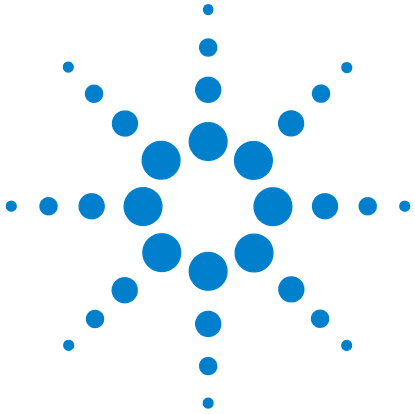

Agilent X-Series Signal Analyzer

This manual provides documentation for the for the following analyzers:

MXA Signal Analyzer N9020A
EXA Signal Analyzer N9010A

N9071A XFP Combined GSM Measurement Application User's and Programmer's Reference

Agilent Technologies

Notices

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Adobe Reader “ is a U.S. registered trademark of Adobe System Incorporated.
Java™ is a U.S. trademark of Sun Microsystems, Inc.
MATLAB “ is a U.S. registered trademark of Math Works, Inc.
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Manual Part Number

N9071-90014
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Safety Notices

CAUTION

A **CAUTION** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a **CAUTION** notice until the indicated conditions are fully understood and met.

WARNING

A WARNING notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

Warranty

This Agilent technologies instrument product is warranted against defects in material and workmanship for a period of one year from the date of shipment. During the warranty period, Agilent Technologies will, at its option, either repair or replace products that prove to be defective.

For warranty service or repair, this product must be returned to a service facility designated by Agilent Technologies. Buyer shall prepay shipping charges to Agilent Technologies and Agilent Technologies shall pay shipping charges to return the product to Buyer. However, Buyer shall pay all shipping charges, duties, and taxes for products returned to Agilent Technologies from another country.

Where to Find the Latest Information

Documentation is updated periodically. For the latest information about this analyzer, including firmware upgrades, application information, and product information, see the following URLs:

http://www.agilent.com/find/mxa
http://www.agilent.com/find/exa

To receive the latest updates by email, subscribe to Agilent Email Updates:

http://www.agilent.com/find/emailupdates

Information on preventing analyzer damage can be found at:

http://www.agilent.com/find/tips

Contents

Contents

Contents

Contents

Contents

Contents

Contents

List of Commands

List of Commands

List of Commands

1 Available Help Resources

Although this measurement application has no embedded Help functionality, you can access various helpful documents provided in a directory on your analyzer's hard disk C: drive. You will need to connect a PC mouse and keyboard to the instrument via the front-panel USB ports.

All available documentation is present on the Analyzer's hard disk, either as HTML Help or Acrobat PDF files.

In addition to the interactive Windows (HTML) Help system files for other modes, the Analyzer's hard disk contains Application Notes, tutorial documents, etc.

Many of the supporting documents use the Adobe Acrobat (PDF) file format. You can view PDF files using the pre-installed Adobe Reader software.

Move the mouse to the lower edge of the display to bring up the task bar, or press Tab + ALT to launch the Windows Explorer utility. Navigate to the directories below to access the files.

Documents and files available are as follows:

- C:\Program Files\Agilent\SignalAnalysis\Infrastructure\Help - CHM Help files for all X-Series measurement applications
- C:\Program Files\Agilent\SignalAnalysis\Infrastructure\Help\bookfiles - PDF versions of all current X-Series User's and Programmer's References and Measurement Guides
- C:\Program Files\Agilent\SignalAnalysis\Infrastructure\Help\otherdocs - PDF versions of Application Notes and other documentation useful for X-Series measurement applications.

This same documentation is also included on the Documentation CD shipped with your Analyzer.

The Adobe Reader user interface differs from the Windows Help interface. For full details on how to navigate within Acrobat documents using Adobe Reader, see "Navigating Acrobat (PDF) Files" on page 30.

Navigating Acrobat (PDF) Files

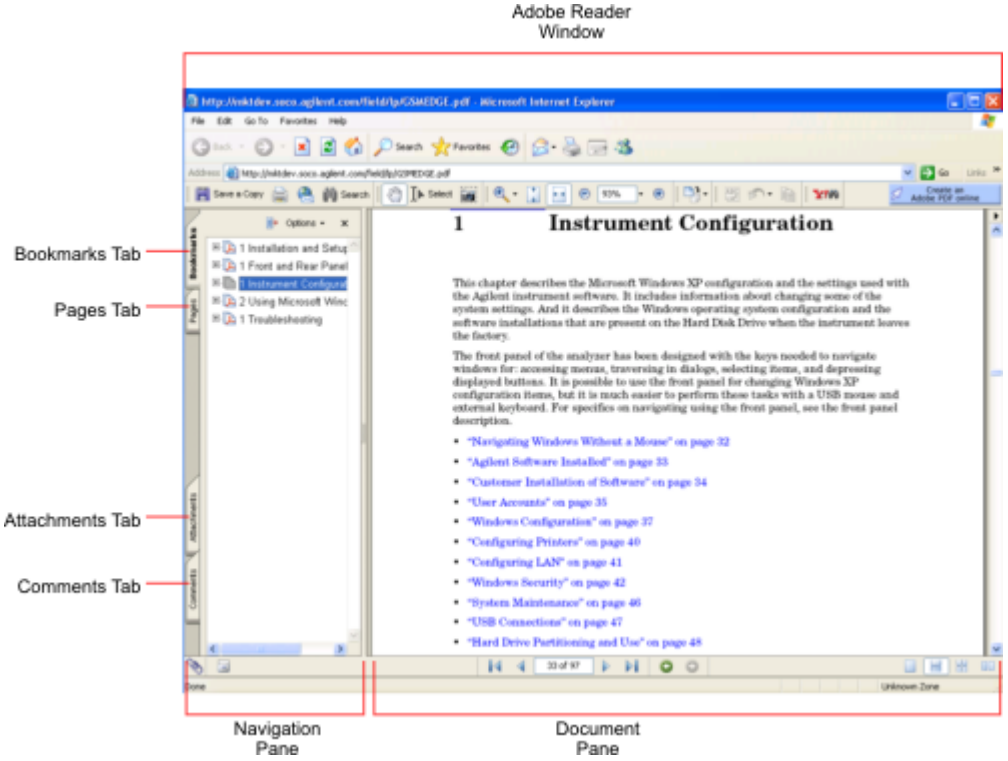
IMPORTANT To navigate PDF files effectively, you must attach a mouse and keyboard to the Analyzer.

If it is not possible to attach a mouse and keyboard to the Analyzer, you should copy the PDF file to a separate computer, then open it on that computer. Every PDF file that is present on the Analyzer's hard disk can also be found on the Documentation CD shipped with the Analyzer. For details, see "Copying the Acrobat (PDF) Files" on page 34.

Adobe Reader Window

When an Adobe Acrobat (PDF) file is open and being viewed, the Analyzer's display appears as below.

Note that, unlike the HTML Help Window, the Acrobat Reader Window is *not* embedded in the Analyzer's Application window. It is a separate window, which can be resized, moved and closed independently of the Application window.



The Adobe Reader Window itself consists of two panes, as shown in the diagram above.

On the left is the Navigation Pane (which may be hidden), and on the right is the Document Pane.

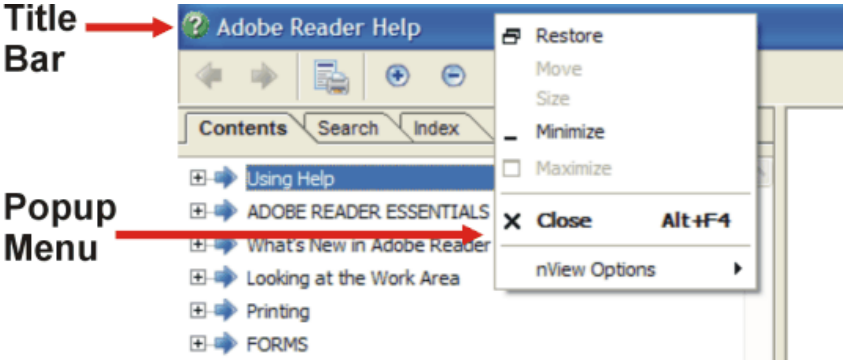
The Navigation Pane is further subdivided into four tabs: Bookmarks, Pages, Attachments and Comments. Typically, PDF files supplied with the Agilent X-Series Analyzers contain useful content only under the Bookmarks and Pages Tabs: the Attachments and Comments Tabs are not used.

Navigating the Acrobat Reader Window

The online Help for Adobe Reader provides detailed information on how to use the Reader. To access the online Help, do the following:

- With the Adobe Reader window open, click **Help**, **Adobe Reader Help** in the menu at the top of the screen. This opens the Help window on top of the document window.
- To close the Help window, *either* click the Red **X** at the top right of the window, *or* right-click

anywhere in the title bar, then select **Close** from the popup menu.



Printing Acrobat Files

NOTE	The driver for the appropriate printer must be installed on the Analyzer's hard disk before any file can be printed.

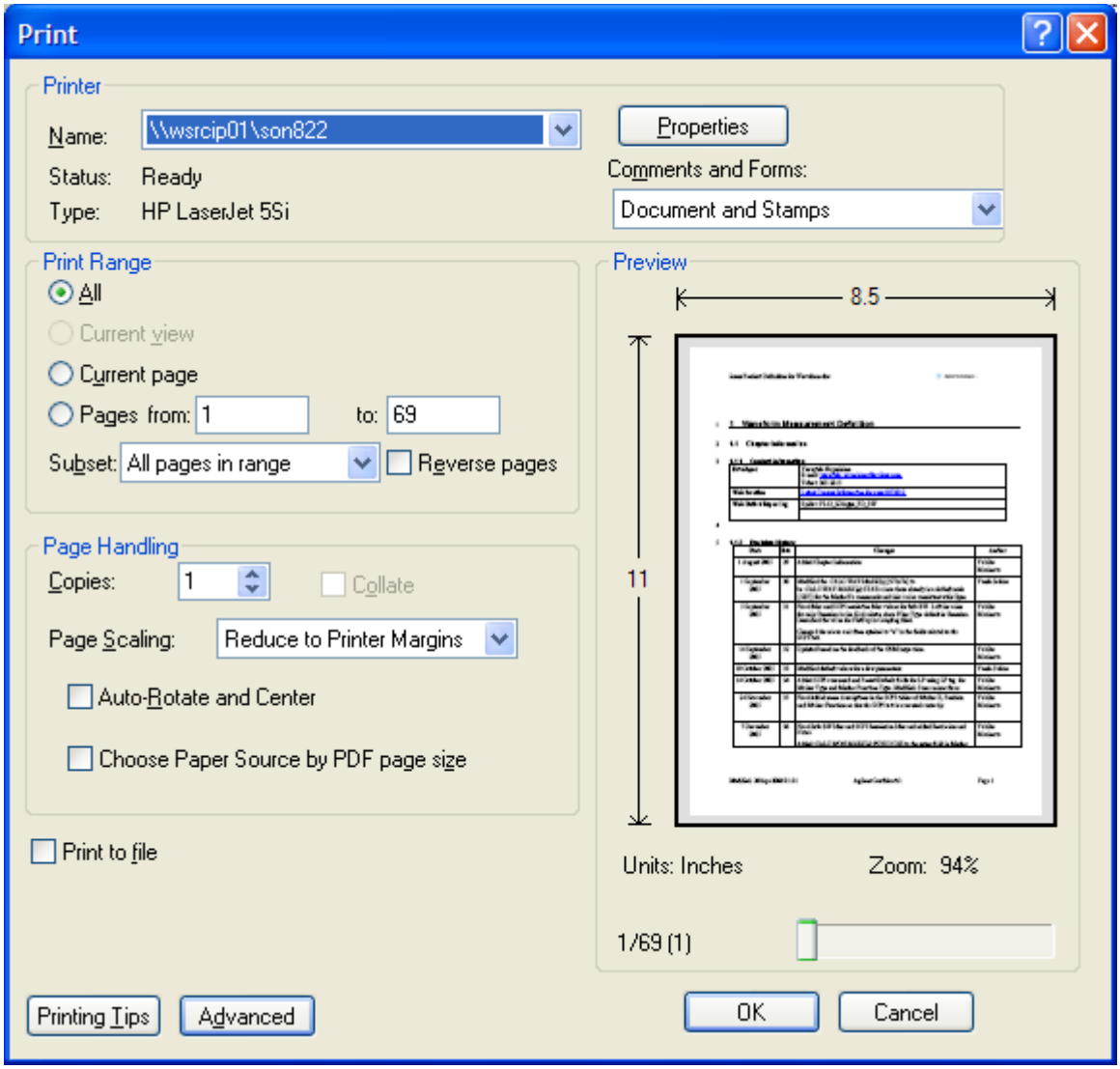
To print all or part of an open Acrobat file, do the following.

1. *Either*,

   a. click on the `Print` icon in the Acrobat Reader toolbar,

   b. *or*, select `File > Print` from the menu.

2. The Acrobat Reader Print dialog opens, as shown below.



3. Choose the desired options within the Print dialog, then click `OK` to print (or click `Cancel` to cancel the printing).

NOTE Clicking the `Properties` button within the Print dialog opens a window containing controls that are specific to the printer model installed. Check the printer manufacturer's documentation for details of these capabilities.

Viewing Help on a Separate Computer

You may want to view help pages *without* having them appear on top of the Analyzer's screen.

There are two separate Help files for most Analyzer Modes, which contain all the same help pages in different formats:

1. A file in HTML Help (CHM) format,
2. A file in Acrobat (PDF) format.

You can copy any of the Help files to another computer, then open and view the help pages in the file on that computer.

Your choice of which file to copy and view may depend on what you want to do with the file (for example, whether you want to print it and read the paper copy, or view it on the computer). The table below compares the relative advantages of the two formats:

Format Type	**HTML Help** Format (**CHM** Files)	**Acrobat** Format (**PDF** Files)
File Extension	CHM	PDF
Software Required to view file	Microsoft Windows operating system only, with Microsoft Internet Explorer installed.	Free Adobe Reader software can be downloaded for many operating systems, including: Microsoft Windows, Macintosh, Linux, Solaris.
Full Text Search?	Yes	Yes
Printable?	Yes, but with limited control.	Yes. Full print control.
Printable Table of Contents?	No	Yes
Navigable without a Mouse and Keyboard?	Yes, but with some loss of functionality.	No
Has Page Numbers?	No	Yes
Context-Sensitive Display?	Yes, when viewed using the X-Series Analyzer application window.	No
Indexed?	Yes	No
Active Hyperlinks?	Yes	Yes

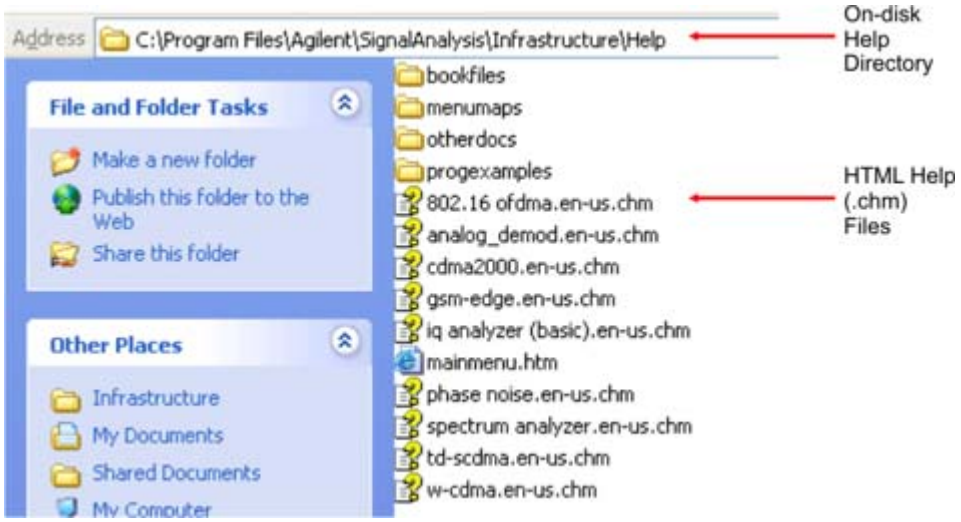
Copying the HTML Help (CHM) Files

You can copy the HTML Help file(s) you need to a separate computer running Microsoft Windows. Each HTML Help file has a `.chm` extension.

You can find the HTML Help (`.chm`) files:

- *Either*, on the documentation CD that came with the Analyzer,

- *Or*, in a special directory on the Analyzer's hard disk. The directory path is:
  `C:\Program Files\Agilent\SignalAnalysis\Infrastructure\Help`
  The illustration below shows an example listing of the HTML Help files in this directory, viewed using Windows Explorer.
  Depending on which Analyzer software licenses you purchased, the content of the directory on your machine may vary.



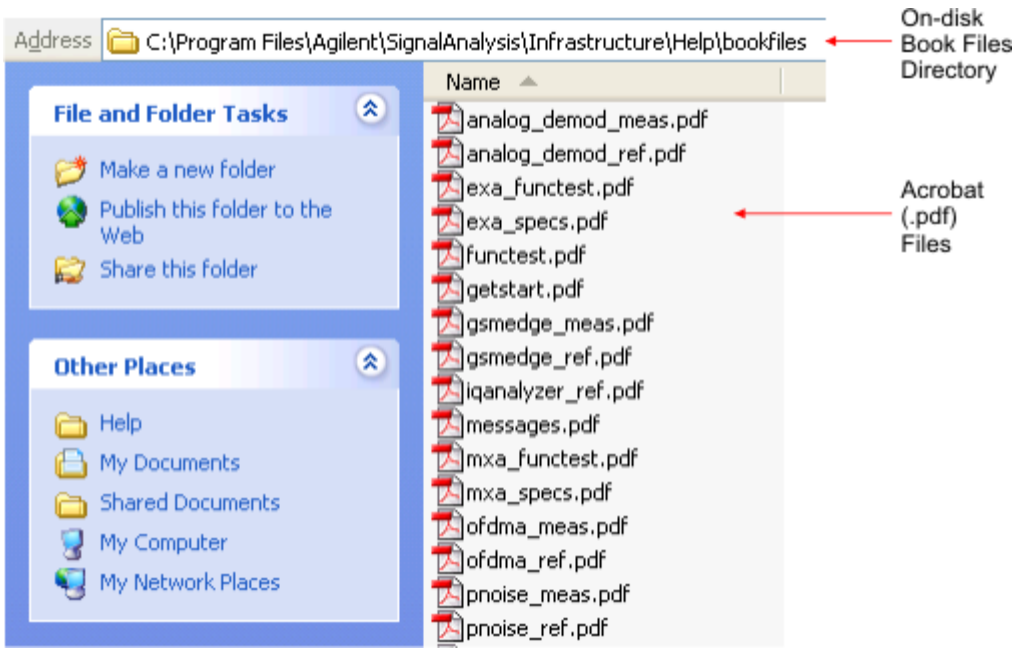
NOTE	You can open and view the HTML Help files only on a PC that has Microsoft Windows and Microsoft Internet Explorer installed.

Copying the Acrobat (PDF) Files

You can copy the Acrobat file(s) you need to a separate computer running any of several different operating systems. Each Acrobat file has a `.pdf` extension.

You can find the Acrobat (`.pdf`) files:

- *Either*, on the documentation CD that came with the Analyzer,
- *Or*, in a special directory on the Analyzer's hard disk. The directory path is:
  `C:\Program Files\Agilent\SignalAnalysis\Infrastructure\Help\bookfiles`
  - — The illustration below shows an example listing of the Acrobat files in this directory, viewed using Windows Explorer.
  - — The PDF versions of the help files are named `<mode>_ref.pdf`, where `<mode>` is the name of the Analyzer Mode. For example, the name of the PDF file for GSM/EDGE Mode is `gsmedge_ref.pdf`. (Note that the directory also contains other PDF documents.)
  - — When you open any `<mode>_ref.pdf` document, the title page displays "`<Mode> User's and Programmer's Reference`", where `<Mode>` is the name of the Analyzer Mode described by the document.
  - — Depending on which Analyzer software licenses you purchased, the content of the directory on your machine may vary.


Address
C:\Program Files\Agilent\SignalAnalysis\Infrastructure\Help\bookfiles
On-disk Book Files Directory
File and Folder Tasks
Make a new folder
Publish this folder to the Web
Share this folder
Other Places
Help
My Documents
Shared Documents
My Computer
My Network Places
Name
analog_demod_meas.pdf
analog_demod_ref.pdf
exa_functest.pdf
exa_specs.pdf
functest.pdf
getstart.pdf
gsmedge_meas.pdf
gsmedge_ref.pdf
iqanalyzer_ref.pdf
messages.pdf
mxa_functest.pdf
mxa_specs.pdf
ofdma_meas.pdf
ofdma_ref.pdf
pnoise_meas.pdf
pnoise_ref.pdf
Acrobat (.pdf) Files

Terms Used in This Documentation

Many special terms are used throughout this documentation. Please refer to the "Getting Started Guide" for detailed explanations of all these terms.

The Section below provides a brief description of special terms used in the Key parameter tables.

Terms used in Key Parameter Tables

The following terms are used in the parameter tables for each Front-panel key or softkey. However, a particular key description may not use all the terms listed.

Term	Meaning
Default Unit	The default measurement unit of the setting.
Default Terminator	Indicates the units that will be attached to the numeric value that you have entered. This default will be used from the front panel, when you terminate your entry by pressing the **Enter** key, rather then selecting a units key. This default will be used remotely when you send the command without specifying any units after your value(s).
Dependencies/ Couplings	Some commands may be unavailable when other parameters are set in certain ways. If applicable, any such limitations are described here.
Example	Provides command examples using the indicated remote command syntax.
Factory Preset	Describes the function settings after a **Factory Preset**.
Key Path	The sequence of Front-panel keys that accesses the function or setting.
Knob Increment/Decrement	The numeric value of the minimum increment or decrement that is applied when turning the thumb wheel knob.
Max	The Maximum numerical value that the setting can take.
Min	The Minimum numerical value that the setting can take.
Meas Global	The functionality described is the same in all measurements.
Meas Local	The functionality described is only true for the measurement selected.
Mode Global	The functionality described is the same for all modes.
Preset	In some cases, a Preset operation changes the status of a parameter. If the operation of the key specified is modified by a Preset operation, the effect is described here.
Range	Describes the range of the smallest to largest values to which the function can be set. If you try to set a value below the minimum value, the analyzer defaults to the minimum value. If you try to set a value above the maximum value, the analyzer defaults to the maximum value.
Remote Command	Shows the syntax requirements for each SCPI command.

Term	Meaning
Remote Command Notes	Additional notes regarding Remote Commands.
Resolution	Specifies the smallest change that can be made to the numeric value of a parameter.
SCPI Status Bits/OPC Dependencies	Pressing certain keys may affect one or more status bits. If applicable, details are given here.
State Saved	Indicates what happens to a particular function when the Analyzer state is saved (either to an external memory device or the internal D: drive). It also indicates whether the current settings of the function are maintained if the Analyzer is powered on or preset using **Power On Last State** or **User Preset**.

2 About the Analyzer

The X-Series signal analyzer measures and monitors complex RF and microwave signals. Analog baseband analysis is available on MXA. The analyzer integrates traditional spectrum measurements with advanced vector signal analysis to optimize speed, accuracy, and dynamic range. The analyzer has Windows XP Pro® built in as an operating system, which expands the usability of the analyzer.

With a broad set of applications and demodulation capabilities, an intuitive user interface, outstanding connectivity and powerful one-button measurements, the analyzer is ideal for both R&D and manufacturing engineers working on cellular, emerging wireless communications, general purpose, aerospace and defense applications.

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 analyzer 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 N9020A Signal Analyzer to activate the new measurement application. See below for more information.

For the latest information on Agilent Signal Analyzer measurement applications and upgrade kits, visit the following internet URL.

http://www.agilent.com/find/sa_upgrades

Viewing a License Key

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

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

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

C:\Programing Files\Agilent\Licensing

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.

Obtaining and Installing a License Key

If you purchase an additional application that requires installation, you will receive an “Entitlement Certificate” which may be redeemed for a license key for one instrument. 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 instrument. It is found through the instrument front panel keys at **System**, **Licensing. . .** , or internally at C:\Programming Files\Agilent\Licensing.

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

Missing and Old Measurement Application Software

All the software applications were loaded at the time of original instrument manufacture. It is a good idea to regularly update your software with the latest available version. This 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/mxa_software
http://www.agilent.com/find/exa_software

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

X-Series Options and Accessories

"MXA Instrument Options" on page 41

"MXA Accessories" on page 42

"EXA Instrument Options" on page 42

"EXA Accessories" on page 43

"Advanced Measurement Application Software" on page 43

MXA Instrument Options

Product	Description
N9020A	MXA Signal Analyzer
N9020A-503	Frequency range from 20 Hz to 3.6 GHz
N9020A-508	Frequency range from 20 Hz to 8.4 GHz
N9020A-513	Frequency range from 20 Hz to 13.6 GHz
N9020A-526	Frequency range from 20 Hz to 26.5 GHz
N9020A-B25	Analysis bandwidth, 25 MHz
N9020A-BBA	Analog baseband IQ inputs
N9020A-PFR	Precision frequency reference
N9020A-PRC	Portable configuration

Product	Description
N9020A-EA3	Electric attenuator, 3.6 GHz
N9020A-S40	Baseband analysis bandwidth, 40 MHz/channel
N9020A-P03	Preamplifier, 3.6 GHz
N9020A-P08	Preamplifier, 8.4 GHz
N9020A-P13	Preamplifier, 13.6 GHz
N9020A-P26	Preamplifier, 26.5 GHz

MXA Accessories

Product	Description
N9020A-MLP	75 ohm minimum loss pad
N9020A-EFM	USB flash drive
N9020A-DVR	DVD-ROM drive
N9020A-MSE	Mouse, USB interface
N9020A-KYB	Keyboard, USB interface
N9020A-HTC	Hard transit case
N9020A-1CP	Rackmount kit with handles
N9020A-1CN	Front handle kit
N9020A-1CM	Rackmount kit
N9020A-1CR	Rack slide kit
N9020A-CPU	Instrument security, additional CPU and HDD
N9020A-UK6	Commercial Calibration Certificate with Test Data
N9020A-1A7	ISO 17025 Compliant Calibration
N9020A-A6J	ANSI Z540 Compliant Calibration

EXA Instrument Options

Product	Description
N9010A	EXA Signal Analyzer (3.6, 7.0, 13.6, and 26.5 GHz)
N9010A-503	Frequency range from 9 kHz to 3.6 GHz
N9010A-507	Frequency range from 9 kHz to 7.0 GHz
N9010A-513	Frequency range from 9 kHz to 13.6 GHz
N9010A-526	Frequency range from 9 kHz to 26.5 GHz

Product	Description
N9010A-FSA	Fine step attenuator
N9010A-PFR	Precision frequency reference
N9010A-PRC	Portable configuration
N9010A-EA3	Electric attenuator, 3.6 GHz
N9010A-P03	Preamplifier, 3.6 GHz

EXA Accessories

Product	Description
N9010A-MLP	Minimum loss pad, 50 to 75 ohms
N9010A-EFM	USB flash drive
N9010A-DVR	DVD-ROM/CD-R/RW drive
N9010A-MSE	Mouse, USB interface
N9010A-KYB	Keyboard, USB interface
N9010A-HTC	Hard transit case
N9010A-1CP	Rackmount kit with handles
N9010A-1CN	Front handle kit
N9010A-1CM	Rackmount kit
N9010A-1CR	Rack slide kit
N9010A-CPU	Instrument security, additional CPU and HDD
N9010A-UK6	Commercial Calibration Certificate with Test Data
N9010A-1A7	ISO 17025 Compliant Calibration
N9010A-A6J	ANSI Z540 Compliant Calibration

Advanced Measurement Application Software

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

For MXA,

http://www.agilent.com/find/mxa/options

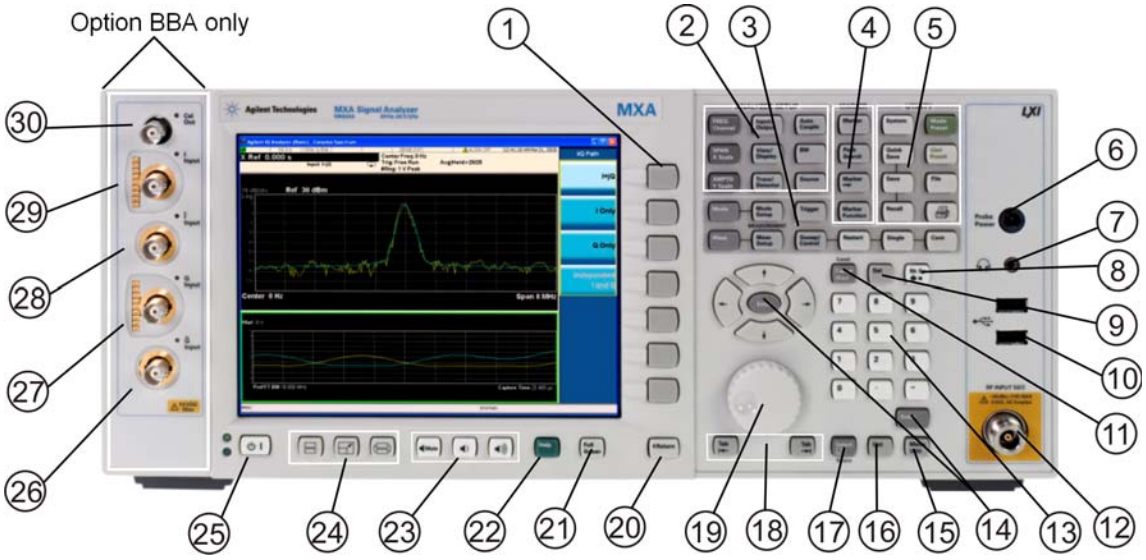
Select the *MXA N9020A, Options and Measurement Applications* link on the top of the page.

For EXA,

http://www.agilent.com/find/exa/options

Select the *EXA N9010A, Options and Measurement Applications* link on the top of the page.

Front-Panel Features



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	Analyzer Setup Keys	These keys set the parameters used for making measurements in the current Mode and Measurement.
3	Measurement Keys	These keys select the Mode, and the Measurement within the mode. They also control the initiation and rate of recurrence of measurements.
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: • instrument configuration information and I/O setup, • printer setup and printing, • file management, save and recall, • instrument presets.
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.

Item		Description
#	Name	
9	Delete Key	Press this key to delete files, or to perform other deletion tasks.
10	USB Connectors	Standard USB 2.0 ports, Type A. Connect to external peripherals such as a mouse, keyboard, DVD drive, or hard drive.
11	Local/Cancel/(Esc) Key	If you are in remote operation, Local: • returns instrument control from remote back to local (the front panel). • turns the display on (if it was turned off for remote operation). • can be used to clear errors. (Press the key once to return to local control, and a second time to clear error message line.) If you have not already pressed the units or Enter key, Cancel exits the currently selected function without changing its value. Esc works the same as it does on a pc keyboard. It: • exits Windows dialogs • clears errors • aborts printing • cancels operations.
12	RF Input	Connector for inputting an external signal. Make sure that the total power of all signals at the analyzer input does *not* exceed +30 dBm (1 watt).
13	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.
14	Enter and Arrow Keys	The Enter key terminates data entry when either no unit of measure is needed, or you want to use the default unit. The arrow keys: • Increment and decrement the value of the current measurement selection. • Navigate help topics. • Navigate, or make selections, within Windows dialogs. • Navigate within forms used for setting up measurements. • Navigate within tables. **Note** The arrow keys cannot be used to move a mouse pointer around on the display.
15	Menu/ (Alt) Key	Alt works the same as a pc keyboard. Use it to change control focus in Windows pull-down menus.
16	Ctrl Key	Ctrl works the same as a pc keyboard. Use it to navigate in Windows applications, or to select multiple items in lists.
17	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.
18	Tab Keys	Use these keys to move between fields in Windows dialogs.
19	Knob	Increments and decrements the value of the current active function.
20	Return Key	Exits the current menu and returns to the previous menu. Has typical pc functionality.

Item		Description
#	Name	
21	Full Screen Key	Pressing this key turns off the softkeys to maximize the graticule display area. Press the key again to restore the normal display.
22	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.
23	Speaker Control Keys	Enables you to increase or decrease the speaker volume, or mute it.
24	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.
25	Power Standby/ On	Turns the analyzer on. A green light indicates power on. A yellow light indicates standby mode. NOTE The front-panel switch is a standby switch, *not* a LINE switch (disconnecting device). The analyzer 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.
26	$\overline{Q}$ Input	Input port for the Q channel when in differential mode.[a]
27	Q Input	Input port for the Q channel for either single or differential mode.[a]
28	$\overline{I}$ Input	Input port for the I channel when in differential mode.[a]
29	I Input	Input port for the I channel for either single or differential mode.[a]
30	Cal Out	Output port for calibrating the I, $\overline{I}$, Q and $\overline{Q}$ inputs and probes used with these inputs.. [a]

a. Status of the LED indicates whether the current state of the port is active (green) or is not in use (dark).

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

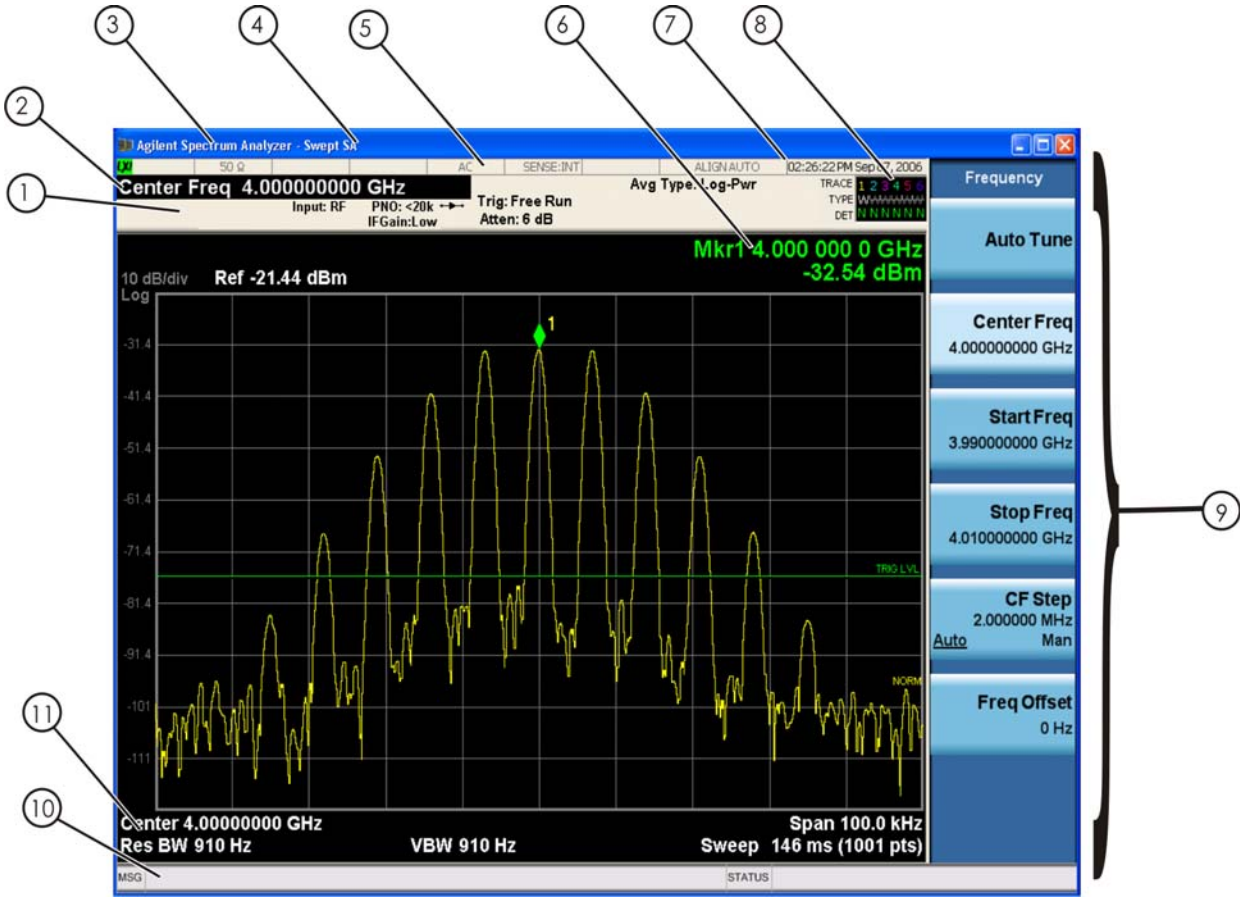
Some of the menu keys are grouped together by a yellow bar running behind the keys near the left side or by a yellow border around the group of keys. When you press a key within the yellow region, such as **Marker Noise**, the highlight moves to that key to show it has been selected. The keys that are 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 Trace** key (in the **Trace/Detector** menu), it brings up its own menu of keys. The **Trace 1** key is highlighted. When you press the **Trace 2** key, the highlight moves to that key and the screen returns to the **Trace/Detector** 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 settings.

Display Annotations

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

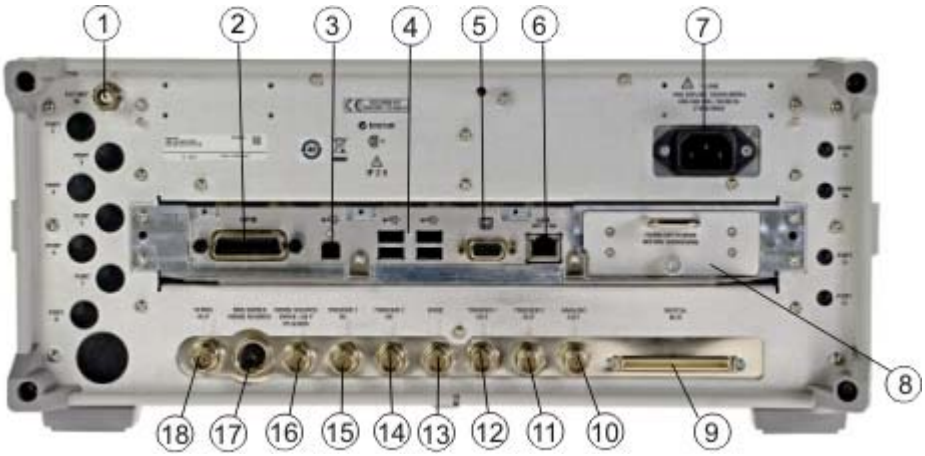


Item	Description	Function Keys
1	Measurement bar - Shows general measurement settings and information.  Indicates single/continuous measurement. Some measurements include limits that the data is tested against. A Pass/Fail indication may be shown in the lower left of the measurement bar.	All the keys in the Analyzer 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.	**Mode**
4	Measurement title - shows title information for the current measurement, or a title that you created for the measurement.	**Meas** **View/Display**, **Display**, **Title**

Item	Description	Function Keys
5	Settings panel - displays system information that is not specific to any one application. • Input/Output status - green LXI indicates the LAN is connected. RLTS indicate Remote, Listen, Talk, SRQ • Input impedance and coupling • Selection of external frequency reference • Setting of automatic internal alignment routine	**Local** and **System, I/O Config** **Input/Output**, **Amplitude**, **System** and others
6	Active marker frequency, amplitude or function value	**Marker**
7	Settings panel - time and date display.	**System**, **Control Panel**
8	Trace and detector information	**Trace/Detector**, **Clear Write (W) Trace Average (A) Max Hold (M) Min Hold (m)** **Trace/Detector**, **More, Detector, Average (A) Normal (N) Peak (P) Sample (S) Negative Peak (p)**
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 Analyzer Setup part of the front panel.

