquisition, and the results in Lower, Upper or Range extension acquisition should be NAN.</li> </ul>
Dependencies	None.
Couplings	If Integration Type is set to Lower, Upper, or Range Extension, all parameters 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
Initial S/W Revision	A.11.50
Help Map ID	35341

### Span Extension in Frequency Domain

For some wide-band formats, such as the LTE 20 MHz uplink signal, the OBW, ACP, and SEM measurements require a frequency span wider than the 40 MHz span which the EXT is able to capture in one acquisition. In such cases, set up two extra acquisitions (to add upper and lower frequency-span extensions to the primary acquisition).



For example, to make an SEM measurement of a 20 MHz uplink signal which requires a 69 MHz bandwidth, you can divide the measurement across three acquisitions, each using an IF bandwidth of 23 MHz (that is,  $69/3$  MHz). The lower acquisition has a center frequency 23 MHz below that of the primary acquisition; the upper acquisition is 23 MHz above it.



Results from the extra acquisitions are integrated into the results of the primary.

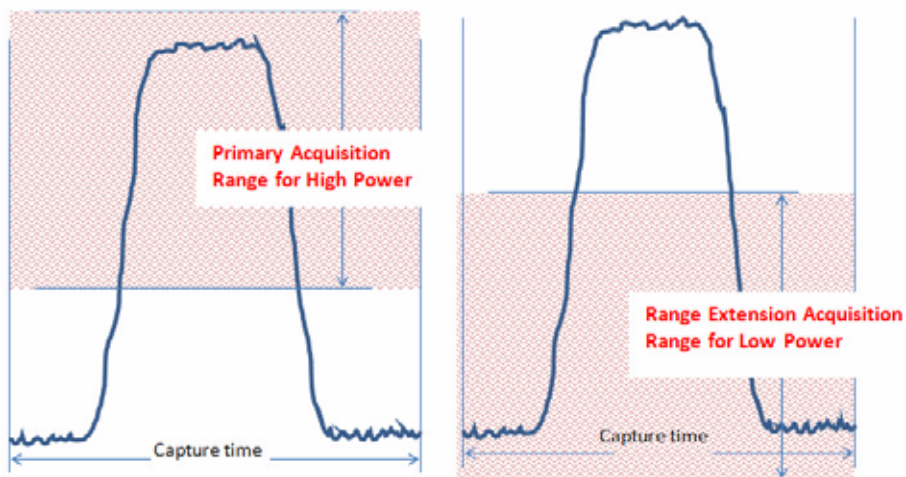
### Range Extension

Some measurements call for a very wide dynamic range which cannot be captured within one acquisition. In such cases, set up an extra acquisition (to add a low dynamic-range extension to the primary acquisition).

For example, to make a TD-SCDMA Power vs. Time measurement which requires a very wide dynamic range, you can set up a primary acquisition which has a Peak Power setting and Expected Power setting of +33 dBm, and also set up a Range Extension acquisition which has a Peak Power setting of -40 dBm

## Meas Setup

and an Expected Power setting of -70 dBm.



Results from the extra acquisition are integrated into the results of the primary.

### Normal

Sets the acquisition integration to Normal (the acquisition is not integrated with other acquisitions).

Key Path	<b>Meas Setup, Acquisition Setup, Acquisition Integration</b>
Initial S/W Revision	A.11.50
Help Map ID	0

### Primary

Sets the acquisition integration to Primary (this acquisition will be integrated with acquisitions which follow it, for purpose of span extension, range extension, or both).

Key Path	<b>Meas Setup, Acquisition Setup, Acquisition Integration</b>
Initial S/W Revision	A.11.50
Help Map ID	0

### Lower

Sets the acquisition integration to Lower (it will be integrated with the last primary acquisition which precedes it in the sequence, and will provide a lower extension to the primary).

Key Path	<b>Meas Setup, Acquisition Setup, Acquisition Integration</b>
Initial S/W Revision	A.11.50
Help Map ID	0

### Upper

Sets the acquisition integration to Upper (it will be integrated with with the last primary acquisition which precedes it in the sequence, and will add an upper extension to the primary).

Key Path	<b>Meas Setup, Acquisition Setup, Acquisition Integration</b>
Initial S/W Revision	A.11.50
Help Map ID	0

### Range Ext

Sets the acquisition integration to Range Extention (it will be integrated with the last primary acquisition which precedes it in the sequence, and will add a lower extension to the dynamic range of the primary).

Key Path	<b>Meas Setup, Acquisition Setup, Acquisition Integration</b>
Initial S/W Revision	A.11.50
Help Map ID	0

### Analysis Step Setup

Enters the menu structure to set up the Acquisitions.

Key Path	<b>Meas Setup</b>
Notes	See <a href="#">“Output Trigger” on page 469.</a>
Notes	No SCPI : Front panel only.
Initial S/W Revision	A.05.00
Help Map ID	35128

### Number of Analysis Steps

This parameter is used to define the number of Analysis periods within the current Acquisition.

Key Path	<b>Meas Setup, Acquisition Setup, Analysis Setup</b>
<b>Remote Command</b>	[:SENSe]:LSEQuencer:ACQuire [1] 2   3   4...512:NUMBer:ASTeps <integer> [:SENSe]:LSEQuencer:ACQuire [1] 2   3   4...512:NUMBer:ASTeps?
Example	:LSEQ:ACQ1:NUMB:AST 25
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.

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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
Initial S/W Revision	A.05.00
Help Map ID	35129

### Current Analysis Step

This parameter is used to define the current active Analysis Step with the current Acquisition period.

Key Path	<b>Meas Setup, Acquisition Setup, Analysis Step Setup</b>
Notes	For setting this parameter using SCPI, see <a href="#">“Programming Acquisitions Via SCPI” on page 617.</a>
Couplings	Updates UI Analysis parameters to selected Analysis Step
Preset	1
Range	1 to Number of Steps
Initial S/W Revision	A.05.00
Help Map ID	35130

### Insert Before Analysis Step

This inserts a default Analysis Step before the current Analysis Step.

Key Path	<b>Meas Setup, Acquisition Setup, Analysis Setup</b>
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 <b>Number of Analysis Steps</b> by 1
Initial S/W Revision	A.05.00
Help Map ID	35131

### Delete Analysis Step

This deletes the current Analysis.

Key Path	<b>Meas Setup, Acquisition Setup, Analysis Setup</b>
Notes	No SCPI, front panel access only Cannot delete when <b>Number of Analysis Steps</b> is equal to 1.

Couplings	Decreases <b>Number of Analysis Steps</b> by 1
Initial S/W Revision	A.05.00
Help Map ID	35132

### 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	<b>Meas Setup, Acquisition Setup, Analysis Setup</b>
SCPI Command	<p>To set the analysis offset as an individual value:</p> <pre>[ :SENSE ] :LSEQuencer:ACQuire{1:512}:ASTep{1:1000}:SETup:TIME:OFFSet &lt;time&gt;</pre> <pre>[ :SENSE ] :LSEQuencer:ACQuire{1:512}:ASTep{1:1000}:SETup:TIME:OFFSet?</pre> <p>To set the analysis offset as an array:</p> <pre>[ :SENSE ] :LSEQuencer:ACQuire{1:512}:LIST:SETup:TIME:OFFSet &lt;time&gt;, &lt;time&gt;, &lt;time&gt;, ...</pre> <pre>[ :SENSE ] :LSEQuencer:ACQuire{1:512}:LIST:SETup:TIME:OFFSet?</pre> <p>The array form of the command is used to make a different setting for each analysis interval in the acquisition (the number of array values must match the number of analysis intervals; otherwise a "settings conflict" error will occur).</p>
SCPI Examples	<pre>:LSEQ:ACQ2:AST3:SET:TIME:OFFS 10ms</pre> <pre>:LSEQ:ACQ2:AST3:SET:TIME:OFFS?</pre> <pre>:LSEQ:ACQ2:LIST:SET:TIME:OFFS 500us,1ms,2ms</pre> <pre>:LSEQ:ACQ2:LIST:SET:TIME:OFFS?</pre>
Notes	For setting all the analyzer sequence parameters at once using SCPI, see <a href="#">“Programming Acquisitions Via SCPI” on page 617</a> .
Preset	0 s
State Saved	Saved in instrument state.
Range	0 s to +4 ks
Initial S/W Revision	A.05.00
Help Map ID	35133

### Analysis Interval

This parameter sets the period over which measurements are made.

Key Path	<b>Meas Setup, Acquisition Setup, Analysis Setup</b>
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SCPI Command	<p>To set the analysis interval as an individual value:</p> <pre>[ :SENSe ] :LSEQuencer:ACQuire { 1 : 512 } :ASTep { 1 : 1000 } :SETup: TIME:INTerval &lt;time&gt;</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:INTe rval &lt;time&gt;, &lt;time&gt;, &lt;time&gt;, ...</pre> <pre>[ :SENSe ] :LSEQuencer:ACQuire { 1 : 512 } :LIST:SETup:TIME:INTe rval?</pre> <p>The array form of the command is used to make a different setting for each analysis interval in the acquisition (the number of array values must match the number of analysis intervals; otherwise a "settings conflict" error will occur).</p>
SCPI Examples	<pre>:LSEQ:ACQ2:AST3:SET:TIME:INT 10ms</pre> <pre>:LSEQ:ACQ2:AST3:SET:TIME:INT?</pre> <pre>:LSEQ:ACQ2:LIST:SET:TIME:INT 500us,1ms,2ms</pre> <pre>:LSEQ:ACQ2:LIST:SET:TIME:INT?</pre>
Notes	For setting all the analyzer sequence parameters at once using SCPI, see <a href="#">“Programming Acquisitions Via SCPI” on page 617</a> .
Preset	500 us
State Saved	Saved in instrument state.
Range	0 to 1 s
Initial S/W Revision	A.05.00
Help Map ID	35134

### 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, TD-SCDMA
Basic Frequency and Phase Error	1	ALL: BASIC, GSM, EDGE, WCDMA, CDMA2000, 1xEV-DO, LTE-FDD, LTE-TDD, TD-SCDMA
Basic Discrete PAVT	2	ALL: BASIC, GSM, EDGE, WCDMA, CDMA2000, 1xEV-DO, LTE-FDD, LTE-TDD, TD-SCDMA

Measurement	Bit	Radio Standards Supported
Basic IQ Data	3	ALL: BASIC, GSM, EDGE, WCDMA, CDMA2000, 1xEV-DO, LTE-FDD, LTE-TDD, TD-SCDMA
PVT	4	GSM,EDGE, LTE-TDD, TD-SCDMA
ORFS	5	GSM,EDGE
GMSK Phase&Freq	6	GSM
EDGE EVM	7	EDGE
ACP	8	WCDMA, CDMA2000, 1xEV-DO, LTE-FDD, LTE-TDD, TD-SCDMA
SEM	9	WCDMA, CDMA2000, 1xEV-DO, LTE-FDD, LTE-TDD, TD-SCDMA
Occupied BW	10	WCDMA, CDMA2000, 1xEV-DO, LTE-FDD, LTE-TDD, TD-SCDMA
Mod Accuracy	11	WCDMA, CDMA2000, 1xEV-DO, LTE-FDD, LTE-TDD, TD-SCDMA
QPSK EVM	12	WCDMA, CDMA2000
WCDMA CDP	13	WCDMA, TD-SCDMA
Phase Discontinuity	14	WCDMA
Loopback BER	15	GSM, EDGE, WCDMA, TD-SCDMA

Key Path	Meas Setup, Acquisition Setup, Analysis Setup
SCPI Command	<p>To set the measurement bitmap as an individual value:</p> <pre>[ :SENSe ] :LSEQuencer :ACQuire { 1 : 512 } :ASTep { 1 : 1000 } :SETup : MBITmap &lt;Integer&gt;</pre> <pre>[ :SENSe ] :LSEQuencer :ACQuire { 1 : 512 } :ASTep { 1 : 1000 } :SETup : MBITmap?</pre> <p>To set the measurement bitmap as an array:</p> <pre>[ :SENSe ] :LSEQuencer :ACQuire { 1 : 512 } :LIST :SETup :MBITmap &lt;Integer&gt;, &lt;Integer&gt;, &lt;Integer&gt;, ...</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 analysis interval in the acquisition (the number of array values must match the number of analysis intervals; otherwise a "settings conflict" error will occur).</p>
SCPI Examples	<pre>:LSEQ:ACQ2:SET:MPA:MBIT 1</pre> <pre>:LSEQ:ACQ2:SET:MPA:MBIT?</pre> <pre>:LSEQ:LIST:SET:MPA:MBIT 1,256,1032</pre> <pre>:LSEQ:LIST:SET:MPA:MBIT?</pre>

## Meas Setup

Notes	<p>For setting all the analyzer sequence parameters at once using SCPI, see <a href="#">“Programming Acquisitions Via SCPI” on page 617</a>.</p> <p>Each bit in the bitmap 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, if an analysis step requires the measurements Basic Transmit Power and EDGE EVM, the Bit Mask for this combination is 10000001).</p> <p>However, this parameter <b>must be entered in decimal form</b>; if the bitmap binary value is 10000001, enter the decimal equivalent (129).</p>
Couplings	<p>Coupled to Radio Standard, which limits the measurement choices.</p> <p>The results displayed vary depending on the setting of this parameter.</p>
Preset	1
State Saved	Saved in instrument state.
Range	0 to 65535
Initial S/W Revision	A.05.00
Help Map ID	35135

### Basic Transmit Power

This parameter determines if the Basic Transmit Power measurement is computed on the selected analysis step.

Key Path	<b>Meas Setup, Step Setup, Meas Bit Mask</b>
Notes	See <a href="#">“Measurement Bitmap” on page 482</a> .
Preset	On
State Saved	Saved in instrument state.
Range	On   Off
Initial S/W Revision	A.05.00
Help Map ID	35136

### 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	<b>Meas Setup, Step Setup, Meas Bit Mask</b>
Notes	See <a href="#">“Measurement Bitmap” on page 482</a> .
Preset	Off
State Saved	Saved in instrument state.
Range	On   Off



Initial S/W Revision	A.05.00
Help Map ID	35137

### 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	<b>Meas Setup, Step Setup, Meas Bit Mask</b>
Notes	See <a href="#">“Measurement Bitmap” on page 482.</a>
Preset	Off
State Saved	Saved in instrument state.
Range	On   Off
Initial S/W Revision	A.05.00
Help Map ID	35277

### Basic IQ Data

This parameter determines if the Basic IQ Data measurement is computed on the selected analysis step.

Key Path	<b>Meas Setup, Step Setup, Meas Bit Mask</b>
Notes	See <a href="#">“Measurement Bitmap” on page 482.</a>
Preset	Off
State Saved	Saved in instrument state.
Range	On   Off
Initial S/W Revision	A.05.00
Help Map ID	35165

### Power vs Time

This parameter determines if the Power vs Time measurement is computed on the selected analysis step.

Key Path	<b>Meas Setup, Step Setup, Meas Bit Mask</b>
Notes	See <a href="#">“Measurement Bitmap” on page 482.</a>
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

## Meas Setup

Initial S/W Revision	A.05.00
Help Map ID	35139

### Output RF Spectrum

This parameter determines if the Output RF Spectrum measurement is computed on the selected analysis step.

Key Path	<b>Meas Setup, Step Setup, Meas Bit Mask</b>
Notes	See <a href="#">“Measurement Bitmap” on page 482.</a>
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
Help Map ID	35140

### GMSK Phase & Freq

This parameter determines if the GMSK Phase & Freq measurement is computed on the selected analysis step.

Key Path	<b>Meas Setup, Step Setup, Meas Bit Mask</b>
Notes	See <a href="#">“Measurement Bitmap” on page 482.</a>
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
Help Map ID	35141

### EDGE EVM

This parameter determines if the EDGE EVM measurement is computed on the selected analysis step.

Key Path	<b>Meas Setup, Step Setup, Meas Bit Mask</b>
Notes	See <a href="#">“Measurement Bitmap” on page 482.</a>
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
Help Map ID	35142

### Adjacent Channel Power

This parameter determines if the Adjacent Channel Power measurement is computed on the selected analysis step.

Key Path	<b>Meas Setup, Step Setup, Meas Bit Mask</b>
Notes	See <a href="#">“Measurement Bitmap” on page 482.</a>
Dependencies	This parameter is only enabled when the Radio Standard parameter is set to WCDMA, cdma2000, 1xEV-DO, LTE-FDD, LTE-TDD, or TDSCDMA.
Preset	Off
State Saved	Saved in instrument state.
Range	On   Off
Initial S/W Revision	A.05.00
Help Map ID	35143

### Spectrum Emission Mask

This parameter determines if the Spectrum Emission Mask measurement is computed on the selected analysis step.

Key Path	<b>Meas Setup, Step Setup, Meas Bit Mask</b>
Notes	See <a href="#">“Measurement Bitmap” on page 482.</a>
Dependencies	This parameter is only enabled when the Radio Standard parameter is set to WCDMA, cdma2000, 1xEV-DO, or LTE-FDD, LTE-TDD, or TDSCDMA.
Preset	Off
State Saved	Saved in instrument state.
Range	On   Off
Initial S/W Revision	A.05.00
Help Map ID	35144

### Occupied BW

This parameter determines if the Occupied BW measurement is computed on the selected analysis step.

Key Path	<b>Meas Setup, Step Setup, Meas Bit Mask</b>
Notes	See <a href="#">“Measurement Bitmap” on page 482.</a>

## Meas Setup

Dependencies	This parameter is only enabled when the Radio Standard parameter is set to WCDMA, cdma2000, 1xEV-DO, or LTE-FDD, LTE-TDD, or TDSCDMA.
Preset	Off
State Saved	Saved in instrument state.
Range	On   Off
Initial S/W Revision	A.05.00
Help Map ID	35145

## Modulation Accuracy

This parameter determines if the Modulation Accuracy measurement is computed on the selected analysis step.

Key Path	<b>Meas Setup, Step Setup, Meas Bit Mask</b>
Notes	See <a href="#">“Measurement Bitmap” on page 482.</a>
Dependencies	This parameter is only enabled when the Radio Standard parameter is set to WCDMA, cdma2000, 1xEV-DO, or LTE-FDD, LTE-TDD, or TDSCDMA.
Preset	Off
State Saved	Saved in instrument state.
Range	On   Off
Initial S/W Revision	A.05.00
Help Map ID	35146

## QPSK EVM

This parameter determines if the QPSK EVM measurement is computed on the selected analysis step.

Key Path	<b>Meas Setup, Step Setup, Meas Bit Mask</b>
Notes	See <a href="#">“Measurement Bitmap” on page 482.</a>
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
Help Map ID	35147

**WCDMA CDP**

This parameter determines if the WCDMA CDP measurement is computed on the selected analysis step.

Key Path	<b>Meas Setup, Step Setup, Meas Bit Mask</b>
Notes	See <a href="#">“Measurement Bitmap” on page 482</a> .
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
Help Map ID	35148

**Phase Discontinuity**

This parameter determines if the Phase Discontinuity measurement is computed on the selected analysis step.

Key Path	<b>Meas Setup, Step Setup, Meas Bit Mask</b>
Notes	See <a href="#">“Measurement Bitmap” on page 482</a> .
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
Help Map ID	35278

**Loopback BER**

This parameter determines if the Loopback BER measurement is computed on the selected analysis step.

Key Path	<b>Meas Setup, Step Setup, Meas Bit Mask</b>
Notes	See <a href="#">“Measurement Bitmap” on page 482</a> .
Dependencies	This parameter is only enabled when the Radio Standard parameter is set to GSM, EDGE, or WCDMA, or TDSCDMA.
Preset	Off
State Saved	Saved in instrument state.
Range	On   Off

## Meas Setup

Initial S/W Revision	A.11.50
Help Map ID	35329

### 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.

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**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.

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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
SCPI Command	<p>To set the expected power as an individual value:</p> <pre>[ :SENSE ] :LSEQuencer :ACQuire { 1 : 512 } :ASTep { 1 : 1000 } :SETup :EPOWer &lt; amp &gt;</pre> <pre>[ :SENSE ] :LSEQuencer :ACQuire { 1 : 512 } :ASTep { 1 : 1000 } :SETup :EPOWer ?</pre> <p>To set the expected power as an array:</p> <pre>[ :SENSE ] :LSEQuencer :ACQuire { 1 : 512 } :LIST :SETup :EPOWer &lt; amp &gt; , &lt; amp &gt; , &lt; amp &gt; , ...</pre> <pre>[ :SENSE ] :LSEQuencer :ACQuire { 1 : 512 } :LIST :SETup :EPOWer ?</pre> <p>The array form of the command is used to make a different setting for each analysis interval in the acquisition (the number of array values must match the number of analysis intervals; otherwise a "settings conflict" error will occur).</p>
SCPI Examples	<pre>:LSEQ:ACQ2:SET:MPA:EPOW 20dBm</pre> <pre>:LSEQ:ACQ2:SET:MPA:EPOW?</pre> <pre>:LSEQ:LIST:SET:MPA:EPOW 0,20dBm,10dBm</pre> <pre>:LSEQ:LIST:SET:MPA:EPOW?</pre>
Notes	For setting all the analyzer sequence parameters at once using SCPI, see <a href="#">“Programming Acquisitions Via SCPI” on page 617</a> .
Couplings	<p>Coupled to Basic Tx Power measurement limits if this meas is selected.</p> <p>Coupled to Auto Set RF Level when set to On.</p>
Preset	0 dBm

State Saved	Saved in instrument state.
Min	-100 dBm
Max	100 dBm
Initial S/W Revision	A.05.00
Help Map ID	35149

## Basic Meas Setup

Provides access to setup menus for the four basic measurements included in Sequence Analyzer mode: Basic Transmit Power, Basic Phase Error, Basic Frequency Error, and Basic IQ Data.

Key Path	<b>Meas Setup</b>
Mode	Sequence Analyzer
Initial S/W Revision	A.05.00
Help Map ID	35150

## 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, and TDSCDMA.

Key Path	<b>Meas Setup, Basic Meas Setup</b>
Mode	Sequence Analyzer
Initial S/W Revision	A.05.00
Help Map ID	35151

The settings defined under Basic Transmit Power Setup take effect only when the radio standard of the acquisition 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, TDSCDMA, LTE-FDD, and LTE-TDD modes:

Radio Standard	Digital IF BW	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

## Meas Setup

Radio Standard	Digital IF BW	Channel Filter BW (Hz)	Channel Filter Shape	Channel Filter Parameter
GSM/EDGE	510*10e3	510*10e3	Flattop	
LTE-FDD & LTE-TDD <sup>1</sup>	Bandwidth * 1.6	Bandwidth	Short Nyquist	Alpha = 0.1
TDSCDMA	1.5e6	1.5e6	RRC	Alpha = 0.22

1. The bandwidth of LTE-FDD and LTE-FDD is not fixed. The current bandwidth can be derived from **Mode Setup > Demod > Bandwidth** in the relevant LTE mode.

### Radio Standard None

Setup parameters for Basic Transmit Power with “None” selected as the Radio Standard.

Key Path	<b>Meas Setup, Basic Meas Setup, Basic Transmit Power</b>
Mode	Sequence Analyzer
Initial S/W Revision	A.05.00
Help Map ID	35153

### 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	<b>Meas Setup, Basic Meas Setup, Basic Transmit Power Setup, Radio Std None</b>
Remote Command	[ :SENSe ] :LSEQuencer :BTXPowEr : [NONE] :DIF :BANDwidth   BWIDt h [ :RESolution ] <freq> [ :SENSe ] :LSEQuencer :BTXPowEr : [NONE] :DIF :BANDwidth   BWIDt h [ :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	1kHz
Max	40 MHz
Help Map ID	35154



**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	<b>Meas Setup, Basic Meas Setup, Basic Transmit Power Setup, Radio Std None</b>
<b>Remote Command</b>	[ :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
Help Map ID	35155

**Gaussian**

Selects Gaussian for the filter type that is used when Radio Standard of the acquisition is set to None.

Key Path	<b>Meas Setup, Basic Meas Setup, Basic Transmit Power Setup, Radio Std None, Filter Type</b>
Initial S/W Revision	A.05.00
Help Map ID	35156

**Flat Top**

Selects Flat Top for the filter type that is used when Radio Standard of the acquisition is set to None.

Key Path	<b>Meas Setup, Basic Meas Setup, Basic Transmit Power Setup, Radio Std None, Filter Type</b>
Initial S/W Revision	A.05.00
Help Map ID	35157

**Short Nyquist**

Selects short nyquist for the filter type that is used when Radio Standard of the acquisition is set to None.

Key Path	<b>Meas Setup, Basic Meas Setup, Basic Transmit Power Setup, Radio Std None, Filter Type</b>
Initial S/W Revision	A.05.00

## Meas Setup

Help Map ID	35238
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### RRC

Selects RRC for the filter type that is used when Radio Standard of the acquisition is set to None.

Key Path	<b>Meas Setup, Basic Meas Setup, Basic Transmit Power Setup, Radio Std None, Filter Type</b>
Initial S/W Revision	A.05.00
Help Map ID	35158

### 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	<b>Meas Setup, Basic Meas Setup, Basic Transmit Power Setup, Radio Std None</b>
<b>Remote Command</b>	[ :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.
Help Map ID	35239

### 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	<b>Meas Setup, Basic Meas Setup, Basic Transmit Power Setup, Radio Std None</b>
<b>Remote Command</b>	[ :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
Help Map ID	35159

### 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	<b>Meas Setup, Basic Meas Setup, Basic Transmit Power Setup</b>
<b>Remote Command</b>	[ :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?

## Meas Setup

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
Help Map ID	35187

### 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	<b>Meas Setup, Basic Meas Setup, Basic Transmit Power Setup</b>
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 if it is enabled.
Preset	-10 ON
State Saved	Saved in instrument state.
Min	-100

Max	100
Initial S/W Revision	A.05.00
Help Map ID	35188

### 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.

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**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.

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Key Path	<b>Meas Setup, Basic Meas Setup</b>
Mode	Sequence Analyzer
Initial S/W Revision	A.05.00
Help Map ID	35189

### 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	<b>Meas Setup, Basic Meas Setup, Freq and Phase Error Setup</b>
<b>Remote Command</b>	[ :SENSE] :LSEQuencer:BFERor:DIF:BANDwidth[:RESolution] <freq> [ :SENSE] :LSEQuencer:BFERor:DIF:BANDwidth[:RESolution] ?
Example	LSEQ:BFERor:DIF:BAND 25 MHz LSEQ:BFERor: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

## Meas Setup

Help Map ID	35190
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### Limit: Freq Error

This parameter sets the pass/fail limit for the frequency error result. Units are in parts per million (ppm).

Key Path	<b>Meas Setup, Basic Meas Setup,</b>
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
Help Map ID	35193

### Basic Discrete PAVT Setup

This measurement returns the amplitude, phase and frequency errors of each step. For the first step, frequency errors are referenced to the frequency set for the acquisition, and phase is taken as zero. The amplitude, frequency and phase errors of the remaining steps are referenced to the first step. Because Basic Discrete PAVT needs to set the channel filter, it is exclusive with other measurements; once Basic Discrete PAVT measurement is selected for one analysis of this acquisition, only Basic Discrete PAVT is allowed for all analyses of this acquisition.

Key Path	<b>Meas Setup, Basic Meas Setup</b>
Mode	Sequence Analyzer
Initial S/W Revision	A.05.00
Help Map ID	35279

## 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	<b>Meas Setup, Basic Meas Setup, Basic Discrete PAVT Setup</b>
Remote Command	[ :SENSE] :LSEQuencer:PCALibration:FILTer WIDE NARrow VNARrow ENARrow [ :SENSE] :LSEQuencer:PCALibration:FILTer?
Example	LSEQ:PCAL:FILT WIDE LSEQ:PCAL:FILT?
Preset	WIDE
State Saved	Saved in instrument state.
Range	Wide Narrow Very Narrow Extremely Narrow
Max	40 MHz
Help Map ID	35280

### Wide

Selects Wide for the filter type (a short Nyquist filter of filter alpha 0.5 and bandwidth 150 kHz).

Key Path	<b>Meas Setup, Basic Meas Setup, Basic Discrete PAVT Setup, Filter Type</b>
Initial S/W Revision	A.05.00
Help Map ID	35281

### Narrow

Selects Narrow for the filter type (a short Nyquist filter of filter alpha 0.5 and bandwidth 120 kHz).

Key Path	<b>Meas Setup, Basic Meas Setup, Basic Discrete PAVT Setup, Filter Type</b>
Initial S/W Revision	A.05.00
Help Map ID	35282

### Very Narrow

Selects Very Narrow for the filter type (a short Nyquist filter of filter alpha 0.5 and bandwidth 80 kHz).

Key Path	<b>Meas Setup, Basic Meas Setup, Basic Discrete PAVT Setup, Filter Type</b>
Initial S/W Revision	A.05.00
Help Map ID	35283

## Meas Setup

### Extremely Narrow

Selects Extremely Narrow for the filter type (a short Nyquist filter of filter alpha 0.5 and bandwidth 30 kHz).

Key Path	<b>Meas Setup, Basic Meas Setup, Basic Discrete PAVT Setup, Filter Type</b>
Initial S/W Revision	A.05.00
Help Map ID	35284

### Interval Count (Remote Command Only)

This allows you to specify the total number of steps to be measured.

<b>Remote Command</b>	<code>[ :SENSe ] :LSEQuencer:PCALibration:STEP:COUNT &lt;integer&gt;</code> <code>[ :SENSe ] :LSEQuencer:PCALibration:STEP:COUNT?</code>
Example	<code>:LSEQ:PCAL:STEP:COUN 25</code>
Couplings	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.
Min	1
Max	512
Help Map ID	0

### Interval Centers (Remote Command Only)

This parameter sets the center time of each step.

<b>Remote Command</b>	<code>[ :SENSe ] :LSEQuencer:PCALibration:STEP:CENTer &lt;time&gt;, ... , &lt; time &gt;</code> <code>[ :SENSe ] :LSEQuencer:PCALibration:STEP:CENTer?</code>
Example	<code>:LSEQ:PCAL:STEP:CENT 1ms,2ms,3ms</code>
Couplings	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 minus half of the step interval width must be greater than or equal to zero. Step center time plus half of the step interval width must be less than or equal to the analysis interval.
Preset	1 ms
State Saved	Saved in instrument state.
Min	.05 ms
Max	399.5 ms



Help Map ID	0
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### Interval Widths (Remote Command Only)

This parameter sets the interval width of each step to be measured.

<b>Remote Command</b>	[ :SENSE ] :LSEQuencer:PCALibration:WIDTh <time>, ..., < time > [ :SENSE ] :LSEQuencer:PCALibration:WIDTh?
Example	:LSEQ:PCAL:STEP:WIDTh 1ms,1ms,1ms
Couplings	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 minus half of the step interval must be greater than or equal to zero. Step center time plus half of the step interval width mut be less than or equal to the analysis interval.
Preset	1 ms
State Saved	Saved in instrument state.
Min	.1 ms
Max	400 ms
Help Map ID	0

### 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 meas is selected in an Acquisition. If set a "settings conflict" is returned.

Basic IQ Data has two measurement parameters: "Digital IF BW" and "MeasType", which apply to the entire Sequence.

You can choose to return the result as raw IQ samples or as amplitude and phase pair. The amount of data returned per Analysis Step is limited to 20000 IQ pairs.

Key Path	<b>Meas Setup, Basic Meas Setup</b>
Mode	Sequence Analyzer
Initial S/W Revision	A.05.00
Help Map ID	35179

### 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	<b>Meas Setup, Basic Meas Setup, Basic IQ Data Setup</b>
----------	--

## Meas Setup

<b>Remote Command</b>	[ :SENSe] :LSEQuencer:BIQData:DIF:BANDwidth[:RESolution] <freq> [ :SENSe] :LSEQuencer:BIQData:DIF:BANDwidth[:RESolution]?
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
Help Map ID	35194

## Measurement Type

This setting is used to set the Basic IQ measurement to return raw IQ samples or Amplitude/Phase pairs.

Key Path	<b>Meas Setup, Basic Meas Setup, Basic IQ Data Setup</b>
<b>Remote Command</b>	[ :SENSe] :LSEQuencer:BIQData:TYPE RDATA APHase [ :SENSe] :LSEQuencer:BIQData:TYPE?
Example	LSEQ:BIQD:TYPE RDATA LSEQ:BIQD:TYPE?
Preset	RData
State Saved	Saved in instrument state.
Range	RDATA APHase
Initial S/W Revision	A.05.00
Help Map ID	35260

## Auto Set RF Levels

Allows you to set the mechanical attenuation for the whole Sequence and set the instrument gain automatically, based on the Sequence parameters which are being used on the test set.

---

**NOTE** Auto Set RF Levels can be set On or Off by the user in the E6607A and E6607B

test sets. In E6607C, it is always on, and is not user-settable.

Key Path	<b>Meas Setup, Auto Set RF Levels</b>
Initial S/W Revision	A.05.00
Help Map ID	35196

### Auto Set RF Levels

**NOTE** This parameter is not user-settable in the case of the E6607C test set; in that model, it is always in the On state.

When set to ON, this allows the RF level settings on the test set's analyzer to be set automatically, depending on the values of other parameters which affect the sequence.

Auto Set RF Levels controls the Instrument Gain setting and the Mech Atten setting (the latter is also dependent on the Auto Rules setting).

When Auto Set RF Levels is set to ON and Auto Rules is set to Include Mech Atten, the List Sequencer measurement algorithm takes in the input parameters described below and generates two output parameters (the Instrument Gain setting for each acquisition, and Mech Atten setting for the entire Sequence). The Instrument Gain setting, as defined in the Acquisition setup, is ignored, and the Mech Atten setting is defined under the AMPTD key is disabled.

When Auto Set RF Levels is set to ON and Auto Rules is set to Exclude Mech Atten, List Sequencer measurement algorithm takes in the input parameters described below and generates one output parameter (the Instrument Gain setting for each acquisition). The Instrument Gain setting, as defined in the Acquisition setup, is ignored, and the Mech Atten setting is defined under the AMPTD key is enabled. Its value is used as input and can only be changed manually.

The auto level setting is performed when you have loaded a Sequence and performed an "init"; then the auto level setting algorithm is started in the List Sequencer and populates the output parameters before acquiring the measurement data. The instrument gain for each acquisition and mechanical attenuation for the entire Sequence is not returned to the UI to inform you what settings were used.

When "Auto Set RF Levels" parameter is set to OFF, the Instrument Gain setting in the Acquisition setup is used in the Sequence, and the mechanical attenuation parameter (under the AMPTD, Attenuation keys) is used. The mechanical attenuation parameter is also used when "Auto Set RF Levels" is set to ON and "Auto Rules" is set to Exclude Mech Atten.

When "Auto Set RF Levels" is set to OFF, the Preamp setting of Multiport Adptr Input in the Acquisition setup is used in the Sequence.

### Algorithm Input Parameters

- Peak Power per acquisition -- that is, the value of the Peak Power parameter for the acquisition.
- Min Expected Power per acquisition -- that is, the lowest value of the Expected Power parameter for any analysis step in the acquisition.
- Max IF BW per acquisition -- that is, the highest value of Digital IF BW that is needed for any measurement in the acquisition (some measurements have higher BW requirements than others).

## Meas Setup

- Amplitude Correction -- obtained from the table of Input/Output Corrections for the test set port for the entire Sequence.
- Path Selection -- that is, the Input/Output path.
- Peak Power Margin -- the margin that is reserved to avoid overloading caused by UE output level uncertainty; it is specified as an Auto Set RF Levels parameter for the whole sequence.
- Acquisition Frequency -- that is, the Frequency parameter for the Acquisition. This is used to determine whether or not the Acquisition is in the high band (> 3.6 GHz).
- Auto Rules -- that is, the selection of "Exclude Mech Atten" or "Include Mech Atten" for Auto Rules.
- Mech Atten setting for entire sequence (applicable only when "Exclude Mech Atten" is selected for Auto Rules).

### Algorithm Output Parameters

- Instrument Gain setting (Low/Zero/High) per Acquisition.
- Mechanical attenuation setting for entire Sequence (applicable only when "Include Mech Atten" is selected for Auto Rules)..

### Setup of Auto Set RF Levels

See the table below.

Key Path	Meas Setup, Auto Set RF Levels
Mode	SEQA
<b>Remote Command</b>	[ :SENSE] :LSEQuencer :ASRLevels [:STATE] ON   OFF   1   0 [ :SENSE] :LSEQuencer :ASRLevels [:STATE] ?
Example	LSEQ:ASRL ON LSEQ:ASRL?
Notes	Not available for E6607C test sets.
Couplings	When set to OFF, the Inst Gain setting in the acquisition parameter is used in the Sequence, and the Mech Atten parameter under the Amptd key is used.
Preset	ON
State Saved	Saved in instrument state.
Range	ON   OFF   1   0
Initial S/W Revision	A.05.00
Help Map ID	35170

### Auto Rules

This parameter is a 1-of-N selection with the 2 choices ("Exclude Mech Atten" and "Include Mech Atten".)

---

**NOTE** This parameter is not available for E6607C test sets.

---

The default value of Auto Rules is Exclude Mech Atten. This disables the Auto Set RF Levels algorithm from changing Mech Atten during calculation; Mech Atten can only be set manually, and is used as initial value in the algorithm.

When set to Include Mech Atten, the **Mech Atten** setting under **AMPLD > Attenuation** is disabled. Mech Atten is controlled by the algorithm automatically.

If the Auto Set RF Level is set to OFF, then this parameter is disabled, the mechanical attenuator defaults to 0 dB and is enabled for you to set.

Key Path	Meas Setup, Set RF Levels
<b>Remote Command</b>	[ :SENSe ] :LSEQuencer:ASRLevels:ARULes EMAT   IMAT [ :SENSe ] :LSEQuencer:ASRLevels:ARULes?
Example	LSEQ:ASRL:ARUL EMAT
Notes	This parameter is not available for E6607C test sets.
Couplings	If the Auto Set RF Level is set to OFF, then this parameter is disabled, the mechanical attenuator defaults to 0 dB and is enabled for you to change.
Preset	EMAT
State Saved	Yes
Readback Text	Exclude Mech Atten or Include Mech Atten
Initial S/W Revision	A.05.00
Help Map ID	35171

### Exclude Mech Atten

Selects the Exclude Mech Atten setting for Auto Set RF Levels..

Key Path	Meas setup, Auto Set RF Levels, Auto Rules
Example	LSEQ:ASRL:ARUL EMAT
Notes	This parameter is not available for E6607C test sets.
Dependencies	If the Auto Set RF Level is set to OFF, then this parameter is disabled.
State Saved	Yes.
Help Map ID	35172

## Meas Setup

### Include Mech Atten

Selects the Include Mech Atten setting for Auto Set RF Levels.

Key Path	<b>Meas setup, Auto Set RF Levles, Auto Rules</b>
Example	LSEQ:ASRL:ARUL IMAT
Notes	This parameter is not available for E6607C test sets.
Dependencies	If the Auto Set RF Level is set to OFF, then this parameter is disabled.
State Saved	Yes.
Help Map ID	35177

### 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	<b>Meas setup, Auto Set RF Levels</b>
Remote Command	[ :SENSe ] :LSEQuencer:ASRLevels:MSNRati <rel_ampl> [ :SENSe ] :LSEQuencer:ASRLevels:MSNRati?
Example	:LSEQ:ASRL:MSNR 10
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
Initial S/W Revision	A.05.00
Help Map ID	35178

### 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
<b>Remote Command</b>	[ :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
Initial S/W Revision	A.05.00
Help Map ID	35261

## 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
<b>Remote Command</b>	[ :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

## Meas Setup

State Saved	Saved in instrument state.
Range	1 us to 4 ks
Initial S/W Revision	A.05.00
Help Map ID	35197

### Include Source in Sequence

This parameter determines if the source sequence 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	<b>Meas Setup</b>
<b>Remote Command</b>	[ :SENSE ] :LSEQuencer :INCLude :SOURce YES   NO   0   1 [ :SENSE ] :LSEQuencer :INCLude :SOURce ?
Example	LSEQ : INCL : SOUR YES LSEQ : INCL : SOUR ?
Dependencies and Coupligns	If “Include Source in Sequence” is enabled, then <b>Source, List Sequencer, Initiate Sequence</b> is disabled. If <b>Source, List Sequencer, Sequencer</b> is set OFF, “Include Source in Sequence” is disabled.
Preset	OFF
State Saved	Saved in instrument state.
Range	YES   NO   1   0
Initial S/W Revision	A.05.00
Help Map ID	35198

### 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	<b>Meas Setup, Abort On Limit Fail</b>
Mode	SEQA
<b>Remote Command</b>	[ :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:  Basic Phase Error  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
Help Map ID	35199

### Abort on Error

When this parameter is set to ON, if any of the integrity errors (see [“Integrity Indicator” on page 288](#)) 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
<b>Remote Command</b>	[ :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

## Meas Setup

Help Map ID	35200
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## 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	<b>Meas Setup</b>
Mode	Sequence Analyzer
Initial S/W Revision	A.05.00
Help Map ID	35201

## Video

Sets the trigger type to Video (that is, IF envelope triggering).

Key Path	<b>Meas Setup, Input Trigger Setup</b>
Mode	Sequence Analyzer
Initial S/W Revision	A.05.00
Help Map ID	35240

## 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	<b>Meas Setup, Input Trigger Setup</b>
<b>Remote Command</b>	: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
Help Map ID	35241

**External 1**

Sets the trigger type to External 1 (uses a signal applied to TRIGGER 1 IN connector).

Key Path	<b>Meas Setup, Input Trigger Setup</b>
Mode	Sequence Analyzer
Initial S/W Revision	A.05.00
Help Map ID	35204

**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	<b>Meas Setup, Input Trigger Setup</b>
<b>Remote Command</b>	: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
Help Map ID	35205

**Trigger Level**

Sets the voltage level for the External 1 trigger.

Key Path	<b>Meas Setup, Input Trigger Setup</b>
<b>Remote Command</b>	: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

## Meas Setup

Help Map ID	35206
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### External 2

Sets the trigger type to External 2 (uses a signal applied to TRIGGER 2 IN connector).

Key Path	<b>Meas Setup, Input Trigger Setup</b>
Mode	Sequence Analyzer
Initial S/W Revision	A.05.00
Help Map ID	35207

### 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	<b>Meas Setup, Input Trigger Setup</b>
<b>Remote Command</b>	: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
Help Map ID	35208

### Trigger Level

Sets the voltage level for the External 2 trigger.

Key Path	<b>Meas Setup, Input Trigger Setup</b>
<b>Remote Command</b>	: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
Help Map ID	35209

## Trigger Holdoff

Opens up a menu that lets you adjust Trigger Holdoff parameters.

Key Path	<b>Meas Setup, Input Trigger Setup</b>
Initial S/W Revision	A.11.50
Help Map ID	35338

## Trigger Holdoff

This parameter sets the trigger holdoff time and state. When the state is On, the trigger only occurs after the holdoff time expires (if the trigger condition, as defined by the Holdoff Type, is satisfied during the time span.)

Key Path	<b>Meas setup, Input Trigger Setup, Trigger Holdoff</b>
<b>Remote Command</b>	:TRIGger:LSEQuencer[:SEQuence]:HOLDoff:STATe OFF ON 0 1 :TRIGger:LSEQuencer[:SEQuence]:HOLDoff:STATe? :TRIGger:LSEQuencer[:SEQuence]:HOLDoff <time> :TRIGger:LSEQuencer[:SEQuence]:HOLDoff?
Example	:TRIG:LSEQ:HOLD:STAT 1 :TRIG:LSEQ:HOLD:STAT? :TRIG:LSEQ:HOLD 500ms :TRIG:LSEQ:HOLD?
Dependencies	None
Couplings	None
Preset	Off 0 s
State Saved	Yes
Range	Off On 0 s to 4 s
Resolution	100 us
Initial S/W Revision	A.11.50
Help Map ID	35339

## Meas Setup

### Holdoff Type

Lets you set the Trigger Holdoff Type as 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?
Couplings	None
Preset	Below
State Saved	Yes
Initial S/W Revision	A.11.50
Help Map ID	35340

### 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.

---

**NOTE** This setting is specific to E6607A and E6607B test sets; it is not displayed for E6607C test sets.

---

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	This parameter is not available for E6607C test sets.

Preset	LOW
State Saved	Saved in instrument state.
Readback Text	High Gain or Low Gain
Initial S/W Revision	A.05.00
Help Map ID	35213

### Low Gain

Deactivates the FFT IF Gain.

Key Path	<b>Meas setup, IF Gain</b>
Example	LSEQ:IF:GAIN LOW
State Saved	Saved in instrument state.
Help Map ID	35214

### High Gain

Activates the FFT IF Gain.

Key Path	<b>Meas setup, IF Gain</b>
Example	LSEQ:IF:GAIN HIGH
State Saved	Saved in instrument state.
Help Map ID	35215

### Multiport Adapter Input Mode

When this parameter is set to List, then the Multiport Adapter Input Port of each acquisition step can be set independently (see “[Input Port](#)” on page 470). Otherwise, the Multiport Adapter Input will be fixed within the sequence at the Input Port setting under the Multiport Adapter RF Output & Test Set Config on the Input/Output menu.

Key Path	<b>Meas Setup, Multiport Adaptr Input Mode</b>
<b>Remote Command</b>	[ :SENSE] :LSEQuencer:MPADapter:PORT:INPut:MODE FIXed LIST [ :SENSE] :LSEQuencer:MPADapter:PORT:INPut:MODE?
Example	LSEQ:MPAD:PORT:INP:MODE LIST LSEQ:MPAD:PORT:INP:MODE?

## Meas Setup

Dependencies	In E6607A and E6607B, this setting is displayed only when the Multiport Adapter (E6617A) is connected by way of the USB interface. Otherwise, the setting is hidden and is set to OFF.  In E6607C, the Multiport Adapter is embedded in the test set; it requires Option E6607C-MPA for use.
Couplings	None
Preset	Fixed
State Saved	Yes
Range	Fixed List
Initial S/W Revision	A.10.00
Help Map ID	35288

## Meas Preset

For more information, see the section under the Preset key in the Utility section.

Key Path	<b>Meas Setup</b>
Help Map ID	35216

## Advanced Setup (Remote Command Only)

The Advanced setup is to set the radio format specific parameters for the whole sequence. These parameters will affect all related measurements and acquisitions.

---

**NOTE** Menu key are not provided for these parameters; they are accessible only by means of remote commands

---

Key Path	<b>Remote Command Only</b>
Mode	Sequence Analyzer
Initial S/W Revision	A.05.00
Help Map ID	0

## GSM/EDGE Setup

The advanced setup for all GSM/EDGE related measurements..

Key Path	<b>Remote Command Only</b>
Mode	Sequence Analyzer
Initial S/W Revision	A.05.00



Help Map ID

0

### Ignore Error In Average

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	Remote Command Only
Mode	Sequence Analyzer
SCPI Command	[ :SENSe ] :LSEQuencer :ASETup :GSM : IEAVerage ON   OFF   1   0 [ :SENSe ] :LSEQuencer :ASETup :GSM : IEAVerage?
SCPI 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.
Dependencies	None
Couplings	None
Preset	OFF
Force Restart	Yes
State Saved	Yes
Range	ON   OFF   1   0
Annotation	None
Initial S/W Revision	A.05.00
Help Map ID	0

### PVT Time Offsets

The user may specify 12 offset time values for which power levels can be queried. See “PVT Results” on [page 253](#) for details. The measurement offset results may be used by the user to perform a statistical

## Meas Setup

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	Remote Command Only
Mode	Sequence Analyzer
SCPI 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 ] ?
SCPI Example	LSEQ:ASET:GSM:PVT:TIME -28us,-18us,-10us,0,2us,4us, 538.2us, 540.2us,542.8us,552.8us,560.8us,570.8us
Dependencies	None
Couplings	None
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
Force Restart	Yes
State Saved	Yes
Range	-50 us to 593 us
Annotation	None
Initial S/W Revision	A.05.00
Help Map ID	0

## Loopback BER Pattern (GSM)

This parameter allows you to specify the reference bits used in GSM Loopback BER calculation. There are two options: by file and by string.

To load the pattern bits by file:

Key Path	Remote Command Only
Mode	Sequence Analyzer
SCPI Command	:SERVice [ :PRODUCTION ] :LSEQuencer :ADVanced :GSM :LBER :PATT ern <filepath + filename>
SCPI Example	SERV:LSEQ:ADV:GSM:LBER:PATT "D:\pat.txt"

Dependencies	None
Couplings	None
Force Restart	Yes
State Saved	Yes
Annotation	None
Format of Pattern File	<pre>#GSM loopback BER Loop C Mode length = 114 pattern = 0000010000101000000100000010000001000000101000010000001 0100001000000001000010000000010000100000001100001010 pattern = 010101001010000101011010101001010100101010010101001010100101010010101 0010101000010100101010000101001010100001010110101000 pattern = 01000000100000010100001000000101000011000000010000100000000100 0010000000110000101000001100001010000001000010100000 pattern = 0100101000010101001010100101010010101001010100101010010101001010010 1010000101011010100001010100101000010101001010000101</pre>
Initial S/W Revision	A.11.50
Help Map ID	0

To load the pattern bits by string:

Key Path	<b>Remote Command Only</b>
Mode	Sequence Analyzer
SCPI Command	<pre>:SERvice[:PRODUCTION]:LSEQuencer:ADVanced:GSM:LBer:PATT ern:LOAD {1:4}, &lt;String&gt; :SERvice[:PRODUCTION]:LSEQuencer:ADVanced:GSM:LBer:PATT ern:LOAD? {1:4}</pre>
SCPI Example	<pre>:SERV:LSEQ:ADV:GSM:LBer:PATT:LOAD 1,"54A15AA54A952A54A852A14A856A0" :SERV:LSEQ:ADV:GSM:LBer:PATT:LOAD?</pre>
Dependencies	The characters of the string must be '0'~'9', 'A'~'F' or 'a~f'. The length of string must be 29. Each character of the string stands for four bits, and the last two bits of the last character will be ignored in program.
Couplings	None

## Meas Setup

Preset	{1}: "54A15AA54A952A54A852A14A856A0" {2}: "408142050C04201080C2830A04280" {3}: "4A152A54A952A54A856A152854A14" {4}: "04281020408142050804201080C28"
Force Restart	Yes
State Saved	Yes
Annotation	None
Initial S/W Revision	A.11.50
Help Map ID	0

### Loopback BER Pattern (EDGE)

This parameter allows you to specify the reference bits used in EDGE Loopback BER calculation. There are two options: by file and by string.

To load the pattern bits by file:

Key Path	<b>Remote Command Only</b>
Mode	Sequence Analyzer
SCPI Command	:SERVice[:PRODUCTION]:LSEQuencer:ADVanced:EDGE:LBer:PAT Tern <filepath + filename>
SCPI Example	SERV:LSEQ:ADV:EDGE:LBer:PATT "D:\pat.txt"
Dependencies	None
Couplings	None
Force Restart	Yes
State Saved	Yes
Annotation	None

Format of Pattern File	<pre>#EDGE loopback BER Loop C Mode  length = 306  pattern = 00100011001000110011010100110101010000010100000001111000011111 0111011101111001100110011110101010101011100000000000110111111 11110100111111110001011111110110001111111001011011111101000 10011111000110010111110110101000111100100000110111010011110100 110001011100010101100011011000001011010010111100010  pattern = 000000000000000111111111111011111111111001111111111101011111 1111100001111111101110111111100110011111110101010111111000 000001111110111110111110011111001111010111101011100001111000 01101110111011101001100110011000101010101010101000000000001011 11111111100011111111101101111111100100111111  pattern = 1110100101111111000100011111101100110111110010101001111101000 000101111000111110001110110111101101100100111001001010010110100 10000100010001001110011001100101101010101000100000000001100 1111111110101011111110000001111110111101111110011110011111 101011101011111000011000011110111010111011100110001  pattern = 10011010101110101010000001100000001111101011111011110000111110 011101110111101011001100111000010101010110111000000000100110111 1111100101001111110100001011111000111000111101101101101111001 00100100111010010010010110001001001000101100100100110001010010 010101100001001000001011100100111100011010010111011010</pre>
Initial S/W Revision	A.11.50
Help Map ID	0

To load the pattern bits by string:

Key Path	<b>Remote Command Only</b>
Mode	Sequence Analyzer
SCPI Command	<pre>:SERVICE[:PRODUCTION]:LSEQUENCER:ADVANCED:EDGE:LBER:PAT Tern:LOAD {1:4}, &lt;String&gt;  :SERVICE[:PRODUCTION]:LSEQUENCER:ADVANCED:EDGE:LBER:PAT Tern:LOAD? {1:4}</pre>
SCPI Example	<pre>:SERV:LSEQ:ADV:EDGE:LBER:PATT:LOAD 1,"232335354140787EEEEF999EAAB8006FFE9FF8BFEC7F96FE89F8CBE D47906E9E98B8AC6C169788"  :SERV:LSEQ:ADV:EDGE:LBER:PATT:LOAD?</pre>
Dependencies	The characters of the string must be '0'~'9', 'A'~'F' or 'a'~'f'. The length of string must be 77. Each character of the string stands for four bits, and the last two bits of the last character will be ignored in program.

## Meas Setup

Couplings	None
Preset	{1}: "0001FFFBF7FE7FFAFFE1FFB7FE67FAAFE01FBFB7E7AFAE1E1BBB A6662AAB0005FFE3FFB7FE4FC" {2}: "E97F88FECDF953E8178F8EDED93929690889CCCB55440067FEAFF81 FEFBF9E7EBAF861EEBB984" {3}: "9ABAA0603EBF787CEEF599C2AB7004DFE53FA17E38FB6DE493A496 248B24C5256120B93C69768" {4}: "232335354140787EEEF999EAAB8006FFE9FF8BFEC7F96FE89F8CBED 47906E9E98B8AC6C169788"
Force Restart	Yes
State Saved	Yes
Annotation	None
Initial S/W Revision	A.11.50
Help Map ID	0

### Loopback BER Threshold (GSM)

This parameter allows you to specify the threshold level used in GSM Loopback BER calculation. If the BER is below the threshold level, then this result will be available to be accumulated; if above, it will be ignored.

Key Path	<b>Remote Command Only</b>
Mode	Sequence Analyzer
SCPI Command	:SERvice[:PRODUCTION]:LSEQuencer:ADVanced:GSM:LBER:DISC ard <real>
SCPI Example	SERV:LSEQ:ADV:GSM:LBER:DISC 0.2
Dependencies	None
Couplings	None
Preset	0.2
Range	0.0 to 1.0
Force Restart	Yes
State Saved	Yes
Annotation	None
Initial S/W Revision	A.11.50
Help Map ID	0

**Loopback BER Threshold (EDGE)**

This parameter allows you to specify the threshold level used in EDGE Loopback BER calculation. If the BER is below the threshold level, then this result will be available to be accumulated; if above, it will be ignored.

Key Path	<b>Remote Command Only</b>
Mode	Sequence Analyzer
SCPI Command	:SERVice [:PRODUCTION] :LSEQuencer:ADVanced:EDGE:LBER:DIS Card <real>
SCPI Example	SERV:LSEQ:ADV:EDGE:LBER:DISC 0.2
Dependencies	None
Couplings	None
Preset	0.2
Range	0.0 to 1.0
Force Restart	Yes
State Saved	Yes
Annotation	None
Initial S/W Revision	A.11.50
Help Map ID	0

**LTE-FDD Setup**

The advanced setup for all LTE-FDD related measurements.

Key Path	<b>Remote Command Only</b>
Mode	Sequence Analyzer
Initial S/W Revision	A.05.00
Help Map ID	0

**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	<b>Remote Command Only</b>
Mode	Sequence Analyzer

## Meas Setup

SCPI Command	:SERVice[:PRODUCTION]:LSEQuencer:ADVanced:LTE:CConditio n NORMal EXTReMe  :SERVice[:PRODUCTION]:LSEQuencer:ADVanced:LTE:CConditio n?
SCPI Example	:SERV:LSEQ:ADV:LTE:CCON EXTR :SERV:LSEQ:ADV:LTE:CCON?
Dependencies	None
Couplings	None
Preset	NORMal
Force Restart	Yes
State Saved	Yes
Range	NORMal   EXTReMe
Annotation	None
Initial S/W Revision	A.05.00
Help Map ID	0

## LTE-TDD Setup

The advanced setup for all LTE-TDD related measurements.

Key Path	<b>Meas Setup, Advanced Setup</b>
Mode	Sequence Analyzer
Initial S/W Revision	A.12.00
Help Map ID	0

## 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-FDD Channel Condition are set for the entire Sequence.

Key Path	<b>Remote Command Only</b>
Mode	Sequence Analyzer
SCPI Command	:SERVice[:PRODUCTION]:LSEQuencer:ADVanced:LTETdd:CCondi tion NORMal EXTReMe  :SERVice[:PRODUCTION]:LSEQuencer:ADVanced:LTETdd:CCondi tion?



SCPI Example	:SERV:LSEQ:ADV:LTET:CCON EXTR :SERV:LSEQ:ADV:LTET:CCON?
Dependencies	None
Couplings	None
Preset	NORMal
Force Restart	Yes
State Saved	Yes
Range	NORMal   EXTReme
Annotation	None
Initial S/W Revision	A.12.00
Help Map ID	0

### WCDMA Setup

The advanced setup for all WCDMA related measurements..

Key Path	<b>Remote Command Only</b>
Mode	Sequence Analyzer
Initial S/W Revision	A.11.50
Help Map ID	0

### Loopback BER Pattern (WCDMA)

This parameter allows you to specify the reference bits used in WCDMA Loopback BER calculation. There are two options: by file or by string.

To load the pattern bits by file:

Key Path	<b>Remote Command Only</b>
Mode	Sequence Analyzer
SCPI Command	:SERvice [:PRODUCTION]:LSEQuencer:ADVanced:WCDMa:LBer:PATtern <filepath + filename>
SCPI Example	SERV:LSEQ:ADV:WCDM:LBer:PATT "D:\pat.txt"
Dependencies	None
Couplings	None
Force Restart	Yes
State Saved	Yes
Annotation	None





## Meas Setup

SCPI Example	<code>:SERV:LSEQ:ADV:TDSC:LBER:PATT:LOAD</code> <code>"FF"</code> <code>:SERV:LSEQ:ADV:TDSC:LBER:PATT:LOAD?</code>
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.
Couplings	None
Preset	<code>"FF"</code> <code>FFFFFFFF"</code>
Force Restart	Yes
State Saved	Yes
Initial S/W Revision	A.12.00
Help Map ID	0

### Loopback BER CodeRMC (TD-SCDMA)

This parameter allows you to specify the RMC (Reference Measurement Code) decoder type used in TD-SCDMA Loopback BER calculation. Its type is bool. TRUE means it is single code, FALSE means it is multi code.

Key Path	<b>Remote Command Only</b>
Mode	Sequence Analyzer
SCPI Command	<code>[ :SENSe ] :LSEQuencer :ADVanced :TDSCdma :LBER :RMC :SCODE</code> <code>TRUE   FALSE</code> <code>[ :SENSe ] :LSEQuencer :ADVanced :TDSCdma :LBER :RMC :SCODE?</code>
SCPI Example	<code>:LSEQ:ADV:TDSC:LBER:RMC:SCOD true</code> <code>:LSEQ:ADV:TDSC:LBER:RMC:SCOD?</code>
Dependencies	None
Couplings	None
Force Restart	Yes
State Saved	Yes
Initial S/W Revision	A.12.00
Help Map ID	0

### Loopback BER CodeLevel (TD-SCDMA)

This parameter allows you to specify the code level of the Reference Measurement Code used in

TD-SCDMA Loopback BER calculation.

Key Path	Remote Command Only
Mode	Sequence Analyzer
SCPI Command	[ :SENSe] :LSEQuencer :ADVanced :TDSCdma :LBER :CLEVel <int> [ :SENSe] :LSEQuencer :ADVanced :TDSCdma :LBER :CLEVel?
SCPI Example	:LSEQ:ADV:TDSC:LBER:CLEV 4 :LSEQ:ADV:TDSC:LBER:CLEV?
Dependencies	None
Couplings	None
Force Restart	Yes
State Saved	Yes
Initial S/W Revision	A.12.00
Help Map ID	0

#### Loopback BER Code Index0 (TD-SCDMA)

This parameter allows you to specify the code index of the Reference Measurement Code used in TD-SCDMA Loopback BER calculation. If singleCodeRMC is true, it is only necessary to set this value; if it is false, it is necessary to set this value and also the value of Loopback BER Code Index1.

Key Path	Remote Command Only
Mode	Sequence Analyzer
SCPI Command	[ :SENSe] :LSEQuencer :ADVanced :TDSCdma :LBER :CINDeX0 <int> [ :SENSe] :LSEQuencer :ADVanced :TDSCdma :LBER :CINDeX0?
SCPI Example	:LSEQ:ADV:TDSC:LBER:CIND0 0 :LSEQ:ADV:TDSC:LBER:CIND0?
Dependencies	None
Couplings	None
Force Restart	Yes
State Saved	Yes
Initial S/W Revision	A.12.00
Help Map ID	0

#### Loopback BER Code Index1 (TD-SCDMA)

This parameter allows you to specify the code index of the Reference Measurement Code used in

## Meas Setup

TD-SCDMA Loopback BER calculation. If singleCodeRMC is true, it is not necessary to set this value; if it is false, it is necessary to set this value and also the value of Loopback BER Code Index0.

Key Path	Remote Command Only
Mode	Sequence Analyzer
SCPI Command	[ :SENSE ] :LSEQuencer :ADVanced :TDSCdma :LBER :CINdex1 <int> [ :SENSE ] :LSEQuencer :ADVanced :TDSCdma :LBER :CINdex1?
SCPI 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.
Couplings	None
Force Restart	Yes
State Saved	Yes
Annotation	None
Initial S/W Revision	A.12.00
Help Map ID	0

### Loopback BER TFCI Detection Mode (TD-SCDMA)

This parameter allows you to specify 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	Remote Command Only
Mode	Sequence Analyzer
SCPI Command	:SERVice [ :PRODUCTION ] :LSEQuencer :ADVanced :TDSCdma :LBER : TFCI :AUTO TRUE   FALSE :SERVice [ :PRODUCTION ] :LSEQuencer :ADVanced :TDSCdma :LBER : TFCI :AUTO?
SCPI Example	:SERV:LSEQ:ADV:TDSC:LBER:TFCI:AUTO TRUE :SERV:LSEQ:ADV:TDSC:LBER:TFCI:AUTO?
Dependencies	None
Couplings	None
Force Restart	Yes
State Saved	Yes
Initial S/W Revision	A.12.00
Help Map ID	0

**Loopback BER TFCI Word (TD-SCDMA)**

This parameter allows you to specify the TFCI word used in TD-SCDMA Loopback BER calculation. Its type is int.

Key Path	Remote Command Only
Mode	Sequence Analyzer
SCPI Command	[ :SERvice [:PRODUCTION] :LSEQuencer:ADVanced:TDSCdma:LBer :TFCI <int>  :SERvice [:PRODUCTION] :LSEQuencer:ADVanced:TDSCdma:LBer: TFCI?
SCPI 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.
Couplings	None
Force Restart	Yes
State Saved	Yes
Initial S/W Revision	A.12.00
Help Map ID	0

**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	Remote Command Only
Mode	Sequence Analyzer
SCPI Command	[ :SENSe] :LSEQuencer:ADVanced:TDSCdma:PVT:DEMod ON OFF 1 0  [ :SENSe] :LSEQuencer:ADVanced:TDSCdma:PVT:DEMod?
SCPI Example	:SENS:LSEQ:ADV:TDSC:PVT:DEM 1 :SENS:LSEQ:ADV:TDSC:PVT:DEM?
Dependencies	None
Couplings	None
Force Restart	Yes

## Meas Setup

State Saved	Yes
Range	ON OFF 1 0
Initial S/W Revision	A.12.00
Help Map ID	0

### 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 [“TDSCDMA PVT Results” on page 281](#)) 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 envelope trace will be used to compare with the upper limit trace point by point. If any point of the envelope 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 [“Envelope Trace Results” on page 283](#) and [“Upper Limit Results” on page 283](#).

Key Path	Remote Command Only
Mode	Sequence Analyzer
SCPI Command	[ :SENSe] :LSEQuencer :ADVanced :TDSCdma :PVT :MOMentum ON OFF 1 0  [ :SENSe] :LSEQuencer :ADVanced :TDSCdma :PVT :MOMentum?
SCPI Example	:SENS:LSEQ:ADV:TDSC:PVT:MOM 1 :SENS:LSEQ:ADV:TDSC:PVT:MOM?
Dependencies	None
Couplings	None
Force Restart	Yes
State Saved	Yes
Initial S/W Revision	A.12.00
Help Map ID	0

### 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 doutput 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 (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. As for the DOWN-THEN-UP 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.

---

**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.

---



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**NOTE** The ILPC setup command is only applicable to the WCDMA radio standard, as of the present software release.

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Key Path	Remote Command Only
Mode	Sequence Analyzer
SCPI Command	[ :SENSE ] :LSEQuencer:ILPControl:SETup <frequency>, <peak power>, <step count>, <step size>, <step interval>, <pattern>, <fast algorithm enable>
SCPI Example	LSEQ:ILPC:SET 2.14GHz, 25dbm, 80, 1, 200us, DOWN, ON
Dependencies	None
Couplings	None
Force Restart	Yes
State Saved	Yes
Initial S/W Revision	A.12.00
Help Map ID	0

## Meas Setup

To fetch the results of the ILPC measurement:

Key Path	Remote Command Only
Mode	Sequence Analyzer
SCPI Command	:FETCh:LSEQuencer:ILPControl?
SCPI Example	:FETC:LSEQ:ILPC?
Notes	Result index 0 : Number of analysis steps Result index 1 : Array of average output power or basic tx power
Dependencies	None
Couplings	None
Force Restart	Yes
State Saved	Yes
Initial S/W Revision	A.12.00
Help Map ID	0

### Command to Query the Sequence Version for Sequence Studio

This command is used by the Agilent Sequence Studio application to query the supported sequence file version of both Sequence Analyzer and Source. This command is query only.

Key Path	Remote Command Only
Mode	Sequence Analyzer
SCPI Command	To query the supported sequence file version of Analyzer: :SERVice[:PRODUCTION]:LSEQuencer:ANALyzer:FILE:VERSion? <string>  To query the supported sequence file version of Source: :SERVice[:PRODUCTION]:LSEQuencer:SOURce:FILE:VERSion? <string>
SCPI Example	:SERV:LSEQ:ANAL:FILE:VERS ? "01.03.00" :SERV:LSEQ:SOUR:FILE:VERS ? "01.03.00"
Dependencies	None
Couplings	None
Force Restart	Yes
State Saved	Yes
Initial S/W Revision	A.12.00
Help Map ID	0

To fetch the results of the ILPC measurement:

Key Path	Remote Command Only
Mode	Sequence Analyzer
SCPI Command	:FETCh:LSEQuencer:ILPControl?
SCPI Example	:FETC:LSEQ:ILPC?
Notes	Result index 0 : Number of analysis steps Result index 1 : Array of average output power or basic tx power
Dependencies	None
Couplings	None
Force Restart	Yes
State Saved	Yes
Initial S/W Revision	A.12.00
Help Map ID	0

### 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 407 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
Help Map ID	0

### PVT Meas Setup

Power Versus Time measurement is available in GSM/EDGE mode and in LTE-TDD mode.

#### GSM/EDGE PVT Meas Setup

The 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.