Rear-Panel Features

MXA and EXA with Option PC2



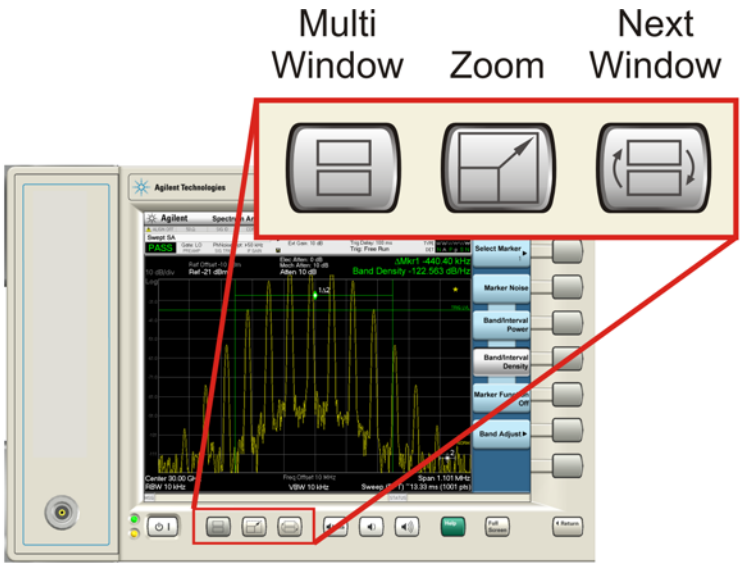
EXA

Item		Description
#	Name	
1	EXT REF IN	Input for an external frequency reference signal: For MXA – 1 to 50 MHz For EXA – 10 MHz.
2	GPIB	A General Purpose Interface Bus (GPIB, IEEE 488.1) connection that can be used for remote analyzer operation.

Item		Description
#	Name	
3	USB Connector	USB 2.0 port, Type B. USB TMC (test and measurement class) connects to an external pc controller to control the instrument 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 analyzer operation.
7	Line power input	The AC power connection. See the product specifications for more details.
8	Removable Disk Drive	Standard on MXA. Optional on EXA.
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 analyzer. Configurable from the Input/Output keys.
12	TRIGGER 1 OUT	A trigger output used to synchronize other test equipment with the analyzer. 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)	For use with Agilent 346A, 346B, and 346C Noise Sources
17	SNS Series Noise Source	For use with Agilent N4000A, N4001A, N4002A Smart Noise Sources (SNS).
18	10 MHz OUT	An output of the analyzer internal 10 MHz frequency reference signal. It is used to lock the frequency reference of other test equipment to the analyzer.

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 is not used at this time. It is there to support future functionality.

Key Path	**Front-panel key**
Help Map ID	3496
Instrument S/W Revision	Prior to A.02.00

Zoom

Zoom is a toggle function. Pressing once Zooms the selected window; pressing again un-zooms.

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
Help Map ID:	3497
Instrument S/W Revision:	Prior to A.02.00

Next Window

This key selects the next window of the current view.

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

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

Selected Window

One and only one window is always selected. The selected window has the focus; as far as you are concerned, all key presses are going to that window.

If a window is not selected, its boundary is gray. The selected window has a green boundary.

If a window in a multi-window display is zoomed it is still outlined in green. If there is only one window, the green outline is not used. This allows you 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.

Navigating Windows

When the Next Window key is pressed, the next window in the order of precedence (see below) becomes

selected. If the selected window was zoomed, the next window will also be zoomed.

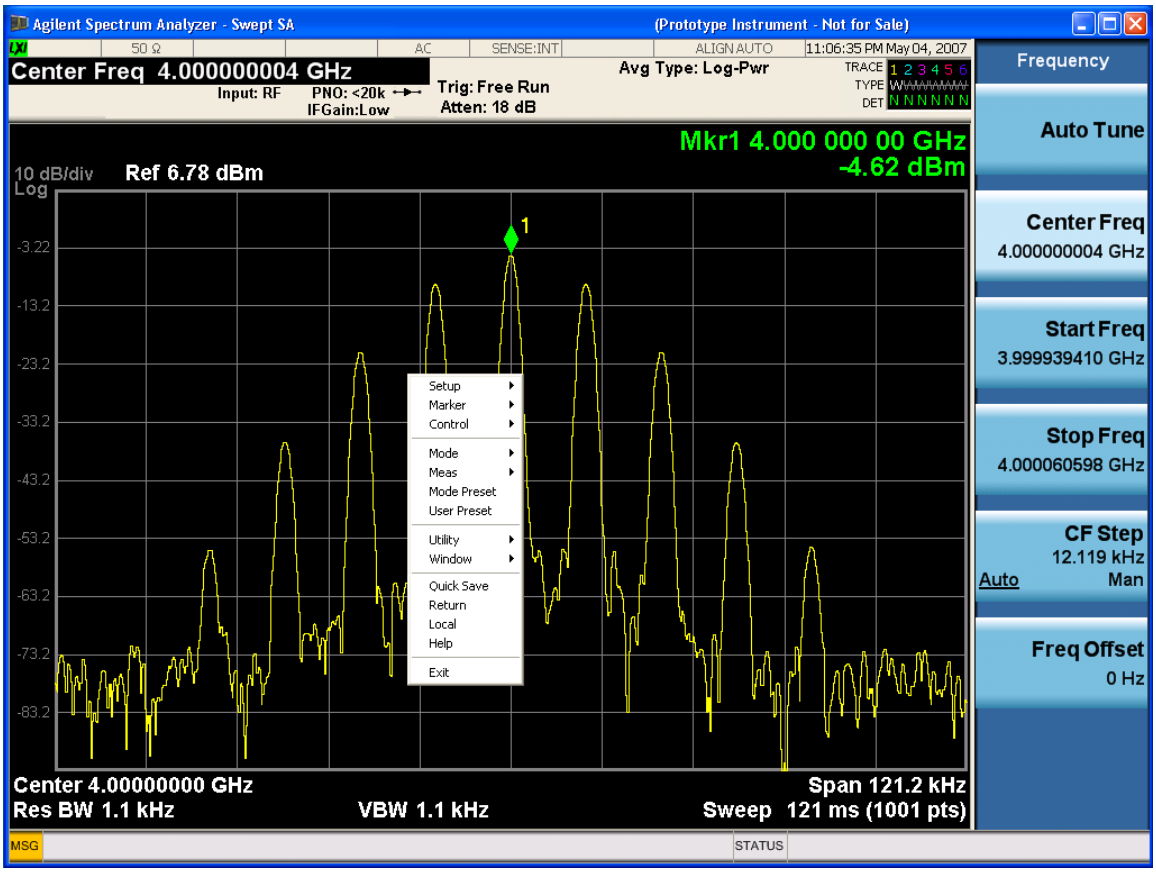
The window navigation does NOT use the arrow and select keys. Those are reserved for navigation within a window.

Mouse and Keyboard Control

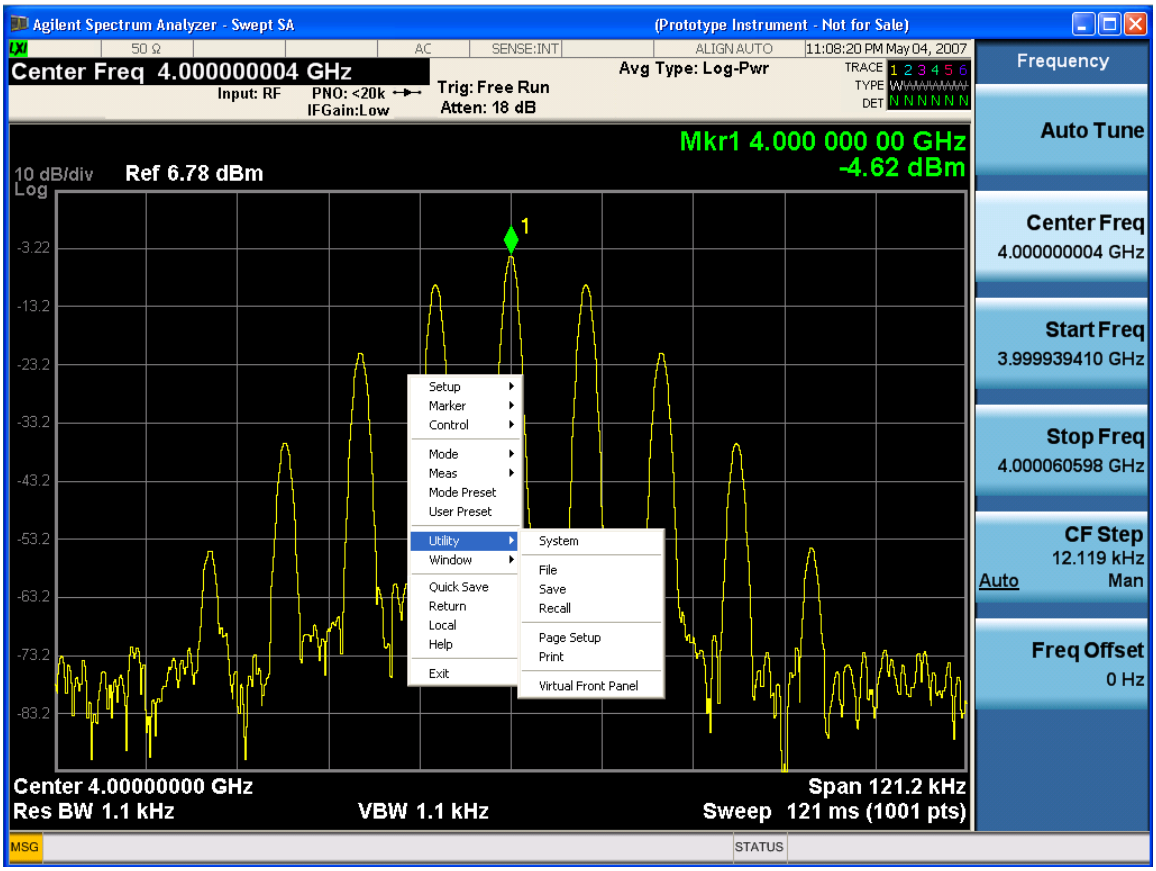
If you do not have access to the instrument front-panel, there are several ways that a mouse and PC Keyboard can give you access to functions normally accessed using the front-panel keys.

Right-Click

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

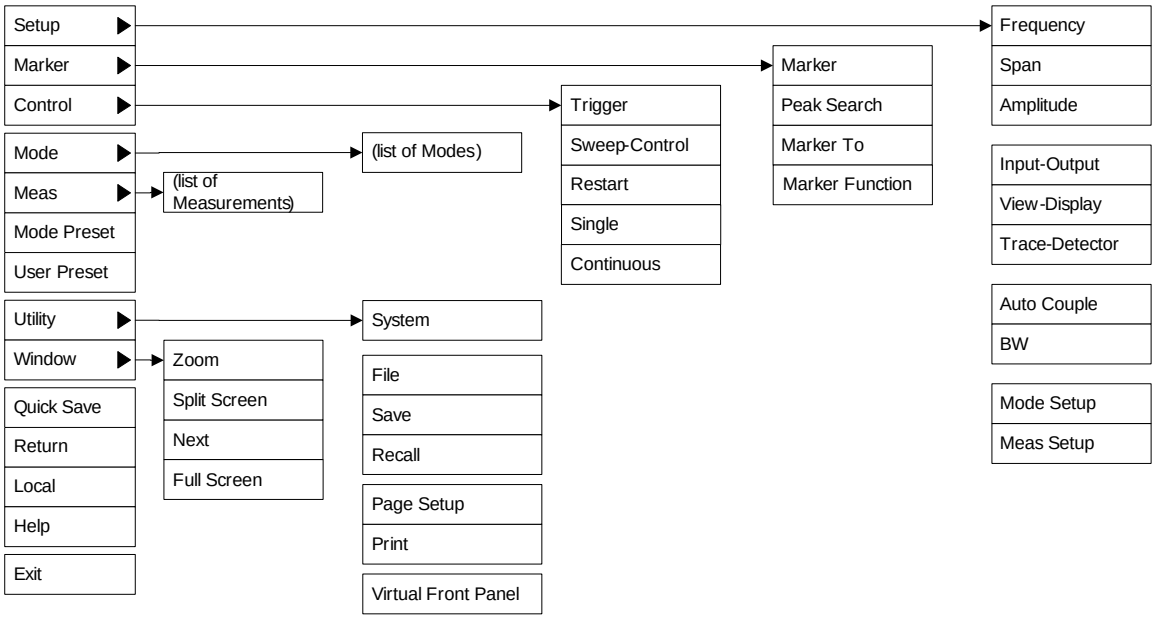


Placing the mouse on one of the rows marked with a right arrow symbol will cause that row to expand, as for example below where the mouse is hovered over the “Utility” row:



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

The array of keys thus available is shown below :



PC Keyboard

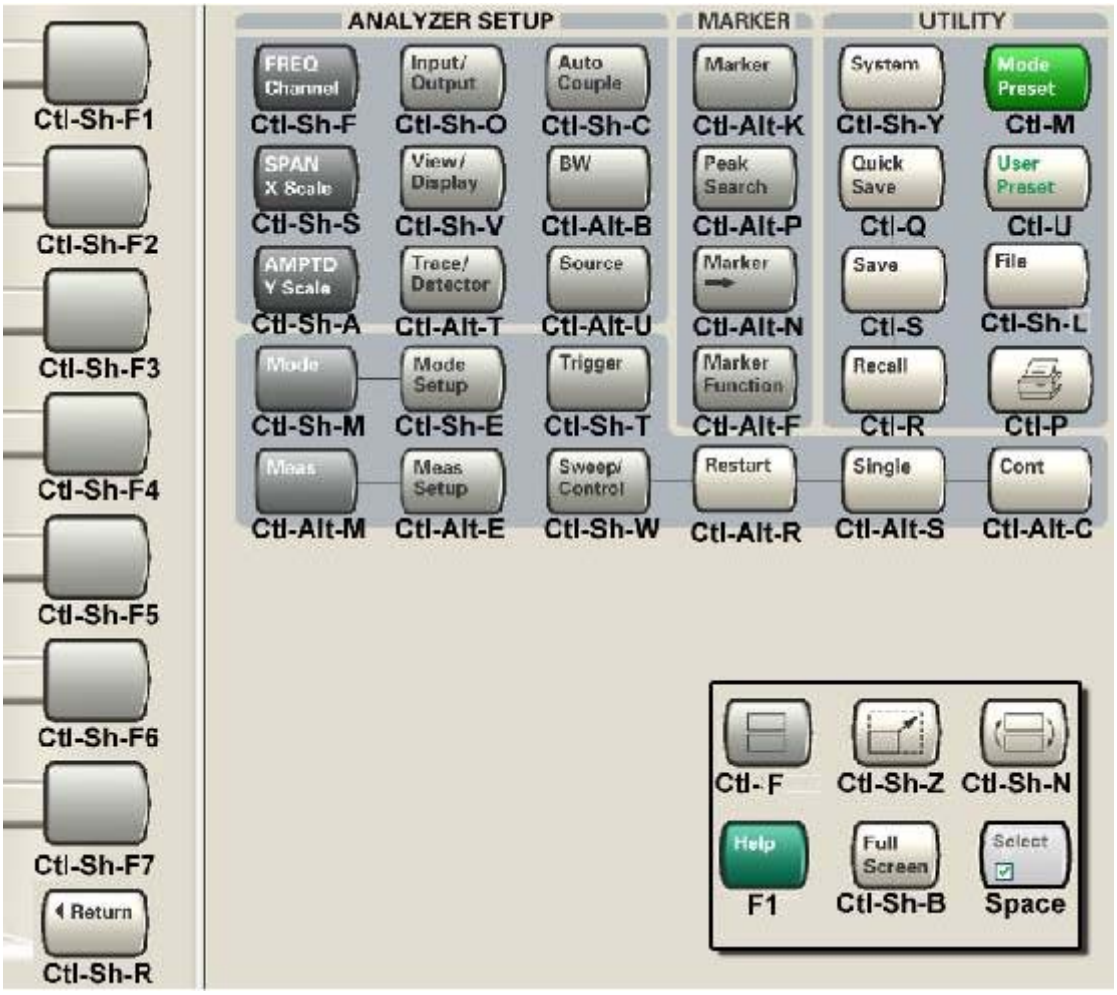
If you have a PC keyboard plugged in (or via Remote Desktop), certain key codes on the PC keyboard map to front-panel keys on the GPSA front panel. These key codes are shown below:

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+SHIFT+E
Marker	CTRL+SHIFT+K
Peak Search	CTRL+SHIFT+P
Marker To	CTRL+ALT+N
Marker Function	CTRL+ALT+F
System	CTRL+SHIFT+Y
Quick Save	CTRL+SHIFT+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+ALT+E
Meas Setup	CTRL+ALT+U
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
Control	CTRL
Alt	ALT
Enter	Return
Cancel	Esc
Del	Delete
Backspace	Backspace
Select	Space
Up Arrow	Up
Down Arrow	Down
Left Arrow	Left
Right Arrow	Right
Menu key 1	CTRL+SHIFT+F1
Menu key 2	CTRL+SHIFT+F2
Menu key 3	CTRL+SHIFT+F3
Menu key 4	CTRL+SHIFT+F4
Menu key 5	CTRL+SHIFT+F5
Menu key 6	CTRL+SHIFT+F6
Menu key 7	CTRL+SHIFT+F7
Backspace	BACKSPACE
Enter	ENTER
Tab	Tab
1	1

2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
0	0

Here is a pictorial view of the table above:



3 Introduction

This chapter provides overall information on the Agilent N9071A XFP Combined GSM Measurement Application and describes the measurements made by the analyzer. Installation instructions for adding this option to your analyzer are provided in this section, in case you purchased this option separately.

What Does the Agilent N9071A Combined GSM Measurement Application Do?

The N9071A Combined GSM is a full-featured GSM signal analyzer that can help determine if a GSM modulated source or transmitter is working correctly.

The N9071A Combined GSM measurement provides a measurement that combines multiple measurements in a single package. The goal of this application is to provide all necessary measurement results at once in the fastest manner. The supporting measurements in the Combined GSM measurement application are:

- List Power Step
- Phase and Frequency Error (PFER)
- Edge EVM (EEVM)
- Power vs Time (PVT)
- Output RF Spectrum (ORFS)
- Marker Meas
- Harmonics

This manual is intended to supplement the standard N9071A EDGE/GSM User's and Programmer's Reference and Help. Only features specific to the N9073A XFP Combined GSM Measurement Application are documented here.

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 analyzer 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 N9020A Signal Analyzer to activate the new measurement application. See below for more information.

For the latest information on Agilent Signal Analyzer measurement applications and upgrade kits, visit the following internet URL.

http://www.agilent.com/find/sa_upgrades

Viewing a License Key

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

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

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

C:\Programing Files\Agilent\Licensing

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.

Obtaining and Installing a License Key

If you purchase an additional application that requires installation, you will receive an "Entitlement Certificate" which may be redeemed for a license key for one instrument. 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 instrument. It is found through the instrument front panel keys at **System**, **Licensing. . .** , or internally at C:\Programming Files\Agilent\Licensing.

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

Missing and Old Measurement Application Software

All the software applications were loaded at the time of original instrument manufacture. It is a good idea to regularly update your software with the latest available version. This 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/mxa_software
http://www.agilent.com/find/exa_software

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

4 Programming the Analyzer

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

What Programming Information is Available?

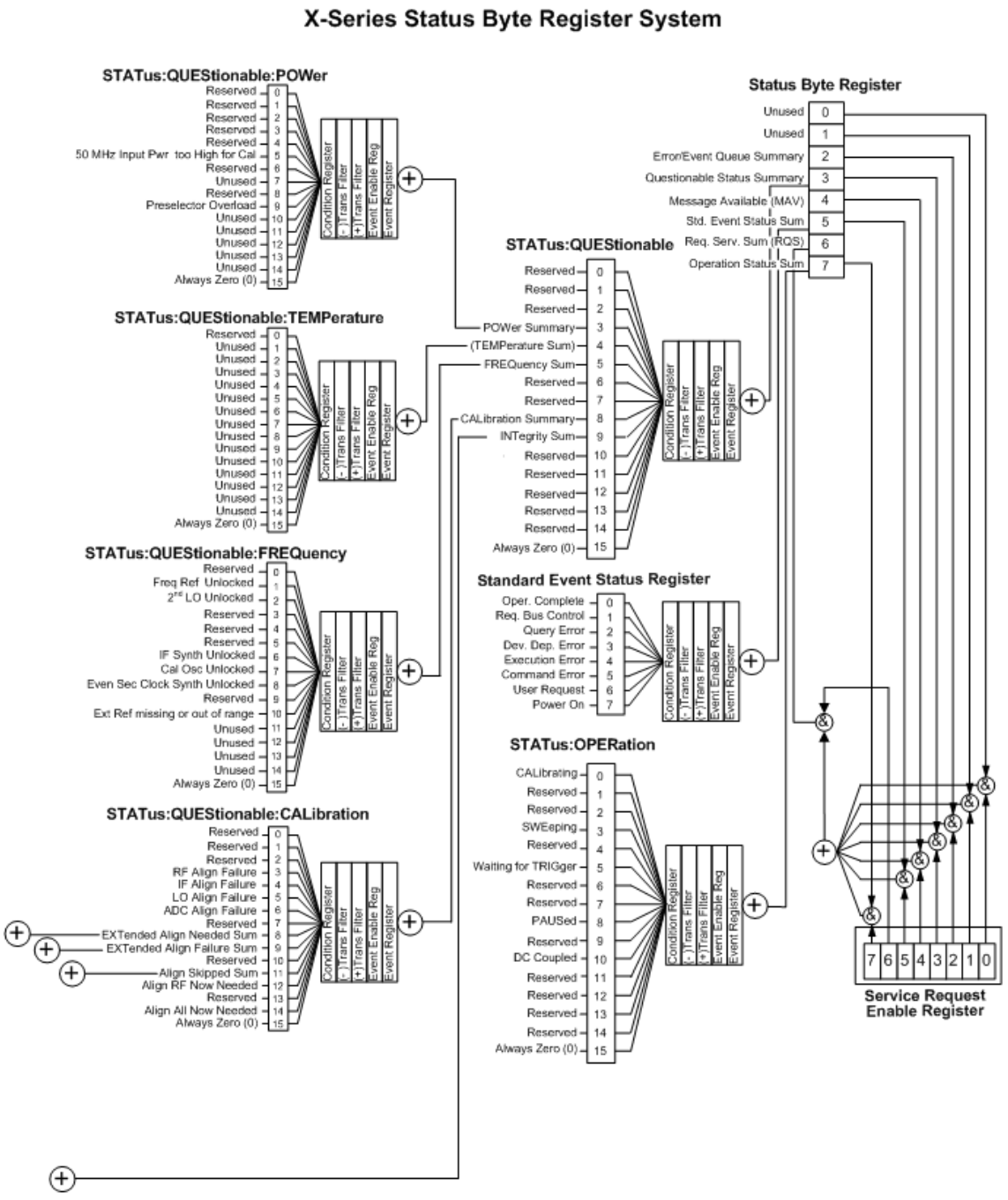
The X-Series Documentation can be accessed through the Additional Documentation page in the instrument Help system and is included on the Documentation CD shipped with the instrument. It can also be found in the instrument at: `C:\ProgramsFiles\Agilent\SignalAnalysis\Infrastructure\Help\otherdocs`, or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

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

Resource	Description
X-Series Programmer's Guide	Provides general SCPI programming information on the following topics: • Programming the X-Series Applications • Programming fundamentals • Programming examples Note that SCPI command descriptions for measurement applications are NOT in this book, but are in the User's and Programmer's Reference.
User's and Programmer's Reference manuals	Describes all front-panel keys and softkeys, including SCPI commands for a measurement application. Note that: • Each measurement application has its own User's and Programmer's Reference. • The content in this manual is duplicated in the analyzer's Help (the Help that you see for a key is identical to what you see in this manual).
Embedded Help in your instrument	Describes all front-panel keys and softkeys, including SCPI commands, for a measurement application. Note that the content that you see in Help when you press a key is identical to what you see in the User's and Programmer's Reference.
X-Series Getting Started Guide	Provides valuable sections related to programming including: • Licensing New Measurement Application Software - After Initial Purchase • Configuring instrument LAN Hostname, IP Address, and Gateway Address • Using the Windows XP Remote Desktop to connect to the instrument remotely • Using the Embedded Web Server Telnet connection to communicate SCPI This printed document is shipped with the instrument.
Agilent Application Notes	Printable PDF versions of pertinent application notes.
Agilent VISA User's Guide	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.

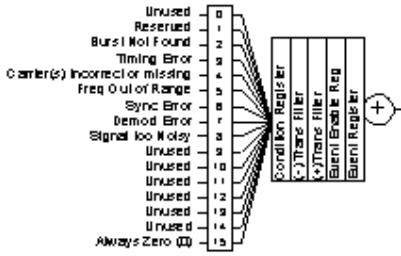
STATus Subsystem (No equivalent front-panel keys)

The following graphics show the current X-Series Status Register Subsystem implementation.

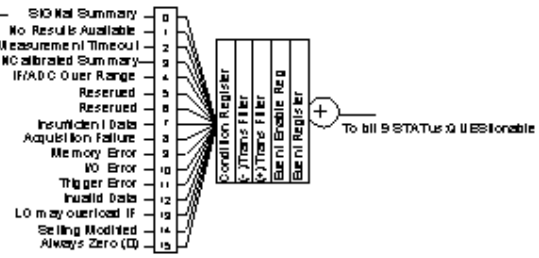


Additional Registers:

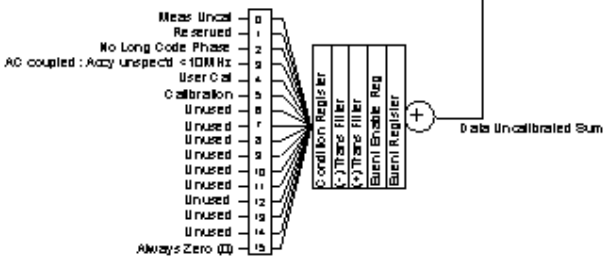
STATus:QUEStionable:INTegrity:SIGNal
[for Base Analyzer]



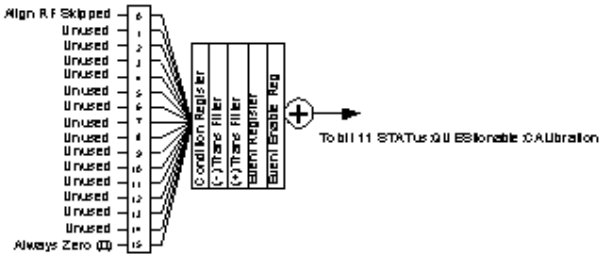
STATus:QUEStionable:INTegrity
[for Base Analyzer]



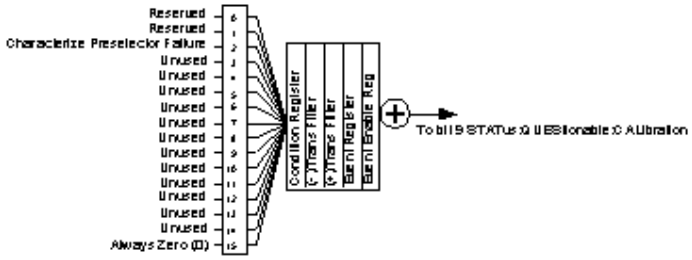
STATus:QUEStionable:INTegrity:UNCalibrated
[for Base Analyzer]



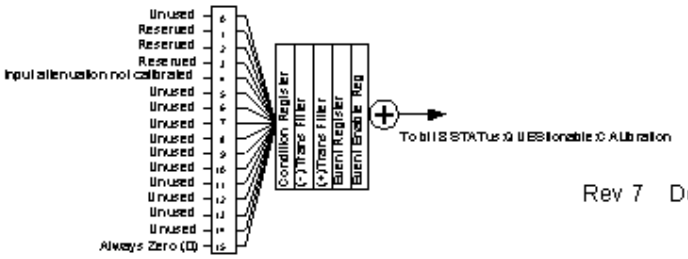
STATus:QUEStionable:CALibration:SKIPped



STATus:QUEStionable:CALibration:EXTended:FAILure



STATus:QUEStionable:CALibration:EXTended:NEEDed



Rev 7 December 11, 2007

Detailed Description

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

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

What Are Status Registers

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

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

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

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

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

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

What Are Status Register SCPI Commands

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

- *CLS (clear status) clears the status byte by emptying the error queue and clearing all the event registers.
- *ESE, *ESE? (event status enable) sets and queries the bits in the enable register part of the standard event status register.
- *ESR? (event status register) queries and clears the event register part of the standard event status register.
- *OPC, *OPC? (operation complete) sets the standard event status register to monitor the completion of all commands. The query stops any new commands from being processed until the current processing is complete, then returns a ‘1’.
- *PSC, *PSC? (power-on state clear) sets the power-on state so that it clears the service request enable register and the event status enable register at power on.
- *SRE, *SRE? (service request enable) sets and queries the value of the service request enable register.
- *STB? (status byte) queries the value of the status byte register without erasing its contents.

How to Use the Status Registers

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

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

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

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

Use the SRQ method when:

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

Use polling when:

- your programming language/development environment does not support SRQ interrupts
- you want to write a simple, single-purpose program and don't want the added complexity of setting up an SRQ handler
- To monitor a condition:

1. Determine which register contains the bit that reports the condition.
2. Send the unique SCPI query that reads that register.
3. Examine the bit to see if the condition has changed.

You can monitor conditions in different ways.

- Check the current instrument hardware and firmware status.

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

- Monitor a particular condition (bit).

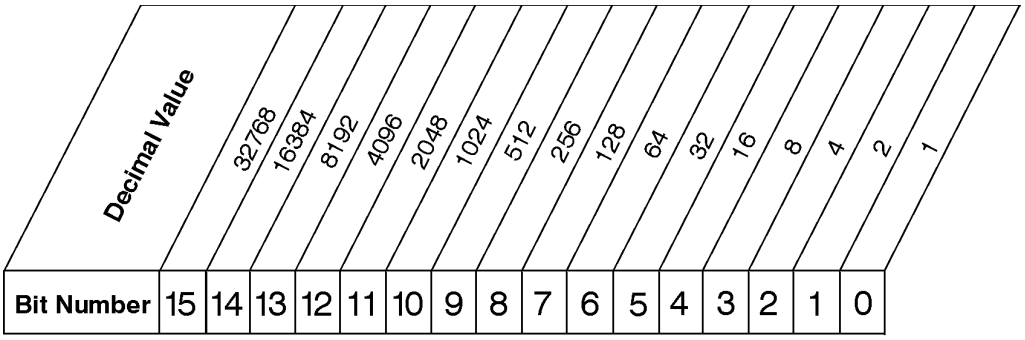
You can enable a particular bit(s), using the event enable register. The instrument will then monitor that particular condition(s). If the bit becomes true (0 to 1 transition) in the event register, it will stay set until the event register is cleared. Querying the event register allows you to detect that this condition occurred even if the condition no longer exists. The event register can only be cleared by querying it or sending the *CLS command.

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

Using a Status Register

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

Figure: Status Register Bit Values



Standard Operation Event Enable Register ck730a

Bit 15 is not used to report status.

Example 1:

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

Example 2:

1. Suppose you want to know if an Auto-trigger Timeout occurs, but you only cared about that specific condition. So you would want to know what was happening with bit 10 in the Status Questionable Integrity register, and not about any other bits.
2. It's usually a good idea to start by clearing all the status registers with *CLS.
3. Sending the STAT:QUES:INT:ENAB 1024 command lets you monitor only bit 10 events, instead of the default monitoring all the bits in the register. The register default is for positive transition events (0 to 1 transition). That is, when an auto-trigger timeout occurs. If instead, you wanted to know when the Auto-trigger timeout condition is cleared, then you would set the STAT:QUES:INT:PTR 0 and the STAT:QUES:INT:NTR 32767.
4. So now the only output from the Status Questionable Integrity register will come from a bit 10 positive transition. That output goes to the Integrity Sum bit 9 of the Status Questionable register.
5. You can do a similar thing with this register to only look at bit 9 using, STAT:QUES:ENAB 512.
6. The Status Questionable register output goes to the "Status Questionable Summary" bit 3 of the Status Byte Register. The output from this register can be enabled using the *SRE 8 command.
7. Finally, you would use the serial polling functionality available for the particular bus/software that you are using to monitor the Status Byte Register. (You could also use *STB? to poll the Status Byte Register.)

Using the Service Request (SRQ) Method

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

method, you must:

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

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

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

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

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

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

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

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

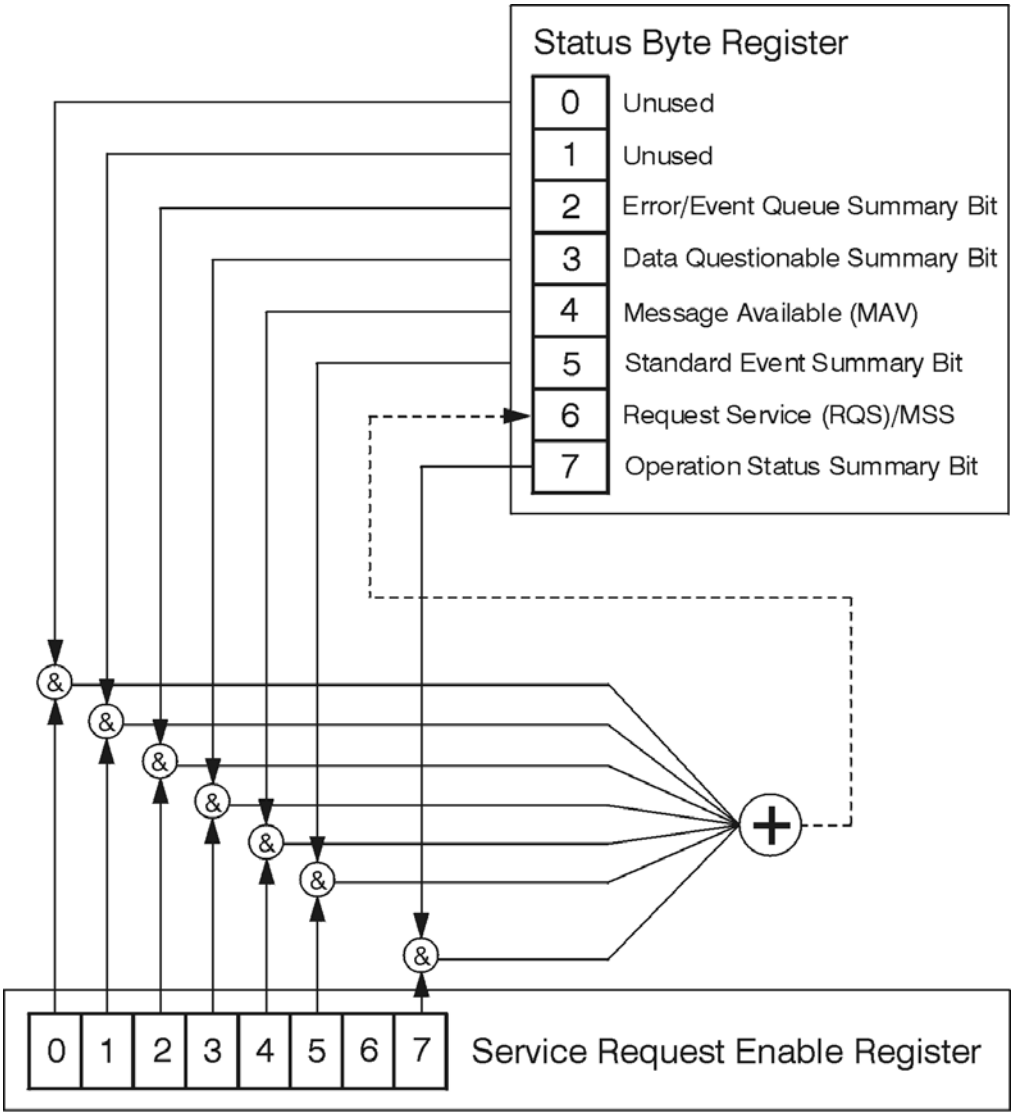
If the status register is configured to SRQ on end-of-measurement and the measurement is in continuous mode, then restarting a measurement (INIT command) can cause the measuring bit to pulse low. This causes an SRQ when you have not actually reached the "end-of-measurement" condition. To avoid this:

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

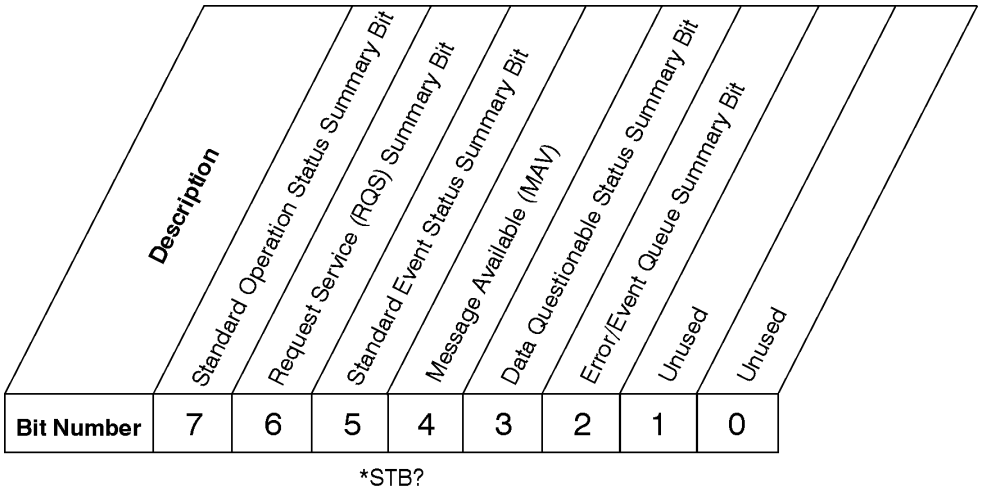
Status Register System

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

The Status Byte Register



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



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

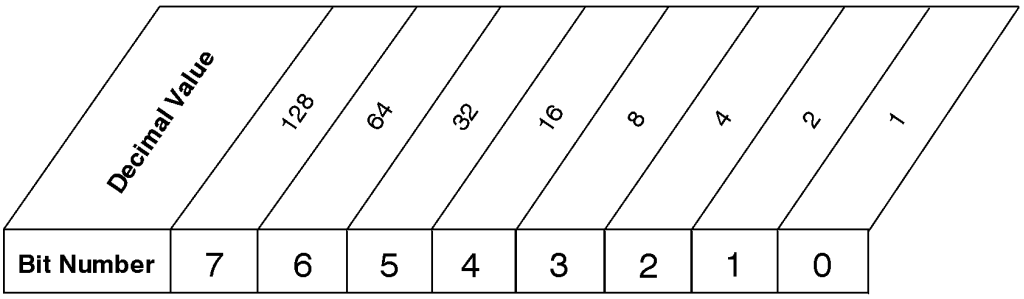
To query the status byte register, send the command *STB? The response will be the decimal sum of the bits which are set to 1. For example, if bit number 7 and bit number 3 are set to 1, the decimal sum of the 2 bits is 128 plus 8. So the decimal value 136 is returned. The *STB command does not clear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

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

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

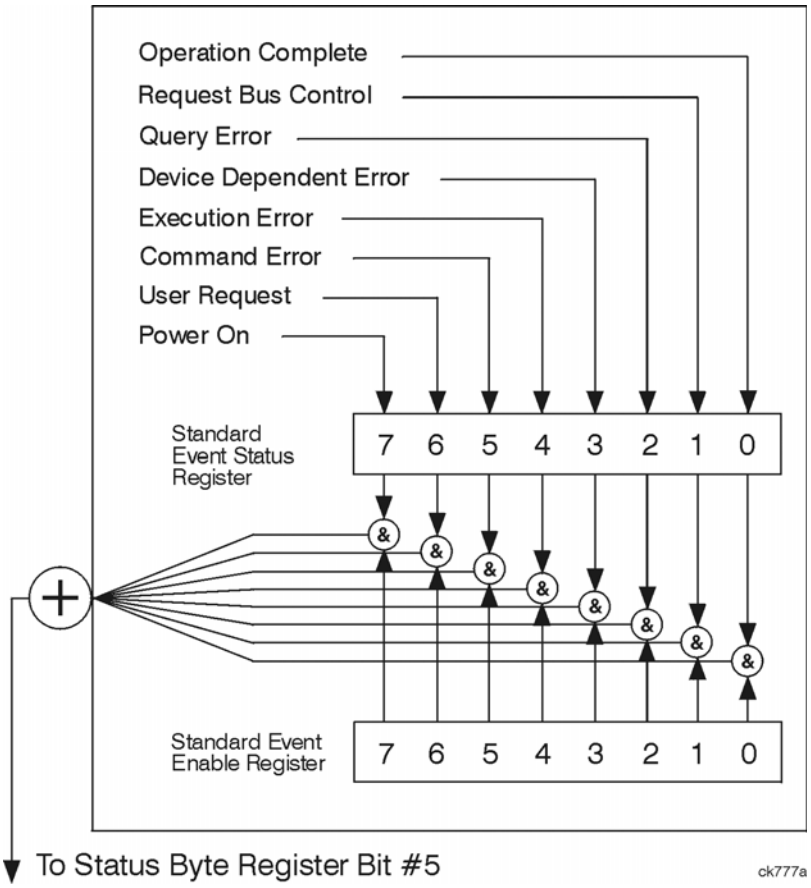
RQS bit 6) to your numeric sum when you enable any bits for a service request. The command *SRE? returns the decimal value of the sum of the bits previously enabled with the *SRE <integer> command.