## Meas Setup

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 [:SENSe]:EPVTime:BANDwidth[:RESolution]:TYPE?	Filter Type	
[:SENSe]:EPVTime:BSYNc:SOURce TSEQUence RFBurst NONE RFAMplitude [:SENSe]:EPVTime:BSYNc:SOURce?	Burst Sync	
: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:SLENgth EVEN INTEger	Timeslot Length	
[:SENSe]:EPVTime:MASK:LIST:LOWer:ABSolute <real>, ... [:SENSe]:EPVTime:MASK:LIST:LOWer:ABSolute	Lower Mask Absolute Amplitude Levels	
[:SENSe]:EPVTime:MASK:LIST:LOWer:POINts?	Lower Mask Points	
[:SENSe]:EPVTime:MASK:LIST:LOWer:RELative <rel_ampl>, ... [:SENSe]:EPVTime:MASK:LIST:LOWer:RELative?	Lower Mask Relative Points	
[:SENSe]:EPVTime:MASK:LIST:LOWer:TIME <seconds>, ... [:SENSe]:EPVTime:MASK:LIST:LOWer:TIME?	Lower Mask Time Points	
[:SENSe]:EPVTime:MASK:LIST:UPPer:ABSolute <real>, ... [:SENSe]:EPVTime:MASK:LIST:UPPer:ABSolute?	Upper Mask Absolute Amplitude	
[:SENSe]:EPVTime:MASK:LIST:UPPer:POINts?	Upper Mask Points	

Command	Description	Notes
[[:SENSe]:EPVTime:MASK:LIST:UPPer:RELative <rel_ampl>, ... [:SENSe]:EPVTime:MASK:LIST:UPPer:RELative?	Upper Mask Relative Points	
[[:SENSe]:EPVTime:MASK:LIST:UPPer:TIME <seconds>, ... [:SENSe]:EPVTime:MASK:LIST:UPPer:TIME?	Upper Mask Time Points	
[[:SENSe]:EPVTime:MASK[:UPARt]:LOWer:NORMal QAM16 QAM32, <rel_ampl> [:SENSe]:EPVTime:MASK[:UPARt]:LOWer:NORMal?	Limit Mask Useful Part Lower Normal	
[[:SENSe]:EPVTime:MASK[:UPARt]:LOWer:HSRate QAM16 QAM32, <rel_ampl>	Limit Mask Useful Part Lower HSR	

Help Map ID:

35220

### 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 40 MHz
[[: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	

## Meas Setup

Command	Description	Notes
[: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)	

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### TDSCDMA PVT Meas Setup

The TDSCDMA PVT measurement used in the TDSCDMA 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 TDSCDMA 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:TDSCdma:PVTime
- CALCulate:PVTime is replaced with :CALCulate:LSEQuencer:TDSCdma:PVTime

Command	Description	Notes
[:SENSe]:PVTime:SWEep:TIME <integer> [:SENSe]:PVTime:SWEep:TIME?	Meas Interval	Since Sequencer measurement only works when Radio Device is MS, sweep time value is fixed to 1
[:SENSe]:PVTime:MASK:SElect CUSTom STANdard [:SENSe]:PVTime:MASK:SElect?	Limit Mask Selection	

Command	Description	Notes
[[:SENSe]:PVTime:MASK:LIST:LOWer:ABSolute <ampl>, <ampl>, <ampl>, <ampl> [:SENSe]:PVTime:MASK:LIST:LOWer:ABSolute?	Lower Mask Absolute Amplitude Levels	
[[:SENSe]:PVTime:MASK:LIST:LOWer:POINts?	Lower Mask Points	
[[:SENSe]:PVTime:MASK:LIST:LOWer:RELative <ampl>, <ampl>, <ampl>, <ampl> [:SENSe]:PVTime:MASK:LIST:LOWer:RELative?	Lower Mask Relative Amplitude Levels	
[[:SENSe]:PVTime:MASK:LIST:LOWer:TIME <time>, <time>, <time>, <time> [:SENSe]:PVTime:MASK:LIST:LOWer:TIME?	Lower Mask Time Points	
[[:SENSe]:PVTime:MASK:LIST:UPPer:ABSolute <ampl>, <ampl>, <ampl>, <ampl> [:SENSe]:PVTime:MASK:LIST:UPPer:ABSolute?	Upper Mask Absolute Amplitude Levels	
[[:SENSe]:PVTime:MASK:LIST:UPPer:POINts?	Upper Mask Points	
[[:SENSe]:PVTime:MASK:LIST:UPPer:RELative <ampl>, <ampl>, <ampl>, <ampl> [:SENSe]:PVTime:MASK:LIST:UPPer:RELative?	Upper Mask Relative Amplitude Levels	
[[:SENSe]:PVTime:MASK:LIST:UPPer:TIME <time>, <time>, <time>, <time> [:SENSe]:PVTime:MASK:LIST:UPPer:TIME?	Upper Mask Time Points	
[[:SENSe]:SLOT TS0 TS1 TS2 TS3 TS4 TS5 TS6 UPTS DPTS [:SENSe]:SLOT?	Analysis Timeslot	Sequencer PVT measurement will return "Measurement Error" when Analysis TimeSlot is DwPTS, TS4, TS5 or TS6
[[:SENSe]:RADio:CONFigure:HSDPa[:STATe] 0 1 OFF ON [:SENSe]:RADio:CONFigure:HSDPa[:STATe]?	HSPA/8PSK Enable	
[[:SENSe]:TDEMod:SCODE <integer> [:SENSe]:TDEMod:SCODE?	Scramble Code	
[[:SENSe]:TDEMod:UPTS <integer> [:SENSe]:TDEMod:UPTS?	Uplink Pilot	
[[:SENSe]:TDEMod:ULSPoint <integer> [:SENSe]:TDEMod:ULSPoint?	Switching Point	

## Meas Setup

Command	Description	Notes
[[:SENSe]:TDEMod:MXUSer:TS0 <integer> [:SENSe]:TDEMod:MXUSer:TS0?	Max Users for TS0	
[[:SENSe]:TDEMod:MXUSer:TS1 <integer> [:SENSe]:TDEMod:MXUSer:TS1?	Max Users for TS1	
[[:SENSe]:TDEMod:MXUSer:TS2 <integer> [:SENSe]:TDEMod:MXUSer:TS2?	Max Users for TS2	
[[:SENSe]:TDEMod:MXUSer:TS3 <integer> [:SENSe]:TDEMod:MXUSer:TS3?	Max Users for TS3	
[[:SENSe]:TDEMod:MXUSer:TS4 <integer> [:SENSe]:TDEMod:MXUSer:TS4?	Max Users for TS4	
[[:SENSe]:TDEMod:MXUSer:TS5 <integer> [:SENSe]:TDEMod:MXUSer:TS5?	Max Users for TS5	
[[:SENSe]:TDEMod:MXUSer:TS6 <integer> [:SENSe]:TDEMod:MXUSer:TS6?	Max Users for TS6	
[[:SENSe]:TDEMod:CDCHannel:DETection AUTO MAN [:SENSe]:TDEMod:CDCHannel:DETection?	Code Channel Detection	
[[:SENSe]:TDEMod:MODScheme:AUTO 1 0 ON OFF [:SENSe]:TDEMod:MODScheme:AUTO?	Mod Scheme	
[[:SENSe]:TDEMod:CDCHannel:ACTive <spread_code_length>,<code_channel>,0 1 OFF ON [:SENSe]:TDEMod:CDCHannel:ACTive? <spread_code_length>,<code_channel>	Code Channel Status	
[[:SENSe]:TDEMod:MSHift <spread_code_length>,<code_channel>,<integer> [:SENSe]:TDEMod:MSHift? <spread_code_length>,<code_channel>	Midamble Shift	
[[:SENSe]:TDEMod:MODFormat <integer>,<integer>,AUTO QPSK PSK8 QAM16 QAM64 [:SENSe]:TDEMod:MODFormat? <integer>,<integer>	Modulation Format (Note)	
[[:SENSe]:TDEMod:PHASe:SHIFt <integer>,<integer>,<real> [:SENSe]:TDEMod:PHASe:SHIFt? <integer>,<integer>	Phase Shift	
[[:SENSe]:TDEMod:PHASe:SHIFt:DETection:AUTO ON OFF 1 0 [:SENSe]:TDEMod:PHASe:SHIFt:DETection:AUTO?	Phase Shift Detected	
[[:SENSe]:TDEMod:ALPHa <real> [:SENSe]:TDEMod:ALPHa?	Filter Alpha	
[[:SENSe]:TDEMod:THReshold:CHANnel <real> [:SENSe]:TDEMod:THReshold:CHANnel?	Active Channel Threshold	



Command	Description	Notes
[:SENSe]:TDEMod:SPECTrum:MIRROr NORMAl INVert [:SENSe]:TDEMod:SPECTrum:MIRROr?	Mirror Frequency Spectrum	

Help Map ID:

0

### 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:SOUR ce	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:R PHase	RMS Phase Error limit for MS	
:CALCulate:PFERror:LIMit:BTS: PPHase	Peak Phase Error limit for BTS	
:CALCulate:PFERror:LIMit:MS:P PHase	Peak Phase Error limit for MS	
:CALCulate:PFERror:LIMit:BTS: FERRor	Frequency Error limit for BTS	
:CALCulate:PFERror:LIMit:MBT S:FERRor	Frequency Error limit for mBTS	
:CALCulate:PFERror:LIMit:PBTS :FERRor	Frequency Error limit for pBTS	
:CALCulate:PFERror:LIMit:MS:F ERRor	Frequency Error limit for MS	

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35218

## Meas Setup

### 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  $\pm 1.8$  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 the 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]:MODulat ion:CARRier <freq> [:SENSe]:EORFSpectrum:BANDwidth[:RESolution]:MODulat ion:CARRier?	Carrier RBW	For Modualtion Meas BWs
[:SENSe]:EORFSpectrum:BANDwidth[:RESolution]:MODulat ion:OFFSet:CLOSe <freq> [:SENSe]:EORFSpectrum:BANDwidth[:RESolution]:MODulat ion:OFFSet:CLOSe?	<1800 kHz Offset RBW	For Modualtion Meas BWs
[:SENSe]:EORFSpectrum:BANDwidth[:RESolution]:MODulat ion:OFFSet:FAR <freq> [:SENSe]:EORFSpectrum:BANDwidth[:RESolution]:MODulat ion:OFFSet:FAR?	>=1800kHz Offset RBW	For Modualtion Meas BWs
[:SENSe]:EORFSpectrum:BANDwidth[:RESolution]:SWITchi ng:CARRier <freq> [:SENSe]:EORFSpectrum:BANDwidth[:RESolution]:SWITchi ng:CARRier?	Carrier RBW	For Switching Meas BWs

Command		Description		Notes
[: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>, ... [:SENSe]:EORFSpectrum:LIST:MODulation:BANDwidth?		RBW List		For Custom Modulation
[:SENSe]:EORFSpectrum:LIST:MODulation:LOFFset[:RCARrier] <rel_ampl>, ... [:SENSe]:EORFSpectrum:LIST:MODulation:LOFFset[:RCARrier]?		Rel Limit Level Offset		For Custom Modulation
[:SENSe]:EORFSpectrum:LIST:MODulation:LOFFset:ABSolute <rel_ampl>, ... [:SENSe]:EORFSpectrum:LIST:MODulation:LOFFset:ABSolute?		Abs Limit Level Offset		For Custom Modulation
[:SENSe]:EORFSpectrum:LIST:MODulation:APPLY RELative BOTH ABSolute, ... [:SENSe]:EORFSpectrum:LIST:MODulation:APPLY?		Apply Limit Level Offset List		For Custom Modulation
[:SENSe]:EORFSpectrum:LIST:SWITChing[:FREQuency] <freq>, ... [:SENSe]:EORFSpectrum:LIST:SWITChing[:FREQuency]?		Offset Freq List		For Custom Switching
[:SENSe]:EORFSpectrum:LIST:SWITChing:BANDwidth <freq>, ... [:SENSe]:EORFSpectrum:LIST:SWITChing:BANDwidth?		RBW List		For Custom Switching
[:SENSe]:EORFSpectrum:LIST:SWITChing:LOFFset[:RCARrier] <rel_ampl>, ... [:SENSe]:EORFSpectrum:LIST:SWITChing:LOFFset[:RCARrier]?		Rel Limit Level Offset		For Custom Switching
[:SENSe]:EORFSpectrum:LIST:SWITChing:LOFFset:ABSolute <rel_ampl>, ... [:SENSe]:EORFSpectrum:LIST:SWITChing:LOFFset:ABSolute?		Abs Limit Level Offset		For Custom Switching
[:SENSe]:EORFSpectrum:LIST:SWITChing:APPLY RELative BOTH ABSolute, ... [:SENSe]:EORFSpectrum:LIST:SWITChing:APPLY?		Apply Limit Level Offset List		For Custom Switching

## Meas Setup

Command	Description	Notes
[[:SENSe]:EORFSpectrum:MODulation:RPOWer <ampl> [:SENSe]:EORFSpectrum:MODulation:RPOWer?	Modulation Reference Power	Yes
[[:SENSe]:EORFSpectrum:SWITching:RPOWer <ampl> [:SENSe]:EORFSpectrum:SWITching:RPOWer?	Switching Reference Power	Yes

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### 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:

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)	

Command	Description	Notes
: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)	

## Meas Setup

Command	Description	Notes
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)	

Command	Description	Notes
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
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### 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:

## Meas Setup

or

:CALCulate:LSEQuencer:WCDMa:ACPpower:

:CALCulate:LSEQuencer:C2K:ACPpower:

:CALCulate:LSEQuencer:EVDO:ACPpower:

:CALCulate:LSEQuencer:LTE:ACPpower:

:CALCulate:LSEQuencer:LTETdd:ACPpower:

:CALCulate:LSEQuencer:TDSCdma:ACPpower:

[[:SENSe]:ACPpower:BANDwidth[:RESolution]	Resolution BW	
[[:SENSe]:ACPpower:BANDwidth:SHAPE	Filter shape	
[[:SENSe]:ACPpower:BANDwidth:TYPE	Filter Bandwidth	
[[:SENSe]:ACPpower:CARRier[1] 2:COUNt	Num carriers	
[[:SENSe]:ACPpower:CARRier[1] 2:REFerence	Reference carrier	
[[:SENSe]:ACPpower:CARRier[1] 2:RCARRier:AUTO	Auto Ref car state	
[[:SENSe]:ACPpower:CARRier[1] 2:RCFrequency	Ref Carrier frequency	
[[:SENSe]:ACPpower:CARRier[1] 2:RCFrequency:AUTO	Ref carrier frequency auto state	
[[:SENSe]:ACPpower:CARRier[1] 2[:POWER]	Power reference	
[[:SENSe]:ACPpower:CARRier[1] 2:AUTO[:STATE]	Power Reference State	
[[:SENSe]:ACPpower:CARRier[1] 2:CPSD	PSD reference	
[[:SENSe]:ACPpower:CARRier[1] 2:LIST:COUple	Carrier Coupling	
[[:SENSe]:ACPpower:CARRier[1] 2:LIST:PPResent	Carrier Power Present	
[[:SENSe]:ACPpower:CARRier[1] 2:LIST:WIDTH	Carrier spacing	Maximum span is 40 MHz
[[:SENSe]:ACPpower:CARRier[1] 2:LIST:BANDwidth[:INTegration]	Measurement noise bandwidth	Maximum span is 40 MHz
[[:SENSe]:ACPpower: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	
[[:SENSe]:ACPower:OFFSet[1] 2:LIST:BANDwidth:RESolution:AUTO	Offset RBW auto state	
[[:SENSe]:ACPower:OFFSet[1] 2:LIST:BANDwidth:SHAPE	Filter type	
[[:SENSe]:ACPower:OFFSet[1] 2:LIST:BANDwidth:TYPE	Filter BW	
[[:SENSe]:ACPower:OFFSet[1] 2:LIST:ABSolute	Abs limit	
[[:SENSe]:ACPower:OFFSet[1] 2:LIST:TEST	Fail	
[[:SENSe]:ACPower:OFFSet[1] 2:LIST:RCARRier	Rel Lim (Carr)	
[[:SENSe]:ACPower:OFFSet[1] 2:LIST:RPSDensity	Rel Lim (PSD)	

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:

## Meas Setup

[[: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	

Command	Description	Notes
[[:SENSe]:SEMAsk:OFFSet[1]2:LIST:BANDwidth[:RESolu tion]	Res BW	
[[:SENSe]:SEMAsk:OFFSet[1]2:LIST:BANDwidth[:RESol ution]: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:CO UPlE	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:CO UPlE	Rel stop coupling	
[[:SENSe]:SEMAsk:OFFSet[1]2:LIST:TEST	Fail Mask	
[[:SENSe]:SEMAsk:FILTer[:RRC][:STATe]	Method	
[[:SENSe]:SEMAsk:FILTer[:RRC]:ALPHa	Filter Alpha	
[[:SENSe]:SEMAsk:LIMits	Limits state	TD-SCDMA only
[[:SENSe]:SEMAsk:LIMIits:TYPE	Limits Type	Only for DVB-T/H
TRACe:SEMAsk:TYPE	Trace Type	This applies to the temporal averaging

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35224

### 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

## Meas Setup

[[:SENSE]:LSEQuencer:WCDMa:OBWidth:

[[:SENSE]:LSEQuencer:C2K:OBWidth:

[[:SENSE]:LSEQuencer:EVDO:OBWidth:

[[:SENSE]:LSEQuencer:LTE:OBWidth:

[[:SENSE]:LSEQuencer:LTETdd:OBWidth:

[[:SENSE]:LSEQuencer:TDSCdma: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:

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	

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35225

## Modulation Accuracy Meas Setup

The Modulation Accuracy (Rho) measurement used in the other supported modes is also used in Sequence Analyzer mode. The measurement parameters usable by the List Sequencer are shown below. For complete details of each parameter, please see the online help associated with the measurement mode. Some SCPI commands are usable within the native measurement mode, but are not usable in the Sequence Analyzer mode, and are not shown here.

The SCPI command format 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:

In the case of LTE-FDD and LTE-TDD modulation accuracy, the node name is "CEVM" rather than "RHO". For LTE commands:

[: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

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## Meas Setup

### 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	

Command	Description	Notes
[[: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:NCChannels?	Query num channels	
[[:SENSe]:RHO:SSLot:NUMBER	Sync Start Slot (BTS Only)	
[[:SENSe]:RHO:SWEEp: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	

## Meas Setup

Command	Description	Notes
[:SENSe]:RHO:FERRor:TRANge	Frequency Error Tolerance Range	
[:SENSe]:RHO:PICH:SPRead	PICH Code Number	
[:SENSe]:RHO:MICH:SPRead	MICH Code Number (BTS Only)	

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**C2K RHO**

: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		

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**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		

## Meas Setup

: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	

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35228

## Meas Setup

### LTE CEVM (for both LTE-FDD and LTE-TDD)

Command	Description	Notes
[[:SENSe]:CEVM:EETTime	Exclude EVM Transient Time	
[[:SENSe]:CEVM:EQUalizer:TRAIning	Equalizer Training	
[[:SENSe]:CEVM:EQUalizer:TRAIning:MAFilter	Moving Average Filter State	
[[:SENSe]:CEVM:EQUalizer:TRAIning:MAFilter:LENGth	Moving Average Filter value	
[[:SENSe]:CEVM:EQUalizer:TRAIning:MCFNormalize	Normalize MIMO Channel Frequency	
[[:SENSe]:CEVM:EQUalizer:TRAIning:MODE	Equalizer Training Mode	
[[:SENSe]:CEVM:EVMMinimize	EVM Minimization	
[[:SENSe]:CEVM:EVMMinimize:AMPLitude	EVM Minimization by Amplitude	
[[:SENSe]:CEVM:EVMMinimize:FREQuency	EVM Minimization by Frequency/Phase	
[[:SENSe]:CEVM:EVMMinimize:IQOffset	EVM Minimization by IQ Offset	
[[:SENSe]:CEVM:EVMMinimize:TIMing	EVM Minimization by Timing	
[[:SENSe]:CEVM:EXTended:FREQuency:LOCK:RANGe	Extended Freq Lock Range	
[[:SENSe]:CEVM:FREQuency:SYNThesis[:STATe]	Phase Noise Optimization	
[[:SENSe]:CEVM:MCFilter:STATe	Multi Carrier Filter	
[[:SENSe]:CEVM:POWer:BOOSt:NORMAlize	Power Boost Normalize	
[[:SENSe]:CEVM:PROFile:AUTO[:DETECT]	Detection	
[[:SENSe]:CEVM:PROFile:NALlocation	Include Non Allocation	

Command	Description	Notes
[[:SENSe]:CEVM:SYMBOL:TIMing:ADJust	Symbol Timing Adjust	
[[:SENSe]:CEVM:SYMBOL:TIMing:ADJust:USER	% FFT Size	Selects %FFT Size for Symbol Timing Adjust which enables you to enter the value. When % of FFT Size is selected, the symbol FFT used for EVM and demodulation results begins at the specified location. A maximum value of 0% begins the FFT at the end of the CP (beginning of the Symbol). The minimum value of -7.125% (or -25% for extended CP Length) begins the FFT at the beginning of the cyclic prefix. Setting the value to 0% will provide the maximum amount of time for all the paths in a multipath environment to arrive at the receiver before the symbol FFT is taken.
[[:SENSe]:CEVM:TIME:ASBoundary	Analysis Start Boundary	
[[:SENSe]:CEVM:TIME:INterval:SLOT	Meas Interval Slot	
[[:SENSe]:CEVM:TIME:INterval:SYMBOL	Meas Interval Symbol	
[[:SENSe]:CEVM:TIME:OFFSet:SLOT	Meas Offset Slot	
[[:SENSe]:CEVM:TIME:OFFSet:SYMBOL	Meas Offset Symbol	
[[:SENSe]:CEVM:TIME:RESult:LENGth	Result Length	
[[:SENSe]:CEVM:ULINK:DECode:PUSCh	PUSCH decoding type	

## Meas Setup

Command	Description	Notes
[::SENSe]:CEVM:ULINK:PROFile:ADD:USER/nquery/	Add user	
[::SENSe]:CEVM:ULINK:PROFile:AUTO:CID	Auto Detect Cell ID	
[::SENSe]:CEVM:ULINK:PROFile:AUTO[:DETECT]:POWER	Auto Detect Power Levels	
[::SENSe]:CEVM:ULINK:PROFile:AUTO:HOPping:GROup	Auto Detect Group Hopping	
[::SENSe]:CEVM:ULINK:PROFile:AUTO:HOPping:SEQuen ce	Auto Detect Seq Hopping	
[::SENSe]:CEVM:ULINK:PROFile:AUTO:PRACH	Include Auto Detect PRACH	
[::SENSe]:CEVM:ULINK:PROFile:AUTO:PRACH:ACTive	Auto Detect PRACH Active	
[::SENSe]:CEVM:ULINK:PROFile:AUTO:PRACH:CINdex	Auto Detect Configuration Index	
[::SENSe]:CEVM:ULINK:PROFile:AUTO:PRACH:CSSet	Auto Detect Cyclic Shift Set	
[::SENSe]:CEVM:ULINK:PROFile:AUTO:PRACH:LRSindex	Auto Detect Logical Root Seq Index	
[::SENSe]:CEVM:ULINK:PROFile:AUTO:PRACH:NCSConfi g	Auto Detect $N_{CS}$ Configuration	
[::SENSe]:CEVM:ULINK:PROFile:AUTO:PRACH:NRAPrb	Auto Detect Resource Block Offset ( $n_{PRB}^{RA}$ )	
[::SENSe]:CEVM:ULINK:PROFile:AUTO:PRACH:PINDEX	Auto Detect Preamble Index	
[::SENSe]:CEVM:ULINK:PROFile:AUTO:PRACH:PWRBoos t	Auto Detect PRACH Power Boost	
[::SENSe]:CEVM:ULINK:PROFile:AUTO:PUCCh	Include PUCCH	
[::SENSe]:CEVM:ULINK:PROFile:AUTO:PUCCh:ACTive	Auto Detect PUCCH Active	
[::SENSe]:CEVM:ULINK:PROFile:AUTO:PUCCh:CSHift	Auto Detect PUCCH Cyclic Shift	

Command	Description	Notes
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:PUCCh:DMRS	Include Auto Detect PUCCH DMRS	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:PUCCh:DMRS:GROup	Auto Detect PUCCH DMRS Group	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:PUCCh:DMRS:PARams	Auto Detect DMRS Params	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:PUCCh:DMRS:PWReBoost	Auto Detect PUCCH DMRS Power Boost	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:PUCCh:FNpucch:AUTO	Auto-detect Format/ N PUCCH(1)	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:PUCCh:FORMat	Auto Detect PUCCH Format	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:PUCCh:N:ONE	Auto Detect PUCCH N PUCCH (1)	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:PUCCh:N:TWO	Auto Detect PUCCH N PUCCH (2)	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:PUCCh:NCS:ONE	Auto Detect PUCCH N CS (1)	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:PUCCh:NRB:TWO	Auto Detect PUCCH N RB (2)	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:PUCCh:OS	Auto Detect PUCCH OS	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:PUCCh:PWRBoos t	Auto Detect PUCCH Power Boost	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:PUCCh:RB	Auto Detect PUCCH First RB	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:PUCCh:SHIFt	Auto Detect PUCCH Shift	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:PUCCh:SSLot	Auto Detect PUCCH Sync Slot	

## Meas Setup

Command	Description	Notes
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:PUCCh:SSLot:AUTO	Auto Detect PUCCH Sync Slot Auto	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:PUSCh	Include Auto Detect PUSCH	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:PUSCh:ACTive	Auto Detect PUSCH Active	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:PUSCh:DMRS	Include Auto Detect PUSCH DMRS	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:PUSCh:DMRS:CS Hift	Auto Detect PUSCH DMRS Cyclic Shift	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:PUSCh:DMRS:GR Oup	Auto Detect PUSCH DMRS Group	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:PUSCh:DMRS:O NE	Auto PUSCH n DMRS (1)	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:PUSCh:DMRS:PA Rams	Auto Detect DMRS Params	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:PUSCh:DMRS:P WRBoost	Auto Detect PUSCH DMRS Power Boost	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:PUSCh:DMRS:SE Quence	Auto Detect PUSCH DMRS Sequence	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:PUSCh:DMRS:T WO	Auto Detect PUSCH n DMRS (2)	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:PUSCh:DSS	Auto Detect Delta SS	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:PUSCh:NSB	Auto Detect Number of Sub-bands ( $N_{sb}$ )	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:PUSCh:PWRBoost	Auto Detect PUSCH Power Boost	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:PUSCh:RB:END	Auto Detect PUSCH RB End	



Command	Description	Notes
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:PUSCh:RB:STARt	Auto Detect PUSCH RB Start	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:PUSCh:SSLot	Auto Detect PUSCH Sync Slot	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:PUSCh:SSLot:AUTO	Auto Detect PUSCH Sync Slot	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:RNTI	Auto Detect RNTI	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:SFNumber	Auto Detect System Frame Number	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:SRS	Includes Auto Detected S-RS in the results.	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:SRS:ACTive	Auto Detect S-RS Active	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:SRS:BCONfig	Auto Detect Bandwidth Configuration ( $C_{SRS}$ )	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:SRS:BWIDth	Auto Detect Bandwidth ( $B_{SRS}$ )	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:SRS:CINDeX	Auto Detect Configuration Index ( $I_{SRS}$ )	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:SRS:CSHift	Auto Detect Cyclic Shift	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:SRS:FDPosition	Auto Detect Frequency Domain Position ( $n_{RRC}$ )	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:SRS:HBWIDth	Auto Detect Hopping Bandwidth ( $b_{HOP}$ )	
[[:SENSe]:CEVM:ULINK:PROFile:AUTO:SRS:PWRBoost	Auto Detect S-RS Power Boost	

## Meas Setup

Command	Description	Notes
[::SENSe]:CEVM:ULINK:PROFile:AUTO:SRS:SFConfig	Auto Detect Subframe Configuration	
[::SENSe]:CEVM:ULINK:PROFile:AUTO:SRS:SSLot	Auto Detect S-RS Sync Slot	
[::SENSe]:CEVM:ULINK:PROFile:AUTO:SRS:SSLot:AUTO	Auto Detect S-RS Sync Slot Auto	
[::SENSe]:CEVM:ULINK:PROFile:AUTO:SRS:TCOMb	Auto Detect Transmission Comb (k <sub>TC</sub> )	
[::SENSe]:CEVM:ULINK:PROFile:CLear/nquery/	Reset Changes	
[::SENSe]:CEVM:ULINK:PROFile:COUNt?/qonly/	Count Number of Users	
[::SENSe]:CEVM:ULINK:PROFile:EXCLude:ALL/nquery/	Uplink Exclude All	
[::SENSe]:CEVM:ULINK:PROFile:INCLude:ALL/nquery/	Uplink Include All	
[::SENSe]:CEVM:ULINK:PROFile:USER{1:50}:CID	Sets uplink user's physical-layer Cell ID when Detection is Man.	
[::SENSe]:CEVM:ULINK:PROFile:USER{1:50}:DELeTe/nquery/	Delete User	
[::SENSe]:CEVM:ULINK:PROFile:USER{1:50}:HOPPIng:GRoup	Determines if Group Hopping is enabled when Detection is Manual	
[::SENSe]:CEVM:ULINK:PROFile:USER{1:50}:HOPPIng:SEQuence	Determines if Seq Hopping is enabled when Detection is Manual	
[::SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PRACH	Include PRACH	

Command	Description	Notes
[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PRACH:ACTive	Selects whether or not PRACH exists in the input signal when Detection is Manual	
[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PRACH:CIN Dex	Sets PRACH Configuration Index to give frame structure when Detection is Manual	
[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PRACH:CSS et	Sets Cyclic Shift Set to give $N_{CS}$ (Number of Cyclic Shifts) for PRACH preamble sequence generation when Detection is Manual.	
[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PRACH:LRS index	Sets the Logical Root Seq Index to give root Zadoff-Chu sequence order when Detection is Manual	
[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PRACH:NC SConfig	Sets the Cyclic Shift Configuration Number to give $N_{CS}$ (Number of Cyclic Shifts) PRACH preamble sequence generation when Detection is Manual	

## Meas Setup

Command	Description	Notes
[[:SENSe]:CEVM:ULINk:PROFile:USER{ 1:50}:PRACH:NRAPrb	Sets the number of Resource Block that PRACH is offset from 0 in the frequency domain ( $n_{PRB}^{RA}$ ) when Detection is Manual	
[[:SENSe]:CEVM:ULINk:PROFile:USER{ 1:50}:PRACH:PIN Dex	Sets the Preamble Index when Detection is Manual	
[[:SENSe]:CEVM:ULINk:PROFile:USER{ 1:50}:PRACH:PW RBoost	Sets the PRACH Power Boost value when Detection is Manual	
[[:SENSe]:CEVM:ULINk:PROFile:USER{ 1:50}:PUCCh	Include PUCCH	
[[:SENSe]:CEVM:ULINk:PROFile:USER{ 1:50}:PUCCh:AC Tive	Selects whether or not PUCCH exists in the input signal when Detection is Manual	
[[:SENSe]:CEVM:ULINk:PROFile:USER{ 1:50}:PUCCh:AD D:SLOT/nquery/	Adds a new PUCCH allocation pair	
[[:SENSe]:CEVM:ULINk:PROFile:USER{ 1:50}:PUCCh:CO UNT?/qonly/	This command returns the number of added PUCCH slots.	
[[:SENSe]:CEVM:ULINk:PROFile:USER{ 1:50}:PUCCh:CS Hift	Sets the Cyclic Shift for all the PUCCH Slots when Cyclic Shift Couple is On and Auto Detect is Off.	

Command	Description	Notes
[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUCCh:CSHift:COUPle	Determines whether or not all the PUCCH Slots will use the Common Cyclic Shift value.	
[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUCCh:DMRS	Include PUCCH DMRS	
[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUCCh:DMRS:GROup	Sets the group number for the PUCCH demodulation reference signal (DMRS) when DMRS Group Couple is On and Detection is Manual.	
[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUCCh:DMRS:GROup:COUPle	Determines whether or not all the PUCCH Slots will use the DMRS Group All value.	
[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUCCh:DMRS:PARams	Determines if all DMRS parameters to be used are common to all Slots or if they are to be defined on a per Slot basis when Detection is Manual	
[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUCCh:DMRS:PWRBoost	Sets the DMRS Power Boost value for all the PUCCH Slots when DMRS Power Boost Couple is On and Detection is Manual.	

## Meas Setup

Command	Description	Notes
[::SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUCCh:DMRS:PWRBoost:COUPle	Determines whether or not all the PUCCH Slots will use the Common DMRS Power Boost value	
[::SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUCCh:FORMat	Selects the PUCCH Format type for all the PUCCH Slots when Format Couple is On.	
[::SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUCCh:FORMat:COUPle	Determines whether or not all the PUCCH Slots will use the Common Format value	
[::SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUCCh:N:ONE	Sets the N PUCCH (1) for all PUCCH Slots when Detection is Manual	
[::SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUCCh:N:ONE:COUPle	Determines whether or not all the PUCCH Slots will use the Common N PUCCH (1) value	
[::SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUCCh:N:TWO	Sets the N PUCCH(2) for all PUCCH Slots when Detection is Manual	
[::SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUCCh:NC S:ONE	Sets the $N_{CS}(1)$ for all PUCCH Slots when Detection is Manual	

Command	Description	Notes
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUCCh:NRB:TWO	Sets the $N_{RB(2)}$ for all PUCCH Slots when Detection is Manual	
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUCCh:OS	Sets the Orthogonal Sequence index for all the PUCCH Slots when OS Couple is On and Detection is Auto	
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUCCh:OS:COUPlE	Determines whether or not all the PUCCH Slots will use the Common OS value	
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUCCh:PW RBoost	Sets the Power Boost value for all the PUCCH Slots when Power Boost Couple is On and Auto Detect is Off	
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUCCh:PW RBoost:COUPlE	Determines whether or not all the PUCCH Slots will use the Common Power Boost value	
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUCCh:RB	User PUCCH First RB	
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUCCh:RB:COUPlE	Determines whether or not all the PUCCH Slots will use the Common First RB value.	

## Meas Setup

Command	Description	Notes
[::SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUCCh:SHIFt	Sets the PUCCH Shift for all PUCCH Slots when Detection is Manual	
[::SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUCCh:SLOT{0:19}:CSHift	Sets the Cyclic Shift for the selected PUCCH Slot	
[::SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUCCh:SLOT{0:19}:DELeTe/nquery/	Deletes the currently selected slot allocation and its paired slot allocation	
[::SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUCCh:SLOT{0:19}:DMRS:GRoup	Selects the DMRS Group for the selected PUCCH Slot	
[::SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUCCh:SLOT{0:19}:DMRS:PWRBoost	Sets the DMRS Power Boost value for the selected PUCCH Slot	
[::SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUCCh:SLOT{0:19}:FORMat	Selects the PUCCH Format type to be used for the selected PUCCH Slot	
[::SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUCCh:SLOT{0:19}:N:ONE	Sets the N PUCCH (1) value for the selected PUCCH Slot	
[::SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUCCh:SLOT{0:19}:OS	Sets the Orthogonal Sequence index for the selected PUCCH Slot	
[::SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUCCh:SLOT{0:19}:POSition?/qonly/	Queries the PUCCH slot start position	



Command	Description	Notes
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUCCh:SLOT{0:19}:PWRBoost	Sets the Power Boost value for the selected PUCCH Slot	
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUCCh:SLOT{0:19}:RB	Sets the First Resource Block for the selected PUCCH slot allocation	
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUCCh:SSLot	PUCCH Sync Slot	
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUCCh:SSLot:AUTO	PUCCH Sync Slot Auto	
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUSCh	Includes PUSCH in the results	
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUSCh:ACTIVE	Selects whether or not PUSCH exists in the input signal when Detection is Manual	
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUSCh:ADD:SLOT/nquery/	Adds a new allocation in the slot position specified, if available	
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUSCh:COUNT?/qonly/	This command returns the number of added PUSCH slots	
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUSCh:CTNB	Selects CURRENT_TX_NB when Detection is Manual	
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUSCh:CTNB:COUPLE	Determines whether or not all the PUSCH Slots will use the Common CURRENT_TX_NB value	

## Meas Setup

Command	Description	Notes
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUSCh:DMRS	Includes PUSCH DMRS in the results	
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUSCh:DMRS:CSHift	Sets the DMRS Cyclic Shift for all the PUSCH Slots when DMRS Cyclic Shift Couple is On and Detection is Manual	
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUSCh:DMRS:CSHift:COUPlE	Determines whether or not all the PUSCH Slots will use the Common DMRS Cyclic Shift value	
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUSCh:DMRS:GROUp	Sets the DMRS Group for all the PUSCH Slots when DMRS Group Couple is On and when Detection is Manual.	
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUSCh:DMRS:GROUp:COUPlE	Determines whether or not all the PUSCH Slots will use the Common DMRS Group value	
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUSCh:DMRS:ONE	Sets the value of $n_{\text{DMRS}}(1)$ used by the selected user mapping when Detection is Manual	

Command	Description	Notes
[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUSCh:DMRS:PARams	Determines if all DMRS parameters are common to all Slots or if they are to be defined on a per Slot basis when Detection is Manual	
[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUSCh:DMRS:PWRBoost	Sets the DMRS Power Boost value for all the PUSCH Slots when DMRS Power Boost Couple is On and Detection is Manual.	
[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUSCh:DMRS:PWRBoost:COUPle	Determines whether or not all the PUSCH Slots will use the Common DMRS Power Boost value	
[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUSCh:DMRS:SEQuence	Sets the DMRS Sequence ( $v$ ) for all the PUSCH Slots when DMRS Sequence Couple is On and when Detection is Manual. DMRS Sequence or $v$ , is the sequence number within the group and can take on values from 0 to $\text{floor}(N_{ZC}^{RS}/30) - 1$ , where $N_{ZC}^{RS}$ is the largest prime number less than $M_{SC}^{RS}$	

## Meas Setup

Command	Description	Notes
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUSCh:DMRS:SEQuence:COUPle	Determines whether or not all the PUSCH Slots will use the Common DMRS Sequence value	
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUSCh:DMRS:TWO	Sets the value of nDMRS(2) used by the selected user mapping when Detection is Manual	
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUSCh:DSS	Sets the value of Delta SS used by the selected user mapping when Detection is Manual	
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUSCh:FHO Pping	Selects the frequency hopping type or disables frequency hopping	
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUSCh:MO Dulation:TYPE	Selects the Modulation Type for all the PUSCH Slots when Mod Type Couple is On and Detection is Manual	
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUSCh:MO Dulation:TYPE:COUPle	Determines whether or not all the PUSCH Slots will use the Common Mod Type value	

Command	Description	Notes
[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUSCh:NRBHo	Sets the value of Hopping Offset ( $N_{RB}^{HO}$ ) when Detection is Manual. Hopping Offset is the offset used for PUSCH frequency hopping, expressed in number of resource blocks	
[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUSCh:NSB	Sets the number of sub-bands ( $N_{SB}$ ) when Detection is Manual	
[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUSCh:PW RBoost	Sets the Power Boost value for all the PUSCH Slots when Power Boost Couple is On and Detection is Manual	
[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUSCh:PW RBoost:COUPle	Determines whether or not all the PUSCH Slots will use the Common Power Boost value	
[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUSCh:RB: END	Sets the End Resource Block for all the PUSCH Slots when RB End Couple is On and when Detection is Manual.	

## Meas Setup

Command	Description	Notes
[[:SENSe]:CEVM:ULINk:PROFile:USER{1:50}:PUSCh:RB:END:COUPle	Determines whether or not all the PUSCH Slots will use the Common RB Start value	
[[:SENSe]:CEVM:ULINk:PROFile:USER{1:50}:PUSCh:RB:START	Sets the Start Resource Block for all the PUSCH Slots when RB Start Couple is On and when Detection is Manual	
[[:SENSe]:CEVM:ULINk:PROFile:USER{1:50}:PUSCh:RB:START:COUPle	Determines whether or not all the PUSCH Slots will use the Common RB Start value	
[[:SENSe]:CEVM:ULINk:PROFile:USER{1:50}:PUSCh:SLOT{0:19}:CTNB	Sets the CURRENT_TX_NB for the selected PUSCH Slot	
[[:SENSe]:CEVM:ULINk:PROFile:USER{1:50}:PUSCh:SLOT{0:19}:DELe/nquery/	Deletes the currently selected slot allocation	
[[:SENSe]:CEVM:ULINk:PROFile:USER{1:50}:PUSCh:SLOT{0:19}:DMRS:CSHift	Specifies the DMRS Cyclic Shift for the selected PUSCH Slot	
[[:SENSe]:CEVM:ULINk:PROFile:USER{1:50}:PUSCh:SLOT{0:19}:DMRS:GROup	Specifies the DMRS Group for the selected PUSCH Slot	
[[:SENSe]:CEVM:ULINk:PROFile:USER{1:50}:PUSCh:SLOT{0:19}:DMRS:PWRBoost	Sets the DMRS Power Boost value for the selected PUSCH Slot	

Command	Description	Notes
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUSCh:SLOT{0:19}:DMRS:SEquence	Specifies the DMRS Sequence (v) for the selected PUSCH. DMRS Sequence or v, is the sequence number within the group and can take on values from 0 to $\text{floor}(N_{ZC}^{RS}/30) - 1$ , where $N_{ZC}^{RS}$ is the largest prime number less than $M_{SC}^{RS}$	
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUSCh:SLOT{0:19}:MODulation:TYPE	Selects the Modulation Type for the selected PUSCH Slot	
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUSCh:SLOT{0:19}:POStion?/qonly/	Queries the PUSCH slot start position	
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUSCh:SLOT{0:19}:PWRBoost	Sets the Power Boost value for the selected PUSCH Slot	
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUSCh:SLOT{0:19}:RB:END	Sets the Stop Resource Block for the selected PUSCH Slot	
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUSCh:SLOT{0:19}:RB:START	Sets the Start Resource Block for the selected PUSCH Slot	
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUSCh:SSLot	Sets the Sync Slot for all PUSCH Slots when Detection is Manual	
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:PUSCh:SSLot:AUTO	PUSCH Sync Slot Auto	

## Meas Setup

Command	Description	Notes
[[:SENSe]:CEVM:ULINk:PROFile:USER{1:50}:RNTI	Sets uplink user's radio network temporary identifier	
[[:SENSe]:CEVM:ULINk:PROFile:USER{1:50}:SFNumber	Sets uplink user's System Frame Number when Detection is Man	
[[:SENSe]:CEVM:ULINk:PROFile:USER{1:50}:SRS	Includes S-RS in the results	
[[:SENSe]:CEVM:ULINk:PROFile:USER{1:50}:SRS:ACTive	Selects whether or not S-RS exists in the input signal when Detection is Manual	
[[:SENSe]:CEVM:ULINk:PROFile:USER{1:50}:SRS:BCONf ig	Sets S-RS Bandwidth Configuration ( $C_{SRS}$ ) when Detection is Manual	
[[:SENSe]:CEVM:ULINk:PROFile:USER{1:50}:SRS:BWIDt h	Sets S-RS Bandwidth ( $B_{SRS}$ ) when Detection is Manual. This parameter, along with $C_{SRS}$ , determines the values of $m_{SRS,b}$ and $N_b$	
[[:SENSe]:CEVM:ULINk:PROFile:USER{1:50}:SRS:CINDe x	Sets the S-RS Configuration Index ( $I_{SRS}$ ) when Detection is Manual	



Command	Description	Notes
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:SRS:CSHift	Sets S-RS Cyclic Shift when Detection is Manual. This value determines the cyclic shift of R-RS	
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:SRS:FDPosition	Sets the S-RS Frequency Domain Position ( $n_{RRC}$ ) when Detection is Manual	
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:SRS:HBWidth	Sets S-RS Hopping Bandwidth ( $b_{hop}$ ) when Detection is Manual	
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:SRS:PWRBoost	Sets S-RS Power Boost value when Detection is Manual	
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:SRS:SFConfig	Sets the value for <i>srsSubframeConfiguration</i> when Detection is Manual	
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:SRS:SSLot	Sets the S-RS Sync Slot when Detection is Manual	
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:SRS:SSLot:AUTO	S-RS Sync Slot Auto.	
[[:SENSe]:CEVM:ULINK:PROFile:USER{1:50}:SRS:TCOMB	Sets Transmission Comb ( $k_{TC}$ ) of S-RS when Detection is Manual	
[[:SENSe]:CEVM:ULINK:SYNC:CPLength	Cyclic Prefix Length	

## Meas Setup

Command	Description	Notes
[[:SENSe]:CEVM:ULINK:SYNC:HSSHift	Half Subcarrier Shift	
[[:SENSe]:CEVM:ULINK:SYNC:PDSWap	PUSCh DFT Swap	
[[:SENSe]:CEVM:ULINK:SYNC:TYPE	Sync Type	
[[:SENSe]:WINDow:LENGth	EVM Window Length	
[[:SENSe]:WINDow:LENGth:CUSTom	EVM Window Length Custom	

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## TDCDMa 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	

## Meas Setup

Command	Description	Notes
: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.
[: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.

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37023

### 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	

Help Map ID:	35229
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### Code Domain Power Meas Setup

The Code Domain Power measurement used in 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 mode.

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

## Meas Setup

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

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:NUMChannels?		Num channels		
:CALCulate:CDPower:THSDpcch		Time offset tHS-DPCCH		
:CALCulate:CDPower:DTXBurst		DTX/Burst Detect		
:CALCulate:CDPower:IQPhase:ROTation		TX Diversity IQ Axis Rotation		
:CALCulate:CDPower:SSLot:NUMBER		Synch Start Slot		
[:SENSe]:CDPower:SPECTrum		Spectral inversion		

## Meas Setup

Command		Description		Notes
: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		
[:SENSe]:CDPower:SSUPpress[:STATe]		SCH Suppression		

Key Path	Meas Setup
Help Map ID	35230



## 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.

## Meas Setup

Command		Description		Notes
[[: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
Help Map ID	0

### Phase Dicontinuity Meas Setup

The Slot Phase mode of UE Power Control measurement used in the W-CDMA mode 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		

Command		Description		Notes
[[:SENSe]:PCONtrol:FILTer[:RRC]:ALPHa		RRC Filter Alpha		RRC Filter Alpha value setting
[[:SENSe]:PCONtrol:CRATe		Chip Rate		
All the PRACH Power measurement 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 EXCLu de, select EXclude means to remove 25us(96chips) each end of the slot (or half-slot)

## Meas Setup

Key Path	Meas Setup
Help Map ID	35290

### Loopback BER Meas Setup

The Loopback BER measurement in the Sequencer involves the following measurements for different radio standards:

- GMSK Phase & Frequency measurement, used in the GSM mode for the GSM radio standard
- EDGE EVM measurement, used in the GSM mode for the EDGE radio standard
- Code Domain Power measurement, used in the W-CDMA mode for the W-CDMA radio standard
- Code Domain Power measurement, used in the TD-SCDMA mode for the TD-SCDMA radio standard

The Meas parameters usable within the List Sequencer measurement are listed below. For complete details of each parameter, see the online help associated with the relevant measurement modes.

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**

Command		Description		Notes
[:SENSe]:PFERror:BSYNc:SOURce		Burst Sync		

Key Path	Meas Setup
Help Map ID	35330

**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		

Key Path	Meas Setup
Help Map ID	35331

**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		

## Meas Setup

Command	Description	Notes
: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:CHANNELS?	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	

Command		Description		Notes
:CALCulate:CDPower:SEVM:FCOMpen		Frequency Compensation		
:CALCulate:CDPower:SEVM:PCOMpen		Phase Compensation		
:CALCulate :CDPower:SSUPpress[:STATe]		SCH Suppression		

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**NOTE** The parameters of Loopback BER measurement for WCDMA are the same as the parameters of WCDMA's Code Domain Power measurement.

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Key Path	Meas Setup
Help Map ID	35332

## Meas Setup

### 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.



Command		Description		Notes
[[: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.

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Key Path	Meas Setup
Help Map ID	37026

### 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.

Help Map ID:	0
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### 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?

Help Map ID:	0
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## Meas Setup

### 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?
```

Help Map ID:	0
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### 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?
```

Help Map ID:	0
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### 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?
```

Help Map ID:	0
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### 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?
```

Help Map ID:	0
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### 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
- GMSK/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?
```

Help Map ID:	0
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### 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.

## Meas Setup

The SCPI commands in Sequence Analyzer mode are:

```
[[:SENSe]:LSEQuencer:EDGE:SYNC:ALIGNment GSM|HBIT
```

```
[[:SENSe]:LSEQuencer:EDGE:SYNC:ALIGNment?
```

Help Map ID:	0
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### 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?
```

Help Map ID:	0
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### 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 ?
```

Help Map ID:	0
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### 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]?

Help Map ID:

0

### 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?

Help Map ID:

0

### 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?

Help Map ID:

0

### 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?

Help Map ID:

0

## Meas Setup

### TDSCDMA HSPA/8PSK Enable

HSPA/8PSK Enable setting for TDSCDMA mode. (This feature requires installation of the HSPA/8PSK option license.)

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]?
```

Help Map ID:	0
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### 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?
```

Help Map ID:	0
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### 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?
```

Help Map ID:	0
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### 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|TRIGGER
```

```
[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:SYNC?
```

Help Map ID:	0
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### 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?
```

Help Map ID:	0
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### 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?
```

Help Map ID:	0
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### 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.

## Meas Setup

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?
```

Help Map ID:	0
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### 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 ?
```

Help Map ID:	0
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### 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?
```

Help Map ID:	0
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### 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?

Help Map ID:

0

#### 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?

Help Map ID:

0

#### 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?

Help Map ID:

0

#### 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 PILot|MIDamble

[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:SREference?

Help Map ID:

0

## Meas Setup

### 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?
```

Help Map ID:	0
--------------	---

### TDSCDMA Demod – Mod Scheme

Modulation Scheme setting for TDSCDMA mode. (This setting can be made only if the HSPA/8PSK option license is installed and Enable HSPA/8PSK is ON; otherwise the value is fixed at AUTO.)

More Information about Mod Scheme:

- If the Mod Scheme is MAN, you must 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, only MAN mode is supported.

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?
```

Help Map ID:	0
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### 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?
```

Help Map ID:	0
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### TDSCDMA Demod – Channel Configuration

This set of commands allows you to specify the parameters for the channel. They 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
- Phase Shift Detection

### TDSCDMA 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?
```

Help Map ID:	0
--------------	---

### TDSCDMA 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?
```

Help Map ID:	0
--------------	---

### TDSCDMA Select Code Channel

Select Code Channel in Channel Configuration setting for TDSCDMA mode. The max value for the

## Meas Setup

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.

This is unavailable if Select All Code Channel is ON.

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?
```

Help Map ID:	0
--------------	---

### TDSCDMA Code Channel Status

Code Channel Status in Channel Configuration setting for TDSCDMA mode. This 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>
```

Help Map ID:	0
--------------	---

### TDSCDMA 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
```

Help Map ID:	0
--------------	---

### TDSCDMA 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>
```

Help Map ID:	0
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### TDSCDMA 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>
```

Help Map ID:	0
--------------	---

### TDSCDMA 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?
```

Help Map ID:	0
--------------	---

### 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
```

## Meas Setup

[[:SENSe]:LSEQuencer:TDSCdma:TDEMod:TREference?

Help Map ID:	0
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### 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?

Help Map ID:	0
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### 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?

Help Map ID:	0
--------------	---

### 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?

Help Map ID:

0

### 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?

Help Map ID:

0

### 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?

Help Map ID:

0

### 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?

Help Map ID:

0

### TDSCDMA Demod – Multi-Carrier Demod

Multi-Carrier Demod setting for TDSCDMA mode.

## Meas Setup

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?
```

Help Map ID:	0
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## Remote Setup

There are 3 ways of setting up the Sequence.

1. Using a TAB delimited file (usually exported from a spreadsheet) to input the Sequence setup in table format. The TAB delimited file can contain setup parameters for both the analyzer list sequencer and the source sequencer. Only the setup parameters which are specific to particular acquisitions or source steps can be loaded in via this method; measurement setup parameters and other parameters which apply broadly to the sequence as a whole are set via the front panel or remote SCPI commands.
2. Implementing the sequence directly, using front panel keys or remote SCPI commands.
3. Using Agilent 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 separated value file (TSV). 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 two tables (with the analyzer table placed first).

The recommended method of producing a TSV file is to enter the values in a spreadsheet and export the spreadsheet contents as a TSV file. The spreadsheet can be customized with dropdown selectors for fields which are limited to a finite list of possible settings (for example, a field which contains the name



of the radio standard to be used).

A sequence spreadsheet template file, which can be copied and used as a basis for setting up sequences, is provided with the test set, in this directory:

C:\Program Files\Agilent\SignalAnalysis\Infrastructure\Help\otherdocs

An example of a spreadsheet is shown below.

## Meas Setup

### 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).

A	B	C	D	E	F	G	H	I
#AcqNumber	Radio Standard	Radio Band	Device	Freq(MHz)/ Chan	Number of Averages	Peak Power (dBm)	Inst Gain Type	Transition Time(ms)
###								
1	CDMA1XEV	USCELL	MS	722	1	0	ZERO	.5

J	K	L	M	N	O	P	Q	R
Acquisition Duration(ms)	Input Trigger Type	Input Trigger Level	Input Trigger Delay (ms)	Acquisition Output Trigger	Inst Gain LOw value (dB)	Multiport Adptr Input Port	Multiport Adapter Preamp	Acquisition Integration
0.72	VIDeo	-10	0	INTERNAL	-20	OFF	OFF	NORMAL

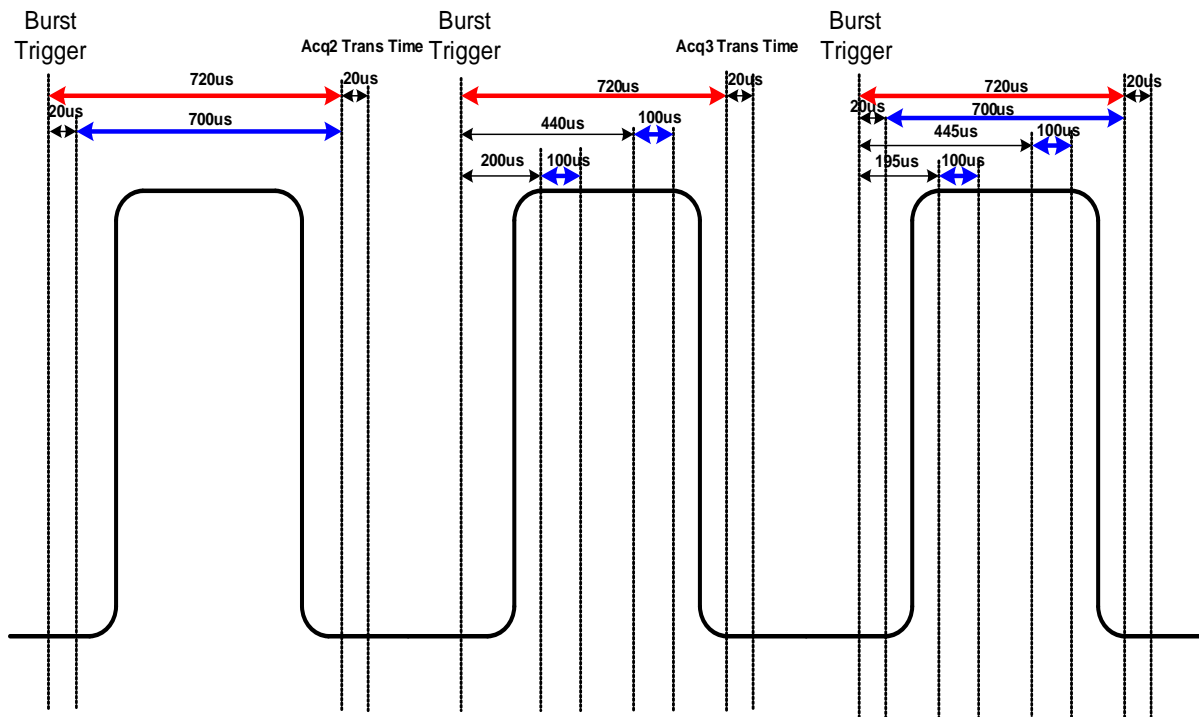
The fields required for the analysis interval (a “blue bar”) are shown in the example spreadsheet below.

S	T	U	V	W
Analysis Step Number	Analysis Step Offset(ms)	Analysis Step Interval (ms)	Measurement Bitmap	Exp Power at DUT Output (dBm)
1	0.02	0.7	7	-5

The full width of the spreadsheet is illustrated below.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	
#AcqNumber	Radio Standard	Radio Band	Device	Freq(MHz)/ Chan	Number of Averages	Peak Power (dBm)	Inst Gain Type	Transition Time(ms)	Acquisition Duration(ms)	Input Trigger Type	Input Trigger Level	Input Trigger Delay (ms)	Acquisition Output Trigger	Inst Gain LOw value (dB)	Multiport Adptr Input Port	Multiport Adapter Preamp	Acquisition Integration	Analysis Step Number	Analysis Step Offset(ms)	Analysis Step Interval (ms)	Measurement Bitmap	Exp Power at DUT Output (dBm)	
###																							
1	CDMA1XEV	USCELL	MS	722	1	0	ZERO	.5	0.72	VIDeo	-10	0	INTERNAL	-20	OFF	OFF	NORMAL	1	0.02	0.7	7	-5	
2	CDMA2K	SECOND	MS	1056	5	0	LOW	.5	0.72	VIDeo	-10	0	INTERNAL	-15	OFF	OFF	NORMAL	1	0.02	0.1	1025	-5	
																			2	0.44	0.1	1025	-5
3	GSM	PGSM	MS	8	1	0	ZERO	.5	0.72	VIDeo	-10	0	INTERNAL	-15	OFF	OFF	NORMAL	1	0.02	0.7	88	-5	
																			2	0.195	0.1	88	-5
																			3	0.445	0.1	88	-5

For a description of each column, look up the relevant parameter in “Meas Setup” on page 407.



In this case there are three RF bursts, and different sets of acquisition parameters are needed for them, so they are covered by three separate acquisitions. The acquisitions are shown here as red bars.

The first acquisition has one Analysis interval within it (shown as a blue 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 619 for more details on limits.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
Wave Number	Radio Standard	Radio Band	Device	Freq (MHz) Chan	Number of Bursts	Pre-Proc Filter	Int (Gain Type)	Transition (Transition)	Resolution (Resolution)	Input Trigger Level	Post Trigger Delay (ns)	Acquisition Delay (ns)	Int (Gain Type)	Int (Gain Type)	Int (Gain Type)	Int (Gain Type)	Int (Gain Type)	Analysis Step Number	Analysis Step Delay (ns)	Analysis Step Width (ns)	Resolution (Resolution)	Eq. Power or DUT Output (dBm)
1	CDMA1XEV	USCELL	MS	722	1	0	ZERO	S	0.72	VIDeo	-10	0	Internal	-20	OFF	OFF	NORMu	1	0.02	0.7	7	S
2	CDMA2K	SECOND	MS	1058	5	0	LOW	S	0.72	VIDeo	-10	0	Internal	-15	OFF	OFF	NORMu	1	0.02	0.1	1025	S
																		2	0.44	0.1	1025	S
3	CDM	POSM	MS	8	1	0	ZERO	S	0.72	VIDeo	-10	0	Internal	-15	OFF	OFF	NORMu	1	0.02	0.7	68	S
																		2	0.195	0.1	68	S
																		3	0.445	0.1	68	S

For a description of each column see the equivalent parameter in “Meas Setup Parameters” on page 407.

The start of the analyzer sequence in the TSV file is indicated by the row:

### Analyzer ###

## Meas Setup

### EXT Source Table

The start of the source sequence in the TSV file is indicated by the row:

```
### Source ###
```

The fields required for a source setp are shown in the example spreadsheet below.

#Step Number	Step Trigger	Transition Time(ms)	Radio Band	Radio Band Link	Freq(MHz)Chan	Power(dBm)	Waveform	Step Duration	Time(ms)Count	Output Trigger
### Source ###										
1	INTernal	1	USCELL	DOWN	722	-55	t01.wav	TIME	4.62	OFF

### Excel Spreadsheet

A sequence spreadsheet template file, which can be copied and used as a basis for setting up sequences, is provided with the test set, in this directory:

C:\Program Files\Agilent\SignalAnalysis\Infrastructure\Help\otherdocs

### Drop down lists

These dropdown selectors in the spreadsheet template provide valid entries for the following analyzer list sequencer parameters:

- Radio Standard
- Radio Band
- Device
- Instrument Gain Type
- Input Trigger Type
- Acquisition Output Trigger
- Multiport Adapter Input Port
- Multiport Adapter Preamp
- Acquisition Integration

These dropdown selectors in the spreadsheet template provide valid entries for the following source list sequencer parameters:

- Radio Band
- Radio Band Link
- Waveform
- Step Duration
- Output Trigger

Refer to the Sequence Analyzer Measurement Guide and the Source User's Guide for more information about sequence parameters.

### Programming Acquisitions Via SCPI

The SCPI command used to configure the Acquisition and Analysis Meas Setup parameters is detailed in the table below. 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 619.

### Acquisition Setup using SCPI

Key Path	SCPI only
<b>Remote Command</b>	<pre>[ :SENSe ] :LSEQuencer:ACQuire [1]   2   3   4 . . . 512 :SETup NONE   GSM   EDGE   WCDMA   CDMA2K   CDMA1XEV   LTE, NONE   PGSM   EGSM   RGSM   DCS1800   PCS1900   TGSM810   GSM450   GSM480   GSM850   GSM700   BANDI   BANDII   BANDIII   BANDIV   BANDV   BANDVI   BANDVII   BANDVIII   BANDIX   BANDX   BANDXI   BANDXII   BANDX III   BANDXIV   USCELL   USPCS   JAPAN   KOREAN   NMT   IMT2K   UPPER   SECOND   PAMR400   PAMR800   IMTEXT   USPCS1DOT9G   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   BAND33   BAND34   BAND35   BAND36   BAND37   BAND38   BAND39   BAND40   BAND41   BAND42   BAND43   BANDA   BANDB   BANDC   BANDD   BANDE   BANDF, BTS   MS, &lt;real&gt;, &lt;integer&gt;, &lt;ampl&gt;, LOW   ZERO   HIGH, &lt;time&gt;, &lt;time&gt;, IMMEDIATE   VIDEO   INTERNAL   EXT1   EXT2, &lt;amptd&gt;, &lt;time&gt;, NONE   INT, &lt;relative ampl&gt;, OFF   RFIO0   RFIO1   RFIO2   RFIO3   RFIO4   RFIO5   RFIO6   RFIO7, ON   OFF, NORMAl   PRIMary   LOWer   UPPer   RANGE  [ :SENSe ] :LSEQuencer:ACQuire [1]   2   3   4 . . . 512 :SETup?</pre>
<b>Example</b>	<pre>:LSEQ:ACQ1 GSM, PGSM, MS, 10, 10, 0dB, LOW, 5ms, 50ms, VID, -10dBm, 0, NONE, -20, RFIO0, ON, NORM :LSEQ:ACQ1?</pre>

## Meas Setup

Notes	<p>The parameters are:</p> <p><b>&lt;enum&gt;</b> - specifies the Radio Standard for the Acquisition.</p> <p><b>&lt;enum&gt;</b> - specifies the Radio Band for the Acquisition.</p> <p><b>&lt;enum&gt;</b> - specifies the DeviceType for the Acquisition.</p> <p><b>&lt;real&gt;</b> - 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.</p> <p><b>&lt;integer&gt;</b> - specifies the Number of Averages for the Acquisition.</p> <p><b>&lt;ampl&gt;</b> - specifies the peak expected power in dB for the Acquisition.</p> <p><b>&lt;enum&gt;</b> - specifies the Instrument Gain Type for the Acquisition.</p> <p><b>&lt;time&gt;</b> - specifies the Transition Time for the Acquisition.</p> <p><b>&lt;time&gt;</b> - specifies the Duration of the Acquisition.</p> <p><b>&lt;enum&gt;</b> - specifies the Input Trigger Type for the Acquisition.</p> <p><b>&lt;ampl&gt;</b> - specifies the Input Trigger Level for the Acquisition.</p> <p><b>&lt;time&gt;</b> - specifies the Input Trigger Delay for the Acquisition.</p> <p><b>&lt;enum&gt;</b> - specifies the Output Trigger for the Acquisition.</p> <p><b>&lt;relative ampl&gt;</b> - specifies the dB value of Instrument Gain when Instrument Gain Type is set to LOW. 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> <p><b>&lt;enum&gt;</b> - specifies the step Multiport Adapter Input path selection for the Acquisition.</p> <p><b>&lt;enum&gt;</b> - specifies the step Multiport Adapter Preamplify On/Off state for the Acquisition.</p> <p><b>&lt;enum&gt;</b> - specifies the specify the Acquisition Integration (for frequency span extension or dynamic range extension) of the Acquisition.</p>
Dependencies	<p>The range of sub op code values is determined by the number of Acquisitions you have configured.</p> <p>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
Help Map ID	35231

## Analysis Step Setup

Key Path	<b>SCPI only</b>
<b>Remote Command</b>	[ :SENSE] :LSEQuencer:ACQuire [1]   2   3   4 . . 512 :ASTep [1]   2   3   4...1000:SETUp <time>, <time>, <integer>, <ampl>
Example	:LSEQ:ACQ1:ASTEPI:SETUp 20,20,1, -10 :LSEQ:ACQ1:ASTEPI:SETUp?
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
Help Map ID	35232

## 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).

## Meas Setup

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.



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## 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 622](#)

Key Path:	<b>Front-panel key</b>
<b>Remote Command:</b>	:INSTrument [:SElect] SEQAN BASIC WCDMA EDGEgSM WIMAXOFDMA ADEMOD BT00th TDSC DMA CDMA2K CDMA1XEV LTE LTETDD  :INSTrument [:SElect] ?
Example:	INST SEQAN
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:	Not affected by Preset.  In the EXT, the mode set by Restore System Defaults is the Sequence Analyzer mode.
State Saved:	Saved in instrument state
Backwards Compatibility SCPI:	:INSTrument[:SElect] GSM  provided for backwards compatibility. Mapped to EDGEgSM.
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.

## 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.10.01
Help Map ID:	2670

Example:	INST 'SEQAN'?
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] 'GSM' 'BASIC'
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	0

### More Information

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 test set. 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 test set 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 test set program (xSA.exe) is shut down.

Agilent 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:

Close and restart the test set program without changing your configured preloads. This may free up enough memory to load the requested Mode, depending on your configured preloads

Clear out all preloads and close and restart the test set 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.

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 test set program with your new configuration). This is the recommended choice because it gives you full flexibility to select exactly what you want.

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 test set 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, BASIC for IQ Analyzer Mode.

### 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 628](#) 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
802.16 OFDMA (WiMAX/WiBro)	75	WIMAXOFDMA
Analog Demod	234	ADEMOD
Bluetooth	228	BTtooth

## Mode

Mode	Mode Number	Mode Parameter
TD-SCDMA with HSPA/8PSK	211	TDSCDMA
cdma2000	10	CDMA2K
1xEV-DO	15	CDMA1XEV
LTE	102	LTE
LTE TDD	105	LTETDD

<b>Remote Command:</b>	:INSTRument:NSElect <integer> :INSTRument:NSElect?
Example:	:INST:NSEL 1
Notes:	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 following Restore System Defaults.
State Saved:	Saved in instrument state
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	0

## 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.

<b>Remote Command:</b>	:INSTRument:CATalog?
Example:	:INST:CAT?
Notes:	Query returns a quoted string of the installed and licensed modes separated with a comma. Example: "BASIC,EDGE GSM,CDMA"
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","EDGE GSM","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: "BASIC,CDMA,CDMA2K,WCDMA,CDMA1XEV,EDGE GSM,GSM,TDS CDMA,DMODULATION,WLAN"

Initial S/W Revision:	Prior to A.02.00
Help Map ID:	0

### 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 625](#)

[“Current Application Revision” on page 625](#)

[“Current Application Options” on page 626](#)

### Current Application Model

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

<b>Remote Command:</b>	: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
Help Map ID:	0

### Current Application Revision

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

<b>Remote Command:</b>	:SYSTem:APPLication[:CURRent] :REVersion?
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)

## Mode

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
Help Map ID:	0

### Current Application Options

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

<b>Remote Command:</b>	: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
Help Map ID:	0

### 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 626](#)

[“Application Catalog Revision” on page 627](#)

[“Application Catalog Options” on page 627](#)

### Application Catalog Number of Entries

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

<b>Remote Command:</b>	: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

Help Map ID:	0
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### Application Catalog Model Numbers

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

<b>Remote Command:</b>	: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
Help Map ID:	0

### Application Catalog Revision

Returns the Revision of the provided Model Number.

<b>Remote Command:</b>	: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
Help Map ID:	0

### Application Catalog Options

Returns a list of Options for the provided Model Number

<b>Remote Command:</b>	:SYSTem:APPLication:CATalog:OPTion? <model>
Example:	:SYST:APPL:CAT:OPT? 'N9060A'

## Mode

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
Help Map ID:	0

### 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:	<b>Mode</b>
Example:	INST:SEL CDMA1XEV INST:NSEL 15
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3566

#### 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:	<b>Mode</b>
Example:	INST:SEL WIMAXOFDMA INST:NSEL 75



Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3531

### 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:	<b>Mode</b>
Example:	INST:SEL ADEMOM INST:NSEL 234
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3529

### 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:	<b>Mode</b>
Example:	INST:SEL BT INST:NSEL 228
Initial S/W Revision:	A.06.01
Help Map ID:	30035

### 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:	<b>Mode</b>
Example:	INST:SEL CDMA2K INST:NSEL 10
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3533

## Mode

### 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:	<b>Mode</b>
Example:	INST:SEL EDGEGSM INST:NSEL 13
Initial S/W Revision:	Prior to A.02.00
Modified at S/W Revision:	A.02.00
Help Map ID:	3532

### IQ Analyzer (Basic)

The IQ Analyzer Mode makes general purpose frequency domain and time domain measurements. These measurements often use alternate hardware signal paths. 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:	<b>Mode</b>
Example:	INST:SEL BASIC INST:NSEL 8
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3526

### 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:	<b>Mode</b>
Example:	INST:SEL LTE INST:NSEL 102
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3586

**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:	<b>Mode</b>
Example:	INST:SEL LTETDD INST:NSEL 105
Initial S/W Revision:	A.03.00
Help Map ID:	44220

**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:	<b>Mode</b>
Example:	INST:SEL SEQAN INST:NSEL 400
Initial S/W Revision:	A.05.01
Help Map ID:	30033

**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:	<b>Mode</b>
Example:	INST:SEL TDSCDMA INST:NSEL 211
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3534

## Mode

### 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:	<b>Mode</b>
Example:	INST:SEL WCDMA INST:NSEL 9
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3530

### Global Settings

Opens up 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:	<b>Front Panel Key</b>
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	4003

### 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 which 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:	<b>Mode Setup, Global Settings</b>
Scope:	Mode Global

<b>Remote Command:</b>	: 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
Help Map ID:	4009

<b>Remote Command:</b>	: GLOBal : FREQuency : CENTer [ : STATE ] 1   0   ON   OFF : GLOBal : FREQuency : CENTer [ : STATE ] ?
Preset:	Off
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	0

### 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:	<b>Mode Setup, Global Settings</b>
<b>Remote Command:</b>	: INStRument : COUPle : DEFault
Example:	INST:COUP:DEF
Backwards Compatibility SCPI:	: GLOBal : DEFault
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	4010

Mode

---

## Mode Setup

There are no Mode Setup parameters in the Sequence Analyzer. All parameters are set up in the List Sequencer measurement.

Key Path	Front-panel key
Help Map ID	4001

## Mode Setup



---

## Peak Search

This function is not supported in the Sequence Analyzer mode.

## Peak Search

---

## Recall

Most of the functions under this key work the same way in many measurements, so they are documented in “Recall” on page 112.[Proc\_iFrame:2637@]

The Amplitude Correction Import Data function under Recall is documented here.

### 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 softkey.

A set of preloaded Corrections files can be found in the directory

/My Documents/ EMC Limits and Ampcor.

Under this directory, the directory called Ampcor (Legacy Naming) contains a set of legacy corrections files, generally the same files that were supplied with older Agilent EMI analyzers, that use the legacy suffixes .ant, .oth, .usr, and .cbl, and the old 8-character file names. In the directory called Ampcor, the same files can be found, with the same suffixes, but with longer, more descriptive filenames.

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:	<b>Recall</b>
Mode:	EDGE GSM
<b>Remote Command:</b>	:MMEMory:LOAD:CORRection 1 2 3 4 5 6, <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 My Documents\amplitudeCorrections.

## Recall

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 test set 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 ( <b>Correction ON</b> ) and <b>Apply Corrections</b> is set to On. This allows the user to see its effect, thus confirming the load.
Readback:	selected Correction
Backwards Compatibility SCPI:	<p>:MMEMory:LOAD:CORRection ANTenna CABLE OTHer USER, &lt;filename&gt;</p> <p>For backwards compatibility, ANTenna maps to 1, CABLE maps to 2, OTHER maps to 3 and USER maps to 4</p>
Initial S/W Revision:	A.02.00
Help Map ID:	2649

### 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:	<b>Recall, Data, Amplitude Correction</b>
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
Help Map ID:	2650

### Multiport Adapter Amplitude Correction

This key selects the Multiport Adapter 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 softkey.

A set of preloaded Corrections files can be found in the directory

/My Documents/ EMC Limits and Ampcor.

Under this directory, the directory called Ampcor (Legacy Naming) contains a set of legacy corrections files, generally the same files that were supplied with older Agilent EMI analyzers, that use the legacy suffixes .ant, .oth, .usr, and .cbl, and the old 8-character file names. In the directory called Ampcor, the same files can be found, with the same suffixes, but with longer, more descriptive filenames.

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:	<b>Recall, Data, Amplitude Correction</b>
Mode:	SA EDGE GSM PN
<b>Remote Command:</b>	:MMEMory:LOAD:MPADapter:CORRection 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16, <filename>.
Example:	:MMEM:LOAD:MPAD:CORR 2 "myAmpcor.csv" recalls the Multiport Adapter Amplitude Correction data from the file myAmpcor.csv in the current directory to the 2nd Multiport Adapter Amplitude Correction table, and turns on MPA Correction 2.  The default path is My Documents\amplitudeCorrections.

## Recall

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> <p>If the file is empty, message –250.3005 is reported. If the file does not exist message –256 is reported. If there is a mismatch between the file and the destination data type, an message is reported. –250.3003. See error list in the X-series Messaging document for the exact error text.</p>
Couplings:	When a correction file is loaded from mass storage, it is automatically turned on ( <b>Correction ON</b> ) and <b>Apply Corrections</b> is set to On. This allows the user to see its effect, thus confirming the load.
Readback:	selected Correction
Backwards Compatibility SCPI:	<p>For backwards compatibility, the following parameters syntax is supported:</p> <pre>:MMEMory:LOAD:MPADapter:CORRection ANTenna CABLe OTHer USER, &lt;filename&gt;</pre> <p>ANTenna maps to 1, CABLe maps to 2, OTHer maps to 3 and USER maps to 4</p>
Initial S/W Revision:	A.10.00
Help Map ID:	0

### Multiport Adapter Amplitude Correction 1,2,3,4,5,6,7,8,9,10,11,~,15,16

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 Multiport Adapter 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:	<b>Recall, Data, Amplitude Correction, Multiport Adptr Correction</b>
Notes:	auto return

Dependencies:	Only Multiport Adapter 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.10.00
Help Map ID:	0

## Recall



## 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

Key Path:	<b>Front-panel key</b>
<b>Remote Command:</b>	: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 <b>Restart</b> hardkey and the INITiate:RESTART command restart trace averages (displayed average count reset to 1) for a trace in <b>Clear Write</b> , but did not restart <b>Max Hold</b> and <b>Min Hold</b> .  In the X-Series, the <b>Restart</b> hardkey and the INITiate:RESTART command restart not only <b>Trace Average</b> , but <b>Max Hold</b> and <b>Min Hold</b> traces as well.  For wireless comms modes in ESA and PSA, the <b>Restart</b> 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
Help Map ID:	3307

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

## Restart

a new data acquisition (sweep) taken once the trigger condition is met.

If the test set 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 test set 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 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 test set 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

Most of the functions under this key work the same way in many measurements, so they are documented in “Save” on page 125.[Proc\_iFrame:2600@]

The Amplitude Correction function under Save is documented here.

### 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.

Key Path:	<b>Save</b>
<b>Remote Command:</b>	: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
Help Map ID:	2612

### Correction Data File

A Corrections Data File contains a copy of one of the test set correction tables. Corrections provide a

**Save**

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
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)

Line #	Type of field	Example	Notes
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 test set. 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 test set 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

## Save

- 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

### Multiport Adapter Amplitude Correction

Pressing this key selects **Multiport Adapter 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 **Multiport Adapter Amplitude Correction** to save.

Amplitude Corrections are fully discussed in the documentation of the Input/Output key, under the Corrections softkey.

Key Path:	<b>Save, Data, Amplitude Correction</b>
Remote Command:	:MMEMory:STORe:MPADapter:CORRection 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16, <filename>
Example:	:MMEM:STOR:MPAD:CORR 2 "myAmpcor.csv" saves Multiport Adapter 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:	For backwards compatibility only, the following parameters syntax is supported: :MMEMory:STORe:MPADapter:CORRection ANTenna CABLe OTHer USER, <filename>  ANTenna maps to 1, CABLe maps to 2, OTHer maps to 3 and USER maps to 4
Initial S/W Revision:	A.10.00
Help Map ID:	0

### 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"	45 characters max; may be empty but may not be omitted. If exceeds 45 characters, error -233 Too much data reported
3	Comment (in quotes)	"Class B Radiated"	45 characters max; may be empty but may not be omitted. . If exceeds 45 characters, error -233 Too much data reported
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

## Save

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

### **Multiport Adapter Amplitude Correction 1,2,3,4,5,6,7,8,9,10,11,~,15,16**

These keys let you pick 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:	<b>Save, Data, Amplitude Correction, Multiport Adptr Correction</b>
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.10.00
Help Map ID:	0

Save

## Single (Single Measurement/Sweep)

Sets the test set 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.

Key Path:	<b>Front-panel key</b>
Example:	:INIT:CONT OFF
Notes:	See <b>Cont</b> key description.
Backwards Compatibility Notes:	<p>For Spectrum Analysis mode in ESA and PSA, the <b>Single</b> 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 <b>Max Hold</b> and <b>Min Hold</b>. In the X-Series, the <b>Single</b> hardkey and the INITiate:IMM command initiate a sweep/ measurement/ average sequence/hold sequence including <b>Max Hold</b> and <b>Min Hold</b>.</p> <p>For Spectrum Analysis mode in ESA and PSA, the <b>Single</b> hardkey restarted the sweep regardless of whether or not you were in an active sweep or sweep sequence. In the X-Series, <b>Restart</b> does this but <b>Single</b> only restarts the sweep or sweep sequence if you are in the idle state.</p>
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3515

Single (Single Measurement/Sweep)

## Source (Internal)

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:	<b>Front-panel key</b>
Help Map ID:	35360

## RF Output

This parameter sets the source RF power output state.

Key Path:	<b>Source</b>
<b>Remote Command:</b>	:OUTPut [:EXTErnal] [:STATe] ON OFF 1 0 :OUTPut [:EXTErnal] [:STATe] ?
Example:	OUTP OFF OUTP?
Notes:	This setting is for the independent mode and has no effect on the <a href="#">“List Sequencer” on page 746</a> . If the <a href="#">“Sequencer” on page 747</a> 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.  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 <a href="#">“Sequencer” on page 747</a> 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.
Preset:	Off
Range:	On   Off
Initial S/W Revision:	A.05.00
Help Map ID:	35361

## Amplitude

Allows you to access the Amplitude sub-menu.

Key Path:	<b>Source</b>
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## Source (Internal)

Notes:	The sub-menu under this button is for independent mode and has no effect on “List Sequencer” on page 746. If the “Sequencer” on page 747 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 747 to Off will make source leave list sequencer and this button will be black out.
Initial S/W Revision:	A.05.00
Help Map ID:	35362

## 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 659 table below for the valid ranges.

Key Path:	<b>Source, Amplitude</b>
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>
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 659 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 659 table below for the valid ranges.
Initial S/W Revision:	A.05.00
Help Map ID:	35363

### RF Power Range

RF Output Port	Frequency Range	Min Output Power	Max Output Power
High Power RF Out	10 MHz ≤ f ≤ 6 GHz	-130 dBm	20 dBm
RFIO 1 & RFIO 2	10 MHz ≤ f ≤ 6 GHz	-130 dBm	0 dBm

### 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:

Output power = reference power 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.

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#### 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.

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## Source (Internal)

Key Path:	<b>Source, Amplitude</b>
Dependencies:	This key is unavailable, and is grayed out when the “List Sequencer” on <a href="#">page 746</a> is turned ON.
Initial S/W Revision:	A.05.00
Help Map ID:	35364

## 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:

Output power = reference power + 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 659](#)

Key Path:	<b>Source, Amplitude</b>
<b>Remote Command:</b>	: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 <a href="#">page 746</a> is turned ON.
Couplings:	This value is coupled to the “Set Reference Power ” on <a href="#">page 659</a> 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



Help Map ID:

35365

**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:	<b>Source, Amplitude</b>
<b>Remote Command:</b>	: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
Help Map ID:	35366

**ALC**

Allows you to enable or disable the automatic leveling control (ALC) circuit.

The purpose of the ALC circuit is to hold output power at a desired level by adjusting the source's power

## Source (Internal)

circuits to compensate for power drift. Power drift occurs over time and changes in temperature.

Turning the ALC off disables the ALC circuitry, enabling you to measure the output at a specific point in a test setup and adjust as required for the desired power level at that point. Turning the ALC off is useful when the modulation consists of very narrow pulses that are below the pulse width specification of the ALC, or when the modulation consists of slow amplitude variations that the automatic leveling would remove.

Key Path:	<b>Source, Amplitude</b>
<b>Remote Command:</b>	:SOURce:POWer:ALC[:STATe] ON OFF 1 0 :SOURce:POWer:ALC[:STATe] ?
Example:	SOUR:POW:ALC OFF SOUR:POW:ALC?
Preset:	On
Range:	On   Off
Initial S/W Revision:	A.05.00
Help Map ID:	35367

## Modulation

Allows you to toggle the state of the modulation.

Key Path:	<b>Source</b>
<b>Remote Command:</b>	: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 <a href="#">“List Sequencer” on page 746</a> . If the <a href="#">“Sequencer” on page 747</a> 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 <a href="#">“Sequencer” on page 747</a> 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

Help Map ID:	35373
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## Frequency

Allows you to access the Frequency sub-menu.

Key Path:	<b>Source</b>
Notes:	The sub-menu under this button is for independent mode and has no effect on “List Sequencer” on page 746. If the “Sequencer” on page 747 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
Help Map ID:	35374

## 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:	<b>Source, Frequency</b>
<b>Remote Command:</b>	: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
Min:	10.00 MHz
Max:	Hardware Dependant: Option 503 = 3.6 GHz Option 504 = 3.8 GHz
Initial S/W Revision:	A.05.00
Help Map ID:	35375

## Source (Internal)

### 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 665, “[W-CDMA Channel Number Ranges](#)” on page 665, “[CDMA 2000 / 1xEVDO Channel Number Ranges](#)” on page 668, “[LTE FDD Channel Number Ranges](#)” on page 670, “[LTE TDD Channel Number Ranges](#)” on page 671, and “[TDSCDMA Channel Number Ranges](#)” on page 672.

Key Path:	<b>Source, Frequency</b>
<b>Remote Command:</b>	:SOURce:FREQuency:CHANnels:NUMBer <int> :SOURce:FREQuency:CHANnels:NUMBer?
Example:	SOUR:FREQ:CHAN:NUMB 1
Notes:	This key is grayed out when the “ <a href="#">Radio Standard</a> ” on page 673 is set to NONE.
Dependencies:	This key is grayed out when the “ <a href="#">Radio Standard</a> ” on page 673 is set to NONE.
Couplings:	The channel number is coupled to the frequency value when the “ <a href="#">Radio Standard</a> ” on page 673 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
Help Map ID:	35376

**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)	$306 \leq n \leq 340$	$479.000 + 0.20*(n-306)$
	Downlink (BS)	$306 \leq n \leq 340$	$489.000 + 0.20*(n-306)$
GSM 850	Uplink (MS)	$128 \leq n \leq 251$	$824.200 + 0.20*(n-128)$
	Downlink (BS)	$128 \leq n \leq 251$	$869.200 + 0.20*(n-128)$
GSM 700	Uplink (MS)	$438 \leq n \leq 516$	$777.200 + 0.20*(n-438)$
	Downlink (BS)	$438 \leq n \leq 516$	$747.200 + 0.20*(n-438)$
T-GSM810	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	$9612 \leq n \leq 9888$	$n \div 5$

Source (Internal)

Band	Link (Device)	Range	Frequency (MHz)
Band II	Downlink	$412 \leq n \leq 687$ $9662 \leq n \leq 9938$	$n+5 + 1850.1$ $n+5$
	Uplink	$12 \leq n \leq 287$ $350 \leq n \leq 425$	$n+5 + 1850.1$ $n+5$
Band III	Downlink	$1162 \leq n \leq 1513$	$n+5 + 1575$
	Uplink	$937 \leq n \leq 1288$	$n+5 + 1525$
Band IV	Downlink	$537 \leq n \leq 1738$ $1887 \leq n \leq 2087$	$n+5 + 1805$ $n+5 + 1735.1$
	Uplink	$1312 \leq n \leq 1513$ $1662 \leq n \leq 1862$	$n+5 + 1450$ $n+5 + 1380.1$
Band V	Downlink	$1007 \leq n \leq 1087$ $4357 \leq n \leq 4458$	$n+5 + 670.1$ $n+5$
	Uplink	$782 \leq n \leq 862$ $4132 \leq n \leq 4233$	$n+5 + 670.1$ $n+5$
Band VI	Downlink	$1037 \leq n \leq 1062$ $4387 \leq n \leq 4413$	$n+5 + 670.1$ $n+5$
	Uplink	$812 \leq n \leq 837$ $4162 \leq n \leq 4188$	$n+5 + 670.1$ $n+5$
Band VII	Downlink	$2237 \leq n \leq 2563$ $2587 \leq n \leq 2912$	$n+5 + 2175$ $n+5 + 2105.1$
	Uplink	$2012 \leq n \leq 2338$ $2362 \leq n \leq 2687$	$n+5 + 2100$ $n+5 + 2030.1$
Band VIII	Downlink	$2937 \leq n \leq 3088$	$n+5 + 340$
	Uplink	$2712 \leq n \leq 2863$	$n+5 + 340$
Band IX	Downlink	$9237 \leq n \leq 9387$	$n+5$
	Uplink	$8762 \leq n \leq 8912$	$n+5$
Band X	Downlink	$3112 \leq n \leq 3388$ $3412 \leq n \leq 3687$	$n+5 + 1490$ $n+5 + 1430.1$
	Uplink	$2887 \leq n \leq 3163$ $3187 \leq n \leq 3462$	$n+5 + 1135$ $n+5 + 1075.1$

Band	Link (Device)	Range	Frequency (MHz)
Band XI	Downlink	$3712 \leq n \leq 3812$	$n+5 + 736$
	Uplink	$3487 \leq n \leq 3587$	$n+5 + 733$
Band XII	Downlink	$3837 \leq n \leq 3903$	$n+5 - 37$
		$3927 \leq n \leq 3992$	$n+5 - 54.9$
	Uplink	$3612 \leq n \leq 3678$	$n+5 - 22$
		$3702 \leq n \leq 3767$	$n+5 - 39.9$
Band XIII	Downlink	$4017 \leq n \leq 4043$	$n+5 - 55$
		$4067 \leq n \leq 4092$	$n+5 - 64.9$
	Uplink	$3792 \leq n \leq 3818$	$n+5 + 21$
		$3702 \leq n \leq 3767$	$n+5 - 39.9$
Band XIV	Downlink	$4117 \leq n \leq 4143$	$n+5 - 63$
		$4167 \leq n \leq 4192$	$n+5 - 72.9$
	Uplink	$3892 \leq n \leq 3918$	$n+5 + 12$
		$3942 \leq n \leq 3967$	$n+5 + 2.1$

## 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)	$1 \leq N \leq 799$	$0.030 * N + 870.000$
		$991 \leq N \leq 1023$	$0.030 \times (N - 1023) + 870.000$
		$1024 \leq N \leq 1323$	$0.030 \times (N - 1024) + 860.040$
US PCS	Uplink (MS, reverse link)	$0 \leq N \leq 1199$	$1850.000 + 0.050 \times N$
	Downlink (BS, forward link)	$0 \leq N \leq 1199$	$1930.000 + 0.050 \times N$
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)	$1 \leq N \leq 400$	$0.025 \times (N - 1) + 450.000$
		$472 \leq N \leq 871$	$0.025 \times (N - 472) + 410.000$
		$1039 \leq N \leq 1473$	$0.020 \times (N - 1024) + 451.010$
		$1536 \leq N \leq 1715$	$0.025 \times (N - 1536) + 479.000$
		$1792 \leq N \leq 2016$	$0.020 \times (N - 1792) + 479.000$
	Downlink (BS, forward link)	$1 \leq N \leq 400$	$0.025 \times (N - 1) + 460.000$
		$472 \leq N \leq 871$	$0.025 \times (N - 472) + 420.000$
		$1039 \leq N \leq 1473$	$0.020 \times (N - 1024) + 461.010$
		$1536 \leq N \leq 1715$	$0.025 \times (N - 1536) + 489.000$
		$1792 \leq N \leq 2016$	$0.020 \times (N - 1792) + 489.000$



Band	Link (Device)	Range	Frequency (MHz)
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)	$0 \leq N \leq 719$ $720 \leq N \leq 919$	$0.025 \times N + 806.000$ $0.025 \times (N - 720) + 896.000$
	Downlink (BS, forward link)	$0 \leq N \leq 719$ $720 \leq N \leq 919$	$0.025 \times N + 851.000$ $0.025 \times (N - 720) + 935.000$
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)	$0 \leq N \leq 1299$	$1850.000 + 0.050 \times N$
	Downlink (BS, forward link)	$0 \leq N \leq 1299$	$1930.000 + 0.050 \times N$
AWS	Uplink (MS, reverse link)	$0 \leq N \leq 899$	$1710.000 + 0.050 \times N$
	Downlink (BS, forward link)	$0 \leq N \leq 899$	$2100.000 + 0.050 \times N$
US 2.5 GHz	Uplink (MS, reverse link)	$140 \leq N \leq 1459$	$2495.000 + 0.050 \times N$
	Downlink (BS, forward link)	$140 \leq N \leq 1459$	$2617.000 + 0.050 \times N$
700 Public Safety	Uplink (MS, reverse link)	$0 \leq N \leq 240$	$787.000 + 0.050 \times N$
	Downlink (BS, forward link)	$0 \leq N \leq 240$	$757.000 + 0.050 \times N$
C2K Lower 700	Uplink (MS, reverse link)	$0 \leq N \leq 360$	$698.000 + 0.050 \times N$
	Downlink (BS, forward link)	$0 \leq N \leq 360$	$728.000 + 0.050 \times N$

Source (Internal)

Band	Link (Device)	Range	Frequency (MHz)
400 Euro PAMR	Uplink (MS, reverse link)	$1 \leq N \leq 400$	$0.025 \times (N-1) + 450.000$
		$472 \leq N \leq 871$	$0.025 \times (N-472) + 410.000$
		$1536 \leq N \leq 1715$	$0.025 \times (N-1536) + 479.000$
	Downlink (BS, forward link)	$1 \leq N \leq 400$	$0.025 \times (N-1) + 460.000$
		$472 \leq N \leq 871$	$0.025 \times (N-472) + 420.000$
		$1536 \leq N \leq 1715$	$0.025 \times (N-1536) + 489.000$
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  $F_{DL\_low}$  and  $N_{Offs-DL}$  are given in table 5.4.4–1 and  $N_{DL}$  is the downlink EARFCN.

$$F_{DL} = F_{DL\_low} + 0.1(N_{DL} - N_{Offs-DL})$$

The relation between EARFCN and the carrier frequency in MHz for the uplink is given by the following equation where  $F_{UL\_low}$  and  $N_{Offs-UL}$  are given in table 5.4.4–1 and  $N_{UL}$  is the uplink EARFCN.

$$F_{UL} = F_{UL\_low} + 0.1(N_{UL} - N_{Offs-UL})$$

Band	Downlink			Uplink		
	$F_{DL\_low}$ (MHz)	$N_{Offs-DL}$	Range of $N_{DL}$	$F_{UL\_low}$ (MHz)	$N_{Offs-UL}$	Range of $N_{UL}$
1	2110	0	0 – 599	1920	18000	18000 – 18599
2	1930	600	600 - 1199	1850	18600	18600 – 19199
3	1805	1200	1200 – 1949	1710	19200	19200 – 19949
4	2110	1950	1950 – 2399	1710	19950	19950 – 20399
5	869	2400	2400 – 2649	824	20400	20400 – 20649
6	875	2650	2650 – 2749	830	20650	20650 – 20749

7	2620	2750	2750 – 3449	2500	20750	20750 – 20449
8	925	3450	3450 – 3799	880	21450	21450 – 21799
9	1844.9	3800	3800 – 4149	1749.9	21800	21800 – 22149
10	2110	4150	4150 – 4749	1710	22150	22150 – 22749
11	1475.9	4750	4750 – 4949	1427.9	22750	22750 – 22949
12	729	5010	5010 – 5179	699	23010	23010 – 23179
13	746	5180	5180 – 5279	777	23180	23180 – 23279
14	758	5280	5280 – 5379	788	23280	23280 – 23379
...						
17	734	5730	5730 – 5849	704	23730	23730 – 23849
18	860	5850	5850 – 5999	815	23850	23850 – 23999
19	875	6000	6000 – 6149	830	24000	24000 – 24149
20	791	6150	6150 – 6449	832	24150	24150 – 24449
21	1495.9	6450	6450 – 6599	1447.9	24450	24450 – 24599
...						
24	1525	7700	7700 – 8039	1626.5	25700	25700 – 26039
25	1930	8040	8040 – 8689	1850	26040	26040 – 26689
26	859	8690	8690 - 9039	814	26690	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  $F_{DL\_low}$  and  $N_{Offs-DL}$  are given in table 5.4.4–1 and  $N_{DL}$  is the downlink EARFCN.

$$F_{DL} = F_{DL\_low} + 0.1(N_{DL} - N_{Offs-DL})$$

The relation between EARFCN and the carrier frequency in MHz for the uplink is given by the following equation where  $F_{UL\_low}$  and  $N_{Offs-UL}$  are given in table 5.4.4–1 and  $N_{UL}$  is the uplink EARFCN.

## Source (Internal)

$$F_{UL} = F_{UL\_low} + 0.1(N_{UL} - N_{Offs-UL})$$

Band	Downlink			Uplink		
	F <sub>DL_low</sub> (MHz)	N <sub>Offs-DL</sub>	Range of N <sub>DL</sub>	F <sub>UL_low</sub> (MHz)	N <sub>Offs-UL</sub>	Range of N <sub>UL</sub>
33	1900	36000	36000 – 36199	1900	36000	36000 – 36199
34	2010	36200	36200 – 36349	2010	36200	36200 – 36349
35	1850	36350	36350 – 36949	1850	36350	36350 – 36949
36	1930	36950	36950 – 37549	1930	36950	36950 – 37549
37	1910	37550	37550 – 37749	1910	37550	37550 – 37749
38	2570	37750	37750 – 38249	2570	37750	37750 – 38249
39	1880	38250	38250 – 38649	1880	38250	38250 – 38649
40	2300	38650	38650 – 39649	2300	38650	38650 – 39649
41	2496	39650	39650 – 41589	2496	39650	39650 – 41589
42	3400	41590	41590 – 43589	3400	41590	41590 – 43589
43	3600	43590	43590 – 45589	3600	43590	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.

Key Path:	<b>Source, Frequency</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35377

### 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:	<b>Source, Frequency, Radio Setup</b>
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## Source (Internal)

<b>Remote Command:</b>	: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   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   BAND33   BAND34   BAND35   BAND36   BAND37   BAND38   BAND39   BAND40   BAND41   BAND42   BAND43   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 664 Channel
Initial S/W Revision:	A.05.00
Help Map ID:	35378

### 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:	<b>Source, Frequency, Radio Setup, Radio Standard</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35678

### GSM/EDGE

Sets GSM/EDGE as the radio standard for use and accesses the GSM/EDGE specific channel band sub-menus.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35379

### P-GSM

Selects P-GSM as the active channel band.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, GSM/EDGE</b>
Example:	SOUR:FREQ:CHAN:BAND PGSM
Initial S/W Revision:	A.05.00
Help Map ID:	35380

**E-GSM**

Selects E-GSM as the active channel band.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, GSM/EDGE</b>
Example:	SOUR:FREQ:CHAN:BAND EGSM
Initial S/W Revision:	A.05.00
Help Map ID:	35381

**R-GSM**

Selects R-GSM as the active channel band.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, GSM/EDGE</b>
Example:	SOUR:FREQ:CHAN:BAND RGSM
Initial S/W Revision:	A.05.00
Help Map ID:	35382

**DCS 1800**

Selects DCS 1800 as the active channel band.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, GSM/EDGE</b>
Example:	SOUR:FREQ:CHAN:BAND DCS1800
Initial S/W Revision:	A.05.00
Help Map ID:	35383

**PCS 1900**

Selects PCS 1900 as the active channel band.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, GSM/EDGE</b>
Example:	SOUR:FREQ:CHAN:BAND PCS1900
Initial S/W Revision:	A.05.00
Help Map ID:	35384

**GSM 450**

Selects GSM 450 as the active channel band.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, GSM/EDGE</b>
Example:	SOUR:FREQ:CHAN:BAND GSM450
Initial S/W Revision:	A.05.00

## Source (Internal)

Help Map ID:	35386
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### GSM 480

Selects GSM 480 as the active channel band.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, GSM/EDGE</b>
Example:	SOUR:FREQ:CHAN:BAND GSM480
Initial S/W Revision:	A.05.00
Help Map ID:	35387

### GSM 850

Selects GSM 850 as the active channel band.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, GSM/EDGE</b>
Example:	SOUR:FREQ:CHAN:BAND GSM850
Initial S/W Revision:	A.05.00
Help Map ID:	35389

### GSM 700

Selects GSM 700 as the active channel band.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, GSM/EDGE</b>
Example:	SOUR:FREQ:CHAN:BAND GSM700
Initial S/W Revision:	A.05.00
Help Map ID:	35388

### T-GSM 810

Selects T-GSM 810 as the active channel band.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, GSM/EDGE</b>
Example:	SOUR:FREQ:CHAN:BAND T-GSM810
Initial S/W Revision:	A.05.00
Help Map ID:	35385

### WCDMA

Sets WCDMA as the radio standard for use and accesses the W-CDMA specific channel band sub-menus.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard</b>
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Initial S/W Revision:	A.05.00
Help Map ID:	35390

**Band I**

Selects Band I as the active channel band.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, WCDMA</b>
Example:	SOUR:FREQ:CHAN:BAND BANDI
Initial S/W Revision:	A.05.00
Help Map ID:	35391

**Band II**

Selects Band II as the active channel band.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, WCDMA</b>
Example:	SOUR:FREQ:CHAN:BAND BANDII
Initial S/W Revision:	A.05.00
Help Map ID:	35392

**Band III**

Selects Band III as the active channel band.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, WCDMA</b>
Example:	SOUR:FREQ:CHAN:BAND BANDIII
Initial S/W Revision:	A.05.00
Help Map ID:	35393

**Band IV**

Selects Band IV as the active channel band.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, WCDMA</b>
Example:	SOUR:FREQ:CHAN:BAND BANDIV