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

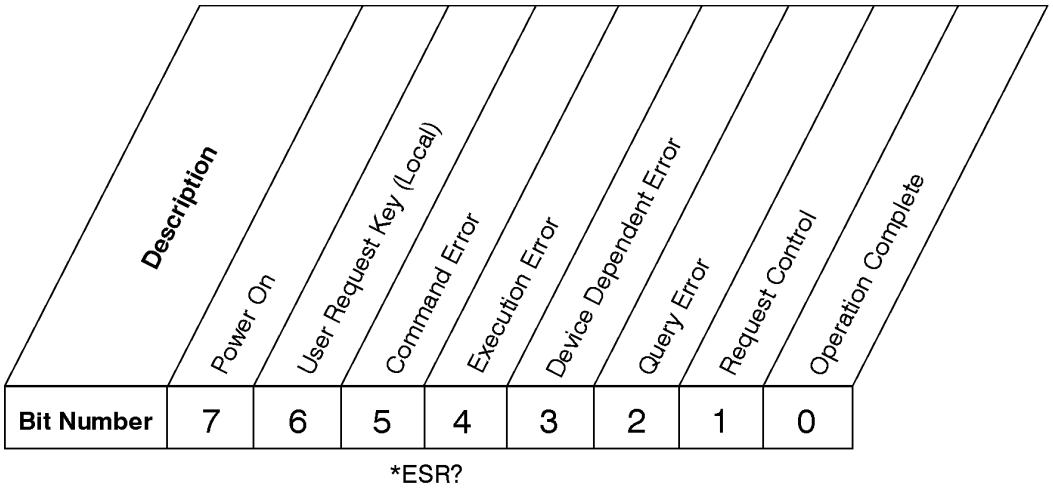


Service Request Enable Register ck726a

Standard Event Status Register



The standard event status register contains the following bits:



Standard Event Status Register

ck727a

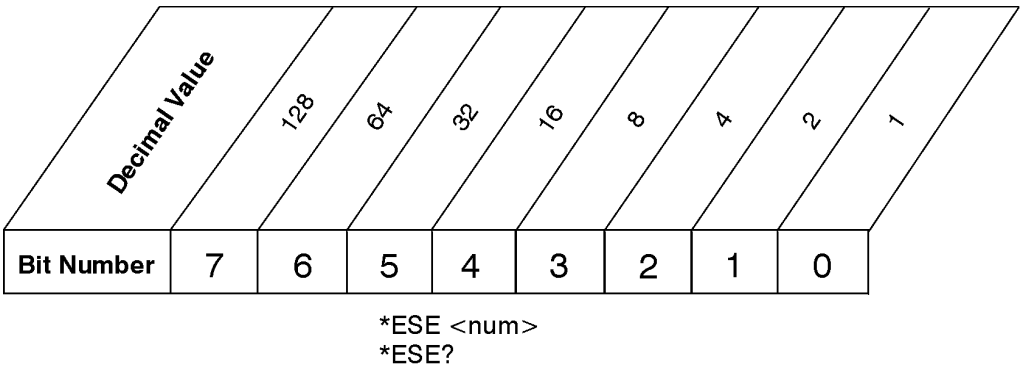
Bit	Description
0	A 1 in this bit position indicates that all pending operations were completed following execution of the *OPC command.
1	This bit is for GPIB handshaking to request control. Currently it is set to 0 because there are no implementations where the spectrum analyzer controls another instrument.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

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

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

and bit 6 so that whenever either of those bits is set to 1, the standard event status summary bit of the status byte register will be set to 1, send the command *ESE 192 (128 + 64). The command *ESE? returns the decimal value of the sum of the bits previously enabled with the *ESE <integer> command.

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



Standard Event Status Enable Register ck728a

Operation and Questionable Status Registers

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

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

Bit	Condition	Operation
0	Calibrating	The instrument is busy executing its Align Now process
3	Sweeping	The instrument is busy taking a sweep.
4	Measuring	The instrument is busy making a measurement. Measurements often require multiple sweeps. They are initiated by keys under the MEASURE key or with the MEASure group of commands. The bit is valid for most X-Series Modes.
5	Waiting for trigger	The instrument is waiting for the trigger conditions to be met, then it will trigger a sweep or measurement.
8	Paused	The instrument is paused (waiting) because you have pressed the Pause Meas Control key or send the INITiate:PAUSe command. Bit is currently only valid for Modes: ESA/PSA: Spectrum Analysis, Phase Noise, and ESA: Bluetooth, cdmaOne, GSM

Questionable Status Register

The questionable status register monitors the instrument's condition to see if anything questionable has happened to it. It is looking for anything that might cause an error or a bad measurement like a hardware

problem, an out of calibration situation, or a unusual signal. All the bits are summary bits from lower-level event registers.

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

STATus Subsystem Command Descriptions

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

Numeric values for bit patterns can be entered using decimal or hexadecimal representations. (i.e. 0 to 32767 is equivalent to #H0 to #H7FFF. It is also equal to all ones, 111111111111111) See the SCPI Basics information about using bit patterns for variable parameters.

Operation Register

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

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

Mode	All
Remote Command	`:STATus:OPERation:CONDition?`
Example	STAT:OPER:COND?
Preset	0
SCPI Status Bits/OPC Dependencies	Sequential command
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

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

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

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

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

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

Mode	All
Remote Command	`:STATus:OPERation[:EVENt]?`
Example	STAT:OPER?
Preset	0
SCPI Status Bits/OPC Dependencies	Sequential command
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

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

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

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

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

Preset the Status Byte

Sets bits in most of the enable and transition registers to their default state. It presets all the Transition Filters, Enable Registers, and the Error/Event Queue Enable. It has no effect on Event Registers,

Error/Event QUEue, IEEE 488.2 ESE, and SRE Registers as described in IEEE Standard 488.2–1992, IEEE Standard Codes, Formats, Protocols, and Common Commands for Use with ANSI/IEEE Std 488.1–1987. New York, NY, 1992.

Remote Command:	`:STATus:PRESet`
Example:	STAT:PRES
Help Map ID:	0
Instrument S/W Revision:	Prior to A.02.00

Questionable Register

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

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

Mode	All
Remote Command	`:STATus:QUEStionable:CONDition?`
Example	STAT:QUES:COND?
Preset	0
SCPI Status Bits/OPC Dependencies	Sequential command
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

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

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

Mode	All

Remote Command	`:STATus:QUEStionable:ENABle 16 Sets the register so that temperature summary will be reported to the Status Byte Register` `:STATus:QUEStionable:ENABle?`
Example	STAT:OPER:PTR 1 Align Now operation beginning will be reported to the Status Byte Register.
Preset	0
SCPI Status Bits/OPC Dependencies	Sequential command
Min	0
Max	32767
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

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

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

Mode	All
Remote Command	`:STATus:QUEStionable[:EVENt]?`
Example	STAT:QUES?
Preset	0
SCPI Status Bits/OPC Dependencies	Sequential command
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

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

Mode	All

Remote Command	`:STATus:QUEStionable:NTRansition 16 Temperature summary ‘questionable cleared’ will be reported to the Status Byte Register.` `:STATus:QUEStionable:NTRansition?`
Example	STAT:QUES:NTR 16 Temperature summary ‘questionable cleared’ will be reported to the Status Byte Register.
Preset	0
SCPI Status Bits/OPC Dependencies	Sequential command
Min	0
Max	32767
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

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

Mode	All
Remote Command	`:STATus:QUEStionable:PTRansition <integer>` `:STATus:QUEStionable:PTRansition?`
Example	STAT:QUES:PTR 16 Temperature summary ‘questionable asserted’ will be reported to the Status Byte Register.
Preset	32767
SCPI Status Bits/OPC Dependencies	Sequential command
Min	0
Max	32767
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

Questionable Calibration Register

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

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

Mode	All
Remote Command	`:STATus:QUEStionable:CALibration:CONDition?`
Example	STAT:QUES:CAL:COND?
Preset	0
SCPI Status Bits/OPC Dependencies	Sequential command
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

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

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

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

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

Mode	All
Remote Command	`:STATus:QUEStionable:CALibration[:EVENt]?`

Example	STAT:QUES:CAL?
Preset	0
SCPI Status Bits/OPC Dependencies	Sequential command
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

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

Mode	All
Remote Command	`:STATus:QUEStionable:CALibration:NTRansition <integer>` `:STATus:QUEStionable:CALibration:NTRansition?`
Example	STAT:QUES:CAL:NTR 16384 Alignment is not required.
Preset	0
SCPI Status Bits/OPC Dependencies	Sequential command
Min	0
Max	32767
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

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

Mode	All
Remote Command	`:STATus:QUEStionable:CALibration:PTRansition <integer>` `:STATus:QUEStionable:CALibration:PTRansition?`
Example	STAT:QUES:CAL:PTR 16384 Alignment is required.
Preset	32767
SCPI Status Bits/OPC Dependencies	Sequential command
Min	0

Max	32767
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

Questionable Calibration Skipped Register

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

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

Mode	All
Remote Command	`:STATus:QUEStionable:CALibration:SKIPped:CONDition?`
Example	STAT:QUES:CAL:SKIP:COND?
Preset	0
SCPI Status Bits/OPC Dependencies	Sequential command
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

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

Mode	All
Remote Command	`:STATus:QUEStionable:CALibration:SKIPped:ENABle <integer>` `:STATus:QUEStionable:CALibration:SKIPped:ENABle?`
Example	STAT:QUES:CAL:SKIP:ENAB 1 Can be used to query if an EMI alignment skipped condition is detected
Preset	32767
SCPI Status Bits/OPC Dependencies	Sequential command
Min	0
Max	32767
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

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

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

Mode	All
Remote Command	`:STATus:QUEStionable:CALibration:SKIPped[:EVENt]?`
Example	STAT:QUES:CAL:SKIP?
Preset	0
SCPI Status Bits/OPC Dependencies	Sequential command
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

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

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

Questionable Calibration Skipped Positive Transition This command determines which bits in the Questionable Calibration Skipped Condition register will set the corresponding bit in the Questionable Calibration Skipped Event register when the condition register bit has a positive transition (0 to 1). The

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

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

Questionable Calibration Extended Failure Register

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

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

Mode	All
Remote Command	`:STATus:QUEStionable:CALibration:EXTended:FAILure:CONDition?`
Example	STAT:QUES:CAL:EXT:FAIL:COND?
Preset	0
SCPI Status Bits/OPC Dependencies	Sequential command
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

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

Mode	All

Remote Command	`:STATus:QUEStionable:CALibration:EXTended:FAILure:ENABle <integer>` `:STATus:QUEStionable:CALibration:EXTended:FAILure:ENABle?`
Example	STAT:QUES:CAL:EXT:FAIL:ENAB 1 Can be used to query if an EMI conducted alignment is needed.
Preset	32767
SCPI Status Bits/OPC Dependencies	Sequential command
Min	0
Max	32767
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

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

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

Mode	All
Remote Command	`:STATus:QUEStionable:CALibration:EXTended:FAILure[:EVENt]?`
Example	STAT:QUES:CAL:EXT:FAIL?
Preset	0
SCPI Status Bits/OPC Dependencies	Sequential command
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

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

Mode	All

Remote Command	`:STATus:QUEStionable:CALibration:EXTended:FAILure:NTRansition <integer>` `:STATus:QUEStionable:CALibration:EXTended:FAILure:NTRansition?`
Example	STAT:QUES:CAL:EXT:FAIL:NTR 1 EMI conducted align failure is not required.
Preset	0
SCPI Status Bits/OPC Dependencies	Sequential command
Min	0
Max	32767
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

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

Mode	All
Remote Command	`:STATus:QUEStionable:CALibration:EXTended:FAILure:PTRansition <integer>` `:STATus:QUEStionable:CALibration:EXTended:FAILure:PTRansition?`
Example	STAT:QUES:CAL:EXT:FAIL:PTR 1 EMI conducted align failure is required.
Preset	32767
SCPI Status Bits/OPC Dependencies	Sequential command
Min	0
Max	32767
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

Questionable Calibration Extended Needed Register

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

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

Mode	All
Remote Command	`:STATus:QUEStionable:CALibration:EXTended:NEEDed:CONDition?`
Example	STAT:QUES:CAL:EXT:NEED:COND?
Preset	0
SCPI Status Bits/OPC Dependencies	Sequential command
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

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

Mode	All
Remote Command	`:STATus:QUEStionable:CALibration:EXTended:NEEDed:ENABle <integer>` `:STATus:QUEStionable:CALibration:EXTended:NEEDed:ENABle?`
Example	STAT:QUES:CAL:EXT:NEED:ENAB 2 Can be used to query if an EMI conducted alignment is needed.
Preset	32767
SCPI Status Bits/OPC Dependencies	Sequential command
Min	0
Max	32767
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

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

NOTE The register requires that the associated PTR or NTR filters be set before a condition register bit can set a bit in the event register. The data in this register is

latched until it is queried. Once queried, the register is cleared.

Mode	All
Remote Command	`:STATus:QUEStionable:CALibration:EXTended:NEEDed[:EVENt]?`
Example	STAT:QUES:CAL:EXT:NEED?
Preset	0
SCPI Status Bits/OPC Dependencies	Sequential command
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

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

Mode	All
Remote Command	`:STATus:QUEStionable:CALibration:EXTended:NEEDed:NTRansition <integer>` `:STATus:QUEStionable:CALibration:EXTended:NEEDed:NTRansition?`
Example	STAT:QUES:CAL:EXT:NEED:NTR 2 Align EMI conducted is not required.
Preset	0
SCPI Status Bits/OPC Dependencies	Sequential command
Min	0
Max	32767
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

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

Mode	All

Remote Command	`:STATus:QUEStionable:CALibration:EXTended:NEEDed:PTRansition <integer>` `:STATus:QUEStionable:CALibration:EXTended:NEEDed:PTRansition?`
Example	STAT:QUES:CAL:EXT:NEED:PTR 2 Align EMI conducted is required.
Preset	32767
SCPI Status Bits/OPC Dependencies	Sequential command
Min	0
Max	32767
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

Questionable Frequency Register

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

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

Mode	All
Remote Command	`:STATus:QUEStionable:FREQuency:CONDition?`
Example	STAT:QUES:FREQ:COND?
Preset	0
SCPI Status Bits/OPC Dependencies	Sequential command
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

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

Mode	All
Remote Command	`:STATus:QUEStionable:FREQuency:ENABle <integer>` `:STATus:QUEStionable:FREQuency:ENABle?`

Example	STAT:QUES:FREQ:ENAB 2 Frequency Reference Unlocked will be reported to the Frequency Summary of the Status Questionable register.
Preset	32767
SCPI Status Bits/OPC Dependencies	Sequential command
Min	0
Max	32767
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

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

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

Mode	All
Remote Command	`:STATus:QUEStionable:FREQuency[:EVENt]?`
Example	STAT:QUES:FREQ?
Preset	0
SCPI Status Bits/OPC Dependencies	Sequential command
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

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

Mode	All
Remote Command	`:STATus:QUEStionable:FREQuency:NTRansition <integer>` `:STATus:QUEStionable:FREQuency:NTRansition?`
Example	STAT:QUES:FREQ:NTR 2 Frequency Reference ‘regained lock’ will be reported to the Frequency Summary of the Status Questionable register.
Preset	0

SCPI Status Bits/OPC Dependencies	Sequential command
Min	0
Max	32767
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

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

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

Questionable Integrity Register

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

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

Mode	All
Remote Command	`:STATus:QUEStionable:INTegrity:CONDition?`
Example	STAT:QUES:INT:COND?
Preset	0
SCPI Status Bits/OPC Dependencies	Sequential command

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

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

Mode	All
Remote Command	`:STATus:QUEStionable:INTegrity:ENABle <integer>` `:STATus:QUEStionable:INTegrity:ENABle?`
Example	STAT:QUES:INT:ENAB 8 Measurement Uncalibrated Summary will be reported to the Integrity Summary of the Status Questionable register.
Preset	32767
SCPI Status Bits/OPC Dependencies	Sequential command
Min	0
Max	32767
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

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

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

Mode	All
Remote Command	`:STATus:QUEStionable:INTegrity[:EVENt]?`
Example	STAT:QUES:INT?
Preset	0
SCPI Status Bits/OPC Dependencies	Sequential command
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

Questionable Integrity Negative Transition This command determines which bits in the

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

Mode	All
Remote Command	`:STATus:QUEStionable:INTegrity:NTRansition <integer>` `:STATus:QUEStionable:INTegrity:NTRansition?`
Example	STAT:QUES:INT:NTR 8 Measurement ‘regained calibration’ Summary will be reported to the Integrity Summary of the Status Questionable register.
Preset	0
SCPI Status Bits/OPC Dependencies	Sequential command
Min	0
Max	32767
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

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

Mode	All
Remote Command	`:STATus:QUEStionable:INTegrity:PTRansition <integer>` `:STATus:QUEStionable:INTegrity:PTRansition?`
Example	STAT:QUES:INT:PTR 8 Measurement ‘became uncalibrated’ Summary will be reported to the Integrity Summary of the Status Questionable register.
Preset	32767
SCPI Status Bits/OPC Dependencies	Sequential command
Min	0
Max	32767
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

Questionable Integrity Signal Register

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

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

Mode	All
Remote Command	`:STATus:QUEStionable:INTegrity:SIGNal:CONDition?`
Example	STAT:QUES:INT:SIGN:COND?
Preset	0
SCPI Status Bits/OPC Dependencies	Sequential command
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

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

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

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

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

Mode	All

Remote Command	`:STATus:QUEStionable:INTegrity:SIGNal[:EVENt]?`
Example	STAT:QUES:INT:SIGN?
Preset	0
SCPI Status Bits/OPC Dependencies	Sequential command
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

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

Mode	All
Remote Command	`:STATus:QUEStionable:INTegrity:SIGNal:NTRansition <integer>` `:STATus:QUEStionable:INTegrity:SIGNal:NTRansition?`
Example	STAT:QUES:INT:SIGN:NTR 4 Burst found will be reported to the Integrity Summary of the Status Questionable register.
Preset	0
SCPI Status Bits/OPC Dependencies	Sequential command
Min	0
Max	32767
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

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

Mode	All
Remote Command	`:STATus:QUEStionable:INTegrity:SIGNal:PTRansition <integer>` `:STATus:QUEStionable:INTegrity:SIGNal:PTRansition?`
Example	STAT:QUES:INT:SIGN:PTR 4 Burst not found will be reported to the Integrity Summary of the Status Questionable register.
Preset	32767

SCPI Status Bits/OPC Dependencies	Sequential command
Min	0
Max	32767
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

Questionable Integrity Uncalibrated Register

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

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

Mode	All
Remote Command	`:STATus:QUEStionable:INTegrity:UNCalibrated:CONDition?`
Example	STAT:QUES:INT:UNC:COND?
Preset	0
SCPI Status Bits/OPC Dependencies	Sequential command
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

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

Mode	All
Remote Command	`:STATus:QUEStionable:INTegrity:UNCalibrated:ENABle` `:STATus:QUEStionable:INTegrity:UNCalibrated:ENABle?`
Example	STAT:QUES:INT:UNC:ENAB 1 Oversweep (Meas Uncal) will be reported to the Integrity Summary of the Status Questionable register.
Preset	32767
SCPI Status Bits/OPC Dependencies	Sequential command
Min	0

Max	32767
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

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

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

Mode	All
Remote Command	`:STATus:QUEStionable:INTegrity:UNCalibrated[:EVENt]?`
Example	STAT:QUES:INT:UNC?
Preset	0
SCPI Status Bits/OPC Dependencies	Sequential command
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

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

Mode	All
Remote Command	`:STATus:QUEStionable:INTegrity:UNCalibrated:NTRansition <integer>` `:STATus:QUEStionable:INTegrity:UNCalibrated:NTRansition ?`
Example	STAT:QUES:INT:UNC:NTR 1 Oversweep cleared will be reported to the Integrity Summary of the Status Questionable register.
Preset	0
SCPI Status Bits/OPC Dependencies	Sequential command
Min	0
Max	32767

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

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

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

Questionable Power Register

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

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

Mode	All
Remote Command	`:STATus:QUEStionable:POWer:CONDition?`
Example	STAT:QUES:POW:COND?
Preset	0
SCPI Status Bits/OPC Dependencies	Sequential command
Help Map ID	0

Instrument S/W Revision	Prior to A.02.00

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

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

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

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

Mode	All
Remote Command	`:STATus:QUEStionable:POWer[:EVENt]?`
Example	STAT:QUES:POW?
Preset	0
SCPI Status Bits/OPC Dependencies	Sequential command
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

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

decimal values of the bits that you want to enable.

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

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

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

Questionable Temperature Register

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

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

Mode	All
Remote Command	`:STATus:QUEStionable:TEMPerature:CONDition?`
Example	STAT:QUES:TEMP:COND?
Preset	0
SCPI Status Bits/OPC Dependencies	Sequential command
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

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

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

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

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

Mode	All

Remote Command	`:STATus:QUEStionable:TEMPerature[:EVENt]?`
Example	STAT:QUES:TEMP?
Preset	0
SCPI Status Bits/OPC Dependencies	Sequential command
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

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

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

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

Mode	All
Remote Command	`:STATus:QUEStionable:TEMPerature:PTRansition <integer>` `:STATus:QUEStionable:TEMPerature:PTRansition?`
Example	STAT:QUES:TEMP:PTR 1 Reference Oscillator Oven became cold will be reported to the Temperature Summary of the Status Questionable register.
Preset	32767

SCPI Status Bits/OPC Dependencies	Sequential command
Min	0
Max	32767
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

IEEE Common GPIB Commands

Numeric values for bit patterns can be entered using decimal or hexi-decimal representations. (i.e. 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]?

Clear Status

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

Key Path	**No equivalent key. Related key System, Show Errors, Clear Error Queue**
Remote Command	`*CLS`
Example	*CLS Clears the error queue and the Status Byte Register.
Remote Command Notes	For related commands, see the SYSTem:ERRor[:NEXT]? command. See also the STATus:PRESet command and all commands in the STATus subsystem.
SCPI Status Bits/OPC Dependencies	Resets all bits in all event registers to 0, which resets all the status byte register bits to 0 also.
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

Standard Event Status Enable

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

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

Key Path	**No equivalent key. Related key System, Show Errors, Clear Error Queue**
Remote Command	`*ESE <integer>` `*ESE?`

Example	*ESE 36 Enables the Standard Event Status Register to monitor query and command errors (bits 2 and 5). *ESE? Returns a 36 indicating that the query and command status bits are enabled.
Remote Command Notes	For related commands, see the STATus subsystem and SYSTem:ERRor[:NEXT]? commands.
Preset	255
SCPI Status Bits/OPC Dependencies	Event Enable Register of the Standard Event Status Register.
State Saved	Not saved in state.
Min	0
Max	255
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

Standard Event Status Register Query

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

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

Identification Query

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

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

- Manufacturer

- Model
- Serial number
- Firmware version
-

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

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

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 Spectrum Analyzer 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?`
Help Map ID:	0
Instrument S/W Revision:	Prior to A.02.00

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.
Restriction and Notes:	Registers 0 through 6 are accessible from the front panel in menu keys for Recall Registers.
SCPI Status Bits/OPC Dependencies:	The command is sequential.
Min:	0
Max:	127
Help Map ID:	0
Instrument S/W Revision:	Prior to A.02.00

Save Instrument State

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

Remote Command:	`*SAV <register #>`
Example:	*SAV 9 Saves the instrument state in register 9.
Restriction and Notes:	Registers 0 through 6 are accessible from the front panel in menu keys for Save Registers.
SCPI Status Bits/OPC Dependencies:	The command is sequential.

Min:	0
Max:	127
Help Map ID:	0
Instrument S/W Revision:	Prior to A.02.00

Service Request Enable

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

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

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

Status Byte Query

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

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

Trigger

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

Key Path	**No equivalent key. See related keys Single and Restart.**
Remote Command	`*TRG`
Example	*TRG Triggers the instrument to take a sweep or start a measurement, depending on the current instrument settings.
Remote Command Notes	See related command :INITiate:IMMediate.
Help Map ID	0
Instrument S/W Revision	Prior to A.02.00

Self Test Query

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

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

Wait-to-Continue

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

Remote Command:	`*WAI`
Example:	INIT:CONT OFF; INIT;*WAI Sets the instrument to single sweep. Starts a sweep and waits for its completion.
SCPI 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.
Help Map ID:	0
Instrument S/W Revision:	Prior to A.02.00

5 Combined GSM/EDGE Measurement

Combined GSM/EDGE is a measurement that combines multiple measurements in a single package. The goal of this measurement is to perform all necessary measurements simultaneously and provide the results in the fastest manner. Combined GSM/EDGE measurement include: Phase and Frequency Error (PFER), Edge EVM (EEVM), Power vs. Time (PVT), Output RF Spectrum(ORFS), Marker Measurement, and Harmonics.

Remote Commands and Results:

NOTE: Measurements may be configured remotely as well as via Front-Panel keys. This section details Remote commands and results. For information on Front-Panel configuration and results also see:

"Measurement List view" on page 195

"Parameter List view" on page 196

"Result Metrics view" on page 197

"Power vs Time View" on page 198

Remote Commands:

```
:CONFigure:CGSM

:CONFigure:CGSM:NDEFault

:FETCh:CGSM[n]?

:INITiate:CGSM

:MEASure:CGSM[n]?

:READ:CGSM[n]?
```

Remote Command Results:

N	Results Returned
0	Returns unprocessed I/Q trace data, as a series of comma-separated trace points, in volts. The I values are listed first in each pair, using the 0 through even-indexed values. The Q values are the odd-indexed values.

not specified or n = 1

Measurement Result Values

Total result length is variable.

The returned contents could change depending on the measurement setting. For ex, depending on how many Frequency List States are enable, the result length varies. If there are multiple frequency lists, then the result below starts at the lowest active freq list.

Measurement Results are provided in the following order:

Freq List1, GSM or EDGE Demod Results

Freq List1, ORFS Results

Freq List1, PVT Results

Freq List2, GSM or EDGE Demod Results

Freq List2, ORFS Results

Freq List2, PVT Results

…

ZSPan Results

HARMonics Results

GSM Results (Radio Format = GSM):

Note that PFER results and EDGE results are exclusive each other. That depends on which Radio Format is used in the frequency and it is written in the result of n=2 (that is, “read:cgsm2?”). Regarding with the LD, also refer the description of n=2. The result contents are customizable. See “GSM Result Selection” on page 182 for details. The list below represents the default result.

(LD). Averaged RMS Phase Error

(LD+1). Maximum of the Peak Phase Error

(LD+2). Maximum of the Peak Phase Error Symbol Position

(LD+3). Averaged Frequency Error

(LD+4). Maximum Frequency Error

(LD+5). Averaged I/Q Origin Offset

(LD+6). Maximum I/Q Origin Offset

(LD+7). Averaged T0 Offset

EDGE Results (Radio Format = EDGE):

not specified or n = 1 (Continued)

Note that PFER results and EDGE results are exclusive each other. That depends on which Radio Format is used in the frequency and it is written in the result of n=2 (that is, “read:cgsm2?”). For more information on LD, also refer the description of n=2. The result contents are customizable. See “EDGE Result Selection” on page 184 for details. The list below represents the default result.

(LD). RMS 95th %tile EVM

(LD+1). Average RMS EVM

(LD+2). Maximum of the Peak EVM

(LD+3). Symbol position of the peak EVM

(LD+4). Average Magnitude Error

(LD+5). Maximum of the Peak Magnitude Error

(LD+6). Average Phase Error

(LD+7). Maximum of the Peak Phase Error

(LD+8). Average Frequency Error

(LD+9). Maximum Frequency Error

(LD+10). I/Q Origin Offset

(LD+11). Amplitude Droop Error

(LD+12). Trigger to T0

ORFS Results:

The result contents are customizable and the list shown below is a sample. See “ORFS Result Selection” on page 186 for details.For more information on LM and LS, refer to description of n=2.

ORFS Modulation Result Table (if there are one or more ORFS modulation results):

(LM). Offset0 (Ref Carrier) Absolute

(LM+1). Offset1 Lower Relative

(LM+2). Offset1 Lower Absolute

(LM+2). Offset1 Lower Delta

(LM+4). Offset1 Upper Relative

(LM+5). Offset1 Upper Absolute

(LM+6). Offset1 Upper Delta

(LM+7). Offset2 Lower Relative

(LM+8). Offset2 Lower Absolute

(LM+9). Offset2 Lower Delta

(LM+10). Offset2 Upper Relative

(LM+11). Offset2 Upper Absolute

(LM+12). Offset2 Upper Delta

…

not specified or
n = 1 (Continued)

ORFS Switching Result Table (if there are one or more ORFS switching results):

(LS). Offset0 (Ref Carrier) Absolute

(LS+1). Offset1 Lower Relative

(LS+2). Offset1 Lower Absolute

(LS+3). Offset1 Lower Delta

(LS+4). Offset1 Upper Relative

(LS+5). Offset1 Upper Absolute

(LS+6). Offset1 Upper Delta

(LS+7). Offset2 Lower Relative

(LS+8). Offset2 Lower Absolute

(LS+9). Offset2 Lower Delta

(LS+10). Offset2 Upper Relative

(LS+11). Offset2 Upper Absolute

(LS+12). Offset2 Upper Delta

…

not specified or n = 1 (Continued)

PVT Results:

The result contents are customizable and the list shown below is a sample. See "Power vs Time Result Selection" on page 187 for details. For more information on LP, refer description of n=2.

Note that the "1st Bust" doesn't always mean the leftmost burst in a frequency list. It means the leftmost burst that PVT mask test is done and it depends on the PVT Test Bitmap, PVT Secondary Test Group, and their backup burst test settings. If there aren't any valid backup bursts configured, it always returns the test results of bursts configured by PVT Test Bitmap. If backup bursts are enabled, the list includes both primary and backup bursts' results even though secondary bursts are not tested.

. PVT (Primary) Group Pass/Fail

0: Pass, 1: Fail

(LP+1). 1st Burst, PVT Mask Test Pass/Fail

0: Pass, 1: Fail, –1:Not Tested

(LP+2). 1st Burst, Averaged Power

(LP+3). 1st Burst, Max Power

(LP+4). 1st Burst, 1st Error Point

(LP+5). 1st Burst, 1st Error Time

(LP+6). 2nd Burst, PVT Mask Test Pass/Fail

(LP+7). 2nd Burst, Averaged Power

(LP+8). 2nd Burst, Max Power

(LP+9). 2nd Burst, 1st Error Point

(LP+10). 2nd Burst, 1st Error Time

…

not specified or n = 1 (Continued)

ZSPan Results:

(LZ). Marker1 Y Value

Same result what "CALC:CGSM:ZSP:MARK:Y" returns.

HARMonics Results:

Number of results varies depending on number of harmonics to be measured

(LH). Marker1 Y Value at 1st Harmonics

Marker1 Y Value for 1st Harmonics

(LH+1). Marker1 Y Value at 2nd Harmonics

Marker1 Y Value for 2nd Harmonics

(LH+2). Marker1 Y Value at 3rd Harmonics

Marker1 Y Value for 3rd Harmonics

…

2 **Contents Location Pointer and Result Attributes**

Total result length is variable.

The returned contents could change depending on the measurement setting. For example, depending on how many Frequency List States are enabled, the result length will vary.

Returns the following scalar results:

0. Number of Total Result Length -
Returns the number of the total result length of this query.

1. Index where general measurement attributes starts. -
It shows the location where the general measurement results starts. The value is zero-based. The location is denoted as Lg. For example, the value will be 14 in many cases.

1. **2. Index where PVT Attributes starts.**
   The location is denoted as in this list. The value is zero-based.
2. **3. Index where ZSPan result starts.**
   The location is denoted as (LZ) in n = 1 list. The value is zero-based.
3. **4. Index where HARMonics result starts.**
   The location is denoted as (LH) in n = 1 list. The value is zero-based.
4. **5. Number of Frequency Lists pointers below.**
   The number is denoted as NF. It will be 8 at present. May possibly be expanded in future.
5. **6. Index where Frequency List 1 result starts.**
6. **7. Index where Frequency List 2 result starts**
   …
7. **(5+NF). Index where Frequency List NF result starts**
   The values [3] to [2+NF] show the pointer where the result lists of the frequency list start. The values are zero-based. For example, the value of [3] will be 19 in many cases. If there are no results in the frequency list, the value will be –999.0. The location is denoted as LF (1..NG)

General Measurement Attributes:

Note that the contents here might be expanded or selectable later. That is, the each content could be selectable to output or not. And other parameters might be added in future.

(Lg). Sampling Rate - returns sampling rate in Hz.

(Lg+1). Total Acquisition Points

(Lg+2). IF Bandwidth - returns IF bandwidth in Hz.

n = 2 (Continued)

PVT Attributes:

. Number of PVT Bursts - number of PVT bursts reported in n=1 list.

(Lp+1). Burst Index of 1st Bursts

(Lp+2). Burst Index of 2nd Bursts

…

Result Tables of each Frequency Pointer List :

(LF). Index where general attribute of the list starts - the location is denoted as (LR) in this list. The value is zero-based.

(LF+1). Index where Demod result starts - the location is denoted as (LD) in n=1 list. The value is zero-based. If there are no results about Demod measurement, the value will be –999.0.

(LF+2). Index where ORFS modulation result starts - the location is denoted as (LM) in n=1 list. The value is zero-based. If there are no results about ORFS modulation measurement, the value will be –999.0.

(LF+3). Index where ORFS switching result starts - the location is denoted as (LS) in n=1 list. The value is zero-based. If there are no results about ORFS switching measurement, the value will be –999.0.

(LF+4). Index where PVT result starts - the location is denoted as in n=1 list. The value is zero-based.

General Attribute of the List:

Note that the contents here might be expanded or selectable later.

(LR). Radio Format

1:GSM, 2:EDGE

(LR+1). Center Frequency - returns the center frequency of the list in Hz.

4 **GSM and EDGE individual bursts results:**

Returns demod result of each burst. The total result length is variable and the returned contents could change depending on the measurement setting. For example, depending on how many Frequency List States are enabled, the result length varies. If there are multiple frequency lists, then the result below starts at the lowest active freq list. If there are multiple bursts active on a frequency list, then the result starts at the leftmost burst.

Measurement Results are provided in the following order:

1st Freq List, 1st Burst, GSM or EDGE Demod Results

1st Freq List, 2nd Burst, GSM or EDGE Demod Results

1st Freq List, 3rd Burst, GSM or EDGE Demod Results

…

2nd Freq List, 1st Burst, GSM or EDGE Demod Results

2nd Freq List, 2nd Burst, GSM or EDGE Demod Results

2nd Freq List, 3rd Burst, GSM or EDGE Demod Results

…

GSM Results (Radio Format = GSM):

Note that PFER results and EDGE results are exclusive of each other. The results depend on which Radio Format is used in the frequency and is written in the result of n=2 (that is, “read:cgsm2?”). Whether the following results are output or not is decided by the setting. This is the single burst’s result, so the average and the maximum value is the same. If any of the following parameters are active, the result is output.

RMS Phase Error

Peak Phase Error

Peak Phase Error Symbol Position

Frequency Error

I/Q Origin Offset

T0 Offset

TSC

n = 4 (Continued)

EDGE Results (Radio Format = EDGE):

Note that PFER results and EDGE results are exclusive of each other. Te results depend on which Radio Format is used in the frequency and is written in the result of n=2 (that is, “read:cgsm2?”). Whether the following results are output or not is decided by the GSM Result Selection setting (see “GSM Result Selection” on page 182). This is the single burst’s result, so the average and the maximum value is the same. For such parameters, if either one of them is active, the result is output.

RMS 95th %tile EVM

RMS EVM

Peak EVM

Symbol position of the peak EVM

Magnitude Error

Peak Magnitude Error

Phase Error

Peak Phase Error

Frequency Error

I/Q Origin Offset

Amplitude Droop Error

Trigger to T0

Timing Offset of AM/PM path

TSC

5

GSM and EDGE individual burst attributes

Returns attributes of n=4 results

Number of individual bursts -
Returns the number of burst results that exist in the n=4 result. If it is ‘n’ for example, the total length of this list must be 1 + 3 * n.

1st Burst, Location in the n=4 result

1st Burst, Frequency Index

1st Burst, Burst Index

2nd Burst, Location in the n=4 result

2nd Burst, Frequency Index

2nd Burst, Burst Index

…

Measurement Example - Configuration and Results

The following are examples of Measurement configuration SCPI commands and results queries for the CGSM measurement.

NOTE In all examples, the following SCPI commands should be sent first:

:INST:SEL EDGEGSM

*RST

:CONF:CGSM:NDEF

Example 1, Two Frequencies, 4 Bursts

Test Configuration

Frequency	850MHz and 950MHz
Radio Format	GSMK for 850MHz, EDGE for 950MHz
# of Bursts	4 Bursts for each frequency
Time Duration	10ms for each frequency
Burst Interval	1.154846ms (2 slots)
Start Offset	200us
Start Trigger	RF Burst
Demod (PFER and EEVM) Burst Location	The 3rd and 4th burst
PVT Burst	The 4th burst
ORFS Burst	All bursts
ORFS Meas Type	Both Modulation and Switching Modulation: 400k and 600kHz Switching: 400kHz
Result Values	As default (see “Result Values” on page 182)

Measurement Configuration SCPI :CGSM:LIST:FORM PFER,EEVM
:CGSM:LIST:FREQ 850MHZ,950MHZ
:CGSM:LIST:STAT 1,1,0,0,0,0,0,0
:CGSM:SWE:BURS:NUMB 4
:CGSM:SWE:OFFS 200US
:CGSM:SWE:BURS:INT 1.154846MS
:CGSM:CAPT 9MS
:CGSM:GATE:RTIM 1MS
:CGSM:GATE:SOUR IMM
:TRIG:CGSM:SOUR RFB
:TRIG:RFB:DEL –200US
:CGSM:DEM 1
:CGSM:DEM:TEST 12
:CGSM:PVT 1
:CGSM:PVT:TEST 8
:CGSM:PVT:SEC 0
:CGSM:PVT:BACK 0
:CGSM:ORFS 1
:CGSM:ORFS:TEST 15
:CGSM:ORFS:TYPE MSW
:CGSM:ZSP 0
:CGSM:HARM 0
:CALC:CGSM:PVT:MASK:SEL 1
:CALC:CGSM:PVT:MASK:PRES
:CALC:CGSM:PVT:MASK:SEL 2
:CALC:CGSM:PVT:MASK:PRES
:CGSM:FLIS:ORFS:MOD:STAT 1,0,0,0,1,1,0
:CGSM:FLIS2:ORFS:MOD:STAT 1,0,0,0,1,1,0
:CGSM:FLIS:ORFS:SWIT:STAT 1,1,0
:CGSM:FLIS2:ORFS:SWIT:STAT 1,1,0

READ:CGSM1 Result Here is an example of a ":READ:CGSM1" query and its explanation.