Initial S/W Revision:	A.05.00
Help Map ID:	35394

## Source (Internal)

### Band V

Selects Band V as the active channel band.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, WCDMA</b>
Example:	SOUR:FREQ:CHAN:BAND BANDV
Initial S/W Revision:	A.05.00
Help Map ID:	35395

### Band VI

Selects Band VI as the active channel band.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, WCDMA</b>
Example:	SOUR:FREQ:CHAN:BAND BANDVI
Initial S/W Revision:	A.05.00
Help Map ID:	35396

### Band VII

Selects Band VII as the active channel band.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, WCDMA</b>
Example:	SOUR:FREQ:CHAN:BAND BANDVII
Initial S/W Revision:	A.05.00
Help Map ID:	35397

### Band VIII

Selects Band VIII as the active channel band.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, WCDMA</b>
Example:	SOUR:FREQ:CHAN:BAND BANDVIII
Initial S/W Revision:	A.05.00
Help Map ID:	35398

### Band IX

Selects Band IX as the active channel band.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, WCDMA</b>
Example:	SOUR:FREQ:CHAN:BAND BANDIX
Initial S/W Revision:	A.05.00

Help Map ID:	35399
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**Band X**

Selects Band X as the active channel band.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, WCDMA</b>
Example:	SOUR:FREQ:CHAN:BAND BANDX
Initial S/W Revision:	A.05.00
Help Map ID:	35400

**Band XI**

Selects Band XI as the active channel band.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, WCDMA</b>
Example:	SOUR:FREQ:CHAN:BAND BANDXI
Initial S/W Revision:	A.05.00
Help Map ID:	35401

**Band XII**

Selects Band XII as the active channel band.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, WCDMA</b>
Example:	SOUR:FREQ:CHAN:BAND BANDXII
Initial S/W Revision:	A.05.00
Help Map ID:	35402

**Band XIII**

Selects band XIII as the active channel band.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, WCDMA</b>
Example:	SOUR:FREQ:CHAN:BAND BANDXIII
Initial S/W Revision:	A.05.00
Help Map ID:	35403

**Band XIV**

Selects Band XIV as the active channel band.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, WCDMA</b>
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## Source (Internal)

Example:	SOUR:FREQ:CHAN:BAND BANDXIV
Initial S/W Revision:	A.05.00
Help Map ID:	35404

### 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:	<b>Source, Frequency, Radio Setup, Radio Standard</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35405

### US CELL

Selects US Cell as the active channel band.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO</b>
Example:	SOUR:FREQ:CHAN:BAND USCELL
Initial S/W Revision:	A.05.00
Help Map ID:	35406

### US PCS

Selects US PCS as the active channel band.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO</b>
Example:	SOUR:FREQ:CHAN:BAND PCS
Initial S/W Revision:	A.05.00
Help Map ID:	35407

### Japan Cell

Selects Japan Cell as the active channel band.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO</b>
Example:	SOUR:FREQ:CHAN:BAND JAPAN
Initial S/W Revision:	A.05.00
Help Map ID:	35408

**Korean PCS**

Selects Korean PCS as the active channel band.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO</b>
Example:	SOUR:FREQ:CHAN:BAND KOREAN
Initial S/W Revision:	A.05.00
Help Map ID:	35409

**NMT 450**

Selects NMT 450 as the active channel band.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO</b>
Example:	SOUR:FREQ:CHAN:BAND NMT
Initial S/W Revision:	A.05.00
Help Map ID:	35410

**IMT 2000**

Selects IMT 2000 as the active channel band.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO</b>
Example:	SOUR:FREQ:CHAN:BAND IMT2K
Initial S/W Revision:	A.05.00
Help Map ID:	35411

**Upper 700**

Selects Upper 700 as the active channel band.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO</b>
Example:	SOUR:FREQ:CHAN:BAND UPPER
Initial S/W Revision:	A.05.00
Help Map ID:	35412

**Secondary 800**

Selects Secondary 800 as the active channel band.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO</b>
Example:	SOUR:FREQ:CHAN:BAND SECOND
Initial S/W Revision:	A.05.00

## Source (Internal)

Help Map ID:	35413
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### 400 Euro PAMR

Selects 400 Euro PAMR as the active channel band.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO</b>
Example:	SOUR:FREQ:CHAN:BAND PAMR400
Initial S/W Revision:	A.05.00
Help Map ID:	35414

### 800 PAMR

Selects 800 PAMR as the active channel band.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO</b>
Example:	SOUR:FREQ:CHAN:BAND PAMR800
Initial S/W Revision:	A.05.00
Help Map ID:	35415

### 2.5GHz IMT EXT

Selects 2.5 GHz IMT EXT as the active channel band.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO</b>
Example:	SOUR:FREQ:CHAN:BAND IMTEXT
Initial S/W Revision:	A.05.00
Help Map ID:	35416

### US PCS 1.9GHz

Selects US PCS 1.9 GHz as the active channel band.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO</b>
Example:	SOUR:FREQ:CHAN:BAND PCS1DOT9G
Initial S/W Revision:	A.05.00
Help Map ID:	35417

### AWS

Selects AWS as the active channel band.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO</b>
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Example:	SOUR:FREQ:CHAN:BAND AWS
Initial S/W Revision:	A.05.00
Help Map ID:	35418

**US 2.5GHz**

Selects US 2.5 GHz as the active channel band.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO</b>
Example:	SOUR:FREQ:CHAN:BAND US2DOT5G
Initial S/W Revision:	A.05.00
Help Map ID:	35419

**700 Public Safety**

Selects 700 Public Safety as the active channel band.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO</b>
Example:	SOUR:FREQ:CHAN:BAND PUBLIC
Initial S/W Revision:	A.05.00
Help Map ID:	35420

**C2K Lower 700**

Selects C2K Lower 700 as the active channel band.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO</b>
Example:	SOUR:FREQ:CHAN:BAND LOWER
Initial S/W Revision:	A.05.00
Help Map ID:	35421

**LTE**

Sets LTE FDD as the radio standard for use and accesses the LTE FDD specific channel band sub-menus..

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard</b>
Initial S/W Revision:	A.09.50
Help Map ID:	35701

## Source (Internal)

### BAND 1

Selects BAND 1 as the band for the current step.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, LTE</b>
Example:	SOUR:FREQ:CHAN:BAND BAND1
Initial S/W Revision:	A.09.50
Help Map ID:	35702

### BAND 2

Selects BAND 2 as the band for the current step.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, LTE</b>
Example:	SOUR:FREQ:CHAN:BAND BAND2
Initial S/W Revision:	A.09.50
Help Map ID:	35703

### BAND 3

Selects BAND 3 as the band for the current step.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, LTE</b>
Example:	SOUR:FREQ:CHAN:BAND BAND3
Initial S/W Revision:	A.09.50
Help Map ID:	35704

### BAND 4

Selects BAND 4 as the band for the current step.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, LTE</b>
Example:	SOUR:FREQ:CHAN:BAND BAND4
Initial S/W Revision:	A.09.50
Help Map ID:	35705

### BAND 5

Selects BAND 5 as the band for the current step.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, LTE</b>
Example:	SOUR:FREQ:CHAN:BAND BAND5
Initial S/W Revision:	A.09.50



Help Map ID:	35706
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**BAND 6**

Selects BAND 6 as the band for the current step.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, LTE</b>
Example:	SOUR:FREQ:CHAN:BAND BAND6
Initial S/W Revision:	A.09.50
Help Map ID:	35707

**BAND 7**

Selects BAND 7 as the band for the current step.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, LTE</b>
Example:	SOUR:FREQ:CHAN:BAND BAND7
Initial S/W Revision:	A.09.50
Help Map ID:	35708

**BAND 8**

Selects BAND 8 as the band for the current step.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, LTE</b>
Example:	SOUR:FREQ:CHAN:BAND BAND8
Initial S/W Revision:	A.09.50
Help Map ID:	35709

**BAND 9**

Selects BAND 9 as the band for the current step.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, LTE</b>
Example:	SOUR:FREQ:CHAN:BAND BAND9
Initial S/W Revision:	A.09.50
Help Map ID:	35710

**BAND 10**

Selects BAND 10 as the band for the current step.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, LTE</b>
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## Source (Internal)

Example:	SOUR:FREQ:CHAN:BAND BAND10
Initial S/W Revision:	A.09.50
Help Map ID:	35711

### BAND 11

Selects BAND 11 as the band for the current step.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, LTE</b>
Example:	SOUR:FREQ:CHAN:BAND BAND11
Initial S/W Revision:	A.09.50
Help Map ID:	35712

### BAND 12

Selects BAND 12 as the band for the current step.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, LTE</b>
Example:	SOUR:FREQ:CHAN:BAND BAND12
Initial S/W Revision:	A.09.50
Help Map ID:	35713

### BAND 13

Selects BAND 13 as the band for the current step.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, LTE</b>
Example:	SOUR:FREQ:CHAN:BAND BAND13
Initial S/W Revision:	A.09.50
Help Map ID:	35714

### BAND 14

Selects BAND 14 as the band for the current step.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, LTE</b>
Example:	SOUR:FREQ:CHAN:BAND BAND14
Initial S/W Revision:	A.09.50
Help Map ID:	35715

**BAND 17**

Selects BAND 17 as the band for the current step.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, LTE</b>
Example:	SOUR:FREQ:CHAN:BAND BAND17
Initial S/W Revision:	A.09.50
Help Map ID:	35716

**BAND 18**

Selects BAND 18 as the band for the current step.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, LTE</b>
Example:	SOUR:FREQ:CHAN:BAND BAND18
Initial S/W Revision:	A.09.50
Help Map ID:	35717

**BAND 19**

Selects BAND 19 as the band for the current step.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, LTE</b>
Example:	SOUR:FREQ:CHAN:BAND BAND19
Initial S/W Revision:	A.09.50
Help Map ID:	35718

**BAND 20**

Selects BAND 20 as the band for the current step.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, LTE</b>
Example:	SOUR:FREQ:CHAN:BAND BAND20
Initial S/W Revision:	A.09.50
Help Map ID:	35719

**BAND 21**

Selects BAND 21 as the band for the current step.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, LTE</b>
Example:	SOUR:FREQ:CHAN:BAND BAND21
Initial S/W Revision:	A.09.50

## Source (Internal)

Help Map ID:	35720
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### BAND 24

Selects BAND 24 as the band for the current step.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, LTE</b>
Example:	SOUR:FREQ:CHAN:BAND BAND24
Initial S/W Revision:	A.09.50
Help Map ID:	35721

### BAND 25

Selects BAND 25 as the band for the current step.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, LTE</b>
Example:	SOUR:FREQ:CHAN:BAND BAND25
Initial S/W Revision:	A.09.50
Help Map ID:	35722

### BAND 26

Selects BAND 26 as the band for the current step.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, LTE</b>
Example:	SOUR:FREQ:CHAN:BAND BAND26
Initial S/W Revision:	A.12.53
Help Map ID:	35804

### LTE TDD

Sets LTE TDD as the radio standard for use and accesses the LTE TDD specific channel band sub-menus..

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard</b>
Initial S/W Revision:	A.11.50
Help Map ID:	35766

### BAND 33

Selects BAND 33 as the band for the current step.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, LTE TDD</b>
Example:	SOUR:FREQ:CHAN:BAND BAND33

Initial S/W Revision:	A.11.50
Help Map ID:	35767

**BAND 34**

Selects BAND 34 as the band for the current step.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, LTE TDD</b>
Example:	SOUR:FREQ:CHAN:BAND BAND34
Initial S/W Revision:	A.11.50
Help Map ID:	35768

**BAND 35**

Selects BAND 35 as the band for the current step.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, LTE TDD</b>
Example:	SOUR:FREQ:CHAN:BAND BAND35
Initial S/W Revision:	A.11.50
Help Map ID:	35769

**BAND 36**

Selects BAND 36 as the band for the current step.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, LTE TDD</b>
Example:	SOUR:FREQ:CHAN:BAND BAND36
Initial S/W Revision:	A.11.50
Help Map ID:	35770

**BAND 37**

Selects BAND 37 as the band for the current step.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, LTE TDD</b>
Example:	SOUR:FREQ:CHAN:BAND BAND37
Initial S/W Revision:	A.11.50
Help Map ID:	35771

## Source (Internal)

### BAND 38

Selects BAND 38 as the band for the current step.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, LTE TDD</b>
Example:	SOUR:FREQ:CHAN:BAND BAND38
Initial S/W Revision:	A.11.50
Help Map ID:	35772

### BAND 39

Selects BAND 39 as the band for the current step.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, LTE TDD</b>
Example:	SOUR:FREQ:CHAN:BAND BAND39
Initial S/W Revision:	A.11.50
Help Map ID:	35773

### BAND 40

Selects BAND 40 as the band for the current step.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, LTE TDD</b>
Example:	SOUR:FREQ:CHAN:BAND BAND40
Initial S/W Revision:	A.11.50
Help Map ID:	35774

### BAND 41

Selects BAND 41 as the band for the current step.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, LTE TDD</b>
Example:	SOUR:FREQ:CHAN:BAND BAND41
Initial S/W Revision:	A.11.50
Help Map ID:	35775

### BAND 42

Selects BAND 42 as the band for the current step.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, LTE TDD</b>
Example:	SOUR:FREQ:CHAN:BAND BAND42
Initial S/W Revision:	A.11.50

Help Map ID:	35776
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**BAND 43**

Selects BAND 43 as the band for the current step.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, LTE TDD</b>
Example:	SOUR:FREQ:CHAN:BAND BAND43
Initial S/W Revision:	A.11.50
Help Map ID:	35777

**TDSCDMA**

Sets TDSCDMA as the radio standard for use and accesses the TDSCDMA specific channel band sub-menus..

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard</b>
Initial S/W Revision:	A.11.50
Help Map ID:	35778

**BAND A**

Selects BAND A as the band for the current step.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, TDSCDMA</b>
Example:	SOUR:FREQ:CHAN:BAND BANDA
Initial S/W Revision:	A.11.50
Help Map ID:	35779

**BAND B**

Selects BAND B as the band for the current step.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, TDSCDMA</b>
Example:	SOUR:FREQ:CHAN:BAND BANDB
Initial S/W Revision:	A.11.50
Help Map ID:	35780

**BAND C**

Selects BAND C as the band for the current step.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, TDSCDMA</b>
Example:	SOUR:FREQ:CHAN:BAND BANDC

## Source (Internal)

Initial S/W Revision:	A.11.50
Help Map ID:	35781

### BAND D

Selects BAND D as the band for the current step.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, TDSCDMA</b>
Example:	SOUR:FREQ:CHAN:BAND BANDD
Initial S/W Revision:	A.11.50
Help Map ID:	35782

### BAND E

Selects BAND E as the band for the current step.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, TDSCDMA</b>
Example:	SOUR:FREQ:CHAN:BAND BANDE
Initial S/W Revision:	A.11.50
Help Map ID:	35783

### BAND F

Selects BAND F as the band for the current step.

Key Path:	<b>Source, Frequency, Radio Setup, Radio Standard, TDSCDMA</b>
Example:	SOUR:FREQ:CHAN:BAND BANDF
Initial S/W Revision:	A.11.50
Help Map ID:	35784

### 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:	<b>Source, Frequency, Radio Setup</b>
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
Help Map ID:	35422

### 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:

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

In addition, the displayed frequency value will be the same as the value entered under Source>Frequency>Frequency.

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<b>NOTE</b>	<p>If Freq Reference is set to ON with a reference value set, entering a value under Source&gt;Frequency&gt;Frequency and pressing Set Frequency Reference will add that value to the existing Freq Reference value.</p> <p>If you wish to change the reference frequency value to the new value entered under Source&gt;Frequency&gt;Frequency, first you must set Freq Reference to OFF and then press Set Frequency Reference.</p>
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Key Path:	<b>Source, Frequency</b>
<b>Remote Command:</b>	: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.

## Source (Internal)

Initial S/W Revision:	A.05.00
Help Map ID:	35423

### 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 693](#)

Key Path:	<b>Source, Frequency</b>
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
Initial S/W Revision:	A.05.00
Help Map ID:	35424

## 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:	<b>Source, Frequency</b>
<b>Remote Command:</b>	: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
Help Map ID:	35425

## Modulation Setup

Allows access to the menus for setting up the available modulation types: “ARB” on page 696, “AM” on

## Source (Internal)

page 742, “FM” on page 743, and “PM” on page 744.

Key Path:	<b>Source</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35428

## ARB

Allows you access to the ARB sub-menus.

Key Path:	<b>Source, Modulation Setup</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35429

## 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:	<b>Source, Modulation Setup, ARB</b>
<b>Remote Command:</b>	: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 7.1Sequencer to On will put source enter list sequencer mode, and even if ARB state is On, the ARB file will not be played. Setting 7.1Sequencer 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

Help Map ID:	35430
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**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:	<b>Source, Modulation Setup, ARB</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35431

**Select Waveform**

Allows you to select a waveform sequence or segment for the dual ARB to play.

Key Path:	<b>Source, Modulation Setup, ARB, Select Waveform</b>
<b>Remote Command:</b>	:SOURce:RADio:ARB:WAVEform <string> :SOURce:RADio:ARB:WAVEform?
Example:	SOUR:RAD:ARB:WAV "test_waveform.bin"

## Source (Internal)

Notes:	<p>&lt;string&gt; - 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 attempt 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 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.</p> <p>If you select a waveform for playback and the waveform requires a license that is not installed on the instrument, an error is generated. 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
Help Map ID:	35432

### 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:\nvarb.

Pressing this key changes the current view to the Waveform Management View.

Key Path:	<b>Source, Modulation Setup, ARB, Select Waveform</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35433

### 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:\NVARB. The SCPI command supports using either “NVWFM” MSUS or specifying a full path. For more information, see “[Memory Subsystem \(Remote Command Only\)](#)” on page 792.

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.

Key Path:	<b>Source, Modulation Setup, ARB, Select Waveform, Segments on Hard Disk</b>
<b>Remote Command:</b>	:SOURce:RADio:ARB:LOAD <string>
Example:	SOUR:RAD:ARB:LOAD “D:\NVARB\testwaveform.bin” or SOUR:RAD:ARB:LOAD “NVWFM:testwaveform.bin”
Notes:	<p>&lt;string&gt; - specifies the path name of the file to load from the HDD into ARB memory. It could be a &lt;full path + filename&gt;, or &lt;“NVWFM” MSUS + colon + filename&gt;.</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 &lt;filename&gt; successfully, but no license &lt;required licenses&gt; installed”. User can install required licenses according to &lt;required licenses&gt; string to license it, or multi-pack license it.</p>
Initial S/W Revision:	A.05.00
Help Map ID:	35434

### 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

## Source (Internal)

either use Windows File Explorer, or the :MEMory:COpy command.

Key Path:	<b>Source, Modulation Setup, ARB, Select Waveform, Segments on Hard Disk</b>
Remote Command:	:SOURce:RADio:ARB:LOAD:ALL <string>
Example:	SOUR:RAD:ARB:LOAD:ALL "D:\nvarb"
Notes:	<string> - specifies the directory on the HDD to load the files into ARB memory from.  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.  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
Help Map ID:	35435

### 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:	<b>Source, Modulation Setup, ARB, Select Waveform, Segments on Hard Disk</b>
Notes:	No remote command, SCPI front panel only.
Initial S/W Revision:	A.05.00
Help Map ID:	35436

### 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:	<b>Source, Modulation Setup, ARB, Select Waveform, Segments on Hard Disk</b>
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<b>Remote Command:</b>	: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
Help Map ID:	35437

### Segments in ARB Memory

Allows you access to the sub-menus for managing the files within ARB memory.

Key Path:	<b>Source, Modulation Setup, ARB, Select Waveform</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35438

### Delete Segment From ARB Mem

Allows you to remove a segment from ARB playback memory.

Key Path:	<b>Source, Modulation Setup, ARB, Select Waveform, Segments in ARB Memory</b>
<b>Remote Command:</b>	:SOURCE:RADio:ARB:DELete <string>
Example:	SOUR:RAD:ARB:DEL "testwaveform.bin"

**Source (Internal)**

Notes:	<p>&lt;string&gt; - 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
Help Map ID:	35439

**Delete All From ARB Memory**

Allows you to remove all segments from ARB playback memory.

Key Path:	<b>Source, Modulation Setup, ARB, Select Waveform, Segments in ARB Memory</b>
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 <a href="#">“List Sequencer” on page 746</a> and <a href="#">“Sequencer” on page 747</a> 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

Help Map ID:	35440
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#### 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 703.

<b>Remote Command:</b>	: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
Help Map ID:	35686

#### 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.

<b>Remote Command:</b>	: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
Help Map ID:	0

## Source (Internal)

### ARB Setup

Allows access to the ARB setup sub-menus.

Key Path:	<b>Source, Modulation Setup, ARB</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35441

### Sample Rate

Allows you to set the ARB waveform playback sample rate.

Key Path:	<b>Source, Modulation Setup, ARB, ARB Setup</b>
<b>Remote Command:</b>	:SOURce:RADio:ARB:SCLock:RATE <freq> :SOURce:RADio:ARB:SCLock:RATE?
Example:	SOUR:RAD:ARB:SCL:RATE 48.00 MHz
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
Help Map ID:	35442

### 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:	<b>Source, Modulation Setup, ARB, ARB Setup</b>
<b>Remote Command:</b>	:SOURce:RADio:ARB:RSCaling <real> :SOURce:RADio:ARB:RSCaling?
Example:	SOUR:RAD:ARB:RSC 100.00

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
Help Map ID:	35443

### Baseband Freq Offset

Allows you to adjust the value by which the baseband frequency is offset relative to the carrier.

Key Path:	<b>Source, Modulation Setup, ARB, ARB Setup</b>
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
Help Map ID:	35444

### 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:	<b>Source, Modulation Setup, ARB</b>
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## Source (Internal)

<b>Remote Command:</b>	: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
Help Map ID:	35454

### 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:	<b>Source, Modulation Setup, ARB, Trigger Type</b>
<b>Remote Command:</b>	: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
Help Map ID:	35455

### 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:	<b>Source, Modulation Setup, ARB, Trigger Type, Continuous</b>
Example:	SOUR:RAD:ARB:TRIG:TYPE:CONT FREE
Initial S/W Revision:	A.05.00
Help Map ID:	35456

### 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:	<b>Source, Modulation Setup, ARB, Trigger Type, Continuous</b>
Example:	SOUR:RAD:ARB:TRIG:TYPE:CONT TRIG
Initial S/W Revision:	A.05.00
Help Map ID:	35457

### 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:	<b>Source, Modulation Setup, ARB, Trigger Type, Continuous</b>
Example:	SOUR:RAD:ARB:TRIG:TYPE:CONT RES
Initial S/W Revision:	A.05.00
Help Map ID:	35458

### 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:	<b>Source, Modulation Setup, ARB, Trigger Type</b>
<b>Remote Command:</b>	: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
Help Map ID:	35459

### No Retrigger

Selects No Retrigger as the trigger response for single trigger type. No Retrigger sets the waveform generator to

## Source (Internal)

play a waveform sequence or segment once when a trigger is received. Any triggers then received during playback are ignored.

Key Path:	<b>Source, Modulation Setup, ARB, Trigger Type, Single</b>
Example:	SOUR:RAD:ARB:RETR OFF
Initial S/W Revision:	A.05.00
Help Map ID:	35460

### 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:	<b>Source, Modulation Setup, ARB, Trigger Type, Single</b>
Example:	SOUR:RAD:ARB:RETR ON
Initial S/W Revision:	A.05.00
Help Map ID:	35461

### 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:	<b>Source, Modulation Setup, ARB, Trigger Type, Single</b>
Example:	SOUR:RAD:ARB:RETR IMM
Initial S/W Revision:	A.05.00
Help Map ID:	35462

### 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:	<b>Source, Modulation Setup, ARB, Trigger Type</b>
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<b>Remote Command:</b>	: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
Help Map ID:	35463

### 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:	<b>Source, Modulation Setup, ARB, Trigger Type, Segment Advance</b>
Example:	SOUR:RAD:ARB:TRIG:TYPE:SADV SING
Initial S/W Revision:	A.05.00
Help Map ID:	35464

### 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:	<b>Source, Modulation Setup, ARB, Trigger Type, Segment Advance</b>
Example:	SOUR:RAD:ARB:TRIG:TYPE:SADV CONT
Initial S/W Revision:	A.05.00
Help Map ID:	35465

### 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:	<b>Source, Modulation Setup, ARB</b>
<b>Remote Command:</b>	:SOURce:RADio:ARB:TRIGger[:SOURce] KEY BUS EXTErnal2 :SOURce:RADio:ARB:TRIGger[:SOURce]?
Example:	SOUR:RAD:ARB:TRIGger KEY

## Source (Internal)

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
Help Map ID:	35469

### 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:	<b>Source, Modulation Setup, ARB, Trigger Source</b>
Example:	SOUR:RAD:ARB:TRIGger KEY
Initial S/W Revision:	A.05.00
Help Map ID:	35470

### 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:	<b>Source, Modulation Setup, ARB, Trigger Source</b>
Example:	SOUR:RAD:ARB:TRIGger BUS
Initial S/W Revision:	A.05.00
Help Map ID:	35471

### External 2

Sets the current trigger source to External 2. Selecting External 2 enables triggering a waveform by an externally applied signal.

Key Path:	<b>Source, Modulation Setup, ARB, Trigger Source</b>
Example:	SOUR:RAD:ARB:TRIGger EXT2
Initial S/W Revision:	A.05.00
Help Map ID:	35472

### Trigger Initiate

Used to initiate an immediate trigger event if the trigger source is set to Trigger Key.

Key Path:	<b>Source, Modulation Setup, ARB</b>
Notes:	No remote command, SCPI front panel only.

Initial S/W Revision:	A.05.00
Help Map ID:	35475

### 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:	<b>Source, Modulation Setup, ARB</b>
Notes:	No remote command, SCPI front panel only.
Initial S/W Revision:	A.05.00
Help Map ID:	35476

### 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:	<b>Source, Modulation Setup, ARB, Waveform Sequences</b>
Notes:	No remote command, SCPI front panel only.
Initial S/W Revision:	A.05.00
Help Map ID:	35477

### Current Segment

Specifies the selected sequence segment that will be affected by the menu functions.

Key Path:	<b>Source, Modulation Setup, ARB, Waveform Sequences, Build New Sequence</b>
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
Help Map ID:	35478

### 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:	<b>Source, Modulation Setup, ARB, Waveform Sequences, Build New Sequence</b>
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## Source (Internal)

Notes:	No remote command, SCPIfront 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
Help Map ID:	35479

### 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:	<b>Source, Modulation Setup, ARB, Waveform Sequences, Build New Sequence, Insert New Waveform</b>
Notes:	No remote command, SCPIfront 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
Help Map ID:	35480

### Segments on Hard Disk

This key functions the same as [“Segments on Hard Disk”](#) on page 698.

Key Path:	<b>Source, Modulation Setup, ARB, Waveform Sequences, Build New Sequence, Insert New Waveform</b>
Initial S/W Revision:	Prior to A.09.00
Help Map ID:	0

### Load Segment To ARB Memory

This key functions the same as [“Load Segment To ARB Memory”](#) on page 698.

Key Path:	<b>Source, Modulation Setup, ARB, Waveform Sequences, Build New Sequence, Insert New Waveform, Segment on Hard Drive</b>
Initial S/W Revision:	Prior to A.09.00
Help Map ID:	0

### Load All To ARB Memory

This key functions the same as [“Load All To ARB Memory”](#) on page 699.

Key Path:	<b>Source, Modulation Setup, ARB, Waveform Sequences, Build New Sequence, Insert New Waveform, Segment on Hard Drive</b>
Initial S/W Revision:	Prior to A.09.00

Help Map ID:	0
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**Change Directory ...**

This key functions the same as [“Change Directory...”](#) on page 700.

Key Path:	<b>Source, Modulation Setup, ARB, Waveform Sequences, Build New Sequence, Insert New Waveform, Segment on Hard Drive</b>
Initial S/W Revision:	Prior to A.09.00
Help Map ID:	0

**Default Directory ...**

This key functions the same as [“Default Directory...”](#) on page 700

Key Path:	<b>Source, Modulation Setup, ARB, Waveform Sequences, Build New Sequence, Insert New Waveform, Segment on Hard Drive</b>
Initial S/W Revision:	Prior to A.09.00
Help Map ID:	0

**Segments in ARB Memory**

This key functions the same as [“Segments in ARB Memory”](#) on page 701.

Key Path:	<b>Source, Modulation Setup, ARB, Waveform Sequences, Build New Sequence, Insert New Waveform</b>
Initial S/W Revision:	Prior to A.09.00
Help Map ID:	0

**Delete Segment From ARB Memory**

This key functions the same as [“Delete Segment From ARB Mem”](#) on page 701.

Key Path:	<b>Source, Modulation Setup, ARB, Waveform Sequences, Build New Sequence, Insert New Waveform, Segment in ARB Memory</b>
Initial S/W Revision:	Prior to A.09.00
Help Map ID:	0

**Delete All From ARB Memory**

This key functions the same as [“Delete All From ARB Memory”](#) on page 702.

Key Path:	<b>Source, Modulation Setup, ARB, Waveform Sequences, Build New Sequence, Insert New Waveform, Segment in ARB Memory</b>
Initial S/W Revision:	Prior to A.09.00
Help Map ID:	0

## Source (Internal)

### Query ARB Memory File List (Remote Command Only)

This command functions the same as “Query ARB Memory File List (Remote Command Only)” on page 703.

Initial S/W Revision:	Prior to A.09.00
Help Map ID:	0

### Edit Selected Waveform

Allows access to the sub-menus for editing the details of the currently selected waveform segment.

Key Path:	<b>Source, Modulation Setup, ARB, Waveform Sequences, Build New Sequence</b>
Notes:	No remote command, front panel only.
Initial S/W Revision:	A.05.00
Help Map ID:	35481

### Repetitions

Allows you to specify the number of times the currently selected waveform is played within the sequence.

Key Path:	<b>Source, Modulation Setup, ARB, Waveform Sequences, Build New Sequence, Edit Selected Waveform</b>
Notes:	No remote command, SCPI front panel only.
Preset:	1
Min:	1
Max:	65535
Initial S/W Revision:	A.05.00
Help Map ID:	35482

### 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:	<b>Source, Modulation Setup, ARB, Waveform Sequences, Build New Sequence, Edit Selected Waveform</b>
Notes:	No remote command, front panel only.
Preset:	Enabled
Range:	Enabled Disabled
Initial S/W Revision:	A.05.00
Help Map ID:	35483

**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:	<b>Source, Modulation Setup, ARB, Waveform Sequences, Build New Sequence, Edit Selected Waveform</b>
Notes:	No remote command, front panel only.
Preset:	Enabled
Range:	Enabled Disabled
Initial S/W Revision:	A.05.00
Help Map ID:	35484

**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:	<b>Source, Modulation Setup, ARB, Waveform Sequences, Build New Sequence, Edit Selected Waveform</b>
Notes:	No remote command, front panel only.
Preset:	Enabled
Range:	Enabled Disabled
Initial S/W Revision:	A.05.00
Help Map ID:	35485

**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:	<b>Source, Modulation Setup, ARB, Waveform Sequences, Build New Sequence, Edit Selected Waveform</b>
Notes:	No remote command, front panel only.
Preset:	Enabled
Range:	Enabled Disabled
Initial S/W Revision:	A.05.00
Help Map ID:	35486

## Source (Internal)

### Delete Segment

Allows you to delete the selected segment from the waveform sequence.

Key Path:	<b>Source, Modulation Setup, ARB, Waveform Sequences, Build New Sequence</b>
Notes:	No remote command, front panel only.
Initial S/W Revision:	A.05.00
Help Map ID:	35487

### 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:	<b>Source, Modulation Setup, ARB, Waveform Sequences, Build New Sequence</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35488

### 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 711](#).

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:\NVARB 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.

<b>Remote Command:</b>	<pre>:SOURce:RADio:ARB:SEQuence[:MWAVeform] &lt;filename&gt;, &lt;waveform1&gt;, &lt;reps&gt;, NONE M1 M2 M3 M4 M1M2 M1M3 M1M4 M2M3 M2M4 M3M4 M1M2M3 M 1M2M4 M1M3M4 M2M3M4 M1M2M3M4 ALL, {&lt;waveform2&gt;, &lt;reps&gt;, NONE M1 M2 M3 M4 M1M2 M1M3 M1M4 M2M3 M2M4 M3M4 M1M2M3 M 1M2M4 M1M3M4 M2M3M4 M1M2M3M4 ALL, } ...</pre> <p>(For additional description of each item, see Notes below <a href="#">“For Setup SCPI” on page 718</a>“For Setup SCPI”.)</p> <pre>:SOURce:RADio:ARB:SEQuence[:MWAVeform]? &lt;filename&gt;</pre> <p>(For additional description of each item, see Notes <a href="#">“For Query SCPI” on page 719</a> below.)</p>
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Example:	<p>For setup:</p> <pre>SOUR:RAD:ARB:SEQ "NVWFM:testSeq1.seq", "NVWFM:wfmSegment1.wfm",10, M2M3M4, "NVWFM:wfmSegment2.wfm", 20, M1M3</pre> <p>Or</p> <pre>SOUR:RAD:ARB:SEQ "D:\NVARB\testSeq1.seq", " D:\NVARB\wfmSegment1.wfm",10, M2M3M4, " D:\NVARB\wfmSegment2.wfm", 20, M1M3</pre> <p>For query, must specify which waveform sequence file to query.</p> <pre>SOUR:RAD:ARB:SEQ? "NVWFM:testSeq1.seq"</pre> <p>Or</p> <pre>SOUR:RAD:ARB:SEQ? "D:\NVARB\testSeq1.seq",</pre>
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<p>Notes:</p>	<p><b>For Setup SCPI</b></p> <p>For the Setup SCPI command, the parameters are:</p> <p>&lt;filename&gt; - String Type</p> <p>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.</p> <p>&lt;waveform1&gt; - String Type</p> <p>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.</p> <p>The segment file must reside within ARB playback memory before it can be played by the ARB player.</p> <p>&lt;reps&gt; - Integer Type</p> <p>This variable specifies the number of times a segment or sequence plays before moving on to the next segment or sequence.</p> <p>&lt;marker&gt; - Enum Type</p> <p>NONE – This choice disables all four markers for the waveform. Disabling markers means that the waveform sequence ignores the segments or sequence marker settings.</p> <p>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.</p> <p>ALL – This choice enables all four markers in the waveform segment or sequence.</p> <p>&lt;waveform2&gt; - String type.</p> <p>This variable specifies the name of a second existing waveform segment. The path supports MSUS (NVWFM) and real full path representation both. See example.</p> <p>The segment file must reside within ARB playback memory before it can be played by the ARB player.</p> <p>&lt;reps&gt; same as above, for the 2<sup>nd</sup> waveform segment.</p> <p>&lt;marker&gt; same as above, for the 2<sup>nd</sup> waveform segment.</p> <p>You can insert several waveform segments into a waveform sequence file. Just repeat inserting waveform segments as described above.</p> <p>Error Checks for Setup SCPI command:</p> <p>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.</p>
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Notes:	<p>Error Checks for Query SCPI command: (Continued)</p> <p>If the specified waveform sequence file name suffix is not “.seq”, error is generated.</p> <p>If you use an unsupported MSUS (that is, not NVWFM), or have an error in the waveform segment file path, an error is generated.</p> <p>If the first specified waveform file cannot be found, an error is generated.</p> <p>If you nest one waveform sequence file into another waveform sequence file, an error is generated.</p> <p>If the specified repetition value is larger than 65535 or smaller than 1, an error is generated.</p> <p>If the specified marker type is unrecognized, an error is generated.</p> <p><b>For Query SCPI</b></p> <p>For the Query the parameters are:</p> <p>&lt;filename&gt; - String type.</p> <p>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.</p> <p>The return value is a &lt;string&gt;, which includes each waveform segment file name, repetitions, and marker type. For example:</p> <p>SOUR:RAD:ARB:SEQ? “NVWFM:testSeq1.seq”,</p> <p>&lt;“wfmSegment1. wfm, 10, ALL, wfmSegment2.wfm, 20, M1M3”</p> <p>Error Checks for Query SCPI command:</p> <p>If you do not specify a filename, an error is generated.</p> <p>If the waveform sequence file name is empty, an error is generated.</p> <p>If the specified waveform sequence file cannot be found, an error is generated.</p>
Initial S/W Revision:	A.05.00
Help Map ID:	35687

**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:	<b>Source, Modulation Setup, ARB, Waveform Sequences</b>
Notes:	No remote command, front panel only.
Initial S/W Revision:	A.05.00
Help Map ID:	35489

## Source (Internal)

### Current Segment

Specifies the selected sequence segment that will be affected by the menu functions.

Key Path:	<b>Source, Modulation Setup, ARB, Waveform Sequences, Edit Selected Sequence</b>
Notes:	No remote command, front panel only. This key is grayed out and unavailable if the sequence is currently empty.
Initial S/W Revision:	A.05.00
Help Map ID:	35490

### 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:	<b>Source, Modulation Setup, ARB, Waveform Sequences, Edit Selected Sequence</b>
Notes:	No remote command, front panel only.
Initial S/W Revision:	A.05.00
Help Map ID:	35491

### 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:	<b>Source, Modulation Setup, ARB, Waveform Sequences, Edit Selected Sequence, Insert New Waveform</b>
Notes:	No remote command, front panel only.
Initial S/W Revision:	A.05.00
Help Map ID:	35492

### Segments on Hard Disk

This key functions the same as section [“Segments on Hard Disk” on page 698.](#)[\[Proc\\_iFrame:35433@\]](#)

Key Path:	<b>Source, Modulation Setup, ARB, Waveform Sequences, Edit Selected Sequence, Insert New Waveform</b>
Initial S/W Revision:	Prior to A.09.00
Help Map ID:	0

**Load Segment To ARB Memory**

This key functions the same as section [“Load Segment To ARB Memory” on page 698.](#)[\[Proc\\_iFrame:35434@\]](#)

Key Path:	<b>Source, Modulation Setup, ARB, Waveform Sequences, Edit Selected Sequence, Insert New Waveform, Segments on Hard Disk</b>
Initial S/W Revision:	Prior to A.09.00
Help Map ID:	0

**Load All To ARB Memory**

This key functions the same as section [“Load All To ARB Memory” on page 699.](#)[\[Proc\\_iFrame:35435@\]](#)

Key Path:	<b>Source, Modulation Setup, ARB, Waveform Sequences, Edit Selected Sequence, Insert New Waveform, Segments on Hard Disk</b>
Initial S/W Revision:	Prior to A.09.00
Help Map ID:	0

**Change Directory ...**

This key functions the same as section [“Change Directory...” on page 700](#)[\[Proc\\_iFrame:35436@\]](#)

Key Path:	<b>Source, Modulation Setup, ARB, Waveform Sequences, Edit Selected Sequence, Insert New Waveform, Segments on Hard Disk</b>
Initial S/W Revision:	Prior to A.09.00
Help Map ID:	0

**Default Directory ...**

This key functions the same as section [“Default Directory...” on page 700](#)[\[Proc\\_iFrame:35437@\]](#)

Key Path:	<b>Source, Modulation Setup, ARB, Waveform Sequences, Edit Selected Sequence, Insert New Waveform, Segments on Hard Disk</b>
Initial S/W Revision:	Prior to A.09.00
Help Map ID:	0

**Segments in ARB Memory**

This key functions the same as section [“Segments in ARB Memory” on page 701.](#) [\[Proc\\_iFrame:35438@\]](#)

Key Path:	<b>Source, Modulation Setup, ARB, Waveform Sequences, Edit Selected Sequence, Insert New Waveform</b>
Initial S/W Revision:	Prior to A.09.00
Help Map ID:	0

## Source (Internal)

### Delete Segment From ARB Memory

This key functions the same as section [“Delete Segment From ARB Mem”](#) on page 701.[Proc\_iFrame:35439@]

Key Path:	<b>Source, Modulation Setup, ARB, Waveform Sequences, Edit Selected Sequence, Insert New Waveform, Segments in ARB Memory</b>
Initial S/W Revision:	Prior to A.09.00
Help Map ID:	0

### Delete All From ARB Memory

This key functions the same as section [“Delete All From ARB Memory”](#) on page 702.[Proc\_iFrame:35440@]

Key Path:	<b>Source, Modulation Setup, ARB, Waveform Sequences, Edit Selected Sequence, Insert New Waveform, Segments in ARB Memory</b>
Initial S/W Revision:	Prior to A.09.00
Help Map ID:	0

### Query ARB Memory File List (Remote Command Only)

This key functions the same as section [Query “Query ARB Memory File List \(Remote Command Only\)”](#) on page 703[Proc\_iFrame:35686@]

Key Path:	<b>Source, Modulation Setup, ARB, Waveform Sequences, Edit Selected Sequence, Insert New Waveform, Segments in ARB Memory</b>
Initial S/W Revision:	Prior to A.09.00
Help Map ID:	0

### Edit Selected Waveform

Allows access to the sub-menus for editing the details of the currently selected waveform segment.

Key Path:	<b>Source, Modulation Setup, ARB, Waveform Sequences, Edit Selected Sequence</b>
Notes:	No remote command, front panel only.
Initial S/W Revision:	A.05.00
Help Map ID:	35493

### Repetitions

Allows you to specify the number of times the currently selected waveform is played within the sequence.

Key Path:	<b>Source, Modulation Setup, ARB, Waveform Sequences, Edit Selected Sequence, Edit Selected Waveform</b>
Notes:	No remote command, front panel only.
Preset:	1

Min:	1
Max:	TBD
Initial S/W Revision:	A.05.00
Help Map ID:	35494

**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:	<b>Source, Modulation Setup, ARB, Waveform Sequences, Edit Selected Sequence, Edit Selected Waveform</b>
Notes:	No remote command, front panel only.
Preset:	Enabled
Range:	Enabled Disabled
Initial S/W Revision:	A.05.00
Help Map ID:	35495

**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:	<b>Source, Modulation Setup, ARB, Waveform Sequences, Edit Selected Sequence, Edit Selected Waveform</b>
Notes:	No remote command, front panel only.
Preset:	Enabled
Range:	Enabled Disabled
Initial S/W Revision:	A.05.00
Help Map ID:	35496

**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:	<b>Source, Modulation Setup, ARB, Waveform Sequences, Edit Selected Sequence, Edit Selected Waveform</b>
Notes:	No remote command, front panel only.
Preset:	Enabled

## Source (Internal)

Range:	Enabled Disabled
Initial S/W Revision:	A.05.00
Help Map ID:	35497

### 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:	<b>Source, Modulation Setup, ARB, Waveform Sequences, Edit Selected Sequence, Edit Selected Waveform</b>
Notes:	No remote command, front panel only.
Preset:	Enabled
Range:	Enabled Disabled
Initial S/W Revision:	A.05.00
Help Map ID:	35498

### Delete Segment

Allows you to delete the current segment from the waveform sequence.

Key Path:	<b>Source, Modulation Setup, ARB, Waveform Sequences, Edit Selected Sequence</b>
Notes:	No remote command, front panel only.
Initial S/W Revision:	A.05.00
Help Map ID:	35499

### Save Sequence...

Pressing this key displays the “Save As” dialog box. The sequence name is passed to the save as dialog to use as the filename for saving, and the directory the save as dialog opens into is the default waveform directory.

Key Path:	<b>Source, Modulation Setup, ARB, Waveform Sequences, Edit Selected Sequence</b>
Notes:	No remote command, front panel only.
Initial S/W Revision:	A.05.00
Help Map ID:	35500

### 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:	<b>Source, Modulation Setup, ARB, Waveform Sequences</b>
Notes:	No remote command, front panel only.
Initial S/W Revision:	A.05.00
Help Map ID:	35501

### Waveform Utilities

Allows you access to the waveform utilities sub-menus.

Key Path:	<b>Source, Modulation Setup, ARB</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35502

### 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.

Key Path:	<b>Source, Modulation Setup, ARB, Waveform Utilities</b>
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
Help Map ID:	35503

### 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:	<b>Source, Modulation Setup, ARB, Waveform Utilities, Multi-Pack Licenses</b>
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
Help Map ID:	35504

### 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:	<b>Source, Modulation Setup, ARB, Waveform Utilities, Multi-Pack Licenses, Add Waveform</b>
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## Source (Internal)

<b>Remote Command:</b>	: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.
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
Help Map ID:	35659

### Segments on Hard Disk

This key functions the same as ["Segments on Hard Disk"](#) on page 698.

Key Path:	<b>Source, Modulation Setup, ARB, Waveform Utilities, Multi-Pack Licenses, Add Waveform</b>
Initial S/W Revision:	Prior to A.09.00
Help Map ID:	0

### Load Segment To ARB Memory

This key functions the same as ["Load Segment To ARB Memory"](#) on page 698.

Key Path:	<b>Source, Modulation Setup, ARB, Waveform Utilities, Multi-Pack Licenses, Add Waveform, Segment on Hard Drive</b>
Initial S/W Revision:	Prior to A.09.00
Help Map ID:	0

**Load All To ARB Memory**

This key functions the same as [“Load All To ARB Memory”](#) on page 699.

Key Path:	<b>Source, Modulation Setup, ARB, Waveform Utilities, Multi-Pack Licenses, Add Waveform, Segment on Hard Drive</b>
Initial S/W Revision:	Prior to A.09.00
Help Map ID:	0

**Change Directory ...**

This key functions the same as [“Change Directory...”](#) on page 700.

Key Path:	<b>Source, Modulation Setup, ARB, Waveform Utilities, Multi-Pack Licenses, Add Waveform, Segment on Hard Drive</b>
Initial S/W Revision:	Prior to A.09.00
Help Map ID:	0

**Default Directory ...**

This key functions the same as [“Default Directory...”](#) on page 700

Key Path:	<b>Source, Modulation Setup, ARB, Waveform Utilities, Multi-Pack Licenses, Add Waveform, Segment on Hard Drive</b>
Initial S/W Revision:	Prior to A.09.00
Help Map ID:	0

**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:	<b>Source, Modulation Setup, ARB, Waveform Utilities, Multi-Pack Licenses</b>
Dependencies:	This key is only available if the currently selected slot is in the trial state.
Initial S/W Revision:	A.05.00
Help Map ID:	35661

**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:	<b>Source, Modulation Setup, ARB, Waveform Utilities, Multi-Pack Licenses, Replace Waveform</b>
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## Source (Internal)

<b>Remote Command:</b>	: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. "-220 Parameter error; License slot <n> is illegal, slot number must be positive"
Initial S/W Revision:	A.05.00
Help Map ID:	35662

### Segments on Hard Disk

This key functions the same as ["Segments on Hard Disk" on page 698](#).

Key Path:	<b>Source, Modulation Setup, ARB, Waveform Utilities, Multi-Pack Licenses, Replace Waveform</b>
Initial S/W Revision:	Prior to A.09.00
Help Map ID:	0

### Load Segment To ARB Memory

This key functions the same as ["Load Segment To ARB Memory" on page 698](#).

Key Path:	<b>Source, Modulation Setup, ARB, Waveform Utilities, Multi-Pack Licenses, Replace Waveform, Segment on Hard Drive</b>
Initial S/W Revision:	Prior to A.09.00
Help Map ID:	0

### Load All To ARB Memory

This key functions the same as ["Load All To ARB Memory" on page 699](#).

Key Path:	<b>Source, Modulation Setup, ARB, Waveform Utilities, Multi-Pack Licenses, Replace Waveform, Segment on Hard Drive</b>
Initial S/W Revision:	Prior to A.09.00

Help Map ID:	0
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**Change Directory ...**

This key functions the same as [“Change Directory...”](#) on page 700.

Key Path:	<b>Source, Modulation Setup, ARB, Waveform Utilities, Multi-Pack Licenses, Replace Waveform, Segment on Hard Drive</b>
Initial S/W Revision:	Prior to A.09.00
Help Map ID:	0

**Default Directory ...**

This key functions the same as [“Default Directory...”](#) on page 700

Key Path:	<b>Source, Modulation Setup, ARB, Waveform Utilities, Multi-Pack Licenses, Replace Waveform, Segment on Hard Drive</b>
Initial S/W Revision:	Prior to A.09.00
Help Map ID:	0

**Clear Waveform from Slot**

Allows you to clear the waveform from the selected slot.

Key Path:	<b>Source, Modulation Setup, ARB, Waveform Utilities, Multi-Pack Licenses</b>
<b>Remote Command:</b>	: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. "-220 Parameter error; License slot <n> is illegal, slot number must be positive"
Dependencies:	This key is only available if the currently selected slot is in the trial state.
Initial S/W Revision:	A.05.00
Help Map ID:	35664

**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

## Source (Internal)

permanently licensed.

Key Path:	<b>Source, Modulation Setup, ARB, Waveform Utilities, Multi-Pack Licenses</b>
<b>Remote Command:</b>	: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. "-220 Parameter error; License slot <n> is illegal, slot number must be positive"
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
Help Map ID:	35665

## Slot Status Query (Remote Command Only)

Returns the status of the specified slot.

<b>Remote Command:</b>	: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. "-220 Parameter error; License slot <n> is illegal, slot number must be positive"  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
Help Map ID:	35688

**Slots Free Query (Remote Command Only)**

Returns the number of license slots free.

<b>Remote Command:</b>	: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
Help Map ID:	35689

**Slot Used Query (Remote Command Only)**

Returns the number of license slots used.

<b>Remote Command:</b>	: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
Help Map ID:	35690

## Source (Internal)

### Slot Waveform Name Query (Remote Command Only)

Returns the waveform name of the specified slot

<b>Remote Command:</b>	: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. "-220 Parameter error; License slot <n> is illegal, slot number must be positive".  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
Help Map ID:	0

### Slot Waveform Unique ID Query (Remote Command Only)

Returns the waveform unique ID of the specified slot.

<b>Remote Command:</b>	: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. "-220 Parameter error; License slot <n> is illegal, slot number must be positive".  Result type is string. If input slot number exceeds total available slot number, "Nonexistent" is returned.  Only Signal Studio waveform has unique ID, which is a positive number. (User generated waveform has no unique ID). If no waveform stored in the specified slot, then "0" is returned



Initial S/W Revision:	A.12.00
Help Map ID:	0

**Locked Waveform Name List Query (Remote Command Only)**

Returns the waveform name list of locked.

<b>Remote Command:</b>	: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
Help Map ID:	0

**Locked Waveform Unique ID List Query (Remote Command Only)**

Returns the waveform unique id list of locked.

<b>Remote Command:</b>	: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
Help Map ID:	0

**Marker Utilities**

Allows access to the marker utilities sub-menus.

Key Path:	<b>Source, Modulation Setup, ARB</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35505

**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:	<b>Source, Modulation Setup, ARB, Marker Utilities</b>
Initial S/W Revision:	A.05.00

## Source (Internal)

Help Map ID:	35506
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### Mkr 1 Polarity

Allows you to set the polarity of marker 1.

Key Path:	<b>Source, Modulation Setup, ARB, Marker Utilities, Marker Polarity</b>
<b>Remote Command:</b>	: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
Help Map ID:	35507

### Mkr 2 Polarity

Allows you to set the polarity of marker 2.

Key Path:	<b>Source, Modulation Setup, ARB, Marker Utilities, Marker Polarity</b>
<b>Remote Command:</b>	: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
Help Map ID:	35508

**Mkr 3 Polarity**

Allows you to set the polarity of marker 3.

Key Path:	<b>Source, Modulation Setup, ARB, Marker Utilities, Marker Polarity</b>
<b>Remote Command:</b>	: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
Help Map ID:	35509

**Mkr 4 Polarity**

Allows you to set the polarity of marker 4.

Key Path:	<b>Source, Modulation Setup, ARB, Marker Utilities, Marker Polarity</b>
<b>Remote Command:</b>	: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
Help Map ID:	35510

**Marker Routing**

Allows access to the marker routing sub-menus, which allow you to specify where the marker events are routed. It

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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:	<b>Source, Modulation Setup, ARB, Marker Utilities</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35511

## 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:	<b>Source, Modulation Setup, ARB, Marker Utilities, Marker Routing</b>
<b>Remote Command:</b>	: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
Help Map ID:	35512

## None

Sets no marker to be used for the pulse/RF blanking function, essentially turning the RF blanking function off.

Key Path:	<b>Source, Modulation Setup, ARB, Marker Utilities, Marker Routing, Pulse/RF Blank</b>
Example:	SOUR:RAD:ARB:MDES:PULS NONE
Initial S/W Revision:	A.05.00
Help Map ID:	35513

**Marker 1**

Sets marker 1 to be used for the pulse/RF blanking function.

Key Path:	<b>Source, Modulation Setup, ARB, Marker Utilities, Marker Routing, Pulse/RF Blank</b>
Example:	SOUR:RAD:ARB:MDES:PULS M1
Initial S/W Revision:	A.05.00
Help Map ID:	35514

**Marker 2**

Sets marker 2 to be used for the pulse/RF blanking function.

Key Path:	<b>Source, Modulation Setup, ARB, Marker Utilities, Marker Routing, Pulse/RF Blank</b>
Example:	SOUR:RAD:ARB:MDES:PULS M2
Initial S/W Revision:	A.05.00
Help Map ID:	35515

**Marker 3**

Sets marker 3 to be used for the pulse/RF blanking function.

Key Path:	<b>Source, Modulation Setup, ARB, Marker Utilities, Marker Routing, Pulse/RF Blank</b>
Example:	SOUR:RAD:ARB:MDES:PULS M3
Initial S/W Revision:	A.05.00
Help Map ID:	35516

**Marker 4**

Sets marker 4 to be used for the pulse/RF blanking function.

Key Path:	<b>Source, Modulation Setup, ARB, Marker Utilities, Marker Routing, Pulse/RF Blank</b>
Example:	SOUR:RAD:ARB:MDES:PULS M4
Initial S/W Revision:	A.05.00
Help Map ID:	35517

**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

## Source (Internal)

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:	<b>Source, Modulation Setup, ARB, Marker Utilities, Marker Routing</b>
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
Help Map ID:	35518

### None

Sets no marker to be used for the ALC hold function, essentially turning the ALC hold function off.

Key Path:	<b>Source, Modulation Setup, ARB, Marker Utilities, Marker Routing, ALC Hold</b>
Example:	SOUR:RAD:ARB:MDES:PULS NONE
Initial S/W Revision:	A.05.00
Help Map ID:	35519

### Marker 1

Sets marker 1 to be used for the ALC hold function.

Key Path:	<b>Source, Modulation Setup, ARB, Marker Utilities, Marker Routing, ALC Hold</b>
Example:	SOUR:RAD:ARB:MDES:PULS M1
Initial S/W Revision:	A.05.00
Help Map ID:	35520

### Marker 2

Sets marker 2 to be used for the ALC hold function.

Key Path:	<b>Source, Modulation Setup, ARB, Marker Utilities, Marker Routing, ALC Hold</b>
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Example:	SOUR:RAD:ARB:MDES:PULS M2
Initial S/W Revision:	A.05.00
Help Map ID:	35521

**Marker 3**

Sets marker 3 to be used for the ALC hold function.

Key Path:	<b>Source, Modulation Setup, ARB, Marker Utilities, Marker Routing, ALC Hold</b>
Example:	SOUR:RAD:ARB:MDES:PULS M3
Initial S/W Revision:	A.05.00
Help Map ID:	35522

**Marker 4**

Sets marker 4 to be used for the ALC hold function.

Key Path:	<b>Source, Modulation Setup, ARB, Marker Utilities, Marker Routing, ALC Hold</b>
Example:	SOUR:RAD:ARB:MDES:PULS M4
Initial S/W Revision:	A.05.00
Help Map ID:	35523

**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:	<b>Source, Modulation Setup, ARB</b>
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
Help Map ID:	35536

**Clear Header**

Allows you to clear the header information from the file header associated with the currently selected waveform.

Key Path:	<b>Source, Modulation Setup, ARB, Header Utilities</b>
<b>Remote Command:</b>	:SOURce:RADio:ARB:HEADer:CLEar
Example:	SOUR:RAD:ARB:HEAD:CLE

## Source (Internal)

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
Help Map ID:	35537

### Save Setup To Header

Allows you to save new file header information details to the file.

Key Path:	<b>Source, Modulation Setup, ARB, Header Utilities</b>
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
Help Map ID:	35538

### 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.

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:\NVARB\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:\NVARB 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
Help Map ID:	0



**Query Selected Waveform Header info (Remote Command Only)**

This query provides a listing of the current selected ARB header info. If no ARB selected, then empty string is returned..

<b>Remote Command:</b>	:SOURce:RADio:ARB:HEADer:INFormation?
Example:	SOUR:RAD:ARB:HEAD:INF?
Notes:	<p>Query only</p> <p>After each colon of field title string, related header info string will be appended.</p> <p>The field title string in "Range" part cannot change, for Sequence Studio needs to accurately match those string character to know which header info field it is.</p> <p>Below are related abbreviation description:</p> <p>"DESC" - Description</p> <p>"SR" - Sample Rate</p> <p>"RTS" - Run Time Scaling</p> <p>"RMS" - Root Mean Square</p> <p>"M1P" - Marker 1 Polarity</p> <p>"M2P" - Marker 2 Polarity</p> <p>"M3P" - Marker 3 Polarity</p> <p>"M4P" - Marker 4 Polarity</p> <p>"ALCHR" - ALC Hold Routing</p> <p>"RFBR" - RF Blank Routing</p> <p>"FOFF" - Frequency Offset</p> <p>"AWGNST" - AWGN State</p> <p>"AWGNCN" - AWGN C/N Ratio</p> <p>"AWGNCBW" - AWGN Carrier Bandwidth</p> <p>"AWGNNBW" - AWGN Noise Bandwidth</p> <p>"AWGNCRMS" - AWGN Carrier RMS</p> <p>"ORP" - DAC Over Range Protection</p> <p>"UID" - Unique ID</p> <p>"LICSTS" - License Status</p>
Range:	"DESC:", "SR:", "RTS:", "RMS:", "M1P:", "M2P:", "M3P:", "M4P:", "ALCHR:", "RFBR:", "FOFF:", "AWGNST:", "AWGNCN:", "AWGNCBW:", "AWGNNBW:", "AWGNCRMS:", "ORP:", "UID:", "LICSTS"
Initial S/W Revision:	A.12.00

## Source (Internal)

Help Map ID:	0
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### Bus Trigger Command (Remote Command Only)

Used to initiate an immediate trigger event if the trigger source is set to Bus.

<b>Remote Command:</b>	:SOURce:RADio:ARB:TRIGger:INITiate
Example:	SOUR:RAD:ARB:TRIG:INIT
Initial S/W Revision:	A.05.00
Help Map ID:	35691

### AM

Allows access to the menu for configuring the Amplitude Modulation.

Key Path:	<b>Source, Modulation Setup</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35539

### 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:	<b>Source, Modulation Setup, AM</b>
<b>Remote Command:</b>	:SOURce:AM:STATe :SOURce:AM:STATe?
Example:	SOUR:AM:STAT OFF
Preset:	Off
Range:	On   Off
Initial S/W Revision:	A.05.00
Help Map ID:	35540

### AM Depth

Allows you to set the amplitude modulation depth in percent.

Key Path:	<b>Source, Modulation Setup, AM</b>
<b>Remote Command:</b>	: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
Help Map ID:	35541

**AM Rate**

Allows you to set the internal amplitude modulation rate.

Key Path:	<b>Source, Modulation Setup, AM</b>
<b>Remote Command:</b>	: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
Help Map ID:	35542

**FM**

Allows access to the menu for configuring the frequency modulation.

Key Path:	<b>Source, Modulation Setup</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35543

**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:	<b>Source, Modulation Setup, FM</b>
<b>Remote Command:</b>	:SOURce:FM:STATe :SOURce:FM:STATe?
Example:	SOUR:FM:STAT OFF

## Source (Internal)

Preset:	Off
Range:	On   Off
Initial S/W Revision:	A.05.00
Help Map ID:	35544

## FM Deviation

Allows you to set the frequency modulation deviation.

Key Path:	<b>Source, Modulation Setup, FM</b>
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
Help Map ID:	35545

## FM Rate

Allows you to set the internal frequency modulation rate.

Key Path:	<b>Source, Modulation Setup, FM</b>
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
Help Map ID:	35546

## PM

Allows access to the menu for configuring the phase modulation.

Key Path:	<b>Source, Modulation Setup</b>
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Initial S/W Revision:	A.05.00
Help Map ID:	35547

**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:	<b>Source, Modulation Setup, PM</b>
<b>Remote Command:</b>	:SOURce:PM:STATe :SOURce:PM:STATe?
Example:	SOUR:PM:STAT OFF
Preset:	Off
Range:	On   Off
Initial S/W Revision:	A.05.00
Help Map ID:	35548

**PM Deviation**

Allows you to set the phase modulation deviation.

Key Path:	<b>Source, Modulation Setup, PM</b>
<b>Remote Command:</b>	: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
Help Map ID:	35549

**PM Rate**

Allows you to set the internal phase modulation rate.

Key Path:	<b>Source, Modulation Setup, PM</b>
<b>Remote Command:</b>	:SOURce:PM:INTernal:FREQuency :SOURce:PM:INTernal:FREQuency?

## Source (Internal)

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
Help Map ID:	35550

## Multiport Adapter Output Port Amplitude Correction Configuration Validation (Remote Command Only)

This command is used to validate MPA TX port amplitude correction for Source MXG Mode.

Key Path:	<b>Remote Command Only</b>
<b>Remote Command:</b>	:SOURce:RADio:MPADapter:CORRection:ERRor?
Example:	SOUR:RAD:MPAD:CORR:ERR?
Note	Query Only SCPI Remote command only If detected invalid configuration, popup error message "-221 Settings conflict; MPA TX port<n> amplitude correction value <n>dB is out of range. The valid range is <n> ~ <n>dB" Or "-221 Settings conflict; MPA TX port<n> amplitude correction delta exceeds <n>dB between port<n> and port<n>" to report the first detected conflict.
Range:	"No error"   Error info of the first found conflic
Initial S/W Revision:	A.12.00
Help Map ID:	0

## 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 780.

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:	<b>Source</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35551

### 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:	<b>Source, List Sequencer</b>
<b>Remote Command:</b>	: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
Help Map ID:	35552

### 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:	<b>Source, List Sequencer</b>
<b>Remote Command:</b>	:SOURce:LIST:TRIGger[:IMMediate]
Example:	SOUR:LIST:TRIG

## Source (Internal)

Notes:	<p>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.</p> <p>If the file needed by the sequencer is not already in ARB memory, the sequence cannot be initiated and an error will be generated.</p> <p>There is a blocking SCPI query which can be used to query if source list sequence being initiated successfully or not. (see <a href="#">“Query List Sequence Initiation Armed Status (Remote Command Only)”</a> on page 790 Query Source List Sequence Armed Status)</p>
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
Help Map ID:	35554

### 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.

<b>Remote Command:</b>	:SOURce:LIST:TRIGger:INITiate[:IMMediate]
Example:	SOUR:LIST:TRIG:INIT
Initial S/W Revision:	A.05.00
Help Map ID:	35679

### List Sequencer Setup

Allows you access to the list sequencer setup menus.

Key Path:	<b>Source, List Sequencer</b>
Help Map ID:	35555

### Number of Steps

Allows you to specify the number of steps within the list sequence.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup</b>
<b>Remote Command:</b>	: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
Help Map ID:	35556

### Current Step

Allows you to select the step number you wish to view or edit.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup</b>
Notes:	No remote command, front panel only.
Preset:	1
Min:	1
Max:	Step Count
Initial S/W Revision:	A.05.00
Help Map ID:	35557

### 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:	<b>Source, List Sequencer, List Sequencer Setup</b>
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
Help Map ID:	35558

## Source (Internal)

### 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:	<b>Source, List Sequencer, List Sequencer Setup</b>
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
Help Map ID:	35559

### 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:	<b>Source, List Sequencer, List Sequencer Setup</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35560

### Step Trigger

Allows access to the sub-menu for selecting the trigger input for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup</b>
<b>Remote Command:</b>	:SOURce:LIST:STEP[1] 2 3...1000:SETup:INPut:TRIGger IMMediate INTernal EXTernal2 KEY BUS :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
Initial S/W Revision:	A.05.00
Help Map ID:	35561

**Free Run**

Sets the trigger input for the current step to Free Run.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Step Trigger</b>
Example:	SOUR:LIST:STEP2:SET:INP:TRIG IMM
Notes:	SCPI is supported after A.09.40
Initial S/W Revision:	A.05.00
Help Map ID:	35562

**Internal**

Sets the trigger input for the current step to Internal.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Step Trigger</b>
Example:	SOUR:LIST:STEP2:SET:INP:TRIG INT
Notes:	SCPI is supported after A.09.40
Initial S/W Revision:	A.05.00
Help Map ID:	35563

**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:	<b>Source, List Sequencer, List Sequencer Setup, Step Trigger</b>
Example:	SOUR:LIST:STEP2:SET:INP:TRIG KEY
Notes:	SCPI is supported after A.09.40
Initial S/W Revision:	A.05.00
Help Map ID:	35680

**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:	<b>Source, List Sequencer, List Sequencer Setup, Step Trigger</b>
Example:	SOUR:LIST:STEP2:SET:INP:TRIG BUS
Notes:	SCPI is supported after A.09.40

## Source (Internal)

Initial S/W Revision:	A.05.00
Help Map ID:	35681

### External 2

Sets the trigger input for the current step to External 2.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Step Trigger</b>
Example:	SOUR:LIST:STEP2:SET:INP:TRIG EXT2
Notes:	SCPI is supported after A.09.40
Initial S/W Revision:	A.05.00
Help Map ID:	35564

### 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	Switching within same frequency band: 300 $\mu$ s Switching across frequency bands: 1 ms The band ranges are: Frequency Band 1: -0.08 GHz to 0.6075 GHz Frequency Band 2: 0.5075 GHz to 2.1775 GHz Frequency Band 3: 2.0775 GHz to 3.6 GHz
Amplitude	500 $\mu$ s

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:	<b>Source, List Sequencer, List Sequencer Setup</b>
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<b>Remote Command:</b>	: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
Help Map ID:	35571

### 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:	<b>Source, List Sequencer, List Sequencer Setup</b>
Notes:	No remote command, front panel only.
Initial S/W Revision:	A.05.00
Help Map ID:	35572

### 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:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup</b>
<b>Remote Command:</b>	:SOURCE:LIST:STEP [1]   2   3...1000:SETup:RADio:BAND NONE   PGSM   EGSM   RGSM   DCS1800   PCS1900   TGSM810   GSM450   GSM4 80   GSM700   GSM850   BANDI   BANDII   BANDIII   BANDIV   BANDV   BAND VI   BANDVII   BANDVIII   BANDIX   BANDX   BANDXI   BANDXII   BANDXII I   BANDXIV   USCELL   USPCS   JAPAN   KOREAN   NMT   IMT2K   UPPER   SEC OND   PAMR400   PAMR800   IMTEXT   PCS1DOT9G   AWS   US2DOT5G   PUBLI C   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   BAND4 2   BAND43   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?

## Source (Internal)

Notes:	SCPI is supported after A.09.40
Initial S/W Revision:	A.05.00
Help Map ID:	35573

### None

Selects no radio standard for use on the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard</b>
Example:	SOUR:LIST:STEP2:SET:RAD:BAND NONE
Notes:	SCPI is supported after A.09.40
Initial S/W Revision:	A.05.00
Help Map ID:	35574

### 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:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35575

### P-GSM

Selects P-GSM as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, GSM/EDGE</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35576

### E-GSM

Selects E-GSM as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, GSM/EDGE</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35577

**R-GSM**

Selects R-GSM as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, GSM/EDGE</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35578

**DCS 1800**

Selects DCS 1800 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, GSM/EDGE</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35579

**PCS 1900**

Selects PCS 1900 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, GSM/EDGE</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35580

**GSM 450**

Selects GSM 450 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, GSM/EDGE</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35582

**GSM 480**

Selects GSM 480 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, GSM/EDGE</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35583

## Source (Internal)

### GSM 850

Selects GSM 850 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, GSM/EDGE</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35585

### GSM 700

Selects GSM 700 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, GSM/EDGE</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35584

### T-GSM 810

Selects T-GSM 810 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, GSM/EDGE</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35581

### 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:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35586

### Band I

Selects Band I as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, WCDMA</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35587



**Band II**

Selects Band II as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, WCDMA</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35588

**Band III**

Selects Band III as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, WCDMA</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35589

**Band IV**

Selects Band IV as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, WCDMA</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35590

**Band V**

Selects Band V as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, WCDMA</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35591

**Band VI**

Selects Band VI as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, WCDMA</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35592

## Source (Internal)

### Band VII

Selects Band VII as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, WCDMA</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35593

### Band VIII

Selects Band VIII as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, WCDMA</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35594

### Band IX

Selects Band IX as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, WCDMA</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35595

### Band X

Selects Band X as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, WCDMA</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35596

### Band XI

Selects Band XI as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, WCDMA</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35597

**Band XII**

Selects Band XII as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, WCDMA</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35598

**Band XIII**

Selects Band XIII as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, WCDMA</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35599

**Band XIV**

Selects Band XIV as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, WCDMA</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35600

**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:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35601

**US CELL**

Selects US Cell as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35602

## Source (Internal)

### US PCS

Selects US PCS as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35603

### Japan Cell

Selects Japan Cell as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35604

### Korean PCS

Selects Korean PCS as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35605

### NMT 450

Selects NMT 450 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35606

### IMT 2000

Selects IMT 2000 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35607

**Upper 700**

Selects Upper 700 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35608

**Secondary 800**

Selects Secondary 800 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35609

**400 Euro PAMR**

Selects 400 Euro PAMR as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35610

**800 PAMR**

Selects 800 PAMR as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35611

**2.5GHz IMT EXT**

Selects 2.5 GHz IMT EXT as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35612

## Source (Internal)

### US PCS 1.9GHz

Selects US PCS 1.9 GHz as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35613

### AWS

Selects AWS as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35614

### US 2.5GHz

Selects US 2.5 GHz as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35615

### 700 Public Safety

Selects 700 Public Safety as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35616

### C2K Lower 700

Selects C2K Lower 700 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, CDMA 2000 / 1xEVDO</b>
Initial S/W Revision:	A.05.00
Help Map ID:	35617

**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:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard</b>
Initial S/W Revision:	A.09.50
Help Map ID:	35723

**BAND 1**

Selects BAND 1 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE</b>
Initial S/W Revision:	A.09.50
Help Map ID:	35724

**BAND 2**

Selects BAND 2 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE</b>
Initial S/W Revision:	A.09.50
Help Map ID:	35725

**BAND 3**

Selects BAND 3 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE</b>
Initial S/W Revision:	A.09.50
Help Map ID:	35726

**BAND 4**

Selects BAND 4 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE</b>
Initial S/W Revision:	A.09.50
Help Map ID:	35727

## Source (Internal)

### BAND 5

Selects BAND 5 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE</b>
Initial S/W Revision:	A.09.50
Help Map ID:	35728

### BAND 6

Selects BAND 6 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE</b>
Initial S/W Revision:	A.09.50
Help Map ID:	35729

### BAND 7

Selects BAND 7 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE</b>
Initial S/W Revision:	A.09.50
Help Map ID:	35730

### BAND 8

Selects BAND 8 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE</b>
Initial S/W Revision:	A.09.50
Help Map ID:	35731

### BAND 9

Selects BAND 9 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE</b>
Initial S/W Revision:	A.09.50
Help Map ID:	35732



**BAND 10**

Selects BAND 10 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE</b>
Initial S/W Revision:	A.09.50
Help Map ID:	35733

**BAND 11**

Selects BAND 11 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE</b>
Initial S/W Revision:	A.09.50
Help Map ID:	35734

**BAND 12**

Selects BAND 12 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE</b>
Initial S/W Revision:	A.09.50
Help Map ID:	35735

**BAND 13**

Selects BAND 13 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE</b>
Initial S/W Revision:	A.09.50
Help Map ID:	35736

**BAND 14**

Selects BAND 14 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE</b>
Initial S/W Revision:	A.09.50
Help Map ID:	35737

## Source (Internal)

### BAND 17

Selects BAND 17 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE</b>
Initial S/W Revision:	A.09.50
Help Map ID:	35738

### BAND 18

Selects BAND 18 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE</b>
Initial S/W Revision:	A.09.50
Help Map ID:	35739

### BAND 19

Selects BAND 19 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE</b>
Initial S/W Revision:	A.09.50
Help Map ID:	35740

### BAND 20

Selects BAND 20 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE</b>
Initial S/W Revision:	A.09.50
Help Map ID:	35741

### BAND 21

Selects BAND 21 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE</b>
Initial S/W Revision:	A.09.50
Help Map ID:	35742

**BAND 24**

Selects BAND 24 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE</b>
Initial S/W Revision:	A.09.50
Help Map ID:	35743

**BAND 25**

Selects BAND 25 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE</b>
Initial S/W Revision:	A.09.50
Help Map ID:	35744

**BAND 26**

Selects BAND 26 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE</b>
Initial S/W Revision:	A.12.53
Help Map ID:	35805

**LTE TDD**

Pressing this key once selects LTE TDD as the radio standard and the current LTE TDD band as the active channel band. Pressing this key again allows access to the sub-menus for selecting a different LTE TDD band

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard</b>
Initial S/W Revision:	A.11.50
Help Map ID:	35785

**BAND 33**

Selects BAND 33 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE TDD</b>
Initial S/W Revision:	A.11.50
Help Map ID:	35786

## Source (Internal)

### BAND 34

Selects BAND 34 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE TDD</b>
Initial S/W Revision:	A.11.50
Help Map ID:	35787

### BAND 35

Selects BAND 35 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE TDD</b>
Initial S/W Revision:	A.11.50
Help Map ID:	35788

### BAND 36

Selects BAND 36 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE TDD</b>
Initial S/W Revision:	A.11.50
Help Map ID:	35789

### BAND 37

Selects BAND 37 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE TDD</b>
Initial S/W Revision:	A.11.50
Help Map ID:	35790

### BAND 38

Selects BAND 38 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE TDD</b>
Initial S/W Revision:	A.11.50
Help Map ID:	35791

**BAND 39**

Selects BAND 39 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE TDD</b>
Initial S/W Revision:	A.11.50
Help Map ID:	35792

**BAND 40**

Selects BAND 40 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE TDD</b>
Initial S/W Revision:	A.11.50
Help Map ID:	35793

**BAND 41**

Selects BAND 41 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE TDD</b>
Initial S/W Revision:	A.11.50
Help Map ID:	35794

**BAND 42**

Selects BAND 42 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE TDD</b>
Initial S/W Revision:	A.11.50
Help Map ID:	35795

**BAND 43**

Selects BAND 43 as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, LTE TDD</b>
Initial S/W Revision:	A.11.50
Help Map ID:	35796

## Source (Internal)

### TDSCDMA

Pressing this key once selects TDSCDMA as the radio standard and the current TDSCDMA band as the active channel band. Pressing this key again allows access to the sub-menus for selecting a different TDSCDMA band

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard</b>
Initial S/W Revision:	A.11.50
Help Map ID:	35797

### BAND A

Selects BAND A as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, TDSCDMA</b>
Initial S/W Revision:	A.11.50
Help Map ID:	35798

### BAND B

Selects BAND B as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, TDSCDMA</b>
Initial S/W Revision:	A.11.50
Help Map ID:	35799

### BAND C

Selects BAND C as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, TDSCDMA</b>
Initial S/W Revision:	A.11.50
Help Map ID:	35800

### BAND D

Selects BAND D as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, TDSCDMA</b>
Initial S/W Revision:	A.11.50
Help Map ID:	35801