1.742735654E–01	Freq1, PFER, Averaged RMS Phase Error
4.606593847E–01	Freq1, PFER, Maximum of the Peak Phase Error
3.430000000E+01	Freq1, PFER, Maximum of the Peak Phase Error Symbol Position
2.492690086E–02	Freq1, PFER, Averaged Frequency Error
3.420000374E–01	Freq1, PFER, Maximum Frequency Error
–6.773266799E+01	Freq1, PFER, Averaged I/Q Origin Offset
–6.640914154E+01	Freq1, PFER, Maximum I/Q Origin Offset
2.763937000E–04	Freq1, PFER, Averaged T0 Offset
–1.357914291E+01	Freq1, ORFS, Modulation, Off0 (Ref Carrier) Absolute
–7.215130728E+01	Freq1, ORFS, Modulation, Off1 (400kHz). Lower Relative

–8.573045018E+01	Freq1, ORFS, Modulation, Off1 (400kHz). Lower Absolute
–4.973045018E+01	Freq1, ORFS, Modulation, Off1 (400kHz). Lower Delta
–7.226565353E+01	Freq1, ORFS, Modulation, Off1 (400kHz). Upper Relative
–8.584479643E+01	Freq1, ORFS, Modulation, Off1 (400kHz). Upper Absolute
–4.984479643E+01	Freq1, ORFS, Modulation, Off1 (400kHz). Upper Delta
–8.034658796E+01	Freq1, ORFS, Modulation, Off2 (600kHz). Lower Relative
–9.392573087E+01	Freq1, ORFS, Modulation, Off2 (600kHz). Lower Absolute
–4.292573087E+01	Freq1, ORFS, Modulation, Off2 (600kHz). Lower Delta
–8.069719557E+01	Freq1, ORFS, Modulation, Off2 (600kHz). Upper Relative
–9.427633847E+01	Freq1, ORFS, Modulation, Off2 (600kHz). Upper Absolute
–4.327633847E+01	Freq1, ORFS, Modulation, Off2 (600kHz). Upper Delta
–6.692791840E+00	Freq1, ORFS, Switching, Off0 (Ref Carrier) Absolute
–6.855127423E+01	Freq1, ORFS, Switching, Off1 (400kHz). Lower Relative
–7.524406607E+01	Freq1, ORFS, Switching, Off1 (400kHz). Lower Absolute
–5.224406607E+01	Freq1, ORFS, Switching, Off1 (400kHz). Lower Delta
–6.942512799E+01	Freq1, ORFS, Switching, Off1 (400kHz). Upper Relative
–7.611791983E+01	Freq1, ORFS, Switching, Off1 (400kHz). Upper Absolute
–5.311791983E+01	Freq1, ORFS, Switching, Off1 (400kHz). Upper Delta
0.000000000E+00	Freq1, PVT, Primary Test Group Pass/Fail
0.000000000E+00	Freq1, PVT, 4th Burst, PVT Mask Test Pass/Fail
–6.397717264E+00	Freq1, PVT, 4th Burst, Averaged Power
–6.389250433E+00	Freq1, PVT, 4th Burst, Max Power
–9.990000000E+02	Freq1, PVT, 4th Burst, 1st Error Point
–9.990000000E+02	Freq1, PVT, 4th Burst, 1st Error Time
7.124999841E–01	Freq2, EDGE, RMS 95th %tile EVM
3.715007454E–01	Freq2, EDGE, Average RMS EVM
1.030398846E+00	Freq2, EDGE, Maximum of the Peak EVM
4.400000000E+01	Freq2, EDGE, Symbol position of the peak EVM
6.977381185E–02	Freq2, EDGE, Average Magnitude Error
1.973391026E–01	Freq2, EDGE, Maximum of the Peak Magnitude Error
2.472979203E–01	Freq2, EDGE, Average Phase Error
1.847238302E+00	Freq2, EDGE, Maximum of the Peak Phase Error

3.048159122E–01	Freq2, EDGE, Average Frequency Error
1.567105276E+00	Freq2, EDGE, Maximum Frequency Error
–6.483923579E+01	Freq2, EDGE, I/Q Origin Offset
–4.778547013E–04	Freq2, EDGE, Amplitude Droop Error
2.773540643E–04	Freq2, EDGE, Trigger to T0
–1.419562637E+01	Freq2, ORFS, Modulation, Off0 (Ref Carrier) Absolute
…	…

READ:CGSM2 Result Here is an example of a ":READ:CGSM2" query and its explanation.

33	Number of Total Result Length in this list
14	Index where general measurement attributes starts in this list
17	Index where PVT Attributes starts in this list
–999	Index where ZSPan result starts in n=1 list
–999	Index where HARMonics result starts in n=1 list
8	Number of Frequency Lists pointers below.
19	Index where Frequency List 1 result starts in n=1 list
26	Index where Frequency List 2 result starts in n=1 list
–999	Index where Frequency List 3 result starts in n=1 list
–999	Index where Frequency List 4 result starts in n=1 list
–999	Index where Frequency List 5 result starts in n=1 list
–999	Index where Frequency List 6 result starts in n=1 list
–999	Index where Frequency List 7 result starts in n=1 list
–999	Index where Frequency List 8 result starts in n=1 list
3.75E+06	General Measurement Attributes , Sampling Rate
67500	General Measurement Attributes , Total Acquisition Points
1.5E+06	General Measurement Attributes , IF Bandwidth
1	PVT Attributes, Number of PVT Bursts
4	PVT Attributes, Burst Index of 1st Bursts
24	Result Tables of Freq List 1, Index where general attribute of the list starts
0	Result Tables of Freq List 1, Index where Demod result starts
8	Result Tables of Freq List 1, Index where ORFS modulation result starts
21	Result Tables of Freq List 1, Index where ORFS switching result starts

28	Result Tables of Freq List 1, Index where PVT result starts
1	General Attribute of Freq List 1, Radio Format = GSM
8.50E+08	General Attribute of Freq List 1, Center Frequency = 850MHz
31	Result Tables of Freq List 2, Index where general attribute of the list starts
34	Result Tables of Freq List 2, Index where Demod result starts
47	Result Tables of Freq List 2, Index where ORFS modulation result starts
60	Result Tables of Freq List 2, Index where ORFS switching result starts
67	Result Tables of Freq List 2, Index where PVT result starts
2	General Attribute of Freq List 2, Radio Format = EDGE
9.50E+08	General Attribute of Freq List 2, Center Frequency = 950MHz

READ:CGSM4 Result Here is an example of a ":READ:CGSM4" query and its explanation.

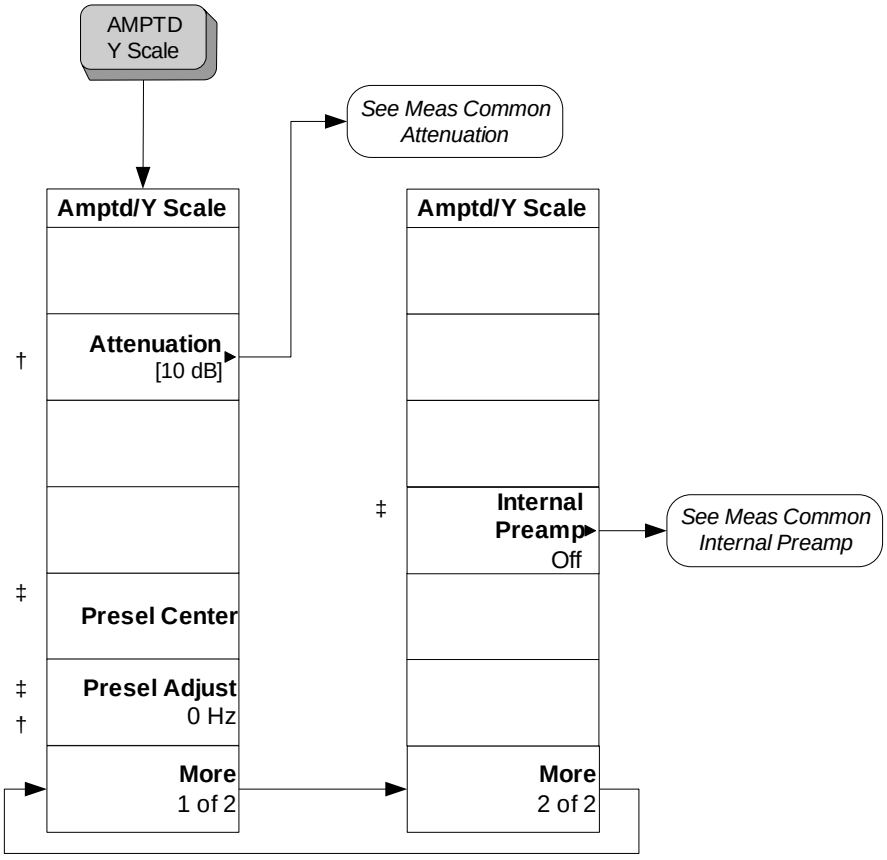
1.624448299E–01	Freq1, 3rd Burst, PFER, RMS Phase Error
4.606593847E–01	Freq1, 3rd Burst, PFER, Peak Phase Error
3.430000000E+01	Freq1, 3rd Burst, PFER, Peak Phase Error Symbol Position
3.420000374E–01	Freq1, 3rd Burst, PFER, Frequency Error
–6.640914154E+01	Freq1, 3rd Burst, PFER, I/Q Origin Offset
2.768930510E–04	Freq1, 3rd Burst, PFER, T0 Offset
1.861023009E–01	Freq1, 4th Burst, PFER, RMS Phase Error
4.573341906E–01	Freq1, 4th Burst, PFER, Peak Phase Error
5.000000000E+00	Freq1, 4th Burst, PFER, Peak Phase Error Symbol Position
–2.921462357E–01	Freq1, 4th Burst, PFER, Frequency Error
–6.964576721E+01	Freq1, 4th Burst, PFER, I/Q Origin Offset
2.758943491E–04	Freq1, 4th Burst, PFER, T0 Offset
7.249999838E–01	Freq2, 3rd Burst, EDGE, RMS 95th %tile EVM
3.871338069E–01	Freq2, 3rd Burst, EDGE, RMS EVM
1.030398846E+00	Freq2, 3rd Burst, EDGE, Peak EVM
4.400000000E+01	Freq2, 3rd Burst, EDGE, Symbol position of the peak EVM
7.250271738E–02	Freq2, 3rd Burst, EDGE, Magnitude Error
1.790225953E–01	Freq2, 3rd Burst, EDGE, Peak Magnitude Error
2.689246535E–01	Freq2, 3rd Burst, EDGE, Phase Error
1.847238302E+00	Freq2, 3rd Burst, EDGE, Peak Phase Error

–9.574734515E–01	Freq2, 3rd Burst, EDGE, Frequency Error
–6.609591484E+01	Freq2, 3rd Burst, EDGE, I/Q Origin Offset
–1.176257863E–03	Freq2, 3rd Burst, EDGE, Amplitude Droop Error
2.778531547E–04	Freq2, 3rd Burst, EDGE, Trigger to T0
6.999999844E–01	Freq2, 4th Burst, EDGE, RMS 95th %tile EVM
3.558676839E–01	Freq2, 4th Burst, EDGE, RMS EVM
9.535019994E–01	Freq2, 4th Burst, EDGE, Peak EVM
9.300000000E+01	Freq2, 4th Burst, EDGE, Symbol position of the peak EVM
6.704490632E–02	Freq2, 4th Burst, EDGE, Magnitude Error
1.973391026E–01	Freq2, 4th Burst, EDGE, Peak Magnitude Error
2.256711870E–01	Freq2, 4th Burst, EDGE, Phase Error
–2.987661362E–01	Freq2, 4th Burst, EDGE, Peak Phase Error
1.567105276E+00	Freq2, 4th Burst, EDGE, Frequency Error
–6.386576653E+01	Freq2, 4th Burst, EDGE, I/Q Origin Offset
2.205484603E–04	Freq2, 4th Burst, EDGE, Amplitude Droop Error
2.768549738E–04	Freq2, 4th Burst, EDGE, Trigger to T0

READ:CGSM5 Result Here is an example of a ":READ:CGSM5" query and its explanation.

4	Total number of bursts in n=4 result
0	The location index of the 1st burst in the n=4 list
1	The frequency index of the 1st burst
3	The burst index of the 1st burst
6	The location index of the 2nd burst in the n=4 list
1	The frequency index of the 2nd burst
4	The burst index of the 2nd burst
12	The location index of the 3rd burst in the n=4 list
2	The frequency index of the 3rd burst
3	The burst index of the 3rd burst
24	The location index of the 4th burst in the n=4 list
2	The frequency index of the 4th burst
4	The burst index of the 4th burst

Amplitude (AMPTD) Y Scale



Attenuation

This menu controls both the electrical and mechanical attenuators and their interactions. The value read back on the key in square brackets is the current Total (Elec + Mech) attenuation. When in Pre-Adjust for Min Clip mode, this value can change at the start of every measurement.

For more information see Attenuation under AMPTD Y Scale in the User's and Programmer's reference or Help for your mode.

Presel Center

When this key is pressed, the centering of the preselector filter is adjusted to optimize the amplitude accuracy at the frequency of the selected marker.

For more information see Presel Center under AMPTD Y Scale in the User's and Programmer's reference or Help for your mode.

Presel Adjust

Allows you to manually adjust the preselector filter frequency to optimize its response to the signal of

interest. This function is only available when Presel Center is available.

For more information see Presel Adjust under AMPTD Y Scale in the User's and Programmer's reference or Help for your mode.

Internal Preamp

This menu controls the internal preamplifier. Turning Internal Preamp on gives a better noise figure, but a poorer inter-modulation distortion (TOI) to noise floor dynamic range. You can optimize this setting for your particular measurement.

For more information see Internal Preamp under AMPTD Y Scale in the User's and Programmer's reference or Help for your mode.

BW

There is no BW functionality implemented for this measurement.

Marker

There is no Marker functionality implemented for this measurement.

Marker Fctn

There are no Marker Functions implemented for this measurement.

Marker > (Marker To)

There is no Marker To functionality implemented for this measurement.

Meas Setup

There are no menu keys available in the Meas Setup menu. Meas Setup functions are performed using Remote Commands documented in the following sections, or via setup tables, using the front-panel keys or a mouse and keyboard.

For more information on the measurement setup table screens see:

"Measurement List view" on page 195

"Parameter List view" on page 196

General Setting Commands

IF Gain

In order to take full advantage of the RF dynamic range of the analyzer, we will offer a switched IF amplifier with approximately 10 dB of gain. When 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 Auto, or to On (the extra 10 dB) or Off. These settings affect sensitivity and IF overloads.

IF Gain Auto Activates the auto rules for IF Gain

Mode	GSM
Remote Command	`[:SENSe]:CGSM:IF:GAIN:AUTO[:STATe] ON|OFF|1|0` `[:SENSe]:CGSM:IF:GAIN:AUTO[:STATe]?`
Example	CGSM:IF:GAIN:AUTO ON CGSM:IF:GAIN:AUTO?
Notes	You must be in the GSM/EDGE mode to use this command. Use INSTrument:SELect to set the mode.
Dependencies/Couplings	When either the auto attenuation works (for example, with electrical attenuator), or the optimized mechanical attenuator range is requested, the IF Gain setting is changed as following rule. 'Auto' sets IF Gain High under any of the following conditions: the input attenuator is set to 0 dB, the preamp is turned on, or the Max Mixer Level is 20 dBm or lower. For other settings, auto sets IF Gain to Low.
Preset	OFF
State Saved	Saved in instrument state.
Range	Auto|Man
Instrument S/W Revision	Prior to A.02.00

IF Gain State Selects the range of IF gain.

Mode	GSM
Remote Command	`[:SENSe]:CGSM:IF:GAIN[:STATe] ON|OFF|1|0`
	`[:SENSe]:CGSM:IF:GAIN[:STATe]?`
Example	CGSM:IF:GAIN ON
	CGSM:IF:GAIN?
Notes	You must be in the GSM/EDGE mode to use this command. Use INSTrument:SELect to set the mode.
	where ON = high gain
	OFF = low gain
Dependencies/Couplings	Coupling to IF Gain Auto forces to Man.
Preset	OFF
State Saved	Saved in instrument state.
Range	Low Gain (Best for Large Signals)|High Gain (Best Noise Level)
Instrument S/W Revision	Prior to A.02.00

Demodulation Setting Commands

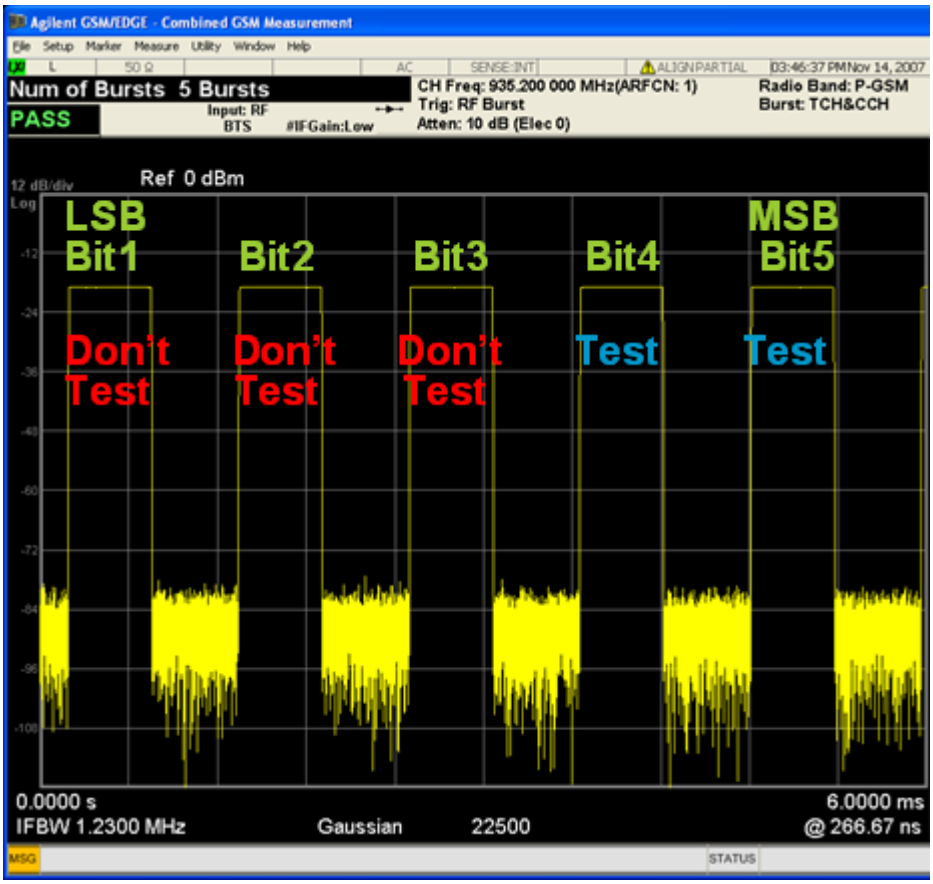
Measurement Enable/Disable

Allows you to enable or disable Demodulation measurements.

Mode	GSM
Remote Command	`[:SENSe]:CGSM:DEMod[:ENABle] ON|OFF|1|0`
	`[:SENSe]:CGSM:DEMod[:ENABle]?`
Example	CGSM:DEM 0
	CGSM:DEM?
Notes	You must be in the GSM/EDGE mode to use this command. Use INSTrument:SELect to set the mode.
Preset	ON
State Saved	Saved in instrument state.
Range	ON|OFF
Instrument S/W Revision	Prior to A.02.00

Demod Test Bitmap

Select which Bits are to be tested using a 16-Bit code.



Note: this figure is not an actual screen shot, but is used to illustrate how the Test Bitmap is used.

The screenshot above shows an example of "Number of Bursts" = 5. The "Test Bitmap" specifies which bursts are to be tested. Set the bit to 1 if you want to test the burst, to 0 if you want the instrument to ignore the burst. If you want to demodulate the 4th and 5th Bursts, set the test bitmap value to the decimal integer of the binary number. In the above example, the binary number is 11000, so the integer is 24. The test bitmap has a 16 bit field (0 to 65535 in decimal) allowing up to 16 bursts to be tested. In this case of the illustration above, only Bits 1 – 5 are used, and Bits 6 to 16 are unused. The screenshot above shows an example of "Number of Bursts" = 5. The "Test Bitmap" specifies which bursts are to be tested. If you want the instrument to test the burst, set the bit to 1. To ignore the burst, set the bit to 0. If you want to demodulate the 4th and 5th Bursts, set the test bitmap value to 11000B=24.

Mode	GSM
Remote Command	`[:SENSe]:CGSM:DEMod:TEST <integer>` `[:SENSe]:CGSM:DEMod:TEST?`
Example	CGSM:DEM:TEST 24 CGSM:DEM:TEST?
Notes	You must be in the GSM/EDGE mode to use this command. Use INSTrument:SELect to set the mode.
Preset	65535

State Saved	Saved in instrument state.
Min	1
Max	65535
Instrument S/W Revision	Prior to A.02.00

EDGE Specific Setting Commands

SCPI commands in this section affect all frequency lists' EDGE measurements.

Droop Compensation Turn droop compensation on or off. Droop compensation corrects amplitude variations across a burst. You may want to turn off this compensation so you can see the changes in the measured magnitude error. Droop can result from signal impairments like a power amplifier problem.

Mode	GSM
Remote Command	`[:SENSe]:CGSM:DEMod:EEVM:DROop OFF|ON|0|1` `[:SENSe]:CGSM:DEMod:EEVM:DROop?`
Example	CGSM:DEM:EEVM:DRO ON CGSM:DEM:EEVM:DRO?
Notes	You must be in the GSM/EDGE mode to use this command. Use INSTrument:SELect to set the mode.
Preset	ON
State Saved	Saved in instrument state.
Range	On|Off
Instrument S/W Revision	Prior to A.02.00

Polar Mod Align Turn On/Off polar modulation alignment.

Mode	GSM
Remote Command	`[:SENSe]:CGSM:DEMod:EEVM:PMODulation:ALIGnment OFF|ON|0|1` `[:SENSe]:CGSM:DEMod:EEVM:PMODulation:ALIGnment?`
Example	CGSM:DEM:EEVM:PMOD:ALIG OFF CGSM:DEM:EEVM:PMOD:ALIG?
Notes	You must be in the GSM/EDGE mode to use this command. Use INSTrument:SELect to set the mode.
Preset	OFF
State Saved	Saved in instrument state.
Range	On|Off

Instrument S/W Revision	Prior to A.02.00

ORFS Related Setting Commands

SCPI commands in this section affect all frequency lists' ORFS measurements.

Measurement Enable/Disable

Allows you to enable or disable ORFS measurement.

Mode	GSM
Remote Command	`[:SENSe]:CGSM:ORFSpectrum[:ENABle] ON|OFF|1|0` `[:SENSe]:CGSM:ORFSpectrum[:ENABle]?`
Example	CGSM:ORFS 0 CGSM:ORFS?
Notes	You must be in the GSM/EDGE mode to use this command. Use INSTrument:SELect to set the mode.
Preset	ON
State Saved	Saved in instrument state.
Range	ON|OFF
Instrument S/W Revision	Prior to A.02.00

ORFS Test Bitmap

See Demod Test Bitmap for the concept of the test bitmap.

Mode	GSM
Remote Command	`[:SENSe]:CGSM:ORFSpectrum:TEST <integer>` `[:SENSe]:CGSM:ORFSpectrum:TEST?`
Example	CGSM:ORFS:TEST 2 CGSM:ORFS:TEST?
Notes	You must be in the GSM/EDGE mode to use this command. Use INSTrument:SELect to set the mode.
Preset	65535
State Saved	Saved in instrument state.
Min	1
Max	65535
Instrument S/W Revision	Prior to A.02.00

Fast Average

Used to change On/Off state of Fast Average.

Fast Average is for ORFS modulation measurement. When it is on, it averages both before-midamble-part and after-midamble-part at each specified offset frequency with regard to the standard specifying only after-midamble-part.

Mode	GSM
Remote Command	`[:SENSe]:CGSM:ORFSpectrum:AVERage:FAST[:STATe] OFF|ON|0|1` `[:SENSe]:CGSM:ORFSpectrum:AVERage:FAST[:STATe]?`
Example	CGSM:ORFS:AVER:FAST ON CGSM:ORFS:AVER:FAST?
Notes	You must be in the GSM/EDGE mode to use this command. Use INSTrument:SELect to set the mode.
Preset	ON
State Saved	Saved in instrument state.
Range	ON|OFF
Instrument S/W Revision	Prior to A.02.00

Meas Type

Selects the measurement type.

Mod & Switch SCPI MSWitching	performs both Modulation and Switching measurements.
Modulation SCPI MODulation	measures the spectrum due to the 0.3 GMSK modulation and noise.
Switching SCPI SWITching	measures the spectrum due to switching transients (burst ramping up and down).

Mode	GSM
Remote Command	`[:SENSe]:CGSM:ORFSpectrum:TYPE MODulation|MSWitching|SWITching` `[:SENSe]:CGSM:ORFSpectrum:TYPE?`
Example	CGSM:ORFS:TYPE MOD CGSM:ORFS:TYPE?
Notes	You must be in the GSM/EDGE mode to use this command. Use INSTrument:SELect to set the mode.

Preset	MODulation
State Saved	Saved in instrument state.
Range	MODulation|MSWitching|SWITching
Instrument S/W Revision	Prior to A.02.00

Mod Average

Select the type of averaging for ORFS modulation measurement.

Log-Pwr Avg (Video) SCPI LOG	The log of the power is averaged. (This is also known as video averaging.)
Pwr Avg (RMS) SCPI RMS	The power is averaged, providing the rms of the voltage.

Mode	GSM
Remote Command	`[:SENSe]:CGSM:ORFSpectrum:AVERage:MODulation:TYPE LOG|RMS` `[:SENSe]:CGSM:ORFSpectrum:AVERage:MODulation:TYPE?`
Example	CGSM:ORFS:AVER:MOD:TYPE LOG CGSM:ORFS:AVER:MOD:TYPE?
Notes	You must be in the GSM/EDGE mode to use this command. Use INSTrument:SELect to set the mode.
Preset	LOG
State Saved	Saved in instrument state.
Range	LOG|RMS
Instrument S/W Revision	Prior to A.02.00

ORFS Filter

Select the type of ORFS filter.

5-Pole Sync Tuned SCPI FPST	5-Pole Sync Tuned filter specified by standard
Gaussian SCPI GAUSsian	Ideal Gaussian filter

Mode	GSM

Remote Command	`[:SENSe]:CGSM:ORFSpectrum:FILTer FPST|GAUSsian` `[:SENSe]:CGSM:ORFSpectrum:FILTer`
Example	CGSM:ORFS:FILT GAUS CGSM:ORFS:FILT?
Notes	You must be in the GSM/EDGE mode to use this command. Use INSTrument:SELect to set the mode.
Preset	FPST
State Saved	Saved in instrument state.
Range	FPST|GAUS
Instrument S/W Revision	Prior to A.02.00

PVT Related Setting Commands

Measurement Enable/Disable

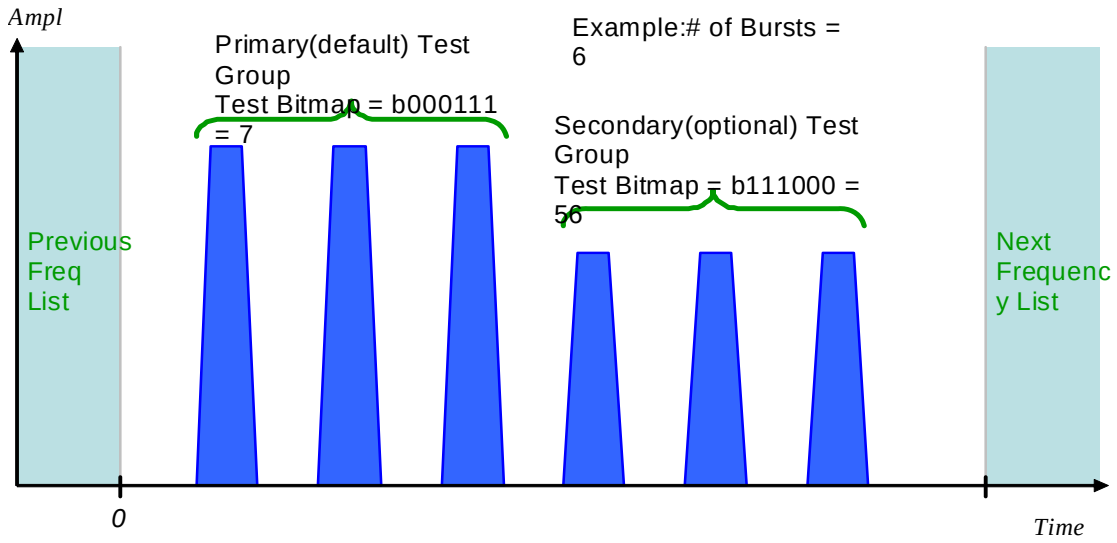
Allows you to enable or disable PVT measurement.

Mode	GSM
Remote Command	`[:SENSe]:CGSM:PVTime[:ENABle] ON|OFF|1|0` `[:SENSe]:CGSM:PVTime[:ENABle]?`
Example	CGSM:PVT 0 CGSM:PVT?
Notes	You must be in the GSM/EDGE mode to use this command. Use INSTrument:SELect to set the mode.
Preset	ON
State Saved	Saved in instrument state.
Range	ON|OFF
Instrument S/W Revision	Prior to A.02.00

PVT Secondary Test Group

A PVT measurement can have a Secondary (optional) test group. When the secondary test group is enabled, the secondary test bitmap is available and the group's pass/fail result is written after the primary (default) PVT group result. In the usual test case, Test bitmaps for both the Primary group and the Secondary group do not overlap, but the instrument will allow overlap if it is used. . The instrument will measure the burst points and the results will be used for both groups. Secondary test group is a feature only for PVT measurement.

Note that all other setups except test bitmap are shared with both test groups.



Mode	GSM
Remote Command	`[:SENSe]:CGSM:PVTime:SECondary[:ENABle] ON|OFF|1|0` `[:SENSe]:CGSM:PVTime:SECondary[:ENABle]?`
Example	CGSM:PVT:SEC ON CGSM:PVT:SEC?
Notes	You must be in the GSM/EDGE mode to use this command. Use INSTrument:SELect to set the mode.
Preset	OFF
State Saved	Saved in instrument state.
Range	ON|OFF
Instrument S/W Revision	Prior to A.02.00

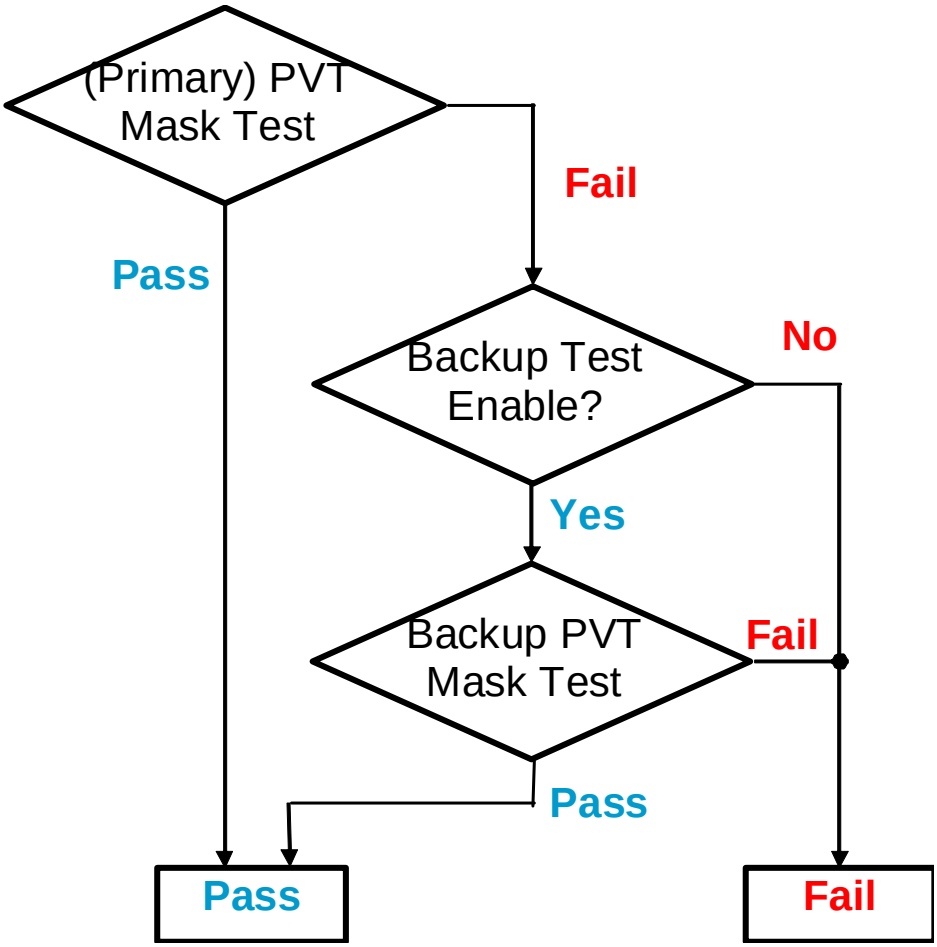
PVT Test Bitmap

See “Demod Test Bitmap” on page 138 for the concept of the test bitmap.

Mode	GSM
Remote Command	`[:SENSe]:CGSM:PVTime:TEST[1]|2 <integer>` `[:SENSe]:CGSM:PVTime:TEST[1]|2?`
Example	CGSM:PVT:TEST 6 CGSM:PVT:TEST?

Notes	You must be in the GSM/EDGE mode to use this command. Use INSTrument:SELect to set the mode. The index 1 or 2 is for the selection of test group.
Preset	65535
State Saved	Saved in instrument state.
Min	1
Max	65535
Instrument S/W Revision	Prior to A.02.00

PVT Backup Burst Test Enable/Disable



The PVT mask test is one of the most severe tests for GSM/EDGE. To reduce the total test time, in CGSM you can specify a set of backup bursts that are tested only when the primary bursts' mask test has failed. See above figure.

In a frequency list, the (primary) bursts that are specified by Demod Test Bitmap is mask tested first. If any bursts fail, the PVT BackupBurst Test is enabled, and the backup bursts are mask tested. If all primary bursts pass the test, the backup bursts aren't tested. Note that the backup bursts can be

configured for each test group (see "PVT Secondary Test Group" on page 144).

Mode	GSM
Remote Command	`[:SENSe]:CGSM:PVTime:BACKup[1]|2[:ENABle] ON|OFF|1|0` `[:SENSe]:CGSM:PVTime:BACKup[1]|2[:ENABle]?`
Example	CGSM:PVT:BACK 1 CGSM:PVT:BACK?
Notes	You must be in the GSM/EDGE mode to use this command. Use INSTrument:SELect to set the mode. The index 1 or 2 is for the selection of test group.
Preset	OFF
State Saved	Saved in instrument state.
Range	ON|OFF
Instrument S/W Revision	Prior to A.02.00

PVT Backup Burst Test Bitmap

A bitmap for PVT Backup burst test. See "PVT Backup Burst Test Enable/Disable" on page 146 for details.

Mode	GSM
Remote Command	`[:SENSe]:CGSM:PVTime:BACKup[1]|2:TEST <integer>` `[:SENSe]:CGSM:PVTime:BACKup[1]|2:TEST?`
Example	CGSM:PVT:BACK2:TEST 6 CGSM:PVT:BACK2:TEST?
Notes	You must be in the GSM/EDGE mode to use this command. Use INSTrument:SELect to set the mode. The index 1 or 2 is for the selection of test group.
Preset	1
State Saved	Saved in instrument state.
Min	1
Max	65535
Instrument S/W Revision	Prior to A.02.00

Zero Span Related Setting Commands

Measurement Enable/Disable

Allows you to enable or disable Zero Span measurement.

Mode	GSM
Remote Command	`[:SENSe]:CGSM:ZSPan[:ENABle] ON|OFF|1|0`
	`[:SENSe]:CGSM:ZSPan[:ENABle]?`
Example	CGSM:ZSP 0
	CGSM:ZSP?
Notes	You must be in the GSM/EDGE mode to use this command. Use INSTrument:SELect to set the mode.
Preset	ON
State Saved	Saved in instrument state.
Range	ON|OFF
Instrument S/W Revision	Prior to A.02.00

Marker

All Markers Off Turns off all markers.

Mode	GSM
Remote Command	`:CALCulate:CGSM:ZSPan:MARKer:AOFF`
Example	CALC:CGSM:ZSP:MARK:AOFF
Notes	You must be in the GSM/EDGE mode to use this command. Use INSTrument:SELect to set the mode.
Instrument S/W Revision	Prior to A.02.00

Couple Marker When this function is ON or true, moving any marker causes an equal X Axis movement of all other markers. “Equal X Axis movement”means that the instrument preserves the difference 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).

Mode	GSM
Remote Command	`:CALCulate:CGSM:ZSPan:MARKer:COUPle[:STATe] OFF|ON|0|1`
	`:CALCulate:CGSM:ZSPan:MARKer:COUPle[:STATe]?`
Example	CALC:CGSM:ZSP:MARK:COUP ON
	CALC:CGSM:ZSP:MARK:COUP?

Notes	You must be in the GSM/EDGE mode to use this command. Use INSTrument:SELect to set the mode.
Preset	OFF
State Saved	Saved in instrument state.
Range	ON|OFF
Instrument S/W Revision	Prior to A.02.00

Marker Type Sets the marker control mode under **Normal**, **Delta** and **Off**, as described below. All interactions and dependencies detailed under the key description are enforced when the remote command is sent.

Mode	GSM
Remote Command	`:CALCulate:CGSM:ZSPan:MARKer[1]|2|3|4|5|6|7|8|9|10|11|12:MODE POSition|DELTa|OFF`
	`:CALCulate:CGSM:ZSPan:MARKer[1]|2|3|4|5|6|7|8|9|10|11|12:MODE?`
Example	CALC:CGSM:ZSP:MARK:MODE POS
	CALC:CGSM:ZSP:MARK:MODE?
Notes	If the selected marker is Off, pressing Marker sets it to Normal and places it at the center of the screen on a trace. You must be in the GSM/EDGE mode to use this command. Use INSTrument:SELect to set the mode.
Preset	OFF|OFF|OFF|OFF|OFF|OFF|OFF|OFF|OFF|OFF|OFF|OFF
State Saved	Saved in instrument state.
Range	Normal|Delta|Off
Instrument S/W Revision	Prior to A.02.00

Marker X Axis Value Sets the marker X Axis value in the current marker X Axis Scale unit. It has no effect if the control mode is **Off,** but is the SCPI equivalent of entering an X value if the control mode is **Normal** or **Delta**.

Mode	GSM
Remote Command	`:CALCulate:CGSM:ZSPan:MARKer[1]|2|3|4|5|6|7|8|9|10|11|12:X <time>`
	`:CALCulate:CGSM:ZSPan:MARKer[1]|2|3|4|5|6|7|8|9|10|11|12:X?`
Example	CALC:CGSM:ZSP:MARK3:X 1ks
	CALC:CGSM:ZSP:MARK3:X?

Notes	If no suffix is sent it will use 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" will be generated. If the specified marker is Fixed and a Marker Function is on, error –221 "Settings conflict; cannot adjust Fixed marker while Marker Function is on" 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**. You must be in the GSM mode to use this command. Use INSTrument:SELect to set the mode.
Preset	3.31333E–02
State Saved	No
Min	1us
Max	6ks
Instrument S/W Revision	Prior to A.02.00

Marker X Axis Position Sets the marker X position in trace points. It has no effect if the control mode is **Off,** but is the SCPI equivalent of entering a value if the control mode is **Normal** or **Delta** - except in trace points rather than X Axis Scale units. The entered value is immediately translated into the current X Axis Scale units for setting the value of the marker.

Mode	GSM
Remote Command	`:CALCulate:CGSM:ZSPan:MARKer[1]|2|3|4|5|6|7|8|9|10|11|12:X:POSition <integer>` `:CALCulate:CGSM:ZSPan:MARKer[1]|2|3|4|5|6|7|8|9|10|11|12:X:POSition?`
Example	CALC:CGSM:ZSP:MARK3:X 10 CALC:CGSM:ZSP:MARK3:X?
Notes	If no suffix is sent it will use 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" will be generated. If the specified marker is Fixed and a Marker Function is on, error –221 "Settings conflict; cannot adjust Fixed marker while Marker Function is on" 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**. You must be in the GSM mode to use this command. Use INSTrument:SELect to set the mode.
Preset	500
State Saved	No
Min	1

Max	6ks
Instrument S/W Revision	Prior to A.02.00

Marker Y Axis Value Queries Y Axis value in the current marker Y Axis unit. Marker Y Axis unit will be depend on the selected marker mode and marker function.

Mode	GSM
Remote Command	`:CALCulate:CGSM:ZSPan:MARKer[1]|2|3|4|5|6|7|8|9|10|11|12:Y?`
Example	CALC:CGSM:ZSP:MARK:Y?
Notes	The query returns the marker Y-axis result, if the control mode is **Normal** or **Delta**. If the marker is **Off**, the response is not a number. You must be in the GSM mode to use this command. Use INSTrument:SELect to set the mode.
Preset	500
State Saved	No
Min	–9.9E37
Max	9.9E37
Instrument S/W Revision	Prior to A.02.00

Relative To Selects the marker the selected marker will be relative to (its reference marker).

Mode	GSM
Remote Command	`:CALCulate:CGSM:ZSPan:MARKer[1]|2|3|4|5|6|7|8|9|10|11|12:REFerence <integer>` `:CALCulate:CGSM:ZSPan:MARKer[1]|2|3|4|5|6|7|8|9|10|11|12:REFerence?`
Example	CALC:CGSM:ZSP:MARK:REF 3 CALC:CGSM:ZSP:MARK:REF?
Notes	A marker cannot be relative to itself so that choice is grayed out, and if sent from SCPI generates error –221: "Settings conflict; marker cannot be relative to itself." You must be in the GSM mode to use this command. Use INSTrument:SELect to set the mode.
Preset	2|3|4|5|6|7|8|9|10|11|12|1
State Saved	No
Min	1
Max	12

Instrument S/W Revision	Prior to A.02.00

Peak Search Places the selected marker on the trace point with the maximum y-axis value for that marker's trace.

Mode	GSM
Remote Command	`:CALCulate:CGSM:ZSPan:MARKer[1]|2|3|4|5|6|7|8|9|10|11|12:MAXimum`
Example	CALC:CGSM:ZSP:MARK:MAX
Instrument S/W Revision	Prior to A.02.00

Marker Function Type Sets the marker function type. All interactions and dependencies detailed under the key description are enforced when the remote command is sent.

Mode	GSM
Remote Command	`:CALCulate:CGSM:ZSPan:MARKer[1]|2|3|4|5|6|7|8|9|10|11|12:FUNCtion NOISe|BPOWer|BDENsity|OFF` `:CALCulate:CGSM:ZSPan:MARKer[1]|2|3|4|5|6|7|8|9|10|11|12:FUNCtion?`
Example	CALC:CGSM:ZSP:MARK:FUNC NOIS CALC:CGSM:ZSP:MARK:FUNC?
Notes	You must be in the GSM/EDGE mode to use this command. Use INSTrument:SELect to set the mode.
Preset	OFF|OFF|OFF|OFF|OFF|OFF|OFF|OFF|OFF|OFF|OFF|OFF
State Saved	No
Range	Noise|BPower|BDensity|Off
Instrument S/W Revision	Prior to A.02.00

Band Span Sets the width of the span for the selected marker.

Mode	GSM
Remote Command	`:CALCulate:CGSM:ZSPan:MARKer[1]|2|3|4|5|6|7|8|9|10|11|12:FUNCtion:BAND:SPAN <time>` `:CALCulate:CGSM:ZSPan:MARKer[1]|2|3|4|5|6|7|8|9|10|11|12:FUNCtion:BAND:SPAN?`
Example	CALC:CGSM:ZSP:MARK:FUNC:BAND:SPAN 10ms CALC:CGSM:ZSP:MARK:FUNC:BAND:SPAN?
Notes	You must be in the GSM mode to use this command. Use INSTrument:SELect to set the mode.

Dependencies/Couplings	Changing the Band Span necessarily changes the Band Left and Band Right values
	Band Span is set to 0 when the marker is turned off
	Band Span is set to 5% of span when any marker function is turned on if and only if it is zero at that time
Preset	5% of Sweep Time
State Saved	No
Min	Graph Start Time
Max	Graph Stop Time
Instrument S/W Revision	Prior to A.02.00

Band Left Sets the left edge frequency or time for the band of the selected marker. The right edge is unaffected.

Mode	GSM
Remote Command	`:CALCulate:CGSM:ZSPan:MARKer[1]|2|3|4|5|6|7|8|9|10|11|12:FUNCtion:BAND:LEFT <time>`
	`:CALCulate:CGSM:ZSPan:MARKer[1]|2|3|4|5|6|7|8|9|10|11|12:FUNCtion:BAND:LEFT?`
Example	CALC:CGSM:ZSP:MARK:FUNC:BAND:LEFT 10ms
	CALC:CGSM:ZSP:MARK:FUNC:BAND:LEFT?
Notes	You must be in the GSM mode to use this command. Use INSTrument:SELect to set the mode.
Dependencies/Couplings	Changing the Band Span necessarily changes the Band Left and Band Right values
	Band Span is set to 0 when the marker is turned off
	Band Span is set to 5% of span when any marker function is turned on if and only if it is zero at that time
Preset	47.5% (50% – 5% / 2) of Sweep Time
State Saved	No
Min	Graph Start Time
Max	Graph Stop Time
Instrument S/W Revision	Prior to A.02.00

Band Right For the band of the selected marker, sets the right edge time or frequency. The left edge is unaffected.

Mode	GSM

Remote Command	`:CALCulate:CGSM:ZSPan:MARKer[1]|2|3|4|5|6|7|8|9|10|11|12:FUNCtion:BAND:RIGHt <time>`
	`:CALCulate:CGSM:ZSPan:MARKer[1]|2|3|4|5|6|7|8|9|10|11|12:FUNCtion:BAND:RIGHt?`
Example	CALC:CGSM:ZSP:MARK:FUNC:BAND:RIGH 10ms
	CALC:CGSM:ZSP:MARK:FUNC:BAND:RIGH?
Notes	You must be in the GSM mode to use this command. Use INSTrument:SELect to set the mode.
Dependencies/Couplings	Changing the Band Span necessarily changes the Band Left and Band Right values
	Band Span is set to 0 when the marker is turned off
	Band Span is set to 5% of span when any marker function is turned on if and only if it is zero at that time
Preset	52.5% (50% + 5% / 2) of Sweep Time
State Saved	No
Min	Graph Start Time
Max	Graph Stop Time
Instrument S/W Revision	Prior to A.02.00

Acquisition Setup

Res BW Sets the resolution bandwidth for the current measurement. If an unavailable bandwidth is entered, the closest available bandwidth is selected.

Mode	GSM
Remote Command	`[:SENSe]:CGSM:ZSPan:BANDwidth[:RESolution] <freq>`
	`[:SENSe]:CGSM:ZSPan:BANDwidth[:RESolution]?`
Example	CGSM:ZSP:BAND 3MHz
	CGSM:ZSP:BAND?
Notes	You must be in the GSM mode to use this command. Use INSTrument:SELect to set the mode
Preset	3.0 MHz
State Saved	Saved in instrument state.
Min	1.0 Hz
Max	8.0 MHz
Instrument S/W Revision	Prior to A.02.00

Res BW Filter Type Sets the type/shape of resolution bandwidth filter for the current measurement.

Mode	GSM
Remote Command	`[:SENSe]:CGSM:ZSPan:BANDwidth:SHAPe GAUSsian|FLATtop`
	`[:SENSe]:CGSM:ZSPan:BANDwidth:SHAPe?`
Example	CGSM:ZSP:BAND:SHAP FLAT
	CGSM:ZSP:BAND:SHAP?
Notes	You must be in the GSM/EDGE mode to use this command. Use INSTrument:SELect to set the mode.
Preset	GAUSsian
State Saved	Saved in instrument state.
Range	Gaussian|flattop
Instrument S/W Revision	Prior to A.02.00

Video BW Sets the video bandwidth for the current measurement. If an unavailable bandwidth is entered, the closest available bandwidth is selected.

When this function is set to ON, Video BW is automatically calculated with using values of VBW:3dB RBW and Res BW.

Video BW = VBW:3dB RBW Res BW

Mode	GSM
Remote Command	`[:SENSe]:CGSM:ZSPan:BANDwidth:VIDeo <freq>`
	`[:SENSe]:CGSM:ZSPan:BANDwidth:VIDeo?`
	`[:SENSe]:CGSM:ZSPan:BANDwidth:VIDeo:AUTO OFF|ON|0|1`
	`[:SENSe]:CGSM:ZSPan:BANDwidth:VIDeo:AUTO?`
Example	CGSM:ZSP:BAND:VID 3MHz
	CGSM:ZSP:BAND:VID?
	CGSM:ZSP:BAND:VID:AUTO ON
	CGSM:ZSP:BAND:VID:AUTO?
Notes	You must be in the GSM mode to use this command. Use INSTrument:SELect to set the mode.
Preset	3.0 MHz
	ON
State Saved	Saved in instrument state.
Min	1.0 Hz
Max	50.0 MHz

Instrument S/W Revision	Prior to A.02.00

VBW:3dB RBW Selects the ratio between the video bandwidth and the equivalent 3 dB resolution bandwidth to be used for setting the VBW when VBW is in Auto.

Mode	GSM
Remote Command	`[:SENSe]:CGSM:ZSPan:BANDwidth:VIDeo:RATio <real>`
	`[:SENSe]:CGSM:ZSPan:BANDwidth:VIDeo:RATio?`
	`[:SENSe]:CGSM:ZSPan:BANDwidth:VIDeo:RATio:AUTO OFF|ON|0|1`
	`[:SENSe]:CGSM:ZSPan:BANDwidth:VIDeo:RATio:AUTO?`
Example	CGSM:ZSP:BAND:VID:RAT 1
	CGSM:ZSP:BAND:VID:RAT?
	CGSM:ZSP:BAND:VID:RAT:AUTO ON
	CGSM:ZSP:BAND:VID:RAT:AUTO?
Notes	You must be in the GSM/EDGE mode to use this command. Use INSTrument:SELect to set the mode.
Preset	1.0
	ON
State Saved	Saved in instrument state.
Min	0.00001
Max	3000000
Instrument S/W Revision	Prior to A.02.00

Detector Allows you to select a specific detector for the current measurement. When the detector choice is Auto, the analyzer selects the detector. The selected detector depends on marker functions, trace functions, and trace averaging functions for the current measurement.

Mode	GSM
Remote Command	`[:SENSe]:CGSM:ZSPan:DETector[:FUNCtion] AVERage|NEGative|NORMal|POSitive|SAMPle`
	`[:SENSe]:CGSM:ZSPan:DETector[:FUNCtion]?`
Example	CGSM:ZSP:DET AVER
	CGSM:ZSP:DET?
Notes	You must be in the GSM/EDGE mode to use this command. Use INSTrument:SELect to set the mode.
Preset	AVERage

State Saved	Saved in instrument state.
Range	Average|Negative|Normal|Positive|Sample
Instrument S/W Revision	Prior to A.02.00

Sweep Points Sets the number of points per sweep. The resolution of setting the sweep time depends on the number of points selected. If Preset is selected, the number of points per sweep defaults to 1001. The current value of points is displayed parenthetically, next to the sweep time in the lower right corner of the display.

Mode	GSM
Remote Command	`[:SENSe]:CGSM:ZSPan:SWEep:POINts <integer>`
	`[:SENSe]:CGSM:ZSPan:SWEep:POINts?`
Example	CGSM:ZSP:SWE:POIN 2000
	CGSM:ZSP:SWE:POIN?
Notes	You must be in the GSM mode to use this command. Use INSTrument:SELect to set the mode.
Preset	1001
State Saved	Saved in instrument state.
Min	2
Max	20001
Instrument S/W Revision	Prior to A.02.00

Sweep Time Selects the length of time in which the spectrum analyzer sweeps the displayed frequency span. Additional overhead time is required by the analyzer. It impacts the sweep rate, but is not calculated as part of the sweep time. Reducing the sweep time increases the rate of sweeps.

Mode	GSM
Remote Command	`[:SENSe]:CGSM:ZSPan:SWEep:TIME <time>`
	`[:SENSe]:CGSM:ZSPan:SWEep:TIME?`
Example	CGSM:ZSP:SWE:TIME 2
	CGSM:ZSP:SWE:TIME?
Notes	You must be in the GSM mode to use this command. Use INSTrument:SELect to set the mode.
Preset	3.0 ms
State Saved	Saved in instrument state.
Min	1.0 us
Max	4000 s

Instrument S/W Revision	Prior to A.02.00

Display

Y – Axis Scale/Div Sets the logarithmic units per vertical graticule division on the display.

Mode	GSM
Remote Command	`:DISPlay:CGSM:ZSPan:TRACe:Y[:SCALe]:PDIVision <rel_ampl>` `:DISPlay:CGSM:ZSPan:TRACe:Y[:SCALe]:PDIVision?`
Example	DISP:CGSM:ZSP:TRAC:Y:PDIV 2 DISP:CGSM:ZSP:TRAC:Y:PDIV?
Notes	You must be in the GSM mode to use this command. Use INSTrument:SELect to set the mode.
Preset	10.0 dB
State Saved	Saved in instrument state.
Min	0.1 dB
Max	20 dB
Instrument S/W Revision	Prior to A.02.00

Y – Axis Ref Value Sets the absolute power reference value.

Mode	GSM
Remote Command	`:DISPlay:CGSM:ZSPan:TRACe:Y[:SCALe]:RLEVel <ampl>` `:DISPlay:CGSM:ZSPan:TRACe:Y[:SCALe]:RLEVel?`
Example	DISP:CGSM:ZSP:TRAC:Y:RLEV 2 DISP:CGSM:ZSP:TRAC:Y:RLEV?
Notes	You must be in the GSM mode to use this command. Use INSTrument:SELect to set the mode.
Preset	10.0 dBm
State Saved	Saved in instrument state.
Min	–250 dBm
Max	250 dBm
Instrument S/W Revision	Prior to A.02.00

Harmonics Related Setting Commands

Measurement Enable/Disable

Allows you to enable or disable Harmonics measurement.

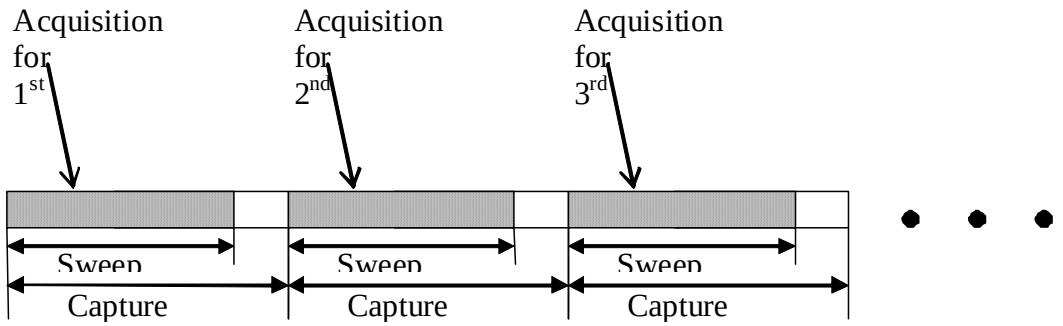
Mode	GSM
Remote Command	`[:SENSe]:CGSM:HARMonics[:ENABle] ON|OFF|1|0` `[:SENSe]:CGSM:HARMonics[:ENABle]?`
Example	CGSM:HARM 0 CGSM:HARM?
Notes	You must be in the GSM/EDGE mode to use this command. Use INSTrument:SELect to set the mode.
Preset	ON
State Saved	Saved in instrument state.
Range	ON|OFF
Instrument S/W Revision	Prior to A.02.00

Number of Harmonics

Sets the number of harmonics to measure.

Mode	GSM
Remote Command	`[:SENSe]:CGSM:HARMonics:NUMBer <integer>` `[:SENSe]:CGSM:HARMonics:NUMBer?`
Example	CGSM:HARM:NUMB 2 CGSM:HARM:NUMB?
Notes	You must be in the GSM mode to use this command. Use INSTrument:SELect to set the mode.
Preset	3
State Saved	Saved in instrument state.
Min	1
Max	10
Instrument S/W Revision	Prior to A.02.00

Capture Interval



Sets the interval of capturing each harmonics. If the value is set to smaller than sweep time, it will be changed to the same value with sweep time.

Mode	GSM
Remote Command	`[:SENSe]:CGSM:HARMonics:INTerval <time>` `[:SENSe]:CGSM:HARMonics:INTerval?`
Example	CGSM:HARM:INT 1ms CGSM:HARM:INT?
Notes	You must be in the GSM mode to use this command. Use INSTrument:SELect to set the mode.
Preset	4.615385ms
State Saved	Saved in instrument state.
Min	1 us
Max	10 s
Instrument S/W Revision	Prior to A.02.00

Frequency List

List of frequencies for harmonics measurement. Parameter settings for Zero span measurement apply to acquisition and marker calculation.

Mode	GSM
Remote Command	`[:SENSe]:CGSM:HARMonics:LIST:FREQuency <freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>` `[:SENSe]:CGSM:HARMonics:LIST:FREQuency?`

Example	CGSM:HARM:LIST:FREQ 850e6,900e6,1.8e9 CGSM:HARM:LIST:FREQ?
Notes	Parameter settings for Zero span measurement apply to acquisition and marker calculation. Caution: When Harmonics are measured at a frequency beyond the electronic attenuator's specified operating range (3.6GHz), the value of E-Atten is changed to zero regardless of the value specified via the front panel or by SCPI command. When this occurs, the setting of the mechanical attenuator remains unchanged, as it has a wider effective range. In addition, the input preamplifier is disabled above frequencies for which a license is installed. You must be in the GSM/EDGE mode to use this command. Use INSTrument:SELect to set the mode.
Preset	935.2MHz, 935.2MHz, 935.2MHz, 935.2MHz, 935.2MHz, 935.2MHz, 935.2MHz, 935.2MHz, 935.2MHz, 935.2MHz
State Saved	Saved in instrument state.
Min	–79.999995 MHz
Max	Hardware Dependent: Same as Center Frequency
Instrument S/W Revision	Prior to A.02.00

Capture Step Setup

Number of Bursts

Number of Bursts specifies how many bursts are to be measured for each frequency in the list.

Mode	GSM
Remote Command	`[:SENSe]:CGSM:SWEep:BURSt:NUMBer <integer>` `[:SENSe]:CGSM:SWEep:BURSt:NUMBer?`
Example	CGSM:SWE:BURS:NUMB 5 CGSM:SWE:BURS:NUMB?
Notes	You must be in the GSM mode to use this command. Use INSTrument:SELect to set the mode.
Dependencies/Couplings	Single Capture Interval, Start Offset and Burst Interval
Preset	1
State Saved	Saved in instrument state.
Min	1
Max	16

Instrument S/W Revision	Prior to A.02.00

Single Capture Interval

Single Capture Interval specifies capture time length in each frequency list.

Mode	GSM
Remote Command	`[:SENSe]:CGSM:CAPTure[:TIME] <real>` `[:SENSe]:CGSM:CAPTure[:TIME]?`
Example	CGSM:CAPT 7MS CGSM:CAPT?
Notes	The total sampling points cannot exceed 4e6(4M) samples. The sampling points are calculated from the number of active freq list, BW and this parameter, Single Capture Interval. You must be in the GSM mode to use this command. Use INSTrument:SELect to set the mode.
Dependencies/Couplings	Number of Bursts, Start Offset and Burst Interval
Preset	9.76923E–4
State Saved	Saved in instrument state.
Min	9.76923E–4
Max	100ms
Instrument S/W Revision	Prior to A.02.00

Start Offset

Start Offset specifies where the first burst slot boundary begins in each frequency list. The minimum value of the Start Offset is 200us.

Mode	GSM
Remote Command	`[:SENSe]:CGSM:SWEep:OFFSet <real>` `[:SENSe]:CGSM:SWEep:OFFSet?`
Example	CGSM:SWE:OFFS 1.153846MS CGSM:SWE:OFFS?
Notes	You must be in the GSM mode to use this command. Use INSTrument:SELect to set the mode.
Preset	200us
State Saved	Saved in instrument state.
Min	200us

Max	50ms
Instrument S/W Revision	Prior to A.02.00

Burst Interval

Burst Interval specifies time between a burst and the next burst.

Mode	GSM
Remote Command	`[:SENSe]:CGSM:SWEep:BURSt:INTerval <real>` `[:SENSe]:CGSM:SWEep:BURSt:INTerval?`
Example	CGSM:SWE:BURS:INT 2MS CGSM:SWE:BURS:INT?
Notes	You must be in the GSM mode to use this command. Use INSTrument:SELect to set the mode.
Preset	1.153846ms
State Saved	Saved in instrument state.
Min	1.153846ms
Max	100ms
Instrument S/W Revision	Prior to A.02.00

Gate Setup

Gate Source

Defines the gate source setting at which the frequency list acquisition is made.

Mode	GSM
Remote Command	`[:SENSe]:CGSM:GATE:SOURce IMMediate|EXTernal1|EXTernal2|RFBurst|FRAMe` `[:SENSe]:CGSM:GATE:SOURce?`
Example	CGSM:GATE:SOUR IMM CGSM:GATE:SOUR?
Preset	IMMediate
State Saved	Saved in instrument state.
Instrument S/W Revision	Prior to A.02.00

Gate Level

Gate Level is set by Trigger Level SCPI commands specified in Trigger, Measurement Functions section in the EDGE/GSM mode User's and Programmer's Reference or Help. For example, when Gate Source

is External1 the trigger level is specified by the following SCPI commands:

:TRIGger:EXTernal1:LEVel <level>.

Gate Recovery

Gate Recovery is the recovery time required before the next list's acquisition begins. The value should be set for a settling time that allows the LO frequency to become stable.

Mode	GSM
Remote Command	`[:SENSe]:CGSM:GATE:RTIMe <time>` `[:SENSe]:CGSM:GATE:RTIMe?`
Example	CGSM:GATE:RTIM 500e–6 CGSM:GATE:RTIM?
Preset	1 ms
State Saved	Saved in instrument state.
Min	1 us
Max	10 ms
Instrument S/W Revision	Prior to A.02.00

Frequency List Setup

Frequency List

Combined CGSM allows setting multiple test frequencies and it captures the specified time length in 'Single Capture interval' at each frequency in order. Frequency List specifies these frequencies and their on/off states. A maximum of 8 frequencies may be set.

This specifies the frequencies for all measurements with the exception of Zero Span and Harmonics measurements.

Mode	GSM

Remote Command	`[:SENSe]:CGSM:LIST:FREQuency <freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>`
	`[:SENSe]:CGSM:LIST:FREQuency?`
	`[:SENSe]:CGSM:LIST:STATe OFF|ON|0|1, OFF|ON|0|1, OFF|ON|0|1, OFF|ON|0|1, OFF|ON|0|1, OFF|ON|0|1, OFF|ON|0|1, OFF|ON|0|1`
	`[:SENSe]:CGSM:LIST:STATe?`

Example	CGSM:LIST:FREQ 850e6,900e6,1.8e9 CGSM:LIST:FREQ? CGSM:LIST:STAT 1,1,1,0 CGSM:LIST:STAT?
Notes	Combined CGSM allows setting multiple test frequencies and it captures the specified time length in 'Single Capture Interval' at each frequency in order. The 'Freq Hopping' under 'Mode Setup' is not related to this feature. In this measurement, frequency settings must be set here. The 'Center Frequency' setting under "Freq / Channel' front panel key or [:SENSe]:FREQuency:CENTer overwrites the first frequency in this list. CAUTION: When list acquisition is performed, the maximum frequency is 3.6 GHz even they are all the same frequency. When only the first list is used (see [:SENSe]:CGSM:LIST:STATe), there is no limitation. You must be in the GSM/EDGE mode to use this command. Use INSTrument:SELect to set the mode.
Preset	935.2e6,935.2e6,935.2e6,935.2e6,935.2e6,935.2e6,935.2e6,935.2e6 1, 0, 0, 0, 0, 0, 0, 0
State Saved	Saved in instrument state.
Min	–79.999995 MHz
Max	Hardware Dependent: Same as Center Frequency
Instrument S/W Revision	Prior to A.02.00

Radio Format List

Allows you to select measurement format.

Mode	GSM
Remote Command	`[:SENSe]:CGSM:LIST:FORMat PFERror|EEVM,PFERror|EEVM, PFERror|EEVM,PFERror|EEVM, PFERror|EEVM,PFERror|EEVM, PFERror|EEVM,PFERror|EEVM` `[:SENSe]:CGSM:LIST:FORMat?`
Example	CGSM:LIST:FORM PFER,EEVM,PFER,EEVM CGSM:LIST:FORM?
Preset	PFERror,PFERror,PFERror,PFERror,PFERror,PFERror,PFERror,PFERror
State Saved	Saved in instrument state.
Range	PFERror|EEVM
Instrument S/W Revision	Prior to A.02.00

PVT Related Setting Commands

Selected Freq Index Sets a frequency index. This value is referred to when PVT Mask Preset is operated. See"PVT Preset Standard Mask" on page 166.

Mode	GSM
Remote Command	`:CALCulate:CGSM:PVTime:MASK:SELect <integer>` `:CALCulate:CGSM:PVTime:MASK:SELect?`
Example	CALC:CGSM:PVT:MASK:SEL 2 CALC:CGSM:PVT:MASK:SEL?
Notes	This value is referred when PVT Mask Preset is operated. See: "PVT Preset Standard Mask" on page 166 You must be in the GSM/EDGE mode to use this command. Use INSTrument:SELect to set the mode.
Preset	1
State Saved	Saved in instrument state.
Min	1
Max	8
Instrument S/W Revision	Prior to A.02.00

PVT Preset Standard Mask This is an immediate action function that resets PVT mask to default settings depending on Radio Band, Radio Device, Power Control Level (Mode Setup parameters), Radio Format Type and Band Index (Band Setup parameters).

Mode	GSM
Remote Command	`:CALCulate:CGSM:PVTime:MASK:PRESet`
Example	CALC:CGSM:PVT:MASK:PRES
Notes	PVT Mask on the specified frequency index (see "Selected Freq Index" on page 166) is automatically set according to "Radio Band", "Radio Device", "Power Control Level", and "Radio Format List". You must be in the GSM/EDGE mode to use this command. Use INSTrument:SELect to set the mode.
Instrument S/W Revision	Prior to A.02.00

PVT Mask Setting Commands

Start Time Specifies the start time for each region.

Mode	GSM

Remote Command

```
:CALCulate:CGSM:FLISt[1]|2|3|4|5|6|7|8:PVTime:MASK:TIME:STARt <time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>
```

```
:CALCulate:CGSM:FLISt[1]|2|3|4|5|6|7|8:PVTime:MASK:TIME:STARt?
```

```
:CALCulate:CGSM:FLISt[1]|2|3|4|5|6|7|8:PVTime:MASK:STATe ON|OFF|1|0, ON|OFF|1|0, ON|OFF|1|0, ON|OFF|1|0, ON|OFF|1|0, ON|OFF|1|0, ON|OFF|1|0, ON|OFF|1|0, ON|OFF|1|0, ON|OFF|1|0, ON|OFF|1|0, ON|OFF|1|0, ON|OFF|1|0, ON|OFF|1|0, ON|OFF|1|0, ON|OFF|1|0, ON|OFF|1|0, ON|OFF|1|0, ON|OFF|1|0, ON|OFF|1|0, ON|OFF|1|0, ON|OFF|1|0, ON|OFF|1|0, ON|OFF|1|0, ON|OFF|1|0
```

```
:CALCulate:CGSM:FLISt[1]|2|3|4|5|6|7|8:PVTime:MASK:STATe?
```

Example

CALC:CGSM:FLIS:PVT:MASK:TIME:STAR 1

CALC:CGSM:FLIS:PVT:MASK:TIME:STAR?

CALC:CGSM:FLIST:PVT:MASK:STAT 1,1,1,1,1,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0

CALC:CGSM:FLIST:PVT:MASK:STAT?

Notes

The time is relative to the T0 point.

This supports variable array length. Undefined parameters will be unchanged.

Dependencies/Couplings

Coupled to Stop Time. When Start Time is set to a larger value than the Stop Time, the Stop Time is forced to increase to the same value as the new Start Time.

When Stop Time is set to a smaller value than the Start Time, the Start Time is forced to decrease to the same value as the new Stop Time.

Preset

–1.0, –5.7688E–04, –2.8938E–04, –2.8138E–04, –2.7138E–04,2.7138E–04,2.8138E–04, 2.8938E–04, 5.7688E–04, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0

1,1,1,1,1,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0

State Saved

Saved in instrument state.

Min

–1.0

Max

1.0

Instrument S/W Revision

Prior to A.02.00

Stop Time Specifies the stop time of each region.

Mode

GSM

Remote Command	`:CALCulate:CGSM:FLISt[1]|2|3|4|5|6|7|8:PVTime:MASK:TIME:STOP <time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>,<time>` `:CALCulate:CGSM:FLISt[1]|2|3|4|5|6|7|8:PVTime:MASK:TIME:STOP?`
Example	CALC:CGSM:FLIS:PVT:MASK:TIME:STOP –5.7688E–04, –2.8938E–04, –2.8138E–04, –2.7138E–04,2.7138E–04, 2.8138E–04, 2.8938E–04, 5.7688E–04, 1.0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0 CALC:CGSM:FLIS:PVT:MASK:TIME:STOP?
Notes	The time is relative to the T0 point. This supports variable array length. Undefined parameters will be unchanged.
Dependencies/Couplings	Coupled to Start Time. When Start Time is set to a larger value than the Stop Time, the Stop Time is forced to increase to the same value as the new Start Time. When Stop Time is set to a smaller value than the Start Time, the Start Time is forced to decrease to the same value as the new Stop Time.
Preset	–5.7688E–04, –2.8938E–04, –2.8138E–04, –2.7138E–04,2.7138E–04, 2.8138E–04, 2.8938E–04, 5.7688E–04, 1.0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
State Saved	Saved in instrument state.
Min	–1.0
Max	1.0
Instrument S/W Revision	Prior to A.02.00

Lower Fail Mask Specifies the fail condition of the lower limit for the selected region.

Absolute SCPI:ABSolute	The measurement reports “FAIL” if the result exceeds the lower absolute limit.
Relative SCPI:Relative	The measurement reports “FAIL” if the result exceeds the lower relative limit.
Abs AND Rel SCPI:AND	The measurement reports “FAIL” if the result exceeds both the lower absolute limit and the lower relative limit.
Abs OR Rel SCPI:OR	The measurement reports “FAIL” if the result exceeds either the lower absolute limit or the lower relative limit.

Mode	GSM

Remote Command	:CALCulate:CGSM:FLISt[1]|2|3|4|5|6|7|8:PVTime:MASK:LOWer:TEST ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR :CALCulate:CGSM:FLISt[1]|2|3|4|5|6|7|8:PVTime:MASK:LOWer:TEST?
Example	CALC:CGSM:FLIST:PVT:MASK:LOW:TEST REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL CALC:CGSM:FLIST:PVT:MASK:LOW:TEST?
Notes	This supports variable array length. Undefined parameters will be unchanged.
Preset	REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL
State Saved	Saved in instrument state.
Range	ABSolute|RELative|AND|OR
Instrument S/W Revision	Prior to A.02.00

Lower Abs Start Specifies the absolute power level limit at the start time of the selected region.

Mode	GSM
Remote Command	:CALCulate:CGSM:FLISt[1]|2|3|4|5|6|7|8:PVTime:MASK:LOWer:STARt:ABSolute <ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl> :CALCulate:CGSM:FLISt[1]|2|3|4|5|6|7|8:PVTime:MASK:LOWer:STARt:ABSolute?
Example	CALC:CGSM:FLIS:PVT:MASK:LOW:STAR:ABS 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0 CALC:CGSM:FLIS:PVT:MASK:LOW:STAR:ABS?
Notes	This supports variable array length. Undefined parameters will be unchanged.
Preset	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0

State Saved	Saved in instrument state.
Min	–200 dBm
Max	200 dBm
Instrument S/W Revision	Prior to A.02.00

Lower Abs Stop Specifies the absolute power level limit at the stop time of the selected region. The parameter can be toggled between Auto and Man. When set to Auto, this parameter is coupled to Lower Abs Start to make a flat limit line. If set to Man, Lower Abs Start and Lower Abs Stop can be assigned different values to make a sloped limit line.

Mode	GSM
Remote Command	`:CALCulate:CGSM:FLISt[1]|2|3|4|5|6|7|8:PVTime:MASK:LOWer:STOP:ABSolute <ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>`
	`:CALCulate:CGSM:FLISt[1]|2|3|4|5|6|7|8:PVTime:MASK:LOWer:STOP:ABSolute?`
	`:CALCulate:CGSM:FLISt[1]|2|3|4|5|6|7|8:PVTime:MASK:LOWer:STOP:ABSolute:AUTO ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0`
	`:CALCulate:CGSM:FLISt[1]|2|3|4|5|6|7|8:PVTime:MASK:LOWer:STOP:ABSolute:AUTO?`
Example	CALC:CGSM:FLIS:PVT:MASK:LOW:STOP:ABS 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
	CALC:CGSM:FLIS:PVT:MASK:LOW:STOP:ABS?
	CALC:CGSM:FLIS:PVT:MASK:LOW:STOP:ABS:AUTO 1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1
	CALC:CGSM:FLIS:PVT:MASK:LOW:STOP:ABS:AUTO?
Notes	This supports variable array length. Undefined parameters will be unchanged.
Dependencies/Couplings	Coupled to Lower Abs Start, if coupling is set to “Auto”. In this case, Lower Abs Stop keeps the same value as Lower Abs Start.
Preset	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
	1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1
State Saved	Saved in instrument state.
Min	–200 dBm
Max	200 dBm

Instrument S/W Revision	Prior to A.02.00

Lower Rel Start Specify the relative power level limit at the start time of the selected region. The reference power level is specified by the useful part of the burst.

Mode	GSM
Remote Command	`:CALCulate:CGSM:FLISt[1]|2|3|4|5|6|7|8:PVTime:MASK:LOWer:STARt:RELative <rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>, <rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>, <rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>, <rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>, <rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>` `:CALCulate:CGSM:FLISt[1]|2|3|4|5|6|7|8:PVTime:MASK:LOWer:STARt:RELative?`
Example	CALC:CGSM:FLIS:PVT:MASK:LOW:STAR:REL –200,–200,–200,–200,–1,–200,–200,–200,–200,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0 CALC:CGSM:FLIS:PVT:MASK:LOW:STAR:REL?
Notes	This supports variable array length. Undefined parameters will be unchanged.
Preset	–200.0, –200.0, –200.0, –200.0,–1.0, –200.0, –200.0, –200.0, –200.0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
State Saved	Saved in instrument state.
Min	–200 dB
Max	200 dB
Instrument S/W Revision	Prior to A.02.00

Lower Rel Stop Specify the relative power level limit at the stop time of the selected region. The parameter can be toggled between Auto and Man. When set to Auto, this parameter is coupled to Lower Rel Start to make a flat limit line. If set to Man, Lower Rel Start and Lower Rel Stop can be assigned different values to make a sloped limit line.

Mode	GSM

Remote Command	`:CALCulate:CGSM:FLISt[1]|2|3|4|5|6|7|8:PVTime:MASK:LOWer:STOP:RELative <rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>` `:CALCulate:CGSM:FLISt[1]|2|3|4|5|6|7|8:PVTime:MASK:LOWer:STOP:RELative?` `:CALCulate:CGSM:FLISt[1]|2|3|4|5|6|7|8:PVTime:MASK:LOWer:STOP:RELative:AUTO ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0` `:CALCulate:CGSM:FLISt[1]|2|3|4|5|6|7|8:PVTime:MASK:LOWer:STOP:RELative:AUTO?`
Example	CALC:CGSM:FLIS:PVT:MASK:LOW:STOP:REL 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0 CALC:CGSM:FLIS:PVT:MASK:LOW:STOP:REL? CALC:CGSM:FLIS:PVT:MASK:LOW:STOP:REL:AUTO 1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1 CALC:CGSM:FLIS:PVT:MASK:LOW:STOP:REL:AUTO?
Notes	This supports variable array length. Undefined parameters will be unchanged.
Dependencies/Couplings	Coupled to Lower Abs Start, if coupling is set to “Auto”. In this case, Lower Rel Stop keeps the same value as Lower Rel Start.
Preset	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0 1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1
State Saved	Saved in instrument state.
Min	–200 dB
Max	200 dB
Instrument S/W Revision	Prior to A.02.00

Upper Fail Mask Specify the fail condition for the upper limit for the selected region.

Absolute SCPI:ABSolute	The measurement reports “FAIL” if the result exceeds the upper absolute limit.
Relative SCPI:Relative	The measurement reports “FAIL” if the result exceeds the upper relative limit.

Abs AND Rel
SCPI:AND

The measurement reports “FAIL” if the result exceeds both the upper absolute limit and the upper relative limit.

Abs OR Rel
SCPI:OR

The measurement reports “FAIL” if the result exceeds either the upper absolute limit or the upper relative limit.

Mode

GSM

Remote Command

`:CALCulate:CGSM:FLISt[1]|2|3|4|5|6|7|8:PVTime:MASK:UPPer:TEST ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR,ABSolute|RELative|AND|OR`

`:CALCulate:CGSM:FLISt[1]|2|3|4|5|6|7|8:PVTime:MASK:UPPer:TEST?`

Example

CALC:CGSM:FLIS:PVT:MASK:UPP:TEST REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL

CALC:CGSM:FLIS:PVT:MASK:UPP:TEST?

Notes

This supports variable array length. Undefined parameters will be unchanged.

Preset

REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL,REL

State Saved

Saved in instrument state.

Range

ABSolute|RELative|AND|OR

Instrument S/W Revision

Prior to A.02.00

Upper Abs Start Specify the absolute power level limit at the start time of the selected region.

Remote Command

`:CALCulate:CGSM:FLISt[1]|2|3|4|5|6|7|8:PVTime:MASK:UPPer:STARt:ABSolute <ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>`

`:CALCulate:CGSM:FLISt[1]|2|3|4|5|6|7|8:PVTime:MASK:UPPer:STARt:ABSolute?`

Example

CALC:CGSM:FLIS:PVT:MASK:UPP:STAR:ABS 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0

CALC:CGSM:FLIS:PVT:MASK:UPP:STAR:ABS?

Mode

GSM

Notes

This supports variable array length. Undefined parameters will be unchanged.

Preset

0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0

State Saved

Saved in instrument state.

Min

–200 dBm

Max

200 dBm

Instrument S/W Revision

Prior to A.02.00

Help Map ID

0

Upper Abs Stop Specify the absolute power level limit at the stop time of the selected region. The parameter can be toggled between Auto and Man. When set to Auto, this parameter is coupled to Upper Abs Start to make a flat limit line. If set to Man, Upper Abs Start and Upper Abs Stop can be assigned different values to make a sloped limit line.

Mode

GSM

Remote Command

```
:CALCulate:CGSM:FLISt[1]|2|3|4|5|6|7|8:PVTime:MASK:UPPer:STOP:ABSolute
<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>
```

```
:CALCulate:CGSM:FLISt[1]|2|3|4|5|6|7|8:PVTime:MASK:UPPer:STOP:ABSolute?
```

```
:CALCulate:CGSM:FLISt[1]|2|3|4|5|6|7|8:PVTime:MASK:UPPer:STOP:ABSolute:AUTO
ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,
ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,
ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,
ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,
ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0
```

```
:CALCulate:CGSM:FLISt[1]|2|3|4|5|6|7|8:PVTime:MASK:UPPer:STOP:ABSolute:AUTO?
```

Example

CALC:CGSM:FLIS:PVT:MASK:UPP:STOP:ABS 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0

CALC:CGSM:FLIS:PVT:MASK:UPP:STOP:ABS?