**BAND E**

Selects BAND E as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, TDSCDMA</b>
Initial S/W Revision:	A.11.50
Help Map ID:	35802

**BAND F**

Selects BAND F as the band for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup, Radio Standard, TDSCDMA</b>
Initial S/W Revision:	A.11.50
Help Map ID:	35803

**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:	<b>Source, List Sequencer, List Sequencer Setup, Radio Setup</b>
<b>Remote Command:</b>	: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
Help Map ID:	35685

**Channel**

Allows you to specify the frequency of the current step via a channel number.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup</b>
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## Source (Internal)

<b>Remote Command:</b>	: SOURce : LIST : STEP [1]   2   3...1000 : SETup : CNFRfrequency <double>  : SOURce : LIST : STEP [1]   2   3...1000 : SETup : CNFRfrequency?
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
Help Map ID:	35619

## Frequency

Allows you to specify a frequency value for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup</b>
<b>Remote Command:</b>	: SOURce : LIST : STEP [1]   2   3...1000 : SETup : CNFRfrequency <double>  : SOURce : LIST : STEP [1]   2   3...1000 : SETup : CNFRfrequency?
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 = 3.8 GHz
Initial S/W Revision:	A.05.00
Help Map ID:	35620

## Power

Allows you to specify a power value for the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup</b>
<b>Remote Command:</b>	: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:	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.
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 658 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 658 and the table RF Power Range for the valid ranges.
Initial S/W Revision:	A.05.00
Help Map ID:	35621

## Source (Internal)

### 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:	<b>Source, List Sequencer, List Sequencer Setup</b>
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
Help Map ID:	35622

### CW

Sets the current step to output a CW tone.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Waveform</b>
Example:	SOUR:LIST:STEP2:SET:WAV "CW"
Notes:	SCPI is supported after A.09.40
Initial S/W Revision:	A.05.00
Help Map ID:	35625

### Selected Waveform

Inserts the currently selected waveform in the waveform selection view as the waveform for playback during the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Waveform</b>
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
Help Map ID:	35623

**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:	<b>Source, List Sequencer, List Sequencer Setup, Waveform</b>
Example:	SOUR:LIST:STEP2:SET:WAV "Cont"
Notes:	SCPI is supported after A.09.40
Initial S/W Revision:	A.05.00
Help Map ID:	35624

**Off**

Disable RF output of the current step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Waveform</b>
Example:	SOUR:LIST:STEP2:SET:WAV "Off"
Notes:	SCPI is supported after A.09.40
Initial S/W Revision:	A.05.00
Help Map ID:	35683

**Segments on Hard Disk**

This key functions the same as [“Segments on Hard Disk”](#) on page 698.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Waveform</b>
Initial S/W Revision:	Prior to A.09.00
Help Map ID:	0

**Load Segment To ARB Memory**

This key functions the same as [“Load Segment To ARB Memory”](#) on page 698.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Waveform, Segment on Hard Drive</b>
Initial S/W Revision:	Prior to A.09.00
Help Map ID:	0

## Source (Internal)

### Load All To ARB Memory

This key functions the same as [“Load All To ARB Memory”](#) on page 699.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Waveform, Segment on Hard Drive</b>
Initial S/W Revision:	Prior to A.09.00
Help Map ID:	0

### Change Directory ...

This key functions the same as [“Change Directory...”](#) on page 700.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Waveform, Segment on Hard Drive</b>
Initial S/W Revision:	Prior to A.09.00
Help Map ID:	0

### Default Directory ...

This key functions the same as [“Default Directory...”](#) on page 700

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Waveform, Segment on Hard Drive</b>
Initial S/W Revision:	Prior to A.09.00
Help Map ID:	0

### Segments in ARB Memory

This key functions the same as [“Segments in ARB Memory”](#) on page 701.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Waveform, Segments in ARB Memory</b>
Initial S/W Revision:	Prior to A.09.00
Help Map ID:	0

### Delete Segment From ARB Memory

This key functions the same as [“Delete Segment From ARB Mem”](#) on page 701.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Waveform, Segments in ARB Memory, Segment in ARB Memory</b>
Initial S/W Revision:	Prior to A.09.00
Help Map ID:	0

**Delete All From ARB Memory**

This key functions the same as “Delete All From ARB Memory” on page 702.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Waveform, Segments in ARB Memory, Segment in ARB Memory</b>
Initial S/W Revision:	Prior to A.09.00
Help Map ID:	0

**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:	<b>Source, List Sequencer, List Sequencer Setup</b>
<b>Remote Command:</b>	:SOURce:LIST:STEP [1]   2   3...1000:SETup:DURation:TYPE TIME   COUNT   CONTInuous :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.
Range:	Time   Play Count   Continuous
Initial S/W Revision:	A.05.00
Help Map ID:	35626

**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:	<b>Source, List Sequencer, List Sequencer Setup, Step Duration</b>
Example:	SOUR:LIST:STEP2:SET:DUR:TYPE TIME
Notes:	SCPI is supported after A.09.40
Initial S/W Revision:	A.05.00
Help Map ID:	35627

## Source (Internal)

### Duration Time

Allows you to specify the length of time the current step will play.

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. 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:	<b>Source, List Sequencer, List Sequencer Setup, Step Duration, Time</b>
Remote Command:	:SOURce:LIST:STEP [1]   2   3...1000:SETup:DURation:TCOUNT <double> :SOURce:LIST:STEP [1]   2   3...1000:SETup:DURation:TCOUNT?
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” and “Duration Time” according to current Duration Type setting if “Play Count” or “Duration Time”. 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
Help Map ID:	35628

### 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:	<b>Source, List Sequencer, List Sequencer Setup, Step Duration</b>
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
Help Map ID:	35684

**Play Count**

Allows you to specify the number of times the current ARB waveform file will play during a step.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Step Duration, Time, Play Count</b>
<b>Remote Command:</b>	:SOURCE:LIST:STEP [1]   2   3...1000:SETup:DURation:TCOUNT <double>  :SOURCE:LIST:STEP [1]   2   3...1000:SETup:DURation:TCOUNT?
Example:	SOUR:LIST:STEP2:SET:DUR:TCO 10  SOUR:LIST:STEP2:SET:DUR:TCO?
Notes:	SCPI is supported after A.09.40  This SCPI is reused by “Play Count” and “Duration Time” according to current Duration Type setting if “Play Count” or “Duration Time”.  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 “Play Count” is set for the last step, the last step of ARB keeps playing as if set to “Continuous” after play count setting is reached.
Preset:	1
Min:	1
Max:	65536
Initial S/W Revision:	A.05.00
Help Map ID:	35629

**Continuous**

Sets the current step to be played continuously until the next step starts.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup, Step Duration</b>
Example:	SOUR:LIST:STEP2:SET:DUR:TYPE CONT
Notes:	SCPI is supported after A.09.40
Initial S/W Revision:	A.05.00
Help Map ID:	35630

**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

## Source (Internal)

off trigger output.

Key Path:	<b>Source, List Sequencer, List Sequencer Setup</b>
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
Help Map ID:	35633

## 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   3   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 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   3   4..1000:SETup?
Example:	SOUR:LIST:STEP1:SET INT, 1ms, PGSM, DOWN, 10, -25 dBm, "GSM_Test1.bin", TIME, 10ms, OFF, 255



Notes:	<p>The parameters are: (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"> <li>1. Step Trigger &lt;enum&gt; - specifies the input trigger for the step. For details of the valid types of step trigger see <a href="#">“Step Trigger” on page 750</a>.</li> <li>2. Transition Time &lt;time&gt; - specifies the transition time for the step in seconds. For details of the valid ranges for the transition time see <a href="#">“Transition Time” on page 752</a>.</li> <li>3. Radio Band &lt;enum&gt; - specifies the radio band for the step. For details of the valid radio bands see <a href="#">“Radio Setup” on page 753</a>.</li> <li>4. Radio Band Link &lt;enum&gt; - specifies the radio band link direction for the step. For details of the valid link types, see <a href="#">“Radio Band Link” on page 771</a>.</li> <li>5. Frequency/Channel Number &lt;freq&gt;/&lt;chan num&gt; - 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 <a href="#">“Channel” on page 771</a> and <a href="#">“Frequency” on page 772</a>.</li> <li>6. Power &lt;ampl&gt; - specifies the output power for the step in dBm. For details of the valid ranges see <a href="#">“Power” on page 773</a>.</li> <li>7. Waveform &lt;string&gt; - 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"> <li>&lt;filename&gt; - 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.</li> <li>CONT – continues playback of the ARB file from the previous step</li> <li>CW – outputs a CW tone</li> <li>OFF – disable RF output</li> </ul> </li> <li>8. Step Duration &lt;enum&gt; - 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 <a href="#">“Step Duration” on page 777</a>.</li> <li>9. Time or Count &lt;time/int&gt; - 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, <a href="#">“Time” on page 777</a> and <a href="#">“Play Count” on page 778</a>.</li> <li>10. Output Trigger &lt;Boolean&gt; - specifies the output trigger for the step. For details of the ranges for this setting see <a href="#">“Output Trigger” on page 779</a>.</li> </ol>
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**Source (Internal)**

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 <a href="#">“Number of Steps” on page 748</a> .  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
Help Map ID:	35692

**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 748](#) Number of Steps. As a step is setup, the value entered run through several levels of validation.

<b>Remote Command:</b>	: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 <a href="#">“Step Trigger” on page 750</a> .  If input parameter number exceeds the step number defined by 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 <a href="#">“Number of Steps” on page 748</a> .
Initial S/W Revision:	A.09.40
Help Map ID:	0

**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 748](#) Number of Steps. As a step is setup, the value entered run through several levels of validation.

<b>Remote Command:</b>	: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 step in seconds. For details of the valid ranges for the transition time see <a href="#">“Transition Time” on page 752</a> If input parameter number exceeds the step number defined by Number of Steps then generate error ", and only those parameters 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 <a href="#">“Number of Steps” on page 748</a> .
Initial S/W Revision:	A.09.40
Help Map ID:	0

### 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 748](#) Number of Steps. As a step is setup, the value entered run through several levels of validation.

<b>Remote Command:</b>	:SOURCE:LIST:SETup:RADio:BAND <enum>, <enum>, <enum>, ... :SOURCE:LIST:SETup:RADio:BAND?
Example:	SOUR:LIST:SET:RAD:BAND PGSM, EGSM, RGSM SOUR:LIST:SET:RAD:BAND?
Notes:	The command is to setup below parameter array of whole list sequence. Radio Band <enum> - specifies the radio band for the step. For details of the valid radio bands see <a href="#">“Radio Setup” on page 753</a> . If input parameter number exceeds the step number defined by Number of Steps then generate error ", and only those parameters whose index number falls in number of steps will be updated.
Remote Command Notes:	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 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
Dependencies:	The range is 1 to 1000 which is determined by the number of steps you have configured. For details see <a href="#">“Number of Steps” on page 748</a> .
Initial S/W Revision:	A.09.40
Help Map ID:	0

## Source (Internal)

### 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 748 Number of Steps. As a step is setup, the value entered run through several levels of validation.

<b>Remote Command:</b>	: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 “ <a href="#">Radio Band Link</a> ” on page 771.  If input parameter number exceeds the step number defined by 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 “ <a href="#">Number of Steps</a> ” on page 748.
Initial S/W Revision:	A.09.40
Help Map ID:	0

### 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 748 Number of Steps. As a step is setup, the value entered run through several levels of validation.

<b>Remote Command:</b>	: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:	<p>The command is to setup below parameter array of whole list sequence.</p> <p>Frequency/Channel Number <b>&lt;freq&gt;/&lt;chan num&gt;</b> - 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 <a href="#">“Channel” on page 771</a> and <a href="#">“Frequency” on page 772</a></p> <p>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</p> <p>If input parameter number exceeds the step number defined by Number of Steps then generate error ", and only those parametes whose index number falls in legal step number will be updated.</p>
Dependencies:	The range is 1 to 1000 which is determined by the number of steps you have configured. For details see <a href="#">“Number of Steps” on page 748</a> .
Initial S/W Revision:	A.09.40
Help Map ID:	0

### 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 748](#) Number of Steps. As a step is setup, the value entered run through several levels of validation.

<b>Remote Command:</b>	<pre>:SOURce:LIST:SETup:AMPLitude &lt;ampl&gt;, &lt;ampl&gt;, &lt;ampl&gt;, ... :SOURce:LIST:SETup:AMPLitude?</pre>
Example:	<pre>SOUR:LIST:SET:AMPL -50dBm,-40dBm,-30dBm SOUR:LIST:SET:AMPL?</pre>
Notes:	<p>The command is to setup below parameter array of whole list sequence.</p> <p>Power <b>&lt;ampl&gt;</b> - specifies the output power for the step in dBm. For details of the valid ranges see <a href="#">“Power” on page 773</a>.</p> <p>If input parameter number exceeds the step number defined by Number of Steps then generate error ", and only those parametes whose index number falls in legal step number will be updated.</p>
Dependencies:	The range is 1 to 1000 which is determined by the number of steps you have configured. For details see <a href="#">“Number of Steps” on page 748</a> .
Initial S/W Revision:	A.09.40
Help Map ID:	0

## Source (Internal)

### 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 748 Number of Steps. As a step is setup, the value entered run through several levels of validation.

<b>Remote Command:</b>	: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 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 “ <a href="#">Number of Steps</a> ” on page 748.
Range:	”filename”   “CW”   “Off”   “CONT”
Initial S/W Revision:	A.09.40
Help Map ID:	0

### 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 748 Number of Steps. As a step is setup, the value entered run through several levels of validation.

<b>Remote Command:</b>	: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:	<p>The command is to setup below parameter array of whole list sequence.</p> <p>Step Duration &lt;enum&gt; - 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 <a href="#">"Step Duration" on page 777</a>.</p> <p>If input parameter number exceeds the step number defined by Number of Steps then generate error ", and only those parametes whose index number falls in number of steps will be updated.</p>
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 <a href="#">"Number of Steps" on page 748</a> .
Initial S/W Revision:	A.09.40
Help Map ID:	0

#### 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 748](#) Number of Steps. As a step is setup, the value entered run through several levels of validation.

<b>Remote Command:</b>	<pre>:SOURCE:LIST:SETup:TOCount &lt;time/int&gt;, &lt;time/int&gt;, &lt;time/int&gt;, ... :SOURce:LIST:SETup:TOCount?</pre>
Example:	<pre>SOUR:LIST:SET:TOC 1s,2s,3s SOUR:LIST:SET:TOC? SOUR:LIST:SET:TOC 5,6,7 SOUR:LIST:SET:TOC?</pre>
Notes:	<p>The command is to setup below parameter array of whole list sequence.</p> <p>Time or Count &lt;time/int&gt; - 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, <a href="#">"Time" on page 777</a> and <a href="#">"Play Count" on page 778</a>.</p> <p>If input parameter number exceeds the step number defined by 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 <a href="#">"Step Duration" on page 777</a> 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 <a href="#">"Number of Steps" on page 748</a> .

## Source (Internal)

Initial S/W Revision:	A.09.40
Help Map ID:	0

### 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 748 Number of Steps. As a step is setup, the value entered run through several levels of validation.

<b>Remote Command:</b>	:SOURce:LIST:SETup:OUTPut:TRIGger <bool>, <bool>, <bool>, ... :SOURce:LIST:SETup:OUTPut:TRIGger ?
Example:	SOUR:LIST:SET:OUTP:TRIG ON,OFF,ON SOUR:LIST:SET:OUTP:TRIG?
Notes:	The command is to setup below parameter array of whole list sequence. Output Trigger <Boolean> - specifies the output trigger for the step. For details of the ranges for this setting see “ <a href="#">Output Trigger</a> ” on page 779. If input parameter number exceeds the step number defined by Number of Steps then generate error ", and only those parametes whose index number falls in legal step number will be updated.
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 “ <a href="#">Number of Steps</a> ” on page 748.
Initial S/W Revision:	A.09.40
Help Map ID:	0

### Clear List (Remote Command Only)

This command is the SCPI equivalent of the Clear List UI feature described in.

<b>Remote Command:</b>	:SOURce:LIST:SETup:CLEar
Example:	SOUR:LIST:SETup:CLE
Initial S/W Revision:	A.05.00
Help Map ID:	35693

### Multiport Adapter Output Port Bitmap Mode

When this setting is set to LIST, it will allow you to select the multiport adapter output path of each step. When this setting is set to FIXed, source list sequence multiport adapter output path on each step is controlled by global multiport adapter output port bitmap setting (same as source independent mode). Under this situation, source list sequence will ignore local multiport adapter output port bitmap setting



defined in each step, they are still there and can be queried out, but take no effect.

Key Path:	<b>Source, List Sequencer</b>
<b>Remote Command:</b>	:SOURce:LIST:MPADapter:PORT:OUTPut:BITMap:MODE LIST   FIXed  :SOURce:LIST:MPADapter:PORT:OUTPut:BITMap:MODE?
Example:	SOUR:LIST:MPAD:PORT:OUTP:BITM:MODE LIST SOUR:LIST:MPAD:PORT:OUTP:BITM:MODE?
Preset:	FIXed
Range:	LIST   FIXed
State Saved:	Yes
Initial S/W Revision:	A.09.40
Help Map ID:	35760

### Multiport Adapter Output Port Amplitude Correction Configuration Validation for List Sequencer (Remote Command Only)

This command is used to validate MPA TX port amplitude correction for Source List Sequencer.

Key Path:	<b>Source, List Sequencer</b>
<b>Remote Command:</b>	:SOURce:LIST:MPADapter:CORRection:ERRor?
Example:	SOUR:LIST:MPAD:CORR:ERR?
Notes:	Query Only SCPI Remote command only If detected invalid configuration, popup error message:  "-221 Settings conflict; Source List Step<n> MPA TX port<n> amplitude correction value <n>dB is out of range. The valid range is <n> ~ <n>dB"  Or  "-221 Settings conflict; Source List Step<n> MPA TX port<n> amplitude correction delta exceeds <n>dB between port<n> and port<n>"  to report the first detected conflict.
Range:	"No error"   Error info of the first found conflict
State Saved:	Yes
Initial S/W Revision:	A.12.00
Help Map ID:	0

## Source (Internal)

### 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:	<b>Source, List Sequencer</b>
<b>Remote Command:</b>	No remote command, front panel only.
Initial S/W Revision:	A.05.00
Help Map ID:	35682

### 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.

<b>Remote Command:</b>	: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 747 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
Help Map ID:	35761

### Source Preset

Allows you to preset the source settings to their default values.

Key Path:	<b>Source</b>
<b>Remote Command:</b>	:SOURce:PRESet
Example:	SOUR:PRES
Help Map ID:	35656

## Source Self Test

### Internal Source

This key in the System, Diagnostics menu gives you access to diagnostic capabilities of Internal Source of the instrument.

Key Path:	<b>System, Diagnostics</b>
Initial S/W Revision:	Prior to A.09.20
Help Map ID:	35762

### Source Self Test

This key invokes internal source self test. When operation is complete, the generated test summary file is: E:\Agilent\Instrument\CRFSSelfTestLog.txt. This test summary file can be retrieved from the instrument using the MMEM set of SCPI command, once you have the fully qualified path and file name.

If self test fails, error message “-330, Self-test failed, see log file E:\Agilent\Instrument\CRFSSelfTestLog.txt” is generated. If self test passes, an advisory message “Source self-test completed successfully” is generated.

Key Path:	<b>System, Diagnostics, Internal Source, Self Test</b>
<b>Remote Command:</b>	:SOURce:SELF:TEST [:ALL]
Example:	SOUR:SELF:TEST
Notes:	MMEM:DATA? "E:\ Agilent\Instrument\CRFSSelfTestLog.txt"
Initial S/W Revision:	A.09.20
Help Map ID:	35763

## Recall

Most of the functions under this key work the same way in many measurements, so they are documented in the System Functions section. For details about this key, see [“Recall” on page 112\[Proc\\_iFrame:2637@\]](#)

## Save

Most of the functions under this key work the same way in many measurements, so they are documented in the Utility Functions section. For details about this key, see [“Save” on page 125\[Proc\\_iFrame:2600@\]](#)

## Signal Studio Commands

### Overview

EXT supports connectivity with Signal Studio. To achieve this, the SCPI commands described in this chapter enable you to connect Signal Studio to the EXT test set and to download waveform into the hard

## Source (Internal)

disk. They are SCPI only, no menu

Initial S/W Revision:	A.05.00
Help Map ID:	35694

### Query License List (Remote Command Only)

This query provides a listing of the current licenses for external software installed for the test set internal source.

<b>Remote Command:</b>	:SYSTem:LIcense:EXTeRnal:LIST?
Example:	SYST:LIC:EXT:LIST?
Notes:	Query only.
Initial S/W Revision:	A.05.00
Help Map ID:	35695

### Query License List Detail (Remote Command Only)

This is an obsolete command for Signal Studio. However, it has not been removed from Signal Studio to prevent a Signal Studio connectivity time out. Using this command returns a null string and does not affect Signal Studio.

<b>Remote Command:</b>	:SYSTem:LIcense:LIST:DETAil?
Example:	SYST:LIC:LIST:DET?
Notes:	Query only. Always returns a null string "".
Initial S/W Revision:	A.05.00
Help Map ID:	35696

### Memory Subsystem (Remote Command Only)

To be compatible with other Signal Generator products, the EXT test set internal source provides a memory subsystem for Signal Studio to download waveform file into the instrument.

“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:\NVARB.

In addition, you can load a waveform file from the hard disk to the ARB memory, using the [“Load Segment To ARB Memory” on page 698](#) remote command :SOURce:RADio:ARB:LOAD, which also supports using either “NVWFM” MSUS or specifying a full path.

<b>Remote Command:</b>	:MEMory [ :SOURce]
------------------------	--------------------

Example:	MEM
Initial S/W Revision:	A.05.00
Help Map ID:	35697

**:DATA (Remote Command Only)**

This command loads data into the EXT test set hard disk using the <data> parameter and saves the data to a file designated by the <file\_name> variable. For downloads to non-volatile waveform memory, use the path “NVWFM:<file\_name>”.

<b>Remote Command:</b>	:MEMory[:SOURce]:DATA <file_name>, <data>
Example:	MEM:DATA “NVWFM:test.wfm”, #1212 or MEM:DATA “D:\NVARB\test.wfm”, #1212
Notes:	Data is in 488.2 block format. If a file already exists with same name, the file will be overwritten without warning.
Initial S/W Revision:	A.05.00
Help Map ID:	35698

**:DATA:APPend (Remote Command Only)**

This command appends data to an existing file stored in hard disk using the <data> parameter and saves the data to a file designated by the <file\_name> variable. For downloads to non-volatile waveform memory, use the path “NVWFM:<file\_name>”.

<b>Remote Command:</b>	:MEMory[:SOURce]:DATA:APPend <file_name>, <data>
Example:	MEM:DATA:APP “NVWFM:test.wfm”, #14Y9oL or MEM:DATA:APP “D:\NVARB\test.wfm”, #14Y9oL
Notes:	Data is in 488.2 block format. If no file exists with the name designated in the command, a file will be created the first time this command is used with that designated name.
Initial S/W Revision:	A.05.00
Help Map ID:	35699

**Sequence Studio Commands****Overview**

EXT supports connectivity with Sequence Studio. The SCPI commands described in this chapter are

## Source (Internal)

used to support connectivity from Sequence Studio to the EXT test set. These are only intended for Sequence Studio, so provided as service commands, and SCPI only, no menu

Initial S/W Revision	A.12.00
Help Map ID	0

### Query Supportable System Information Query SCPI List (Remote Command Only)

This query provides a listing of the current EXT supportable list of query SCPI which is used to query EXT HW/SW information. It returns string result and parsed by Sequence Studio.

Sequence Studio needs to query some EXT system information like capability etc. when connecting. With more and more new SCPIs added in EXT FW, each time when Sequence Studio try to connect to an old version FW without those new SCPI commands, VISA timeout in Sequence Studio will occur and just make Sequence Studio looks dead. To avoid that, this SCPI is provided to give a list of current supportable information-query SCPI list.

<b>Remote Command</b>	:SERvice[:PRODUCTION]:SIQuery:SCPI:LIST?
Example	SERV:SIQ:SCPI:LIST?
Notes	Query only The string in “Range” part cannot change, for Sequence Studio needs to accurately match those string character. If “SEQ Ver Info” string presents, then means “:SERvice[:PRODUCTION]:LSEQuencer:ANALyzer:FILE:VERSion?” and “:SERvice[:PRODUCTION]:LSEQuencer:SOURce:FILE:VERSion?” query SCPIs are supported in current version. If “ARB Header Info” string presents, that means <a href="#">“Query Selected Waveform Header info (Remote Command Only)” on page 741</a> query SCPI is supported in current version.
Range	“HW Capability Info”, “SEQ Ver Info”, “ARB Header Info”
Initial S/W Revision	A.12.00
Help Map ID	0

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## **SPAN X Scale**

This function is not supported in the Sequence Analyzer mode.

## SPAN X Scale



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## Sweep/Control

This function is not supported in the Sequence Analyzer mode.

Sweep/Control

## 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
Help Map ID	35266

### Max Hold

This key enables you to select visible/invisible Max Hold Trace.

Key Path	Trace/Detector
Mode	SEQAN
Remote Command	:DISPlay:LSEQuencer:VIEW[1]:WINDow[1]:TRACe:MAXHold[:ST ATe] 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
Help Map ID	35262

### Min Hold

This key enables you to select visible/invisible Min Hold Trace.

Key Path	Trace/Detector
Mode	SEQAN
Remote Command	:DISPlay:LSEQuencer:VIEW[1]:WINDow[1]:TRACe:MINHold[:ST ATe] ON OFF 1 0  :DISPlay: LSEQuencer:VIEW[1]:WINDow[1]:TRACe:MINHold[:STATE ]?

## Trace/Detector

Example	DISP:LSEQ:VIEW:WIND:TRAC:MINH ON DISP:LSEQ:VIEW:WIND:TRAC:MINH?
Notes	You must be in the Sequence Analyzer 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
Help Map ID	35263

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## Trigger

There is no local functionality for this function in the Sequence Analyzer mode. Triggering is set up under the Meas Setup menus.

Trigger

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## View/Display

This section describes the Display key, which is the key in the View/Display menu that is common to multiple Modes and Measurements. See the Measurement descriptions for information on the View functions of each measurement.

### 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:	<b>Display</b>
Key Path:	<b>View/Display</b>
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3440

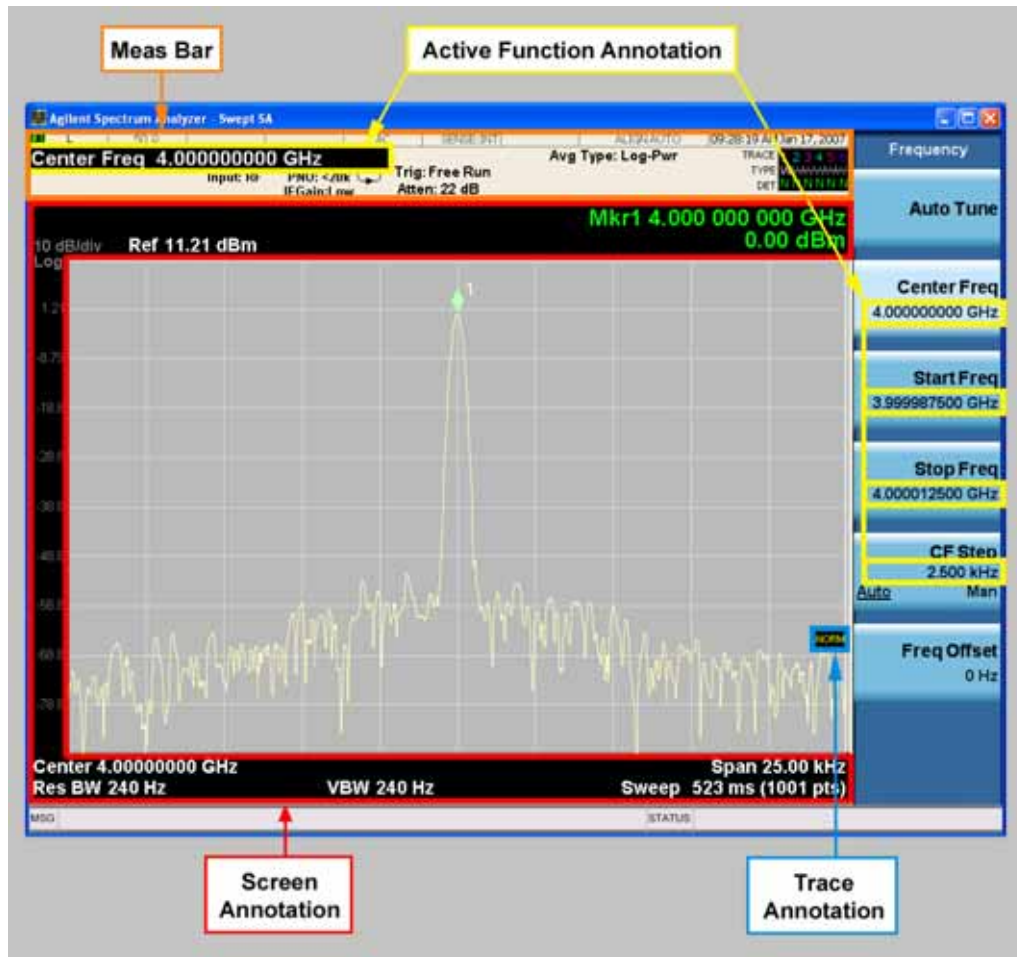
### Annotation

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.

## View/Display



Key Path:	View/Display, Display
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3441

### 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 <b>System Display Settings, Annotation</b> is set to Off.



Preset:	On This should remain Off through a Preset when <b>System Display Settings, Annotation</b> is set to Off.
State Saved:	Saved in instrument state.
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3443

### 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:	<b>View/Display, Display, Annotation</b>
<b>Remote Command:</b>	: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 <b>System Display Settings, Annotation</b> is set to Off.
Preset:	On This should remain Off through a Preset when <b>System Display Settings, Annotation</b> is set to Off
State Saved:	Saved in instrument state.
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3442

### Trace

Turns on and off the labels on the traces, showing their detector (or their math mode) as described in the Trace/Detector section.

If trace math is being performed with a trace, then the trace math annotation will replace the detector annotation.

Key Path:	<b>View/Display, Display, Annotation</b>
<b>Remote Command:</b>	:DISPlay:ANNOtation:TRACe[:STATe] ON OFF 1 0 :DISPlay:ANNOtation:TRACe[:STATe] ?
Example:	DISP:ANN:TRAC OFF
Preset:	Off

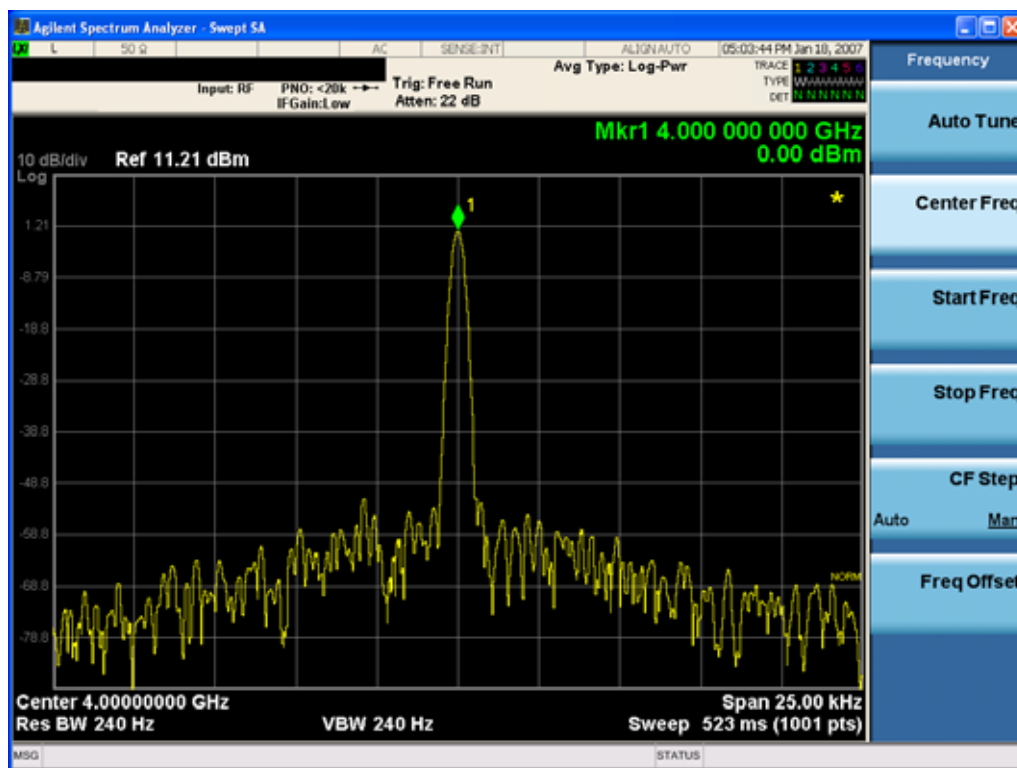
## View/Display

State Saved:	Saved in instrument state.
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3444

### 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 <b>System Display Settings, Annotation</b> is set to Off.
Preset:	On  This should remain Off through a Preset when <b>System Display Settings, Annotation</b> is set to Off

State Saved:	Saved in instrument state.
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3445

### Title

Displays menu keys that enable you to change or clear a title on your display.

Key Path:	<b>View/Display, Display</b>
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3446

### Change Title

Writes a title into the "measurement name" field in the banner, for example, "Channel Power".

Press **Change Title** to enter a new title through the alpha editor. Press **Enter** or **Return** to complete the entry. Press **Cancel (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.

---

Key Path:	<b>View/Display, Display, Title</b>
Mode:	All
<b>Remote Command:</b>	:DISPlay:<measurement>:ANNotation:TITLe:DATA <string> :DISPlay:<measurement>:ANNotation:TITLe:DATA?
Example:	DISP:ACP:ANN:TITL:DATA "This Is My Title" This example sets 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
Modified at S/W Revision:	A.02.00, A.03.00

## View/Display

Help Map ID:	3447
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### 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:	<b>View/Display, Display, Title</b>
Example:	The following commands clear the title and restore the measurement's original title:  DISP:ACP:ANN:TITL:DATA ""  This example is for ACP; the measurement name is required.
Notes:	Uses the :DISPlay:<measurement>:ANNotation:TITLe:DATA <string> command with an empty string.
Preset:	Performed on Preset.
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3448

### Graticule

Pressing Graticule turns the display graticule On or Off. It also turns the graticule y-axis annotation on and off.

Key Path:	<b>View/Display, Display</b>
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
Help Map ID:	3449

### Display Line

Activates an adjustable horizontal line that is used as a visual reference line. The line's vertical position corresponds to its amplitude value. The value of the display line (for example, "-20.3 dBm") appears above the line itself on the right side of the display in the appropriate font.

The display line can be adjusted using the step keys, knob, or numeric keypad. The unit of the Display

Line is determined by the **Y axis unit** setting under **Amplitude**. If more than one window has a display line, the display line of the selected window is controlled.

If the display line is off the screen, it shows as a line at the top/bottom of the screen with an arrow pointing up or down. As with all such lines (Pk Thresh, Trigger Level, etc.) it is drawn on top of all traces.

The display line is unaffected by Auto Couple.

Key Path:	<b>View/Display, Display</b>
<b>Remote Command:</b>	:DISPlay:WINDow [1] :TRACe:Y:DLINe <ampl> :DISPlay:WINDow [1] :TRACe:Y:DLINe? :DISPlay:WINDow [1] :TRACe:Y:DLINe:STATe OFF ON 0 1 :DISPlay:WINDow [1] :TRACe:Y:DLINe:STATe?
Example:	DISP:WIND:TRAC:Y:DLIN:STAT ON DISP:WIND:TRAC:Y:DLIN:STAT -32 dBm
Preset:	Set the Display Line to Off and -25 dBm on Preset. When the Display Line goes from Off to On, if it is off screen, set it to either the top or bottom of screen, depending on which direction off screen it was.  The Display Line's value does not change when it is turned off.
State Saved:	Saved in instrument state.
Min:	-∞ (minus infinity) in current units
Max:	+∞ (plus infinity) in current units
Default Unit:	Depends on the current selected Y axis unit
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3450

### 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:	<b>View/Display, Display</b>
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3488

### Annotation Local Settings

This is a Mode Global override of the meas local annotation settings. When it is **All Off**, it forces **Screen Annotation, 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 test sets; hence it uses the legacy SCPI command.

## View/Display

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:	<b>View/Display, Display, System Display Settings</b>
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
Help Map ID:	3451

## Theme

This key allows you to change the Display theme. This is similar to the Themes selection under Page Setup and Save Screen Image. The four themes are detailed below.

Key Path:	<b>View/Display, Display, System Display Settings</b>
Remote Command:	:DISPlay:THEME TDColor TDMonochrome FCOLor FMONochrome :DISPlay:THEMe?
Example:	DISP:THEM TDM sets the display theme to 3D Monochrome.
Notes:	TDColor – 3D is the standard color theme with filling and shading TDMonochrome – is similar to 3D color, but only black is used FCOLor – flat color is intended for inkjet printers to conserve ink. It uses a white background instead of black. FMONochrome – is like flat color, but only black is used
Preset:	TDColor (Set by Restore Misc Defaults)
State Saved:	Not saved in instrument state.
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3452

## Backlight

Accesses the display backlight on/off keys. This setting may interact with settings under the Windows "Power" menu.

When the backlight is off, pressing ESC, TAB, SPACE, ENTER, UP, DOWN, LEFT, RIGHT, DEL,

BKSP, CTRL, or ALT turns the backlight on without affecting the application. Pressing any other key will turn backlight on and could potentially perform the action as well.

Key Path:	<b>View/Display, Display, System Display Settings</b>
<b>Remote Command:</b>	:DISPlay:BACKlight ON OFF :DISPlay:BACKlight?
Preset:	ON (Set by Restore Misc Defaults)
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3453

### On

Turns the display backlight on.

Key Path:	<b>View/Display, Display, System Display Settings, Backlight</b>
Example:	DISP:BACK ON
Readback:	On
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3516

### Off

Turns the display backlight off.

Key Path:	<b>View/Display, Display, System Display Settings, Backlight</b>
Example:	DISP:BACK OFF
Readback:	Off
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3517

### Backlight Intensity

An active function used to set the backlight intensity. It goes from 0 to 100 where 100 is full on and 0 is off. This value is independent of the values set under the Backlight on/off key.

Key Path:	<b>View/Display, Display, System Display Settings</b>
<b>Remote Command:</b>	:DISPlay:BACKlight:INTensity <integer> :DISPlay:BACKlight:INTensity?
Example:	DISP:BACK:INT 50
Preset:	100 (Set by Restore Misc Defaults)

## View/Display

Min:	0
Max:	100
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3454

### Full Screen

When **Full Screen** is pressed the measurement window expands horizontally over the entire instrument display. The screen graticule area expands to fill the available display area.

It turns off the display of the softkey labels, however the menus and active functions still work. (Though it would obviously be very hard to navigate without the key labels displayed.) Pressing **Full Screen** again while Full Screen is in effect cancels Full Screen.

Note that the banner and status lines are unaffected. You can get even more screen area for your data display by turning off the Meas Bar (in the Display menu) which also turns off the settings panel.

Full Screen is a Meas Global function. Therefore it is cancelled by the **Preset** key.

Key Path:	Display
<b>Remote Command:</b>	:DISPlay:FSCreen[:STATe] OFF ON 0 1 :DISPlay:FSCreen[:STATe] ?
Preset:	Off
State Saved:	Not saved in instrument state.
Backwards Compatibility SCPI:	:DISPlay:MENU[:STATe] OFF ON 0 1  This emulates ESA full screen functionality, which is the same as the FSCreen command in PSA except that the sense of on/off is reversed (that is, OFF means the menus are OFF, so Fullscreen is ON) and the default is ON (meaning Fullscreen is OFF).
Backwards Compatibility Notes:	1. In ESA/PSA, Full Screen was turned on with a softkey, so pressing any other key turned Full Screen off. In the X-Series, because a hardkey is provided to turn this function on and off, pressing any other key no longer turns off Full Screen
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	3464

### Display Enable (Remote Command Only)

Turns the display on/off, including the display drive circuitry. The backlight stays lit so you can tell that the instrument is on. The display enable setting is mode global. The reasons for turning the display off are three:

- To increase speed as much as possible by freeing the instrument from having to update the display



- To reduce emissions from the display, drive circuitry
- For security purposes

If you have turned off the display:

- and you are in local operation, the display can be turned back on by pressing any key or by sending the SYSTem:DEFaults MISC command or the DISPlay:ENABle ON (neither \*RST nor SYSTem:PRESet enable the display.)
- and you are in remote operation, the display can be turned back on by pressing the **Local** or **Esc** keys or by sending the SYSTem:DEFaults MISC command or the DISPlay:ENABle ON (neither \*RST nor SYSTem:PRESet enable the display.)

and you are using either the SYSTem:KLOCK command or GPIB local lockout, then no front-panel key press will turn the display back on. You must turn it back on remotely.

<b>Remote Command:</b>	:DISPlay:ENABle OFF ON 0 1 :DISPlay:ENABle?
Example:	DISP:ENAB OFF
Couplings:	DISP:ENAB OFF turns Backlight OFF and DISP:ENAB ON turns Backlight ON. However, settings of Backlight do not change the state of DISP:ENAB
Preset:	On Set by SYST:DEF MISC, but Not affected by *RST or SYSTem:PRESet.
State Saved:	Not saved in instrument state.
Backwards Compatibility Notes:	1. SYST:PRES no longer turns on DISPlay:ENABle as it did in legacy analyzers
Initial S/W Revision:	Prior to A.02.00
Help Map ID:	0