CALC:CGSM:FLIS:PVT:MASK:UPP:STOP:ABS:AUTO 1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1

CALC:CGSM:FLIS:PVT:MASK:UPP:STOP:ABS:AUTO?

Notes

This supports variable array length. Undefined parameters will be unchanged.

Dependencies/Couplings	Coupled to Upper Abs Start, if coupling is set to “Auto”. In this case, Upper Abs Stop keeps the same value as Upper Abs Start.
Preset	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0 1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1
State Saved	Saved in instrument state.
Min	–200 dBm
Max	200 dBm
Instrument S/W Revision	Prior to A.02.00

Upper Rel Start Specify the relative power level limit at the start time of the selected region. The reference power level is specified by the useful part of the burst.

Mode	GSM

Remote Command	`:CALCulate:CGSM:FLISt[1]|2|3|4|5|6|7|8:PVTime:MASK:UPPer:STARt:RELative`
	`<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,`
	`<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,`
	`<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,`
	`<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,`
	`<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>`
	`:CALCulate:CGSM:FLISt[1]|2|3|4|5|6|7|8:PVTime:MASK:UPPer:STARt:RELative?`

Example	CALC:CGSM:FLIS:PVT:MASK:UPP:STAR:REL –30,–30,–6,4,1,1,–6,–30,–30, 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0 CALC:CGSM:FLIS:PVT:MASK:UPP:STAR:REL?
Notes	This supports variable array length. Undefined parameters will be unchanged.
Preset	–30.0, –30.0, –6.0, 4.0, 1.0, 1.0, –6.0, –30.0, –30.0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
State Saved	Saved in instrument state.
Min	–200 dB
Max	200 dB
Instrument S/W Revision	Prior to A.02.00

Upper Rel Stop Specify the relative power level limit at the stop time of the selected region. The parameter can be toggled between Auto and Man. When set to Auto, this parameter is coupled to Upper Rel Start to make a flat limit line. If set to Man, Upper Rel Start and Upper Rel Stop can be assigned different values to make a sloped limit line.

Mode	GSM

Remote Command

```
:CALCulate:CGSM:FLISt[1]|2|3|4|5|6|7|8:PVTime:MASK:UPPer:STOP:RELative
<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,
<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,
<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,
<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,
<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>

:CALCulate:CGSM:FLISt[1]|2|3|4|5|6|7|8:PVTime:MASK:UPPer:STOP:RELative?

:CALCulate:CGSM:FLISt[1]|2|3|4|5|6|7|8:PVTime:MASK:UPPer:STOP:RELative:AUTO
ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,
ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,
ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,
ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,
ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0,ON|OFF|1|0

:CALCulate:CGSM:FLISt[1]|2|3|4|5|6|7|8:PVTime:MASK:UPPer:STOP:RELative:AUTO?
```

Example	CALC:CGSM:FLIS:PVT:MASK:UPP:STOP:REL 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0 CALC:CGSM:FLIS:PVT:MASK:UPP:STOP:REL? CALC:CGSM:FLIS:PVT:MASK:UPP:STOP:REL:AUTO 1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1 CALC:CGSM:FLIS:PVT:MASK:UPP:STOP:REL:AUTO?
Notes	This supports variable array length. Undefined parameters will be unchanged.
Dependencies/Couplings	Coupled to Upper Abs Start, if coupling is set to “Auto”. In this case, Upper Rel Stop keeps the same value as Upper Rel Start.
Preset	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0 1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1
State Saved	Saved in instrument state.
Min	–200 dB
Max	200 dB
Instrument S/W Revision	Prior to A.02.00

ORFS Related Setting Commands

Modulation Configuration Commands **Offset Frequency** Define a list of offset frequencies for ORFS Modulation test. The list value must be positive. Measurements are performed at both lower and upper frequencies from the reference (0Hz).

Mode	GSM

Remote Command	`[:SENSe]:CGSM:FLISt[1]|2|3|4|5|6|7|8:ORFSpectrum:MODulation:FREQuency <freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>`
	`[:SENSe]:CGSM:FLISt[1]|2|3|4|5|6|7|8:ORFSpectrum:MODulation:FREQuency?`
	`[:SENSe]:CGSM:FLISt[1]|2|3|4|5|6|7|8:ORFSpectrum:MODulation:STATe OFF|ON|0|1,OFF|ON|0|1,OFF|ON|0|1,OFF|ON|0|1,OFF|ON|0|1,OFF|ON|0|1,OFF|ON|0|1,OFF|ON|0|1,OFF|ON|0|1,OFF|ON|0|1,OFF|ON|0|1,OFF|ON|0|1,OFF|ON|0|1,OFF|ON|0|1,OFF|ON|0|1`
	`[:SENSe]:CGSM:FLISt[1]|2|3|4|5|6|7|8:ORFSpectrum:MODulation:STATe?`
Example	CGSM:FLIS:ORFS:MOD:FREQ 0.0,2.0e5,4.0e5,6.0e5
	CGSM:FLIS:ORFS:MOD:FREQ?
	CGSM:FLIS:ORFS:MOD:STAT 1,1,1,1
	CGSM:FLIS:ORFS:MOD:STAT?
Notes	Freq0 (1st parameter) is always ‘0’. It’s for the reference carrier.
	It supports variable array length. Undefined parameters will be unchanged.
	You must be in the GSM/EDGE mode to use this command. Use INSTrument:SELect to set the mode.
Preset	0, 1e5, 2e5, 2.5e5, 4e5, 6e5, 8e5, 0, 0, 0, 0, 0, 0, 0, 0
	1, 0, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0
State Saved	Saved in instrument state.
Min	0.0 Hz
Max	800 kHz
Instrument S/W Revision	Prior to A.02.00

Res BW Define the resolution bandwidth list for the modulation spectrum part of the ORFS measurement. The first bandwidth specified is for the reference carrier. Each resolution bandwidth in this list corresponds to an offset frequency in the modulation offset frequency list.

Mode	GSM
Remote Command	`[:SENSe]:CGSM:FLISt[1]|2|3|4|5|6|7|8:ORFSpectrum:MODulation:BANDwidth <freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>`
	`[:SENSe]:CGSM:FLISt[1]|2|3|4|5|6|7|8:ORFSpectrum:MODulation:BANDwidth?`

Example	CGSM:FLIS:ORFS:MOD:BAND 3.0e4,3.0e4,3.0e4,3.0e4
	CGSM:FLIS:ORFS:MOD:BAND?
Notes	This supports variable array length. Undefined parameters will be unchanged.
	This command is valid only when SENS:CGSM:ORFS:TYPE is set to 'MOD' or 'MSW'.
	You must be in the GSM/EDGE mode to use this command. Use INSTrument:SELect to set the mode.
Preset	3e4,3e4,3e4,3e4,3e4,3e4,3e4,3e4,3e4,3e4,3e4,3e4,3e4,3e4,3e4,3e4
State Saved	Saved in instrument state.
Min	1 kHz
Max	500 kHz
Instrument S/W Revision	Prior to A.02.00

Relative Limit Level Define relative limit level list in dB for the modulation spectrum part of the ORFS measurement. The first limit level is for the reference carrier and it is not used. Each relative limit level in this list corresponds to an offset frequency in the modulation offset frequency list.

Mode	GSM
Remote Command	`[:SENSe]:CGSM:FLISt[1]|2|3|4|5|6|7|8:ORFSpectrum:MODulation:LIMit:RELative <rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>, <rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>, <rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>`
	`[:SENSe]:CGSM:FLISt[1]|2|3|4|5|6|7|8:ORFSpectrum:MODulation:LIMit:RELative?`
Example	CGSM:FLIS:ORFS:MOD:LIM:REL 0.0,–35.0,–60.0,–60.0
	CGSM:FLIS:ORFS:MOD:LIM:REL?
Notes	This implementation is different from the regular ORFS measurement.
	This supports variable array length. Undefined parameters will be unchanged.
	You must be in the GSM mode to use this command. Use INSTrument:SELect to set the mode.
Preset	0, 0.5, –30, –33, –60, –60, –60, 0, 0, 0, 0, 0, 0, 0, 0
State Saved	Saved in instrument state.
Min	–200.0
Max	200.0
Instrument S/W Revision	Prior to A.02.00

Absolute Limit Level Define absolute limit level list in dBm for the modulation spectrum part of the ORFS measurement. The first limit level is for the reference carrier and it is not used. Each absolute limit level in this list

corresponds to an offset frequency in the modulation offset frequency list.

Mode	GSM
Remote Command	`[:SENSe]:CGSM:FLISt[1]|2|3|4|5|6|7|8:ORFSpectrum:MODulation:LIMit:ABSolute <ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>`
	`[:SENSe]:CGSM:FLISt[1]|2|3|4|5|6|7|8:ORFSpectrum:MODulation:LIMit:ABSolute?`
Example	CGSM:FLIS:ORFS:MOD:LIM:ABS 0.0,–65.0,–65.0,–65.0
	CGSM:FLIS:ORFS:MOD:LIM:ABS?
Notes	This implementation is different from the regular ORFS measurement.
	This supports variable array length. Undefined parameters will be unchanged.
	You must be in the GSM mode to use this command. Use INSTrument:SELect to set the mode.
Preset	0, –36, –36, –36, –36, –51, –51, 0, 0, 0, 0, 0, 0, 0, 0
State Saved	Saved in instrument state.
Min	–200.0
Max	200.0
Instrument S/W Revision	Prior to A.02.00

Switching Configuration Commands **Offset Frequency** Define a list of offset frequencies for ORFS Switching test. The list value must be positive and it's measured at both lower and upper frequencies from the reference(0Hz).

Mode	GSM
Remote Command	`[:SENSe]:CGSM:FLISt[1]|2|3|4|5|6|7|8:ORFSpectrum:SWITching:FREQuency <freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>`
	`[:SENSe]:CGSM:FLISt[1]|2|3|4|5|6|7|8:ORFSpectrum:SWITching:FREQuency?`
	`[:SENSe]:CGSM:FLISt[1]|2|3|4|5|6|7|8:ORFSpectrum:SWITching:STATe OFF|ON|0|1, OFF|ON|0|1,OFF|ON|0|1,OFF|ON|0|1,OFF|ON|0|1,OFF|ON|0|1,OFF|ON|0|1,OFF|ON|0|1,OFF|ON|0|1,OFF|ON|0|1,OFF|ON|0|1,OFF|ON|0|1,OFF|ON|0|1,OFF|ON|0|1`
	`[:SENSe]:CGSM:FLISt[1]|2|3|4|5|6|7|8:ORFSpectrum:SWITching:STATe?`

Example	CGSM:FLIS:ORFS:SWIT:FREQ 0.0,4.0e5,6.0e5 CGSM:FLIS:ORFS:SWIT:FREQ? CGSM:FLIS:ORFS:SWIT:STAT 1,1,1 CGSM:FLIS:ORFS:SWIT:STAT?
Notes	Freq0 (1st parameter) is always '0'. It's for the reference carrier. This supports variable array length. Undefined parameters will be unchanged. You must be in the GSM/EDGE mode to use this command. Use INSTrument:SELect to set the mode.
Preset	0,4e5,6e5,0,0,0,0,0,0,0,0,0,0,0 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
State Saved	Saved in instrument state.
Min	0.0 Hz
Max	800 kHz
Instrument S/W Revision	Prior to A.02.00

Res BW Define the resolution bandwidths list for the switching spectrum part of the ORFS measurement. The first bandwidth specified is for the reference carrier. Each resolution bandwidth in this list corresponds to an offset frequency in the switching offset frequency list.

Mode	GSM
Remote Command	`[:SENSe]:CGSM:FLISt[1]|2|3|4|5|6|7|8:ORFSpectrum:SWITching:BANDwidth <freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>,<freq>` `[:SENSe]:CGSM:FLISt[1]|2|3|4|5|6|7|8:ORFSpectrum:SWITching:BANDwidth?`
Example	CGSM:FLIS:ORFS:SWIT:BAND 3.0e5,3.0e4,3.0e4 CGSM:FLIS:ORFS:SWIT:BAND?
Notes	This supports variable array length. Undefined parameters will be unchanged. This command is valid only when CGSM:ORFS:TYPE is set to 'SWIT' or 'MSW'. You must be in the GSM/EDGE mode to use this command. Use INSTrument:SELect to set the mode.
Preset	3e5,3e4,3e4,3e4,3e4,3e4,3e4,3e4,3e4,3e4,3e4,3e4,3e4,3e4,3e4
State Saved	Saved in instrument state.
Min	1 kHz
Max	500 kHz

Instrument S/W Revision	Prior to A.02.00

Relative Limit Level Define relative limit level list in dB for the switching spectrum part of the ORFS measurement. The first limit level is for the reference carrier and it is not used. Each relative limit level in this list corresponds to an offset frequency in the switching offset frequency list.

Mode	GSM
Remote Command	`[:SENSe]:CGSM:FLISt[1]|2|3|4|5|6|7|8:ORFSpectrum:SWITching:LIMit:RELative <rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>, <rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>, <rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>,<rel_ampl>` `[:SENSe]:CGSM:FLISt[1]|2|3|4|5|6|7|8:ORFSpectrum:SWITching:LIMit:RELative?`
Example	CGSM:FLIS:ORFS:SWIT:LIM:REL 0.0,–57.0,–67.0 CGSM:FLIS:ORFS:SWIT:LIM:REL?
Notes	This implementation is different from the regular ORFS measurement. You must be in the GSM mode to use this command. Use INSTrument:SELect to set the mode.
Preset	–200,–200,–200,–200,–200,–200,–200,–200,–200,–200,–200,–200,–200,–200,–200
State Saved	Saved in instrument state.
Min	–200.0
Max	200.0
Instrument S/W Revision	Prior to A.02.00

Absolute Limit Level Define the absolute limit level list in dBm for the switching spectrum part of the ORFS measurement. The first limit level is for the reference carrier and it is not used. Each absolute limit level in this list corresponds to an offset frequency in the switching offset frequency list.

Mode	GSM
Remote Command	`[:SENSe]:CGSM:FLISt[1]|2|3|4|5|6|7|8:ORFSpectrum:SWITching:LIMit:ABSolute <ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>,<ampl>` `[:SENSe]:CGSM:FLISt[1]|2|3|4|5|6|7|8:ORFSpectrum:SWITching:LIMit:ABSolute?`
Example	CGSM:FLIS:ORFS:SWIT:LIM:ABS 0.0,–36.0,–36.0 CGSM:FLIS:ORFS:SWIT:LIM:ABS?

Notes	This implementation is different from the regular ORFS measurement. You must be in the GSM mode to use this command. Use INSTrument:SELect to set the mode.
Preset	0, –23, –26, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
State Saved	Saved in instrument state.
Min	–200.0
Max	200.0
Instrument S/W Revision	Prior to A.02.00

Result Values

GSM Result Selection

Here is the mapping of the Array index and Result parameter

Index	Result Parameter
1	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 (i.e. 2 points/symbol). If there is more than one burst selected for Demod Bitmap, then the rms values are averaged.
2	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 (i.e. 2 points/symbol). If there is more than one burst selected for Demod Bitmap, then it takes the highest rms value.
3	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 there is more than one burst selected for Demod Bitmap, then the rms values are averaged.
4	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 there is more than one burst selected for Demod Bitmap, then it takes the highest.

5	Peak Phase Error Symbol Position A floating point number (in symbols) representing the symbol number at which the peak phase error occurred. If multiple bursts are configured, it just takes the last burst's result.
6	Maximum of the Peak Phase Error Symbol Position A floating point number (in symbols) representing the symbol number at which the peak phase error occurred.
7	Average Frequency Error A floating point number (in Hz) of the frequency error over the entire measurement area. This is the difference between the measured phase trajectory and the reference phase trajectory.
8	Maximum Frequency Error A floating point number (in Hz) of the peak frequency error through over the measurement area. Take the peak frequency error from each burst and identify the highest.
9	Average I/Q Origin Offset A floating point number (in dB) of the I and Q error (magnitude squared) offset from the origin over the entire measurement area.
10	Maximum I/Q Origin Offset A floating point number (in dB) of the maximum I and Q error (magnitude squared) offset over the measurement area.
11	Average T0 Offset 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.
12	Maximum T0 Offset 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.
13	Detected TSC A floating-point number of detected TSC of the last measured burst. The returned value is 0~7 (Burst Type: Normal), 8 (Burst Type: Access), 9 (Burst Type: Sync) if TSC detected. If TSC not detected, the returned value is –999.0.

Mode CGSM

Remote Command	`[:SENSe]:CGSM:DEMod:PFERror:RESult ON|OFF|0|1,…` `[:SENSe]:CGSM:DEMod:PFERror:RESult?`
Example	CGSM:DEM:PFER:RES 0,1,0 CGSM:DEM:PFER:RES?
Notes	Refer to the above table to see the mapping of the index and result parameter. This setting applies to all frequencies' results. The array length might be expanded for future enhancement.
Preset	1,0,0,1,0,1,1,1,1,1,1,0,0
State Saved	Saved in instrument state.
Instrument S/W Revision	Prior to A.02.00

EDGE Result Selection

Here is the mapping of the Array index and Result parameter

Index	Result Parameter
1	RMS 95th %tile EVM A floating point number (in percent) of EVM over 95% of the entire burst. The result is averaged over the all demodulated bursts at the frequency.
2	Average RMS EVM A floating point number (in percent) of EVM over the burst. The result is averaged over the all demodulated bursts at the frequency.
3	Maximum RMS EVM a floating point number (in percent) of the highest EVM over the all demodulated bursts at the frequency
4	Average of the 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.
5	Maximum of the 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.
6	Symbol position of the peak EVM An integer number of the symbol position where the peak EVM error is detected.
7	Average Magnitude Error A floating point number (in percent) of the average magnitude error over the all demodulated bursts at the frequency.

8	Maximum Magnitude Error A floating point number (in percent) of maximum magnitude error over the all demodulated bursts at the frequency.
9	Average of the Peak Magnitude Error A floating point number (in percent) of the average of peak magnitude error over the all demodulated bursts at the frequency.
10	Maximum of the Peak Magnitude Error A floating point number (in percent) of the highest peak magnitude error over the all demodulated bursts at the frequency.
11	Average Phase Error A floating point number (in degrees) of average phase error over the entire measurement area.
12	Maximum Phase Error A floating point number (in degrees) of the highest of the average phase error over the entire measurement area.
13	Average of the Peak Phase Error A floating point number (in percent) of the average of peak phase error over the all demodulated bursts at the frequency.
14	Maximum of the Peak Phase Error A floating point number (in degrees) of the highest peak phase error over the entire measurement area.
15	Average Frequency Error A floating point number (in Hz) of the frequency error in the measured signal.
16	Maximum Frequency Error A floating point number (in Hz) of the highest frequency error in the measured signal.
17	I/Q Origin Offset A floating point number (in dB) of the I and Q error (magnitude squared) offset from the origin.
18	Amplitude Droop Error A floating point number (in dB) of the amplitude droop measured across the 142 symbol burst.
19	Trigger to T0 A floating-point number (in sec) of the time interval between the slot boundary T0. T0 means the transition time from symbol 13 to symbol 14 of the midamble training sequence for each time slot. The ‘RF Sync Delay’ under ‘Mode Setup’ is not considered in this measurement.

20	Timing Offset of AM/PM path A floating number (in sec) of the time interval between Amplitude Modulation path and Phase Modulation path.
21	Detected TSC A floating-point number of detected TSC of the last measured burst. . The returned value is 0~7 (Burst Type: Normal) if TSC detected. If TSC not detected, the returned value is –999.0.

Mode	CGSM
Remote Command	`[:SENSe]:CGSM:DEMod:EEVM:RESult ON|OFF|0|1,…` `[:SENSe]:CGSM:DEMod:EEVM:RESult?`
Example	CGSM:DEM:EEVM:RES 1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0 CGSM:DEM:EEVM:RES?
Notes	Refer above table to see the mapping of the index and result parameter. This setting applies to all frequencies' results. The array length might be expanded for future enhancement.
Preset	1,1,0,0,1,1,1,0,0,1,1,0,0,1,1,1,1,1,1,0,0
State Saved	Saved in instrument state.
Instrument S/W Revision	Prior to A.02.00

ORFS Result Selection

Here is the mapping of the Array index and Result parameter

Index	Result Parameter
1	Lower Relative Amplitude relative to Offset 0 at Lower Offset in dB For the offset0, it isn't output regardless this state.
2	Lower Absolute Absolute amplitude at Lower Offset in dBm
3	Lower Delta Pick the lower value up between the "Lower Relative Delta" and the "Lower Absolute Delta". For the offset0, it isn't output regardless this state.
4	Upper Relative Amplitude relative to Offset 0 at Upper Offset in dB For the offset0, it isn't output regardless this state.

5	Upper Absolute Absolute amplitude at Upper Offset in dBm For the offset0, it isn't output regardless this state because it is same as the index 1.
6	Upper Delta Pick the lower value up between the "Upper Relative Delta" and the "Upper Absolute Delta". For the offset0, it isn't output regardless this state.

Mode	CGSM
Remote Command	`[:SENSe]:CGSM:ORFSpectrum:RESult ON|OFF|0|1,…` `[:SENSe]:CGSM:ORFSpectrum:RESult?`
Example	CGSM:ORFS:RES 1,1,1,1,1,1 CGSM:ORFS:RES?
Notes	Refer above table to see the mapping of the index and result parameter. This setting applies to all frequencies' results. The array length might be expanded for future enhancement.
Preset	1,1,1,1,1,1
State Saved	Saved in instrument state.
Instrument S/W Revision	Prior to A.02.00

Power vs Time Result Selection

Here is the mapping of the Array index and Result parameter

Index	Result Parameter
1	Pass/Fail Result shows the mask test result 0:Pass, 1:Fail, –1:Not tested
2	Burst Amplitude The mean power (in dBm) across the useful part of the selected burst
3	Maximum Amplitude The peak amplitude of the specified region around the burst in dBm
4	Minimum Amplitude The lowest amplitude of the specified region around the burst in dBm

5	1st Error Point of the Burst It shows the first error point where the RF envelope exceeds the PVT mask from the point where the acquisition starts at the frequency, in sample. If the measured waveform is in the mask, it will be –999.0.
6	1st Error Time of the Burst It shows the first error point where the RF envelope exceeds the PVT mask from the slot boundary, in time unit. If the measured waveform is in the mask, it will be –999.0.

Mode	CGSM
Remote Command	`[:SENSe]:CGSM:PVTime:RESult ON|OFF|0|1,…` `[:SENSe]:CGSM:PVTime:RESult?`
Example	CGSM:PVT:RES 1,0,0,0,0,0 CGSM:PVT:RES?
Preset	1,1,1,0,1,1
State Saved	Saved in instrument state.
Instrument S/W Revision	Prior to A.02.00

Meas Preset

Restores all measurement parameters to their default values.

For more information, see the section under the Preset key in the Utility section.

Mode	GSM
Remote Command	`:CONFigure:CGSM`
Example	:CONF:CGSM
Notes	You must be in the GSM mode to use this command. Use INSTrument:SELect to set the mode.
Instrument S/W Revision	Prior to A.02.00

Peak Search

There is no Peak Search functionality implemented for this measurement.

Sweep/Control

There is no Sweep/Control functionality implemented for this measurement.

SPAN X Scale

There is no Span X Scale functionality implemented for this measurement.

Trace/Detector

There is no Trace/Detector functionality implemented for this measurement.

Trigger

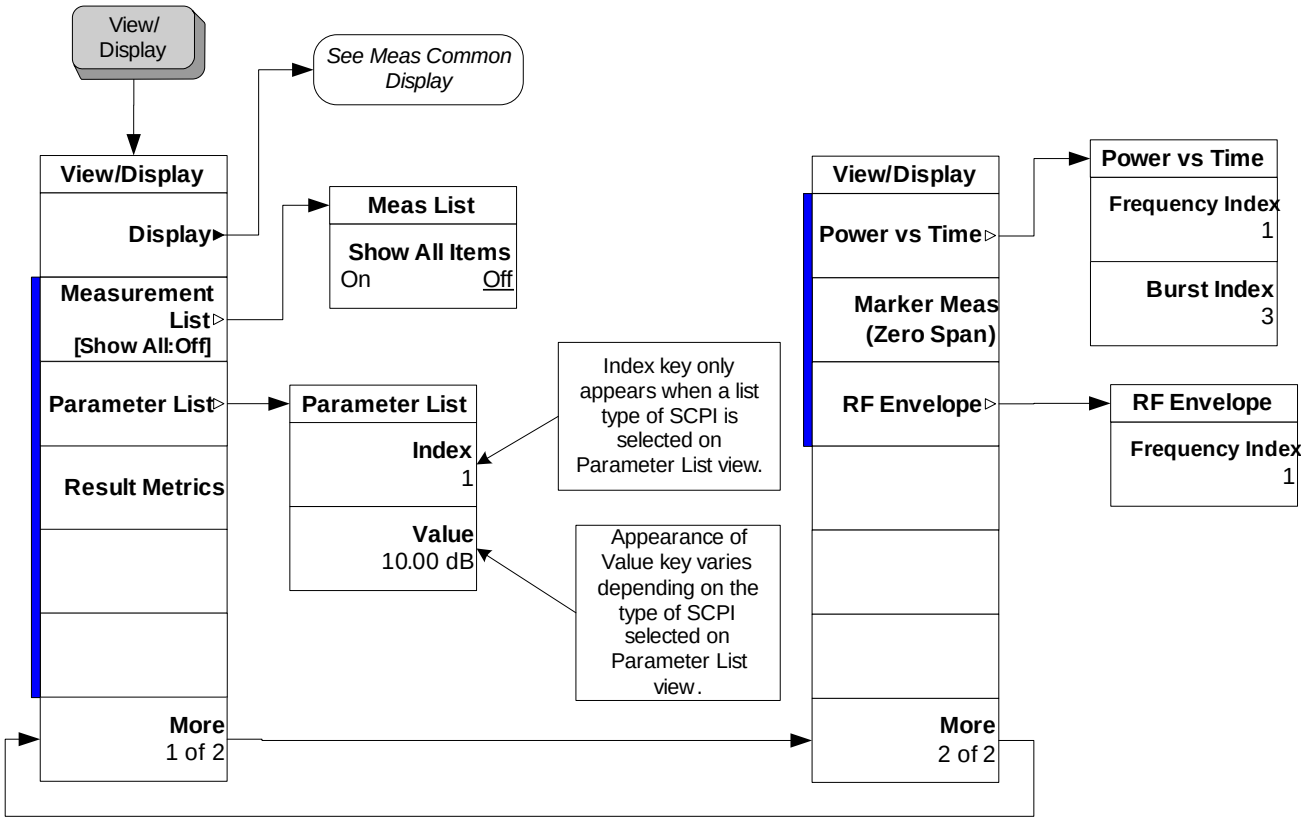
Selects the trigger source and trigger setup functionality. See the “Trigger” section in the EDGE/GSM User's and Programmer's Reference or Help for trigger setup information.

View/Display

The CGSM measurement provides six views:

- “Measurement List view” on page 195
- “Parameter List view” on page 196
- “Parameter List view” on page 196
- “Result Metrics view” on page 197
- “Power vs Time View” on page 198
- “RF Envelope view” on page 200

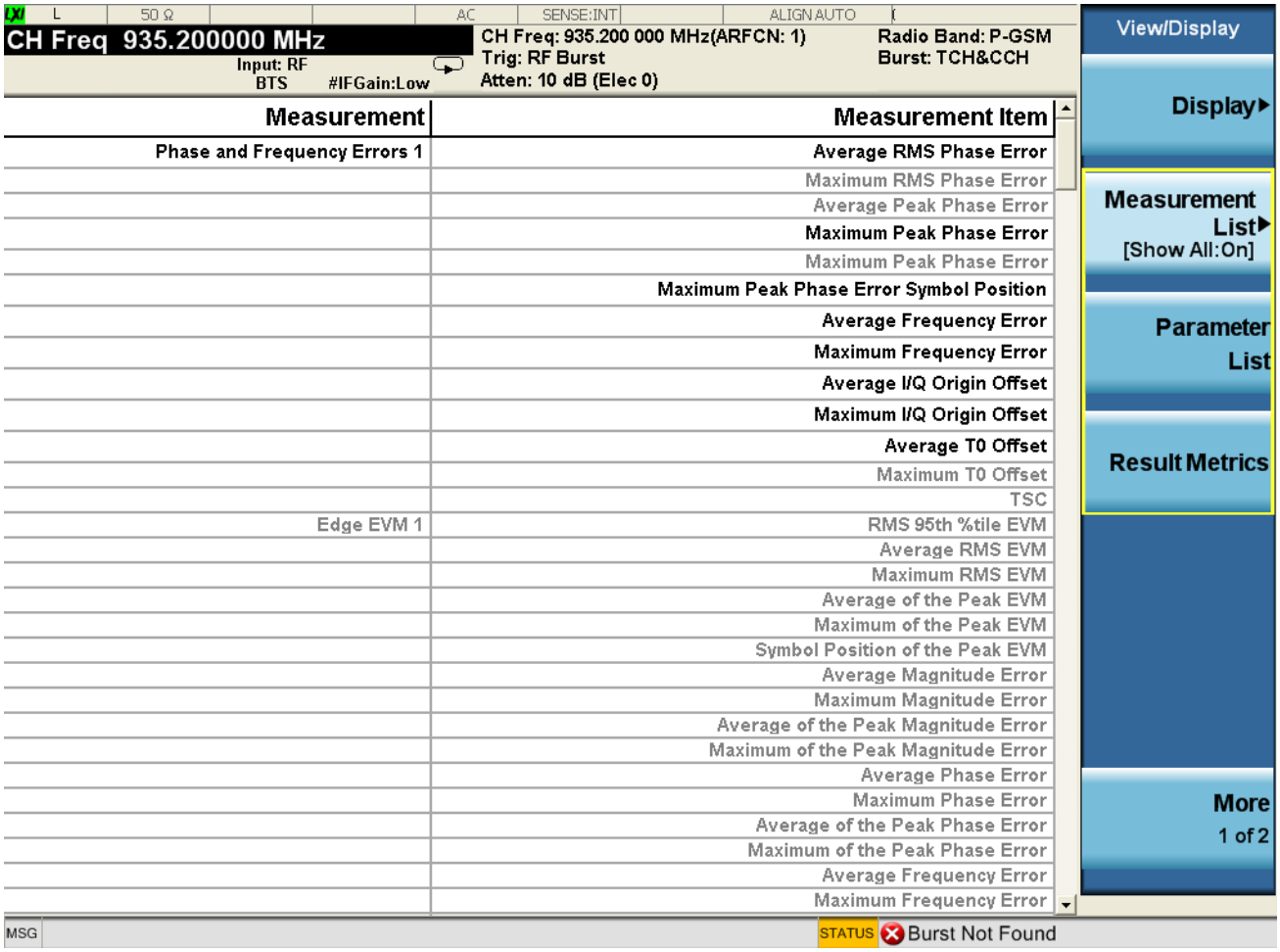
For View-related commands see: “View-Related Commands” on page 200



Measurement List view

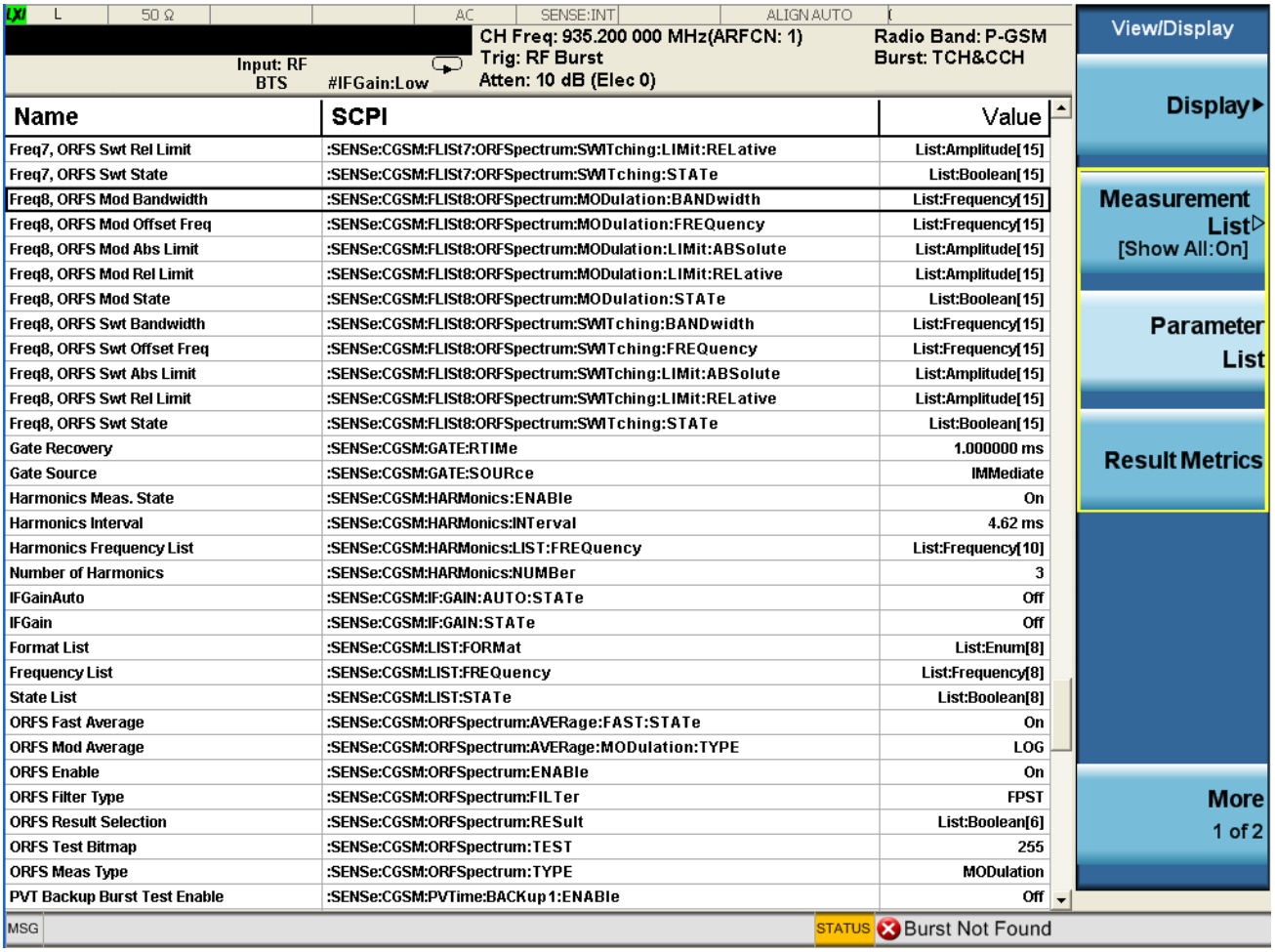
By default, this view shows the current status of enabled measurements and results.

If “Show All Items” parameter is enabled from the soft key, all available measurements and items are displayed. When the measurement is disabled, the measurement name and items which belong to the measurement are grayed out.



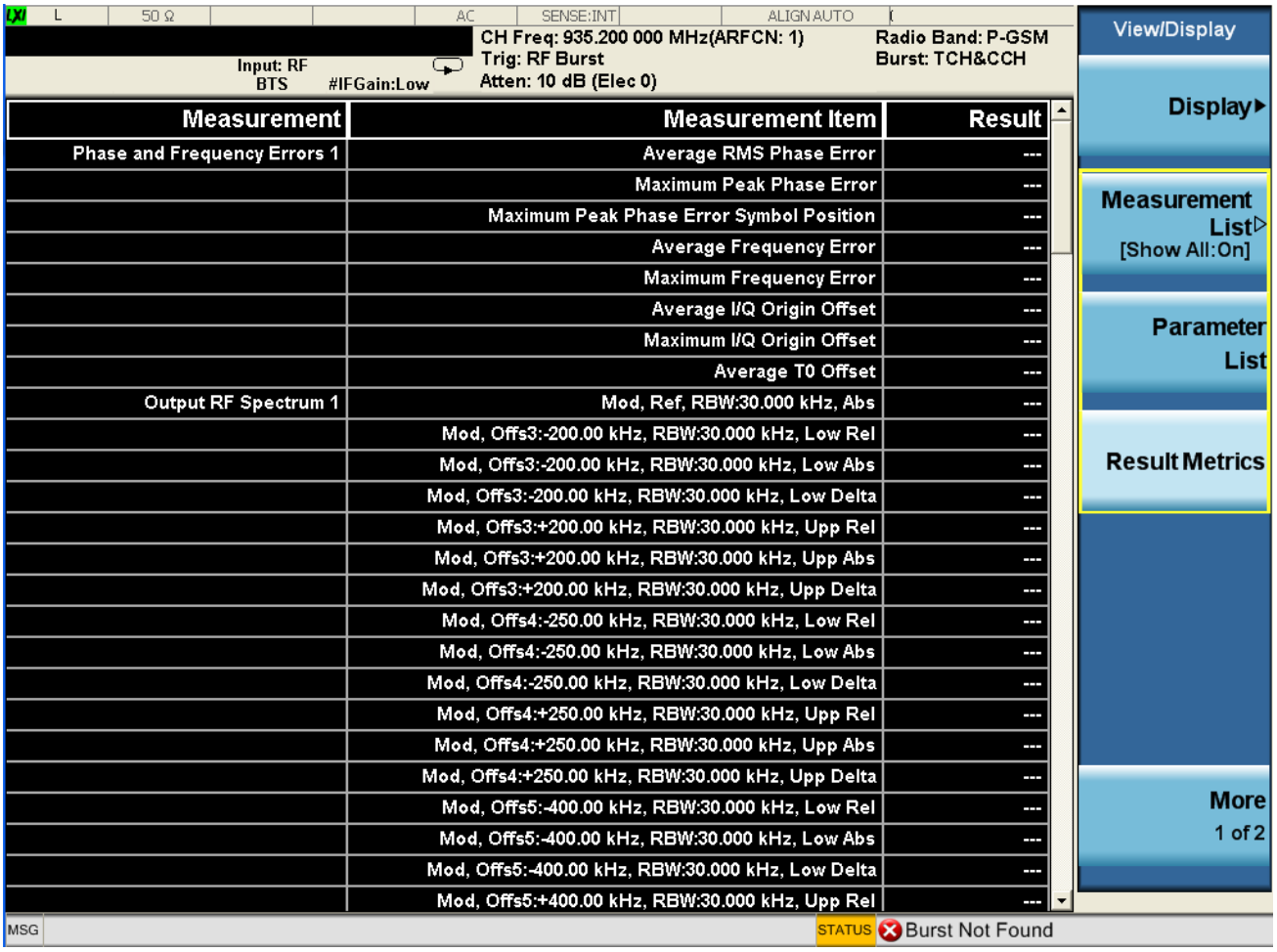
Parameter List view

This view shows name, remote command and value of available commands for this measurement. The user can verify and change values with using menu and front panel keys or by using a mouse and keyboard.



Result Metrics view

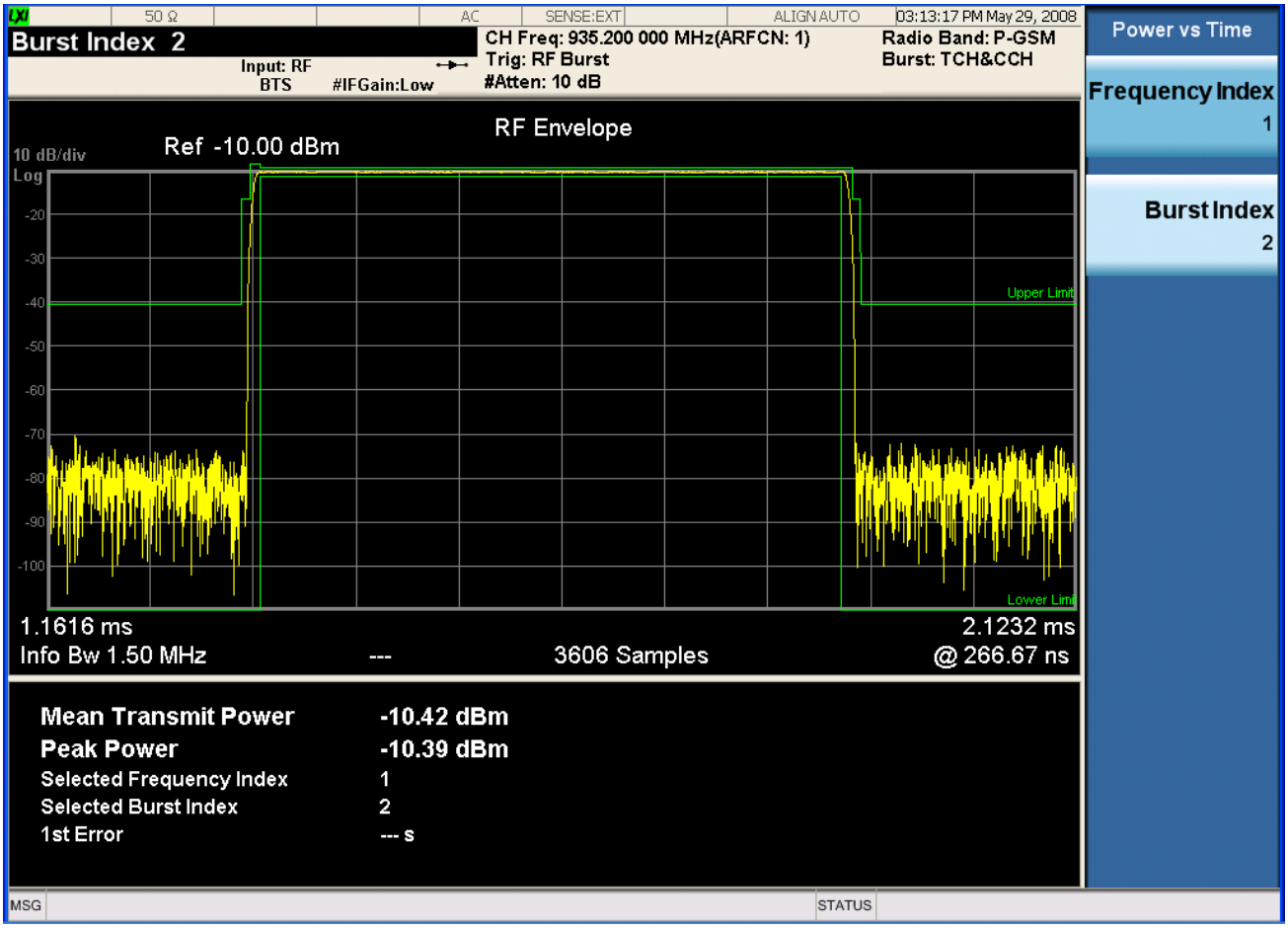
This view shows measurement results in the same order in which remote command measurement results by index (n=1) returns are provided.



Measurement	Measurement Item	Result
Phase and Frequency Errors 1	Average RMS Phase Error	---
	Maximum Peak Phase Error	---
	Maximum Peak Phase Error Symbol Position	---
	Average Frequency Error	---
	Maximum Frequency Error	---
	Average I/Q Origin Offset	---
	Maximum I/Q Origin Offset	---
	Average T0 Offset	---
Output RF Spectrum 1	Mod, Ref, RBW:30.000 kHz, Abs	---
	Mod, Offs3:-200.00 kHz, RBW:30.000 kHz, Low Rel	---
	Mod, Offs3:-200.00 kHz, RBW:30.000 kHz, Low Abs	---
	Mod, Offs3:-200.00 kHz, RBW:30.000 kHz, Low Delta	---
	Mod, Offs3:+200.00 kHz, RBW:30.000 kHz, Upp Rel	---
	Mod, Offs3:+200.00 kHz, RBW:30.000 kHz, Upp Abs	---
	Mod, Offs3:+200.00 kHz, RBW:30.000 kHz, Upp Delta	---
	Mod, Offs4:-250.00 kHz, RBW:30.000 kHz, Low Rel	---
	Mod, Offs4:-250.00 kHz, RBW:30.000 kHz, Low Abs	---
	Mod, Offs4:-250.00 kHz, RBW:30.000 kHz, Low Delta	---
	Mod, Offs4:+250.00 kHz, RBW:30.000 kHz, Upp Rel	---
	Mod, Offs4:+250.00 kHz, RBW:30.000 kHz, Upp Abs	---
	Mod, Offs4:+250.00 kHz, RBW:30.000 kHz, Upp Delta	---
	Mod, Offs5:-400.00 kHz, RBW:30.000 kHz, Low Rel	---
	Mod, Offs5:-400.00 kHz, RBW:30.000 kHz, Low Abs	---
	Mod, Offs5:-400.00 kHz, RBW:30.000 kHz, Low Delta	---
	Mod, Offs5:+400.00 kHz, RBW:30.000 kHz, Upp Rel	---

Power vs Time View

PVT view shows a time-domain magnitude plot with its PVT masks of the selected burst for the selected frequency. The burst and frequency are specified by ‘Burst Index’ and ‘Frequency Index’ respectively. When the indexed burst is not PVT tested, no plot will be shown.

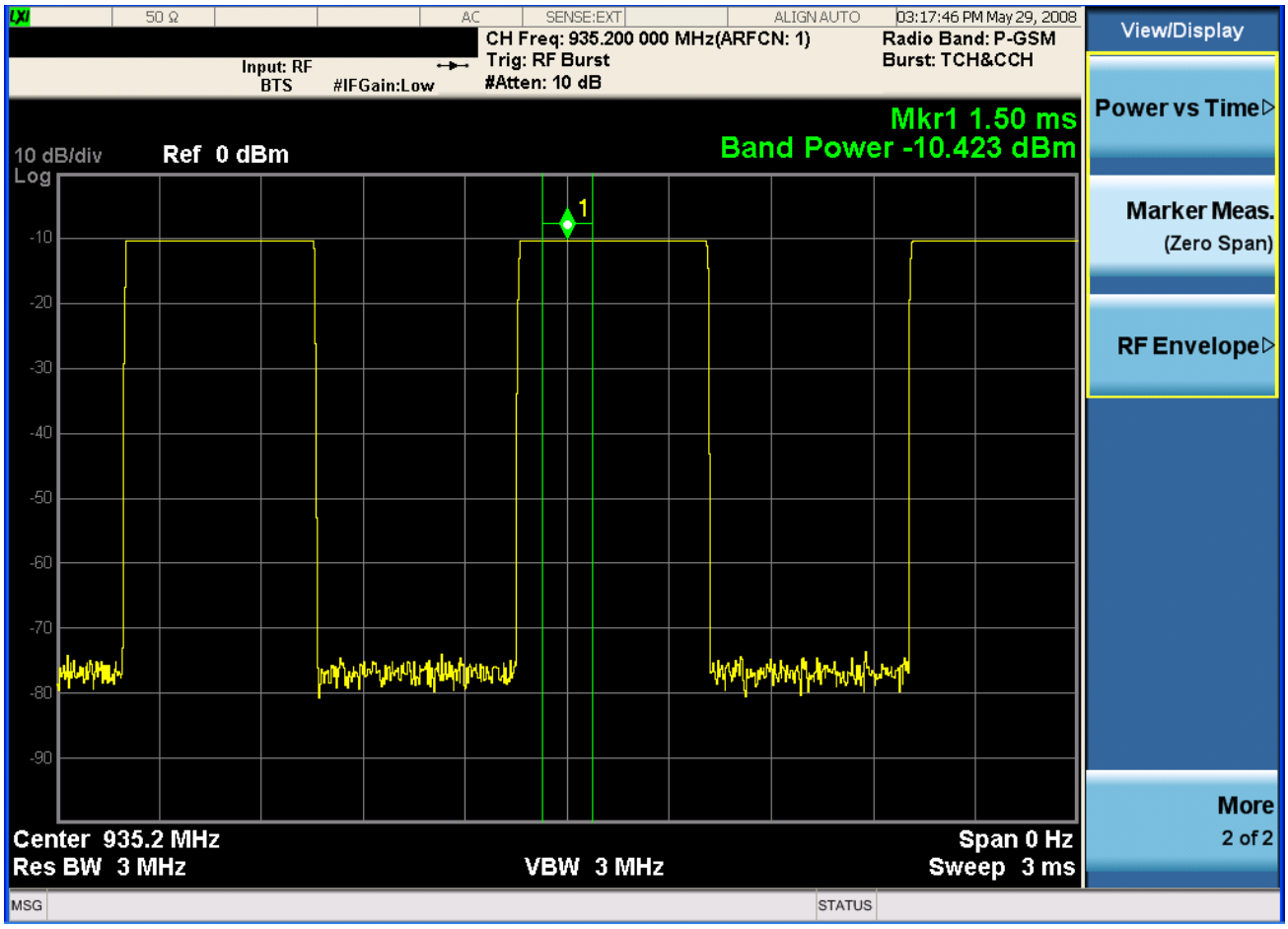


Metrics Window

Name	Corresponding Results	Display Format
Mean Transmit Power	n=1, the location is variable. See "5.1.1 Remote Results"	xx.xx dBm
Peak Power	n=1, the location is variable. See "5.1.1 Remote Results".	xx.xx dBm
Selected Frequency Index	It describes the index of the frequency list.	x
Selected Burst Index	It describes which burst to be shown in the frequency list.	x
1st Error	It describes the first point where the mask test failed. The location is aligned by the slot boundary defined by "5.2.7.3 Start Offset" and "5.2.7.4 Burst Interval".	xx s

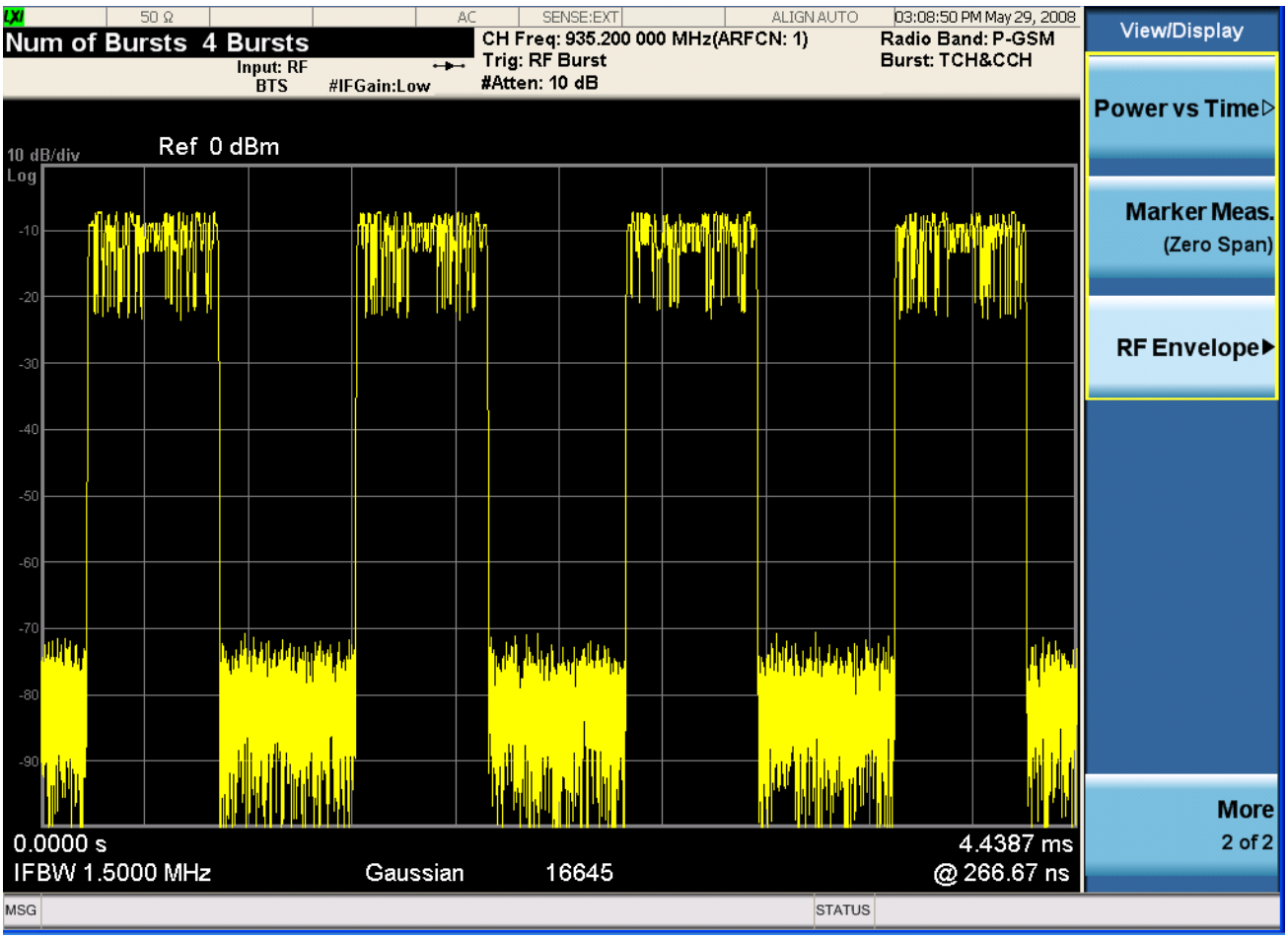
Marker Meas (Zero Span) View

This view shows the trace and markers of Marker Meas (ZSPan).



RF Envelope view

For diagnostic purposes, RF Envelope View shows a time-domain magnitude plot of each frequency. By changing Frequency Index, you can see the plot of the selected frequency. When the frequency list is off (see "Frequency List" on page 164), no plot of the list is shown.



View-Related Commands

View Selection

Allows you to select the desired measurement view from the following selections:

- MLISt – Measurement List view
- PARameter – Parameter List view
- RESult - Result Metrics view
- PVTime - Power vs Time view
- ZSPan – Marker Meas (Zero Span) view
- RFENvelope - RF Envelope view

•

Key Path	**View/Display**
Mode	GSM
Remote Command	`:DISPlay:CGSM:VIEW[:SELect] MLISt|PARameter|RESult|PVTime|ZSPan|RFENvelope` `:DISPlay:CGSM:VIEW[:SELect]?`
Example	DISP:CGSM:VIEW RES DISP:CGSM:VIEW?
Preset	RESult
State Saved	Saved in instrument state.
Range	Measurement List|Parameter, List|Result Metrics||Power vs Time|Marker Meas|RF Envelope
Instrument S/W Revision	Prior to A.02.00

Show All Items

Allows you to specify display settings of the Measurement List view. In default (OFF), the current status of enabled measurements, items are displayed.

Key Path	**View/Display, Measurement List**
Mode	GSM
Preset	OFF
State Saved	Saved in instrument state.
Range	On|Off
Instrument S/W Revision	Prior to A.02.00

Index

Allows you to specify an index of array for editing the value of specified index. This key only appears when a list type of “SCPI” is selected on Parameter List view. Maximum number of this index corresponds to the length of selected SCPI.

Key Path	**View/Display, Parameter List**
Mode	GSM
Instrument S/W Revision	Prior to A.02.00

Value

Allows you to edit the value of the selected SCPI function in the Parameter List view.

Key Path	**View/Display, Parameter List**
Mode	GSM
Instrument S/W Revision	Prior to A.02.00

Frequency Index (for RF Envelope and PVT)

Frequency Index specifies which frequency index result is plotted on the display. If the state of the index is off, it shows nothing.

Key Path	**View/Display, RF Envelope or Power vs Time**
Mode	CGSM
Remote Command	`:DISPlay:CGSM:VIEW:FREQuency <integer>` `:DISPlay:CGSM:VIEW:FREQuency?`
Example	DISP:CGSM:VIEW:FREQ 2 DISP:CGSM:VIEW:FREQ?
Notes	If the selected frequency index isn't active, no meaningful result will be shown.
Preset	1
State Saved	Saved in instrument state.
Min	1
Max	8
Instrument S/W Revision	Prior to A.02.00

Burst Index (for Power vs Time)

Burst Index specifies which bursts index's result is plotted on the display. If the state of the burst of the frequency is off, it shows nothing.

Key Path	**View/Display, Power vs Time**
Mode	CGSM
Remote Command	`:DISPlay:CGSM:VIEW:BURSt <integer>` `:DISPlay:CGSM:VIEW:BURSt?`
Example	DISP:CGSM:VIEW:BURS 2 DISP:CGSM:VIEW:BURS?
Notes	If the selected burst index isn't active, no meaningful result will be shown.

Preset	1
State Saved	Saved in instrument state.
Min	1
Max	16
Instrument S/W Revision	Prior to A.02.00

Change Title

Accesses an Alpha Editor menu that enables you to write a title across the top of the display.

See the “View/Display” section of the EDGE/GSM User's and Programmer's Reference or Help for details.

Key Path	**View/Display, Display, Title**
Mode	GSM
Remote Command	`:DISPlay:CGSM:ANNotation:TITLe:DATA <string>` `:DISPlay:CGSM:ANNotation:TITLe:DATA?`
Example	DISP:CGSM:ANN:TITL:DATA “Agilent” DISP:CGSM:ANN:TITL:DATA?
Preset	Combined GSM/EDGE
State Saved	Saved in instrument state.
Range	Uppercase, Lowercase, Numeric, Symbol
Instrument S/W Revision	Prior to A.02.00

6 List Power Step Measurement

List Power Step is a fast measurement that performs multiple sweeps using the zero span method using listed frequency, electric attenuator and sweep points settings. The settings are accessed sequentially and make a trace from the multiple sweeps.

List Power Step

NOTE: List Power Step measurement results may be queried remotely by SCPI (see below) or via results displays.

For more information see:

“Result Metrics” on page 244 for the List Power Step measurement

and

“RF Envelope” on page 245 for the RF Envelope measurement

Key Path	**Meas**
Instrument S/W Revision	Prior to A.02.00

Remote Commands

```
:CONFigure:LPSTep
:CONFigure:LPSTep:NDEFault
:INITiate:LPSTep
:FETCh:LPSTep[n]?
:MEASure:LPSTep[n]?
:READ:LPSTep[n]?
```

Remote Results

n	Results Returned

not specified or n = 1	Returns the following scalar results: Sample Interval is a floating point number representing the time between samples when using the trace queries (n=2). Mean Power is the mean power (in dBm). This is the power across the entire trace. If averaging is on, the power is for the latest acquisition. Mean Power Averaged is the power (in dBm) for N averages, if averaging is on. This is the power across the entire trace. If averaging is on, the power is for the latest acquisition. If averaging is off, the value of the mean power averaged is the same as the value of the mean power. Sweep Points is the number of data points in the swept signal. This number is useful when performing a query on the signal (i.e. when n=2). Peak-to-Mean ratio has units of dB. This is the ratio of the maximum signal level to the mean power. Valid values are only obtained with averaging turned off. If averaging is on, the peaktomean ratio is calculated using the highest peak value, rather than the displayed average peak value. Maximum value is the maximum of the most recently acquired data (in dBm). 1. Minimum value is the minimum of the most recently acquired data (in dBm).
n = 2	Returns trace point values of the entire captured signal envelope trace data. These data points are floating point numbers representing the power of the signal (in dBm). There are N data points, where N is the sweep points. The period between the samples is defined by the sample interval.

Calculate Results (Query Only)

Return power results of the selected sweep. The calculated period is specified with Calculation Time Setup.

Mode	WCDMA, GSM
Remote Command	`:CALCulate:LPSTep:LIST[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16|17|18|19|20|21|22|23|24|25|26|27|28|29|30|31|32|33|34|35|36|37|38|39|40|41|42|43|44|45|46|47|48|49|50?[RMS]|MAXimum|MINimum`
Example	CALC:LPST:LIST2? MAX

Notes	Query only command For obtaining results efficiently, it is recommended to query this result when analyzer is not sweeping during query. It is generally advisable to be in Single Sweep. ex) Here is a sequence: INIT:CONT 0 Set Parameter INIT *OPC? CALC:LPST:LIST?
Instrument S/W Revision	Prior to A.02.00

Amplitude (AMPTD) Y Scale

Accesses the AMPTD Y Scale menu that allows you to set desired vertical scale settings.

See “AMPTD Y Scale” section for more information.

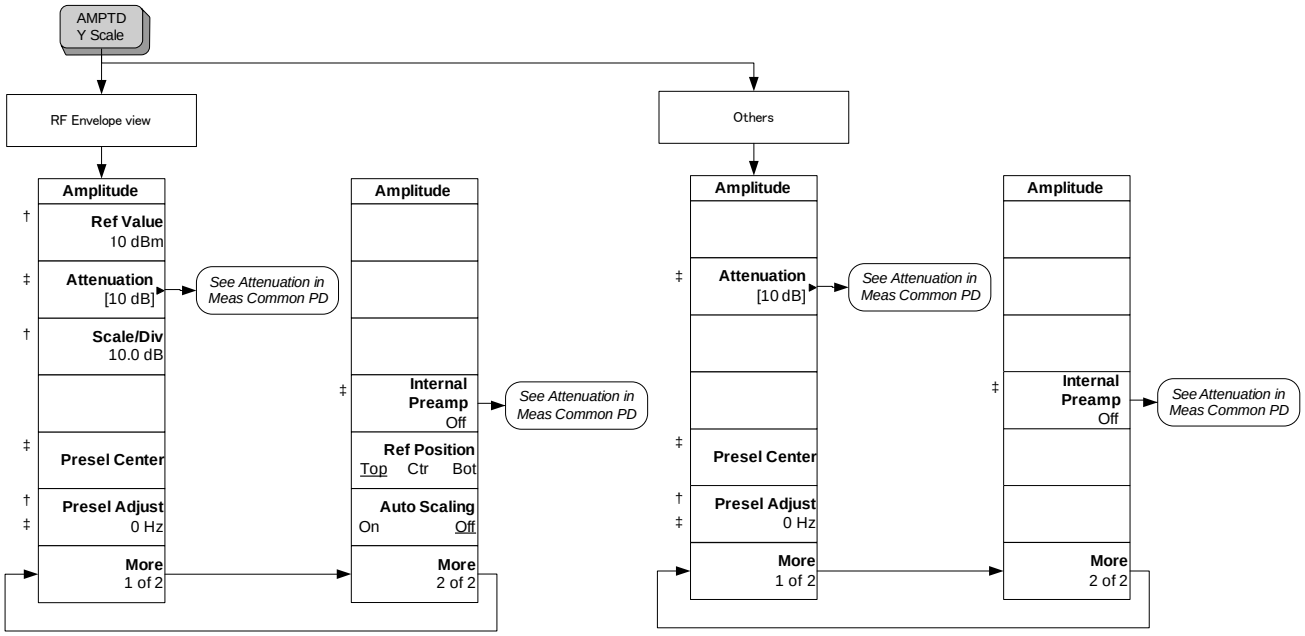


Figure 4-1 AMPTD Y Scale

Ref Value

Sets the absolute power reference.

Key Path	**AMPTD Y Scale**
Mode	WCDMA, GSM
Remote Command	`:DISPlay:LPSTep:VIEW[1]:WINDow[1]:TRACe:Y[:SCALe]:RLEVel <ampl>`
	`:DISPlay:LPSTep:VIEW[1]:WINDow[1]:TRACe:Y[:SCALe]:RLEVel?`
Example	DISP:LPST:VIEW:WIND:TRAC:Y:SCAL:RLEV 5dbm
	DISP:LPST:VIEW:WIND:TRAC:Y:SCAL:RLEV?
Dependencies/Couplings	When Y Auto Scaling is set to On, this value is automatically determined by the measurement result. When you set this value manually, Y Auto Scaling is automatically set to Off.
Preset	10.00
State Saved	Saved in instrument state.

Min	–250.0
Max	250.0
Instrument S/W Revision	Prior to A.02.00

Attenuation

This menu controls both the electrical and mechanical attenuators and their interactions. The value read back on the key in square brackets is the current Total (Elec + Mech) attenuation. When in Pre-Adjust for Min Clip mode, this value can change at the start of every measurement.

See Attenuation under the AMPTD Y Scale section of the User's and Programmer's reference or Help for your application for more information.

Scale/Div

Allows you to enter a numeric value to change vertical display sensitivity.

Key Path	**AMPTD Y Scale**
Mode	WCDMA, GSM
Remote Command	`:DISPlay:LPSTep:VIEW[1]:WINDow[1]:TRACe:Y[:SCALe]:PDIVision <rel_ampl>`
	`:DISPlay:LPSTep:VIEW[1]:WINDow[1]:TRACe:Y[:SCALe]:PDIVision?`
Example	DISP:LPST:VIEW:WIND:TRAC:Y:SCAL:PDIV 10dB
	DISP:LPST:VIEW:WIND:TRAC:Y:SCAL:PDIV?
Dependencies/Couplings	When the Y Auto Scaling is set to On, this value is automatically determined by the measurement result. When you set a value manually, Y Auto Scaling is automatically set to Off.
Preset	10.00 dB
State Saved	Saved in instrument state.
Min	0.1 dB
Max	20.00 dB
Instrument S/W Revision	Prior to A.02.00

Presel Center

When this key is pressed, the centering of the preselector filter is adjusted to optimize the amplitude accuracy at the frequency of the selected marker.

See Presel Center under the AMPTD Y Scale section of the User's and Programmer's reference or Help for your application for more information.

Presel Adjust

Allows you to manually adjust the preselector filter frequency to optimize its response to

the signal of interest. This function is only available when Presel Center is available

See Presel Adjust under the AMPTD Y Scale section of the User's and Programmer's reference or Help for your application for more information.

Internal Preamp

This menu controls the internal preamplifier. Turning Internal Preamp on gives a better noise figure, but a poorer inter-modulation distortion (TOI) to noise floor dynamic range. You can optimize this setting for your particular measurement. See Internal Preamp under the AMPTD Y Scale section of the User's and Programmer's reference or Help for your application for more information.

Ref Position

Allows you to set the display reference position to the top, center, or bottom of the display.

Key Path	**AMPTD Y Scale, More**
Mode	WCDMA, GSM
Remote Command	`:DISPlay:LPSTep:VIEW[1]:WINDow[1]:TRACe:Y[:SCALe]:RPOSition TOP|CENTer|BOTTom`
	`:DISPlay:LPSTep:VIEW[1]:WINDow[1]:TRACe:Y[:SCALe]:RPOSition?`
Example	DISP:LPST:VIEW:WIND:TRAC:Y:SCAL:RPOS CENT
	DISP:LPST:VIEW:WIND:TRAC:Y:SCAL:RPOS?
Preset	TOP
State Saved	Saved in instrument state.
Range	Top|Ctr|Bot
Instrument S/W Revision	Prior to A.02.00

Auto Scaling

Allows you to toggle the Y axis Auto Scaling function between On and Off.

Key Path	**AMPTD Y Scale, More**
Mode	WCDMA, GSM
Remote Command	`:DISPlay:LPSTep:VIEW[1]:WINDow[1]:TRACe:Y[:SCALe]:COUPle 0|1|OFF|ON`
	`:DISPlay:LPSTep:VIEW[1]:WINDow[1]:TRACe:Y[:SCALe]:COUPle?`

Example	DISP:LPST:VIEW:WIND:TRAC:Y:COUP 0 DISP:LPST:VIEW:WIND:TRAC:Y:COUP?
Dependencies/Couplings	When Auto Scaling is On, and you press the Restart front-panel key, this function automatically determines the scale per division and reference values based on the measurement results. When you manually set a value for the Y Rel Value or Y Scale/Div, this parameter is automatically set to Off.
Preset	OFF
State Saved	Saved in instrument state.
Range	On|Off
Instrument S/W Revision	Prior to A.02.00

Auto Couple

For Auto Couple information see the User's and Programmer's reference or Help for your application.

BW

Allows you to control the Information Bandwidth and Video Bandwidth functions of the instrument.

Info BW

Enables you to manually set the information bandwidth of the analyzer.

Mode	WCDMA, GSM
Remote Command	`[:SENSe]:LPSTep:BANDwidth[:RESolution] <freq>`
	`[:SENSe]:LPSTep:BANDwidth[:RESolution]?`
Example	LPST:BAND 10
	LPST:BAND?
Notes	You must be in the GSM or WCDMA mode to use this command. Use INSTrument:SELect to set the mode.
Preset	1MHz
State Saved	Saved in instrument state.
Min	10 Hz
Max	8 MHz
Instrument S/W Revision	Prior to A.02.00

Filter Type

Selects the type of bandwidth filter that is used. The choices are Gaussian or Flat top.

Mode	WCDMA, GSM
Remote Command	`[:SENSe]:LPSTep:BANDwidth:SHAPe GAUSsian|FLATtop`
	`[:SENSe]:LPSTep:BANDwidth:SHAPe?`
Example	LPST:BAND:SHAP FLAT
	LPST:BAND:SHAP?
Preset	GAUS
State Saved	Saved in instrument state.
Range	Gaussian|Flattop
Instrument S/W Revision	Prior to A.02.00

Video BW

Allows you to change the analyzer post-detection filter (VBW).

Mode	WCDMA, GSM
Remote Command	`[:SENSe]:LPSTep:BANDwidth:VIDeo <freq>`
	`[:SENSe]:LPSTep:BANDwidth:VIDeo?`
Example	LPST:BAND:VID 1MHz
	LPST:BAND:VID?
Preset	1MHz
State Saved	Saved in instrument state.
Min	1Hz
Max	50MHz
Instrument S/W Revision	Prior to A.02.00

FREQ Channel

For FREQuency Channel information see the User's and Programmer's reference or Help for your application.

Input/Output

For Input/Output information see the User's and Programmer's reference or Help for your application.

Marker

There are no Markers implemented for this measurement.

Marker Fctn (Function)

There are no Marker Functions implemented for this measurement.

Marker > (Marker To)

There is no Marker To functionality implemented for this measurement.

Meas Setup

Avg/Hold Num

Sets the number of data acquisitions that will be averaged. After the specified number of average counts, the average mode (termination control) setting determines the average action.

Mode	WCDMA, GSM
Remote Command	`[:SENSe]:LPSTep:AVERage:COUNt <integer>`
	`[:SENSe]:LPSTep:AVERage:COUNt?`
	`[:SENSe]:LPSTep:AVERage[:STATe] OFF|ON|0|1`
	`[:SENSe]:LPSTep:AVERage[:STATe]?`
Example	LPST:AVER:COUN 3
	LPST:AVER:COUN?
	LPST:AVER ON
	LPST:AVER?
Notes	You must be in the WCDMA or GSM mode to use this command. Use INSTrument:SELect to set the mode.
Dependencies/Couplings	When this value is changed, Avg State is set to On.
Preset	10
	OFF
State Saved	Saved in instrument state.
Min	1
Max	20001
Instrument S/W Revision	Prior to A.02.00

Average Mode

Select the type of termination control used to averaging. This determines the averaging action after the specified number of data acquisitions (average count) is reached.

Mode	WCDMA, GSM
Remote Command	`[:SENSe]:LPSTep:AVERage:TCONtrol EXPonential|REPeat`
	`[:SENSe]:LPSTep:AVERage:TCONtrol?`
Example	LPST:AVER:TCON REP
	LPST:AVER:TCON?

Notes	EXPonential - When Measure is set at Cont, data acquisitions will continue indefinitely. After N averages, exponential averaging is used with a weighting factor of N (the displayed average count stops at N). Exponential averaging weights new data more than old data, which allows tracking of slow-changing signals. The weighting factor N is set using the Averages, Avg Bursts key. REPeat - When Measure is set at Cont, data acquisitions will continue indefinitely. After N averages is reached, all previous result data is cleared and the average count is set back to 1. This is equivalent to being in Measure Single and pressing the Restart key when the Single measurement finishes.
Preset	EXPonential
State Saved	Saved in instrument state.
Instrument S/W Revision	Prior to A.02.00

Average Type

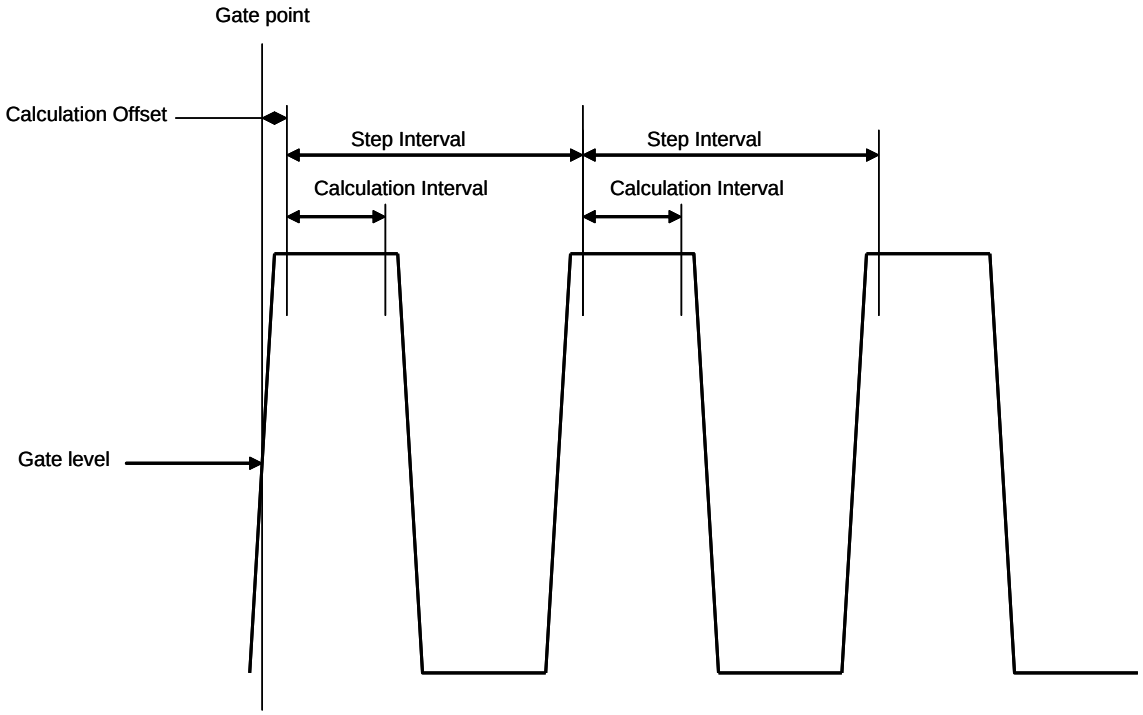
Specifies the type of trace and result averaging to use.

This parameter is valid only for Measure Trace.

Mode	WCDMA, GSM
Remote Command	`[:SENSe]:LPSTep:AVERage:TYPE LOG|RMS` `[:SENSe]:LPSTep:AVERage:TYPE?`
Example	LPST:AVER:TYPE LOG LPST:AVER:TYPE?
Notes	LOG - simulates the traditional spectrum analyzer type of averaging by averaging the log of the power. RMS - true power averaging that is equivalent to taking the RMS value of the voltage. It is the most accurate type of averaging.
Preset	RMS
State Saved	Saved in instrument state.
Instrument S/W Revision	Prior to A.02.00

Calculation Time Setup

Specify the period to be calculated for the swept trace.



Step Interval

Step Interval is a real number in seconds. It defines the beginning of the next field of trace elements to be calculated. This is relative to the beginning of the previous field.

Mode	WCDMA, GSM
Remote Command	`[:SENSe]:LPSTep:SWEep:STEP:TIME <time>`
	`[:SENSe]:LPSTep:SWEep:STEP:TIME`
Example	LPST:SWE:STEP:TIME 0.001
	LPST:SWE:STEP:TIME?
Preset	500 us
State Saved	Saved in instrument state.
Min	1 ns
Max	1s
Instrument S/W Revision	Prior to A.02.00

Calculation Offset

Calculation Offset is a real number in seconds. It specifies the amount of data points at the beginning of the gated sweep that will be ignored before the calculation process starts.

Mode	WCDMA, GSM

Remote Command	`[:SENSe]:LPSTep:LIST:SWEep:STEP:OFFSet <time>, …`
	`[:SENSe]:LPSTep:LIST:SWEep:STEP:OFFSet?`
Example	LPST:LIST:SWE:STEP:OFFS 0.00005,0.00005
	LPST:LIST:SWE:STEP:OFFS?
Preset	0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0, 0,0,0,0,0,0,0,0,0
State Saved	Saved in instrument state.
Min	0 s
Max	1 s
Instrument S/W Revision	Prior to A.02.00

Calculation Interval

Calculation Interval is a real number in seconds. It defines how much data points will be calculated into one value.

Mode	WCDMA, GSM
Remote Command	`[:SENSe]:LPSTep:SWEep:STEP:LENGth <time>`
	`[:SENSe]:LPSTep:SWEep:STEP:LENGth?`
Example	LPST:SWE:STEP:LENG 0.00004
	LPST:SWE:STEP:LENG?
Preset	250 us
State Saved	Saved in instrument state.
Min	1 ns
Max	1 s
Instrument S/W Revision	Prior to A.02.00

List Setup

Number of Steps

Allows you to set the number of periods to be calculated in a sweep.

Mode	WCDMA, GSM
Remote Command	`[:SENSe]:LPSTep:LIST:STEP <integer>, …`
	`[:SENSe]:LPSTep:LIST:STEP?`

Example	LPST:LIST:STEP 10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10,10 ,10,10,10,10,10 LPST:LIST:STEP?
Preset	1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1, 1,1,1,1,1,1,1,1,1
State Saved	Saved in instrument state.
Min	1
Max	100
Instrument S/W Revision	Prior to A.02.00

Sweep State

The command defines a list of state at which the sweep is made.

Mode	WCDMA, GSM

Remote Command	`[:SENSe]:LPSTep:LIST:STATe ON|OFF|1|0, …`
	
	`[:SENSe]:LPSTep:LIST:STATe?`

Example	LPST:LIST:STAT 1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0, 0,0,0,0,0,0,0,0,0 LPST:LIST:STAT?
Notes	The state of the first list doesn’t change to OFF|0.
Preset	1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0, 0,0,0,0,0,0,0,0,0
State Saved	Saved in instrument state.
Instrument S/W Revision	Prior to A.02.00

Sweep Frequency

The command defines a list of center frequencies at which the sweep is made.

Mode	WCDMA, GSM

Remote Command	`[:SENSe]:LPSTep:LIST:FREQuency <freq>, …`
	
	`[:SENSe]:LPSTep:LIST:FREQuency?`

Example	LPST:LIST:FREQ 1e9, 2e9, 3e9 LPST:LIST:FREQ?

Notes	The 'Center Frequency' setting under "Freq / Channel' front panel key or [:SENSe]:FREQuency:CENTer overwrites the first frequency in this list. Any values less than 3.6GHz can be set. Note that when Sweep E-ATT has a cycle consisting of n values, then the same Sweep Frequency should be repeated n times. [Example of the combination of Sweep Frequency and E-ATT] N=1 (No cycle) Sweep Frequency 1GHz, 1.5GHz, 2GHz, 2.5GHz, 3GHz, 3.5GHz Sweep E-ATT 20, 20, 20, 20, 20, 20 N=3 cycle Sweep Frequency 1GHz, 1GHz, 1GHz, 2GHz, 2GHz, 2GHz, 3GHz, 3GHz, 3GHz Sweep E-ATT 20, 0, 20, 20, 0, 20, 20, 0, 20 N=5 cycle Sweep Frequency 1GHz, 1GHz, 1GHz, 1GHz, 1GHz, 2GHz, 2GHz, 2GHz, 2GHz, 2GHz Sweep E-ATT 20, 0, 20, 20, 0, 20, 0, 20, 20, 0 N=10 cycle Sweep Frequency 1GHz, 1GHz, 1GHz, 1GHz, 1GHz, 1GHz, 1GHz, 1GHz, 1GHz, 1GHz, 2GHz, 2GHz, 2GHz, 2GHz, 2GHz, 2GHz, 2GHz, 2GHz, 2GHz, 2GHz Sweep E-ATT 20, 0, 20, 0, 0, 20, 20, 20, 20, 0, 20, 0, 20, 0, 0, 20, 20, 20, 20, 0
Preset	WCDMA: 1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9,1e9 GSM: 935.2MHz,,935.2MHz,,935.2MHz,935.2MHz,935.2MHz,935.2MHz,935.2MHz
State Saved	Saved in instrument state.
Min	–79.999995 MHz
Max	3.6GHz
Instrument S/W Revision	Prior to A.02.00

Sweep Time

This command defines a list of sweep time settings at which the sweep is made.

Mode	WCDMA, GSM
Remote Command	`[:SENSe]:LPSTep:LIST:TIME <time>, …` `[:SENSe]:LPSTep:LIST:TIME?`
Example	LPST:LIST:TIME 10e–4,10e–4 LPST:LIST:TIME?
Preset	10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms,10ms
Min	1us
Max	0.5
Instrument S/W Revision	Prior to A.02.00

Sweep E-ATT

This command defines a list of electric attenuator settings at which the sweep is made. The value must be 0 or 20.

Mode	WCDMA, GSM
Remote Command	`[:SENSe]:LPSTep:LIST:EATTen <rel_ampl>, …` `[:SENSe]:LPSTep:LIST:EATTen`
Example	LPST:LIST:EATT 20,0,20,0,20,0,20,0 LPST:LIST:EATT?
Notes	Either 20dB or 0 dB can be set for each value. When Sweep E-ATT has a cycle consisting of n values, then the same Sweep Frequency should be repeated n times. See examples in Notes of Sweep Frequency.
Preset	20dB,0dB,20dB,0dB
State Saved	Saved in instrument state.
Min	0

Max	20
Instrument S/W Revision	Prior to A.02.00

Gate Source

This command defines a list of gate source settings at which the sweep is made.

Mode	WCDMA, GSM
Remote Command	`[:SENSe]:LPSTep:LIST:GATE:SOURce IMMediate|EXTernal1|EXTernal2|RFBurst|FRAMe, …` `[:SENSe]:LPSTep:LIST:GATE:SOURce?`
Example	LPST:LIST:GATE:SOUR RFB,IMM,RFB,IMM LPST:LIST:GATE:SOUR?
Notes	One or any two types of Gate Sources can be set. When two sources are set, in accordance with the Ns cycle, each combination must include one source and the other repeated Ns–1 times. [Example] No cycle RFB, RFB, RFB,RFB,,, Ns=2 cycle EXT, IMM, EXT, IMM, EXT, IMM, EXT, IMM EXT1, EXT2, EXT1, EXT2, EXT1, EXT2, EXT1, EXT2 Ns=5 cycle RFB, IMM, IMM, IMM, IMM, RFB, IMM, IMM, IMM, IMM
Preset	IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM,IMM
State Saved	Saved in instrument state.
Instrument S/W Revision	Prior to A.02.00

Gate Recovery Time

It defines the recovery time until next sweep starts.

Mode	WCDMA, GSM
Remote Command	`[:SENSe]:LPSTep:LIST:GATE:RTIMe <time>, …` `[:SENSe]:LPSTep:LIST:GATE:RTIMe?`
Example	LPST:LIST:GATE:RTIM 2e–6, 1e–3 LPST:LIST:GATE:RTIM?

Notes	One or any two values can be set. When two values are set, in accordance with the Nr cycle, each combination must include one value repeated Nr–1 times and one another value. [Example] No cycle 2u, 2u, 2u, 2u, 2u, 2u,,, Nr=3 cycle 2u, 2u, 500u, 2u, 2u, 500u, 2u, 2u, 500u Nr=6 cycle 10u, 10u, 10u, 10u, 10u, 100u, 10u, 10u, 10u, 10u, 10u, 100u
Preset	0.5ms,0.5ms
State Saved	Saved in instrument state.
Min	2us
Max	500 ms
Instrument S/W Revision	Prior to A.02.00

IF Gain

IF Gain Auto

Activates the auto rules for IF Gain. When Auto is active, the IF Gain is set to High Gain under the following conditions:

1. The input attenuator is set to 0 dB
2. The preamp is turned On and the frequency range is under 3.6 GHz

For other settings, Auto sets the IF Gain to Low Gain.

Mode	WCDMA, GSM
Remote Command	`[:SENSe]:LPSTep:IF:GAIN:AUTO[:STATe] ON|OFF|1|0` `[:SENSe]:LPSTep:IF:GAIN:AUTO[:STATe]?`
Example	LPST:IF:GAIN:AUTO ON LPST:IF:GAIN:AUTO?
Preset	ON
State Saved	Saved in instrument state.
Range	On|Off

Instrument S/W Revision	Prior to A.02.00

IF Gain State

Selects the range of IF gain.

Mode	WCDMA, GSM
Remote Command	`[:SENSe]:LPSTep:IF:GAIN[:STATe] AUTOrange|LOW|HIGH`
	`[:SENSe]:LPSTep:IF:GAIN[:STATe]?`
Example	LPST:IF:GAIN HIGH
	LPST:IF:GAIN?
Notes	AUTO – slower follows signals
	LOW – best for large signals
	HIGH – best noise level
Preset	AUTOrange
State Saved	Saved in instrument state.
Range	Autorange|Low|High
Instrument S/W Revision	Prior to A.02.00

Meas Preset

Restores all the measurement parameters to their default values.

For more information, see the section under the Preset key in the Utility section.

Mode	WCDMA, GSM
Remote Command	`:CONFigure:LPSTep`
Example	CONF:LPST
Notes	You must be in the WCDMA or GSM mode to use this command. Use INSTrument:SELect to set the mode.
Instrument S/W Revision	Prior to A.02.00

Trigger

For Trigger information see the User's and Programmer's reference or Help for your application.

Sweep/Control

For more Sweep/Control information see the User's and Programmer's reference or Help for your application.

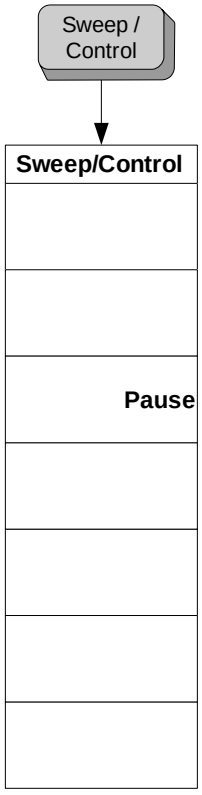


Figure 14-1Sweep/Control

Points

Sets the number of points per sweep, from 1 to 20001. The sweep time and calculation time resolution setting will depend on the number of points selected.

Mode	WCDMA, GSM
Remote Command	`[:SENSe]:LPSTep:SWEep:POINts <integer>`
	`[:SENSe]:LPSTep:SWEep:POINts`
Example	LPST:SWE:POIN 1005
	LPST:SWE:POIN?
Preset	1001
State Saved	Saved in instrument state.
Min	100

Max	20001
Instrument S/W Revision	Prior to A.02.00

Peak Search

There is no Peak Search functionality implemented for this measurement

Source

There is no Source functionality for this application.

SPAN X Scale

Accesses the SPAN/X Scale menu that allows you to set the desired horizontal scale settings.

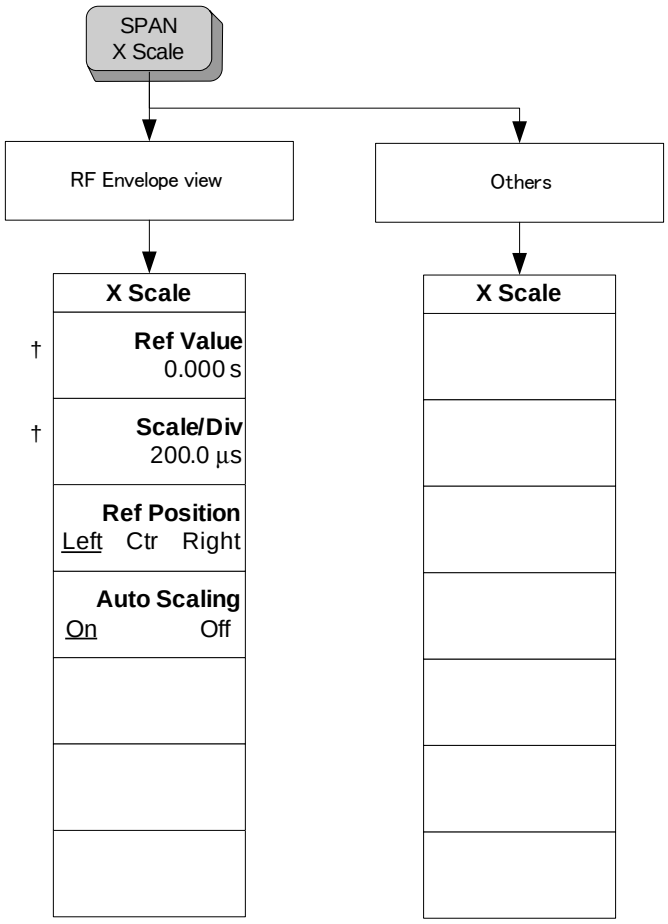


Figure 17-1 SPAN X Scale

Ref Value

Allows you to set the display X reference value.

Key Path	**SPAN X Scale**
Mode	WCDMA, GSM
Remote Command	`:DISPlay:LPSTep:VIEW[1]:WINDow[1]:TRACe:X[:SCALe]:RLEVel <time>`
	`:DISPlay:LPSTep:VIEW[1]:WINDow[1]:TRACe:X[:SCALe]:RLEVel?`
Example	DISP:LPST:VIEW:WIND:TRAC:X:RLEV 1
	DISP:LPST:VIEW:WIND:TRAC:X:RLEV?

Notes	If X Auto Scaling is On, this value is automatically determined by the measurement result. When a value is set manually, X Auto Scaling is automatically set to Off.
Dependencies/Couplings	See Notes
Preset	Automatically calculated
State Saved	Saved in instrument state.
Min	–1s
Max	10s
Instrument S/W Revision	Prior to A.02.00

Scale/Div

Allows you to set the display X scale/division value.

Key Path	**SPAN X Scale**
Mode	WCDMA, GSM
Remote Command	`:DISPlay:LPSTep:VIEW[1]:WINDow[1]:TRACe:X[:SCALe]:PDIVision <time>`
	`:DISPlay:LPSTep:VIEW[1]:WINDow[1]:TRACe:X[:SCALe]:PDIVision?`
Example	DISP:LPST:VIEW:WIND:TRAC:X:PDIV 1ms
	DISP:LPST:VIEW:WIND:TRAC:X:PDIV?
Notes	If X Auto Scaling is set to On, this value is automatically determined by the measurement result. When a value is set manually, X Auto Scaling is automatically set to Off.
Dependencies/Couplings	See Notes
Preset	Automatically calculated
State Saved	Saved in instrument state.
Min	1.00 ns
Max	1.00 s
Instrument S/W Revision	Prior to A.02.00

Ref Position

Allows you to set the X reference position to the left, center, or right of the display.

Key Path	**SPAN X Scale**
Mode	WCDMA, GSM

Remote Command	`:DISPlay:LPSTep:VIEW[1]:WINDow[1]:TRACe:X[:SCALe]:RPOSition LEFT|CENTer|RIGHt`
	`:DISPlay:LPSTep:VIEW[1]:WINDow[1]:TRACe:X[:SCALe]:RPOSition?`
Example	DISP:LPST:VIEW:WIND:TRAC:X:RPOS LEFT
	DISP:LPST:VIEW:WIND:TRAC:X:RPOS?
Preset	LEFT
State Saved	Saved in instrument state.
Range	Left|Ctr|Right
Instrument S/W Revision	Prior to A.02.00

Auto Scaling

Allows you to toggle the X Auto Scaling function between On and Off.

Key Path	**SPAN X Scale**
Mode	WCDMA, GSM
Remote Command	`:DISPlay:LPSTep:VIEW[1]:WINDow[1]:TRACe:X[:SCALe]:COUPle 0|1|OFF|ON`
	`:DISPlay:LPSTep:VIEW[1]:WINDow[1]:TRACe:X[:SCALe]:COUPle?`
Example	DISP:LPST:VIEW:WIND:TRAC:X:COUP OFF
	DISP:LPST:VIEW:WIND:TRAC:X:COUP?
Notes	Upon pressing the Restart front-panel key, or Restart softkey under the Meas Control menu, the scale coupling function automatically determines the scale per division and reference values, based on the measurement results, if this parameter is set to On. When you manually set a value to either X Rel Value or X Scale/Div, X Auto Scaling is automatically set to Off.
Dependencies/Couplings	See Notes
Preset	ON
State Saved	Saved in instrument state.
Range	On|Off
Instrument S/W Revision	Prior to A.02.00

Trace/Detector

For more Trace/Detector information see the User's and Programmer's reference or Help for your application.

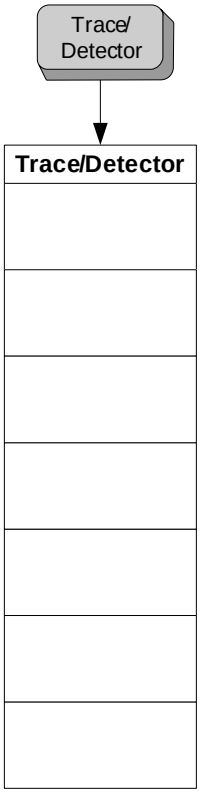


Figure 18-1 Trace/Detector

Detector

Selects a detector.

Mode	WCDMA, GSM
Remote Command	`[:SENSe]:LPSTep:DETector[:FUNCtion] AVERage|NEGative|SAMPle|NORMal|POSitive` `[:SENSe]:LPSTep:DETector[:FUNCtion]?`
Example	LPST:DET NEG LPST:DET?
Preset	AVERage
State Saved	Saved in instrument state.
Instrument S/W Revision	Prior to A.02.00

View Display

The View/Display menu provides access to many settings and results for the List Power Step measurement.

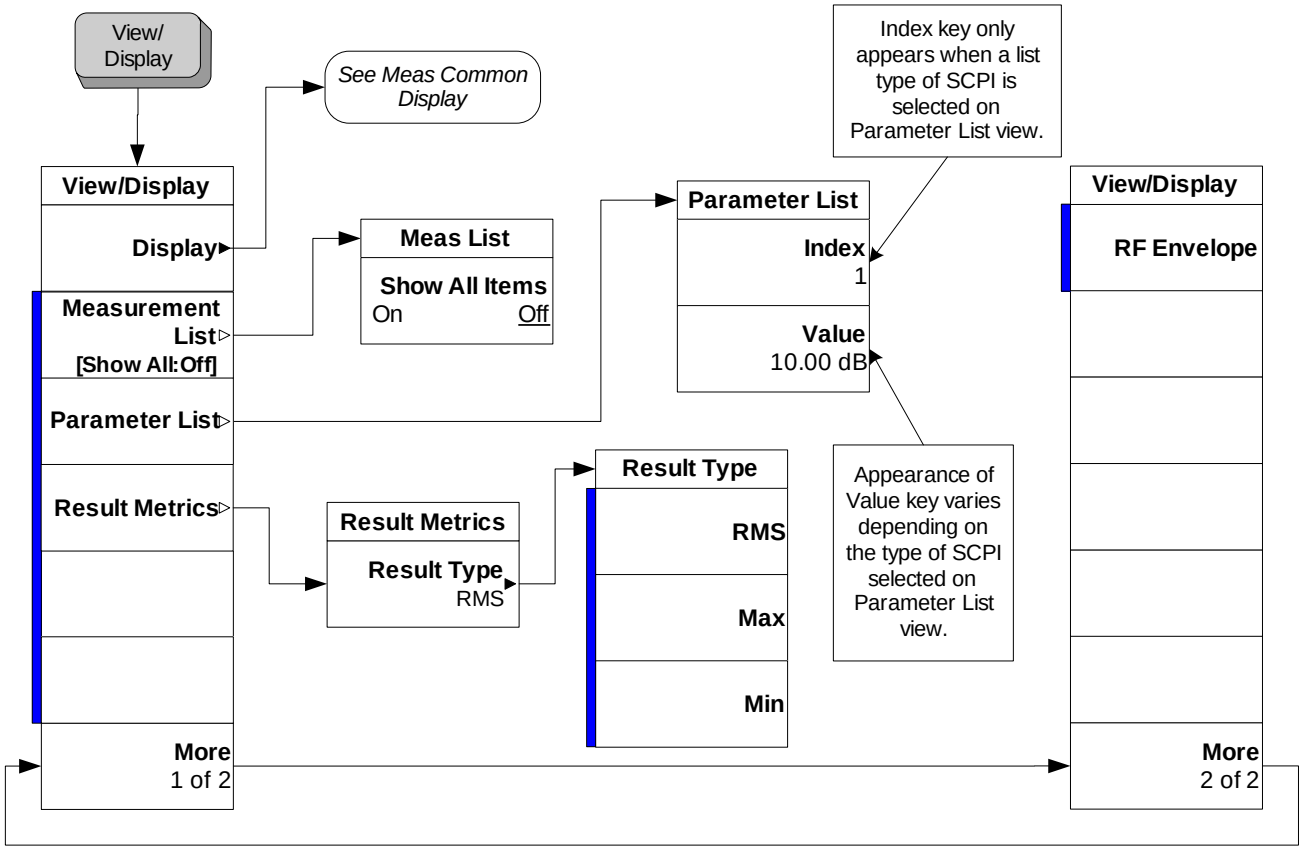


Figure 19-1 View/Display

Display

Change Title

Accesses an Alpha Editor menu that enables you to write a title across the top of the display.

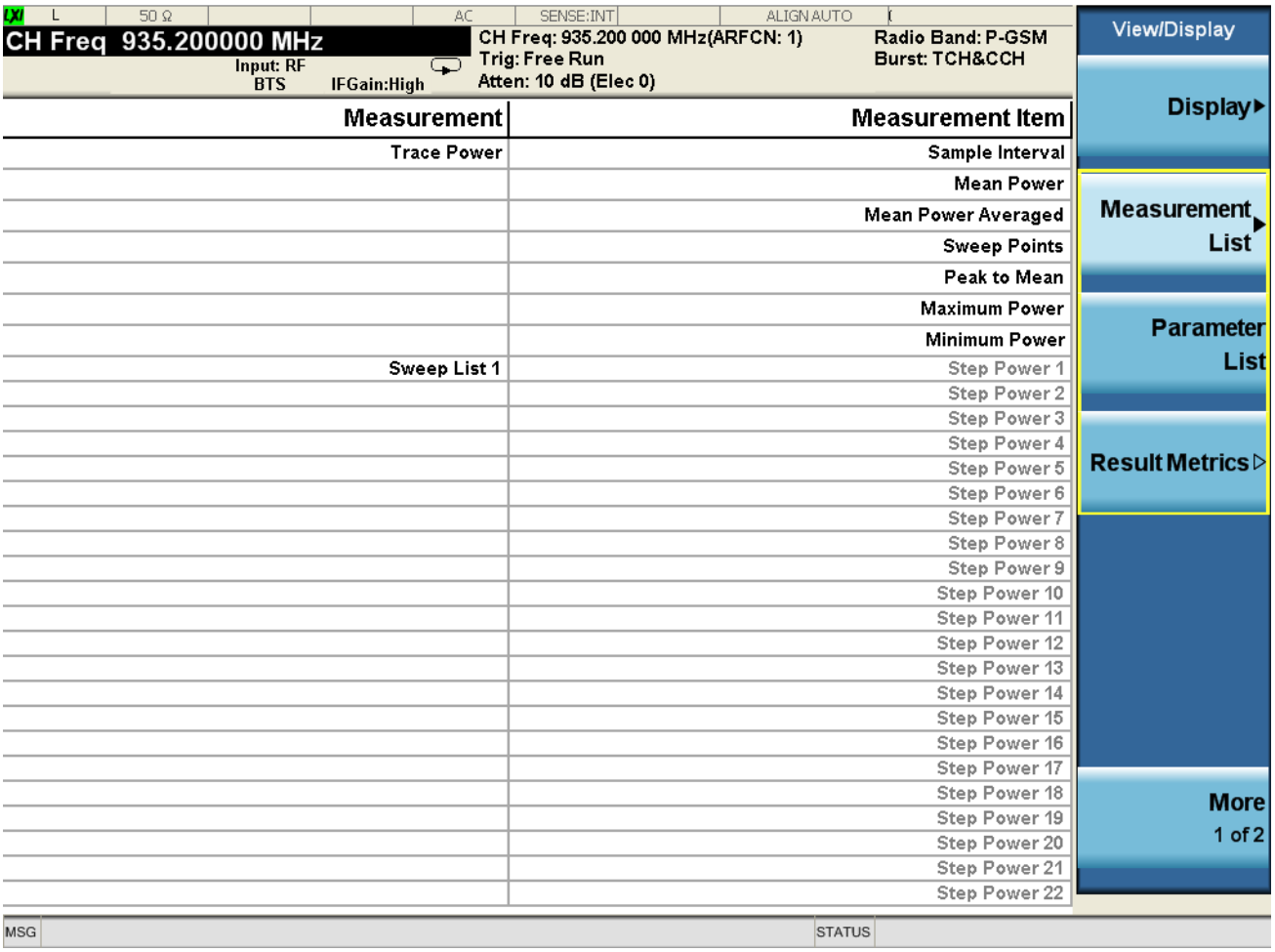
See the “View Display ” section in your mode User's and Programmer's Reference for details.

Key Path	**View/Display, Display, Title**
Mode	WCDMA, GSM
Remote Command	`:DISPlay:LPSTep:ANNotation:TITLe:DATA <string>` `:DISPlay:LPSTep:ANNotation:TITLe:DATA?`
Example	DISP:LPST:ANN:TITL:DATA “List Power Step” DISP:LPST:ANN:TITL:DATA?
Preset	List Power Step
State Saved	Saved in instrument state.
Range	Uppercase, Lowercase, Numeric, Symbol
Instrument S/W Revision	Prior to A.02.00

Measurement List

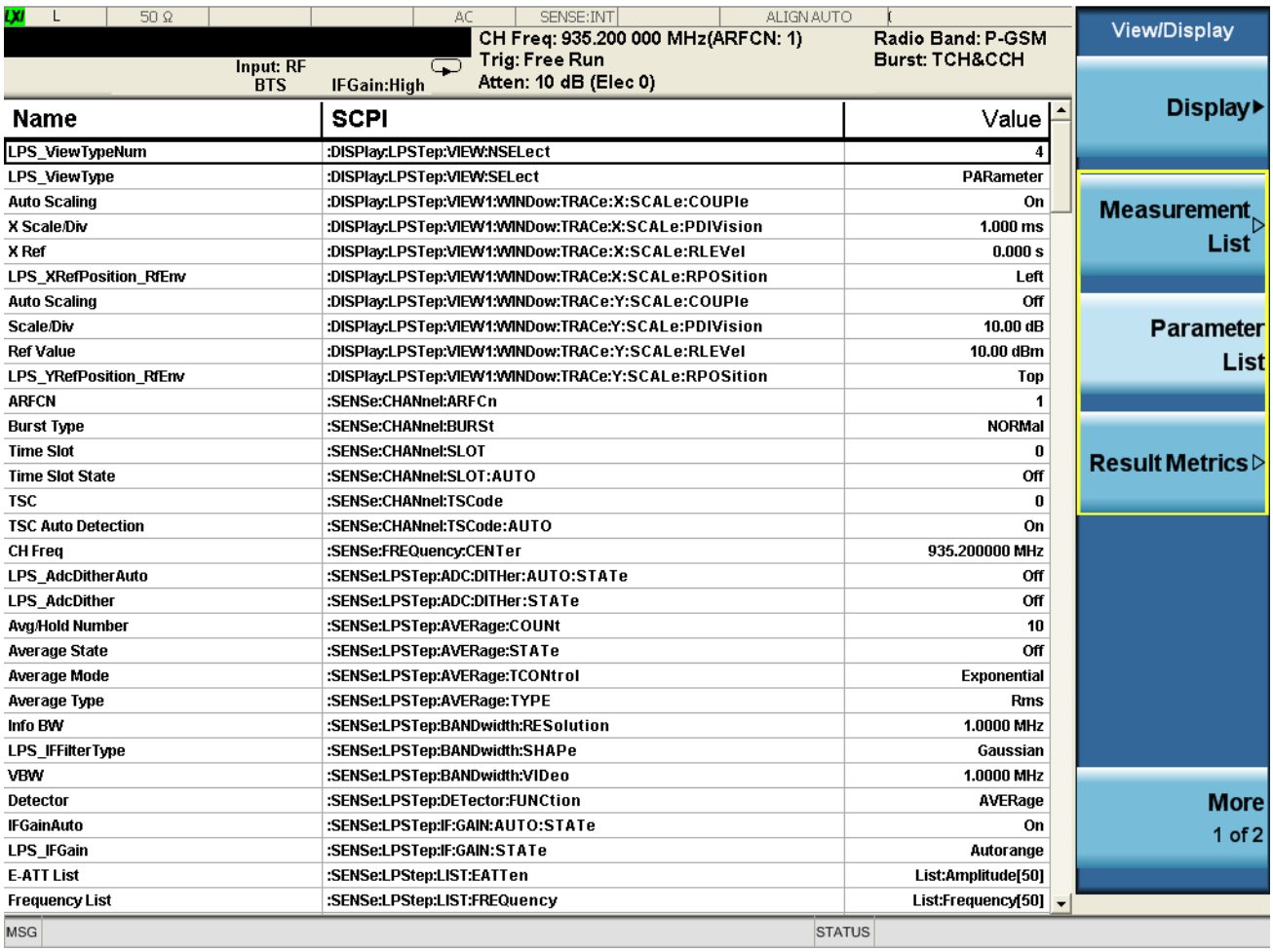
This view shows the results of currently enabled measurements.

If “Show All Items” parameter is enabled from the soft key, all available measurements and results are displayed. When a measurement is disabled, the measurement name and results for the disabled measurement are grayed out.



Parameter List

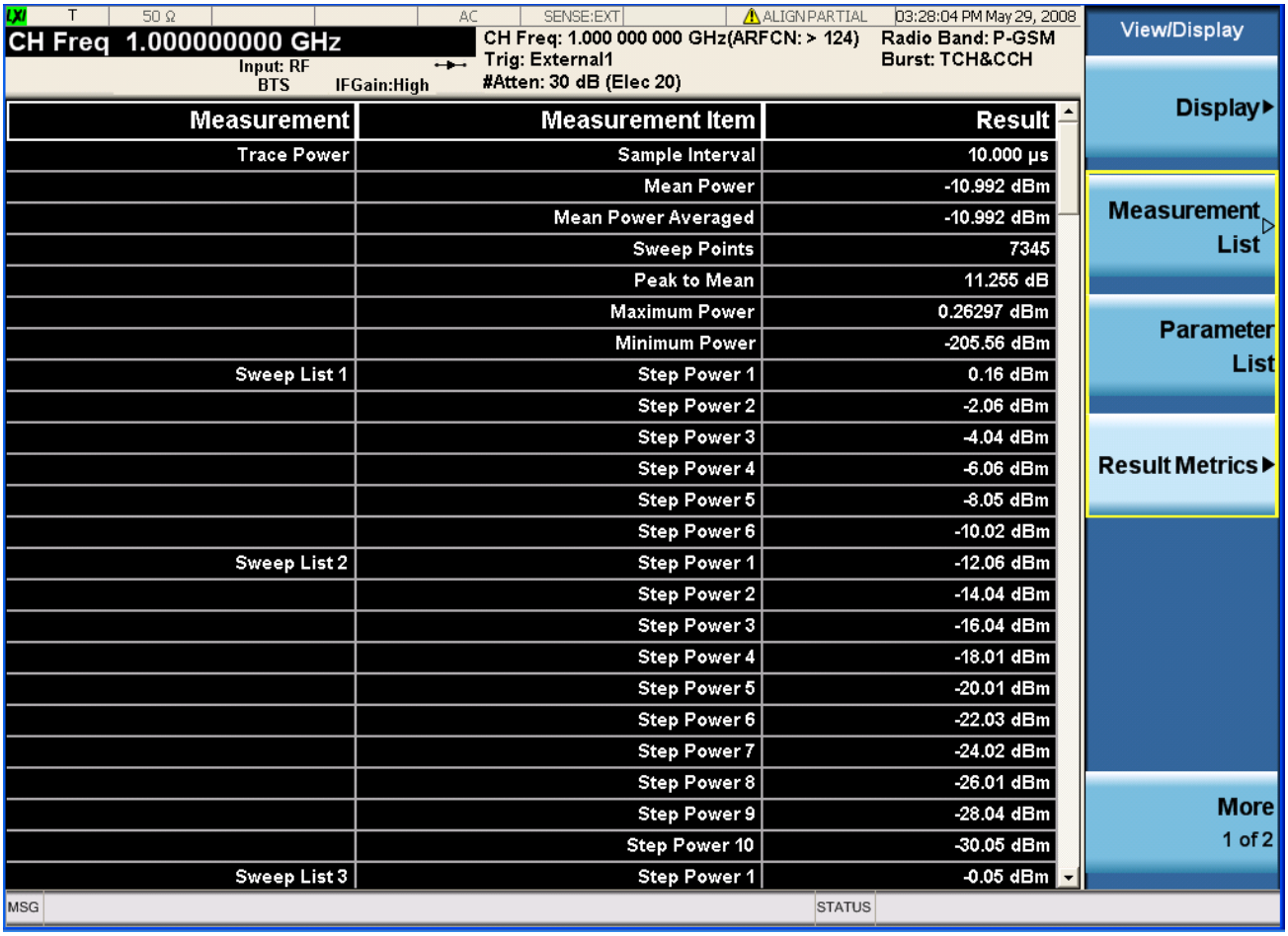
This screen shows the name, remote commands and values of all available commands for the current measurement. You can verify and change values in the table by using front panel keys or a mouse and keyboard.



Name	SCPI	Value
LPS_ViewTypeNum	:DISPlay:LPSTep:VIEW:NSELect	4
LPS_ViewType	:DISPlay:LPSTep:VIEW:SELect	PARameter
Auto Scaling	:DISPlay:LPSTep:VIEW1:WINDow:TRACe:X:SCALe:COUPle	On
X Scale/Div	:DISPlay:LPSTep:VIEW1:WINDow:TRACe:X:SCALe:PDIVision	1.000 ms
X Ref	:DISPlay:LPSTep:VIEW1:WINDow:TRACe:X:SCALe:RLEVel	0.000 s
LPS_XRefPosition_RfEnv	:DISPlay:LPSTep:VIEW1:WINDow:TRACe:X:SCALe:RPOSition	Left
Auto Scaling	:DISPlay:LPSTep:VIEW1:WINDow:TRACe:Y:SCALe:COUPle	Off
Scale/Div	:DISPlay:LPSTep:VIEW1:WINDow:TRACe:Y:SCALe:PDIVision	10.00 dB
Ref Value	:DISPlay:LPSTep:VIEW1:WINDow:TRACe:Y:SCALe:RLEVel	10.00 dBm
LPS_YRefPosition_RfEnv	:DISPlay:LPSTep:VIEW1:WINDow:TRACe:Y:SCALe:RPOSition	Top
ARFCN	:SENSe:CHANnel:ARFCn	1
Burst Type	:SENSe:CHANnel:BURSt	NORMal
Time Slot	:SENSe:CHANnel:SLOT	0
Time Slot State	:SENSe:CHANnel:SLOT:AUTO	Off
TSC	:SENSe:CHANnel:TSCode	0
TSC Auto Detection	:SENSe:CHANnel:TSCode:AUTO	On
CH Freq	:SENSe:FREQuency:CENTer	935.200000 MHz
LPS_AdcDitherAuto	:SENSe:LPSTep:ADC:DITHer:AUTO:STATe	Off
LPS_AdcDither	:SENSe:LPSTep:ADC:DITHer:STATe	Off
Avg/Hold Number	:SENSe:LPSTep:AVERage:COUNt	10
Average State	:SENSe:LPSTep:AVERage:STATe	Off
Average Mode	:SENSe:LPSTep:AVERage:TCONtrol	Exponential
Average Type	:SENSe:LPSTep:AVERage:TYPE	Rms
Info BW	:SENSe:LPSTep:BANDwidth:RESolution	1.0000 MHz
LPS_IFFilterType	:SENSe:LPSTep:BANDwidth:SHAPe	Gaussian
VBW	:SENSe:LPSTep:BANDwidth:VIDeo	1.0000 MHz
Detector	:SENSe:LPSTep:DETector:FUNCtion	AVERage
IFGainAuto	:SENSe:LPSTep:IF:GAIN:AUTO:STATe	On
LPS_IFGain	:SENSe:LPSTep:IF:GAIN:STATe	Autorange
E-ATT List	:SENSe:LPStep:LIST:EATTen	List:Amplitude[50]
Frequency List	:SENSe:LPStep:LIST:FREQuency	List:Frequency[50]

Result Metrics

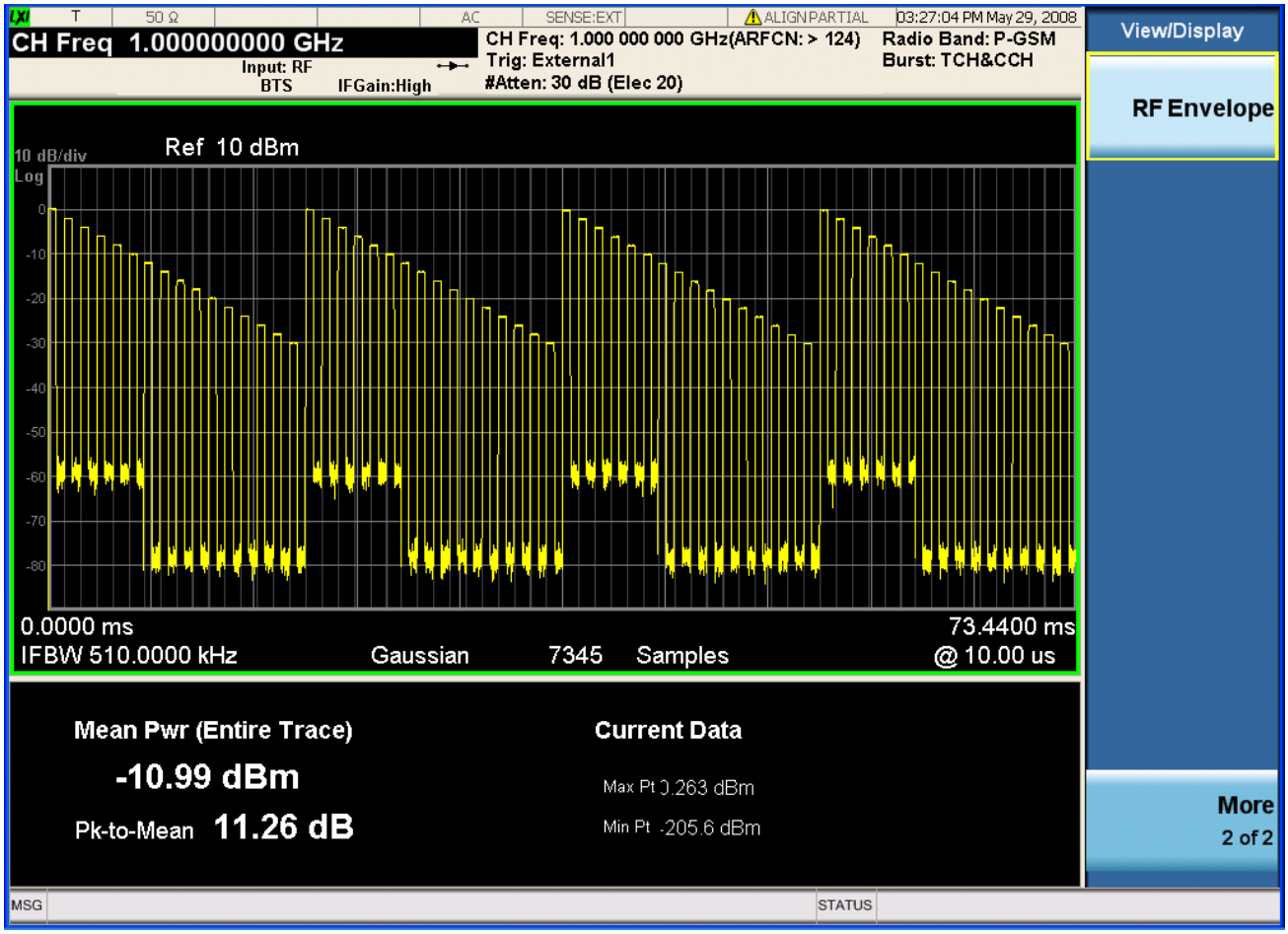
This screen displays measurement results in the same order as they are returned by the remote results(n=1) query.
See



Measurement	Measurement Item	Result
Trace Power	Sample Interval	10.000 µs
	Mean Power	-10.992 dBm
	Mean Power Averaged	-10.992 dBm
	Sweep Points	7345
	Peak to Mean	11.255 dB
	Maximum Power	0.26297 dBm
	Minimum Power	-205.56 dBm
Sweep List 1	Step Power 1	0.16 dBm
	Step Power 2	-2.06 dBm
	Step Power 3	-4.04 dBm
	Step Power 4	-6.06 dBm
	Step Power 5	-8.05 dBm
	Step Power 6	-10.02 dBm
Sweep List 2	Step Power 1	-12.06 dBm
	Step Power 2	-14.04 dBm
	Step Power 3	-16.04 dBm
	Step Power 4	-18.01 dBm
	Step Power 5	-20.01 dBm
	Step Power 6	-22.03 dBm
	Step Power 7	-24.02 dBm
	Step Power 8	-26.01 dBm
	Step Power 9	-28.04 dBm
	Step Power 10	-30.05 dBm
Sweep List 3	Step Power 1	-0.05 dBm

RF Envelope

This view shows a time-domain magnitude trace that is connected multiple gated sweeps by setting of List Setup parameters. The gray vertical bars show the calculation period of related power results.



Trace Window

Corresponding Trace	yellow – n=2

Results Window

Name	Corresponding Results	Display Format
Meas Pwr (Entire Trace)	n=1 2nd Meas power across the entire trace in dBm	XX.XX dBm
Pk-to-Mean	n=1 5th The ratio of the maximum signal level to the mean power in dB.	XX.XX dB

Current Data Max	n=1 6th Maximum value of the most recently acquired data in dBm	XX.XX dBm
Current Data Min	n=1 7th Minimum value of the most recently acquired data in dBm	XX.XX dBm

View Selection Remote Commands

Allows you to select the desired measurement view from the following selections:

- MLISt – Measurement List view
- PARameter – Parameter List view
- RESult - Result Metrics view
- RFENvelope - RF Envelope view

Key Path	**View/Display**
Mode	WCDMA, GSM
Remote Command	`:DISPlay:LPSTep:VIEW[:SELect] MLISt|PARameter|RESult|RFENvelope` `:DISPlay:LPSTep:VIEW[:SELect]?`
Example	DISP:LPST:VIEW RES DISP:LPST:VIEW?
Preset	RESult
State Saved	Saved in instrument state.
Range	Measurement List|Parameter List|Result Metrics|RF Envelope
Instrument S/W Revision	Prior to A.02.00

Show All Items

Allows you to specify display settings of the Measurement List view. In default (OFF), the current status of enabled measurements, items, limit settings and pass fail states are displayed.

Key Path	**View/Display, Measurement List**
Mode	GSM
Preset	OFF
State Saved	Saved in instrument state.
Range	On|Off
Instrument S/W Revision	Prior to A.02.00

Index

Allows you to specify an index of array for editing the value of specified index. This key only appears when a list type of SCPI is selected on Parameter List view. Maximum number of this index corresponds to the length of selected SCPI.

Key Path	**View/Display, Parameter List**

Mode	GSM
Instrument S/W Revision	Prior to A.02.00

Value

Allows you to edit the value of selected SCPI on Parameter List view.

Key Path	**View/Display, Parameter List**
Mode	GSM
Instrument S/W Revision	Prior to A.02.00

Result Type

Allows you to choose type of power displayed in the Result Metrics view.

Key Path	**Diplay/View, Result Metrics**
Mode	WCDMA, GSM
Remote Command	`:DISPlay:LPSTep:VIEW:RESType RMS|MAXimum|MINimum` `:DISPlay:LPSTep:VIEW:RESType?`
Example	DISP:LPST:VIEW:REST MAX DISP:LPST:VIEW:REST?
Preset	RMS
State Saved	Saved in instrument state.
Range	RMS|Max|Min
Instrument S/W Revision	Prior to A.02.00